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MARINE CORPS TM 11773A-OI/1
NAVY 7610-LL-L1A-0025**

TECHNICAL MANUAL

**FIELD AND SUSTAINMENT MAINTENANCE MANUAL INCLUDING REPAIR
PARTS AND SPECIAL TOOLS LIST**

FOR

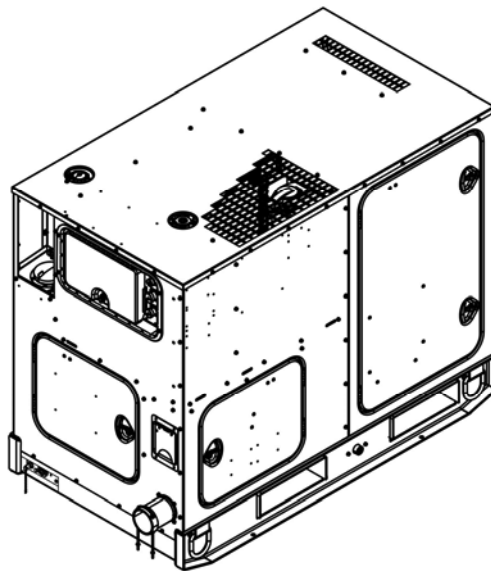
**GENERATOR SET, SKID MOUNTED
15KW ADVANCED MEDIUM MOBILE POWER SOURCES
(AMMPS)**

MEP-1050, 50/60 Hz

(NSN: 6115-01-561-7634) (EIC: N/A)

MEP-1051, 400 Hz

(NSN: 6115-01-561-7674) (EIC: N/A)



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**HEADQUARTERS, DEPARTMENTS OF
THE ARMY, AIR FORCE, NAVY, AND
HEADQUARTERS, US MARINE CORPS**

1 JULY 2011

PCN 184 117731 00

WARNING SUMMARY

FIRST AID

For First Aid information, refer to Field Manual (FM) 4-25.11.



5

5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK:

1

Do not try to pull or grab the individual.

2

If possible, turn off the electrical power.

3

If you cannot turn off the electrical power, pull, push, or lift the person to safety using a dry wooden pole, dry rope, or some other insulating material.

4

Send for help as soon as possible.

5

After the injured person is free of contact with the source of electrical shock, move the person a short distance away. Immediately start artificial respiration if necessary.

The Warning Summary summarizes critical safety and hazardous material warnings that must be understood and applied during operation and maintenance of the Advanced Medium Mobile Power Sources (AMMPS) generator sets.

- These warnings are important.
- Study and understand all warnings.
- These warnings can save your life and the lives of personnel with whom you work.
- Some general warnings found in the Warning Summary will not be repeated within the Technical Manual (TM).
- Specific warnings will be listed above the task or paragraph to which they apply.

Operation and maintenance of the AMMPS generator set contains many possibilities for injury or death to personnel. Be sure to be familiar with general first aid procedures as references in FM 4-25.11, First Aid.

WARNING ICONS

The following icons are used in conjunction with warnings so that you do not miss important information. They are not meant to be a substitute for reading the warnings, but they give graphic descriptions of danger.



EAR PROTECTION — Headphones over ears shows that noise level will harm ears.



ELECTRICAL — Electrical wire to arm with electricity symbol running through human body shows that life-threatening shock hazard is present.



ELECTRICAL — Electrical wire to hand with electricity symbol running through hand shows that shock hazard is present.



FLYING PARTICLES — Objects striking person shows that the material presents a danger to life or health.



HEAVY OBJECT — Human figure stooping over heavy object shows physical injury potential from improper lifting technique.



HEAVY PARTS — Heavy object on human figure shows that heavy parts present a danger to life or limb.



HIGH PRESSURE — Human hand being penetrated by high pressure shows system pressures present a danger to life or limb.



HOT AREA — Hand over object radiating heat shows that equipment is hot and can burn.



MOVING PARTS — Human figure with an arm caught between the gears shows that the larger moving parts of the equipment present a danger to life or limb.



MOVING PARTS — Hand with fingers caught between gears shows that the smaller moving parts of the equipment present a danger to life or limb.



SHARP OBJECT — Human hand being punctured shows equipment presents a danger to life or limb.

WARNING DESCRIPTIONS

WARNING



Electrical

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- High voltage is produced when this generator set is in operation. Do not contact output cables when operating this generator set. Failure to comply may cause injury or death to personnel.
- High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that soldiers working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.
- High voltages may be present at the generator terminals when unit is rotating. Tools, equipment, clothing, and your body must be kept clear of rotating parts and electrical connections. Special precautions must be taken during troubleshooting because protective covers and safety devices may be removed or disabled to gain access and perform tests. Use extreme caution. Failure to comply may cause injury or death to personnel by electrocution.

WARNING**Electrical — Continued.**

- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator set is running. Failure to comply may cause injury or death to personnel.
- Dangerously high voltage can exist across Current Transformer (CT) output with engine operating. CT can explode if disconnected from load with engine running. Do not disconnect CT with Alternating Current (AC) generator rotating. Failure to comply may cause injury or death to personnel by electrocution.
- Shut down generator sets before performing inspection of load cables. Failure to comply may cause injury or death to personnel by electrocution.
- Power is available to the convenience receptacle only when the main contactor is closed. Avoid accidental contact. Electrocution is possible. Failure to comply may cause injury or death to personnel.
- Ensure equipment/vehicles being used to jump-start the generator set are not touching. Touching of metal surfaces can cause improper grounding. Do not allow the cable ends to touch each other or any part of the generator set/vehicle/equipment other than the North Atlantic Treaty Organization (NATO) slave receptacle. Failure to comply may cause injury or death to personnel.
- NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main Direct Current (DC) circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.
- DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.
- The right-hand battery negative lead that connects directly to the grounding stud must be disconnected prior to disconnecting or removing batteries. Follow procedural steps in exact order given for removal and installation. Failure to comply may cause injury or death to personnel.
- Ensure the frequency of any device powered by the GFCI convenience receptacle matches the frequency of the generator set. Failure to comply can cause serious injury or death to personnel.

WARNING



Heat

- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- When operating, winterization heater has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow heater to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Wear heat resistant gloves and avoid contacting hot metal surfaces with hands and exposed skin after components have been heated. Wear additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Top and some housing panels can get very hot. Allow panels to cool down before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Allow engine to cool from normal operating temperature prior to draining engine oil and removing oil filter. Failure to comply may cause injury or death to personnel.
- A turbocharger may become very hot and requires more time to cool down than other parts of engine assembly. Shut down generator set and allow it to cool sufficiently before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

WARNING



Jewelry/Clothing

- Metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry and do not wear loose clothing when working on equipment. Failure to comply may cause injury or death to personnel.
- While inspecting the operation of the generator set, do not inadvertently reach into the generator set. Failure to comply can cause injury or death to personnel.

WARNING



Lifting

- Comply with all lifting requirements. Observe the decals on equipment and parts that identify the weight and determine if assistance is needed. Maximum lift is 37 lb (16.8 kg) for one person, 74 lb (33.6 kg) for two persons, and 101 lb (45.8 kg) for three persons. Failure to comply may cause injury or death to personnel.
- When lifting the engine, use lifting equipment with minimum lifting capacity of 500 pounds (lb) (227 kilograms (kg)). Do not stand or put arms, legs, or any body part under hoisted load. Do not permit engine to swing while hoisted. Failure to comply may cause injury or death to personnel.
- When lifting generator set, use lifting equipment with minimum lifting capacity of 1000 lb (453.6 kg). Do not stand or put arms, legs, or any body part under hoisted load. Do not permit generator set to swing. Failure to comply may cause injury or death to personnel.
- AC generator assembly weighs approximately 252 – 262 lb (114 – 119 kg). Use suitable lifting device with capacity to lift the weight of assembly. Do not stand or put arms, legs, or any body part under hoisted load. Failure to comply may cause injury or death to personnel.
- When lifting generator set, use lifting equipment with minimum lifting capacity of 1100 lb (500 kg). Do not stand or put arms, legs, or any body part under hoisted load. Do not permit generator set to swing. Failure to comply may cause injury or death to personnel.
- Engine assembly weighs approximately 355 lb (161 kg). Use suitable lifting device with the capacity to lift the weight of the engine assembly. Failure to comply may cause injury or death to personnel.

WARNING



Operating

Starting engine when the unit is partially disassembled is dangerous. Run the engine in this condition only as long as required to test operation. Keep away from unprotected moving engine parts during operation. Failure to comply may cause injury or death to personnel.

WARNING



Sharp Object

- Cooling fan has sharp blades. Use caution and wear gloves when removing or installing fan. Failure to comply may cause injury or death to personnel.
- The surface of the charge air cooler may contain sharp edges. Handle with care. Failure to comply may cause injury or death to personnel.

HAZARDOUS MATERIALS ICONS



CHEMICAL — Drops of liquid on hand shows that the material will cause burns or irritation to human skin or tissue.



EXPLOSION — Rapidly expanding symbol shows that the material may explode if subjected to high temperatures, source of ignition or high pressure.



EYE PROTECTION — Person with goggles shows that the material will injure the eyes.



FIRE — Flame shows that a material may ignite and cause burns.



POISON — Skull and crossbones shows that a material is poisonous or is a danger to life.



VAPOR — Human figure in a cloud shows that material vapors present a danger to life or health.

HAZARDOUS MATERIALS WARNING DESCRIPTIONS

There is a potential risk that soldiers and other users may be exposed to chemical substances and diesel engine exhaust during the operation, maintenance, and repair of the AMMPS generator sets.

Potential sources of chemical substances include fuels, oils, lubricants, paints, cleaners/solvents, engine coolant fluids, cold start fluid, fire extinguishing agents, battery acid/chemicals, and miscellaneous chemicals used during the setup/operation/maintenance and sustainment throughout the life-cycle of the AMMPS generator sets.

WARNING



This manual describes physical and chemical processes that may require the use of chemicals, solvents, paints, or other commercially available material. Users of the manual should obtain the Material Safety Data Sheets (MSDS) (Occupational Safety and Health Act (OSHA) Form 20 or equivalent) from the manufacturers or suppliers of materials to be used. Failure to comply with all procedures, recommendations, warnings and cautions for safe use, handling, storage, and disposal of these materials may result in serious injury or death to personnel.

Batteries

- Battery acid can cause burns to skin and cause eye injury. Wear safety goggles and chemical gloves and avoid acid splash while working on the batteries. Failure to comply may cause injury or death to personnel.
- Batteries give off combustible gas. Do not smoke or use open flame when performing maintenance. Failure to comply may cause injury or death to personnel and damage to equipment.
- Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.
- Lifting batteries may cause back strain. Ensure proper lifting techniques are used when lifting batteries. Failure to comply may cause injury or death to personnel.

WARNING



Cleaning

- Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.
- Engine cooling system cleaning compound MIL-C-10597 will not be used as a routine maintenance procedure each time antifreeze is added or drained from the cooling system. The compound will be used only when necessary to clean heavily rusted or partially clogged cooling systems. Failure to comply may cause injury or death to personnel.
- Engine cleaning compound MIL-C-10597 for cooling systems is designed to clean the interiors of cooling systems, to neutralize residual cleaning acids, and to coat the interiors with a silicate. Failure to comply may cause injury or death to personnel.

WARNING



Exhaust

- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- Hot exhaust gases can ignite combustible materials. Allow room for safe discharge of hot gases. Failure to comply may cause injury or death to personnel.
- Exhaust gases are most dangerous in places with poor ventilation. The best defense against exhaust gas poisoning is very good ventilation. To protect yourself and others, always obey the following rules:
 - Do not run engine indoors unless you have very good ventilation.
 - Do not idle engine for a long time unless there is very good ventilation.
 - Be alert at all times. Check for smell of exhaust fumes.
 - Failure to comply may cause injury or death to personnel.
- Exhaust gas poisoning causes dizziness, headache, loss of muscle control, sleepiness, coma, and death. If anyone shows signs of exhaust gas poisoning, get all personnel clear of AMMPS. Make sure they have lots of fresh air. Keep them warm, calm, and inactive. Get medical help. If anyone stops breathing, give artificial respiration. Failure to comply may cause injury or death to personnel.

WARNING



Eye

- Flying debris or material may enter eyes or strike the face. Wear appropriate eye/face protection while performing maintenance tasks. Failure to comply may cause injury or death to personnel.
- Eye protection is required when working with compressed air. Do not use compressed air to clean skin. Do not aim at personnel. Compressed air can propel particles at high velocity and injure eyes. Failure to comply may cause injury or death to personnel.

WARNING



Fuel

- Never inject fuel near a fire source. Atomized fuel is highly combustible. Fuel pressure is high enough to penetrate skin. Ensure that spray from the injector nozzle is directed away from all personnel. Direct contact with spray can cause skin cell destruction and blood poisoning. Skin and eye protection are required when working in contact with fuel. Failure to comply may cause injury or death to personnel and damage to equipment.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.
- Fuels used in the generator set are combustible. When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to ESD. Fire and possible explosion may occur. Failure to comply may cause injury or death to personnel.
- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change soaked clothing promptly if exposed to fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (fuel fill static ground). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate Electrostatic Discharge (ESD). Fire and possible explosion can result. Failure to comply may cause injury or death to personnel.
- Do not operate generator set if any fuel leaks are present. Fuel is combustible. Always perform PMCS before operation. Failure to comply may cause injury or death to personnel.
- Make sure engine control switch is only set to PRIME & RUN during fuel system checks. Failure to comply may cause injury or death to personnel.

WARNING



Fuel — Continued.

- Hot engine surfaces from engine and generator circuitry are possible sources of ignition. When hot refueling during unit operation with DF-1, DF-2, JP5, or JP8, avoid fuel splash and fuel spill.
- Do not smoke or use open flame when performing refueling. Remember PMCS are still required. Flames and possible explosion may result. Failure to comply may cause injury or death to personnel.

WARNING



High Temperature/Pressure

- Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.
- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.
- Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.

WARNING



Noise

Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.

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Original 1 July 2011

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HEADQUARTERS,
DEPARTMENTS OF THE ARMY, AIR FORCE,
NAVY, AND HEADQUARTERS, US MARINE CORPS
WASHINGTON, D.C., 1 JULY 2011

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FIELD AND SUSTAINMENT MAINTENANCE MANUAL INCLUDING
REPAIRS PARTS AND SPECIAL TOOLS LIST
FOR
GENERATOR SET, SKID MOUNTED
15KW ADVANCED MEDIUM MOBILE POWER SOURCES (AMMPS)
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(NSN: 6115-01-561-7634) (EIC: N/A)
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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes, or if you know of a way to improve the procedures, please let us know. Reports, as applicable by the requiring Service, should be submitted as follows:

- (a) (A) Army — Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) located in the back of this manual, directly to: Commander, U.S. Army CECOM Life Cycle Management Command (LCMC) and Fort Monmouth, ATTN: AMSEL-LC-LEO-E-CM, Fort Monmouth, NJ 07703-5006. You may also send in your recommended changes via electronic mail or by fax. Our fax number is 732-532-1556, DSN 992-1556. Our e-mail address is MONM-AMSELLEOPUBSCHG@conus.army.mil. Our online web address for entering and submitting DA Form 2028s is <http://edm.monmouth.army.mil/pubs/2028.html>.
- (b) (MC) Marine Corps — Submit notice of discrepancies or suggested changes on a NAVMC 10772. The NAVMC may be submitted via the Internet using URL: <http://192.156.19.109/ar/mcefs.nsf>. Once the form is completed click on file in the tool bar at top of screen, scroll to "Send" and select "Page by email", and enter SMB.LOG.Tech.Pubs.fct@usmc.mil, this will come in to the Pubs Sections mailbox. This method of submittal does not require a Common Access Card (CAC) to access the form. The <https://pubs.ala.usmc.mil/front.htm> URL will allow access to the Albany Publications web site where the form can be filled out and be submitted by electronic mail to mbmatcommarlogbases@logcom.usmc.mil. A paper copy NAVMC 10772 can be mailed in an envelope addressed to Commander, Marine Corps Systems Command (LOG/TP), 814 Radford Blvd, Suite 20343, Albany, GA 31704-0343. Problems or questions regarding the NAVMC 10772 program should be reported by calling DSN 567-7628, DSN 567-6439 or DSN 567-5017.
- (c) (N) Navy — By letter directly to Commander, Space and Naval Warfare Systems Command, ATTN: SPAWAR 8122, Washington, DC 20363-5100.
- (d) (F) Air Force — By Air Force AFTO Form 22 TM Change Recommendation and Reply in accordance with paragraph 6-5, Section VI, TO 00-5-1 directly to prime ALC/MST.

A reply will be furnished to you.

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Glossary
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HOW TO USE THIS MANUAL

This manual contains field and sustainment maintenance instructions with Repair Parts and Special Tools List (RPSTL) for the 15 kW AMMPS skid-mounted generator sets, Mobile Electric Power (MEP)-1050 and MEP-1051.

This field and sustainment maintenance manual is part of a family of manuals which includes an operator's manual (TM 9-6115-751-10), an operator and field maintainer manual with Repair Parts and Special Tools List (RPSTL) for Power Units (PU) and Power Plants (PP) (TM 9-6115-757-13&P), and a National Maintenance Work Requirement (NMWR) maintenance manual (NMWR 9-6115-751).

NOTE

Throughout the family of manuals, generator set directional orientation is described from the point of view of the operator facing the operator's controls looking out over the generator set. From this perspective, the end of the generator set containing the operator's controls will be referred to as the rear of the generator set.

Manual Overview

This field and sustainment maintenance manual provides troubleshooting, PMCS, maintenance, parts information, and supporting information required to maintain and repair the AMMPS 15 kW generator set. Listed below are some of the features included in this TM to help locate and use the provided information.

WORK PACKAGES (WPs)

This TM has been organized using the WP concept. Each chapter contains a series of WPs rather than sections and paragraphs. Each WP is designed to stand alone as a complete information module. If you keep your section(s) of this TM in a loose-leaf binder, you will be able to remove just the WP needed to complete a specific task.

Each WP is numbered using a four-digit number beginning with WP 0001. WPs are numbered sequentially throughout the TM (e.g. WP 0022, WP 0023, etc.). The Table of Contents lists each chapter and WP title, as well as all figures and tables contained within each WP. Figures and tables are numbered sequentially within each WP.

The WP number is located at the top right of each page. It is also located at the bottom of the page with the WP page number included (0001-1 would be page 1 of the General Information WP (WP 0001, General Information)).

Each WP starts on a right-hand page. This is done so you can remove a single WP from the paper TM if needed for a task. Blank pages are assigned a number, but it appears on the preceding or following page. For example, if page 0001-10 of a WP is blank, page 0001-9 will have the number 0001-9/10 blank; or if page 0001-1 of a WP is blank, page 0001-2 will have the number 0001-1 blank/2.

Each task within a maintenance or troubleshooting WP contains step-by-step procedures and will end with the words END OF TASK, and each WP ends with the statement END OF WORK PACKAGE. Think of each WP as a small, stand-alone TM.

References to equipment placarding are printed as they appear on the equipment whenever possible. On-screen text is shown in brackets in the manual (i.e. [Ready to Crank]).

Warnings, Cautions, and Notes Definitions

Warning, caution, and note headings, chapter titles, and paragraph headings are printed in bold type. Multiple warning, caution, or note paragraphs may appear above a procedure, task, or step with one warning, caution, or note heading. Prior to starting a WP, all warnings included in the WP should be reviewed, understood, and followed. Review the materials/parts in the initial setup of the WP for any hazardous materials used during maintenance of the equipment. Then refer to the detailed warnings for hazardous materials in the Warning Summary. Make sure to read all warnings within referenced WP that are required to complete tasks.

WARNING

Warning highlights an essential operating or maintenance procedure, practice, condition, statement, etc., which, if not strictly observed, could result in injury to, or death of, personnel or long-term health hazards.

CAUTION

Caution highlights an essential operating or maintenance procedure, practice, condition, statement, etc., which, if not strictly observed, could result in damage to, or destruction of, equipment or loss of mission effectiveness.

NOTE

Note highlights an essential operating or maintenance procedure, condition, or statement.

TM CONTENT

Front Matter

The front cover of the manual identifies the exact model(s) covered by this manual. Be certain the generator set you are working on is covered by the information in the manual. Additional manuals will be required to provide information on models not covered by this manual.

The List of Effective Pages/Work Packages provides a list of pages/WPs that have been modified from a previous edition of the manual.

The Table of Contents will help you understand the organization of the manual. The overall Table of Contents in the front of the manual directs you to chapters and lists all WPs in the manual with tables and figures identified for each WP. The chapters contain descriptive information, maintenance procedures organized by maintenance level, and supporting data. Each chapter is divided into WPs with titles that describe the information or procedure in the WP. Each chapter contains its own chapter index that lists all the WPs within the chapter to help you find information.

Chapter 1 – General Information, Equipment Description, and Theory of Operation

The General Information WP (WP 0001, General Information) provides general information including characteristics, capabilities, features, and theory of operation for the AMMPS and its major components. It contains a nomenclature cross-reference list, a list of abbreviations and acronyms used in this TM, general information about this manual, and the related forms and records. Instructions are provided for making equipment improvement and recommendations. Coverage includes a reference to the manual that contains instructions on destruction of materiel to prevent enemy use.

The Equipment Description and Data WP (WP 0002, Equipment Description and Data) describes the characteristics, capabilities, and features of the generator set and provides information on location and description of major components.

The Theory of Operation WP (WP 0003, Theory of Operation) provides an overview of the operation of the generator set.

Chapter 2 – Field Maintenance Troubleshooting

The AMMPS generator set provides electronic troubleshooting through the Digital Control System (DCS). If a malfunction occurs or is about to occur to a component monitored by the DCS, a fault or warning code is displayed on the DCS screen at the rear of the generator set. This fault and warning information, along with manual troubleshooting guidelines, provide a comprehensive level of information to identify problems that may occur with the generator set and minimize downtime for repair.

An index organized by system (WP 0004, Troubleshooting Index) linking potential problems to troubleshooting WPs is provided for a quick reference.

The Operational Checkout WP (WP 0005, Operational Checkout) provides procedures to ensure the AMMPS generator set is capable of performing as required and provides corrective action steps to take if it is not.

The warnings and fault codes displayed on the DCS screen are identified in the Warning and Fault Codes WP (WP 0006, Warning and Fault Codes).

WP 0007 through 0013 are used to troubleshoot problems with the major systems of the generator set (engine, electrical system, winterization kit, etc.). See the Table of Contents for specific WP numbers and titles for each system.

Chapter 3 – Field Maintenance Instructions

The service procedures required to be performed when a generator set is first received in the field are described in the Service Upon Receipt WP (WP 0014, Service Upon Receipt).

Every generator set requires some periodic scheduled maintenance. The theory of the scheduled maintenance or PMCS is outlined in Field PMCS Introduction WP (WP 0015, Field PMCS Introduction). A detailed table to guide through the scheduled maintenance tasks is provided by Field PMCS WP (WP 0016, Field PMCS).

Detailed instructions for removal, installation, test, and adjustment of critical components (Line Replaceable Units (LRUs)) of the generator set are the subject of WPs 0017 through 0088. See the Table of Contents for specific WP numbers and titles for each LRU.

Each field maintenance WP begins with an initial setup table that contains information about the tools and equipment conditions, parts and supplies, reference WPs and manuals, and personnel required to perform each task.

Specific lubrication instructions are found in Lubrication Instructions WP (WP 0089, Lubrication Instructions).

If the design engineers responsible for the AMMPS generator set have specified a critical torque value for tightening fasteners, that value will be stated in the field maintenance WP for the appropriate LRU. Otherwise, information for nominal torque values of common U.S. standard units and metric hardware is provided in the Torque Limits WP (WP 0090, Torque Limits).

Chapter 4 – Sustainment Troubleshooting Procedures

All troubleshooting procedures for the AMMPS generator set will be handled at the field maintenance level.

Chapter 5 – Sustainment Maintenance Instructions

Maintenance tasks not specific to AMMPS generator sets but common to many types of equipment may be listed in the General Maintenance WP (WP 0095, General Maintenance).

Most maintenance tasks required above field maintenance level will be performed at NMWR level. However, detailed instructions for removal, installation, test, and adjustment of some critical components (LRU) of the generator set are the subject of WP 0096 through 0098. See the Table of Contents for specific WP numbers and titles for each LRU.

Large size electrical diagrams and drawings, such as schematics, are found in the Foldout Pages (Foldout Pages) section in Rear Matter.

Chapter 6 – Parts Information

The Repair Parts and Special Tools List (RPSTL) contains parts that support both field and sustainment maintenance. This chapter covers WPs 0100 through 0160. The repair parts lists (WP 0100 through WP 0156) itemize all available parts required to maintain and repair the generator set.

The Special Tools List WP (WP 0158, Special Tools List) provides information on special tools, special Test, Measurement, and Diagnostic Equipment (TMDE), and other special support equipment authorized for maintenance of the AMMPS generator set. Bulk items (WP 0157, Bulk Item), National Stock Numbers (NSN) (WP 0159, National Stock Number (NSN) Index), and Part Number (P/N) (WP 0160, Part Number Index) indexes also are included in this chapter.

Chapter 7 – Supporting Information

The supporting information chapter provides the Maintenance Allocation Chart (MAC) (WP 0161, Maintenance Allocation Chart (MAC)) that lists the proper level of maintenance where critical tasks are to be performed. The MAC also provides a list of all tools, kits, and test equipment, both special and common, required to maintain the AMMPS 15 kW generator set.

Other WPs found in this chapter list commonly used supplies (WP 0163, Expendable and Durable Items List) and referenced material (WP 0160, References) used throughout this TM

Rear Matter

Rear Matter includes a Glossary to define terms and phrases which are uncommon and not identified within the manual or within a standard dictionary.

The Department of Army (DA) Form 2028, Recommended Changes to Publications and Blank Forms (DA Form 2028) is the document to be submitted to correct errors found in the manual or to make recommended changes that will improve the manual.

Large size electrical diagrams and drawings, such as schematics, are located in the Foldout Pages (Foldout Pages) section at the rear of this manual.

Rear Matter also provides a conversion chart between SAE and metric values.

CHAPTER 1

**GENERAL INFORMATION, EQUIPMENT DESCRIPTION,
AND THEORY OF OPERATION
FOR
AMMPS 15KW GENERATOR SET**

CHAPTER 1

GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND THEORY OF OPERATION

WORK PACKAGE INDEX

<u>Title</u>	<u>WP Sequence No.</u>
GENERAL INFORMATION.....	0001
EQUIPMENT DESCRIPTION AND DATA.....	0002
THEORY OF OPERATION.....	0003

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
GENERAL INFORMATION**

SCOPE

This field and sustainment maintenance including repair parts and special tools list TM contains instructions for troubleshooting and maintaining the AMMPS 15 kW generator set.

Type of Manual

Field and sustainment maintenance manual including repair parts and special tools list.

Model Number(s) and Equipment Name(s)

AMMPS 15 kW 50/60 and 400 hertz (Hz) generator set, skid mounted (Table 1):

Table 1. Model Numbers and Equipment Names.

MODEL	HERTZ	NSN
MEP-1050	50/60	6115-01-561-7634
MEP-1051	400	6115-01-561-7674

Purpose of Equipment

The AMMPS 15 kW generator set is designed to provide tactical, quiet Alternating Current (AC) power in a combat setting. The generator set is designed for ease of transportation, operation, and maintenance. The Yanmar 4TNV84T-BMCU engine supplied with the AMMPS 15 kW generator set eliminates wet stacking problems.

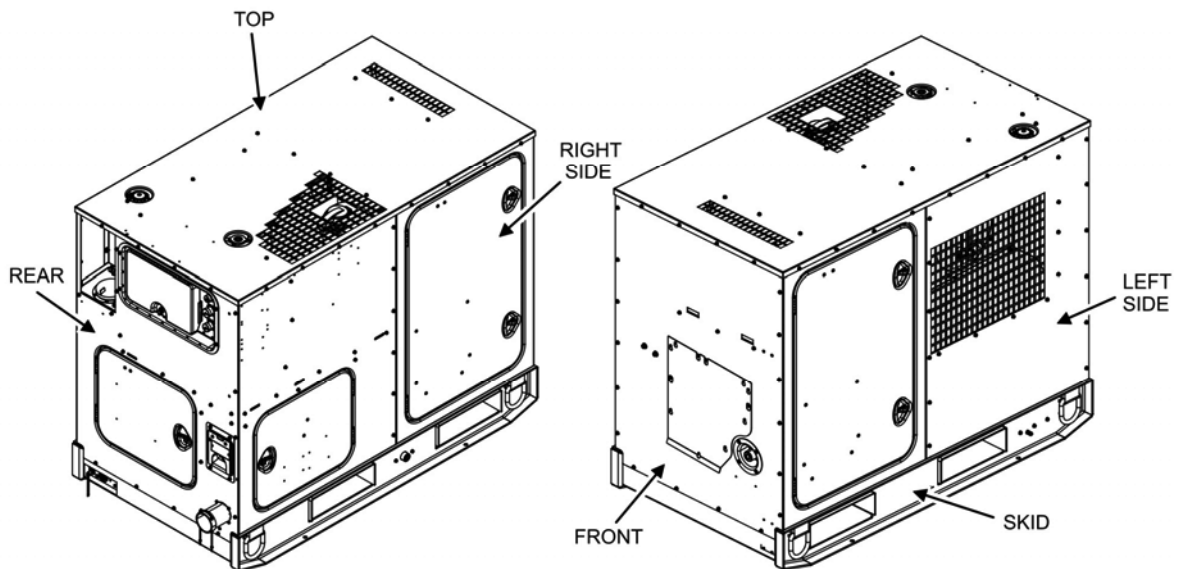


Figure 1. Skid-Mounted 15 kW AMMPS Generator Set.

MAINTENANCE FORMS, RECORDS, AND REPORTS

- (1) (Army). Department of the Army forms and procedures used for equipment maintenance will be those prescribed by (as applicable) DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual; DA PAM 738-751, Functional Users Manual for the Army Maintenance Management System – Aviation (TAMMS-A); or AR 700-138, Army Logistics Readiness and Sustainability.
- (2) (Marine Corps). Maintenance forms and records used by Marine Corps personnel are prescribed by TM 4700-15/1.
- (3) (Air Force). Maintenance forms and records used by Air Force personnel are prescribed in AFI 21-101 and the applicable TO 00-20, Series of Technical Orders.
- (4) (Navy). Navy users should refer to their service peculiar directives to determine applicable maintenance forms and records to be used.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

(1) (Army). If your equipment needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. If you have Internet access, the easiest and fastest way to report problems or suggestions is to follow the instructions and links below:

If you have a user's account, you can submit the PQDR for ALL CECOM (B16) Warranty, EIR, and PQDRs (including those B16 Aviation related) through the Navy's Web Product Quality Deficiency Reporting (PQDR) site, <http://www.nslcptsmh.csd.disa.mil/webpqdr/webpqdr.htm>. If you do not, either go to EZPQDR, <http://www.nslcptsmh.csd.disa.mil/webpqdr/files/ezpqdr.htm> and input your PQDR there, or establish a new account. New accounts can be established at the following address: <http://www.nslcptsmh.csd.disa.mil/accessforms/uarform.htm>.

CECOM (B16) aviation PQDRs will not go to AMCOMs Joint Deficiency Reporting System (JDERS). If AMCOM should get a CECOM aviation PQDR, they will redirect it to the CECOM PQDR Team.

Use the PQDR for Warranties, EIRs, and PQDRs. There is a block on the PQDR that can be clicked if it is a Warranty. The originator can still put in the description that they want this investigated as an EIR and then enter what the issue is.

You may also submit your SF 368 (Product Quality Deficiency Report) via email (MONM-AMSELLEODCSCFO@CONUS.ARMY.MIL), facsimile (732-532-2929), or regular mail (call 732-532-8843 for the current mailing address).

We will send you a reply.

- (2) (Air Force). Air Force personnel are encouraged to submit EIRs IAW Air Force Regulation (AFR) 900-4.
- (3) (Navy). Navy personnel are encouraged to submit EIRs through their local Beneficial Suggestion Program.
- (4) (Marine Corps). QDR shall be reported on SF 368 IAW MCO P4855.10, Product Quality Deficiency Report Manual. Submit to Commanding General, Marine Corps Logistics Base (Code 850), Albany, Georgia 31704-5000. A reply will be furnished to you.

CORROSION PREVENTION AND CONTROL (CPC)

Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.

Corrosion specifically occurs with metals. It is an electrochemical process that causes the degradation of metals. It is commonly caused by exposure to moisture, acids, bases, or salts. An example is the rusting of iron. Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking.

Plastics, composites, and rubbers can also degrade. Degradation is caused by thermal (heat), oxidation (oxygen), solvation (solvents), or photolytic (light, typically Ultraviolet (UV)) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling, and/or breaking. SF 368, Product Quality Deficiency Report, should be submitted to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

For aircraft TMs, this information shall include a reference to TM 1-1500-344-23, volumes 1 through 4 (Cleaning and Corrosion Control).

OZONE-DEPLETING SUBSTANCES (ODS)

The use of Class 1 Ozone-Depleting Substances (ODS) for new acquisitions has been curtailed by Section 326 of the National Defense Authorization Act of Fiscal Year 1993 (Public Law 102, 484) and related Army policy. ODS are listed in Title VI of the Clean Air Act. For systems procured and fielded prior to the effectiveness of the above law (June 1993) that use a Class 1 ODS, a listing of those substances required to operate and maintain the system shall be included in the TM. This requirement applies to any system procured or fielded after June 1993 that requires the use of a Class 1 ODS, where the use of the ODS has been properly documented and waived. The procuring activity will provide a list of Class 1 ODS on request.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Destruction of Army electronics materiel to prevent enemy use shall be IAW TM 750-244-2.

Destruction of Air Force materiel to prevent enemy use shall be IAW AFI 33-201.

Destruction of Navy materiel to prevent enemy use shall be IAW Navy direction.

Destruction of Marine Corps materiel to prevent enemy use shall be IAW MC direction.

DEMOLITION OF MARINE CORPS MATERIEL TO PREVENT ENEMY USE

Demolition to Render the Generator Set Inoperative

1. When capture or abandonment of the generator set to an enemy is imminent, the responsible unit commander must make the decision to either destroy or render the equipment inoperative.
2. Based on this decision, orders are issued which cover the desired extent of destruction.
 - a. Operators should be thoroughly familiar with all methods of destruction without referencing any particular manual.
 - b. Demolition of the generator set can be accomplished by explosives, fire, or tools such as a sledge hammer, pick, or ax. Demolition can also be accomplished by misuse.
3. The method used will depend on the time available and the availability of these materials in the vicinity of the generator set.
4. Demolition by mechanical means:
 - a. Use hammer, pick, ax, or any other available tool to destroy vital engine and control parts.
 - b. Control box, fuel injection lines, and the radiator should be smashed, engine and control box wires pulled and cut, and any other external engine components (fuel filter, alternator) should be damaged enough to make them inoperable.

5. Demolition by misuse:
 - a. Drain diesel generator crankcase oil.
 - b. Block diesel generator engine air supply ports.
 - c. Start diesel generator engine and allow it to operate until it fails.
 - d. Pour sand, dirt, or other available abrasive compound in all exposed surfaces and access ports of the diesel engine and generator.
 - e. Drain engine coolant.
6. Demolition by burning: Complete as much mechanical damage as possible, and then saturate unit with combustible fuel and ignite.
7. Demolition by explosives: Place explosive charges in priority order (Table 2).

Table 2. Demolition Priority Levels.

PRIORITY LEVEL	COMPONENT	EXPLOSIVE CHARGE REQUIRED
1	Generator Engine	1 pound (lb)
2	Control Box	1 lb
3	Generator Housing	1 lb
4	Housing/Structure	2 lb

PREPARATION FOR STORAGE OR SHIPMENT

Administrative storage of equipment issued to and used by Army activities will have Preventive Maintenance Checks and Services (PMCS) performed before storing. When removing the equipment from administrative storage, the PMCS checks should be performed to assure operational readiness.

WARRANTY INFORMATION

The AMMPS 15 kW generator set is warranted for 1800 hours (hr) of operation or 36 months, whichever occurs first. The warranty starts on the date the equipment is accepted in the "Wide Area Work Flow" system. This warranty includes repair or replacement of any items that prove to be nonconforming and/or defective within the warranty period. Report all defects to your supervisor, who will take appropriate action.

NOMENCLATURE CROSS-REFERENCE LIST

Shortened nomenclature is used in this manual to make procedures easier to read. A cross-reference between the shortened, common name used in this manual and the official nomenclature is provided below.

Common Name	Official Nomenclature
15 kW Genset	15 kW Generator Set
24-VDC Electrical System	DC Electrical System
24-VDC Electrical System	Engine Electrical System
AC Generator	AC Generator Assembly
Cylinder Head	Cylinder Head Assembly
DCS	Control Box Assembly
DCS	Control Box
DCS Mounting Bracket	Control Box Frame
DCS Mounting Bracket	Control Box Side Panels
DCS Mounting Bracket	Control Box Tray
DCS Wiring Harness	Control Box Wiring Harness
Dipstick	Oil-Level Bayonet Gage
Doors	Access Doors
Engine Block	Main Bearing Case Assembly
Engine Block	Short Block
Engine Block Assembly	Crankcase Assembly
Engine Block Assembly	Short Block Assembly
Flywheel	Flywheel Assembly
Front Body Panel	Front Housing Section
Fuel Injection System	Engine Fuel System
Gear Case	Gear Case Assembly
Housing	Housing Assembly
Oil Drain Hose Assembly	Oil Drain Assembly
Operator Control Panel	Main Control Panel
Output Box Assembly	Output Box
Output Box Harness	Output Box Harness And Cables
Output Terminal Board	Output Load Terminal Board
Rear Body Panel	Rear Housing Section
Rectifier	Rectifier Assembly
Speed Governor	Governor System
Starter	Starter Assembly
Top Body Panel	Top Housing Section
Unit Skid	Skid Assembly

LIST OF ABBREVIATIONS/ACRONYMS

Acronyms and abbreviations used in this TM are provided and defined below.

Abbreviation/Acronym	Definition
-	Negative
%	Percent
+	Positive
±	Plus Or Minus
°	Degree
°C	Degree Celsius
°F	Degree Fahrenheit
Ω	Ohm
mΩ	Megohm
A	Army
AAL	Additional Authorization List
AC	Alternating Current
ADC	Amperes Direct Current
AF	Air Force
AFI	Air Force Instruction
AFR	Air Force Regulation
AFTO	Air Force Technical Order
AGM	Absorbed Glass Mat
AH	Ampere Hour
AMMPS	Advanced Medium Mobile Power Sources
Amp	Ampere
AM – VM	Ampere Meter – Voltage Meter
AOAP	Army Oil Analysis Program
AR	Army Regulation
Aux	Auxiliary
AUX CONTACT	Auxiliary Contact
AVR	Automatic Voltage Regulation
BII	Basic Issue Items
BOI	Basis of Issue
C	Crew (level of maintenance)
CAGEC	Commercial and Government Entity Code
CARC	Chemical Agent Resistant Coating
CB	Circuit Breaker
CBRN	Chemical, Biological, Radiological, and Nuclear
CCV	Close Crankcase Ventilation
CECOM LCMC	Communications-Electronics Command Life Cycle Management Command
cm	Centimeter
cm ³	Cubic centimeters
CPC	Corrosion Prevention and Control
CPG	Cummins Power Generation
CSV	Comma-Separated Values
CT	Current Transformer
CTA	Common Table of Allowances
CTL	Control
D	Depot (level of maintenance)
DA	Department of the Army
DC	Direct Current

Abbreviation/Acronym	Definition
DCS	Digital Control System
DD	Department of Defense (forms only)
DF	Diesel Fuel
DI	Direct Injection
DoD	Department Of Defense
DS2	Decontamination Solution number 2
E	Empty
ea.	Each
ECP	Engineering Change Proposal
EIR	Equipment Improvement Recommendation
e-mail	Electronic mail
EMP	Electromagnetic Pulse
ESC	Equipment Service Criteria
ESD	Electrostatic Discharge
E-Stop	Emergency Stop
F	Field (level of maintenance)
F	Full
FGC	Functional Group Code
Fig.	Figure
FM	Field Manual
ft	Foot
ft/lb	Foot/pound
gal	Gallon
Genset	Generator Set
GFCI	Ground Fault Circuit Interrupter
GFI	Ground Fault Interrupter
Glow plg	Glow Plug
GMTK	General Mechanic's Tool Kit
GND	Ground
Gov	Governor
GPH	Gallon Per Hour
H	Below Depot (level of maintenance)
hr	Hour
Hz	Hertz
IAW	In Accordance With
IBM	International Business Machine
ID	Identification
in	Inch
in/lb	Inch-pound
in ³	Cubic inches
IUID	Individual Unit Identification
JDRS	Joint Deficiency Reporting System
JP	Jet Propulsion Fuel
kg	Kilogram
kgf/cm ²	Kilogram of force per square centimeter
kPa	KiloPascal
kVAR	Kilovolt-Ampere Reactive

Abbreviation/Acronym	Definition
kW	Kilowatt
L	Liter
lb	Pound
LCD	Liquid Crystal Display
L/Hr	Liters Per Hour
L-L	Line-to-Line
L-N	Line-to-Neutral
LRU	Line Replaceable Unit
m	Meter
mA	MilliAmpere
MAC	Maintenance Allocation Chart
MC	Marine Corps
MCO	Marine Corps Order
MEP	Mobile Electric Power
MG	Mobile Generator
min	Minute
mL	Milliliter
mm	Millimeter
MPa	MegaPascals
ms	Millisecond
MSD	Maintenance Support Device
MSDS	Material Safety Data Sheets
MTOE	Modified Table of Organization and Equipment
MWO	Modification Work Order
N/A	Not Applicable
N	Navy
N	Neutral
NATO	North Atlantic Treaty Organization
NBC	Nuclear Biological Chemical
NEMA	National Electrical Manufacturers Association
NG	National Guard
NHA	Next Higher Assembly
NIIN	National Item Identification Number
Nm	Newton meter
NMWR	National Maintenance Work Requirement
No.	Number
NSN	National Stock Number
ODS	Ozone Depleting Substances
OEM	Original Equipment Manufacture
OOR	Out Of Range
OSHA	Occupational Safety and Health Act
oz	Ounce
PAM	Pamphlet
PC	Personal Computer
PDA	Personal Data Assistant
PMCS	Preventive Maintenance Checks and Services
PMG	Permanent Magnet Generator
P/N	Part Number
PP	Power Plant

Abbreviation/Acronym	Definition
PQDR	Product Quality Deficiency Report
Press	Pressure
psi	Pounds per square inch
PU	Power Unit
PWM	Pulse Width Modulated
QDR	Quality Deficiency Report
qt	Quart
Qty	Quantity
Qty. Recm.	Quantity Recommended
Qty. Rqr.	Quantity Required
RP	Relay Panel
rpm	Revolutions per minute
RPSTL	Repair Parts and Special Tools List
RTC	Real Time Clock
SAE	Society of Automotive Engineers
sec	Second
SF	Standard Form
SMR	Source, Maintenance, and Recoverability
SOP	Standard Operating Procedure
SRA	Specialized Repair Activity
STB	Super-Tropical Bleach
TAMMS	The Army Maintenance Management System
TAMMS-A	The Army Maintenance Management System — Aviation
TBD	To Be Determined
TDA	Tactical Decision Aid
TDC	Top Dead Center
TDR	Transportation Discrepancy Report
Temp	Temperature
TM	Technical Manual
TMDE	Test, Measurement, and Diagnostic Equipment
TO	Technical Order
TOE	Table of Organization and Equipment
U/I	Unit of Issue
UOC	Usable On Code
USB	Universal Serial Bus
UV	Ultraviolet
V	Volt
VAC	Volts Alternating Current
VDC	Volts Direct Current
WP	Work Package
Wtr	Winterization

QUALITY OF MATERIAL

Material used for replacement, repair, or modification must meet the requirements of this AMMPS 15 kW generator set field and sustainment maintenance manual. If quality of material requirements are not stated in this field and sustainment maintenance manual, the material must meet the requirements of the drawings, standards, specifications, or approved Engineering Change Proposals (ECP) applicable to the subject equipment.

SAFETY, CARE, AND HANDLING

ESD. The AMMPS 15 kW generator set contains no radioactive components or parts or radioactive material requiring special handling or consideration. The AMMPS 15 kW generator set DCS contains printed circuit boards and control cards requiring special handling to protect them from ESD when being serviced. The operator does not need to use special handling for operation of the AMMPS 15 kW generator set.

This manual describes physical and chemical processes that may require the use of chemicals, solvents, paints, or other commercially available materials. Users of the TM should obtain the Material Safety Data Sheets (MSDS) (OSHA Form 20 or equivalent) from the manufacturers or suppliers of materials to be used. Users must be completely familiar with manufacturer/supplier information and adhere to their procedures, recommendations, warnings, and cautions for safe use, handling, storage, and disposal of these materials.

END OF WORK PACKAGE

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
EQUIPMENT DESCRIPTION AND DATA**

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

The AMMPS 15 kW generator set (Figure 1) is a fully-enclosed, self-contained, skid-mounted mobile unit. The generator set consists of six major assemblies: engine assembly, internal fuel assembly, external fuel assembly (not shown), AC generator assembly, Digital Control System (DCS), and output box assembly. An optional winterization kit is available for installation in cold weather climates.

The AMMPS 15 kW generator set is designed to accommodate the continuing proliferation of electronics (computers, Personal Data Assistants (PDA), etc.), life support systems, and global communications necessary in today's battlefield that require a continuous, uninterrupted flow of electricity to accommodate all tactical situations.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

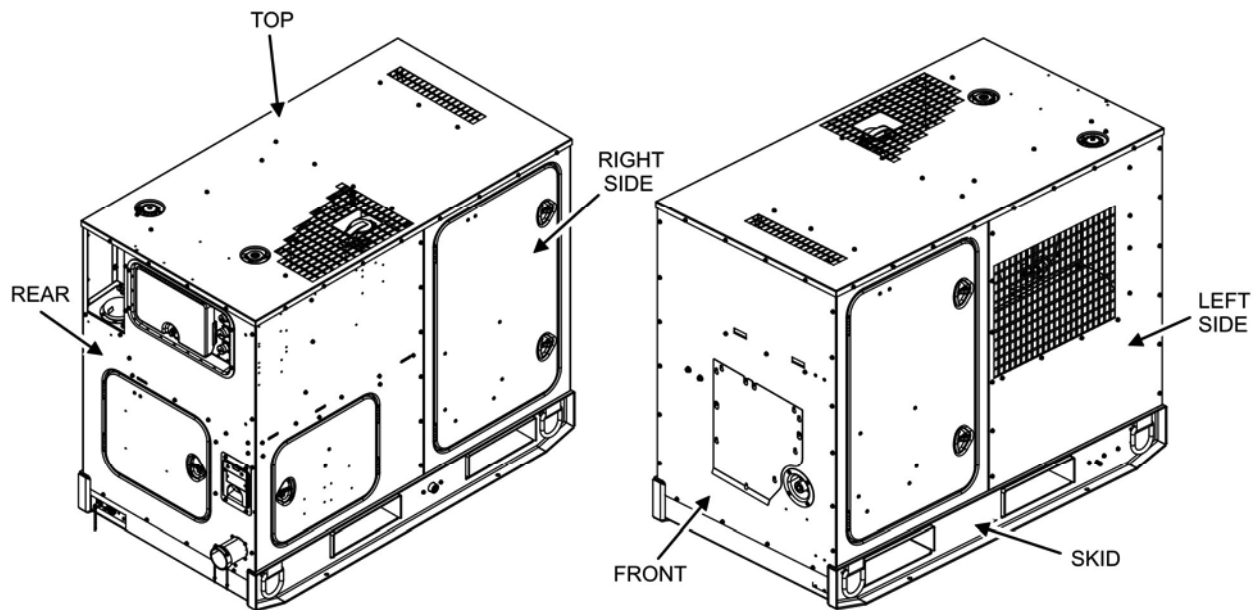


Figure 1. AMMPS 15 kW Generator Set with Doors Closed.

HOUSING

A steel housing consisting of several individual body panels encloses the AMMPS 15 kW generator set and protects it from the environment. The housing provides acoustical protection, entry access to generator set assemblies, control of air flow over internal surfaces, and mounting for generator set components.

The steel housing is durable enough so that no damage should occur within normal usage. The housing design prevents the invasion of wind-driven rain, snow, and sand to the interior of the units through the design and placement of the louver and a rain cap. The Chemical Agent Resistant Coating (CARC) paint, polyurethane coating on circuit boards, sealed connectors, and immersion-proof fan motor housing provide additional protection against moisture and condensation damage.

Self-supporting hinged doors allow easy interior access for scheduled service and preventive maintenance. Individual body panels are removable to allow additional access for replacement and service of major components.

Body Panels

All body panels are connected using corrosion-resistant captive nuts. All seals are interference fit to the housing panels.

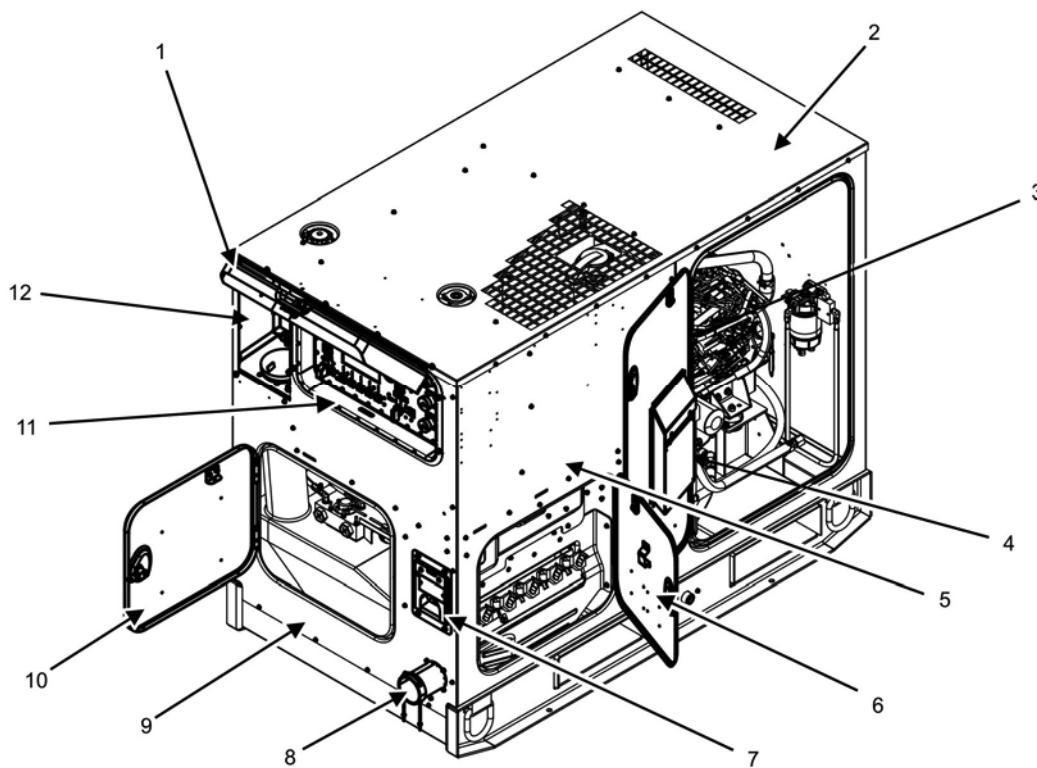


Figure 2. Rear- and Right-Side View with Doors Open.

Top Body Panel (Figure 2, Item 2). The top body panel shields components from the elements.

Rear Body Panel (Figure 2, Item 9). Located at the rear of the generator set, the rear body panel contains the DCS access door (Figure 2, Item 1), DCS (Figure 2, Item 11), rear access door (Figure 2, Item 10), convenience receptacle (Figure 2, Item 7), entrance for load cables (Figure 2, Item 8), and fuel fill (Figure 2, Item 12).

Right-Side Body Panel (Figure 2, Item 5). Located on the right side of the generator set, the right-side body panel contains the right-side access door (Figure 2, Item 3) and output box door (Figure 2, Item 6).

Storage Box (Figure 2, Item 4). An accessory box, stenciled Storage Box, has been installed on the inside of the right-side access door (Figure 2, Item 3) to provide space for the paralleling cable, grounding rod connecting hardware, and auxiliary fuel line.

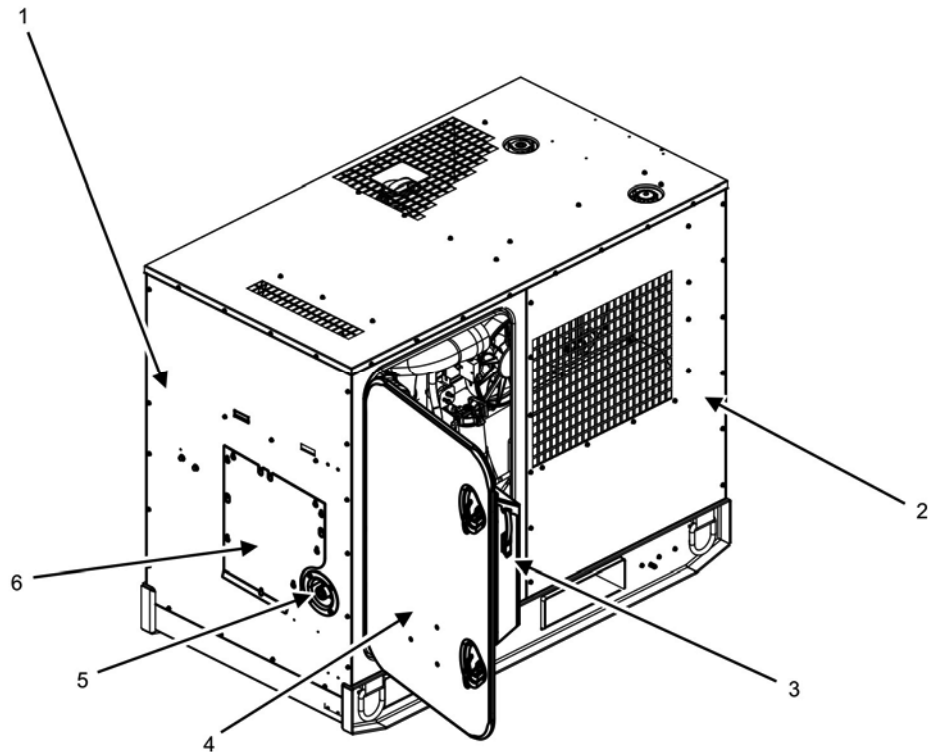


Figure 3. Front- and Left-Side View with Door Open.

Front Body Panel (Figure 3, Item 1). The front body panel is located on the front of the generator set and contains the NATO slave receptacle (Figure 3, Item 5) and the access panel (Figure 3, Item 6).

Left-Side Body Panel (Figure 3, Item 2). The left-side body panel is located on the left side of the generator set and contains the left-side access door (Figure 3, Item 4).

Document Box (Figure 3, Item 3). An accessory box, stenciled Document Box, has been installed on the rear of the left-side access door (Figure 3, Item 4) to provide space for the TM.

Identification (ID) Plates. Identification (ID) plates and placards for system safety and operation are attached to the housing. See TM 9-6115-751-10 for the placement and contents of the identification and safety placards.

DCS (Figure 2, Item 11)

The DCS is a microprocessor-based control that allows the operator and maintainer to: start/stop the generator set and regulate fuel source using the engine control switch; stop the generator set in emergencies with the EMERGENCY STOP switch; operate the contactor using the AC CIRCUIT INTERRUPT switch; adjust voltage, frequency, gain, panel lights, and other settings using the adjustment screens with the soft keys; clear/reset generator faults using the FAULT RESET control; operate in parallel with other generator sets using the UNIT PARALLEL switch; and perform other necessary functions to provide output power.

The control unit is powered by the generator set 24-VDC system. The controls are fully functional after approximately 4 seconds (sec) (boot-up time). Once the generator set model, frequency, and voltage configurations are determined by the DCS programming, the control automatically adjusts the display value limits, menus, and operational parameters accordingly, reducing potential operator error.

The AMMPS 15 kW generator sets provide limited remote operation capabilities through interface with an International Business Machine (IBM)-compatible Personal Computer (PC). The operational status of the generator set can be monitored, battleshort conditions can be set and released, and emergency stop can be executed from up to a 250-foot (ft) (76.2-meters (m)) distance. Loss of signal between the remote monitoring site and the generator set does not adversely affect the generator set operation.

The DCS display is a color Liquid Crystal Display (LCD) with a 6.5-inch (in) (165.1-millimeter (mm)), diagonal viewing area. It provides a combination of switches and LCD soft keys to allow the operator and maintainer to control the generator set.

SKID ASSEMBLY

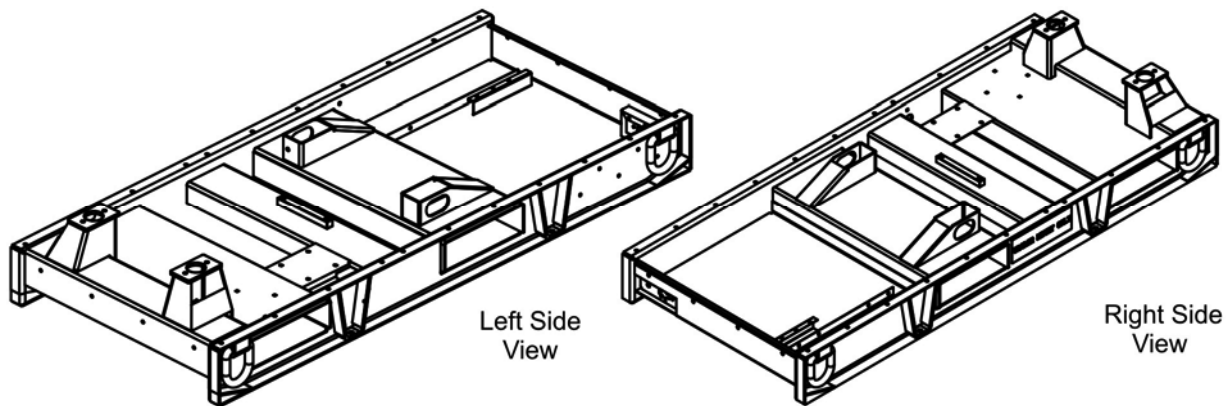


Figure 4. Skid.

The housing sits on a steel skid (Figure 4) that extends beyond the housing walls by approximately 0.39 in (10 mm). The engine and AC generator are directly mounted to the skid with the focus toward the roll inertia axis. This improves vibration isolation. The skid is equipped with forklift pockets for transportation capability. The skid base has drains located between the forklift pockets on each side for draining liquids from the generator set.

ENGINE ASSEMBLY

The AMMPS 15 kW generator set uses a Yanmar 4TNV84T diesel engine. The vertical, water-cooled, four-cycle Direct Injection (DI) diesel engine utilizes a four-cylinder, turbocharged process. It consists of the cylinder head and valve cover, crankcase assembly, pistons, main bearing case, and lubrication system. It is mounted to the skid toward the front body panel of the generator set. See Figure 5 and Figure 6 for a breakdown of major engine components.

NOTE

The heat shield has been removed from Figure 5 for clarity.

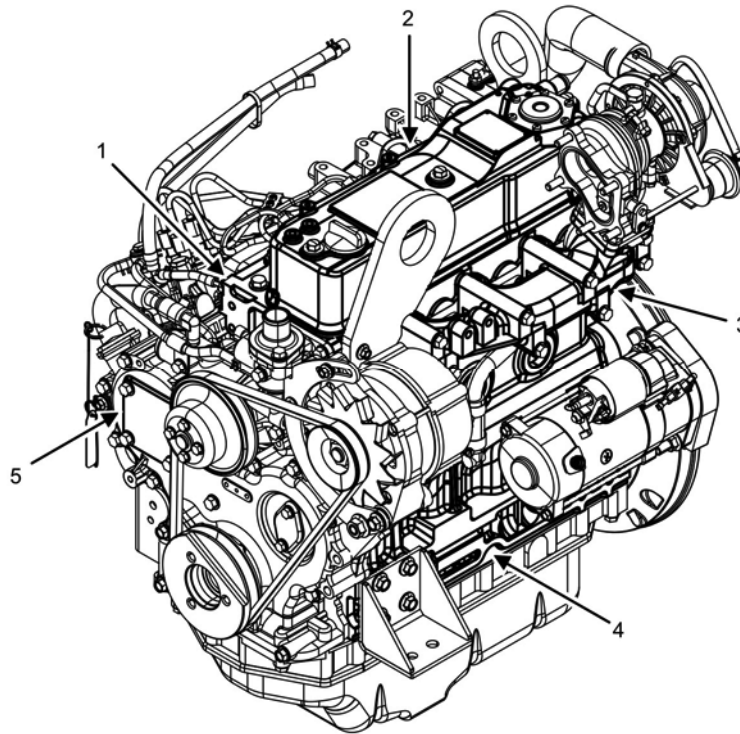


Figure 5. Engine Components — Left Side.

Major Engine Components/Assemblies

Major engine components/assemblies include: cylinder head and valve cover assembly, block assembly, flywheel, lubrication system, fuel system, cooling system, DC electrical system, and air intake and exhaust system.

Cylinder Head (Figure 5, Item 1) and Valve Cover (Figure 5, Item 2) Assembly. The cylinder head is located on the top of the block assembly (Figure 5, Item 4) and seals the upper ends of the cylinders to provide compression, protects the portion of the engine where combustion takes place, and houses the valve assembly. The valve cover is located on top of the cylinder head assembly and protects the valve assembly from contamination.

Block Assembly (Figure 5, Item 4). The block assembly houses the connecting rods, crankshaft, pistons, camshaft, and bearings.

Lubrication System. The AMMPS 15 kW generator set lubrication system is compatible with MIL-PRF-21260E preservative oil. The lubricating oil conforms to MIL-PRF-46167C and MIL-PRF-2104H.

Operators can safely check and add oil to the lubricating system while the generator set is operating or in the off condition. The lubrication system includes an oil-filler opening with captive cap (Figure 6, Item 2) to permit oil-filling from a standard 8-qt capacity can and a readily-accessible oil-level bayonet gage (dipstick) (Figure 6, Item 7). The dipstick is marked to ensure accurate reading of oil levels. See TM 9-6115-751-10 for more information.

Oil Drain Assembly (Figure 6, Item 5). The oil drain assembly is located between the oil pan (Figure 6, Item 8) and the unit skid. It allows the engine oil to be easily drained into a remote catch basin using a ball valve (Figure 6, Item 6).

Oil Filter (Figure 6, Item 4). The oil filter is located at the intake side of the engine behind the battery-charging alternator belt. It removes impurities from the engine lubricating oil utilizing a full-flow, disposable oil filter cartridge. The oil filter attaches to an oil cooler assembly (Figure 6, Item 3), which uses the engine cooling system to keep the oil temperature in the optimum temperature range.

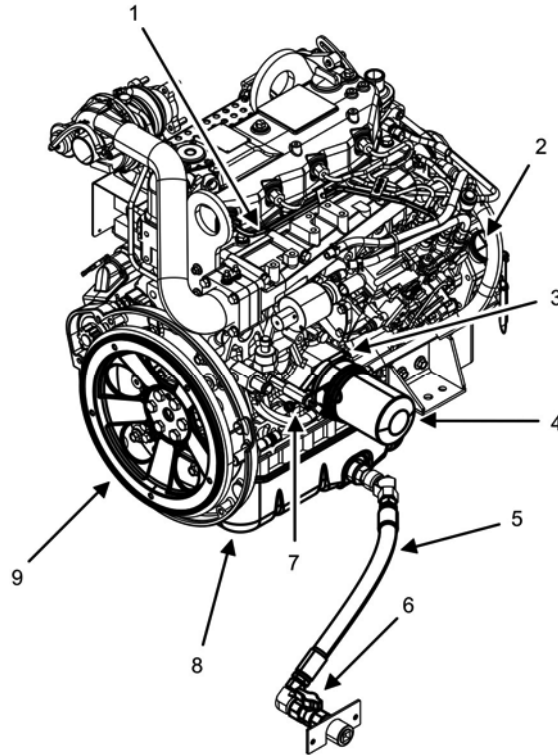


Figure 6. Engine Components — Right Side.

Fuel Injection System. Once fuel has passed through the fuel filter/water separator (Figure 8, Item 1), the fuel passes through the fuel injection pump (Figure 5, Item 5). The fuel injection pump divides equal amounts of fuel for each of the engine's four cylinders. The fuel then passes through the valve cover using high-pressure injector lines (Figure 6, Item 1) to the fuel injector in each cylinder. The injector sprays the fuel at high pressure into the cylinder where it is burned.

Flywheel (Figure 6, Item 9). The flywheel connects the engine to the AC generator to transmit rotational mechanical energy for the production of electricity.

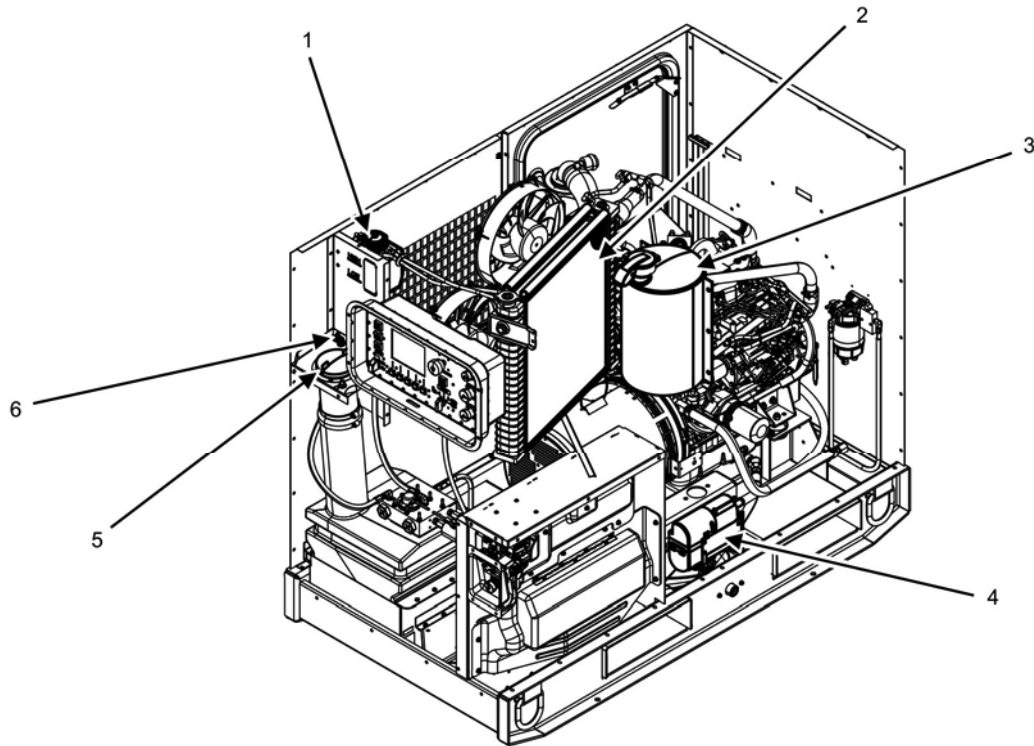


Figure 7. Systems Components — Right Side.

Unit Cooling System

Cooling Fans (Figure 8, Item 3). The two cooling fans allow the generator set to operate in all required operational environments. The 16-in, variable-speed 24-VDC cooling fans optimize radiator location and air flow paths for improved cooling efficiency. Intake air for the cooling system is drawn by the cooling fans through a grille on the left-side body panel. This air passes through the cooling fins of the radiator, charge air cooler, and fuel cooler, transferring heat from the cooling system to the air flow. The warm air is then expelled into the atmosphere through a grille in the top body panel. The cooling system also reduces wear on the battery-charging alternator belt and water pump. Cold weather operation is also improved by regulating cabinet temperature at or near ideal operating temperatures.

Coolant Circulation System. This system consists of the radiator, thermostat, water pump, and coolant overflow bottle. It is responsible for keeping the engine at a safe temperature. See TM 9-6115-751-10 for further information on maintaining the cooling system.

Coolant Overflow Bottle (Figure 7, Item 1). Mounted to the rear body panel at the fuel fill opening, the coolant overflow bottle is clearly visible for inspection of coolant level. It provides easy access for coolant filling through the top body panel.

Radiator (Figure 7, Item 2). An aluminum radiator acts as a heat exchanger for the coolant. A radiator fill port is accessible on the top body panel. The captive radiator cap prevents loss of coolant.

Thermostat (Figure 8, Item 2). A thermostat is located inside the housing where the upper radiator connects to the top of the engine. It monitors coolant temperature and adjusts the cooling system accordingly.

Water Pump (Figure 8, Item 7). The water pump circulates the coolant through the block assembly and the radiator.

Winterization Kit (Figure 7, Item 4). The optional winterization kit is located inside of the right-side body panel. The fuel-fired coolant heater warms coolant in extreme cold conditions between -25 degrees Fahrenheit (°F) and -50°F (-32 degrees Celsius (°C) and -46°C) by utilizing the fuel from the generator set. The winterization kit automatically activates, depending on the temperature, and features automatic heat regulation. It is controlled by the DCS, which provides the [READY TO CRANK] indicator when the heater has completed its cycle.

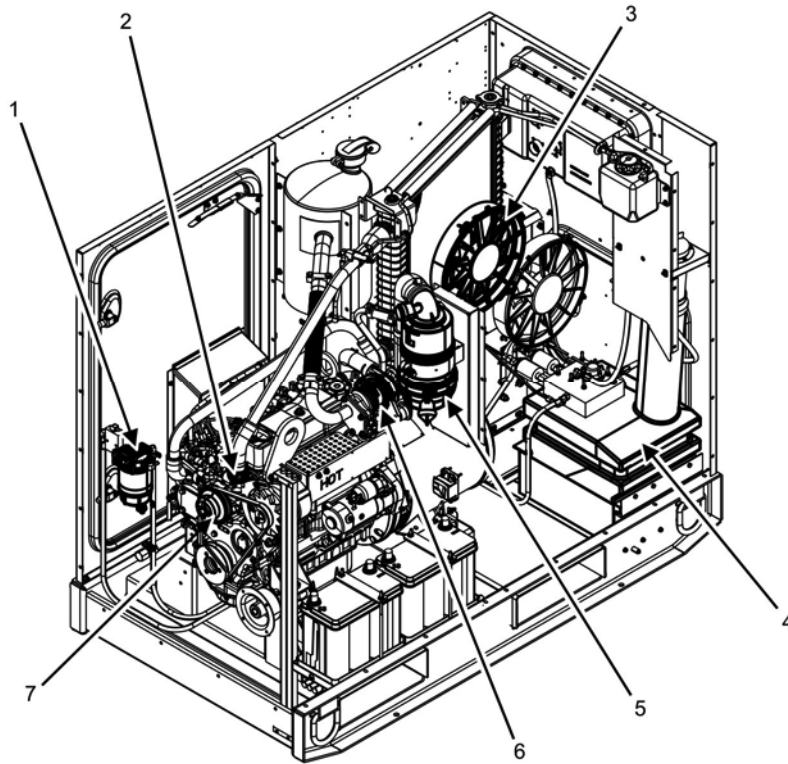


Figure 8. Systems Components — Left-Side.

Air Cleaner Assembly (Figure 8, Item 5)

The air cleaner assembly, mounted on a bracket attached to the left-side of the interior bulkhead, filters contaminants from the air intake. The air cleaner assembly contains an integrated, centrifugal precleaner that removes most dust particles prior to entering the air cleaner element. This extends filter life and reduces maintenance costs and downtime. The air cleaner assembly is fitted with an indicator to show when the filter capacity is exceeded. The filter element is replaceable (TM 9-6115-751-10).

Exhaust System

The exhaust manifold (Figure 5, Item 3) is located on the exhaust side of the engine and is accessible through the left-side access door. As exhaust leaves the compression chamber, it is routed through the exhaust manifold into a single pipe, and then through the turbocharger (Figure 8, Item 6). The turbocharger uses exhaust gases to turn a turbine which compresses the intake air. The compressed intake air is directed to the cylinders through the intake manifold and improves the efficiency and power production of the engine. The exhaust gases exit the turbocharger through the bulkhead-mounted muffler (Figure 7, Item 3). The muffler (Figure 7, Item 3) silences the exhaust pulses from the engine and expels exhaust gases through the top body panel.

Unit Fuel System

Fuel Fill (Figure 7, Item 5) and Fuel Tank (Figure 8, Item 4). The AMMPS 15 kW generator set is designed to utilize diesel fuel or an acceptable substitute (Grade Number (No.) 1-d and Grade No. 2-d fuels per A-A-52557) and include design adaptations to accommodate the usage of Jet Propulsion (JP)-8. The fuel fill is located on the rear body panel and allows refueling during operation (TM 9-6115-751-10). The fuel tank is mounted directly to the skid assembly behind the rear access door. It is designed for 8 hours (hr) of operation at 75 percent (%) load on JP-8 fuel with the generator set at a 15-degree angle. The tank drain extends down into the skid area on the left-side of the unit. The main fuel pump moves lower-pressure fuel from the fuel tank and sends it through an in-line fuel filter to the fuel filter/water separator (Figure 8, Item 1).

Fuel Filter/Water Separator (Figure 8, Item 1). The fuel filter/water separator element is spin-on and removes debris and water particles from fuel before it enters the engine. A water drain cock is on the bottom of the filter.

External Fuel Tank and Auxiliary Connections (Figure 7, Item 6). The external fuel tank auxiliary connections are located at the rear of the fuel filler shroud. The auxiliary fuel pump transfers fuel from the auxiliary fuel tank to the unit fuel tank.

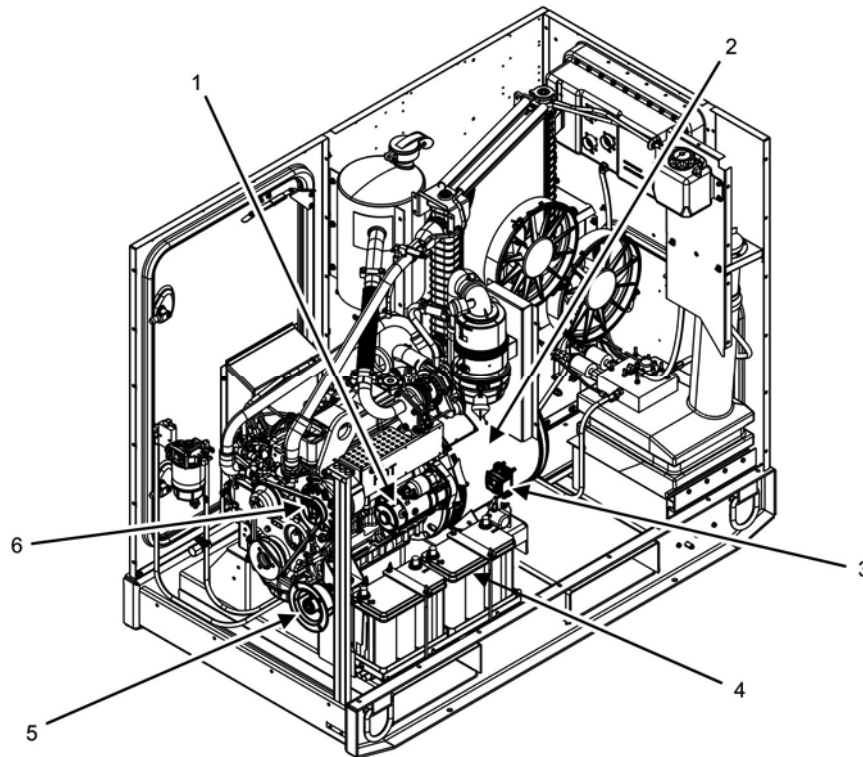


Figure 9. 24 VDC Electrical System and AC Generator — Left Side.

24-VDC Electrical System

The 24-VDC electrical system uses two 12-volt (V) batteries (Figure 9, Item 4) connected in series. The batteries are standard commercial size, maintenance free, sealed, and located side-by-side on the left side of the unit. They are accessed through the left-side door. The batteries are capable of starting the generator set under all conditions between negative (-) 50°F and positive (+) 135°F (-46°C and +57°C) ambient temperatures. The starter (Figure 9, Item 1) is located on the exhaust side of the engine above the oil pan. A NATO slave receptacle (Figure 9, Item 5) is provided should the unit require jump-starting from another 24-VDC source. In the event the engine needs to be manually turned, a three-position DEAD CRANK SWITCH is included. The 24-VDC electrical system is protected by a 50-Amperes (Amp) main DC circuit breaker (Figure 9, Item 3). The main DC circuit breaker is accessed through the left-side door.

If the temperature is between +21°F and -25°F (-6°C and -32°C), intake air heaters are used to aid in starting. For temperatures between -25°F and -50° F (-32°C and -46°C), the optional winterization kit (Figure 7, Item 4) is used as an engine starting aid. See TM 9-6115-751-10 for more information.

Belt-Driven Battery-Charging Alternator (Figure 9, Item 6). The standard belt-driven battery-charging alternator recharges the batteries which in turn provide power to the cooling fan, DCS, and engine systems. The charging system completely charges the batteries during operation within 4 hr of startup. A voltage regulator (internal to the alternator) controls the voltage output of the belt-driven battery-charging alternator.

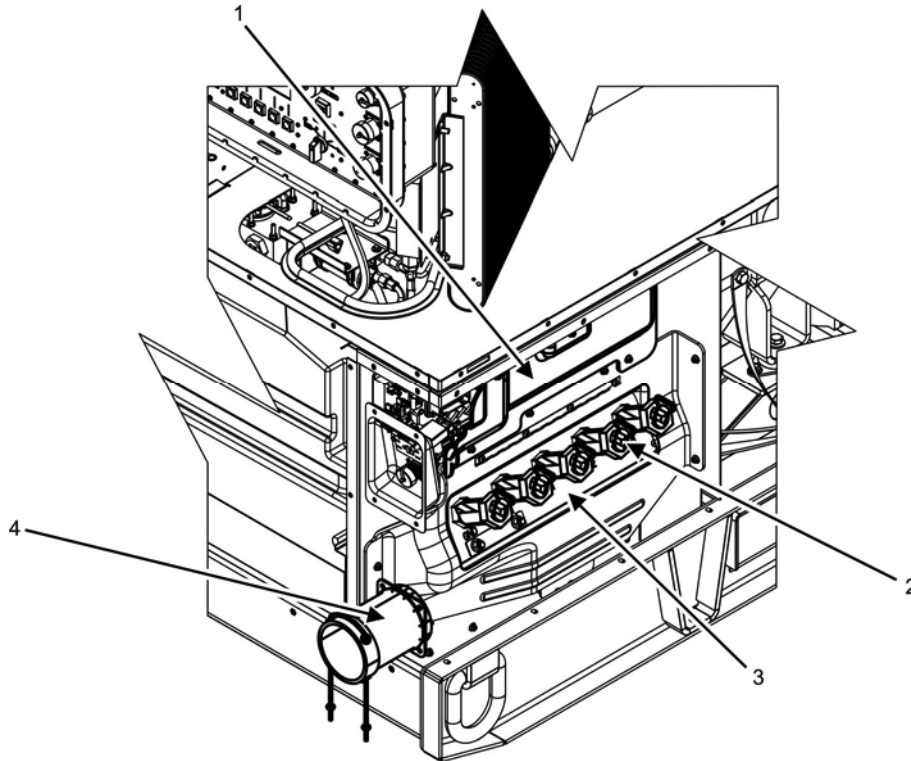


Figure 10. Output Box Components — Right Side.

AC GENERATOR (Figure 9, Item 2)

The AC generator converts the rotating mechanical energy from the engine into electrical energy. The electrical energy is then distributed from the output box assembly (Figure 10, Item 1) through cables that enter the output box assembly (Figure 10, Item 1) via a flexible sleeve (Figure 10, Item 4) from field equipment requiring electric power or a switch box.

The AC generator and voltage control system are drip-proof, guarded machine type and are synchronous and brushless, as specified in National Electrical Manufacturers Association (NEMA) Standard No. MG, part 33. The bearings are sealed and permanently lubricated. System leads are identified with permanent marker and are brought out of the frame through nonabrasive bushings and holders in the output terminal board (Figure 10, Item 3). These isolate each lead and hold it securely in place.

When operating in three-phase at rated load and frequency, the AC generator can withstand, without damage, two consecutive short circuits at the load terminals of 10 sec or less in duration within a 5-min interval at less than 300% of rated output current.

OUTPUT BOX ASSEMBLY (Figure 10, Item 1)

The output box is located on the right-side body panel and distributes electricity produced by the AC generator through the output terminal board (Figure 10, Item 3). The output box contains the output terminal board (Figure 10, Item 3), individual load terminals (Figure 10, Item 2), and unit relays. All relays are socket-mounted and secured with a cover. The relay will not move unless the cover is removed.

DIFFERENCES BETWEEN MODELS

The differences between models of generator set covered in this TM are as follows:

Model MEP-1050 is equipped with a 50/60 Hz generator.

Model MEP-1051 is equipped with a 400 Hz generator.

EQUIPMENT DATA

For a list of leading particulars, refer to Table 1.

Table 1. Equipment Data.

GENERATOR SET:	
Model Numbers: 15 kW 50/60 Hz 15 kW 400 Hz	MEP-1050 MEP-1051
NSN: 15 kW 50/60 Hz 15 kW 400 Hz	NSN 6115-01-561-7634 NSN 6115-01-561-7674
Overall Length: MEP-1050 MEP-1051	65 in (165.1 cm) 65 in (165.1 cm)
Overall Width: MEP-1050 MEP-1051	36 in (91.4 cm) 36 in (91.4 cm)
Overall Height: MEP-1050 MEP-1051	53 in (134.6 cm) 53 in (134.6 cm)
Dry Weights (less Bil): MEP-1050 MEP-1051	1795 lb (814.2 kg) 1795 lb (814.2 kg)
Wet Weights: MEP-1050 MEP-1051	1878 lb (851.85 kg) 1878 lb (851.85 kg)
Engine: Manufacturer Model Type Displacement Altitude Degradation, 4000 – 8000 ft (1220 m – 2440 m) Firing Order Winterization Kit Use Valve Tappet Clearance Adjustment	Yanmar 4TNV84T-BMCU Direct injection, four cylinder, four cycle, vertical, water cooled 121.721 in ³ (1.995 L) 3.5% per 1000 ft (305 m) 1-3-4-2 -25°F – -50°F (-32°C – -46°C) 0.006 – 0.010 in. (0.15 – 0.25 mm)

Table 1. Equipment Data. — Continued.

Cooling System: Type Capacity Normal Operating Temperature Range Temperature Indicating System Voltage Rating	Pressurized radiator, forced circulation with pump 2.8 qt (2 L) 185°F – 223°F (85°C – 106°C) 24 VDC
Lubrication System: Type Oil Pump Type Normal Operating Pressure Oil Filter Type Lubricating System Capacity Pressure Indicating System Voltage Rating	Forced lubrication by pump Gear driven 42 – 64 pounds per square inch (psi) (290 – 441 kiloPascal (kPa)) Spin-on cartridge 7.8 qt (7.38 L) 24 VDC
Fuel System: Type of Fuel Fuel Tank Capacity Fuel Consumption Rate 50/60 Hz: 400 Hz:	DF-2D (ASTM D975) 8.60 gal (32.55 L) 1.04 Gallons Per Hour (GPH) (3.937 Liters per Hour (L/Hr)) 1.14 GPH (4.330 L/Hr)
Auxiliary Fuel Pump: Voltage Rating Delivery Pressure	24 VDC 5.0 – 6.5 psi (34.5 – 65.5 kPa)
Fuel Level Sensor: Type Current	Capacitive 3.0 Amp at 6 – 32 VDC
Starting System: Batteries	2 X 12 VDC (52 AH) in series
Starter: Manufacturer Model Voltage Rating Drive Type	ISKRA AZE4836 24 VDC Integral
Battery-Charging Alternator: Manufacturer Models Rating Protective Fuse	ISKRA DRWNG 19020205 45 Amp None
AC Generator: Manufacturer Type Load Capacity Current Ratings: 120/208 V connection 240/416 V connection Power Factor Cooling Drive Type Duty Classification	Cummins YD-6050-10 (50/60 Hz) and YD-400-10 (400 Hz) 15 kW 52 Amp 26 Amp 0.8 Fan cooled Direct coupling Continuous

Table 1. Equipment Data. — Continued.

Protection Devices:	
Low Oil Pressure:	
Trip Pressure	10 psi (145 kPa)
Voltage Rating	5 VDC
Current Rating	4 mA
Coolant High Temperature:	
Trip Temperature	223°F (106°C)
Voltage Rating	24 VDC
Current Rating	1 mA
Overvoltage:	
Trip Point Conditions	Not more than 30% of rated voltage.
Trip Point	No more than 1.25 seconds after trip condition exists.

END OF WORK PACKAGE

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
THEORY OF OPERATION

SCOPE

The AMMPS 15 kW generator set consists of two modes as follows:

MODES: I – 50/60 Hz
 II – 400 Hz

The AMMPS 15 kW generator set is specifically designed for the best possible performance focusing on areas such as reliability, maintainability, weight, dimensions, and fuel consumption.

OPERATION

The AMMPS 15 kW generator set is designed for deployment in the battlefield to provide personnel with the continuous power generation necessary for today's fielded electronic devices and various electrical equipment demands. The AMMPS 15 kW generator set is developed to be fixed (skid-mounted) or mobile (trailer-mounted) giving the flexibility of movement. The generator sets are designed to accommodate parallel operation of generator sets as well as additional and back-up power generation.

The housing assembly serves as the protective shell for the generator set. The housing has been designed with openings for ease of maintenance and additional acoustical protection to further silence the generator set while operating. The generator has enhancements for protection from unusual/harsh weather and to shield from debris.

The generator set is powered by a turbocharged Yanmar 4TNV84T 121.721 cubic inches (in³) (1.995 L) diesel engine mounted directly to the skid assembly. This particular engine has a built-in Closed Crankcase Ventilation (CCV) system. The engine produces mechanical energy and interconnects with the AC generator via a rotating shaft.

The AC generator is a Cummins Power Generation (CPG) YD-6050-10 (Mode I, Model 1050 (50/60 Hz)) or a CPG YD-400-10 (Mode II, Model 1051 (400 Hz)). It is a synchronous, brushless design with a permanent magnet and was developed specifically to meet performance requirements. The AC generator receives mechanical energy from the engine and converts it to electrical energy. The electricity produced by the AC generator is transmitted to the output terminal board.

DCS

The DCS uses a menu-driven display format to control generator set operations. From the DCS, the operator, and/or maintainer can start the generator set, adjust the output voltage and frequency (Model 1050, Mode I only), operate the contactor, stop the AC generator, clear faults, and perform other functions necessary to produce power (Figure 1). The AMMPS 15 kW generator sets also provide limited remote operation capabilities through interface with an IBM-compatible PC. The operational status of the generator set can be monitored, battleshort conditions can be set and released, and emergency stops can be executed from up to a 250-ft (76.2-m) distance.

The AMMPS 15 kW generator set is capable of self-diagnostics at start up. This prognostics function monitors the protective system and will provide a warning of impending activation of protective devices. All operational data is captured every 15 min. during operation. Faults and warnings are automatically captured upon operation of protective devices and stored in a Fault Log. Additionally, all maintenance prompts and actions are automatically captured and stored in a Maintenance Log.

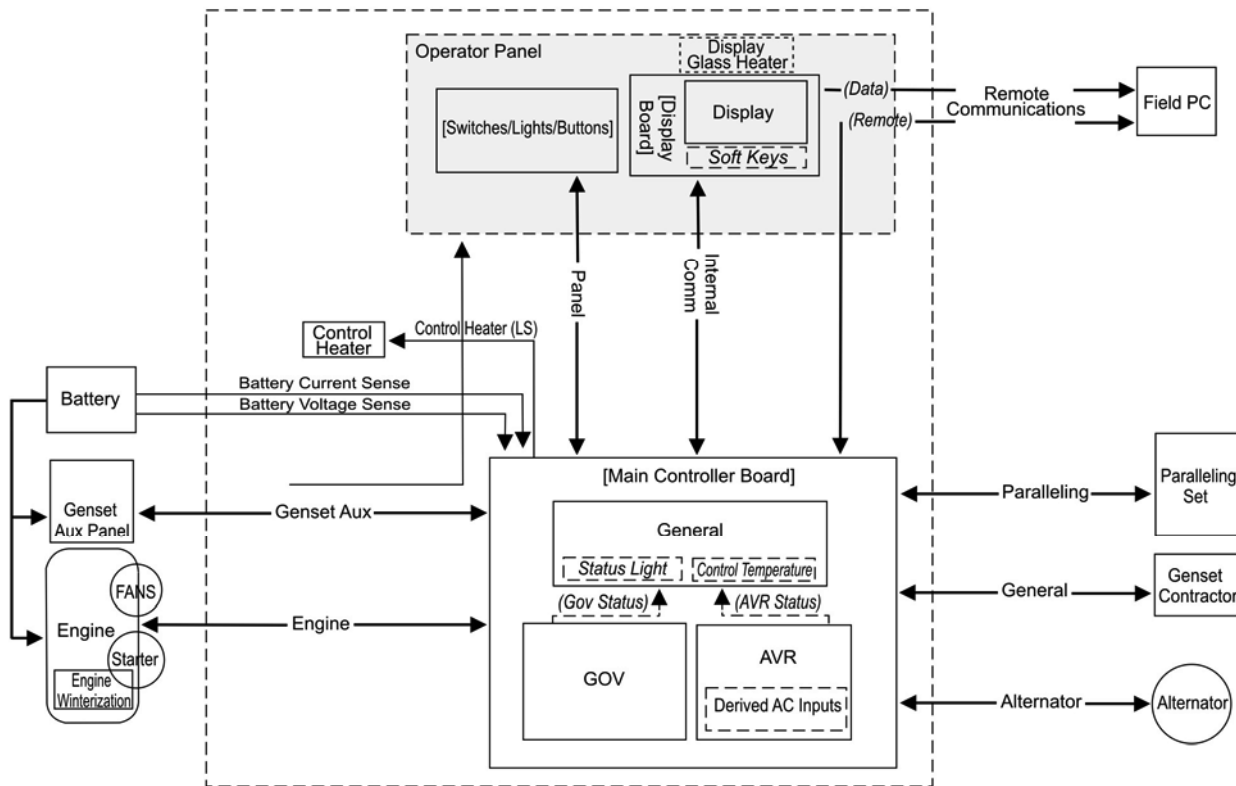


Figure 1. AMMPS Control Overview.

TECHNICAL PRINCIPLES OF OPERATION

Engine Starting System (Figure 2)

The engine starting system consists of two 12-V batteries connected in series to produce 24 V of electric power, a starter, a 24-V battery-charging alternator, a magnetic pickup (for sensing engine speed), and related switches and relays required for controlling the starting system (Figure 1). For engine cranking, battery power is supplied to the starter motor through the starter solenoid, which in turn is controlled by the cranking relay. The starter then engages the engine flywheel, causing the engine to turn over. For engine starting, the DEAD CRANK SWITCH must be in the NORMAL position, the main DC circuit breaker must be in the ON position, the EMERGENCY STOP switch must be pulled out, and the engine control switch must be moved to the START position. The cranking relay is then controlled by a circuit, consisting of the crank disconnect relay and crank disconnect switch. As the engine accelerates to the preset speed (sensed by the magnetic pickup), the crank disconnect switch opens and de-energizes the cranking relay to stop and disengage the starter. The starting sequence may also be stopped by moving the engine control switch to OFF. The engine may be cranked without starting by use of the DEAD CRANK SWITCH. With the DEAD CRANK SWITCH in the CRANK position, the cranking relay, starter solenoid, and starter motor are energized without activating any other starting or control functions. In the event the batteries become discharged, an alternative source of starting power is provided through the NATO slave receptacle.

The batteries are charged by the battery-charging alternator, which is belt-driven by the engine. The DCS is powered by the battery-charging alternator when the engine is operating and by the 24-V batteries at start up. Shown on the DCS display, the [Battery] ammeter indicates the charge/discharge rate of the batteries (from -80 Amps to +80 Amps, in 0.1 Amp increments). Normal operating indication depends on the state of charge in the batteries. A low charge, such as exists immediately after engine starting, will cause a high reading (needle moves toward [+] area). When the charge in the batteries has been restored, the indicator moves toward zero.

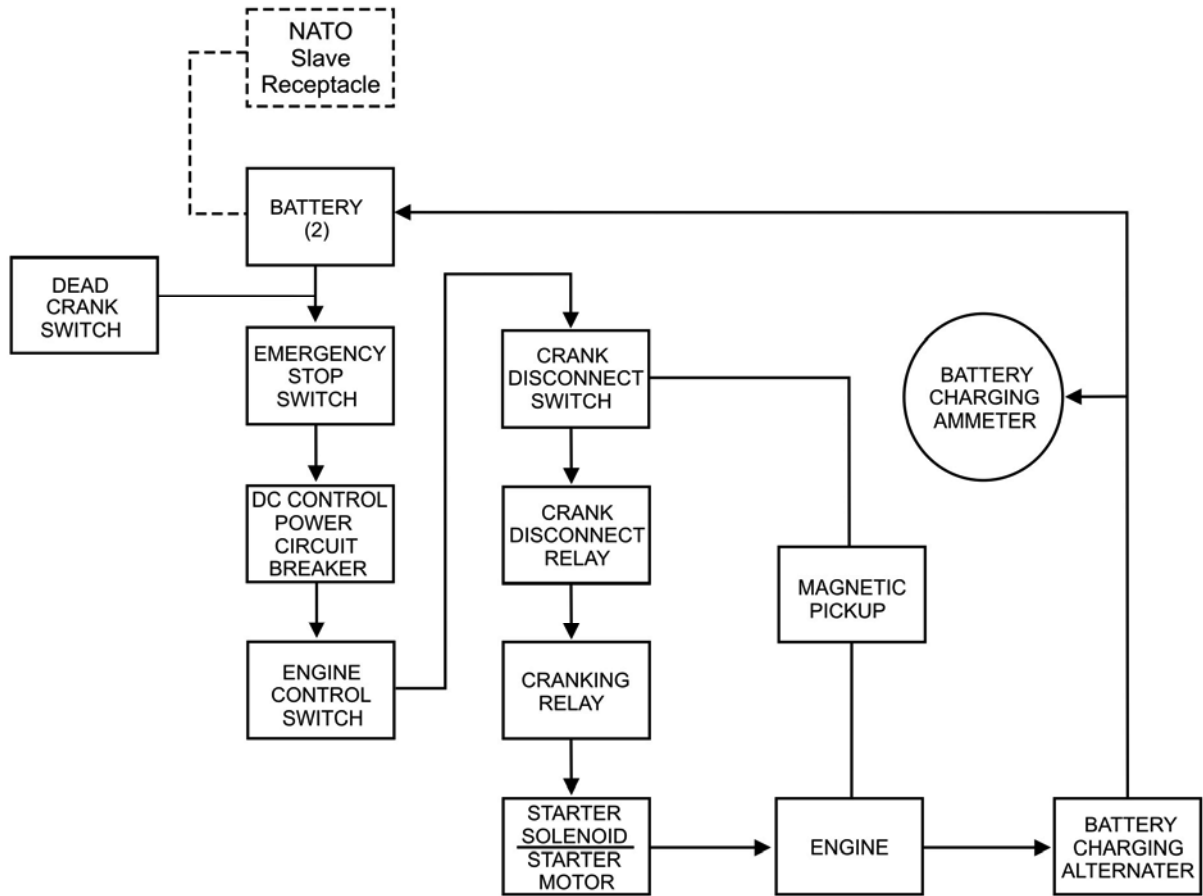


Figure 2. Engine Starting System.

Fuel System (Figure 3)

The fuel system consists of piping, fuel tank, fuel filter, 24-VDC fuel pump, fuel filter/water separator, fuel level sensor, fuel injection pump, and four fuel injectors (one for each cylinder). Fuel is drawn from the fuel tank by the transfer pump when the engine control switch is in the PRIME & RUN positions. After reaching the transfer pump, fuel passes through a fuel filter/water separator where water and small impurities are removed. The fuel then goes to the injection pumps where it is pressurized and is forced into the injectors. Through the injectors, fuel is sprayed into the combustion chamber at high pressure, where it is mixed with air and ignited. The fuel that is not used is returned to the fuel tank via an excess fuel return line.

The auxiliary fuel system consists of an external fuel supply, fuel filter pipe, 24-VDC auxiliary fuel pump, and fuel level switch. The engine control switch, when set to PRIME & RUN AUX FUEL, actuates the auxiliary fuel pump and transfers fuel from the external fuel supply to the generator fuel tank. The fuel level switch shuts off the auxiliary fuel pump when the generator fuel tank is full and reactivates the pump as the level drops to 75%. The [Fuel] indicator on the DCS displays the fuel level of the generator fuel tank from empty [0] to full [100] in 1% increments.

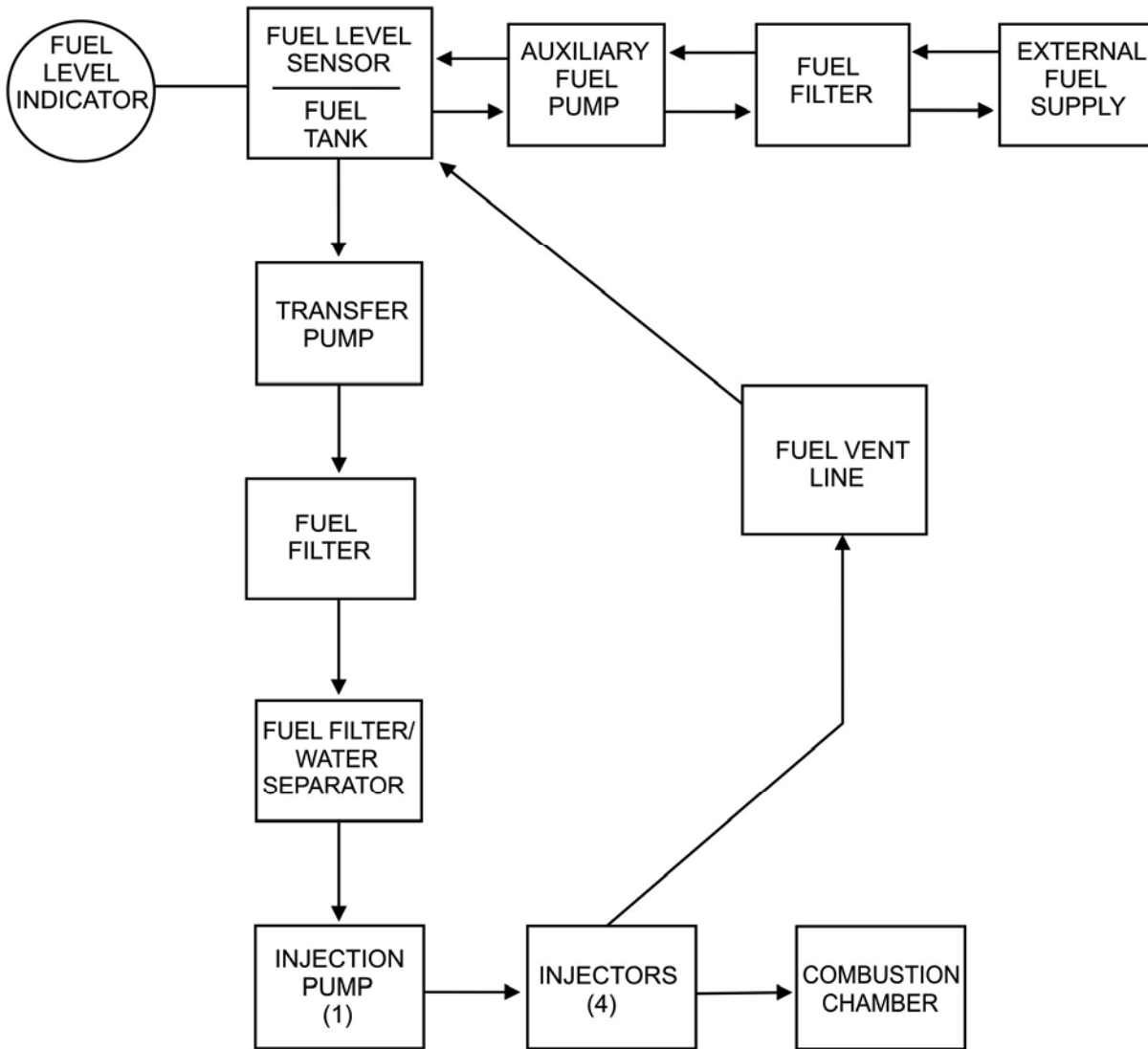


Figure 3. Fuel System.

Engine Cooling System (Figure 4)

The engine cooling system consists of a radiator, hoses, thermostat, water pump, electric fan, temperature sensor, and cooling jackets. The water pump forces coolant through passages (cooling jackets) in the engine block and cylinder head where the coolant absorbs heat from the engine. When the engine reaches normal operating temperature, the thermostat opens and the heated coolant flows through the upper radiator hose assembly into the radiator. Air circulates through the radiator, reducing coolant temperature.

A coolant high-temperature logic control provides automatic shutdown in the event that coolant temperature exceeds 225 plus or minus (\pm) 5°F ($107 \pm 3^\circ\text{C}$). The [Coolant] indicator on the DCS displays coolant temperature range from 100°F to 260°F (38°C to 127°C).

Cold outside temperatures make starting the engine difficult. To improve engine starting, the generator set has two starting aids: standard air intake heaters mounted in the intake manifold and an optional winterization kit. The air intake heaters warm the air in the combustion chamber to assist with ignition when the ambient air temperature is below + 20°F (-6°C). The winterization kit warms the engine coolant and thus the engine block when the ambient air temperature is between -25°F (-32°C) and -50°F (-45.56°C).

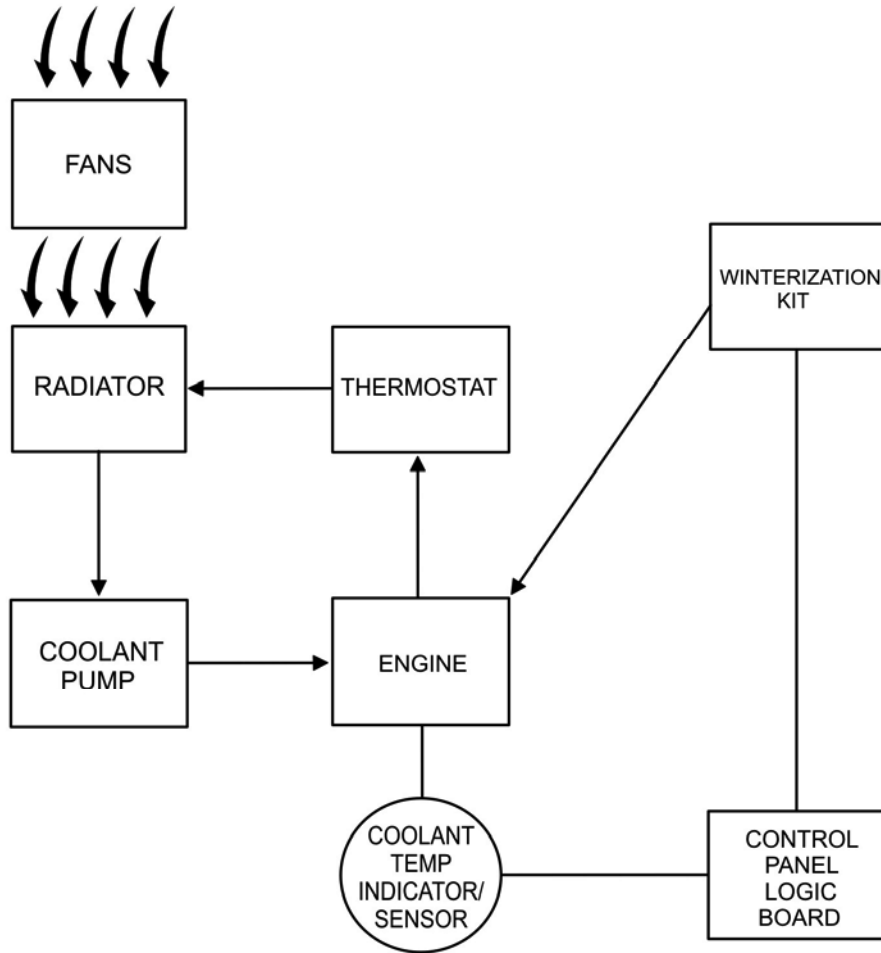


Figure 4. Engine Cooling System.

Lubrication System (Figure 5)

The lubrication system consists of an oil pan, dipstick, oil pump, oil pressure sensor, oil screen, oil cooler, and oil filter. The oil pan is a reservoir for engine lubricating oil. The dipstick indicates oil level in the pan. A pump draws oil from the pan through a screen removing large impurities. After passing through an oil cooler, the oil passes through a spin-on type filter where small impurities are removed. From the filter, oil enters the engine and is distributed to the engine's internal moving parts.

After passing through the engine, the oil returns to the oil pan. The [Oil] pressure indicator on the DCS shows oil pressure sensed by the oil pressure sensor in the engine. The engine automatically shuts off if oil pressure drops to a dangerously low level (into the red area of the DCS oil pressure gage). It is recommended to check the engine oil when the engine is not operating, but it can be checked while the engine is operating (TM 9-6115-751-10).

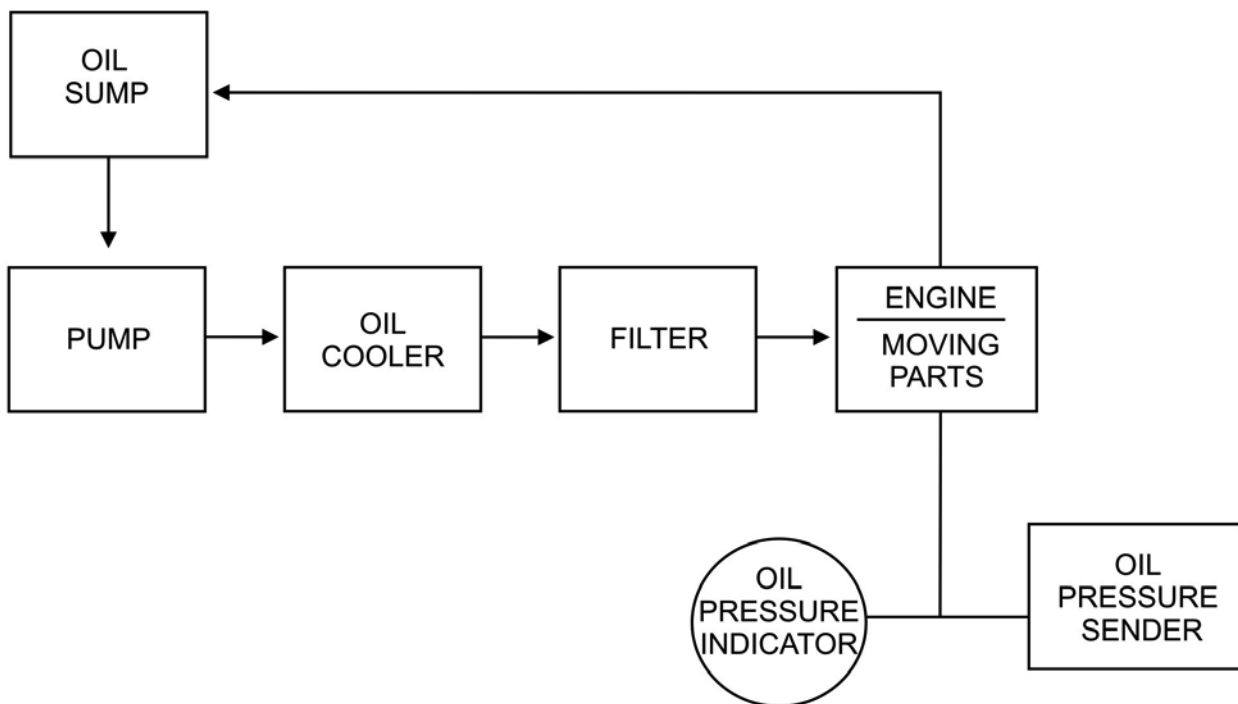


Figure 5. Engine Lubrication System.

Air Intake and Exhaust System (Figure 6)

The air intake and exhaust system consists of an air cleaner assembly, intake manifold, exhaust manifold, turbocharger, and muffler. Ambient air is drawn into the air cleaner assembly where it passes through the air cleaner element.

Airborne dirt is removed and trapped in the element. A restriction indicator, located on the air cleaner assembly housing, displays red when the air cleaner element should be serviced. Filtered air is drawn out of the air cleaner assembly into the inlet portion of the turbocharger. The air exits the turbocharger through an additional air intake tube into the air intake manifold, where it passes into the engine and is mixed with fuel from the injectors.

The engine exhaust gases are expelled into the exhaust manifold. The exhaust manifold channels the gases into the turbocharger which then compresses the air from the air filter and forces the air into the intake manifold. The exhaust gases then pass to the muffler to deaden the sound of the exhaust gases. The gases pass from the muffler outlet and are vented upward from the generator set housing.

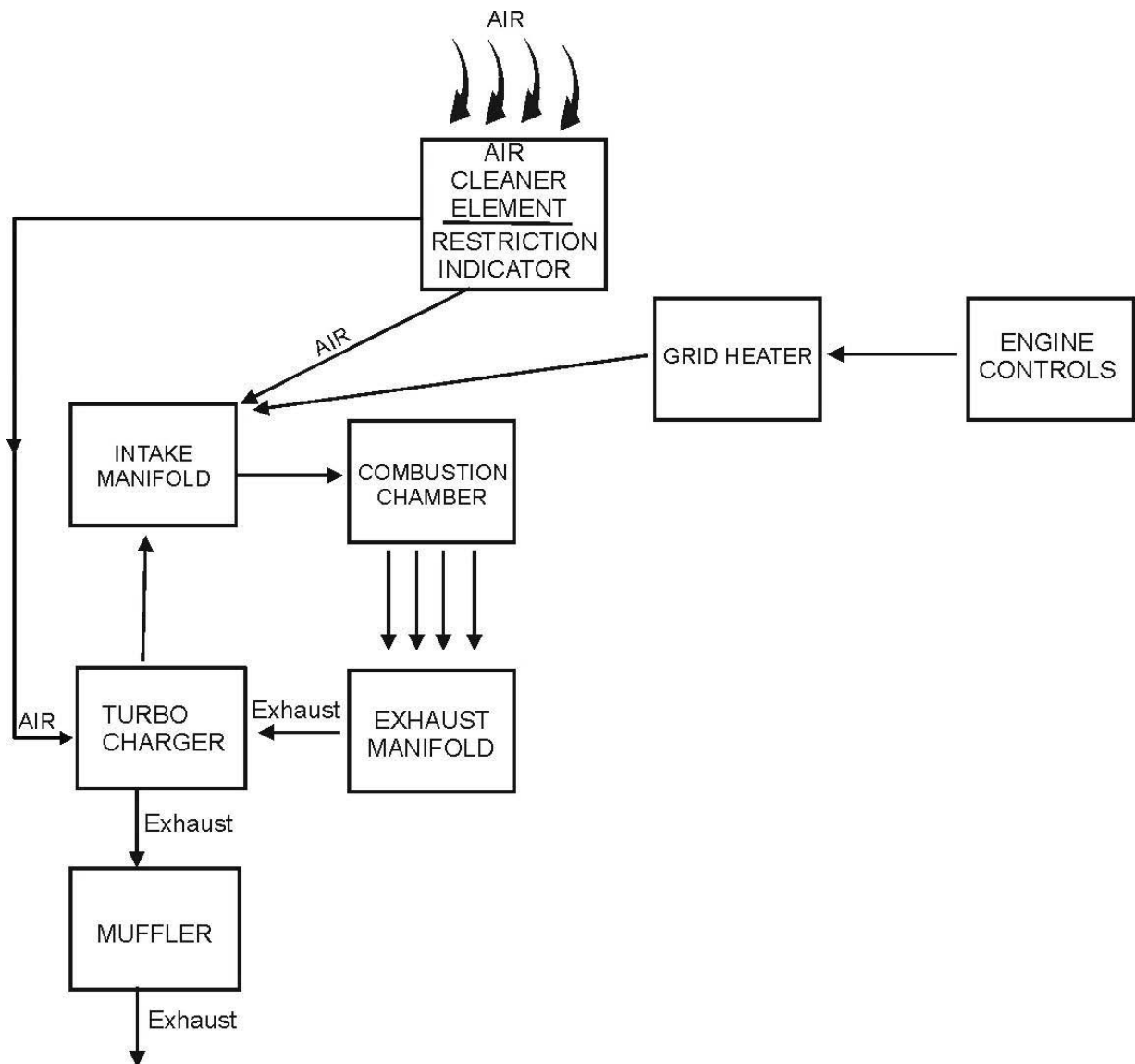


Figure 6. Air Intake and Exhaust System.

Output Supply System (Figure 7)

The output supply system consists of the AC generator, output terminal board, voltage selection board, Automatic Voltage Regulator (AVR), Ampere Meter – Voltage Meter (AM – VM), AC circuit interrupt relay, and contactor. Power created by the generator is supplied through the voltage selection board and the contactor to the output terminals on the output terminal board. For more information on the theory and practice of electrical generation, refer to FM 5-424, Theater of Operations Electrical Systems.

The voltage selection board allows configuration of the generator set for the following voltage ranges:

120/208V, 3 phase, 4 wire

240/416V, 3 phase, 4 wire

The AC CIRCUIT INTERRUPT switch controls the AC circuit interrupter relay. The relay enables or interrupts the power flow between the voltage selection board and the output terminals by opening and closing the contactor. The AC circuit interrupter relay also automatically opens the contactor during any of the faults that require a shutdown. The AVR senses AC voltage output and provides controlled voltage to the AC generator exciter to maintain the desired AC generator output voltage. [Voltage] and [Current] are indicated on the operator control screen on the DCS. The [Genset Voltage] panel on the DCS displays the [Voltage] AC output of the unit. The [Bus Voltage] panel on the DCS displays the [Voltage] AC output at the output terminal board. The [Genset Current] screen on the DCS displays the output of the unit in amperes.

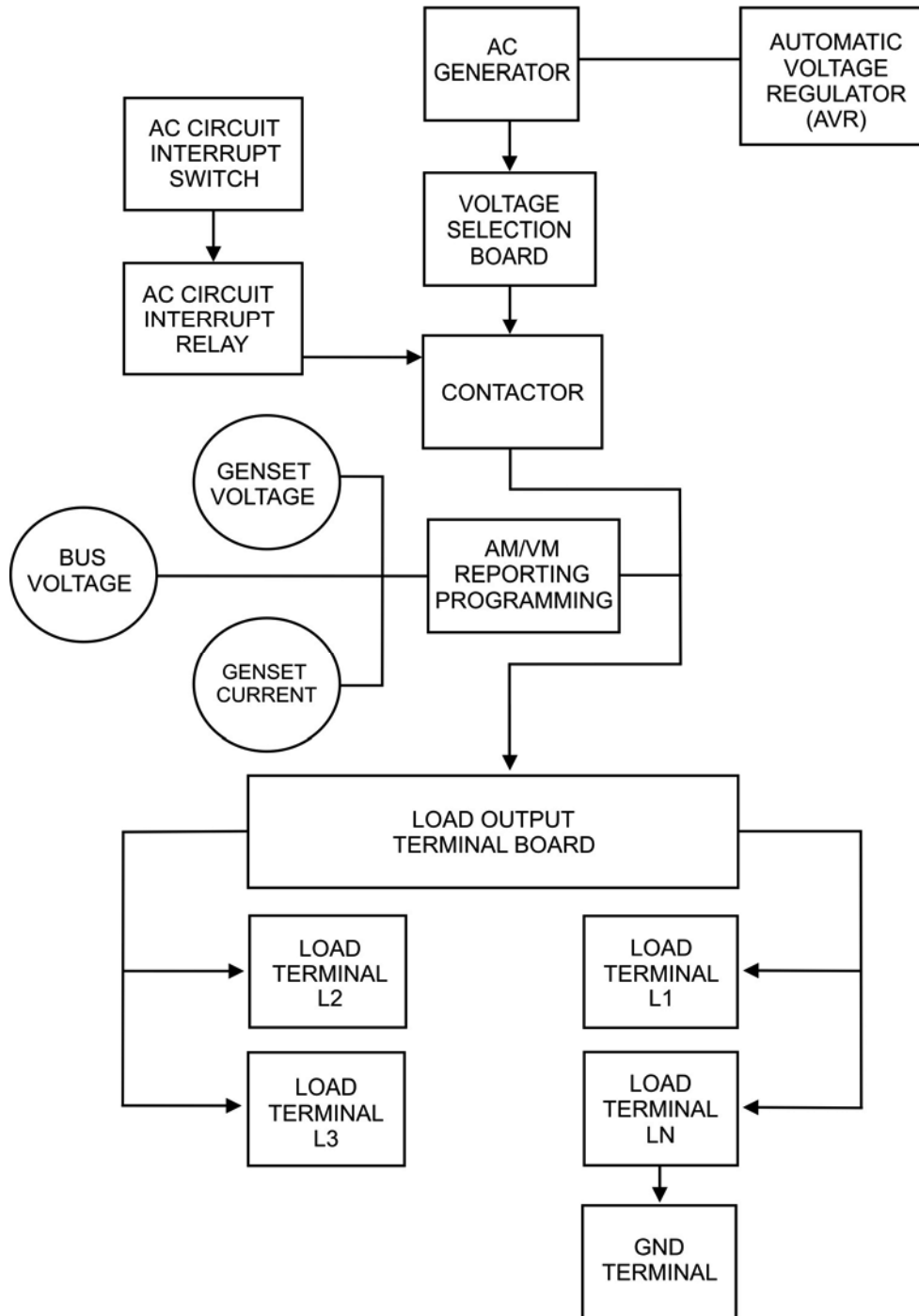


Figure 7. Output Supply System.

END OF WORK PACKAGE

CHAPTER 2
TROUBLESHOOTING PROCEDURES
FOR
AMMPS 15KW GENERATOR SET

CHAPTER 2
TROUBLESHOOTING PROCEDURES

WORK PACKAGE INDEX

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TROUBLESHOOTING INDEX	0004
OPERATIONAL CHECKOUT	0005
WARNINGS AND FAULT CODES.....	0006
COOLING SYSTEM TROUBLESHOOTING WITH DCS CODE	0007
ELECTRICAL SYSTEM TROUBLESHOOTING WITH DCS CODE	0008
ELECTRICAL SYSTEM TROUBLESHOOTING WITHOUT DCS CODE.....	0009
ENGINE SYSTEM TROUBLESHOOTING WITH DCS CODE.....	0010
ENGINE SYSTEM TROUBLESHOOTING WITHOUT DCS CODE	0011
EXHAUST SYSTEM TROUBLESHOOTING WITHOUT DCS CODE.....	0012
WINTERIZATION KIT TROUBLESHOOTING.....	0013

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
TROUBLESHOOTING INDEX

GENERAL TROUBLESHOOTING INFORMATION

Troubleshooting procedures are designed to isolate AMMPS faults to the LRU level. Troubleshooting techniques apply to all AMMPS components as indicated.

Troubleshooting procedures list the symptoms, malfunctions, and corrective actions required to resolve the problem(s). Perform all steps in the order they appear in the WP. Troubleshooting procedures are listed according to symptom, followed by the malfunction, then any corrective action(s). All necessary references to procedures/instructions can be found within the applicable Troubleshooting WP (see the Malfunction/Symptom Index below).

The DCS constantly monitors the engine sensors for abnormal conditions, such as low oil pressure and high coolant temperature. If any of these conditions occur, the DCS control panel display screen will display a message indicating a fault or warning code. The system will shut down if a fault code is indicated. The system will not normally shut down from warning codes. If a warning is indicated but not addressed, it may become a fault. If a malfunction or failure occurs during an operation or performance check, perform troubleshooting IAW the Malfunction/Symptom Index and any displayed fault or warning codes (WP 0006, Warnings and Fault Codes). Troubleshooting is offered in two formats when necessary: a fault with a DCS code and a fault without a DCS code. Always check DCS screen for any fault or warning codes before performing troubleshooting procedures.

DO NOT BEGIN A TASK UNTIL:

- You understand the task.
- You have the tools and equipment you need.

MALFUNCTION/SYMPTOM INDEX

The Malfunction/Symptom Index is a quick reference for locating troubleshooting procedures. Troubleshooting procedures are arranged based on the location of the malfunction (i.e., engine, exhaust system, cooling system) and presence of a DCS code.

DCS Fault/Warning Codes

WP 0006, Warnings and Fault Codes, describes each fault and warning code with applicable reference. When applicable, there are two versions for each troubleshooting system WP: faults with a DCS code and faults without a DCS code.

Operational Checkout

Field maintenance is responsible for performing operational checkout procedures (WP 0005, Operational Checkout) prior to determining generator set as operational or before detailed troubleshooting is attempted.

Indications from Manual Troubleshooting Techniques

Field maintenance is responsible for performing manual troubleshooting techniques, including continuity tests and voltage checks.

After Corrective Action

After the corrective action is completed, the equipment must be tested to verify that the problem is corrected. Locate the malfunction in the troubleshooting procedures and perform the test or inspection. If the correct response is not obtained, continue troubleshooting all suspected malfunctions and performing corresponding corrective actions until the equipment is operational or is replaced with operational equipment.

Specific Troubleshooting Procedures

This TM cannot list all malfunctions that may occur or all tests or inspections and corrective actions. If the malfunction encountered is not listed or is not corrected by the listed corrective action, replace the lowest level LRU component that will remedy the malfunction.

Malfunction/Symptom Troubleshooting Procedure WP and Page

COOLING SYSTEM TROUBLESHOOTING WITH A DCS CODE

- 1. [Fault 151: High Coolant Temperature] displayed on DCS screen WP 0007, Page 2
 - a. Low coolant level, improper type used, or clogged cooling fins in radiator WP 0007, Page 2
 - b. Loose, defective, or improperly fitted radiator cap or coolant overflow bottle cap WP 0007, Page 3
 - c. Coolant system leak WP 0007, Page 3
 - d. Inoperable thermostat WP 0007, Page 4
 - e. Inoperable cooling fan(s) WP 0007, Page 4
 - f. Defective temperature sensor WP 0007, Page 5
 - g. Generator set overload WP 0007, Page 5
 - h. Excessive slack in battery-charging alternator belt causing water pump malfunction WP 0007, Page 6
 - i. Improperly operating water pump WP 0007, Page 6
 - j. Insufficient cooling effect of radiator WP 0007, Page 6
 - k. Low engine oil level WP 0007, Page 6
 - l. Clogged muffler or clog in exhaust system WP 0007, Page 7
 - m. Engine used at high temperatures or high altitude WP 0007, Page 7
 - n. Improper fuel injection WP 0007, Page 7
 - o. Incorrect fuel injection timing or governor actuator fault WP 0007, Page 7
 - p. Internal engine problem WP 0007, Page 8
- 2. [Warning 146: Pre-High Coolant Temperature] displayed on DCS screen WP 0007, Page 8
 - Cooling system malfunction WP 0007, Page 8

ELECTRICAL SYSTEM TROUBLESHOOTING WITH A DCS CODE

- 3. [Fault 115: Speed Signal Lost] displayed on DCS screen WP 0008, Page 3
 - Engine speed sensor malfunction WP 0008, Page 3
- 4. [Fault 1433: Local E-Stop] displayed on DCS screen WP 0008, Page 4
 - Malfunctioning EMERGENCY STOP push button or malfunctioning DCS WP 0008, Page 4

<u>Malfunction/Symptom</u>	<u>Troubleshooting Procedure WP and Page</u>
5. [Fault 1434: Remote E-Stop] displayed on DCS screen	WP 0008, Page 4
Defective remote control cable, pins on DCS, or remote operating source	WP 0008, Page 4
6. [Fault 1445: Short Circuit] displayed on DCS screen	WP 0008, Page 5
Load cables have been shorted or overloaded	WP 0008, Page 5
7. [Fault 1446: High AC Voltage] displayed on DCS screen	WP 0008, Page 6
Incorrect setting or shorted load	WP 0008, Page 6
8. [Fault 1447: Low AC Voltage] displayed on DCS screen	WP 0008, Page 7
Overload, damage to wiring, or damage to DCS.....	WP 0008, Page 7
9. [Fault 1448: Underfrequency] displayed on DCS screen	WP 0008, Page 7
Generator set was subjected to a reduction in speed for a period of time	WP 0008, Page 7
10. [Fault 1452: Genset Contactor Fail To Close] displayed on DCS screen	WP 0008, Page 7
Contactor or wiring malfunction	WP 0008, Page 7
11. [Fault 1453: Genset Contactor Fail To Open] displayed on DCS screen.....	WP 0008, Page 8
Contactor or wiring malfunction	WP 0008, Page 8
12. [Fault 1472: High Current] displayed on DCS screen	WP 0008, Page 9
Short, overload, or AC generator malfunction	WP 0008, Page 9
13. [Fault 1918: Fuel Level Low] displayed on DCS screen.....	WP 0008, Page 10
Low fuel level or fuel level sensor malfunction	WP 0008, Page 10
14. [Fault 2335: Excitation Fault] displayed on DCS screen	WP 0008, Page 11
Circuit breaker, wiring, or AC generator malfunction.....	WP 0008, Page 11
15. [Fault 2914: Genset AC Meter Failed] displayed on DCS screen	WP 0008, Page 13
Generator set AC meter failure.....	WP 0008, Page 13
16. [Fault 2972: Field Overload] displayed on DCS screen	WP 0008, Page 13
Faulty AC generator components or AVR	WP 0008, Page 13
17. [Fault 3664: Invalid Genset Configuration] displayed on DCS screen	WP 0008, Page 13
Incorrect dip switch settings, wiring malfunction, or improper engine or AC generator combination.....	WP 0008, Page 13
18. [Fault 3665: Invalid Voltage Configuration] displayed on DCS screen.....	WP 0008, Page 14
Voltage selection fault	WP 0008, Page 14
19. [Fault 3668: Output Voltage Configuration Bit 0 Changed] or [Fault 3669: Output Voltage Configuration Bit 1 Changed] displayed on DCS screen	WP 0008, Page 15
Voltage selection fault	WP 0008, Page 15
20. [Fault 3673: Convenience Receptacle AC Meter Failed] displayed on DCS screen	WP 0008, Page 15
Convenience receptacle AC meter failed	WP 0008, Page 15
21. [Fault 3677: Genset Config Factory Test Fault] displayed on DCS screen.....	WP 0008, Page 15
Factory calibration error.....	WP 0008, Page 15

<u>Malfunction/Symptom</u>	<u>Troubleshooting Procedure WP and Page</u>
22. [Warning 135: Oil Pressure Sensor High] displayed on DCS screen.....	WP 0008, Page 16
Voltage above normal or shorted to a high source.....	WP 0008, Page 16
23. [Warning 141: Oil Pressure Sensor Low] displayed on DCS screen	WP 0008, Page 17
Voltage below normal or shorted to a low source	WP 0008, Page 17
24. [Warning 144: Coolant Temp Sensor OOR High] displayed on DCS screen.....	WP 0008, Page 17
Defective temperature sensor, poor wiring connection, or a short.....	WP 0008, Page 17
25. [Warning 145: Coolant Temp Sensor OOR Low] displayed on DCS screen	WP 0008, Page 19
Voltage below normal or shorted to a low source	WP 0008, Page 19
26. [Warning 319: Real Time Clock Error] displayed on DCS screen.....	WP 0008, Page 19
Clock no longer accurate due to temporary power loss or backup battery failure	WP 0008, Page 19
27. [Warning 441: Low Battery Voltage] displayed on DCS screen	WP 0008, Page 19
Battery or charging failure	WP 0008, Page 19
28. [Warning 442: High Battery Voltage] displayed on DCS screen	WP 0008, Page 19
Alternator or DCS failure	WP 0008, Page 19
29. [Warning 1131: Battle Short Active] displayed on DCS screen.....	WP 0008, Page 20
BATTLESHORT switch malfunction	WP 0008, Page 20
30. [Warning 1417: Power Down Failure] displayed on DCS screen.....	WP 0008, Page 20
DCS malfunction.....	WP 0008, Page 20
31. [Warning 1441: Low Fuel Level] displayed on DCS screen	WP 0008, Page 20
Low fuel level or sensor malfunction	WP 0008, Page 20
32. [Warning 1442: Weak Battery] displayed on DCS screen.....	WP 0008, Page 21
a. Battery connections are loose or batteries are insufficiently charged.	WP 0008, Page 21
b. Loose belt, defective battery-charging alternator, or defective electrical component.....	WP 0008, Page 21
33. [Warning 1444: KW Overload] displayed on DCS screen	WP 0008, Page 22
Load cable or wiring malfunction	WP 0008, Page 22
34. [Warning 1449: Overfrequency] displayed on DCS screen.....	WP 0008, Page 22
Generator AC output frequency is high	WP 0008, Page 22
35. [Warning 1451: Genset/Bus Voltage Mismatch].....	WP 0008, Page 23
DCS fault	WP 0008, Page 23
36. [Warning 1469: Speed/Hz Mismatch] displayed on DCS screen.....	WP 0008, Page 24
Speed sensor error or flywheel damage.....	WP 0008, Page 24
37. [Warning 1471: High Current Warning] displayed on DCS screen	WP 0008, Page 24
Short, overload, or AC generator malfunction	WP 0008, Page 24
38. [Warning 1689: Reset Real Time Clock] displayed on DCS screen	WP 0008, Page 24
Clock no longer accurate due to temporary power loss or backup battery failure	WP 0008, Page 24

Malfunction/Symptom

Troubleshooting Procedure WP and Page

39. [Warning 2336: Checksum Fault] displayed on DCS screen WP 0008, Page 25
 Calibration File error WP 0008, Page 25

40. [Warning 2915: Genset Bus AC Meter Failed] displayed on DCS screen WP 0008, Page 25
 Generator set Bus AC meter failed..... WP 0008, Page 25

41. [Warning 2917: Genset Bus Voltage High] displayed on DCS screen..... WP 0008, Page 25
 Paralleling or voltage sense fault..... WP 0008, Page 25

42. [Warning 2936: Fuel Level Sensor High] displayed on DCS screen..... WP 0008, Page 26
 Fuel level sensor malfunction WP 0008, Page 26

43. [Warning 2937: Fuel Level Sensor Low] displayed on DCS screen..... WP 0008, Page 27
 Fuel level sensor malfunction WP 0008, Page 27

44. [Warning 2967: Governor Fault] displayed on DCS screen WP 0008, Page 27
 Governor actuator malfunction WP 0008, Page 27

45. [Warning 2968: AVR Fault] displayed on DCS screen WP 0008, Page 28
 Wiring or AC generator failure WP 0008, Page 28

46. [Warning 3662: Battery Discharge] displayed on DCS screen..... WP 0008, Page 28
 Loose belt, defective battery-charging alternator, or defective electrical component WP 0008, Page 28

47. [Warning 3666: Master Control Switch Configuration] displayed on DCS screen WP 0008, Page 29
 Engine control switch fault..... WP 0008, Page 29

48. [Warning 3672: Automatic Field Flash Not Complete] displayed on DCS screen WP 0008, Page 30
 Wiring or DCS malfunction WP 0008, Page 30

49. [Warning 3674: Genset Configuration Change] displayed on DCS screen..... WP 0008, Page 31
 Incorrect dip switch settings, wiring malfunction, or improper engine
 or AC generator combination..... WP 0008, Page 31

ELECTRICAL SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE

50. DCS indicates no power available and no lighted display..... WP 0009, Page 2
 a. Battery malfunction WP 0009, Page 2
 b. Circuit breaker or wiring malfunction..... WP 0009, Page 3
 c. Defective DCS..... WP 0009, Page 5

51. EMERGENCY STOP push button fails to stop generator set WP 0009, Page 5
 EMERGENCY STOP push button failure WP 0009, Page 5

52. No power to convenience receptacle or convenience receptacle fails to work WP 0009, Page 6
 Convenience receptacle is defective or has been subjected to a ground fault condition..... WP 0009, Page 6

53. Circuit interrupter will not close or open WP 0009, Page 8
 Contactor or wiring malfunction WP 0009, Page 8

Malfunction/Symptom **Troubleshooting Procedure WP and Page**

- 54. Hour meter is no longer recording operating hours..... WP 0009, Page 8
- Defective hour meter WP 0009, Page 8

ENGINE SYSTEM TROUBLESHOOTING WITH A DCS CODE

- 55. [Fault 234: Overspeed Shutdown] displayed on DCS screen WP 0010, Page 3
- Large block load removal or vapor drawn into intake air passage WP 0010, Page 3
- 56. [Fault 359: Fail to Start] displayed on DCS screen. WP 0010, Page 4
- a. Fuel tank is empty or improper connection. WP 0010, Page 4
- b. Dirty air cleaner element, intake air restriction, or excess backpressure. WP 0010, Page 4
- c. Fuel system malfunction. WP 0010, Page 4
- d. Fuel injection timing incorrect or governor actuator malfunction WP 0010, Page 5
- e. Improper clearance (open or close timing) of intake/exhaust valves..... WP 0010, Page 5
- f. Cold weather conditions WP 0010, Page 5
- g. Leaking cylinder head gasket WP 0010, Page 6
- h. Fuel injection malfunction..... WP 0010, Page 6
- i. Internal engine problem WP 0010, Page 6
- 57. [Fault 415: Low Oil Pressure] displayed on DCS screen WP 0010, Page 7
- a. Low engine oil level..... WP 0010, Page 7
- b. Diluted engine oil..... WP 0010, Page 7
- c. Defective engine oil pressure sender..... WP 0010, Page 8
- d. Clogged oil strainer WP 0010, Page 8
- e. Internal engine problem WP 0010, Page 8
- 58. [Fault 1438: Fail to Crank] displayed on DCS screen WP 0010, Page 9
- a. DEAD CRANK SWITCH is not in NORMAL position or will not turn over engine WP 0010, Page 9
- b. Battery connections are loose or batteries are insufficiently charged WP 0010, Page 9
- c. Defective starter or flywheel..... WP 0010, Page 10
- d. Defective wiring or DCS WP 0010, Page 10
- 59. [Warning 143: Pre-Low Oil Pressure] displayed on DCS screen WP 0010, Page 11
- Engine oil malfunction WP 0010, Page 11
- 60. [Warning 1992: High Speed Warning] displayed on DCS screen WP 0010, Page 11
- Engine speed malfunction WP 0010, Page 11

ENGINE SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE

- 61. Evidence of fluid leakage found around engine WP 0011, Page 3
- a. Engine is leaking oil WP 0011, Page 3

<u>Malfunction/Symptom</u>	<u>Troubleshooting Procedure WP and Page</u>
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c. Engine is leaking fuel	WP 0011, Page 5
62. Engine cranks slowly and fails to start	WP 0011, Page 5
a. Battery connections are loose or batteries are insufficiently charged	WP 0011, Page 5
b. Dirty air cleaner element or intake air restriction	WP 0011, Page 6
c. Fuel system malfunction	WP 0011, Page 6
d. Fuel injection timing incorrect or governor actuator malfunction	WP 0011, Page 7
e. Cold weather conditions	WP 0011, Page 7
f. Defective starter or wiring is incorrect.....	WP 0011, Page 8
g. Flywheel is defective	WP 0011, Page 8
h. Fuel injection malfunction.	WP 0011, Page 8
i. Internal engine problem	WP 0011, Page 9
63. Engine will not shut down	WP 0011, Page 9
a. Governor actuator malfunction.....	WP 0011, Page 9
b. Engine control switch fault.	WP 0011, Page 9
64. Engine cranks normally but fails to start.....	WP 0011, Page 9
Engine system malfunction.....	WP 0011, Page 9
65. Engine starts but stops after starting	WP 0011, Page 10
a. No or low fuel	WP 0011, Page 10
b. Fuel system malfunction	WP 0011, Page 10
c. Dirty air cleaner element or intake air restriction	WP 0011, Page 10
d. Fuel injection timing incorrect or governor actuator malfunction	WP 0011, Page 10
e. Engine control switch fault	WP 0011, Page 11
f. Fuel injection or DCS malfunction.....	WP 0011, Page 11
66. Engine stops suddenly during normal operation	WP 0011, Page 11
Engine malfunction	WP 0011, Page 11
67. Engine runs erratically, performs poorly (does not develop full power), or misfires.....	WP 0011, Page 12
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b. Insufficient oil level.	WP 0011, Page 12
c. Fuel system malfunction	WP 0011, Page 12
d. Fuel injection timing or governor actuator malfunction	WP 0011, Page 12
e. Dirty turbocharger blower.....	WP 0011, Page 13
f. Turbocharger waste gate valve malfunction	WP 0011, Page 13
g. Valves improperly adjusted	WP 0011, Page 13
h. Fuel injection malfunction.	WP 0011, Page 13
i. Internal engine problem	WP 0011, Page 14

<u>Malfunction/Symptom</u>	<u>Troubleshooting Procedure WP and Page</u>
68. Engine stability or hunting problems.....	WP 0011, Page 14
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69. Excessive oil consumption	WP 0011, Page 14
a. Oil change overdue, incorrect grade or type (for ambient temperature range), or oil level too high	WP 0011, Page 14
b. Leakage from oil lines, oil filter, or valve cover	WP 0011, Page 14
c. Diluted engine oil.....	WP 0011, Page 15
d. Leaking crankcase rear bearing case cover seal	WP 0011, Page 15
e. Crankcase breather line clogged	WP 0011, Page 15
f. Improper seal of oil pan or clogged oil strainer	WP 0011, Page 15
g. Fuel injection malfunction.....	WP 0011, Page 16
h. Internal engine problem	WP 0011, Page 16
70. Engine knocks or makes excessive noise.....	WP 0011, Page 16
a. Oil level low	WP 0011, Page 16
b. Fuel injection or governor actuator malfunction	WP 0011, Page 16
c. Valves improperly adjusted	WP 0011, Page 17
d. Internal engine problem	WP 0011, Page 17
71. Abnormal or high-pitched ascending and descending sounds heard from engine compartment.....	WP 0011, Page 17
a. Turbocharger has a bent shaft or end play in shaft	WP 0011, Page 17
b. Exhaust system malfunction	WP 0011, Page 17
c. Engine problem	WP 0011, Page 17
72. White smoke seen emitting from engine compartment	WP 0011, Page 18
a. Coolant leak	WP 0011, Page 18
b. Fuel injection timing or governor actuator malfunction	WP 0011, Page 18
c. Turbocharger lube oil line or outlet oil line leak.....	WP 0011, Page 19
d. Internal engine problem	WP 0011, Page 19
73. Blue or black smoke from engine compartment with strong odors.	WP 0011, Page 19
Wires burning.....	WP 0011, Page 19
74. Oil mixed with coolant.....	WP 0011, Page 19
Leaking cylinder head assembly gasket or internal engine problem.....	WP 0011, Page 20
75. Oil mixed with fuel.....	WP 0011, Page 20
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76. Cold weather starting aids fail to work properly.....	WP 0011, Page 20
Cold weather starting aid malfunction	WP 0011, Page 20

Malfunction/Symptom

Troubleshooting Procedure WP and Page

EXHAUST SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE

77. High-pitched hiss or whistle heard at exhaust outlet with a decrease in engine performance WP 0012, Page 2
 High back pressure or restriction in exhaust system WP 0012, Page 2

78. Abnormal sounds heard from exhaust system with a decrease in engine performance WP 0012, Page 3
 a. Exhaust system leak WP 0012, Page 3
 b. Internal engine problem WP 0012, Page 4

79. Intermittent hissing or popping noise is heard when engine is running WP 0012, Page 4
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80. Buzzing or rattling sound heard WP 0012, Page 4
 Loose or missing hardware of exhaust component WP 0012, Page 4

81. Engine emits blue or black smoke with insufficient engine output or backfire heard WP 0012, Page 5
 a. Overloaded generator set WP 0012, Page 5
 b. Dirty air cleaner element WP 0012, Page 5
 c. Obstruction in air intake system WP 0012, Page 6
 d. High back pressure or restriction in exhaust system WP 0012, Page 6
 e. Improper or contaminated fuel WP 0012, Page 7
 f. Improper open or close timing of intake/exhaust valves WP 0012, Page 7
 g. Too much oil in oil pan/too much oil added WP 0012, Page 7
 h. Engine used at high temperatures or at high altitude WP 0012, Page 7
 i. Dirty turbocharger assembly WP 0012, Page 7
 j. Turbocharger assembly waste gate malfunction WP 0012, Page 7
 k. Fuel injection timing incorrect or governor actuator malfunction WP 0012, Page 8
 l. Internal engine problem WP 0012, Page 8

82. Engine emits white exhaust smoke WP 0012, Page 8
 a. Fuel contaminated or improper fuel used WP 0012, Page 8
 b. Clogged exhaust pipe or muffler WP 0012, Page 9
 c. Clogged air filter WP 0012, Page 9
 d. Improper intake and exhaust valve open/closure WP 0012, Page 9
 e. Worn turbocharger assembly bearing WP 0012, Page 9
 f. Turbocharger lube oil line or outlet oil line leak WP 0012, Page 10
 g. Engine used at high temperatures or at high altitude WP 0012, Page 10
 h. Fuel injection timing incorrect or governor actuator malfunction WP 0012, Page 10
 i. Internal engine problem WP 0012, Page 10

Malfunction/Symptom

Troubleshooting Procedure WP and Page

WINTERIZATION KIT TROUBLESHOOTING

83. [Warning 3663: Winterization Kit Failure to Heat] displayed on DCS screen..... WP 0013, Page 2

- a. Fuel tank is empty WP 0013, Page 2
- b. Clogged intake port WP 0013, Page 2
- c. Clogged exhaust pipe WP 0013, Page 3
- d. Clogged winterization kit fuel pump or malfunctioning fuel pump..... WP 0013, Page 3
- e. Winterization kit wiring or DCS failure..... WP 0013, Page 3

84. [Warning 3671: Winterization Kit Low Voltage Warning] displayed on DCS screen..... WP 0013, Page 5

- a. Battery connections are loose or batteries are insufficiently charged. WP 0013, Page 5
- b. Winterization kit wiring or DCS failure..... WP 0013, Page 6

85. Winterization kit fails to turn off..... WP 0013, Page 6

- Defective flame or heat sensor..... WP 0013, Page 6

86. Winterization kit activates under usual operating conditions..... WP 0013, Page 7

- Defective temperature sensor or DCS temperature sensor WP 0013, Page 7

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
OPERATIONAL CHECKOUT

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 41)

Materials/Parts

Not Applicable

Personnel Required

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References

WP 0008, Electrical System Troubleshooting with DCS Code

WP 0009, Electrical System Troubleshooting without DCS Code

WP 0010, Engine System Troubleshooting with DCS Code

References

WP 0011, Engine System Troubleshooting without DCS Code

WP 0016, Field PMCS

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

OPERATIONAL CHECKOUT**WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator set is running. Failure to comply may cause injury or death to personnel.
- High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that personnel working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.

WARNING

- NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.
- DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.
- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply may cause damage to equipment.

NOTE

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Inspect Ground Connection

STEP

1. Ensure equipment conditions are met in order presented in initial setup.
2. Ensure ground rod is in ground.
3. Ensure ground cable is connected to output panel.
4. Ensure ground cable is connected to ground rod.
5. Open ground rod door on front panel.
6. Verify that all ground rods (three) have been used.

INDICATION/CONDITION

Ground rods remain in rack or ground rod is not properly installed.

CORRECTIVE ACTION

Install ground properly or install remaining ground rods as required (TM 9-6115-751-10) .

STEP

Inspect connection of ground wire to ground rods for tightness and metal-to-metal contact.

INDICATION/CONDITION

Connection is loose. Metal-to-metal contact is interrupted.

CORRECTIVE ACTION

Tighten connections and reset metal-to-metal contact as required (TM 9-6115-751-10) .

STEP**WARNING**

Shut down generator sets before performing inspection of load cables. Failure to comply may cause injury or death to personnel by electrocution.

1. Open output box assembly door.
2. Inspect connection of ground wire to ground post on output terminal board for tightness and metal-to-metal contact.

INDICATION/CONDITION

Connection is loose. Metal-to-metal contact is interrupted.

CORRECTIVE ACTION

Tighten connections and reset metal-to-metal contact as required (TM 9-6115-751-10).

Check DCS Function**STEP**

Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).

NOTE

Under normal operating conditions, the control panel display will take 4 sec or more to establish contact with the display and main controller boards. While contact is being established, the screen display is gray. It will be indicated in the mode and status lines as: [Genset Mode: Unknown] and [Establishing Communications]. The length of time the screen is either blank or gray depends on ambient temperature. See TM 9-6115-751-10 for cold weather operations.

INDICATION/CONDITION

Operator control screen is not operating.

CORRECTIVE ACTION

1. Ensure battery cables are connected (WP 0036, Remove/Install Batteries).
2. Ensure batteries are charged (WP 0036 Remove/Install Batteries).
3. Ensure wires in DCS are properly seated and in working condition (WP 0017, Remove/Install DCS).
4. Test DCS (WP 0018, Repair DCS) and replace DCS as required (WP 0017, Remove/Install DCS) if batteries are connected and charged and wires are attached and working properly, but DCS does not function.

STEP

1. Turn BATTLESHORT switch ON (TM 9-6115-751-10).
2. Watch DCS for [Warning 1131: Battle Short Active].

INDICATION/CONDITION

BATTLESHORT warning does not appear on DCS screen.

CORRECTIVE ACTION

Check wiring of DCS and BATTLESHORT switch and replace as required (WP 0017, Remove/Install DCS and WP 0018, Repair DCS).

Check Engine Function**STEP**

Start generator set (TM 9-6115-751-10).

INDICATION/CONDITION

Engine fails to start or never reaches rated speed.

CORRECTIVE ACTION**CAUTION**

Do not crank engine in excess of 15 sec. Allow starter to cool for at least 15 sec between attempted starts. Failure to comply may cause damage to equipment.

Troubleshoot engine (WP 0010, Engine System Troubleshooting with DCS Code and WP 0011, Engine System Troubleshooting without a DCS Code).

Check AC Generator Functions**CAUTION**

All of the following steps must be performed before releasing the AMMPS generator set for use. Failure to comply may cause damage to equipment.

STEP**NOTE**

MEP 1051 operates at 400 Hz only. MEP 1051 needs to be checked for voltage settings only. MEP 1050 operates at 50 Hz or 60 Hz and must be checked for voltage and frequency. Set frequency on DCS using adjustments screen (TM 9-6115-751-10).

1. Repeat steps 2 through 5 with MEP 1050 set at each frequency, if working with MEP 1050.
2. Set engine control switch to OFF (TM 9-6115-751-10).
3. Set AC generator voltage selection board to: 120/208-V, three-phase operation (TM 9-6115-751-10) .
4. Set engine control switch to PRIME & RUN (TM 9-6115-751-10).
5. Push FAULT RESET (TM 9-6115-751-10) to clear [Warning 3667: Voltage Configuration Change] (WP 0006, Warnings and Fault Codes).
6. Start generator set (TM 9-6115-751-10).

INDICATION/CONDITION

Output is not as requested from operator's control screen (TM 9-6115-751-10).

CORRECTIVE ACTION

Troubleshoot electrical system (WP 0008, Electrical System Troubleshooting with DCS Code and WP 0009, Electrical System Troubleshooting without DCS Code).

STEP

1. Start generator set (TM 9-6115-751-10).
2. Allow generator set to warm up for 5 min.
3. Press AC CIRCUIT INTERRUPT button (TM 9-6115-751-10).
4. Look for CONTACTOR CLOSED indication on screen (TM 9-6115-751-10).

INDICATION/CONDITION

Contactor does not close.

CORRECTIVE ACTION

Troubleshoot electrical system (WP 0008, Electrical System Troubleshooting with DCS Code and WP 0009, Electrical System Troubleshooting without DCS Code).

STEP**WARNING**

High voltage is produced when this generator set is in operation. Do not contact output cables when operating this generator set. Failure to comply may cause injury or death to personnel.

Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).

INDICATION/CONDITION

Generator set will not hold rated load for 30 min.

CORRECTIVE ACTION

Troubleshoot electrical or engine system (WP 0008, Electrical System Troubleshooting with a DCS Code; WP 0009, Electrical System Troubleshooting without a DCS Code; WP 0010, Engine System Troubleshooting with a DCS Code; and WP 0011, Engine System Troubleshooting without a DCS Code).

END OF WORK PACKAGE

**FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
WARNING AND FAULT CODES**

INITIAL SETUP:

Test Equipment

Not Applicable

Tools and Special Tools

Not Applicable

Materials/Parts

Not Applicable

Personnel Required

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References

TM 9-6115-751-10

TM 9-6115-757-13&P

WP 0007, Cooling System Troubleshooting with a DCS Code

References

WP 0008, Electrical System Troubleshooting with a DCS Code

WP 0010, Engine System Troubleshooting with a DCS Code

WP 0013, Winterization Kit Troubleshooting

WP 0043, Service Fuel System

WP 0060, Remove/Install Current Transformers

Equipment Conditions

Not Applicable

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

WARNING AND FAULT CODES

The AMMPS DCS displays real-time fault and warning codes on the top two lines of the operator main screen. Faults will result in equipment shut down. Warnings indicate items that may result in faults if unattended. The descriptions displayed on-screen and listed below provide detail about the occurrence of the fault code or warning code. By accessing the [Maintenance] screen (TM 9-6115-751-10), troubleshooting suggestions can be accessed and possible solutions indicated. The DCS must be reset using FAULT RESET switch as faults and warnings are addressed. Use the codes displayed by the DCS and the "ACTION" column in Table 1 and Table 2 to resolve problems with the AMMPS system.

Table 1. Fault Codes.

CODE AND PANEL TEXT	MAINTENANCE SCREEN DESCRIPTION	ACTION
[Fault 115: Speed Signal Lost]	[Engine Magnetic Crankshaft Speed/Position lost both of two signals — Data Erratic Intermittent or Incorrect.]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 151: High Coolant Temp]	[Engine Coolant Temperature — Data Valid but Above Normal Operational Range — Most Severe Level]	WP 0007, Cooling System Troubleshooting with a DCS Code.
[Fault 234: Overspeed Shutdown]	[Engine Crankshaft Speed/Position — Data Valid but Above Normal Operational Range — Most Severe Level]	WP 0010, Engine System Troubleshooting with a DCS Code.
[Fault 359: Fail to Start]	[Engine Failed Automatic Start — Condition Exists]	WP 0010, Engine System Troubleshooting with a DCS Code.
[Fault 415: Low Oil Pressure]	[Engine Oil Rifle Pressure — Data Valid but Below Normal Operational Range — Most Severe Level]	WP 0010, Engine System Troubleshooting with a DCS Code.
[Fault 1433: Local E-Stop]	[Local E-Stop Button Engaged]	The local EMERGENCY STOP button has been pressed. Pull the button out. Acknowledge the faults and reset them to return to normal operating mode. If symptom continues, see WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 1434: Remote E-Stop]	[Remote E-Stop Signal Active]	Turn off the remote emergency stop. Acknowledge the faults and reset them to return to normal operating mode. If symptom continues, see WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 1438: Fail To Crank]	[Engine Failed To Crank]	WP 0010, Engine System Troubleshooting with a DCS Code.
[Fault 1445: Short Circuit]	[Alternator Current is Greater Than 175% of Maximum Line Current]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 1446: High AC Voltage]	[AC Output Voltage is Greater Than High AC Voltage Threshold (130%)]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 1447: Low AC Voltage]	[AC Output Voltage is Less Than Low AC Voltage Threshold (70%)]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 1448: Underfrequency]	[Generator AC Output Frequency — Data Valid But Below Normal Operating Range — Moderately Severe Level]	WP 0008, Electrical System Troubleshooting with a DCS Code.

Table 1. Fault Codes — Continued.

CODE AND PANEL TEXT	MAINTENANCE SCREEN DESCRIPTION	ACTION
[Fault 1452: Genset Contactor Fail To Close]	[Genset Contactor Failed to Close Within the Specified Close Time Delay]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 1453: Genset Contactor Fail To Open]	[Genset Contactor Failed to Open Within the Specified Open Time Delay]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 1459: Reverse Power]	[Generator is Absorbing Power from the Bus]	Ensure orientation of current transformers is correct (WP 0060, Remove/Install Current Transformers). See TM 9-6115-757-13&P if symptom continues.
[Fault 1461: Loss of Field]	[Generator is Absorbing Reactive Power from the Bus]	TM 9-6115-757-13&P
[Fault 1472: High Current Shutdown]	[Alternator Current is Between 110% — 175% of Maximum Line Current for More Than the Shutdown Set Time]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 1918: Fuel Level Low]	[Very Low Fuel Level Detected by the Analog Sensor]	Fill generator set with proper fuel (WP 0043, Service Fuel System). See WP 0008, Electrical System Troubleshooting with a DCS Code if symptom continues.
[Fault 2335: Excitation Fault]	[Loss of AC Phase Voltage Sensing — Condition Exists]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 2914: Genset AC Meter Failed]	[Genset AC Meter Chip Failed Health Check]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 2972: Field Overload]	[AVR Field at Maximum Field Drive Limit for Greater than the Maximum Field Time]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 3659: Switch Box Fail To Open]	[The Switch Box Contactor Failed to Open Within Specified Open Time Delay]	TM 9-6115-757-13&P.
[Fault 3664: Invalid Genset Configuration]	[Engine Model Identification Bits are Set to an Invalid Setting]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 3665: Invalid Voltage Configuration]	[Output Voltage Configuration is Invalid for the Given Genset Configuration]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 3668: Output Voltage Config Bit 0 Changed]	[The State of the Output Voltage Configuration Bit 0 has Changed]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 3669: Output Voltage Config Bit 1 Changed]	[The State of the Output Voltage Configuration Bit 1 has Changed]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 3673: Convenience Receptacle AC Meter Failed]	[Convenience Receptacle AC Meter Chip Failed Health Check]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 3677: Genset Configuration Factory Test Fault]	[Genset Configuration ID Bits Do Not Match the Expected Genset Configuration]	WP 0008, Electrical System Troubleshooting with a DCS Code.

Table 2. Warning Codes.

CODE AND PANEL TEXT	MAINTENANCE SCREEN DESCRIPTION	ACTION
[Warning 135: Oil Pressure Sensor High]	[Engine Oil Rifle Pressure 1 Sensor Circuit — Voltage Above Normal, or Shorted to High Source]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 141: Oil Pressure Sensor Low]	[Engine Oil Rifle Pressure 1 Sensor Circuit — Voltage Below Normal, or Shorted to Low Source]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 143: Pre-Low Oil Pressure]	[Engine Oil Rifle Pressure — Data Valid but Below Normal Operational Range — Moderately Severe Level]	WP 0010, Engine System Troubleshooting with a DCS Code.
[Warning 144: Coolant Temp Sensor OOR High]	[Engine Coolant Temperature 1 Sensor Circuit — Voltage Above Normal, or Shorted to High Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 145: Coolant Temp Sensor OOR Low]	[Engine Coolant Temperature 1 Sensor Circuit — Voltage Below Normal, or Shorted to Low Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 146: Pre-High Coolant Temp]	[Engine Coolant Temperature — Data Valid but Above Normal Operational Range — Moderately Severe Level]	WP 0007, Cooling System Troubleshooting with a DCS Code.
[Warning 319: Real Time Clock Error]	[Real Time Clock Power Interrupt — Data Erratic, Intermittent, or Incorrect]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 441: Low Battery Voltage]	[Battery 1 Voltage — Data Valid but Below Normal Operational Range — Moderately Severe Level]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 442: High Battery Voltage]	[Battery 1 Voltage — Data Valid but Above Normal Operational Range — Moderately Severe Level]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 1131: Battle Short Active]	[Battle Short Mode Active]	Displays on DCS screen when BATTLESHORT switch is ON (WP 0008, Electrical System Troubleshooting with a DCS Code).
[Warning 1416: Fail to Shutdown]	[The System Has Failed to Shutdown]	Displays on DCS screen when BATTLESHORT switch is ON and a fault occurs. Switch off BATTLESHORT (TM 9-6115-751-10) as required to address fault.
[Warning 1417: Power Down Failure]	[The System Has Failed to Power Down]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 1441: Low Fuel Level]	[Low Fuel Level Detected by the Analog Sensor]	WP 0008, Electrical System Troubleshooting with a DCS Code.

Table 2. Warning Codes — Continued.

CODE AND PANEL TEXT	MAINTENANCE SCREEN DESCRIPTION	ACTION
[Warning 1442: Weak Battery]	[Battery Voltage Below Normal Operating Voltage During Genset Startup]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 1444: KW Overload]	[The KW Load on Genset is Over the Overload Warning Threshold Continuously for More Than the Overload Warning Set Time]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 1449: Overfrequency]	[Generator AC Output Frequency — Data Valid But Above Normal Operating Range — Moderately Severe Level]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 1451: Genset/Bus Voltage Mismatch]	[Genset Output Voltage and Bus Voltage are Out of Calibration]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 1456: Bus Out Of Synchronization Range]	[Bus Voltage and/or Frequency are Outside Set Limits for Synchronizing]	TM 9-6115-757-13&P
[Warning 1457: Fail To Synchronize]	[Genset Failed to Synchronize within Set Time]	TM 9-6115-757-13&P
[Warning 1458: Synch Phase Rotation Mismatch]	[Genset and Bus Phase Rotations are Reading Opposite for More Than the Dedicated Set Time]	TM 9-6115-757-13&P
[Warning 1469: Speed/Hz Mismatch]	[Genset Measured Speed and AC Output Frequency Conflict — Condition Exists]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 1471: High Current Warning]	[Alternator Current Reading Between 110% – 175% of Maximum Line Current for More than the Warning Set Time]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 1689: Reset Real Time Clock]	[Power to the RTC Chip has been Lost, Clock no Longer Accurate]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 1992: High Speed Warning]	[Engine Crankshaft Speed/Position — Data Valid but Above Normal Operational Range — Moderately Severe Level]	WP 0010, Engine System Troubleshooting with a DCS Code.
[Warning 2336: Checksum Fault]	[The Controller Checksum Calculation Differs From the Calibration Download]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 2915: Gen Bus AC Meter Failed]	[Genset Bus AC Meter Chip Failed Health Check]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 2917: Genset Bus Voltage High]	[Genset Bus Voltage — Voltage Above Normal, or Shorted to High Source]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 2936: Fuel Level Sensor High]	[Fuel Level OOR High Fault from the I/O Module]	WP 0008, Electrical System Troubleshooting with a DCS Code.

Table 2. Warning Codes — Continued.

CODE AND PANEL TEXT	MAINTENANCE SCREEN DESCRIPTION	ACTION
[Warning 2937: Fuel Level Sensor Low]	[Fuel Level OOR Low Fault from the I/O Module]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 2967: Governor Fault]	[The Governor Fault Output is Active]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 2968: AVR Fault]	[The AVR Fault Output is Active]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 3658: Switch Box Fail To Close]	[The Switch Box Contactor Failed to Close Within Specified Close Time Delay]	TM 9-6115-757-13&P
[Warning 3661: Maintenance Item is Active]	[The Time Interval for a Genset Maintenance Item or Deferred Maintenance Item has Expired and Requires a Maintenance Action]	Address maintenance item and perform as required. Reset code once maintenance item is addressed (TM 9-6115-751-10).
[Warning 3662: Battery Discharge]	[Battery Discharge Condition Detected]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 3663: Winterization Kit Failure to Heat]	[Winterization Kit Failed to Heat Engine Coolant]	WP 0013, Winterization Kit Troubleshooting.
[Warning 3666: Master Control Switch Configuration]	[The Number of Active Master Control Switch Inputs is Not Equal to 1]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 3667: Voltage Configuration Change]	[The Output Voltage Configuration has Changed]	Displays on DCS screen when voltage selection board is used to change the generator set voltage configuration (TM 9-6115-751-10). Push FAULT RESET switch to clear fault on DCS display.
[Warning 3671: Winterization Kit Low Voltage Warning]	[The Genset Battery Voltage is Too Low to Run Winterization Kit]	WP 0013, Winterization Kit Troubleshooting.
[Warning 3672: Automatic Field Flash Not Complete]	[The Field Flash Cycle did not Complete Successfully]	WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 3674: Genset Configuration Change]	[The Genset Configuration has Changed]	Displays on DCS screen when the DCS recognize the configuration has changed. This warning is most likely when a DCS is moved from one size generator set to a different size generator set. Push FAULT RESET and continue normal use of the generator set. If symptom continues, see WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 3678: Genset Frequency Changed]	[The Genset Frequency has Changed]	MEP 1050 only. Displays on DCS screen after changing generator set frequency from 60 Hz to 50 Hz or 50 Hz to 60 Hz (TM 9-6115-751-10). Push FAULT RESET switch to clear fault on DCS display.

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
COOLING SYSTEM TROUBLESHOOTING WITH A DCS CODE

INITIAL SETUP:**Test Equipment**

Test Set, Electronic Systems (WP 0163,
Maintenance Allocation Chart, Item 34)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163,
Item 41)

Materials/Parts

Not Applicable

References

TM 9-6115-751-10

WP 0008, Electrical System Troubleshooting with a
DCS Code

WP 0011, Engine System Troubleshooting without a
DCS Code

WP 0012, Exhaust System Troubleshooting without
a DCS Code

WP 0013, Winterization Kit Troubleshooting

WP 0016, Field PMCS

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

WP 0021, Service Cooling System

WP 0022, Remove/Install Coolant Recovery System

WP 0023, Remove/Install Cooling Fans

WP 0024, Remove/Install Radiator Hose and Tube
Assemblies

WP 0025, Remove/Install Winterization Kit
Components

WP 0027, Remove/Install Radiator

References

WP 0036, Remove/Install Batteries

WP 0039, Remove/Install Engine Wiring Harness

WP 0041, Remove/Install Relay Panel

WP 0063, Remove/Install 50/60 Hz Engine
Assembly

WP 0064, Remove/Install 400 Hz Engine Assembly

WP 0065, Service Lubrication System

WP 0067, Remove/Install Oil Cooler

WP 0068, Remove/Install Fuel Injectors

WP 0069, Remove/Install Fuel Injection Pump

WP 0070, Remove/Install Water Pump

WP 0071, Remove/Install Thermostat

WP 0073, Remove/Install Battery-Charging
Alternator Belt

WP 0087, Test Engine Compression

WP 0095, General Maintenance

WP 0098, Replace Cylinder Head Gasket

Foldout Pages

Personnel Required

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Equipment Conditions

Not Applicable

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

COOLING SYSTEM TROUBLESHOOTING WITH A DCS CODE**WARNING**

- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.
- Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.
- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.

NOTE

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

FAULT RESET switch must be pushed to clear each fault code as it is displayed on the DCS display when more than one fault code has been presented.

Capture spilled fluids and dispose of IAW local SOP.

SYMPTOM

[Fault 151: High Coolant Temperature] displayed on DCS screen.

NOTE

[Warning 146: Pre-High Coolant Temperature] is displayed on the DCS screen when coolant temperature reaches 220°F (104.4°C). [Fault 151: High Coolant Temperature] is displayed on the DCS screen and results in a generator set shutdown when coolant temperature reaches 230°F (110°C).

MALFUNCTION

Low coolant level, improper type used, or clogged cooling fins in radiator.

CORRECTIVE ACTION

STEP 1. Check coolant level in coolant overflow bottle first and then check coolant level in radiator. Add coolant as required (TM 9-6115-751-10).

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- STEP 2. Check radiator for excessive debris or clogs on cooling fins. Remove or clean debris or clogs as required (WP 0021, Service Cooling System).
 - STEP 3. If symptom continues, verify proper type of coolant is used (TM 9-6115-751-10).
 - STEP 4. If improper coolant or mixture is suspected, drain cooling system and fill with proper coolant (WP 0021, Service Cooling System).
 - STEP 5. If leak is suspected or symptom continues, proceed to next malfunction.

MALFUNCTION

Loose, defective, or improperly fitted radiator cap or coolant overflow bottle cap.

CORRECTIVE ACTION

- STEP 1. Check for loose, improperly fitted, or visibly defective radiator cap and coolant overflow bottle cap.
- STEP 2. Install properly if loose or improperly fitted or replace if defective (WP 0027, Remove/Install Radiator and WP 0022, Remove/Install Coolant Recovery System).
- STEP 3. If properly secured, test radiator cap to determine proper operation (WP 0021, Service Cooling System).
- STEP 4. If defective, replace as required (WP 0027, Remove/Install Radiator).
- STEP 5. Check coolant level in coolant overflow bottle and radiator, and add coolant as required (TM 9-6115-751-10).
- STEP 6. If symptom continues, proceed to next malfunction.

MALFUNCTION

Coolant system leak.

CORRECTIVE ACTION

- STEP 1. Perform a cooling system pressure check at radiator (WP 0021, Service Cooling System).
- STEP 2. If loss of pressure is observed on gage of cooling system tester, proceed to STEP 4.
- STEP 3. If no loss of pressure is observed, proceed to next malfunction.
- STEP 4. Check radiator and coolant overflow bottle hoses and clamps (WP 0022, Remove/Install Coolant Recovery System and WP 0024, Remove/Install Radiator Hose and Tube Assemblies), hoses and clamps at water pump (WP 0070, Remove/Install Water Pump), hoses and clamps at winterization kit as required (WP 0025, Remove/Install Winterization Kit Components), and hoses and clamps at oil cooler (WP 0067, Remove/Install Oil Cooler) for signs of leakage. Replace any hose or clamp as necessary.
- STEP 5. Check radiator for signs of leaks and replace as required (WP 0027, Remove/Install Radiator).
- STEP 6. Check coolant overflow bottle for signs of leaks and replace as required (WP 0022, Remove/Install Coolant Recovery System).

- STEP 7. Check water pump and hoses for leaks. Check cold start device hoses to and from water pump and cold start device (WP 0070, Remove/Install Water Pump).
- STEP 8. Replace water pump, hoses, or gasket as required (WP 0070, Remove/Install Water Pump).
- STEP 9. Check freeze plugs on engine for leaks. Replace freeze plugs if leaks are found (WP 0095, General Maintenance).
- STEP 10. Flush cooling system and fill as required (WP 0021, Service Cooling System).
- STEP 11. If symptom continues, proceed to next malfunction.

MALFUNCTION

Inoperable thermostat.

CORRECTIVE ACTION

- STEP 1. Test thermostat and replace as required (WP 0071, Remove/Install Thermostat).
- STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Inoperable cooling fan(s).

CORRECTIVE ACTION**WARNING**

Cooling fan has sharp blades. Use caution and wear gloves when removing or installing fan. Failure to comply may cause injury or death to personnel.

NOTE

Cooling fan(s) should run at high Pulse Width Modulated (PWM) signal when coolant temperature is above 223°F (106.1°C). Fan speed (controlled by PWM signal) is dependent on coolant temperature.

- STEP 1. Check air intake for obstruction and remove any obstruction.
- STEP 2. Test cooling fan operation by disconnecting engine temperature sensor wire (WP 0070, Remove/Install Water Pump) or by using InPower AMMPS software (WP 0095, General Maintenance).
- STEP 3. Start generator set and allow it to reach rated speed (TM 9-6115-751-10).

NOTE

Cooling fan(s) should run at high Pulse Width Modulated (PWM) signal when coolant temperature is above 223°F (106.1°C). Fan speed is dependent on coolant temperature.

- STEP 4. Compare fan speed PWM visually with InPower AMMPS software (WP 0095, General Maintenance) to coolant temperature. See Table 1.

Table 1. Cooling Fan PWM Signal.

COOLANT TEMPERATURE °F (°C)	PERCENTAGE OF PWM
-60°F (-51.1°C)	0
198°F (92.2°C)	0
199°F (92.7°C)	0
200°F (93.3°C)	20
210°F (98.9°C)	49
220°F (104.4°C)	61
223°F (106.1°C)	65
227°F (108.3°C)	65

- STEP 5. If fan(s) is not operating, install engine temperature sensor connector and check cooling fan circuit breakers and relays, resetting or replacing as required (WP 0041, Remove/Install Relay Panel).
- STEP 6. If cooling fan is found to be operating properly, install engine temperature sensor connector and proceed to next malfunction.
- STEP 7. If symptom continues, remove battery ground cable (WP 0036, Remove/Install Batteries) and use wiring diagrams and a multimeter set to test continuity to check cooling fan wiring to relay panel and DCS for opens or shorts (WP 0095, General Maintenance and Foldout Pages).
- STEP 8. Replace or repair wiring or connectors as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).
- STEP 9. If symptom continues, replace cooling fan (WP 0023, Remove/Install Cooling Fan).
- STEP 10. If symptom continues, check DCS LEDs and replace as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

MALFUNCTION

Defective temperature sensor.

CORRECTIVE ACTION

- STEP 1. Troubleshoot IAW [Warning 144: Coolant Temp Sensor OOR High] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).
- STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Generator set overload.

CORRECTIVE ACTION

- STEP 1. Check for generator set overload by checking the generator line current indicator on the generator status display screen.
- STEP 2. Proceed to next malfunction if generator set is operating at proper load.
- STEP 3. If load is too great for the generator set, replace with a larger generator set to match load requirements.

MALFUNCTION

Excessive slack in battery-charging alternator belt causing water pump malfunction.

CORRECTIVE ACTION

- STEP 1. Check battery-charging alternator belt for excessive wear and proper tension and replace as required (WP 0073, Remove/Install Battery-Charging Alternator Belt).
- STEP 2. Check water pump pulley for smooth turning and proper seating of belt.
- STEP 3. Replace water pump pulley if malfunction is detected (WP 0070, Remove/Install Water Pump).
- STEP 4. If not defective, proceed to next malfunction.

MALFUNCTION

Improperly operating water pump.

CORRECTIVE ACTION

- STEP 1. Turn shaft/pulley of water pump to feel for excessive resistance and play in the shaft.
- STEP 2. Replace water pump if improper operation is suspected (WP 0070, Remove/Install Water Pump).
- STEP 3. Observe engine temperature after replacement and check for engine overheating.
- STEP 4. If water pump is operating properly, proceed to next malfunction.

MALFUNCTION

Insufficient cooling effect of radiator.

CORRECTIVE ACTION

- STEP 1. Check hoses for obstructions, rust, or buildup and for signs of kinking causing restriction. Repair or replace as required (WP 0024, Remove/Install Radiator Hose and Tube Assemblies).
- STEP 2. Observe engine temperature on DCS screen (TM 9-6115-751-10).
- STEP 3. Replace radiator if insufficient cooling effect of radiator continues (WP 0027, Remove/Install Radiator Assembly).
- STEP 4. If not defective, proceed to next malfunction.

MALFUNCTION

Low engine oil level.

CORRECTIVE ACTION

- STEP 1. Add oil to the proper level (TM 9-6115-751-10).
- STEP 2. If engine oil is low, troubleshoot lubrication system for oil consumption (WP 0011, Engine System Troubleshooting without a DCS Code).
- STEP 3. If full, proceed to next malfunction.

MALFUNCTION

Clogged muffler or clog in exhaust system.

CORRECTIVE ACTION

STEP 1. Troubleshoot exhaust system for restriction (high back pressure/restriction in exhaust system) (WP 0012, Exhaust System Troubleshooting without a DCS Code).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Engine used at high temperatures or at high altitude.

CORRECTIVE ACTION

STEP 1. Check output drop and load matching requirements. Reduce load as required (TM 9-6115-751-10).

STEP 2. If not applicable, proceed to next malfunction.

MALFUNCTION

Improper fuel injection.

CORRECTIVE ACTION**WARNING**

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

STEP 1. Check fuel injectors for proper spray pattern and pressure rating and replace fuel injectors as required (WP 0068, Remove/Install Fuel Injectors).

STEP 2. If not defective, proceed to next malfunction.

MALFUNCTION

Incorrect fuel injection timing or governor actuator fault.

CORRECTIVE ACTION

STEP 1. Troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).

STEP 2. If symptom continues, check fuel injection pump timing and adjust as required (WP 0069, Remove/Install Fuel Injection Pump).

STEP 3. Replace fuel injection pump if timing cannot be adjusted or if found defective (WP 0069, Remove/Install Fuel Injection Pump).

STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

- STEP 1. Perform an engine compression check (WP 0087, Test Engine Compression).
- STEP 2. If compression check reveals fault, replace cylinder head gasket (WP 0098, Replace Cylinder Head Gasket).
- STEP 3. If symptom continues, replace engine (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

[Warning 146: Pre-High Coolant Temperature] displayed on DCS screen.

MALFUNCTION

Cooling system malfunction.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 151: High Coolant Temperature] displayed on DCS screen symptom.

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
ELECTRICAL SYSTEM TROUBLESHOOTING WITH A DCS CODE

INITIAL SETUP:**Test Equipment**

Cable, Remote Control (WP 0163, Maintenance Allocation Chart, Item 9)

Test Set, Electronic Systems (WP 0163, Item 34)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Item 41)

Materials/Parts

Not Applicable

Personnel Required

91D (1)

Assistant (1)

References

TM 9-6115-751-10

TM 9-6115-757-13&P

WP 0002, Equipment Description and Data

WP 0009, Electrical Troubleshooting without a DCS Code

WP 0011, Engine System Troubleshooting without a DCS Code

WP 0016, Field PMCS

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

WP 0036, Remove/Install Batteries

WP 0037, Remove/Install Main DC Circuit Breaker

WP 0039, Remove/Install Engine Wiring Harness

WP 0041, Remove/Install Relay Panel

WP 0043, Service Fuel System

WP 0049, Remove/Install Fuel Level Sensor

WP 0053, Remove/Install 50/60 Hz AC Generator Assembly

References

WP 0054, Remove/Install 400 Hz AC Generator Assembly

WP 0055, Test AC Generator

WP 0056, Remove/Install Contactor

WP 0057, Remove/Install Output Terminal Board

WP 0058, Remove/Install Voltage Selection Board

WP 0060, Remove/Install Transformers

WP 0062, Remove/Install Printed Circuit Board Module

WP 0063, Remove/Install 50/60 Hz Engine Assembly

WP 0064, Remove/Install 400 Hz Engine Assembly

WP 0069, Remove/Install Fuel Injection Pump

WP 0070, Remove/Install Water Pump

WP 0073, Remove/Install Battery-Charging Alternator Belt

WP 0074, Remove/Install Battery-Charging Alternator Assembly

WP 0081, Remove/Install Engine Speed Sensor

WP 0084, Remove/Install Flywheel

WP 0088, Test Engine Oil Pressure

WP 0095, General Maintenance

Foldout Pages

Special Environmental Conditions

Not Applicable

Equipment Conditions

Not Applicable

Drawings Required

Not Applicable

ELECTRICAL SYSTEM TROUBLESHOOTING WITH A DCS CODE**WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator set is operating. Failure to comply may cause injury or death to personnel.
- Ensure power is disconnected from whatever component is being repaired. Always check for power before attempting any other form of troubleshooting. Be sure to notify someone when working on electrical equipment. Never work alone or without someone else knowing that electrical equipment is involved. Failure to comply may cause injury or death to personnel.
- High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that personnel working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.
- DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.
- The right-hand battery negative lead that connects directly to the grounding stud must be disconnected prior to disconnecting or removing batteries. Follow procedural steps in exact order given for removal and installation. Failure to comply may cause injury or death to personnel.
- Batteries give off combustible gas. Do not smoke or use open flame when performing maintenance. Failure to comply may cause injury or death to personnel and damage to equipment.
- Battery acid can cause burns to skin and cause eye injury. Wear safety goggles and chemical gloves and avoid acid splash while working on the batteries. Failure to comply may cause injury or death to personnel.
- Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.
- Lifting batteries may cause back strain. Ensure proper lifting techniques are used when lifting batteries. Failure to comply may cause injury or death to personnel.
- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

WARNING

- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

NOTE

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

FAULT RESET switch must be pushed to clear each fault code as it is addressed.

SYMPTOM

[Fault 115: Speed Signal Lost] displayed on DCS screen.

MALFUNCTION

Engine speed sensor malfunction.

CORRECTIVE ACTION

- STEP 1. Inspect engine speed sensor for loose wires, loose connections, and improper gap (WP 0081, Remove/Install Engine Speed Sensor).
- STEP 2. Remove engine speed sensor to clean tip, adjust engine speed sensor gap (WP 0081, Remove/Install Engine Speed Sensor), or replace or repair wiring as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).
- STEP 3. If symptom continues, remove wiring connector and use a multimeter selected for Ohms scale to measure resistance of engine speed sensor between the two pins (WP 0095, General Maintenance).
- STEP 4. If value of resistance measured in STEP 3 is within 225 to 275 Ohms (Ω) range, engine speed sensor is operable. Proceed to STEP 6.
- STEP 5. If value of resistance measured in STEP 3 is not within 225 to 275 Ω range, engine speed sensor is open or shorted. Replace engine speed sensor (WP 0081, Remove/Install Engine Speed Sensor).

- STEP 6. If malfunction continues, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), and use wiring diagrams (Foldout Pages) to check wiring from sensor to DCS for shorts or opens using a multimeter set to test continuity (WP 0095, General Maintenance and WP 0039, Remove/Install Engine Wiring Harness).
- STEP 7. Repair or replace wiring as required (WP 0095, General Maintenance).
- STEP 8. If symptom continues, troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom.
- STEP 9. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Fault 1433: Local E-Stop] displayed on DCS screen.

MALFUNCTION

Malfunctioning EMERGENCY STOP push button or malfunctioning DCS.

CORRECTIVE ACTION

- STEP 1. Ensure EMERGENCY STOP push button is pulled out and attempt to reset the fault code by pressing FAULT RESET switch.
- STEP 2. If symptom continues, test EMERGENCY STOP push button and replace as required (WP 0018, Repair DCS).
- STEP 3. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Fault 1434: Remote E-Stop] displayed on DCS screen.

MALFUNCTION

Defective remote control cable, pins on DCS, or remote operating source.

CORRECTIVE ACTION

- STEP 1. If operating from a remote source, ensure remote emergency stop was not intentionally activated from a remote source. Proceed to STEP 3.
- STEP 2. If not operating from a remote source, proceed to STEP 9.
- STEP 3. Confirm reason for use of remote emergency stop and continue normal operation as required.
- STEP 4. If remote emergency stop was not intentionally activated, restart computer and reconnect to DCS (TM 9-6115-751-10).
- STEP 5. If symptom continues, inspect remote control cable and computer for damaged, missing, or bent pins where connector of remote control cable attaches.
- STEP 6. Replace remote control cable or computer as required.
- STEP 7. If symptom continues, disconnect remote control cable and use a multimeter set to check continuity to test remote control cable for opens or shorts (WP 0095, General Maintenance).

STEP 8. Replace remote control cable as required.

STEP 9. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Fault 1445: Short Circuit] displayed on DCS screen.

MALFUNCTION

Load cables have been shorted or overloaded.

CORRECTIVE ACTION

WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

STEP 1. Verify that load cables have been de-energized.

STEP 2. Inspect load cables, load, and output box visually for signs of wire damage or short circuit. Repair or replace wires or components as required (WP 0057, Remove/Install Output Terminal Board, WP 0056, Remove/Install Contactor, WP 0058, Remove/Install Voltage Selection Board, and WP 0060, Remove/Install Transformers).

STEP 3. If symptom continues, check operation by disconnecting load cables from generator set and restarting generator set (TM 9-6115-751-10).

STEP 4. If generator set reaches rated speed without fault code shutdown, shutdown generator set, verify proper load, and connect load cables (TM 9-6115-751-10). Proceed to STEP 6.

STEP 5. If generator set operation results in a fault code shutdown, proceed to STEP 8.

STEP 6. If symptom continues, ensure load cables are completely disconnected, and inspect load and load cables for shorts or opens using a multimeter set to test continuity (WP 0095, General Maintenance). Replace as required.

STEP 7. If symptom continues, compare load demands with generator set capacity, and utilize a larger generator set if load is too great for current size generator set.

WARNING

Dangerously high voltage can exist across CT output with engine operating. CT can explode if disconnected from load with engine running. Do not disconnect CT with AC generator rotating. Failure to comply may cause injury or death to personnel by electrocution.

STEP 8. If symptom continues, check CTs for cracks, signs of heat damage, and resistance (WP 0060, Remove/Install Transformers). Replace as required (WP 0060, Remove/Install Transformers).

STEP 9. If symptom continues, use wiring diagrams and inspect CT wires from CTs to printed circuit board module and from printed circuit board module to DCS for loose connections or damage (Foldout Pages).

STEP 10. Repair or replace wiring as required (WP 0061, Remove/Install Printed Circuit Board Module, WP 0060, Remove/Install Transformers, WP 0017, Remove/Install DCS, and WP 0095, General Maintenance).

- STEP 11. If symptom continues, inspect wiring, connectors, and pins on connectors from the contactor to J511 on printed circuit board module for loose connections or damage. Replace as required (WP 0061, Remove/Install Printed Circuit Board Module).
- STEP 12. Inspect wiring running from contactor to output terminals and from contactor to voltage selection switch for loose connections or damage. Replace or repair as required (WP 0056, Remove/Install Contactor and WP 0095, General Maintenance).
- STEP 13. Inspect busbars on contactor for damage and replace as required (WP 0056, Remove/Install Contactor).
- STEP 14. Inspect wiring, connectors, and pins on connectors running from the DCS to printed circuit board module for loose connections and damage. Replace as required (WP 0061, Remove/Install Printed Circuit Board Module).
- STEP 15. If symptom continues, test contactor for proper operation and replace as required (WP 0056, Remove/Install Contactor).
- STEP 16. If symptom continues, check DCS LEDs and replace as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Fault 1446: High AC Voltage] displayed on DCS screen.

MALFUNCTION

Incorrect setting or shorted load.

CORRECTIVE ACTION

- STEP 1. Clear fault and restart generator set (TM 9-6115-751-10).
- STEP 2. If symptom continues, verify that voltage selection matches load requirements (TM 9-6115-751-10).
- STEP 3. If generator set reaches rated speed without fault code shutdown, shutdown generator set, verify proper load, and connect load cables (TM 9-6115-751-10). Proceed to STEP 5.
- STEP 4. If generator set operation results in a fault code shutdown, troubleshoot IAW [Fault 2335: Excitation Fault] displayed on DCS screen symptom.
- STEP 5. If symptom continues, verify that voltage selection matches load requirements (TM 9-6115-751-10).
- STEP 6. Adjust as required (TM 9-6115-751-10).

WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 7. If symptom continues, inspect load cables and cables at output box visually for signs of wire damage.
- STEP 8. Replace any damaged load cables.
- STEP 9. If symptom continues, check for use of large motors, inductive loads, AC air conditioning compressors, or other loads with large inrush currents.

STEP 10. Reduce use of other loads while starting loads with large inrush currents and avoid sudden stopping of inrush current loads during operation.

STEP 11. If symptom continues, ensure load cables are completely disconnected and inspect load and load cables for shorts or opens using a multimeter set to test continuity (WP 0095, General Maintenance). Repair or replace any damaged load cables.

SYMPTOM

[Fault 1447: Low AC Voltage] displayed on DCS screen.

MALFUNCTION

Overload, damage to wiring, or damage to DCS.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 1446: High AC Voltage] displayed on DCS screen symptom.

SYMPTOM

[Fault 1448: Underfrequency] displayed on DCS screen.

MALFUNCTION

Generator set was subjected to a reduction in speed for a period of time.

CORRECTIVE ACTION

STEP 1. Clear fault and restart engine (TM 9-6115-751-10).

STEP 2. If symptom continues, compare load demands with generator set and utilize a larger generator set if load is too great for current size generator set.

STEP 3. If symptom continues, confirm proper voltage and frequency settings for load usage and adjust as required (TM 9-6115-751-10).

STEP 4. If symptom continues, test and adjust engine speed sensor and replace as required (WP 0081, Remove/Install Engine Speed Sensor).

STEP 5. If symptom continues, troubleshoot IAW Warning 2967: Governor Fault] displayed on DCS screen symptom.

STEP 6. If symptom continues, troubleshoot engine system for fuel or air problems (poor performance) (WP 0011, Engine System Troubleshooting without a DCS Code).

SYMPTOM

[Fault 1452: Genset Contactor Fail To Close] displayed on DCS screen.

NOTE

DCS receives signal from contactor within 260 milliseconds (ms) of close operation indicating a closed contactor. [Fault 1452: Genset Contactor Fail To Close] displays on DCS screen when the DCS does not receive the signal or the contactor does not close.

MALFUNCTION

Contactor or wiring malfunction.

CORRECTIVE ACTION

- STEP 1. Inspect wiring, connectors, and pins on connectors from the contactor to J511 on printed circuit board module for loose connections or damage. Replace as required (WP 0062, Remove/Install Printed Circuit Board Module).
- STEP 2. Inspect wiring running from contactor to output terminals and from contactor to voltage Selection Board for loose connections or damage. Replace or repair as required (WP 0056, Remove/Install Contactor) (WP 0095, General Maintenance).
- STEP 3. Inspect busbars on contactor for damage and replace as required (WP 0056, Remove/Install Contactor).
- STEP 4. Inspect wiring, connectors, and pins on connectors running from the DCS to printed circuit board module for loose connections and damage. Replace as required (WP 0062, Remove/Install Printed Circuit Board Module).
- STEP 5. If symptom continues, test contactor for proper operation and replace as required (WP 0056, Remove/Install Contactor).

NOTE

Wires P2-S and P2-F are contactor coil energizing wires from DCS P500 to printed circuit board module J500. Wires P3-H and P3-AA are contactor auxiliary wires (indicating to DCS when contactor is open or closed) from DCS P500 to printed circuit board module J500. Wires from the contactor (K1-Y, K1-X, K1-11, and K1-12) connect to printed circuit board module J511.

- STEP 6. If symptom continues, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), remove connectors, and test all wiring for shorts or opens using wiring diagrams (Foldout Pages) and a multimeter set to test continuity (WP 0095, General Maintenance).
- STEP 7. Repair or replace any wiring as required and install connectors (WP 0095, General Maintenance, WP 0056, Remove/Install Contactor, WP 0062, Remove/Install Printed Circuit Board Module, and WP 0039, Remove/Install Engine Wiring Harness).
- STEP 8. If symptom continues, inspect the printed circuit board module and output terminal board for damage and replace as required (WP 0062, Remove/Install Printed Circuit Board Module and WP 0057, Remove/Install Output Terminal Board).
- STEP 9. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Fault 1453: Genset Contactor Fail To Open] displayed on DCS screen.

NOTE

The DCS receives a signal from the contactor within 1 sec of when it opens. [Fault 1453: Genset Contactor Fail To Open] displays on DCS screen when the DCS does not receive the signal or the contactor does not open.

MALFUNCTION

Contactor or wiring malfunction.

CORRECTIVE ACTION

- STEP 1. Remove output box components as required to access contactor with multimeter leads (WP 0056, Remove/Install Contactor).
- STEP 2. Turn engine control switch to PRIME & RUN without starting generator set (TM 9-6115-751-10).

NOTE

Terminals X and Y on contactor are for the wires that energize the contactor coil.

- STEP 3. Test contactor coil for 24 VDC using a multimeter set to test voltage (WP 0095, General Maintenance).
- STEP 4. If 24 VDC is not detected on contactor coil, troubleshoot IAW [Fault 1452: Genset Contactor Fail To Close] displayed on DCS screen symptom.
- STEP 5. If 24 VDC is detected on contactor coil, remove connectors, and test wiring from contactor, printed circuit board, and DCS for shorts or opens using wiring diagrams (Foldout Pages) and a multimeter set to test continuity (WP 0095, General Maintenance).
- STEP 6. Repair or replace any wiring as required and install connectors (WP 0095, General Maintenance, WP 0056, Remove/Install Contactor, WP 0061, Remove/Install Printed Circuit Board Module, and WP 0051, Remove/Install Engine Wiring Harness).
- STEP 7. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

SYMPTOM

[Fault 1472: High Current] displayed on DCS screen.

MALFUNCTION

Short, overload, or AC generator malfunction.

WARNING

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- Ensure power is disconnected from whatever component is being repaired. Always check for power before attempting any other form of troubleshooting. Be sure to notify someone when working on electrical equipment. Never work alone or without someone else knowing that electrical equipment is involved. Failure to comply may cause injury or death to personnel.
- High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that personnel working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.

CORRECTIVE ACTION

- STEP 1. Compare load demands with generator set capacity and utilize a larger generator set if load is too great for current size generator set.

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- STEP 2. If symptom continues, shut down generator set if not already shut down, and ensure load cables are completely disconnected (TM 9-6115-751-10).
- STEP 3. Check the load and load cables for shorts or opens using a multimeter set to test continuity (WP 0095, General Maintenance). Remove load or repair as required.
- STEP 4. Connect load and check for proper operation (TM 9-6115-751-10), References).
- STEP 5. If symptom continues, check CTs for cracks, signs of heat damage, and resistance (WP 0060, Remove/Install Transformers). Replace as required (WP 0060, Remove/Install Transformers).
- STEP 6. If symptom continues, use wiring diagrams and inspect CT wires from CTs to printed circuit board module and from printed circuit board module to DCS for loose connections or damage (Foldout Pages).
- STEP 7. Repair or replace wiring as required (WP 0061, Remove/Install Printed Circuit Board Module, WP 0060, Remove/Install Transformers, WP 0017, Remove/Install DCS, and WP 0095, General Maintenance).
- STEP 8. If symptom continues, inspect wiring, connectors, and pins on connectors from the contactor to J511 on printed circuit board module for loose connections or damage. Replace as required (WP 0061, Remove/Install Printed Circuit Board Module).
- STEP 9. Inspect wiring running from contactor to output terminals and from contactor to voltage selection switch for loose connections or damage. Replace or repair as required (WP 0056, Remove/Install Contactor and WP 0095, General Maintenance).
- STEP 10. Inspect busbars on contactor for damage and replace as required (WP 0056, Remove/Install Contactor).
- STEP 11. Inspect wiring, connectors, and pins on connectors running from the DCS to printed circuit board module for loose connections and damage. Replace as required (WP 0061, Remove/Install Printed Circuit Board Module).
- STEP 12. If symptom continues, test contactor for proper operation and replace as required (WP 0056, Remove/Install Contactor).
- STEP 13. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Fault 1918: Fuel Level Low] displayed on DCS screen.

NOTE

[Fault 1918: Fuel Level Low] indicates that there are approximately 4 min left (1% of fuel supply left) until the generator set will be out of fuel.

MALFUNCTION

Low fuel level or fuel level sensor malfunction.

CORRECTIVE ACTION

- STEP 1. Verify generator set fuel level and refill as required (WP 0043, Service Fuel System).
- STEP 2. If symptom continues, proceed to [Warning 2936: Fuel Level Sensor High] displayed on DCS screen symptom.

SYMPTOM

[Fault 2335: Excitation Fault] displayed on DCS screen.

MALFUNCTION

Circuit breaker, wiring, or AC generator malfunction.

CORRECTIVE ACTION

- STEP 1. Check circuit breaker CB10 ALT QUAD 1 and CB11 ALT QUAD 2 to see if tripped or seated properly. Reset or secure as required (WP 0041, Remove/Install Relay Panel).
- STEP 2. Attempt restart (TM 9-6115-751-10).
- STEP 3. If restart fails or circuit breaker trips again, proceed to STEP 4 (WP 0041, Remove/Install Relay Panel).

WARNING

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- Ensure power is disconnected from whatever component is being repaired. Always check for power before attempting any other form of troubleshooting. Be sure to notify someone when working on electrical equipment. Never work alone or without someone else knowing that electrical equipment is involved. Failure to comply may cause injury or death to personnel.
- High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that personnel working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.

NOTE

Wires P1-A, P1-R, and P1-C run from DCS (P1) to P500 (to J500) on printed circuit board module. Wires P501-9, P501-5, and P501-11 run from J501 to P501 to contactor terminals A1 through C1 to sense generator set voltage.

- STEP 4. Use wiring diagrams (Foldout Pages) to locate and inspect wires from contactor (K1) to printed circuit board module J501 for damage, moisture, bent pins or connectors, or improper connections.
- STEP 5. Repair or replace wiring or connectors as required (WP 0095, General Maintenance).
- STEP 6. Use wiring diagrams (Foldout Pages) to locate and inspect wires P1-A, P1-R, and P1-C running from P500 and J500 on printed circuit board module to J1 and P1 of DCS for damage, moisture, bent pins or connectors, or improper connections.
- STEP 7. Repair or replace wiring or connectors as required (WP 0095, General Maintenance).
- STEP 8. If symptom continues, ensure battery ground cable is removed (WP 0036, Remove/Install Batteries), remove connectors, and check all wires inspected in STEP 4 and STEP 6 for shorts or opens using a multimeter set to test continuity (WP 0095, General Maintenance).

STEP 9. Repair or replace wiring as required and install connectors (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).

NOTE

Wires P1-J and P1-K run to connector P90 from DCS (P1) to excite the AC alternator field. Wires P85-1 and P85-2 (quad circuit wires to sense AC generator voltage) run from the relay panel through plug P5D to the quad in the AC generator. Wires P1-L and P1-M run to P5D from the DCS (P1).

STEP 10. If circuit breaker trips again, use wiring diagrams (Foldout Pages) to locate and check wires running from AC generator to plug P90 to and plug P85 for damage, moisture, bent pins or connectors, or improper connection.

STEP 11. Repair or replace as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).

STEP 12. If symptom continues, ensure battery ground cable is removed (WP 0036, Remove/Install Batteries), remove wiring connector, and test wires running from P85 to P5D (wires P85-1 and P85-2) at relay panel (Foldout Pages) for shorts or opens using a multimeter set to test continuity (WP 0095, General Maintenance).

STEP 13. Repair or replace wiring as required and install connector (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).

STEP 14. Inspect P5D pins (A, B, G, and H) and connector at relay panel (Foldout Pages) for damage to pins, poor connections, and moisture.

STEP 15. Repair or replace as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).

STEP 16. If symptom continues, ensure battery ground cable is removed (WP 0036, Remove/Install Batteries) and test wires running from P5D to DCS P1 (wires P1-L and P1-M) at relay panel (Foldout Pages) for shorts or opens using a multimeter set to test continuity (WP 0095, General Maintenance).

STEP 17. Repair or replace wiring as required and install connector (WP 0039, Remove/Install Engine Wiring Harness) and (WP 0095, General Maintenance).

STEP 18. Inspect P1 and J1 at DCS (Foldout Pages) for damage to pins, poor connections, and moisture.

STEP 19. Repair or replace wiring or connectors as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).

STEP 20. If symptom continues, test AC generator (WP 0055, Test AC Generator) and replace as required (WP 0053, Remove/Install 50/60 Hz AC Generator Assembly or WP 0054, Remove/Install 400 Hz AC Generator Assembly).

STEP 21. If symptom continues, troubleshoot engine for poor performance (WP 0011, Engine System Troubleshooting without a DCS Code).

STEP 22. If symptom continues, check DCS LEDs for proper function (DS1100 for proper AVR function) and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

STEP 23. If symptom continues, replace AC generator (WP 0053, Remove/Install 50/60 Hz AC Generator Assembly or WP 0054, Remove/Install 400 Hz AC Generator Assembly).

SYMPTOM

[Fault 2914: Genset AC Meter Failed] displayed on DCS screen.

MALFUNCTION

Generator set AC meter failure.

CORRECTIVE ACTION

Check DCS LEDs and replace DCS as required or if symptom continues (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Fault 2972: Field Overload] displayed on DCS screen.

MALFUNCTION

Faulty AC generator components or AVR.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 2335: Excitation Fault] displayed on DCS screen symptom.

SYMPTOM

[Fault 3664: Invalid Genset Configuration] displayed on DCS screen.

MALFUNCTION

Incorrect dip switch settings, wiring malfunction, or improper engine or AC generator combination.

CORRECTIVE ACTION

- STEP 1. Check position of dip switches against settings recorded during removal or replacement to see if there is an incorrect setting (WP 0062, Remove/Install Printed Circuit Board Module).
- STEP 2. Check dip switch settings against data in WP 0062, Remove/Install Printed Circuit Board.
- STEP 3. Move dip switch(es) to correct setting as required (WP 0062, Remove/Install Printed Circuit Board Module).

NOTE

Wires P3-m, P3-n, P3-s, P3-GG, P3-LL, and P3-MM are for dip switch settings. They are pins or sleeves 20, 28, 38, 39, 40, and 50 on P3, J3, P500, and J500.

- STEP 4. If symptom continues, use wiring diagrams (Foldout Pages) to find and inspect wires, pins, sleeves, and connectors on DCS P3 and plug P500 to J500 on printed circuit board module for damage to pins or sleeves, poor connections, and moisture.
- STEP 5. Replace or repair any wires, connectors, or pins as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).

- STEP 6. If symptom continues, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), remove connectors, and use wiring diagrams (Foldout Pages) to check wiring inspected in STEP 4 for shorts and opens using a multimeter set to test continuity (WP 0095, General Maintenance).
- STEP 7. Repair or replace any wires, connectors, or pins as required and install connectors (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).
- STEP 8. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).
- STEP 9. If symptom continues, replace printed circuit board module (WP 0062, Remove/Install Printed Circuit Board Module).

SYMPTOM

[Fault 3665: Invalid Voltage Configuration] displayed on DCS screen.

NOTE

[Fault 3665: Invalid Voltage Configuration] appears on DCS screen if an invalid voltage selection board or some other fault or invalid selection occurs when generator set is not running.

MALFUNCTION

Voltage selection fault.

CORRECTIVE ACTION**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. Examine the position of the voltage selection board to determine that it is at desired voltage configuration and fasteners are to correct torque (WP 0058, Remove/Install Voltage Selection Board).
- STEP 2. Move voltage selection board to the desired voltage position and tighten fasteners as required (WP 0058, Remove/Install Voltage Selection Board and TM 9-6115-751-10).
- STEP 3. If symptom continues, use wiring diagrams (Foldout Pages) to confirm voltage selection board is wired correctly.
- STEP 4. Adjust wiring as required (WP 0058, Remove/Install Voltage Selection Board).
- STEP 5. If symptom continues, check connections and wiring from plug P503 to AUX CONTACT connector on printed circuit board module for damage to pins or sleeves, poor connections, or moisture.
- STEP 6. Repair or replace as required (WP 0062, Remove/Install Printed Circuit Board Module and WP 0095, General Maintenance).
- STEP 7. If symptom continues, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), remove wires as required and test wires P503-1 and P503-2 running to voltage selection board AUX 1 and 2 (S501-AUX) using wiring diagrams (Foldout Pages) and a multimeter set to test continuity (WP 0095, General Maintenance).

STEP 8. Repair or replace wiring as required and install wires (WP 0058, Remove/Install Voltage Selection Board and WP 0095, General Maintenance).

STEP 9. If symptom continues, replace voltage selection board (WP 0058, Remove/Install Voltage Selection Board).

STEP 10. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Fault 3668: Output Voltage Configuration Bit 0 Changed] or [Fault 3669: Output Voltage Configuration Bit 1 Changed] displayed on DCS screen.

NOTE

[Fault 3668: Output Voltage Configuration Bit 0 Changed] or [Fault 3669: Output Voltage Configuration Bit 1 Changed] appears on DCS screen when a change occurs while generator set is running (e.g. voltage selection board change or wire vibrating loose).

MALFUNCTION

Voltage selection fault.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 3665: Invalid Voltage Configuration] displayed on DCS screen symptom.

SYMPTOM

[Fault 3673: Convenience Receptacle AC Meter Failed] displayed on DCS screen.

MALFUNCTION

Convenience receptacle AC meter failed.

CORRECTIVE ACTION

Check DCS LEDs and replace DCS as required or if symptom continues (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Fault 3677: Genset Config Factory Test Fault] displayed on DCS screen.

MALFUNCTION

Factory calibration error.

CORRECTIVE ACTION

Replace DCS (WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 135: Oil Pressure Sensor High] displayed on DCS screen.

MALFUNCTION

Voltage above normal or shorted to a high source.

CORRECTIVE ACTION**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. Check wiring connections to ensure that they are seated securely into connection ends at oil pressure sender and DCS. Reseat wiring connections into connection ends as required (WP 0017, Remove/Install DCS and WP 0088, Test Engine Oil Pressure).
- STEP 2. If symptom continues, inspect wiring connections at oil pressure sensor and DCS for damage to pins or wires.
- STEP 3. If damage to pins or wires is found, repair or replace as required (WP 0017, Remove/Install DCS; WP 0088, Test Engine Oil Pressure; and WP 0095, General Maintenance).

NOTE

Measure resistance of oil pressure sender from pin B (supply voltage) to pin C (signal) of oil pressure sender.

- STEP 4. If symptom continues, remove wire connector (WP 0088, Test Engine Oil Pressure) and test oil pressure sender for correct resistance using a multimeter set to test Ohms (WP 0095, General Maintenance).
- STEP 5. Replace oil pressure sender if value is more than 100, 000 Ω or approximately zero Ohms (WP 0088, Test Engine Oil Pressure).

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

The oil pressure sender (P40) runs directly to the DCS. P3-f supplies 5 VDC to the oil pressure sender, P3-g is the signal wire, and P3-k is the return. All wires enter the DCS through plug P3 (pins B, C, and A) to DCS J3.

- STEP 6. If symptom continues, turn engine control switch to PRIME & RUN (TM 9-6115-751-10), remove wiring connector, and test supply voltage to oil pressure sender using a multimeter set to test VDC (WP 0095, General Maintenance).
- STEP 7. If supply voltage is within 4.75 VDC to 5.25 VDC range, proceed to STEP 11.

- STEP 8. If supply voltage is not within 4.75 VDC to 5.25 VDC range, turn engine control switch to OFF, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), and check engine wiring harness for shorts and opens using a multimeter set to test continuity (WP 0095, General Maintenance and TM 9-6115-751-10).
- STEP 9. Repair or replace engine wiring harness as required and install connector (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).
- STEP 10. If symptom continues, replace engine wiring harness (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).
- STEP 11. If symptom continues, turn engine control switch to OFF if not already in OFF position, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), and use a multimeter set to test continuity to check signal wire P3-g for opens or shorts (WP 0095, General Maintenance and TM 9-6115-751-10).
- STEP 12. Repair or replace wiring as required and install connector (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).
- STEP 13. If symptom continues, replace oil pressure sender if not already replaced as a result of STEP 5 (WP 0088, Test Engine Oil Pressure and TM 9-6115-751-10).
- STEP 14. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 141: Oil Pressure Sensor Low] displayed on DCS screen.

MALFUNCTION

Voltage below normal or shorted to a low source.

CORRECTIVE ACTION**NOTE**

The troubleshooting procedures for DCS code 141 are IAW DCS code 135. The difference between the two codes is the type of short or open, resulting in low voltage for DCS code 141 or high voltage for DCS code 135.

Troubleshoot IAW [Warning 135: Oil Pressure Sensor High] displayed on DCS screen symptom.

SYMPTOM

[Warning 144: Coolant Temp Sensor OOR High] displayed on DCS screen.

NOTE

OOR stands for "Out of Range." [Warning 144: Coolant Temp Sensor OOR High] displayed on DCS screen indicates high signal voltage and/or a short to a high source. [Warning 145: Coolant Temp Sensor OOR Low] displayed on DCS screen indicates low signal voltage and/or a short to a low source (ground/return ground). A shorted return can cause multiple fault or warning codes to be active on the DCS screen.

MALFUNCTION

Defective temperature sensor, poor wiring connection, or a short.

CORRECTIVE ACTION**WARNING**

- Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.
- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.
 - STEP 1. Check wiring connections to ensure that they are seated securely into connection ends at engine wiring harness, temperature sensor, and DCS. Tighten wires into connection ends if necessary (WP 0039, Remove/Install Engine Wiring Harness).
 - STEP 2. If symptom continues, test temperature sensor and replace as required (WP 0070, Remove/Install Water Pump).
 - STEP 3. If symptom continues, inspect wiring connections at engine wiring harness, temperature sensor, and DCS for damage to pins or wires (WP 0039, Remove/Install Engine Wiring Harness).
 - STEP 4. If damage to pins or wires is found, repair or replace as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

Connector P35 attaches to coolant temperature sensor (MT35). From P35, wires P3-h and P3-q on connector P3 (pins A and B) run to DCS J3.

- STEP 5. If symptom continues, turn engine control switch to PRIME & RUN without starting generator set (TM 9-6115-751-10).
- STEP 6. Remove wiring connector and test supply voltage to coolant temperature sensor using wiring diagrams and a multimeter set to test VDC (WP 0095, General Maintenance and Foldout Pages).
- STEP 7. If supply voltage is within 9.5 VDC to 10.5 VDC range, proceed to STEP 11.
- STEP 8. If supply voltage is not within 9.5 VDC to 10.5 VDC range, turn engine control switch to OFF, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), and check engine wiring harness for shorts and opens using wiring diagrams and multimeter set to test continuity (WP 0095, General Maintenance; Foldout Pages; TM 9-6115-751-10).
- STEP 9. Repair or replace wiring harness as required and install wiring connector (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).
- STEP 10. If symptoms continue, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

STEP 11. If symptom continues, turn engine control switch to OFF and replace coolant temperature sensor if not already replaced as a result of STEP 2 (WP 0070, Remove/Install Water Pump and TM 9-6115-751-10).

STEP 12. If symptoms continue, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 145: Coolant Temp Sensor OOR Low] displayed on DCS screen.

MALFUNCTION

Voltage below normal or shorted to a low source.

CORRECTIVE ACTION

Troubleshoot IAW [Warning 144: Coolant Temp Sensor OOR High] displayed on DCS screen symptom.

SYMPTOM

[Warning 319: Real Time Clock Error] displayed on DCS screen.

MALFUNCTION

Clock no longer accurate due to temporary power loss or backup battery failure.

CORRECTIVE ACTION

STEP 1. Reset clock IAW TM 9-6115-751-10.

STEP 2. If symptom continues, remove DCS control panel assembly (WP 0018, Repair DCS) to check for loose backup battery and secure as required.

STEP 3. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 441: Low Battery Voltage] displayed on DCS screen.

MALFUNCTION

Battery or charging failure.

CORRECTIVE ACTION

Troubleshoot IAW [Warning 1442: Weak Battery] displayed on DCS screen symptom.

SYMPTOM

[Warning 442: High Battery Voltage] displayed on DCS screen.

MALFUNCTION

Alternator or DCS failure.

CORRECTIVE ACTION

- STEP 1. Test battery-charging alternator assembly and replace as required (WP 0074 Remove/Install Battery-Charging Alternator Assembly).
- STEP 2. If symptom continues, test DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017 Remove/Install DCS).

SYMPTOM

[Warning 1131: Battle Short Active] displayed on DCS screen.

MALFUNCTION

BATTLESHORT switch malfunction.

CORRECTIVE ACTION

- STEP 1. Ensure BATTLESHORT switch is in OFF position (TM 9-6115-751-10).
- STEP 2. If BATTLESHORT is ON, determine reason for use and switch OFF as required (TM 9-6115-751-10).
- STEP 3. If symptom continues, test BATTLESHORT switch and replace as required (WP 0018, Repair DCS).
- STEP 4. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 1417: Power Down Failure] displayed on DCS screen.

MALFUNCTION

DCS malfunction.

CORRECTIVE ACTION

Check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 1441: Low Fuel Level] displayed on DCS screen.

NOTE

[Fault 1441: Fuel Level Low] indicates that there is 5% of fuel supply left until the generator set will be out of fuel.

MALFUNCTION

Low fuel level or sensor malfunction.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 1918: Fuel Level Low] displayed on DCS screen symptom.

SYMPTOM

[Warning 1442: Weak Battery] displayed on DCS screen.

NOTE

[Warning 1442: Weak Battery] displays when battery voltage is below 14.4 V. [Warning 441: Low Battery Voltage] displays when battery voltage is below 21 V.

MALFUNCTION

Battery connections are loose or batteries are insufficiently charged.

CORRECTIVE ACTION**WARNING**

Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.

- STEP 1. Check for corroded or loose battery connections. Clean/replace corroded battery connections and tighten loose battery connections as required (WP 0036, Remove/Install Batteries).
- STEP 2. If symptom continues, test batteries (WP 0036, Remove/Install Batteries).
- STEP 3. Charge batteries, start engine utilizing the NATO slave receptacle and an outside power source, or replace batteries as required (WP 0036, Remove/Install Batteries; WP 0093, General Maintenance; and TM 9-6115-751-10).
- STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Loose belt, defective battery-charging alternator, or defective electrical component.

CORRECTIVE ACTION

- STEP 1. Check for loose battery-charging alternator belt and adjust tension or replace as required (WP 0073, Remove/Install Battery-Charging Alternator Belt).
- STEP 2. Observe DCS [Battery] [Adc] indicator to ensure battery-charging alternator is charging batteries properly (TM 9-6115-751-10).
- STEP 3. Test battery-charging alternator if batteries are not charging properly and replace as required (WP 0074, Remove/Install Battery-Charging Alternator Assembly).
- STEP 4. If symptom continues, check DCS LEDs (WP 0018, Repair DCS) and replace as required (WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 1444: KW Overload] displayed on DCS screen.

MALFUNCTION

Load cable or wiring malfunction.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 1445: Short Circuit] displayed on DCS screen symptom.

SYMPTOM

[Warning 1449: Overfrequency] displayed on DCS screen.

MALFUNCTION

Generator AC output frequency is high.

CORRECTIVE ACTION**WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- Ensure power is disconnected from whatever component is being repaired. Always check for power before attempting any other form of troubleshooting. Be sure to notify someone when working on electrical equipment. Never work alone or without someone else knowing that electrical equipment is involved. Failure to comply may cause injury or death to personnel.
- High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that personnel working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.
 - STEP 1. Check for sudden reduction in load demands. Adjust governor gain as required (WP 0017, Remove/Install DCS).
 - STEP 2. If symptom continues, ensure load cables are completely disconnected and check for shorts or opens in the load using a multimeter set to test continuity (WP 0095, General Maintenance).
 - STEP 3. Repair or replace load components as required.
 - STEP 4. If symptom continues, check frequency, voltage selection, and voltage settings on DCS (TM 9-6115-751-10).
 - STEP 5. If incorrect, adjust settings as required (TM 9-6115-751-10).
 - STEP 6. If symptom continues, troubleshoot IAW [Fault 115: Speed Signal Lost] displayed on DCS screen symptom.

SYMPTOM

[Warning 1451: Genset/Bus Voltage Mismatch] displayed on DCS screen.

MALFUNCTION

DCS fault.

CORRECTIVE ACTION**WARNING**

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

[Warning 1451: Genset/Bus Voltage Mismatch] indicates a calibration error with the metering circuits on the DCS. The offset in the meters can be hand-calibrated using InPower AMMPS software.

If [Warning 1451: Genset/Bus Voltage Mismatch] is hardware and not calibration error related, there was an extreme voltage drop through the contactor and/or its connections. A damaged contactor, poor connections in the output box between the bus sense voltage and generator sense voltage, or a poor DCS harness connection could cause the warning.

- STEP 1. If operating in parallel, ensure all generator sets in parallel are shut down STEP 3.
- STEP 2. Check connections between generators and ensure voltage and frequency of generator sets are at the same settings (TM 9-6115-751-10).

NOTE

Wires P1-A, P1-R, and P1-C run from DCS (P1) to P500 (to J500) on printed circuit board module. Wires P501-9, P501-5, and P501-11 run from J501 to P501 to contactor terminals A1 through C1 to sense generator set voltage.

- STEP 3. If symptom continues, check for loose voltage sense connections at DCS, printed circuit board module, and contactor (Foldout Pages). Tighten as required.
- STEP 4. If symptom continues, use wiring diagrams (Foldout Pages) to locate and inspect wires from contactor (K1) to printed circuit board module J501 for damage, moisture, bent pins or connectors, or improper connections.
- STEP 5. Repair or replace wiring or connectors as required (WP 0095, General Maintenance).
- STEP 6. If symptom continues, use wiring diagrams (Foldout Pages) to locate and inspect wires P1-A, P1-R, and P1-C running from P500 and J500 on printed circuit board module to J1 and P1 of DCS for damage, moisture, bent pins or connectors, or improper connections.
- STEP 7. Repair or replace wiring or connectors as required (WP 0095, General Maintenance).
- STEP 8. If symptom continues, ensure battery ground cable is removed (WP 0036, Remove/Install Batteries), remove wires as required, and check all wires inspected in STEP 4 and STEP 6 for shorts or opens using a multimeter set to test continuity (WP 0095, General Maintenance).

- STEP 9. Repair or replace wiring as required and install wires (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).
- STEP 10. If symptom continues, test contactor and replace as required (WP 0056, Remove/Install Contactor).
- STEP 11. If symptom continues, adjust offset in voltage metering circuits in DCS using InPower AMMPS software (WP 0095, General Maintenance) until mismatch is resolved.
- STEP 12. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 1469: Speed/Hz Mismatch] displayed on DCS screen.

MALFUNCTION

Speed sensor error or flywheel damage.

CORRECTIVE ACTION

- STEP 1. Inspect flywheel for missing teeth or other damage (WP 0084, Remove/Install Flywheel).
- STEP 2. Replace as required (WP 0084, Remove/Install Flywheel).
- STEP 3. If symptom continues or flywheel is not damaged, troubleshoot IAW [Fault 115: Speed Signal Lost] displayed on DCS screen symptom.

SYMPTOM

[Warning 1471: High Current Warning] displayed on DCS screen.

MALFUNCTION

Short, overload, or AC generator malfunction.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 1472: High Current] displayed on DCS screen symptom.

SYMPTOM

[Warning 1689: Reset Real Time Clock] displayed on DCS screen.

MALFUNCTION

Clock no longer accurate due to temporary power loss or backup battery failure.

CORRECTIVE ACTION

- STEP 1. Reset clock IAW TM 9-6115-751-10.
- STEP 2. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 2336: Checksum Fault] displayed on DCS screen.

MALFUNCTION

Calibration file error.

CORRECTIVE ACTION**NOTE**

[Warning 2336: Checksum Fault] only occurs while installing a calibration file. DCS code may display during process or at end of process.

STEP 1. Attempt to reinstall the calibration file IAW Recovering AMMPS DCS if Initial Calibration Fails task (WP 0095, General Maintenance).

STEP 2. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 2915: Genset Bus AC Meter Failed] displayed on DCS screen.

MALFUNCTION

Generator set Bus AC meter failed.

CORRECTIVE ACTION**NOTE**

Failure of bus AC meter will disable paralleling functions for a generator set.

STEP 1. Press FAULT RESET to attempt to clear fault (TM 9-6115-751-10).

STEP 2. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 2917: Genset Bus Voltage High] displayed on DCS screen.

MALFUNCTION

Paralleling or voltage sense fault.

CORRECTIVE ACTION**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. If operating in parallel, check connections between generator sets to switch box (TM 9-6115-757-13&P) and ensure voltage and frequency of both generator sets are at the same settings (TM 9-6115-751-10).
- STEP 2. If symptom continues, troubleshoot IAW [Fault 2335: Excitation Fault] displayed on DCS screen symptom.

SYMPTOM

[Warning 2936: Fuel Level Sensor High] displayed on DCS screen.

NOTE

The fuel level sensor contains three wires that run to connector P70: P3-F (12 VDC supply), P3-G (signal wire, 0.25 VDC empty tank to 4.75 VDC full tank range), and P3-J (return). All wires run to DCS through P3 connector.

MALFUNCTION

Fuel level sensor malfunction.

CORRECTIVE ACTION**WARNING**

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

- STEP 1. Remove connector from fuel level sensor, turn engine control switch to PRIME & RUN (TM 9-6115-751-10), and use a multimeter set to test VDC (WP 0095, General Maintenance) to check P3-F and P3-J for voltage at P70 connector (Foldout Pages).
- STEP 2. If value is outside of 12 VDC range \pm 10%, proceed to STEP 4.
- STEP 3. If value is within 12 VDC range \pm 10%, proceed to STEP 7.
- STEP 4. Turn engine control switch to OFF (TM 9-6115-751-10), ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), and use a multimeter set to continuity to test wiring (wires P3-F, P3-G, and P3-j) from fuel level sensor unit wiring harness connector to DCS for opens and shorts (WP 0095, General Maintenance).
- STEP 5. Repair or replace wiring as required and install connector (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).
- STEP 6. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).
- STEP 7. Turn engine control switch to OFF and test fuel level sensor (MT70) RED/WHT wire (A) and BLACK wire (B) using a multimeter set to test Ohms (WP 0095, General Maintenance).

- STEP 8. Replace fuel level sensor if Ohms reading stays at zero or shows infinite reading indicating an open. Install connector as required (WP 0049, Remove/Install Fuel Level Sensor).
- STEP 9. If symptom continues, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), remove connector, and test wire P3-j from P70 to DCS P3 for opens or shorts using a multimeter set to test continuity (WP 0095, General Maintenance).
- STEP 10. Repair or replace wiring harness as required and install connector (WP 0039, Remove/Install Engine Wiring Harness).
- STEP 11. If symptom continues and fuel level sensor has not been replaced, replace fuel level sensor (WP 0049, Remove/Install Fuel Level Sensor).
- STEP 12. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 2937: Fuel Level Sensor Low] displayed on DCS screen.

MALFUNCTION

Fuel level sensor malfunction.

CORRECTIVE ACTION

Troubleshoot IAW [Warning 2936: Fuel Level Sensor High] displayed on DCS screen symptom.

SYMPTOM

[Warning 2967: Governor Fault] displayed on DCS screen.

MALFUNCTION

Governor actuator malfunction.

CORRECTIVE ACTION**WARNING**

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

- STEP 1. Inspect wiring connectors and wiring running to governor actuator on fuel injection pump (Foldout Pages) for loose connections, loose, damaged or missing pins, and damaged wiring.
- STEP 2. Replace or repair wiring as required (WP 0095, General Maintenance and WP 0039, Remove/Install Engine Wiring Harness).

NOTE

The governor actuator resistance specification of 15.95 Ohms \pm 5% is for room temperature (68°F (20°C)). The resistance increases about 0.22% per degree Fahrenheit (0.12% per degree Celsius) above room temperature. It will decrease at the same rate below 68°F (20°C). The governor actuator will generally fail by way of an open circuit, coil short to actuator housing, or a resistance decrease due to a partial failure. Partial failure typically causes rapid failure (short circuit) once it begins.

STEP 3. If symptom continues, remove wiring connector from governor actuator and test pins on governor actuator for resistance (WP 0069, Remove/Install Fuel Injection Pump and WP 95, General Maintenance).

STEP 4. Replace governor actuator if resistance is outside of specification or proceed to STEP 5 if within specification (WP 0069, Remove/Install Fuel Injection Pump).

NOTE

Wires P2-J and P2-M run from DCS to P37 at governor actuator.

STEP 5. Ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries) and test wiring from governor actuator to DCS (Foldout Pages) for shorts or opens using a multimeter set to test continuity (WP 0095, General Maintenance).

STEP 6. Repair or replace wiring as required (WP 0095, General Maintenance and WP 0039, Remove/Install Engine Wiring Harness).

STEP 7. If symptom continues, test DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 2968: AVR Fault] displayed on DCS screen.

MALFUNCTION

Wiring or AC generator failure.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 2335: Excitation Fault] displayed on DCS screen symptom.

SYMPTOM

[Warning 3662: Battery Discharge] displayed on DCS screen.

MALFUNCTION

Loose belt, defective battery-charging alternator, or defective electrical component.

CORRECTIVE ACTION

STEP 1. Check for loose battery-charging alternator belt and adjust tension or replace as required (WP 0073, Remove/Install Battery-Charging Alternator Belt).

STEP 2. If battery-charging alternator belt is not loose, test battery-charging alternator and replace as required (WP 0074, Remove/Install Battery-Charging Alternator Assembly).

- STEP 3. If symptom continues, check wiring connections to ensure that they are seated securely into connection ends at battery current sensor and DCS. Reseat wiring connections into connection ends as required (WP 0039, Remove/Install Engine Wiring Harness).
- STEP 4. If symptom continues, inspect wiring connections at battery current sensor and DCS for damage to pins or wires.
- STEP 5. If damage to pins or wires is found, repair or replace as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

Wires P3-E, P3-r, and P3-J run from DCS to connector P5 at battery current sensor. P3-E supplies 5 VDC to battery current sensor, P3-r is the return, and P3-J is the signal wire.

- STEP 6. If symptom continues, turn engine control switch to PRIME & RUN, remove connector, and use a multimeter set to test VDC to check connector P5 at battery current sensor for 4.75 to 5.25 VDC from P3-E to P3-r (WP 0095, General Maintenance and TM 9-6115-751-10).
- STEP 7. If voltage is within range, proceed to STEP 9.
- STEP 8. If voltage is not within range, proceed to STEP 12.
- STEP 9. Turn engine control switch to OFF, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries) and use wiring diagrams (Foldout Pages) to check signal wire (P3-J) from battery current sensor to DCS for shorts or opens using a multimeter set to test continuity (WP 0095, General Maintenance)
- STEP 10. Repair or replace wiring as required and install connector (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).
- STEP 11. If symptom continues, replace battery current sensor as required.
- STEP 12. Turn engine control switch to OFF, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), and use wiring diagrams (Foldout Pages) to check wiring from battery current sensor to DCS for shorts or opens using a multimeter set to test continuity (WP 0095, General Maintenance)
- STEP 13. Repair or replace wiring as required and install connector (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).
- STEP 14. If symptom continues, check DCS LEDs and replace as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 3666: Master Control Switch Configuration] displayed on DCS screen.

MALFUNCTION

Engine control switch fault.

CORRECTIVE ACTION

- STEP 1. Rotate engine control switch and confirm that engine control switch is not between two positions.
- STEP 2. Confirm proper installation of engine control switch and check for loose or damaged wires (WP 0018, Repair DCS). Repair or replace as required (WP 0018, Repair DCS).
- STEP 3. If symptom continues, test engine control switch and replace as required (WP 0018, Repair DCS).
- STEP 4. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 3672: Automatic Field Flash Not Complete] displayed on DCS screen.

MALFUNCTION

Wiring or DCS malfunction.

CORRECTIVE ACTION**NOTE**

DCS wires P1-J and P1-K run from DCS P1 to connector P90 to flash the AC alternator field.

- STEP 1. Use wiring diagrams (Foldout Pages) to locate and check wires running from AC generator to plug P90 to DCS J1 for damage, moisture, bent pins or connectors, or improper connection.
- STEP 2. Repair or replace as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).
- STEP 3. If symptom continues, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), remove connector (WP 0039, Remove/Install Engine Wiring Harness), and test wires P1-J and P1-K to pins J and K in DCS P1 (Foldout Pages) for shorts using a multimeter set to test continuity (WP 0095, General Maintenance).
- STEP 4. Repair or replace wiring as required and install connector (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).
- STEP 5. If symptom continues, test AC generator (WP 0055, Test AC Generator) and replace as required (WP 0053, Remove/Install 50/60 Hz AC Generator Assembly or WP 0054, Remove/Install 400 Hz AC Generator Assembly).
- STEP 6. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 3674: Genset Configuration Change] displayed on DCS screen.

NOTE

[Warning 3674: Genset Configuration Change] displays on DCS screen when the control cards of the DCS recognize the configuration has changed. This warning is most likely when a DCS is moved from one size generator set to a different size generator set. FAULT RESET can be selected and normal use of the generator set can continue. If the symptom continues, then troubleshooting procedures will need to be followed.

MALFUNCTION

Incorrect dip switch settings, wiring malfunction, or improper engine or AC generator combination.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 3664: Invalid Genset Configuration] displayed on DCS screen symptom.

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
ELECTRICAL SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 41)

Materials/Parts

Not Applicable

Personnel Required

91D (1)

Assistant (1)

References

TM 9-6115-751-10

WP 0008, Electrical System Troubleshooting with a DCS Code

WP 0016, Field PMCS

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

WP 0036, Remove/Install Batteries

WP 0037, Remove/Install Main DC Circuit Breaker

WP 0038, Remove/Install Intake Air Heater Relay

References

WP 0039, Remove/Install Engine Wiring Harness

WP 0041, Remove/Install Relay Panel

WP 0042, Remove/Install Power Wiring Harness

WP 0059, Remove/Install Convenience Receptacle

WP 0061, Remove/Install Hour Meter

WP 0062, Remove/Install Printed Circuit Board Module

WP 0074, Remove/Install Battery-Charging Alternator Assembly

WP 0075, Remove/Install Intake Air Heater

WP 0095, General Maintenance

Foldout Pages

Equipment Conditions

Not Applicable

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

ELECTRICAL SYSTEM**WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are operating. Failure to comply may cause injury or death to personnel.

WARNING

- DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

SYMPTOM

DCS indicates no power available and no lighted display.

MALFUNCTION

Battery malfunction.

CORRECTIVE ACTION**WARNING**

- Batteries give off combustible gas. Do not smoke or use open flame when performing maintenance. Failure to comply may cause injury or death to personnel and damage to equipment.
- Battery acid can cause burns to skin and cause eye injury. Wear safety goggles and chemical gloves and avoid acid splash while working on the batteries. Failure to comply may cause injury or death to personnel.
- Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.

STEP 1. If main DC circuit breaker is in OFF/TRIP position, move switch handle to RESET→ON position to reset circuit breaker.

STEP 2. If main DC circuit breaker remains in the RESET→ON position and DCS illuminates, resume operation.

STEP 3. If main DC circuit breaker continues to trip, proceed to next malfunction.

STEP 4. If main DC circuit breaker remains in the RESET→ON position and DCS still has no lighted display, proceed to STEP 5.

STEP 5. Use DEAD CRANK SWITCH to see if batteries turn engine over (TM 9-6115-751-10).

STEP 6. If engine turns over, proceed to Defective DCS malfunction.

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- STEP 7. If engine does not turn over, continue to STEP 8.
- STEP 8. Examine battery posts, cables, and connectors for looseness, corrosion, or other damage.
- STEP 9. Clean and tighten corroded and loose connectors and replace any connecting cables that show signs of damage.
- STEP 10. If symptom continues, completely disconnect the batteries from battery cables (WP 0036, Remove/Install Batteries).
- STEP 11. Test batteries and jump start, charge, or replace as required (WP 0036, Remove/Install Batteries and WP 0095, General Maintenance).
- STEP 12. If symptom continues, proceed to next malfunction.

MALFUNCTION

Circuit breaker or wiring malfunction.

CORRECTIVE ACTION**WARNING**

High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that personnel working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.

- STEP 1. Check circuit breakers in relay panel (RP201) to see if tripped (WP 0041, Remove/Install Relay Panel).
- STEP 2. Reset circuit breaker(s) if tripped and check for signs of damage such as excessive heat or burned insulation (WP 0041, Remove/Install Relay Panel).
- STEP 3. If heat or insulation damage is found, replace circuit breaker or relay and proceed to STEP 5 and follow troubleshooting to find failed component or location of short.
- STEP 4. If no signs of excessive heat or burned insulation are found, but circuit breaker trips again, troubleshooting appropriate circuit using wiring diagrams and a multimeter set to test continuity (WP 0041, Remove/Install Relay Panel; WP 0095, General Maintenance; and Foldout Pages).
- STEP 5. If symptom continues, test main DC circuit breaker (WP 0037, Remove/Install Main DC Circuit Breaker). Replace as required.
- STEP 6. If main DC circuit breaker test shows main DC circuit breaker functioning properly, disconnect battery leads (WP 0036, Remove/Install Batteries) and proceed to STEP 7.

WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

NOTE

If continuity is found between ground and load wire, a short circuit exists within Relay Panel 201 (RP201), battery-charging alternator, the intake air heater relay (K18), or the air heater circuit to ground.

- STEP 7. Ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries) and use a multimeter selected to test continuity to check for shorts to ground in load wires from the main DC circuit breaker (Foldout Pages and WP 0095, General Maintenance).
- STEP 8. If short circuit is found, continue to STEP 10.
- STEP 9. If no short circuit is found, proceed to next malfunction.
- STEP 10. Disconnect load wires from load terminal of the main DC circuit breaker to separate for individual circuit analysis (WP 0041, Remove/Install Relay Panel and Foldout Pages).
- STEP 11. Test wires for shorts using a multimeter set to test continuity (WP 0095, General Maintenance).
- STEP 12. If short circuit is found, examine wiring and components within the isolated short circuit(s) visually to determine the wiring or component that is creating the short circuit.
- STEP 13. If visual examination reveals damaged wiring and/or components, repair and/or replace the damaged wiring (WP 0042, Remove/Install Power Wiring Harness) and/or components (WP 0038, Remove/Install Intake Air Heater Relay; WP 0041, Remove/Install Relay Panel; WP 0074, Remove/Install Battery-Charging Alternator Assembly; and WP 0075, Remove/Install Intake Air Heater).
- STEP 14. If visual examination does not reveal damage caused by a short circuit, disconnect each component at the terminal wires and check for shorts to ground of each component using a multimeter set to test continuity (Foldout Pages and WP 0095, General Maintenance).
- STEP 15. Replace battery-charging alternator if continuity is found (WP 0074, Remove/Install Battery-Charging Alternator Assembly).
- STEP 16. If continuity is found in intake air heater circuit, test air intake heaters and repair or replace as required (WP 0075, Remove/Install Intake Air Heater).
- STEP 17. If continuity is found in RP201, determine whether the relay panel or a circuit or component powered from the relay panel is short circuited to ground using wiring diagrams and a multimeter set to test continuity (Foldout Pages and WP 0095, General Maintenance).
- STEP 18. Identify, isolate, and repair or replace plug connectors and/or components or wires that show evidence of a short circuit (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).
- STEP 19. If there are no visual damages or odor of burned insulation, open relay panel cover to examine internal components for signs of excessive heat and/or the odor of burned insulation.

STEP 20. If the wiring and/or components subjected to short circuit have been identified by a tripped circuit breaker (STEPS 1 through 4), remove the tripped circuit breaker and use wiring diagrams to find the cause of the short circuit (Foldout Pages).

STEP 21. Repair or replace wiring as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).

STEP 22. If symptom continues, test relays (WP 0041, Remove/Install Relay Panel).

STEP 23. Replace any relays and/or wiring that indicates short circuit until the cause of the short circuit has been eliminated (WP 0041, Remove/Install Relay Panel).

STEP 24. If symptom continues, proceed to next malfunction.

MALFUNCTION

Defective DCS.

CORRECTIVE ACTION

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

Wires P2-A, P2-B, and P2-C provide battery power to the DCS.

STEP 1. Check P1, P2, and P3 at DCS and ensure they are connected and tight. Connect or tighten as required (WP 0017, Remove/Install DCS).

STEP 2. If symptom continues, check connections at relay control panel and ensure they are tight and secure. Tighten or secure as required (WP 0041, Remove/Install Relay Panel).

STEP 3. If symptom continues, check CB7 in relay control panel to make sure it is secure and has not been tripped. Secure or reset as required (WP 0041, Remove/Install Relay Panel).

STEP 4. If breaker trips again or symptom continues, check wires P2-A, P2-B, and P2-C to DCS J2 and RP201 P5D for proper connections, opens, or shorts using wiring diagrams and a multimeter set to test continuity (WP 0095, General Maintenance and Foldout Pages).

STEP 5. Repair or replace wires and reset or replace CB7 as required (WP 0095, General Maintenance and WP 0041, Remove/Install Relay Panel).

STEP 6. If symptom continues or breaker was not tripped in STEP 3, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

EMERGENCY STOP push button fails to stop generator set.

MALFUNCTION

EMERGENCY STOP push button failure.

CORRECTIVE ACTION

STEP 1. Push AC CIRCUIT INTERRUPT switch to place generator contactor in [CONTACTOR OPEN] position (TM 9-6115-751-10).

WARNING

- While inspecting the operation of the generator set, do not inadvertently reach into the generator set. Failure to comply can cause injury or death to personnel.
- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry and do not wear loose clothing when working on equipment. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are operating. Failure to comply may cause injury or death to personnel.

STEP 2. Remove CB7 from relay panel (WP 0041, Remove/Install Relay Panel).

STEP 3. Place main DC circuit breaker in OFF/TRIP position (TM 9-6115-751-10).

STEP 4. Reinstall CB7 to relay panel (WP 0041, Remove/Install Relay Panel).

STEP 5. Test EMERGENCY STOP push button and replace as required (WP 0018, Repair DCS).

SYMPTOM

No power to convenience receptacle or convenience receptacle fails to work.

MALFUNCTION

Convenience receptacle is defective or has been subjected to a ground fault condition.

CORRECTIVE ACTION**WARNING**

Power is available to the convenience receptacle only when the main contactor is closed. Avoid accidental contact. Electrocution is possible. Failure to comply may cause injury or death to personnel.

STEP 1. Ensure [CONTACTOR] reads [CLOSED] on the DCS screen and generator set is generating power.

STEP 2. If contactor will not close, troubleshoot IAW Circuit interrupter will not close or open symptom.

WARNING

Ensure the frequency of any device powered by the GFCI convenience receptacle matches the frequency of the generator set. Failure to comply can cause serious injury or death to personnel.

NOTE

MEP 1050 contains a GFCI receptacle as the convenience receptacle. MEP 1051 contains a duplex receptacle as the convenience receptacle and a Ground Fault Interrupter (GFI) located inside the rear access door.

- STEP 3. If generator set is operating and the [CONTACTOR] reads [CLOSED], reset GFCI convenience receptacle or GFI and reset circuit breaker located above GFCI convenience receptacle as required (WP 0059, Remove/Install Convenience Receptacle and TM 9-6115-751-10). Proceed to STEP 4.
- STEP 4. If circuit breaker located above convenience receptacle will not reset, replace circuit breaker (WP 0059, Remove/Install Convenience Receptacle).
- STEP 5. If GFI or GFCI convenience receptacle will not reset, replace convenience receptacle or GFI (WP 0059, Remove/Install Convenience Receptacle).

WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 6. If symptom continues (GFCI convenience receptacle or GFI and/or circuit breaker will not reset), shutdown generator set and remove battery ground cable (WP 0036, Remove/Install Batteries).
- STEP 7. Inspect wiring from relay, neutral, and ground output terminals to circuit breaker and GFCI convenience receptacle or GFI (Foldout Pages) for corrosion, frayed wires, or damaged insulation.
- STEP 8. If symptom continues, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), disconnect wires from relay as required (WP 0059, Remove/Install Convenience Receptacle), and use a multimeter set to test Ω (WP 0095, General Maintenance) to check resistance between terminals 1 and 0 of relay coil.
- STEP 9. If resistance value is approximately 0 Ω (shorted) or approximately 100,000 Ω or greater (open), replace relay (WP 0059, Remove/Install Convenience Receptacle).
- STEP 10. If resistance value is greater than 0 Ω but less than 100,000 Ω , proceed to STEP 12.
- STEP 11. Use a multimeter set to test continuity (WP 0095, General Maintenance) to check continuity between terminals 8 and 7 and between terminals 4 and 3.
- STEP 12. If no continuity is found at either test point in STEP 12, replace relay (WP 0059, Remove/Install Convenience Receptacle).
- STEP 13. If continuity is found at both test points in STEP 12, use a multimeter set to test continuity (WP 0095, General Maintenance) to check for continuity at the following test points: terminal 3 and all other terminals except 4; terminal 4 and all other terminals except terminal 3; terminal 8 and all other terminals except 7; and terminal 7 and all other terminals except terminal 8.

- STEP 14. If continuity is found at any test point in STEP 14, replace relay (WP 0059, Remove/Install Convenience Receptacle).
- STEP 15. If no continuity is found at any test point in STEP 14, proceed to STEP 17.
- STEP 16. Repair or replace wires as required (WP 0059, Remove/Install Convenience Receptacle) (WP 0095, General Maintenance).
- STEP 17. If symptom continues, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), disconnect wires as required, and test all wires for shorts or opens using a multimeter set to test continuity (Foldout Pages and WP 0095, General Maintenance).
- STEP 18. Repair or replace wires as required (WP 0059, Remove/Install Convenience Receptacle and WP 0095, General Maintenance).
- STEP 19. If symptom continues, troubleshoot IAW [Fault 1445: Short Circuit] (WP 0008, Electrical System Troubleshooting with a DCS Code).

SYMPTOM

Circuit interrupter will not close or open.

MALFUNCTION

Contactor or wiring malfunction.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 1452: Genset Contactor Fail To Close] (WP 0008, Electrical System Troubleshooting with a DCS Code).

SYMPTOM

Hour meter is no longer recording operating hours.

MALFUNCTION

Defective hour meter.

CORRECTIVE ACTION**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

NOTE

Wires P2-T and P2-a run from DCS J2 to connector P2 which runs to P500. From P500, the wires go into the printed circuit board module pins 37 and 46 of J500. Wires M3-A and M3-C run from the printed circuit board module to the hour meter.

- STEP 1. Check wiring from hour meter to printed circuit board module for loose connections, bent tabs or pins, or frayed wiring (Foldout Pages).

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- STEP 2. Repair or replace wiring as required (WP 0095, General Maintenance and WP 0062, Remove/Install Printed Circuit Board Module).
- STEP 3. If symptom continues, check wiring from DCS to printed circuit board module for loose connections, bent tabs or pins, or frayed wiring (Foldout Pages).
- STEP 4. Repair or replace wiring as required (WP 0095, General Maintenance and WP 0039, Remove/Install Engine Wiring Harness).
- STEP 5. If symptom continues, ensure battery ground cable is disconnected (WP 0036, Remove/Install Batteries), disconnect wires as required, and check all wiring for shorts or opens using a multimeter set to test continuity (WP 0095, General Maintenance).
- STEP 6. Repair or replace as required (WP 0095, General Maintenance; WP 0062, Remove/Install Printed Circuit Board Module; and WP 0039, Remove/Install Engine Wiring Harness).
- STEP 7. If symptom continues, replace hour meter (WP 0061, Remove/Install Hour Meter).
- STEP 8. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
ENGINE SYSTEM TROUBLESHOOTING WITH A DCS CODE

INITIAL SETUP:**Test Equipment**

Test Set, Electronic Systems (WP 0163,
Maintenance Allocation Chart, Item 34)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163,
Item 41)

Materials/Parts

Cable, Remote Control (WP 0163, Item 9)

Personnel Required

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References

TM 9-6115-751-10

WP 0008, Electrical System Troubleshooting with a
DCS Code

WP 0011, Engine System Troubleshooting without a
DCS Code

WP 0012, Exhaust System Troubleshooting without
a DCS Code

WP 0013, Winterization Kit Troubleshooting

WP 0016, Field PMCS

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

WP 0019, Remove/Install Air Intake Hose
Assemblies

WP 0020, Service Air Cleaner

WP 0029, Remove/Install Front Body Panel

WP 0036, Remove/Install Batteries

WP 0039, Remove/Install Engine Wiring Harness

WP 0041, Remove/Install Relay Panel

WP 0042, Remove/Install Power Wiring Harness

WP 0043, Service Fuel System

References

WP 0045, Remove/Install Fuel Manifold

WP 0046, Remove/Install Fuel Filter/Water
Separator

WP 0047, Replace Fuel Filter/Water Separator
Element

WP 0063, Remove/Install 50/60 Hz Engine
Assembly

WP 0064, Remove/Install 400 Hz Engine Assembly

WP 0065, Service Lubrication System

WP 0066, Remove/Install Engine Oil Drain Hose

WP 0067, Remove/Install Oil Cooler

WP 0068, Remove/Install Fuel Injectors

WP 0069, Remove/Install Fuel Injection Pump

WP 0072, Remove/Install Starter

WP 0074, Remove/Install Battery-Charging
Alternator Assembly

WP 0075, Remove/Install Intake Air Heater

WP 0079, Remove/Install Turbocharger

WP 0081, Remove/Install Engine Speed Sensor

WP 0083, Service Engine Valves

WP 0084, Remove/Install Flywheel

WP 0085, Remove/Install Crankcase Rear Bearing
Case Cover

WP 0086, Remove/Install Oil Pan and Strainer

WP 0087, Test Engine Compression

WP 0088, Test Engine Oil Pressure

WP 0095, General Maintenance

WP 0098, Replace Cylinder Head Gasket

Foldout Pages

Equipment Conditions

Not Applicable

INITIAL SETUP — CONTINUED:**Special Environmental Conditions**

Not Applicable

Drawings RequiredNot Applicable

ENGINE ASSEMBLY**WARNING**

- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.
- Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.
- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gasses are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are running. Failure to comply may cause injury or death to personnel.
- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

NOTE

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

FAULT RESET switch must be pushed to clear each fault code as it is addressed.

Capture spilled fluids and dispose of IAW local SOP.

SYMPTOM

[Fault 234: Overspeed Shutdown] displayed on DCS screen.

NOTE

[Warning 1992: High Speed Warning] displays on DCS when engine speed is 9% greater than rated speed. [Fault 234: Overspeed Shutdown] occurs when engine speed is 10% greater than rated speed.

MALFUNCTION

Large block load removal or vapor drawn into intake air passage.

CORRECTIVE ACTION

- STEP 1. Shut down and restart generator set (TM 9-6115-751-10).
- STEP 2. If symptom continues, adjust engine speed sensor (WP 0081, Remove/Install Engine Speed Sensor).
- STEP 3. If symptom continues, troubleshoot IAW [Fault 115: Speed Signal Lost] (WP 0008, Electrical System Troubleshooting with a DCS Code).
- STEP 4. If symptom continues, check for source of flammable vapor being drawn into the intake air passage.
- STEP 5. Remove source of flammable vapor or relocate generator set as required.
- STEP 6. If symptom continues, check turbocharger seals for leaking oil or test turbocharger for malfunctioning waste gate actuator valve and replace turbocharger as required (WP 0079, Remove/Install Turbocharger).
- STEP 7. If symptom continues, troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).
- STEP 8. If symptom continues, check fuel injection pump. Adjust or replace as required (WP 0069, Remove/Install Fuel Injection Pump).

SYMPTOM

[Fault 359: Fail to Start] displayed on DCS screen.

NOTE

[Fault 359: Fail to Start] displays once a failure to start results after a continuous crank engage time of 75 sec.

MALFUNCTION

Fuel tank is empty or improper connection.

CORRECTIVE ACTION

- STEP 1. Check to see if there is fuel in the tank visually, and check DCS screen for fuel status (TM 9-6115-751-10).
- STEP 2. If tank is empty, fill fuel tank (TM 9-6115-751-10).
- STEP 3. If symptom continues, ensure governor actuator connector is installed to wiring harness and install as required (WP 0069, Remove/Install Fuel Injection Pump).
- STEP 4. If symptom continues, inspect wiring harness at main and auxiliary fuel pumps, and ensure two connectors are installed to correct fuel pumps (WP 0041, Remove/Install Fuel Pump Main/Auxiliary; WP 0051, Remove/Install Engine Wiring Harness; and Foldout Pages).
- STEP 5. If symptom continues, proceed to next malfunction.

MALFUNCTION

Dirty air cleaner element, intake air hose restriction, or excess backpressure.

CORRECTIVE ACTION

- STEP 1. Check air cleaner element and replace as required (WP 0020, Service Air Cleaner).
- STEP 2. Inspect intake hose for restriction or signs of damage and replace as required (WP 0019, Remove/Install Air Intake Hose Assemblies).
- STEP 3. If symptom continues, check for excess backpressure IAW high pitched hiss or whistle heard at exhaust outlet with a decrease in engine performance symptom (WP 0012, Exhaust System Troubleshooting without a DCS Code).
- STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel system malfunction.

CORRECTIVE ACTION

- STEP 1. Check fuel filter/water separator for water and drain fuel filter/water separator as required (TM 9-6115-751-10).
- STEP 2. If symptom continues, check fuel flow and purge fuel lines (WP 0043, Service Fuel System).

- STEP 3. If symptom continues, inspect fuel manifold by fuel filter/water separator for incorrect connections and clogs. Repair or replace as required (WP 0046, Remove/Install Fuel Filter/Water Separator Assembly).
- STEP 4. If symptom continues, service fuel strainers if not already serviced (WP 0043, Service Fuel System) and inspect fuel manifold for leaks or damage. Repair or replace as required (WP 0045, Remove/Install Fuel Manifold).
- STEP 5. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection timing incorrect or governor actuator malfunction.

CORRECTIVE ACTION

- STEP 1. Troubleshoot IAW [Warning 2967: Governor Fault] (WP 0008, Electrical System Troubleshooting with a DCS Code).

CAUTION

Damage or incorrect installation of the barrel plug packing (WP 0069, Remove/Install Fuel Injection Pump, Figure 5, Item 4) for the fuel injection pump may result in inoperability of the generator set. Before checking fuel injection pump timing, ensure brass packing is not damaged and has been installed correctly.

- STEP 2. Ensure barrel plug packing is not damaged and is installed correctly. Check fuel injection timing and adjust as required (WP 0069, Remove/Install Fuel Injection Pump).
- STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Improper clearance (open or close timing) of intake/exhaust valves.

CORRECTIVE ACTION

- STEP 1. Adjust valve clearance (WP 0083, Service Engine Valves).
- STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Cold weather conditions.

CORRECTIVE ACTION**NOTE**

Intake air heaters will turn on between 20°F and -25°F (-6°C and -32°C) and winterization kit will turn on below -25°F (-32°C).

- STEP 1. Allow time for winterization kit/starting aids to work if outside normal temperature range (TM 9-6115-751-10).
- STEP 2. If malfunction is suspected, troubleshoot IAW Cold weather starting aids fail to work properly (WP 0011, Engine System Troubleshooting without a DCS Code)
- STEP 3. If not operating in cold weather conditions, proceed to next malfunction.

MALFUNCTION

Leaking cylinder head gasket.

CORRECTIVE ACTION

- STEP 1. Visually inspect area around cylinder head gasket for leaks or signs of separation. Replace engine assembly as required (WP 0098, Replace Cylinder Head Gasket).
- STEP 2. If symptom continues, examine oil on dipstick for evidence of coolant or other foreign fluid (TM 9-6115-751-10).
- STEP 3. If coolant or foreign fluid is found on dipstick, change oil, if not already changed as a result of troubleshooting (WP 0065, Service Lubrication System).
- STEP 4. If oil remains contaminated with coolant or foreign fluid, check engine compression (WP 0087, Test Engine Compression).
- STEP 5. If compression is low or erratic or oil remains contaminated with coolant or foreign fluid, replace cylinder head (WP 0098, Replace Cylinder Head Gasket).
- STEP 6. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection malfunction.

CORRECTIVE ACTION

- STEP 1. Check fuel injection lines for loose nuts or leakage and replace or repair as required (WP 0068, Remove/Install Fuel Injector).
- STEP 2. If symptom continues, test fuel injectors and replace as required (WP 0068, Remove/Install Fuel Injector).
- STEP 3. If symptom continues, replace fuel injection pump (WP 0069, Remove/Install Fuel Injection Pump).
- STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

[Fault 415: Low Oil Pressure] displayed on DCS screen.

NOTE

[Warning 143: Pre-Low Oil Pressure] will display on DCS when oil pressure reaches 15 psi at rated load or 13 psi at idle. [Fault 415: Low Oil Pressure] will display on the DCS and cause a generator set shutdown when oil pressure reaches 10 psi at rated load or 8 psi at idle.

MALFUNCTION

Low engine oil level.

CORRECTIVE ACTION**NOTE**

Capture drained engine oil and dispose of IAW local SOP.

- STEP 1. Check engine oil level and appearance. If oil appears diluted or contaminated, proceed to next malfunction or add engine oil as required (TM 9-6115-751-10).
- STEP 2. If engine oil was added in STEP 1, proceed to STEP 4.
- STEP 3. If engine oil was not added in STEP 1, proceed to next malfunction.
- STEP 4. Check oil lines for leaks or damage at turbocharger, fuel injection pump, and engine oil drain valve and hose, and check for oil leaks at oil cooler and oil filter. Repair or replace as required (WP 0066, Remove/Install Engine Oil Drain Hose; WP 0069, Remove/Install Fuel Injection Pump; WP 0079, Remove/Install Turbocharger; WP 0065, Service Lubrication System; and WP 0067, Remove/Install Oil Cooler).
- STEP 5. If symptom continues, check for oil leaks at oil cooler and oil filter. Replace or repair as required (WP 0065, Service Lubrication System and WP 0067, Remove/Install Oil Cooler).
- STEP 6. If symptom continues, inspect area around flywheel and AC generator for signs of oil leaks. Replace crankcase rear bearing case cover assembly if leaks are found (WP 0085, Remove/Install Crankcase Rear Bearing Case Cover).
- STEP 7. If symptom continues and no leaks are found, troubleshoot IAW Excessive Oil Consumption symptom (WP 0011, Engine System Troubleshooting without a DCS Code).

MALFUNCTION

Diluted engine oil.

CORRECTIVE ACTION

- STEP 1. Examine oil on dipstick for evidence of coolant or other foreign fluid (TM 9-6115-751-10).
- STEP 2. If coolant or foreign fluid is found, change oil and oil filter, if not already changed as a result of troubleshooting (WP 0065, Service Lubrication System).
- STEP 3. If oil remains contaminated with coolant or foreign fluid, check engine compression (WP 0087, Test Engine Compression).

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- STEP 4. If compression is low or erratic or oil remains contaminated with coolant or foreign fluid, replace cylinder head gasket (WP 0098, Replace Cylinder Head Gasket).
- STEP 5. If compression check does not reveal fault and coolant or foreign fluid is no longer on dipstick, proceed to next malfunction.
- STEP 6. If coolant or foreign fluid continues to show on dipstick after cylinder head gasket replacement, replace engine assembly (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).

MALFUNCTION

Defective engine oil pressure sender.

CORRECTIVE ACTION

- STEP 1. Perform oil pressure test to determine engine oil pressure on DCS screen is accurate (WP 0088, Test Engine Oil Pressure).
- STEP 2. If oil pressure reading on DCS is not accurate, troubleshoot IAW [Warning 135: Oil Pressure Sensor High] symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).
- STEP 3. If symptom continues or pressure reading is accurate, proceed to next malfunction.

MALFUNCTION

Clogged oil strainer.

CORRECTIVE ACTION

- STEP 1. Inspect and replace oil strainer as required (WP 0086, Remove/Install Oil Pan and Strainer).
- STEP 2. If strainer is not clogged or symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

[Fault 1438: Fail to Crank] displayed on DCS screen.

NOTE

[Fault 1438: Fail to Crank] displays when the engine fails to rotate or the DCS fails to sense the engine rotation. When engine control switch turns over the engine, but [Fault 1438: Fail to Crank] appears and prevents starting, the malfunction is speed signal related. See [Fault 115: Speed Signal Lost] (WP 0008, Electrical System Troubleshooting with a DCS Code).

MALFUNCTION

DEAD CRANK SWITCH is not in NORMAL position or will not turn over engine.

CORRECTIVE ACTION

- STEP 1. Ensure the DEAD CRANK SWITCH is in NORMAL position (TM 9-6115-751-10).
- STEP 2. If not in NORMAL position, place DEAD CRANK SWITCH in the NORMAL position (TM 9-6115-751-10).
- STEP 3. If symptom continues, use DEAD CRANK SWITCH to turn over engine (TM 9-6115-751-10).
- STEP 4. If engine turns over, proceed to Defective wiring or DCS malfunction.
- STEP 5. If engine does not turn over, proceed to next malfunction.

MALFUNCTION

Battery connections are loose or batteries are insufficiently charged.

CORRECTIVE ACTION**WARNING**

Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.

- STEP 1. Check for corroded or loose battery connections. Clean/replace corroded battery connections and tighten loose connections as required (WP 0036, Remove/Install Batteries).
- STEP 2. Check DCS voltage meter for a reading less than 24 VDC indicating battery voltage is low (TM 9-6115-751-10).
- STEP 3. If battery voltage is not low, proceed to next malfunction.
- STEP 4. If battery voltage is low, use a multimeter selected for the appropriate VDC scale to measure the voltage of each battery at the battery terminals (WP 0095, General Maintenance and WP 0036, Remove/Install Batteries).
- STEP 5. Charge batteries, start engine utilizing the NATO slave receptacle and an outside power source, or replace batteries as required (WP 0036, Remove/Install Batteries; WP 0095, General Maintenance; and TM 9-6115-751-10).

STEP 6. Start generator set (TM 9-6115-751-10) and observe DCS [Battery] [Adc] indicator to ensure battery-charging alternator is charging batteries properly (TM 9-6115-751-10). Test battery-charging alternator if batteries are not charging properly and replace as required (WP 0074, Remove/Install Battery-Charging Alternator Assembly).

STEP 7. If symptom continues, proceed to next malfunction.

MALFUNCTION

Defective starter or flywheel.

CORRECTIVE ACTION

STEP 1. Test starter and replace as required (WP 0067, Remove/Install Starter).

STEP 2. If symptom continues, check flywheel for damage or obstruction. Repair or replace as required (WP 0084, Remove/Install Flywheel).

STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Defective wiring or DCS.

CORRECTIVE ACTION

STEP 1. Test relay K10 for resistance and proper operation and replace as required (WP 0041, Remove/Install Relay Panel).

NOTE

When performing starter test in STEP 2, use engine control switch in the START position instead of using DEAD CRANK SWITCH. Test will determine if DCS is supplying voltage to the starter.

STEP 2. If symptom continues, test starter IAW WP 0067, Remove/Install Starter, using START position of engine control switch.

STEP 3. If proper voltage is detected at starter, replace starter as required if not already replaced (WP 0067, Remove/Install Starter).

STEP 4. If low or no voltage is detected at starter, remove battery ground cable (WP 0036, Remove/Install Batteries), and test starter wiring leads for shorts or opens using wiring diagrams (Foldout Pages) and a multimeter set to test continuity (WP 0095, General Maintenance).

STEP 5. Repair or replace wiring as required (WP 0095, General Maintenance and WP 0042, Remove/Install Power Wiring Harness).

STEP 6. If symptom continues, ensure battery ground cable is removed (WP 0036, Remove/Install Batteries), and use wiring diagrams (Foldout Pages) and a multimeter set to test continuity (WP 0095, General Maintenance) to troubleshoot wires P3-Y and P2-L for opens or shorts.

STEP 7. Replace or repair wiring as required (WP 0039, Remove/Install Engine Wiring Harness).

STEP 8. If symptom continues, test engine control switch and replace as required (WP 0018, Repair DCS).

STEP 9. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

SYMPTOM

[Warning 143: Pre-Low Oil Pressure] displayed on DCS screen.

NOTE

[Warning 143: Pre-Low Oil Pressure] will display on DCS when oil pressure reaches 15 psi at rated load or 13 psi at idle. [Fault 415: Low Oil Pressure] will display on the DCS and cause a generator set shutdown when oil pressure reaches 10 psi at rated load or 8 psi at idle.

MALFUNCTION

Engine oil malfunction.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 415: Low Oil Pressure] displayed on DCS screen symptom.

SYMPTOM

[Warning 1992: High Speed Warning] displayed on DCS screen.

MALFUNCTION

Engine speed malfunction.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 234: Overspeed Shutdown] displayed on DCS screen symptom.

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
ENGINE SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 41)

Materials/Parts

Not Applicable

Personnel Required

91D (1)

References

TM 9-6115-751-10

WP 0006, Warning and Fault Codes

WP 0007, Cooling System Troubleshooting with a DCS Code

WP 0008, Electrical System Troubleshooting with a DCS Code

WP 0010, Engine System Troubleshooting with a DCS Code

WP 0012, Exhaust System Troubleshooting without a DCS Code

WP 0013, Winterization Kit Troubleshooting

WP 0016, Field PMCS

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

WP 0019, Remove/Install Air Intake Hose Assemblies

WP 0020, Service Air Cleaner

WP 0021, Service Cooling System

WP 0024, Remove/Install Radiator Hose and Tube Assemblies

WP 0025, Remove/Install Winterization Kit Components

WP 0027, Remove/Install Radiator

References

WP 0036, Remove/Install Batteries

WP 0038, Remove/Install Intake Air Heater Relay

WP 0042, Remove/Install Power Wiring Harness

WP 0043, Service Fuel System

WP 0044, Remove/Install Fuel Pump Main/Auxiliary

WP 0045, Remove/Install Fuel Manifold

WP 0046, Remove/Install Fuel Filter/Water Separator

WP 0047, Replace Fuel Filter/Water Separator Element

WP 0048, Remove/Install Fuel Hoses and Clamp Bands

WP 0050, Remove/Install Fuel Tank

WP 0051, Remove/Install Fuel Tank Drain Valve

WP 0052, Remove/Install Fuel Tank Filler Neck

WP 0063, Remove/Install 50/60 Hz Engine Assembly

WP 0064, Remove/Install 400 Hz Engine Assembly

WP 0065, Service Lubrication System

WP 0066, Remove/Install Engine Oil Drain Hose

WP 0067, Remove/Install Oil Cooler

WP 0068, Remove/Install Fuel Injectors

WP 0069, Remove/Install Fuel Injection Pump

WP 0070, Remove/Install Water Pump

WP 0071, Remove/Install Thermostat

WP 0072, Remove/Install Starter

WP 0073, Remove/Install Battery-Charging Alternator Belt

WP 0074, Remove/Install Battery-Charging Alternator Assembly

WP 0075, Remove/Install Intake Air Heater

INITIAL SETUP — CONTINUED:**References**

WP 0078, Service Turbocharger
 WP 0079, Remove/Install Turbocharger
 WP 0082, Remove/Install Valve Cover
 WP 0083, Service Engine Valves
 WP 0084, Remove/Install Flywheel
 WP 0085, Remove/Install Crankcase Rear Bearing
 Case Cover
 WP 0086, Remove/Install Oil Pan and Strainer
 WP 0087, Test Engine Compression
 WP 0095, General Maintenance
 WP 0098, Replace Cylinder Head Gasket
 Foldout Pages

Equipment Conditions

Not Applicable

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

ENGINE SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE**WARNING**

- Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.
- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Allow engine to cool from normal operating temperature prior to draining engine oil and removing oil filter. Failure to comply may cause injury or death to personnel.
- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are running. Failure to comply may cause injury or death to personnel.
- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

WARNING

- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.
- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (fuel fill static grounding). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate ESD. Fire and possible explosion can result. Failure to comply may cause injury or death to personnel.

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

NOTE

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

Capture spilled fluids and dispose of IAW local SOP.

SYMPTOM

Evidence of fluid leakage found around engine.

NOTE

Capture spilled fluids and dispose of IAW local SOP.

MALFUNCTION

Engine is leaking oil.

CORRECTIVE ACTION

- STEP 1. Check for oil leaks at oil cooler and oil filter. Replace or repair as required (WP 0065, Service Lubrication System and WP 0067, Remove/Install Oil Cooler).
- STEP 2. If loose, tighten oil filter as required (WP 0065, Service Lubrication System).
- STEP 3. If symptom continues, inspect valve cover and valve cover gasket (WP 0082, Remove/Install Valve Cover). Replace as required.

- STEP 4. If symptom continues, inspect oil inlet line and oil outlet line to and from turbocharger (WP 0079, Remove/Install Turbocharger), fuel injection pump (WP 0069, Remove/Install Fuel Injection Pump), and engine oil drain valve and hose (WP 0066, Remove/Install Engine Oil Drain Hose).
- STEP 5. Replace any line if found to be leaking or damaged (WP 0079, Remove/Install Turbocharger; WP 0069, Remove/Install Fuel Injection Pump; and WP 0066, Remove/Install Engine Oil Drain Hose).
- STEP 6. If symptom continues, inspect area around flywheel and AC generator for signs of oil leaks. Replace crankcase rear bearing case cover assembly as required (WP 0085, Remove/Install Crankcase Rear Bearing Case Cover).
- STEP 7. If symptom continues, inspect oil pan. Replace oil pan as required (WP 0086, Remove/Install Oil Pan and Strainer).
- STEP 8. If symptom continues with Class III leak, replace engine assembly (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).

MALFUNCTION

Engine is leaking coolant.

CORRECTIVE ACTION

WARNING

- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.
- Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.

CAUTION

Be sure to close radiator cap securely to avoid coolant leakage. Engine may overheat if cap is loose. Failure to comply may cause damage to equipment.

- STEP 1. Inspect radiator hoses and coolant recovery bottle and hoses for leaks (WP 0024, Remove/Install Radiator Hose and Tube Assemblies). Repair or replace as required.
- STEP 2. If symptom continues, inspect radiator and test cap (WP 0027, Remove/Install Radiator and WP 0021, Service Cooling System). Replace as required.
- STEP 3. If symptom continues, inspect water pump and thermostat for leaks. Replace as required (WP 0070, Remove/Install Water Pump and WP 0071, Remove/Install Thermostat).
- STEP 4. If symptom continues, inspect oil cooler and hoses and replace as required (WP 0067, Remove/Install Oil Cooler).
- STEP 5. If symptom continues, inspect winterization kit, if applicable, and replace or repair as required (WP 0025, Remove/Install Winterization Kit Components).

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- STEP 6. If symptoms continue, inspect cylinder head gasket and freeze plugs on engine for signs of a Class III leak. Replace as required (WP 0098, Replace Cylinder Head Gasket or WP 0095, General Maintenance).
- STEP 7. If symptom continues, examine oil on dipstick for evidence of coolant or other foreign fluid.
- STEP 8. If evidence of coolant or other foreign fluid is found on dipstick, check engine compression (WP 0087, Test Engine Compression).
- STEP 9. Replace engine as required (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).

MALFUNCTION

Engine is leaking fuel.

CORRECTIVE ACTION**WARNING**

Do not operate generator set if any fuel leaks are present. Fuel is combustible. Always perform PMCS before operation. Failure to comply may cause injury or death to personnel.

- STEP 1. Inspect all fuel hoses (WP 0048, Remove/Install Fuel Hoses and Clamp Bands). Replace as required.
- STEP 2. If symptom continues, inspect fuel filter/water separator assembly (WP 0046, Remove/Install Fuel Filter/Water Separator). Replace as required.
- STEP 3. If symptom continues, inspect fuel injectors, fuel injection pump, and fuel lines (WP 0068, Remove/Install Fuel Injectors and WP 0069, Remove/Install Fuel Injection Pump). Replace as required.
- STEP 4. If symptom continues, inspect fuel tank (WP 0050, Remove/Install Fuel Tank) and fuel filler neck (WP 0052, Remove/Install Fuel Tank Filler Neck) for leaks. Replace as required.
- STEP 5. If symptom continues, tighten fuel drain line valve if necessary, and inspect fuel drain line for leaks (WP 0051, Remove/Install Fuel Tank Drain Valve). Repair or replace as required.
- STEP 6. If symptom continues, inspect fuel pumps and fuel manifold for leaks (WP 0044, Remove/Install Fuel Pump, Main/Auxiliary and WP 0045, Remove/Install Fuel Manifold). Replace as required.

SYMPTOM

Engine cranks slowly and fails to start.

MALFUNCTION

Battery connections are loose or batteries are insufficiently charged.

CORRECTIVE ACTION**WARNING**

Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.

- STEP 1. Check for corroded or loose battery connections. Clean/replace corroded battery connections and tighten loose battery connections as required (WP 0036, Remove/Install Batteries).
- STEP 2. Check DCS voltage meter for a reading less than 24 VDC indicating battery voltage is low (TM 9-6115-751-10).
- STEP 3. If battery voltage is not low, proceed to next malfunction.
- STEP 4. If battery voltage is low, use a multimeter selected for the appropriate VDC scale to measure the voltage of each battery at the battery terminals (WP 0095, General Maintenance and WP 0036, Remove/Install Batteries).
- STEP 5. Charge batteries, start engine utilizing the NATO slave receptacle and an outside power source, or replace batteries as required (WP 0036, Remove/Install Batteries; WP 0095, General Maintenance; and TM 9-6115-751-10).
- STEP 6. Start generator set and observe DCS [Battery] [Adc] indicator to ensure battery-charging alternator is charging batteries properly (TM 9-6115-751-10). Test battery-charging alternator if batteries are not charging properly and replace as required (WP 0074, Remove/Install Battery-Charging Alternator Assembly).
- STEP 7. If symptom continues, proceed to next malfunction.

MALFUNCTION

Dirty air cleaner element or intake air restriction.

CORRECTIVE ACTION

- STEP 1. Check air cleaner element and replace as required (WP 0020, Service Air Cleaner).
- STEP 2. If symptom continues, inspect intake hose for restriction or signs of damage and replace as required (WP 0019, Remove/Install Air Intake Hose Assemblies).
- STEP 3. If symptom continues, check exhaust system for excess back pressure IAW High pitched hiss or whistle heard at exhaust outlet with a decrease in engine performance symptom (WP 0012, Exhaust System Troubleshooting without a DCS Code).
- STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel system malfunction.

CORRECTIVE ACTION

- STEP 1. Check fuel filter/water separator for water and drain fuel filter/water separator as required (TM 9-6115-751-10).
- STEP 2. If symptom continues, check fuel flow and purge fuel lines (WP 0043, Service Fuel System).
- STEP 3. If symptom continues, inspect fuel manifold by fuel filter/water separator for incorrect connections and clogs. Repair or replace as required (WP 0046, Remove/Install Fuel Filter/Water Separator Assembly).
- STEP 4. If symptom continues, service fuel strainers if not already serviced (WP 0043, Service Fuel System) and inspect fuel manifold for leaks or damage. Repair or replace as required (WP 0045, Remove/Install Fuel Manifold).
- STEP 5. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection timing incorrect or governor actuator malfunction.

CORRECTIVE ACTION

- STEP 1. If symptom continues, troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).

CAUTION

Damage or incorrect installation of the brass packing (WP 0069, Remove/Install Fuel Injection Pump, Figure 5, Item 4) for the fuel injection pump may result in inoperability of the generator set. Before checking fuel injection pump timing, ensure brass packing is not damaged and has been installed correctly.

- STEP 2. Ensure brass packing is not damaged and is installed correctly. Check fuel injection timing and adjust as required (WP 0069, Remove/Install Fuel Injection Pump).

MALFUNCTION

Cold weather conditions.

CORRECTIVE ACTION**NOTE**

Intake air heaters will turn on between 20°F and -25°F (-6°C and -32°C) and winterization kit will turn at -25°F and below.

- STEP 1. Allow time for winterization kit/starting aids to work if outside normal temperature range (TM 9-6115-751-10).
- STEP 2. If malfunction is suspected, proceed to Cold weather starting aids fail to work properly symptom.
- STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Defective starter or wiring is incorrect.

CORRECTIVE ACTION

- STEP 1. Test starter and replace as required (WP 0072, Remove/Install Starter).
- STEP 2. If symptom continues, ensure wiring is correctly installed to starter and adjust as required (WP 0072, Remove/Install Starter).

WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 3. If symptom continues, ensure battery ground cable is removed (WP 0036, Remove/Install Batteries) and test wiring leads for shorts using wiring diagrams (Foldout Pages) and a multimeter set to test continuity (WP 0095, General Maintenance).
- STEP 4. Repair or replace wiring as required (WP 0095, General Maintenance and WP 0042, Remove/Install Power Wiring Harness).
- STEP 5. If symptom continues, proceed to next malfunction.

MALFUNCTION

Flywheel is defective.

CORRECTIVE ACTION

- STEP 1. Inspect starter/flywheel connection and look for damaged or missing flywheel teeth.
- STEP 2. If flywheel is defective (missing teeth) replace flywheel (WP 0084, Remove/Install Flywheel).
- STEP 3. If symptom continues or flywheel is not defective, proceed to next malfunction.

MALFUNCTION

Fuel injection malfunction.

CORRECTIVE ACTION

- STEP 1. If symptom continues, check fuel injection lines for loose nuts or leakage and replace or repair as required (WP 0068, Remove/Install Fuel Injector).
- STEP 2. If symptom continues, test fuel injectors and replace as required (WP 0068, Remove/Install Fuel Injector).
- STEP 3. If symptom continues, replace fuel injection pump (WP 0069, Remove/Install Fuel Injection Pump).
- STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

Engine will not shut down.

MALFUNCTION

Governor actuator malfunction.

CORRECTIVE ACTION

- STEP 1. Use EMERGENCY STOP button to shut down generator set (TM 9-6115-751-10).
- STEP 2. Troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).
- STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Engine control switch fault.

CORRECTIVE ACTION

- STEP 1. Rotate engine control switch and confirm that engine control switch is not between two positions.
- STEP 2. Confirm proper installation of engine control switch (WP 0018, Repair DCS).
- STEP 3. Check for loose or damaged wires (WP 0018, Repair DCS).
- STEP 4. Test engine control switch and replace as required (WP 0018, Repair DCS).
- STEP 5. If symptom continues, test DCS LEDs and replace DCS as required (WP 0017, Remove/Install DCS).

SYMPTOM

Engine cranks normally but fails to start.

MALFUNCTION

Engine system malfunction.

CORRECTIVE ACTION

Troubleshoot IAW [Fault 359: Fail to Start] displayed on DCS screen symptom (WP 0010, Engine System Troubleshooting with a DCS Code).

SYMPTOM

Engine starts but stops after starting.

MALFUNCTION

No or low fuel.

CORRECTIVE ACTION

STEP 1. Check fuel tank. Fill as required (WP 0043, Service Fuel System).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel system malfunction.

CORRECTIVE ACTION

STEP 1. Check fuel filter/water separator for water and drain fuel filter/water separator as required (TM 9-6115-751-10).

STEP 2. If symptom continues, check fuel flow and purge fuel lines (WP 0043, Service Fuel System).

STEP 3. If symptom continues, inspect fuel manifold by fuel filter/water separator for incorrect connections and clogs. Repair or replace as required (WP 0046, Remove/Install Fuel Filter/Water Separator Assembly).

STEP 4. If symptom continues, service fuel strainers if not already serviced (WP 0043, Service Fuel System) and inspect fuel manifold for leaks or damage and repair or replace as required (WP 0045, Remove/Install Fuel Manifold).

STEP 5. If symptom continues, proceed to next malfunction.

MALFUNCTION

Dirty air cleaner element or intake air restriction.

CORRECTIVE ACTION

STEP 1. Check air cleaner element and replace as required (WP 0020, Service Air Cleaner).

STEP 2. If symptom continues, inspect intake hose for restriction or signs of damage and replace as required (WP 0019, Remove/Install Air Intake Hose Assemblies).

STEP 3. If symptom continues, check exhaust system for excess back pressure IAW High pitched hiss or whistle heard at exhaust outlet with a decrease in engine performance symptom (WP 0012, Exhaust System Troubleshooting without a DCS Code).

STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection timing incorrect or governor actuator malfunction.

CORRECTIVE ACTION

- STEP 1. If symptom continues, troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).
- STEP 2. Check fuel injection timing and adjust as required (WP 0069, Remove/Install Fuel Injection Pump).
- STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Engine control switch fault.

CORRECTIVE ACTION

- STEP 1. Rotate engine control switch and confirm that engine control switch is not between two positions.
- STEP 2. If symptom continues, confirm proper installation of engine control switch and check for loose or damaged wires (WP 0018, Repair DCS).
- STEP 3. If symptom continues, test engine control switch and replace as required (WP 0018, Repair DCS).
- STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection or DCS malfunction.

CORRECTIVE ACTION

- STEP 1. Check fuel injection lines for loose nuts or leakage and replace or repair as required (WP 0068, Remove/Install Fuel Injector).
- STEP 2. If symptom continues, test fuel injectors and replace as required (WP 0068, Remove/Install Fuel Injector).
- STEP 3. If symptom continues, replace fuel injection pump (WP 0069, Remove/Install Fuel Injection Pump).
- STEP 4. If symptom continues, check DCS LEDs and replace DCS (WP 0017, Remove/Install DCS).

SYMPTOM

Engine stops suddenly during normal operation.

MALFUNCTION

Engine malfunction.

CORRECTIVE ACTION

Troubleshoot IAW Engine starts but stops after starting symptom.

SYMPTOM

Engine runs erratically, performs poorly (does not develop full power), or misfires.

MALFUNCTION

Dirty air cleaner element.

CORRECTIVE ACTION

- STEP 1. Check air filter restriction indicator and inspect air cleaner element (TM 9-6115-751-10). Replace air cleaner element as required (TM 9-6115-751-10).
- STEP 2. If symptom continues, check exhaust system for excess back pressure IAW High pitched hiss or whistle heard at exhaust outlet with a decrease in engine performance symptom (WP 0012, Exhaust System Troubleshooting without a DCS Code).
- STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Insufficient oil level.

CORRECTIVE ACTION

- STEP 1. Check oil level and fill as required (WP 0065, Service Lubrication System).
- STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel system malfunction.

CORRECTIVE ACTION

- STEP 1. Check fuel filter/water separator for water and drain fuel filter/water separator as required (TM 9-6115-751-10).
- STEP 2. If symptom continues, check fuel flow and purge fuel lines (WP 0043, Service Fuel System).
- STEP 3. If symptom continues, inspect fuel manifold by fuel filter/water separator for incorrect connections and clogs. Repair or replace as required (WP 0046, Remove/Install Fuel Filter/Water Separator).
- STEP 4. If symptom continues, service fuel strainers if not already serviced (WP 0043, Service Fuel System) and inspect fuel manifold for leaks or damage (WP 0045, Remove/Install Fuel Manifold).
- STEP 5. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection timing or governor actuator malfunction.

CORRECTIVE ACTION

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- STEP 1. If symptom continues, troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).
- STEP 2. Check fuel injection timing and adjust as required (WP 0069, Remove/Install Fuel Injection Pump).
- STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Dirty turbocharger blower.

CORRECTIVE ACTION

- STEP 1. Clean turbocharger (WP 0078, Service Turbocharger).
- STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Turbocharger waste gate valve malfunction.

CORRECTIVE ACTION

- STEP 1. Test turbocharger waste gate valve for malfunction (WP 0079, Remove/Install Turbocharger).
- STEP 2. Replace turbocharger if waste gate valve is found to be malfunctioning.
- STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Valves improperly adjusted.

CORRECTIVE ACTION

- STEP 1. Adjust valves (WP 0083, Service Engine Valves).
- STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection malfunction.

CORRECTIVE ACTION

- STEP 1. Check fuel injection lines for loose nuts or leakage and replace or repair as required (WP 0068, Remove/Install Fuel Injector).
- STEP 2. Test fuel injectors and replace as required (WP 0068, Remove/Install Fuel Injector).
- STEP 3. If symptom continues, replace fuel injection pump (WP 0069, Remove/Install Fuel Injection Pump).
- STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

Engine stability or hunting problems.

MALFUNCTION

High or low ambient temperatures.

CORRECTIVE ACTION

Adjust gain settings (WP 0017, Remove/Install DCS).

SYMPTOM

Excessive oil consumption.

MALFUNCTION

Oil change overdue, incorrect grade or type (for ambient temperature range), or oil level too high.

CORRECTIVE ACTION

STEP 1. Perform a lubrication system change (WP 0065, Service Lubrication System).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Leakage from oil lines, oil filter, or valve cover.

CORRECTIVE ACTION

STEP 1. Check for oil leaks at oil cooler and oil filter. Replace or repair as required (WP 0065, Service Lubrication System and WP 0067, Remove/Install Oil Cooler).

STEP 2. If loose, tighten oil filter as required (WP 0065, Service Lubrication System).

STEP 3. Inspect valve cover and valve cover gasket (WP 0082, Remove/Install Valve Cover). Replace as required.

STEP 4. Inspect oil inlet line and oil outlet line to and from turbocharger (WP 0079, Remove/Install Turbocharger), fuel injection pump (WP 0069, Remove/Install Fuel Injection Pump), and engine oil drain valve and hose (WP 0066, Remove/Install Engine Oil Drain Hose).

STEP 5. Replace any line if found to be leaking or damaged (WP 0069, Remove/Install Fuel Injection Pump; WP 0079, Remove/Install Turbocharger; and WP 0066, Remove/Install Engine Oil Drain Hose).

STEP 6. If symptom continues, proceed to next malfunction.

MALFUNCTION

Diluted engine oil.

CORRECTIVE ACTION

STEP 1. Examine oil on dipstick for evidence of coolant or other foreign fluid (TM 9-6115-751-10).

STEP 2. Change oil, if not already changed as a result of troubleshooting (WP 0065, Service Lubrication System).

STEP 3. If oil remains contaminated with coolant or foreign fluid, check engine compression (WP 0087, Test Engine Compression).

STEP 4. If compression check reveals fault, replace engine assembly (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).

STEP 5. If compression check does not reveal fault and coolant or foreign fluid is no longer on dipstick, proceed to next malfunction.

STEP 6. If coolant or foreign fluid continues to show on dipstick, replace engine assembly (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).

MALFUNCTION

Leaking crankcase rear bearing case cover seal.

CORRECTIVE ACTION

STEP 1. Inspect area around flywheel and AC generator for signs of oil leaks.

STEP 2. Replace crankcase rear bearing case cover assembly if signs of oil leaks are found (WP 0085, Remove/Install Crankcase Rear Bearing Case Cover).

STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Crankcase breather line clogged.

CORRECTIVE ACTION

STEP 1. Remove and clean crankcase breather line (WP 0082, Remove/Install Valve Cover).

STEP 2. Replace as required (WP 0082, Remove/Install Valve Cover).

STEP 3. If symptom continues, proceed to Engine runs erratically, performs poorly (does not develop full power), or misfires symptom.

STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Improper seal of oil pan or clogged oil strainer.

CORRECTIVE ACTION

- STEP 1. Replace oil pan or repair seal (WP 0086, Remove/Install Oil Pan and Strainer).
- STEP 2. Inspect and replace oil strainer as required (WP 0086, Remove/Install Oil Pan and Strainer).
- STEP 3. If strainer is not clogged or symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection malfunction.

CORRECTIVE ACTION

- STEP 1. Check fuel injector spray pattern and replace fuel injectors as required (WP 0068, Remove/Install Fuel Injector).
- STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine assembly (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

Engine knocks or makes excessive noise.

MALFUNCTION

Oil level low.

CORRECTIVE ACTION

- STEP 1. Check engine oil level and refill as required (WP 0065, Service Lubrication System).
- STEP 2. Troubleshoot IAW Excessive oil consumption symptom.
- STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection or governor actuator malfunction.

CORRECTIVE ACTION

- STEP 1. If symptom continues, troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).
- STEP 2. Check fuel injection timing and adjust as required (WP 0069, Remove/Install Fuel Injection Pump).
- STEP 3. If symptom continues, check fuel injector spray pattern and replace fuel injectors as required (WP 0068, Remove/Install Fuel Injector).

STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Valves improperly adjusted.

CORRECTIVE ACTION

STEP 1. Adjust valves (WP 0083, Check/Adjust Engine Valves).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

Abnormal or high-pitched ascending and descending sounds heard from engine compartment.

MALFUNCTION

Turbocharger has a bent shaft or end play in shaft.

CORRECTIVE ACTION

STEP 1. Test turbocharger (WP 0079, Remove/Install Turbocharger).

STEP 2. Replace turbocharger if found to be damaged or out of specification (WP 0079, Remove/Install Turbocharger).

STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Exhaust system malfunction.

CORRECTIVE ACTION

STEP 1. Troubleshoot IAW High pitched hiss or whistle heard at exhaust outlet with decrease in engine performance symptom (WP 0012, Exhaust System Troubleshooting without a DCS Code).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Engine problem.

CORRECTIVE ACTION

Troubleshoot IAW Engine knocks or makes excessive noise symptom.

SYMPTOM

White smoke seen emitting from engine compartment.

MALFUNCTION

Coolant leak.

CORRECTIVE ACTION**WARNING**

Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.

- STEP 1. Inspect hoses for leaks (WP 0024, Remove/Install Radiator Hose and Tube Assemblies). Replace as required.
- STEP 2. If symptom continues, pressure test cooling system for evidence of leaks (WP 0021, Service Cooling System).
- STEP 3. Proceed to STEP 5 if evidence of leaks is found.
- STEP 4. Proceed to next malfunction if no evidence of leaks is found.
- STEP 5. Inspect radiator and test cap (WP 0027, Remove/Install Radiator Assembly and WP 0021, Service Cooling System). Replace as required.
- STEP 6. Inspect water pump and/or thermostat for leaks. Replace as required (WP 0070, Remove/Install Water Pump and WP 0071, Remove/Install Thermostat).
- STEP 7. Inspect oil cooler and hoses for leaks and replace as required (WP 0067, Remove/Install Oil Cooler).
- STEP 8. Inspect winterization kit for leaks, if applicable, and repair or replace as required (WP 0025, Remove/Install Winterization Kit Components).
- STEP 9. Inspect freeze plugs on engine block for leaks and replace engine as required (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).
- STEP 10. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection timing or governor actuator malfunction.

CORRECTIVE ACTION

- STEP 1. Troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).
- STEP 2. If symptom continues, check fuel injection lines for loose nuts or leakage and replace or repair as required (WP 0068, Remove/Install Fuel Injectors).
- STEP 3. If symptom continues, test fuel injectors and replace as required (WP 0068, Remove/Install Fuel Injectors).

STEP 4. If symptom continues, check fuel injection pump timing and adjust or replace as required (WP 0069, Remove/Install Fuel Injection Pump).

STEP 5. If symptom continues, proceed to next malfunction.

MALFUNCTION

Turbocharger lube oil line or outlet oil line leak.

CORRECTIVE ACTION

STEP 1. Inspect lube oil line and outline for leaks and replace as required (WP 0079, Remove/Install Turbocharger).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

Blue or black smoke from engine compartment with strong odors.

MALFUNCTION

Wires burning.

CORRECTIVE ACTION

STEP 1. Shut down generator set.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with hands and exposed skin after components have been heated. Wear additional protective clothing as required. Failure to comply may cause injury or death to personnel.

STEP 2. Inspect engine compartment for fire/wires burning.

STEP 3. Extinguish any flames IAW SOP.

STEP 4. If fire is not visible, inspect wires for damage due to excessive heat or odor of burned insulation.

STEP 5. If evidence of wire burning is found, locate cause of problem before replacing any components or attempting restart.

SYMPTOM

Oil mixed with coolant.

MALFUNCTION

Leaking cylinder head assembly gasket or internal engine problem.

CORRECTIVE ACTION

- STEP 1. Replace cylinder head gasket (WP 0098, Replace Cylinder Head Gasket).
- STEP 2. If coolant or foreign fluid continues to show on dipstick after cylinder head gasket has been replaced, replace engine assembly (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

Oil mixed with fuel.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

- STEP 3. Drain all fuel from system (WP 0043, Service Fuel System).
- STEP 4. Purge fuel system (WP 0043, Service Fuel System).
- STEP 5. If symptom continues, replace engine assembly (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

Cold weather starting aids fail to work properly.

MALFUNCTION

Cold weather starting aid malfunction.

CORRECTIVE ACTION**NOTE**

Intake air heater will turn on between 20°F and -25°F (-6°C and -32°C) and winterization kit will turn on at -25°F and below.

- STEP 1. If using a generator set with a winterization kit and a malfunction is suspected, troubleshoot IAW WP 0013, Winterization Kit Troubleshooting.
- STEP 2. If not using a winterization kit or if another malfunction is suspected, test batteries and ensure battery voltage is at proper level (WP 0036, Remove/Install Batteries).
- STEP 3. If symptom continues, check for loose connections, moisture, loose pins or wires, or other damage at connections at intake air heater relay and intake air heater (WP 0075, Remove/Install Intake Air Heater and WP 0038, Remove/Install Intake Air Heater Relay). Repair or replace as required (WP 0095, General Maintenance).
- STEP 4. If symptom continues, test intake air heater relay for proper function. Replace as required (WP 0038).

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- STEP 5. If symptom continues, test intake air heaters for proper function. Replace as required (WP 0075).
- STEP 6. If symptom continues, use a multimeter set to test ohms and wiring diagrams to check wire K18-2 to intake air heaters for shorts or opens (WP 0095 and Foldout Pages). Repair or replace wiring as required (WP 0095).
- STEP 7. If symptom continues, use a multimeter set to test ohms and wiring diagrams to check wires P2-E and P2-b at intake air heater relay for opens or shorts (WP 0095 and Foldout Pages). Repair or replace wiring as required (WP 0095).
- STEP 8. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
EXHAUST SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 41)

Materials/Parts

Not Applicable

Personnel Required

91D (1)

References

TM 9-6115-751-10

WP 0008, Electrical System Troubleshooting with a DCS Code

WP 0009, Electrical System Troubleshooting without a DCS Code

WP 0016, Field PMCS

WP 0017, Remove/Install DCS

WP 0019, Remove/Install Air Intake Hose Assemblies

WP 0020, Service Air Cleaner

WP 0025, Remove/Install Winterization Kit Components

WP 0043, Service Fuel System

WP 0047, Replace Fuel Filter/Water Separator Element

References

WP 0063, Remove/Install 50/60 Hz Engine Assembly

WP 0064, Remove/Install 400 Hz Engine Assembly

WP 0065, Service Lubrication System

WP 0068, Remove/Install Fuel Injectors

WP 0069, Remove/Install Fuel Injection Pump

WP 0071, Remove/Install Thermostat

WP 0073, Remove/Install Battery-Charging Alternator Belt

WP 0075, Remove/Install Intake Air Heater

WP 0076, Remove/Install Intake Manifold

WP 0077, Remove/Install Muffler

WP 0078, Service Turbocharger

WP 0079, Remove/Install Turbocharger

WP 0080, Remove/Install Exhaust Manifold

WP 0083, Service Engine Valves

Equipment Conditions

Not Applicable

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

EXHAUST SYSTEM**WARNING**

- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

WARNING

- Hot exhaust gases can ignite combustible materials. Allow room for safe discharge of hot gases. Failure to comply may cause injury or death to personnel.
- When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Wear heat resistant gloves and avoid contacting hot metal surfaces with hands and exposed skin after components have been heated. Wear additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- A turbocharger may become very hot and requires more time to cool down than other parts of engine assembly. Shut down generator set and allow it to cool sufficiently before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

NOTE

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

SYMPTOM

High-pitched hiss or whistle heard at exhaust outlet with a decrease in engine performance.

MALFUNCTION

High back pressure or restriction in exhaust system.

CORRECTIVE ACTION

WARNING

- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
 - STEP 1. Check exhaust outlet on top of generator set to be sure it is clear of obstructions.
 - STEP 2. Check that protection cap is operating properly. Repair or replace as required (WP 0077, Remove/Install Muffler).
 - STEP 3. Check pipes throughout exhaust system for dents or kinks that could be causing restriction in the exhaust system. Replace or repair as required (WP 0077, Remove/Install Muffler).

- STEP 4. Remove flex pipe and inspect muffler for visual damage, restriction, or excess carbon buildup. Remove restrictions, install or replace flex pipe as required, or replace muffler as required (WP 0077, Remove/Install Muffler).
- STEP 5. Inspect exhaust manifold for signs of damage or restriction. Remove restrictions or replace as required (WP 0080, Remove/Install Exhaust Manifold).
- STEP 6. Inspect/test turbocharger for damage or improper function (WP 0079, Remove/Install Turbocharger).

SYMPTOM

Abnormal sound heard in exhaust system with a decrease in engine performance.

MALFUNCTION

Exhaust system leak.

CORRECTIVE ACTION

WARNING

- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
 - When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- STEP 1. Check cylinder head to exhaust manifold connection, exhaust manifold to turbocharger connection, turbocharger to flex pipe connection, flex pipe to muffler connection, and muffler to rain cap connection for signs of damage or leaks (WP 0079, Remove/Install Turbocharger; WP 0080, Remove/Install Exhaust Manifold; and WP 0077, Remove/Install Muffler). Look for signs of heat escape such as discoloration or heat damage to surrounding components and discolored or burned paint around gasket and cylinder head exhaust outlet ports.
- STEP 2. Replace any connection or gasket that shows signs of damage or leaking (WP 0079, Remove/Install Turbocharger; WP 0080, Remove/Install Exhaust Manifold; and WP 0077, Remove/Install Muffler).
- STEP 3. If symptom continues, check muffler for damage or exhaust leaks. Replace as required (WP 0077, Remove/Install Muffler).
- STEP 4. If symptom continues, inspect exhaust manifold for cracks or signs of damage. Replace as required (WP 0080, Remove/Install Exhaust Manifold).
- STEP 5. If symptom continues, check for air leak from discharge side of turbocharger. Replace as required (WP 0079, Remove/Install Turbocharger).
- STEP 6. If symptom continues, wrap wiping rags around exhaust pipes at areas susceptible to wear or corrosion and use pliers to gently squeeze for weak spots or damage. Replace exhaust pipes as required (WP 0077, Remove/Install Muffler).
- STEP 7. If symptom continues, test turbocharger and replace turbocharger as required (WP 0079, Remove/Install Turbocharger).

STEP 8. If operating generator set in cold weather conditions, inspect system for signs of water corrosion. If evidence of condensation is found, ensure proper function of winterization kit and intake air heaters and replace as required (WP 0025, Remove/Install Winterization Kit Components and WP 0075, Remove/Install Intake Air Heater).

STEP 9. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine assembly (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

Intermittent hissing or popping noise is heard when engine is running.

MALFUNCTION

Exhaust manifold gasket leak.

CORRECTIVE ACTION

WARNING

- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

STEP 1. Inspect exhaust manifold and cylinder head for discoloration or burning around exhaust outlet ports.

STEP 2. Replace exhaust manifold gasket if discoloration or burning is found (WP 0080, Remove/Install Exhaust Manifold).

STEP 3. If symptom continues, troubleshoot IAW Abnormal sound heard from exhaust system with a decrease in engine performance symptom.

SYMPTOM

Buzzing or rattling sound heard.

MALFUNCTION

Loose or missing hardware of exhaust component.

CORRECTIVE ACTION**WARNING**

- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
 - STEP 1. Check for loose or missing fasteners attaching heat shield to exhaust manifold (WP 0080, Remove/Install Exhaust Manifold).
 - STEP 2. Tighten any loose fasteners and replace any missing fasteners (WP 0080, Remove/Install Exhaust Manifold).
 - STEP 3. Use a small pry bar to gently press on heat shield to check for broken welds or damage. Replace as required (WP 0080, Remove/Install Exhaust Manifold).
 - STEP 4. Check muffler hardware and fasteners for loose fasteners, missing parts, or broken welds. Replace or repair as required (WP 0077, Remove/Install Muffler).
 - STEP 5. Check exhaust outlet connection at turbocharger, muffler connections, and exhaust pipes for missing clamps, loose hardware, or damage. Replace or tighten hardware as required (WP 0077, Remove/Install Muffler).

SYMPTOM

Engine emits blue or black smoke with insufficient engine output.

MALFUNCTION

Overloaded generator set.

CORRECTIVE ACTION

- STEP 1. Increase generator set size or reduce load usage.
- STEP 2. Troubleshoot electrical system for load issues (WP 0009, Electrical System Troubleshooting without a DCS Code).
- STEP 3. If symptoms continue, proceed to next malfunction.

MALFUNCTION

Dirty air cleaner element.

CORRECTIVE ACTION

- STEP 1. Check the air cleaner element and service air cleaner assembly as needed (WP 0020, Service Air Cleaner).
- STEP 2. If symptoms continue, proceed to next malfunction.

MALFUNCTION

Obstruction in air intake system.

CORRECTIVE ACTION

- STEP 1. Check air intake hoses for kinks, damage, or signs of restriction. Replace as required (WP 0019, Remove/Install Air Intake Hose Assemblies).
- STEP 2. Inspect intake air heaters for malfunction or blockage causing restriction to air flow. Replace as required (WP 0075, Remove/Install Intake Air Heater).
- STEP 3. Inspect intake manifold for cracks or damage. Inspect air intake hose to intake manifold. Replace either as required (WP 0076, Remove/Install Intake Manifold).
- STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

High back pressure or restriction in exhaust system.

CORRECTIVE ACTION**WARNING**

- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
 - STEP 1. Check exhaust outlet on top of generator set to be sure it is clear of obstructions (WP 0077, Remove/Install Muffler).
 - STEP 2. Check that protection cap is operating properly. Repair or replace as required (WP 0077, Remove/Install Muffler).
 - STEP 3. Check pipes throughout exhaust system for dents or kinks that could be causing restriction in the exhaust system. Replace or repair as required (WP 0077, Remove/Install Muffler).
 - STEP 4. Remove flex pipe and inspect muffler for visual damage, restriction, or excess carbon buildup. Remove restrictions, install or replace flex pipe as required, or replace muffler as required (WP 0077, Remove/Install Muffler).
 - STEP 5. Inspect exhaust manifold for signs of damage or restriction. Remove restrictions or replace as required (WP 0080, Remove/Install Exhaust Manifold).
 - STEP 6. Inspect/test turbocharger for damage or improper function (WP 0079, Remove/Install Turbocharger).
 - STEP 7. If symptom continues, proceed to next malfunction.

MALFUNCTION

Improper or contaminated fuel.

CORRECTIVE ACTION

STEP 1. Drain fuel tank and refill with clean fuel (WP 0043, Service Fuel System).

STEP 2. Drain fuel filter/water separator (TM 9-6115-751-10) and replace fuel filter/water separator element (WP 0047, Replace Fuel Filter/Water Separator Element).

STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Improper open or close timing of intake/exhaust valves.

CORRECTIVE ACTION

STEP 1. Adjust valve clearance (WP 0083, Service Engine Valves).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Too much oil in oil pan/too much oil added.

CORRECTIVE ACTION

STEP 1. Drain oil to obtain proper level (WP 0065, Service Lubrication System).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Engine used at high temperatures or at high altitude.

CORRECTIVE ACTION

STEP 1. Adjust governor gain and/or reduce load as required (WP 0017, Remove/Install DCS).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Dirty turbocharger assembly.

CORRECTIVE ACTION

STEP 1. Inspect turbocharger assembly and clean as required (WP 0079, Remove/Install Turbocharger and WP 0078, Service Turbocharger).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Turbocharger assembly waste gate malfunction.

CORRECTIVE ACTION

- STEP 1. Test/inspect turbocharger assembly waste gate and replace turbocharger as required (WP 0079, Remove/Install Turbocharger).
- STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection timing incorrect or governor actuator malfunction.

CORRECTIVE ACTION

- STEP 1. If symptom continues, troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).
- STEP 2. If symptom continues, check fuel injection lines for loose nuts or leakage. Repair or replace as required (WP 0068, Remove/Install Fuel Injectors).
- STEP 3. Check fuel injection timing and adjust as required (WP 0069, Remove/Install Fuel Injection Pump).
- STEP 4. If symptom continues, test fuel injectors and replace as required (WP 0068, Remove/Install Fuel Injectors).
- STEP 5. If symptom continues, replace fuel injection pump (WP 0069, Remove/Install Fuel Injection Pump).
- STEP 6. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).

SYMPTOM

Engine emits white exhaust smoke.

MALFUNCTION

Fuel contaminated or improper fuel used.

CORRECTIVE ACTION

- STEP 1. Inspect fuel type being used and check with specification on labels and in manual (TM 9-6115-751-10).
- STEP 2. Drain fuel tank and refill with clean fuel (WP 0043, Service Fuel System).
- STEP 3. Replace fuel filter/water separator element (WP 0047, Replace Fuel Filter/Water Separator Element).
- STEP 4. If symptom continues, proceed to next malfunction.

MALFUNCTION

Clogged exhaust pipe or muffler.

CORRECTIVE ACTION

- STEP 1. Check exhaust outlet on top of generator set to be sure it is clear of obstructions (WP 0077, Remove/Install Muffler).
- STEP 2. Check that protection cap is operating properly. Repair or replace as required (WP 0077, Remove/Install Muffler).
- STEP 3. Check pipes throughout exhaust system for dents or kinks that could be causing restriction in the exhaust system. Replace or repair as required (WP 0077, Remove/Install Muffler).
- STEP 4. Remove flex pipe and inspect muffler for visual damage, restriction, or excess carbon buildup. Remove restrictions, install or replace flex pipe as required, or replace muffler as required (WP 0077, Remove/Install Muffler).
- STEP 5. Inspect exhaust manifold for signs of damage or restriction. Remove restrictions or replace as required (WP 0080, Remove/Install Exhaust Manifold).
- STEP 6. Inspect/test turbocharger for damage or improper function (WP 0079, Remove/Install Turbocharger).
- STEP 7. If symptom continues, proceed to next malfunction.

MALFUNCTION

Clogged air filter.

CORRECTIVE ACTION

- STEP 1. Inspect and replace air filter (TM 9-6115-751-10).
- STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Improper intake and exhaust valve open/closure.

CORRECTIVE ACTION

- STEP 1. Adjust engine valves (WP 0083, Service Engine Valves).
- STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Worn turbocharger assembly bearing.

CORRECTIVE ACTION

- STEP 1. Inspect turbocharger for end play and run out (WP 0079, Remove/Install Turbocharger).
- STEP 2. Replace turbocharger as required (WP 0079, Remove/Install Turbocharger).
- STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Turbocharger lube oil line or outlet oil line leak.

CORRECTIVE ACTION

STEP 1. Inspect lube oil line and outlet line for leaks and replace as required (WP 0079, Remove/Install Turbocharger).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Engine used at high temperatures or at high altitude.

CORRECTIVE ACTION

STEP 1. Reduce load as required (TM 9-6115-751-10).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Fuel injection timing incorrect or governor actuator malfunction.

CORRECTIVE ACTION

STEP 1. If symptom continues, troubleshoot IAW [Warning 2967: Governor Fault] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).

STEP 2. If symptom continues, check fuel injection lines for loose nuts or leakage. Repair or replace as required (WP 0068, Remove/Install Fuel Injectors).

STEP 3. If symptom continues, test fuel injectors and replace as required (WP 0068, Remove/Install Fuel Injectors).

STEP 4. Check fuel injection timing and adjust as required (WP 0069, Remove/Install Fuel Injection Pump).

STEP 5. If symptom continues, replace fuel injection pump (WP 0069, Remove/Install Fuel Injection Pump).

STEP 6. If symptom continues, proceed to next malfunction.

MALFUNCTION

Internal engine problem.

CORRECTIVE ACTION

Replace engine (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).

END OF WORK PACKAGE

**FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
WINTERIZATION KIT TROUBLESHOOTING**

INITIAL SETUP:

Test Equipment

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 41)

Materials/Parts

Not Applicable

Personnel Required

91D (1)

References

TM 9-6115-751-10

WP 0008, Electrical System Troubleshooting with a DCS Code

WP 0009, Electrical System Troubleshooting without a DCS Code

WP 0016, Field PMCS

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

WP 0025, Remove/Install Winterization Kit Components

References

WP 0036, Remove/Install Batteries

WP 0037, Remove/Install Main DC Circuit Breaker

WP 0039, Remove/Install Engine Wiring Harness

WP 0043, Service Fuel System

WP 0070, Remove/Install Water Pump

WP 0074, Remove/Install Battery-Charging Alternator Assembly

WP 0095, General Maintenance

Foldout Pages

Equipment Conditions

Not Applicable

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

WINTERIZATION KIT TROUBLESHOOTING**WARNING**

- Eye protection is required when working with compressed air. Do not use compressed air to clean skin. Do not aim at personnel. Compressed air can propel particles at high velocity and injure eyes. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

FAULT RESET switch must be pushed to clear each fault code as it is addressed.

SYMPTOM

[Warning 3663: Winterization Kit Failure to Heat] displayed on DCS screen.

NOTE

[Warning 3663: Winterization Kit Failure to Heat] displays on DCS when coolant temperature fails to rise 5°F (2.75°C) in 5 min.

MALFUNCTION

Fuel tank is empty.

CORRECTIVE ACTION**NOTE**

Capture spilled fuel and dispose of IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

STEP 1. Fill fuel tank as required (WP 0043, Service Fuel System).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Clogged intake port.

CORRECTIVE ACTION

STEP 1. Clean air intake port with compressed air (located next to exhaust pipe port (WP 0025, Remove/Install Winterization Kit Components)).

STEP 2. If symptom continues, proceed to next malfunction.

MALFUNCTION

Clogged exhaust pipe.

CORRECTIVE ACTION

STEP 1. Remove exhaust pipe (WP 0025, Remove/Install Winterization Kit Components).

WARNING

Eye protection is required when working with compressed air. Do not use compressed air to clean skin. Do not aim at personnel. Compressed air can propel particles at high velocity and injure eyes. Failure to comply may cause injury or death to personnel.

STEP 2. Clean exhaust pipe with compressed air.

STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Clogged winterization kit fuel pump or malfunctioning fuel system.

CORRECTIVE ACTION**NOTE**

Capture spilled fuel and dispose of IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

STEP 1. Perform fuel flow test (WP 0025, Remove/Install Winterization Kit Components).

STEP 2. Test and replace fuel system components (WP 0043, Service Fuel System) or winterization kit if necessary (WP 0025, Remove/Install Winterization Kit Components).

STEP 3. If symptom continues, proceed to next malfunction.

MALFUNCTION

Winterization kit wiring or DCS failure.

CORRECTIVE ACTION**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

NOTE

CB201-LOAD/P20A-1 (positive battery current) runs between main DC circuit breaker (CB201) and winterization kit (L20). Winterization kit wires P2-R (signal) and P2-U (negative) run between DCS P2 and winterization kit connectors.

Wire P2-R runs between DCS P2 and P20A at winterization kit. J20C-4 runs from plug P20A (pin 2) on winterization kit (L20, BROWN) and J20C-2 runs from P21-2 (fuel metering pump (M21, pin 2)). Both wires junction at J20C. Wire P2-U is the return from J20C to DCS P2. P20A-4 (green) runs between winterization kit and fuel metering pump (P21-1 to M21).

- STEP 1. Use wiring diagrams (Foldout Pages) to locate and check winterization kit wiring at P20A, P21, J20C, CB201, and DCS P2 for loose connections and bent or broken pins.
- STEP 2. Install connections or repair or replace as required (WP 0039, Remove/Install Engine Wiring Harness, WP 0037, Remove/Install Main DC Circuit Breaker, and WP 0095, General Maintenance).
- STEP 3. If symptom continues, turn engine control switch to PRIME & RUN without starting generator set (TM 9-6115-751-10), remove connector P20A from winterization kit, and check voltage between pins P20A-1 and P20A-2 using a multimeter set to test VDC (WP 0095, General Maintenance).
- STEP 4. If voltage is greater than 21 VDC, proceed to STEP 10.
- STEP 5. If voltage is equal to or less than 21 VDC, proceed to STEP 6.
- STEP 6. Install P20A and test batteries. Charge or replace as required (WP 0036, Remove/Install Batteries).
- STEP 7. If symptom continues, remove battery ground cable (WP 0036, Remove/Install Batteries), remove wires from components as required, and use wiring diagrams and a multimeter set to test continuity to check CB201-LOAD and P2-U for opens or shorts (WP 0095, General Maintenance and Foldout Pages).
- STEP 8. Replace or repair wiring as required (WP 0095, General Maintenance and WP 0039, Remove/Install Engine Wiring Harness).
- STEP 9. If symptom continues, test DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS). Resume operation.
- STEP 10. Leave P20A unplugged and select winterization kit test from DCS screen (TM-9-6115-751-10).
- STEP 11. Use a multimeter set to test VDC to check voltage between pins P20A-7 and P20A-2 (WP 0095, General Maintenance).
- STEP 12. Record voltage and stop winterization kit test (TM-9-6115-751-10).
- STEP 13. If voltage is greater than 21 VDC, proceed to STEP 17.
- STEP 14. If voltage is equal to or less than 21 VDC, remove battery ground cable (WP 0036, Remove/Install Batteries) and use wiring diagrams and a multimeter set to test Ohms to

- check wire P2-R for shorts or opens (WP 0095, General Maintenance and Foldout Pages).
- STEP 15. Repair or replace wire P2.R as required (WP 0095, General Maintenance and WP 0039, Remove/Install Engine Wiring Harness).
- STEP 16. If symptom continues, troubleshoot IAW "Defective DCS" malfunction under DCS has no power or no lighted display symptom (WP 0009, Electrical System Troubleshooting without a DCS Code).
- STEP 17. Select winterization kit test from DCS screen (TM-9-6115-751-10) and proceed to STEP 18.
- STEP 18. Install P20A to winterization kit and remove P21 from fuel metering pump at winterization kit.
- STEP 19. Use a multimeter set to test VDC to check voltage between pins P21-1 and P21-2 (WP 0095, General Maintenance).
- STEP 20. If voltage is within 11.97 to 14.63 VDC range, replace fuel metering pump (WP 0025, Remove/Install Winterization Kit Components).
- STEP 21. If voltage is not within 11.97 to 14.63 VDC range, remove battery ground cable (WP 0036, Remove/Install Batteries) and a multimeter set to test continuity with wiring diagrams to check connector J20C and wires P20A-4 (green), J20C-2, and P2-U for opens or shorts (WP 0095, General Maintenance and Foldout Pages).
- STEP 22. Repair or replace wires or connectors as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0095, General Maintenance).
- STEP 23. If symptom continues, replace winterization kit (WP 0025, Remove/Install Winterization Kit Components).

SYMPTOM

[Warning 3671: Winterization Kit Low Voltage Warning] displayed on DCS screen.

WARNING

The right-hand battery negative lead that connects directly to the grounding stud must be disconnected prior to disconnecting or removing batteries. Follow procedural steps in exact order given for removal and installation. Failure to comply may cause injury or death to personnel.

NOTE

When [Warning 3671: Winterization Kit Low Voltage Warning] appears on DCS screen, winterization kit is draining the batteries or DCS is reading the signal as a battery drain signal. The batteries are below 20 VDC when [Warning 3671: Winterization Kit Low Voltage Warning] appears on DCS screen.

MALFUNCTION

Battery connections are loose or batteries are insufficiently charged.

CORRECTIVE ACTION**WARNING**

Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.

STEP 1. Check for corroded or loose battery connections. Clean/replace corroded battery connections and tighten loose battery connections as required (WP 0036, Remove/Install Batteries).

STEP 2. Check DCS voltage meter for a reading less than 20 VDC indicating battery voltage is low (TM 9-6115-751-10).

STEP 3. If battery voltage is not low, proceed to next malfunction.

STEP 4. If battery voltage is low, use a multimeter selected for the appropriate VDC scale to measure the voltage of each battery at the battery terminals (WP 0095, General Maintenance and WP 0036, Remove/Install Batteries).

STEP 5. Charge batteries, start engine utilizing the NATO slave receptacle and an outside power source, or replace batteries as required (WP 0036, Remove/Install Batteries; WP 0095, General Maintenance; and TM 9-6115-751-10).

STEP 6. Observe DCS [Battery] [Adc] indicator to ensure battery-charging alternator is charging batteries properly (TM 9-6115-751-10). Test battery-charging alternator if batteries are not charging properly and replace as required (WP 0074, Remove/Install Battery-Charging Alternator Assembly).

STEP 7. If symptom continues, proceed to next malfunction.

MALFUNCTION

Winterization kit wiring or DCS failure.

CORRECTIVE ACTION

Troubleshoot IAW Winterization kit wiring or DCS failure malfunction under [Warning 3663: Winterization Kit Failure to Heat] displayed on DCS screen symptom.

SYMPTOM

Winterization kit fails to turn off.

MALFUNCTION

Defective flame or heat sensor.

CORRECTIVE ACTION

Troubleshoot IAW Winterization kit activates under usual operating conditions symptom.

SYMPTOM

Winterization kit activates under usual operating conditions.

MALFUNCTION

Defective temperature sensor or DCS temperature sensor.

CORRECTIVE ACTION

- STEP 1. Test temperature sensor IAW [Warning 144: Coolant Temp Sensor OOR High] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).
- STEP 2. If symptom continues, troubleshoot IAW Winterization kit wiring or DCS failure malfunction under [Warning 3663: Winterization Kit Failure to Heat] displayed on DCS screen symptom.

END OF WORK PACKAGE

CHAPTER 3
FIELD MAINTENANCE INSTRUCTIONS
FOR
AMMPS 15KW GENERATOR SET

CHAPTER 3

FIELD MAINTENANCE INSTRUCTIONS

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FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
SERVICE UPON RECEIPT

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Belt, V-Drive, 1/2 IN X 40 1/8 IN (WP 0132, Repair Parts List, Figure 32, Item 7)

Strainer (80 X 100 L.O.) (WP 0126, Repair Parts List, Figure 26, Item 17)

Antifreeze, ethylene glycol (WP 0164, Expendable and Durable Items List, Item 2)

Bag, barrier (WP 0164, Item 3)

Cap set, protective (WP 0164, Item 9)

Cleaning compound, engine cooling system (WP 0164, Item 10)

Detergent, general purpose (WP 0164, Item 17)

Distilled water, (WP 0164, Item 18)

Fuel, diesel (WP 0164, Item 19)

Fuel, diesel (WP 0164, Item 20)

Grease, electrically conductive (WP 0164, Item 21)

Lubricating oil engine (WP 0164, Item 24)

Lubricating oil, engine (WP 0164, Item 25)

Lubricating oil, engine (WP 0164, Item 26)

Rag, wiping (WP 0164, Item 32)

Sealant (WP 0164, Item 33)

Personnel Required

91D (1)

References

A-A-52557A

DA Form 2258

DA PAM 750-8

MIL-PRF-2104H

MIL-PRF-22191F

MIL-PRF-46167D

MIL-STD-129

SF 361

WP 0015, Field PMCS Introduction

WP 0016, Field PMCS

WP 0021, Service Cooling System

WP 0036, Remove/Install Batteries

WP 0043, Service Fuel System

WP 0065, Service Lubrication System

WP 0073, Remove/Install Battery-Charging Alternator Belt

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

SERVICE UPON RECEIPT**WARNING**

- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gasses are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.
- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are running. Failure to comply may cause injury or death to personnel.
- High voltage is produced when this generator set is in operation. Do not contact output cables when operating this generator set. Failure to comply may cause injury or death to personnel.
- The right-hand battery negative lead that connects directly to the grounding stud must be disconnected prior to disconnecting or removing batteries. Follow procedural steps in exact order given for removal and installation. Failure to comply may cause injury or death to personnel.
- Batteries give off combustible gas. Do not smoke or use open flame when performing maintenance. Failure to comply may cause injury or death to personnel and damage to equipment.
- Battery acid can cause burns to skin and cause eye injury. Wear safety goggles and chemical gloves and avoid acid splash while working on the batteries. Failure to comply may cause injury or death to personnel.
- Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.
- Lifting batteries may cause back strain. Ensure proper lifting techniques are used when lifting batteries. Failure to comply may cause injury or death to personnel.
- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

WARNING

- Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (fuel fill static grounding). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate ESD. Fire and possible explosion can result. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.
- Hot exhaust gases can ignite combustible materials. Allow room for safe discharge of hot gases. Failure to comply may cause injury or death to personnel.
- Wear heat resistant gloves and avoid contacting hot metal surfaces with hands and exposed skin after components have been heated. Wear additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Comply with all lifting requirements. Observe the decals on equipment and parts that identify the weight and determine if assistance is needed. Maximum lift is 37 lb (16.8 kg) for one person, 74 lb (33.6 kg) for two persons, and 101 lb (45.8 kg) for three persons. Failure to comply may cause injury or death to personnel.
- When lifting generator set, use lifting equipment with minimum lifting capacity of 2500 lb (771.1 kg). Do not stand or put arms, legs, or any body part under hoisted load. Do not permit generator set to swing. Failure to comply may cause injury or death to personnel.
- Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.

CAUTION

While filling the coolant, air must be vented from the engine coolant passages. Vent air by opening pressure release valve and pouring slowly into the filler opening. Failure to comply may cause damage to equipment.

Be sure to close radiator cap securely to avoid coolant leakage. Engine may overheat if cap is loose. Failure to comply may cause damage to equipment.

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

Do not move or lift batteries by the terminal studs. Failure to comply will cause damage to equipment.

NOTE

Capture spilled fuel/coolant and dispose of IAW local SOP.

This WP provides information and guidance for service upon receipt of the AMMPS 15 kW generator set. These procedures ensure the AMMPS unit is adequately inspected, serviced, sited, and operationally tested before being subjected to use.

SITING

See the siting requirements contained in TM 9-6115-751-10.

SERVICE UPON RECEIPT OF MATERIEL**Unpacking****NOTE**

The generator set should take approximately half an hour to unpack.

1. Inspect all packaging for damage incurred during transit. See Checking Equipment task and Table 1.
2. Remove 20 lag bolts (Figure 1, Items 4 and 20) and washers (Figure 1, Items 3 and 21) securing top (Figure 1, Item 1) of plywood box.
3. Remove top (Figure 1, Item 1) of plywood box.
4. Remove 11 lag bolts (Figure 1, Items 18 and 16) and washers (Figure 1, Items 15 and 19) from front end (Figure 1, Item 17) of plywood box.
5. Remove front end (Figure 1, Item 17) of plywood box and set aside.
6. Repeat for inspection end (Figure 1, Item 2) of plywood box being sure to remove 11 lag bolts (Figure 1, Item 16) and washers (Figure 1, Item 15) securing side panels.
7. Remove inspection end (Figure 1, Item 2) of plywood box and set aside.
8. Remove six lag bolts (Figure 1, Item 6) and washers (Figure 1, Item 5) from right side (Figure 1, Item 7) of plywood box.
9. Remove right side (Figure 1, Item 7) of plywood box and set aside.
10. Remove left side (Figure 1, Item 24) of plywood box and set aside.
11. Check humidity gage (not shown) at rear side of generator set (Figure 1, Item 23) for color change and record reading.
12. Report any abnormal reading IAW Checking Equipment task, step 2.
13. Remove polyethylene bag (not pictured) and paperboard corner protectors (Figure 1, Item 22).
14. Remove eight nuts (Figure 1, Items 13 and 14), four lock washers (Figure 1, Item 12), and four washers (Figure 1, Item 11) securing generator set (Figure 1, Item 23) to bolts (Figure 1, Item 9) on wooden pallet (Figure 1, Item 8). Discard lock washers (Figure 1, Item 12).

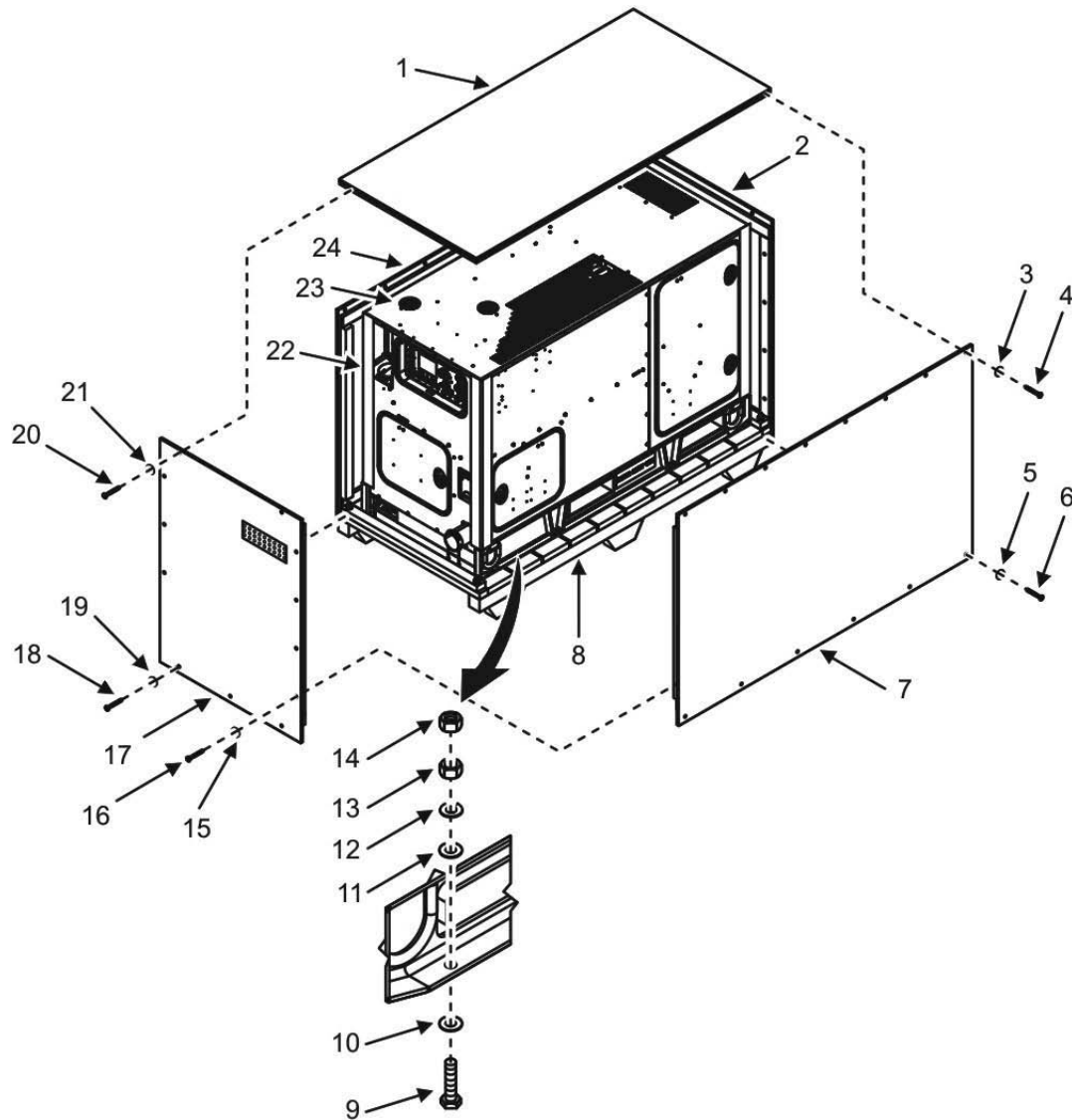


Figure 1. Generator Set Unpacking.

15. Lift generator set (Figure 1, Item 23) clear of wooden pallet (Figure 1, Item 8) using a suitable lifting device.
16. Remove four bolts (Figure 1, Item 9) and four washers (Figure 1, Item 10) from underneath wooden pallet (Figure 1, Item 8).
17. Stack all side and end panels (Figure 1, Items 1, 2, 7, 17, and 24) on wooden pallet (Figure 1, Item 8) and save for reuse.
18. Package all lag bolts (Figure 1, Items 4, 6, 16, 18, and 20), bolts (Figure 1, Item 9), washers (Figure 1, Items 3, 5, 10, 11, 15, 19 and 21) and nuts (Figure 1, Items 13 and 14) and store with wooden pallet (Figure 1, Item 8) for reuse.
19. Dispose of all packaging materials for the 15kW generator IAW local SOP.
20. Store wooden pallet (Figure 1, Item 8), sides and ends (Items 4, 6, 16, 18, and 20), and hardware (Figure 1, Items 3, 4, 5, 6, 9, 10, 11, 13, 14, 15, 16, 18, 19, 20, and 21) for the 15 kW generator set IAW local SOP.

END OF TASK

Packing

1. Ensure oil level is full and fill as required (WP 0065, Service Lubrication System).
2. Service cooling system (WP 0021, Service Cooling System).
3. Run engine for at least 5 min to preserve cooling system (TM 9-6115-751-10).
4. Shut down generator set and allow engine to cool.
5. Prepare generator set IAW Preparation for Movement WP (TM 9-6115-751-10).
6. Ensure auxiliary fuel lines and paralleling cables are stored in the proper storage box within the generator set (TM 9-6115-751-10).
7. Ensure technical publications are sealed into plastic bag IAW MIL-PRF-22191F, Performance Specification, Barrier Materials, Transparent, Flexible, Heat-Sealable and stored in document box (TM 9-6115-751-10).
8. Ensure one copy of DA Form 2258, Depreservation Guide for Vehicles and Equipment, is stored in plastic bag in the document box IAW MIL-PRF-22191F.
9. Attach one copy of depreservation guide DA Form 2258, Depreservation Guide for Vehicles and Equipment, stored in plastic bag IAW MIL-PRF-22191F to outside of generator set.
10. Position wooden pallet (Figure 1, Item 8) on a level surface.
11. Position generator set (Figure 1, Item 23) on wooden pallet (Figure 1, Item 8) using a suitable lifting device.
12. Secure generator set (Figure 1, Item 23) to wooden pallet (Figure 1, Item 8) with one washer (Figure 1, Item 11), one new lock washer (Figure 1, Item 12), and two nuts (Figure 1, Item 13 and 14) on one bolt (Figure 1, Item 9) with washer (Figure 1, Item 10).
13. Repeat for three other bolts and hardware securing generator set (Figure 1, Item 23) to wooden pallet (Figure 1, Item 8).
14. Position right side (Figure 1, Item 7) of plywood box on wooden pallet (Figure 1, Item 8) using six lag bolts (Figure 1, Item 6) and washers (Figure 1, Item 5) to secure to wooden pallet (Figure 1, Item 8).
15. Repeat for left side (Figure 1, Item 24) of plywood box.
16. Position front end (Figure 1, Item 17) of plywood box on wooden pallet (Figure 1, Item 8) using three lag bolts (Figure 1, Item 18) and washers (Figure 1, Item 19).
17. Install four lag bolts (Figure 1, Item 16) and washers (Figure 1, Item 15) to each side of front end (Figure 1, Item 17) of plywood box to secure to left and right sides (Figure 1, Items 7 and 24).
18. Position inspection end (Figure 1, Item 2) of plywood box on wooden pallet (Figure 1, Item 8) and secure with 11 lag bolts and washers.
19. Install top (Figure 1, Item 1) of plywood box.
20. Install two lag bolts (Figure 1, Item 20) and washers (Figure 1, Item 21) to top of each end (Figure 1, Items 17 and 2) of plywood box and eight lag bolts (Figure 1, Item 4) and washers (Figure 1, Item 3) to top of each side (Figure 1, Items 7 and 24) of plywood box.
21. Inspect to ensure box is adequately sealed and assembled correctly.
22. Label box IAW MIL-STD-129 (WP 0161, References) as required.

END OF TASK

Checking Equipment

Table 1. Inspection Criteria for Packaging.

Component	Acceptable	Reparable	Nonreparable
Wooden Boxes and Crates			
Hardware	Operative and tight. Lag bolts, nuts, washers.	Inoperative or loose. Lag bolts, nuts, washers.	None.
Ends	Free from damage.	Broken or missing portions.	Damage that requires disassembly of box.
Wood	Splits less than 3 in (7.62 cm) long, no closer than 1 in (2.54 cm) to edge of board or adjoining split. The board must be secured by at least one lag bolt on each side of the split when it extends to the end of the board.	Splits more than 3 in (7.62 cm) but no closer than 1 in (2.54 cm) to edge of board or adjoining split or 1/2 in (1.27 cm) wide that can be repaired by use of corrugated fasteners.	Splits closer than 1 in (2.54 cm) to edge of board or adjoining split or over 1/2 in (1.27 cm) wide.

1. Ensure all authorized components, materials, and accessories are present upon receipt of the 15 kW generator set by checking the equipment against the packing slips to see if the shipment is complete.
2. Check to see if the equipment has been modified and report all discrepancies IAW applicable service instructions (for Army instructions, see DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual).
3. Inspect the equipment for any exterior or interior damage incurred during shipment.
4. Report any damaged item(s) IAW the instructions in the warranty technical bulletin and note the damage on SF 361, Transportation Discrepancy Report (TDR).
5. Check that all packing materials have been removed and are in "Acceptable" condition. See Table 1.
6. Inspect generator set assemblies, subassemblies, and accessories for any internal or external shipping damage.
7. Check generator set identification plates for positive identification (TM 9-6115-751-10).
8. Inspect generator set for loose or missing mounting hardware or damaged or missing parts.
9. Open left-side door and inspect batteries for damage.
10. Check battery cables for damage.
11. Open output terminal door and check output terminals and cover for damage.
12. Check output terminal board for loose wires or damage.
13. Open DCS cover and visually check DCS for damage.
14. Check air cleaner assembly and exhaust opening for obstruction or damage.
15. Check battery-charging alternator belt for proper adjustment (WP 0073, Remove/Install Battery-Charging Alternator Belt).

- 16. Open grounding rod compartment door on front panel and ensure items are complete and free of damage.
- 17. Open right-side door and ensure auxiliary hose is in place and free of damage.

END OF TASK

INSTALLATION INSTRUCTIONS

Batteries

For battery service, see WP 0036, Remove/Install Batteries.

END OF TASK

Radiator

NOTE

The AMMPS 15 kW generator set normally ships without lubricant, coolant, or fuel.
 For radiator service, see WP 0021, Service Cooling System.

END OF TASK

Fuel Tank

NOTE

- The AMMPS 15 kW generator set normally ships without lubricant, coolant, or fuel.
1. Check that fuel drain valve (WP 0043, Service Fuel System) is closed.
 2. Fill generator set fuel tank (TM 9-6115-751-10) with fuel type specified in Table 2. Fuel capacity is 8.6 gal (32.55 L).

Table 2. Fuel.

AMBIENT TEMPERATURE	FUEL
-50°F to +135°F (-45.6°C to +57.2°C)	JP8
+25°F to +135°F (-3.9°C to +57.2°C)	A-A-52557A ^a GR 2-D
0°F to +20°F (-17.7°C to -6.7°C)	A-A-52557A GR 1-D

^a Fuel Oil, Diesel; for Posts, Camps and Stations.

END OF TASK

Installation of Ground Rod

Ground the AMMPS unit IAW (TM 9-6115-751-10).

END OF TASK

PRELIMINARY SERVICING OF EQUIPMENT

Lubricating Oil

NOTE

The AMMPS 15 kW generator set normally ships without lubricant, coolant, and fuel.

1. Remove dipstick to check for presence of engine oil (WP 0065, Service Lubrication System).
2. Fill engine with proper engine oil IAW Table 3 to FULL mark on dipstick (WP 0065, Service Lubrication System). Lubrication system capacity is 8.4 qt (7.95 L).

Table 3. Lubricating Oil.

AMBIENT TEMPERATURE	SPECIFICATION	CAPACITY	EXPECTED TEMPERATURES
+5°F to +135°F (-15°C to 57°C)	MIL-PRF-2104H ^a OE/HDO 15W40	Crankcase and engine 8.4 qt (7.95 L) with filter	Not Applicable
-15°F to +5°F (-26°C to -15°C)	MIL-PRF-2104H OE/HDO-10		
-50°F to +40°F (-45°C to 4°C)	MIL-PRF-46167D ^b		

^a Performance Specification, Lubrication Oil, Internal Combustion Engine, Combat/Tactical Service.

^b Performance Specification, Lubrication Oil, Internal Combustion Engine, Arctic.

END OF TASK

PRELIMINARY SERVICING OF EQUIPMENT

Checks and adjustments shall be made on all newly installed 15 kW generator sets. Information on the location of items such as controls and components is located in individual WPs. Before any equipment is put into use, checks are required to ensure proper operation of the equipment.

NOTE

To conduct some of these preliminary checks and adjustments, it is necessary to run the AMMPS unit under load.

1. Perform before PMCS (TM 9-6115-751-10).
2. Inspect panels, access doors, and plates.
3. Check for grounding, including earth ground circuits and earth conditioning for conduction, as well as a check of the grounding circuit for negligible resistance.
4. Check for firm seating and connection of all plug-in parts, mating connectors, jacks, and plugs.
5. Check cable and wiring harness routing, dressing, and fastening.
6. Check operation of safety interlocks and switches.
7. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
8. Start unit and generate electrical load at a frequency of 50 Hz and 60 Hz for MEP-1050 and 400 Hz for MEP-1051 (TM 9-6115-751-10).
9. Turn engine control switch to OFF (TM 9-6115-751-10) when generator set has reached normal operating temperature, voltage, and frequency.

10. Check content and operation of liquid cooling systems (WP 0021, Service Cooling System).
11. Complete lubricants and CPC procedures (WP 0015, Field PMCS Introduction).
12. Check terminal connections (TM 9-6115-751-10).
13. Perform after PMCS (TM 9-6115-751-10) on 15 kW generator set.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
FIELD PMCS INTRODUCTION

INTRODUCTION

This section contains information needed to perform field maintenance PMCS. Steps are included to help perform these procedures easily and quickly. PMCS consist of scheduled maintenance items used to make sure the AMMPS are ready for operation at all times. Inspect the system regularly and carefully to find, correct, and prevent any defects.

GENERAL

PMCS are performed to keep the equipment in operating condition. The checks are used to find, correct, or report problems. Pay attention to warning and caution statements. A warning indicates the possibility of injury or death to personnel. A caution means the potential for equipment damage.

Intervals are given in operating hours, calendar intervals, or in both operating hours and calendar intervals. Check or service should be performed using interval that occurs first when both operating hours and calendar intervals are given.

- First 50 hours.
- Every 250 hours.
- Every 500 hours.
- Every 750 hours.
- Every 1000 hours.
- Every 1500 hours.
- Every 250 hours or every 3 months.
- Every 500 hours or every 6 months.
- Every 1500 hours or every 1 year.
- Every 1500 hours or every 2 years.
- Under harsh environmental conditions, PMCS should be conducted more frequently.

EXPLANATION OF THE COLUMNS FOUND IN THE PMCS TABLE

Column (1) – Item No. The item number lists the checks and services in the order they are to be completed. This column will be used as a source of item for the TM Number Column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, or DA Form 5988E (electronic version), Equipment Inspection and Maintenance Worksheet, in recording the result of the PMCS.

Column (2) – Interval. References when the PMCS should be performed.

Column (3) – Item to be Checked or Serviced. Identifies the portion of the system to be inspected.

Column (4) – Procedure. Provides the procedures for performing the checks.

Column (5) – Equipment is not Ready/Available if. Contains the criteria that will render the system incapable of performing its primary mission. If the system does not perform as required, refer to Chapter 2, Field Maintenance Troubleshooting (WP 0004, Troubleshooting Index). If equipment appears to be malfunctioning and the problem cannot be fixed, immediately report it to your supervisor and report it on DA Form 2404, Equipment Inspection and Maintenance Worksheet.

Corrosion Prevention Control (CPC)

CPC of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so the problem can be corrected and improvements can be made to prevent future problems.

Corrosion specifically occurs with metals. It is an electrochemical process that causes the degradation of metals. It is commonly caused by exposure to moisture, acids, bases, or salts. An example is the rusting of iron.

Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking.

Plastics, composites, and rubbers can also degrade. Degradation is caused by thermal (heat), oxidation (oxygen), salvation (solvents), or photolytic (light, typically ultraviolet (UV)) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling, and/or breaking.

(A) SF 368, PQDR should be submitted to the address specified in DA PAM 750-8, TAMMS Users Manual.

(MC) SF 368, PQDR should be submitted in IAW MCO 4855.10B.

Rust Definition

Rust is defined as any various scaly or powdery reddish-brown or reddish-yellow materials that form on iron and iron-coated materials in the presence of moisture, deteriorating as a result of disuse or neglect.

Deterioration Definition

Deterioration is defined as any condition that causes material to be defective or lessens the quality or value of the material.

Cracking Definition

Cracking is defined as when material is found to be split or broken, either completely or partially.

INSPECTION

Look for signs of problems or troubles. Most problems can be detected by sight, touch, smell, or sound. Be alert when around the AMMPS generator set.

Inspect to ensure that all components are in good condition. Are they correctly assembled, stowed, or secured? Are any components worn, corroded, or rusty? Correct any problems found, or notify your immediate supervisor.

There are common items that should be checked. These include the following:

Bolts, clamps, screws, and nuts: Continuously inspect for looseness. Inspect for chipped paint, bare metal, rust, or corrosion around bolt and screw heads and nuts. Replace as necessary. Tighten hardware as required.

Welds: Some components of the AMMPS generator set are welded. To inspect welds, look for chipped paint, rust, corrosion, or gaps. When these conditions are found, repair or replace as required.

WARNING

- NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.
- Metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry and do not wear loose clothing when working on equipment. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are operating. Failure to comply may cause injury or death to personnel.

Electrical wires, connectors, and harnesses: Tighten loose connections. Inspect for cracked or broken insulation, bare wires, and broken connectors. If any are found, repair or replace as required.

Hoses and fluid lines: Inspect for wear, damage, and leaks. Ensure clamps and fittings are tight. Wet spots indicate a leak. A stain by a fitting or connector can also mean a leak. When this is found, repair or replace as required.

CLEANING AND LUBRICATION

Proper cleaning and lubrication can aid in avoiding possible problems or trouble. Make it a habit to do the following:

CAUTION

Follow all cleaning and lubrication instructions carefully. Failure to comply may cause damage to equipment.

Under harsh environmental conditions, conduct PMCS more frequently.

Use only the recommended cleaning solutions and lubricants listed in WP 0164, Expendable and Durable Items List.

Clean the lenses and screens of the DCS using the electronics cleaning cloth listed in WP 0164, Expendable and Durable Items List.

Oil Filters

Oil filters shall be serviced/cleaned/changed, as applicable, when:

- They are known to be contaminated or clogged,
- Service is recommended by AOAP laboratory analysis, or
- At prescribed hard time intervals.

AOAP Sampling Intervals

Engine oil/transmission oil/hydraulic fluids must be sampled at 60 days (Active Army and Reserve NG) as prescribed by DA PAM 750-8, TAMMS Users Manual.

Warranty Hard Time Statement

For equipment under manufacturer's warranty, hard time oil service intervals shall be followed. Intervals shall be shortened if lubricants are known to be contaminated or if operation is under adverse conditions (such as longer-than-usual operating hours, extended idling periods, extreme dust).

FLUID LEAKAGE**WARNING**

- Do not operate generator set if any fuel leaks are present. Fuel is combustible. Always perform PMCS before operation. Failure to comply may cause injury or death to personnel.
- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

CAUTION

When operating with Class I or II leaks, continue to check fluid level as required by PMCS. Class III leaks should be noted and repaired immediately. Any Class I, II, or III fuel leak requires equipment shut down. Failure to comply may cause damage to equipment.

It is necessary for you to know how fluid leakage affects the status of the 15 kW generator sets. Following are types/classes of leakage you need to know to be able to determine the status of the 15 kW generator sets. Learn these leakage definitions, and remember—when in doubt, notify your supervisor. Equipment operation is allowed with minor leakage (Class I or II). Consideration must be given to fluid capacity in the item/system being checked/inspected. When in doubt, notify your supervisor.

Any Class I, II, or III fuel leak requires equipment shut down.

When operating with Class I or II leaks, continue to check fluid levels as required in the PMCS.

Class III leaks should be reported immediately to your supervisor.

- (1) Class I: Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.
- (2) Class II: Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.
- (3) Class III: Leakage of fluid great enough to form drops that fall from item being checked/inspected.

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
FIELD PMCS

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Belt, V-drive 1/2 in X 40 1/8 in (WP 0132, Repair Parts List, Figure 32, Item 7)
 Element, filter (WP 0108, Repair Parts List, Figure 8, Item 10)
 Filter, element (WP 0113, Repair Parts List, Figure 13, Item 7)
 Packing (5) (WP 0128, Repair Parts List, Figure 28, Item 5)
 Packing (P 12.0) (4) (WP 0128, Figure 28, Item 8)
 Protector, nozzle (4) (WP 0128, Figure 28, Item 6)
 Seat, nozzle (4) (WP 0128, Figure 28, Item 7)
 Strainer (80 X 100 L.O.) (WP 0126, Repair Parts List, Figure 26, Item 17)
 Antifreeze, ethylene glycol (WP 0164, Expendable and Durable Items List, Item 2)
 Brush, wire, scratch (WP 0164, Item 8)
 Cap set, protective (WP 0164, Item 9)
 Cleaning compound, engine cooling system (WP 0164, Item 10)
 Cleaning compound, solvent (WP 0164, Item 11)
 Cloth, cleaning, electronics (WP 0164, Item 13)
 Distilled water, (WP 0164, Item 18)
 Fuel, diesel (WP 0164, Item 20)
 Lubricating oil, engine (WP 0164, Item 24)
 Pan, drain (WP 0164, Item 29)
 Penetrating oil (WP 0164, Item 30)

Materials/Parts

Rag, wiping (WP 0164, Item 32)

Sealant (WP 0164, Item 33)

Personnel Required

91D (1)

References

WP 0018, Repair DCS
 WP 0020, Service Air Cleaner
 WP 0021, Service Cooling System
 WP 0025, Remove/Install Winterization Kit Components
 WP 0041, Remove/Install Relay Panel
 WP 0043, Service Fuel System
 WP 0047, Replace Fuel Filter/Water Separator Element
 WP 0065, Service Lubrication System
 WP 0068, Remove/Install Fuel Injectors
 WP 0073, Remove/Install Battery-Charging Alternator Belt
 WP 0079, Remove/Install Turbocharger
 WP 0082, Remove/Install Valve Cover
 WP 0083, Service Engine Valves
 WP 0089, Lubrication Instructions

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

Table 1. Preventive Maintenance Checks and Services.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF
<p>WARNING</p> <ul style="list-style-type: none"> • Metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry and do not wear loose clothing when working on equipment. Failure to comply may cause injury or death to personnel. • While inspecting the operation of the generator set, do not inadvertently reach into the generator set. Failure to comply may cause injury or death to personnel. • Flying debris or material may enter eyes or strike the face. Wear appropriate eye/face protection while performing maintenance tasks. Failure to comply may cause injury or death to personnel. • Hearing protection is required during maintenance or repair with engine running. Failure to comply may cause hearing loss. • When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel. • Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gasses are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel. • Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel. • A turbocharger may become very hot and requires more time to cool down than other parts of engine assembly. Shut down generator set and allow it to cool sufficiently before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel. • High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel. • High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator set is running. Failure to comply may cause injury or death to personnel. 				

Table 1. Preventive Maintenance Checks and Services — Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF
WARNING				
<ul style="list-style-type: none"> • Ensure the frequency of any device powered by the GFCI convenience receptacle matches the frequency of the generator set. Failure to comply may cause serious injury or death to personnel. • Do not operate generator set if fuel any leaks are present. Fuel is combustible. Always perform PMCS before operation. Failure to comply may cause injury or death to personnel. • Make sure engine control switch is only set to PRIME & RUN during fuel system checks. Failure to comply may cause injury or death to personnel. • Never inject fuel near a fire source. Atomized fuel is highly combustible. Fuel pressure is high enough to penetrate skin. Ensure that spray from the injector nozzle is directed away from all personnel. Direct contact with spray can cause skin cell destruction and blood poisoning. Skin and eye protection are required when working in contact with fuel. Failure to comply may cause injury or death to personnel and damage to equipment. • Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel. • Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (fuel fill static grounding). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate ESD. Fire and possible explosion can result. Failure to comply may cause injury or death to personnel. 				
CAUTION				
<p>Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.</p> <p>Be sure to close radiator cap securely to avoid coolant leakage. Engine may overheat if cap is loose. Failure to comply may cause damage to equipment.</p>				
NOTE				
<p>Ensure operator level PMCS (TM 9-6115-751-10) has been performed before performing field maintenance level PMCS.</p>				

Table 1. Preventive Maintenance Checks and Services — Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF
1	50 hr	Engine oil and filter	Perform first engine oil and filter change (WP 0065, Service Lubrication System).	
2	250 hr	DCS	1. Ensure BATTLESHORT switch works, engine control switch operates as required, and EMERGENCY STOP push button pushes in and out (TM 9-6115-751-10). Repair or replace as required (WP 0018, Repair DCS).	Indicators are not working properly, switches fail to operate, or emergency stop does not work.
			2. Ensure screen is clean of dirt and excess debris by using an electronic cleaning cloth. Ensure screen is not damaged or scratched.	Screen is damaged or scratched.
3	250 hr	Relay panel	Check circuit breakers/relays for proper operation and reset or replace as required (WP 0041, Remove/Install Relay Panel).	Circuit breaker or relay missing or blown.
4	250 hr or 3 months	GFCI receptacle	Ensure TEST and RESET functions on GFCI receptacle operate properly (TM 9-6115-751-10).	GFCI TEST or RESET function does not operate properly.
5	250 hr or 3 months	Radiator	Clean radiator exterior surfaces.	Airflow through radiator is restricted.
6	250 hr	Crankcase breather	Inspect breather tube for damage or clogging. Clean or replace as necessary (WP 0082, Remove/Install Valve Cover).	Crankcase breather tube is clogged.
7	500 hr or 6 months	Fuel system	Clean main/auxiliary fuel strainers (WP 0043, Service Fuel System). Replace as required.	
8	500 hr or 6 months	Fuel filter/water separator	Replace the fuel filter/water separator element (WP 0047, Replace Fuel Filter/Water Separator Element).	Filter/water separator element is restricted.
9	500 hr or 6 months	Engine oil and filter	Change engine oil and oil filter (WP 0065, Service Lubrication System).	

Table 1. Preventive Maintenance Checks and Services — Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF
10	500 hr or 6 months	Radiator cap	1. Inspect radiator cap for corrosion, torn or deteriorated seal, and obvious damage.	Radiator cap is damaged.
			2. Test radiator cap for proper operation (WP 0021, Service Cooling System).	Radiator cap fails to open at proper pressure.
11	500 hr or 6 months	Air filter element	Replace air filter element (WP 0020, Service Air Cleaner).	Air filter element is restricted.
12	750 hr	Alternator belt	Replace battery-charging alternator belt (WP 0073, Remove/Install Battery-Charging Alternator Belt).	Battery-charging alternator belt is loose, damaged, or missing.
13	1000 hr	Turbocharger	Inspect turbocharger for damage (WP 0079, Remove/Install Turbocharger).	Turbocharger is damaged.
14	1500 hr or 2 years	Engine valves	Inspect and adjust engine valves (WP 0083, Service Engine Valves).	
15	1500 hr	Fuel injectors	Clean, test, and replace fuel injectors as needed (WP 0068, Remove/Install Fuel Injectors)	Spray pattern is abnormal or pressure is incorrect.
16	1500 hr or 1 year	Cooling system	1. Clean water jacket and radiator interior (WP 0021, Service Cooling System).	
			2. Drain, flush, and refill cooling system with new coolant (WP 0021, Service Cooling System).	
17	1 year	Winterization kit (if applicable)	Test winterization kit and inspect for damage (WP 0025, Remove/Install Winterization Kit Components).	Winterization kit test fails or damage is found during inspection.

Table 2. PMCS Mandatory Replacement Parts List.

ITEM NO.	PART NUMBER (CAGEC)	NSN	NOMENCLATURE	QTY
500 HR OR 6 MONTHS				
1	119005-35160 (0AK42)		Filter, oil	01
2	R15S (55752)		Element, fuel filter/water separator	01
3	AF26168 (44940)		Filter, air cleaner element	01
750 HR				
1	A-A-52155/2P-40A 1R (81348)		Belt, battery-charging alternator	01

LUBRICATION INSTRUCTIONS

There are no scheduled lubrication intervals for external components (i.e. hinges and latches). Lubrication instructions are contained in WP 0089, Lubrication Instructions.

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL DCS

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Control box assembly (1) (WP 0105, Repair Parts List, Figure 5, Item 3)

Washer, lock (WP 0105, Figure 5, Item 2)

Grease, electrically conductive (WP 0164, Expendable and Durable Items List, Item 21)

Personnel Required

91D

References

WP 0018, Repair DCS

References

WP 0030, Remove/Install Rear Body Panel

WP 0034, Remove/Install Door

WP 0095, General Maintenance

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL DCS**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

NOTE

The DCS has a cover that can be closed over the panel. To improve clarity, illustrations in this document show the DCS unit without the cover.

Remove DCS

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate DCS (Figure 1) at rear of generator set.

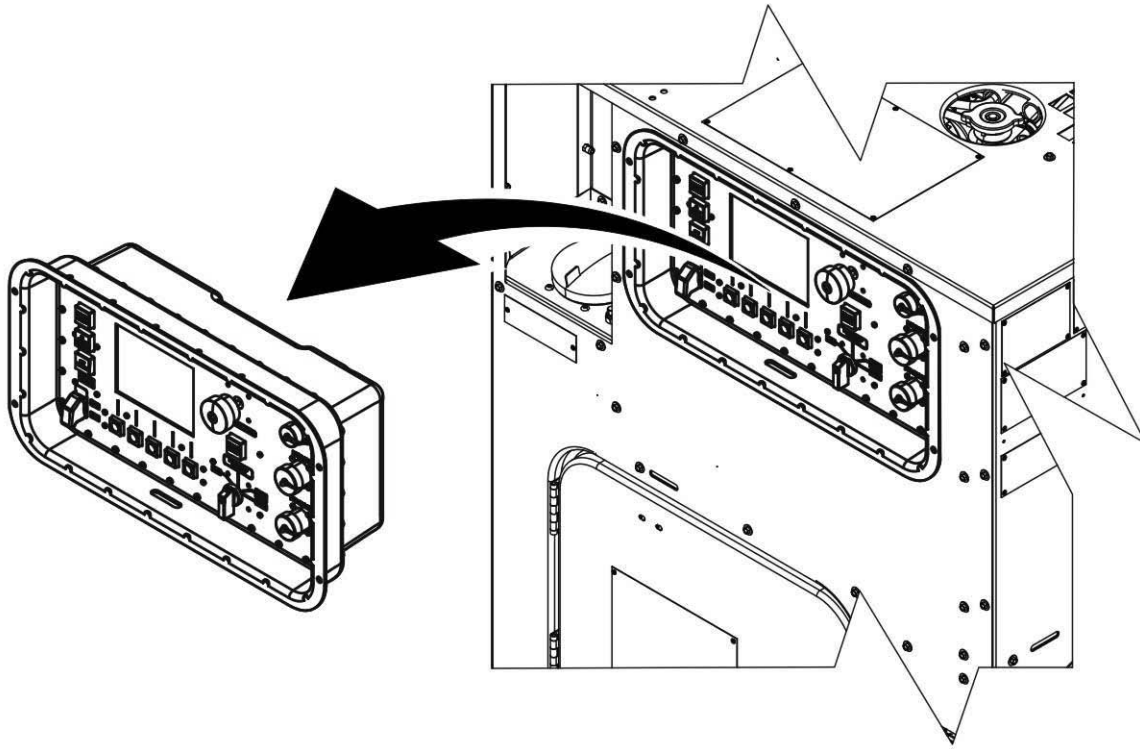


Figure 1. DCS — Location.

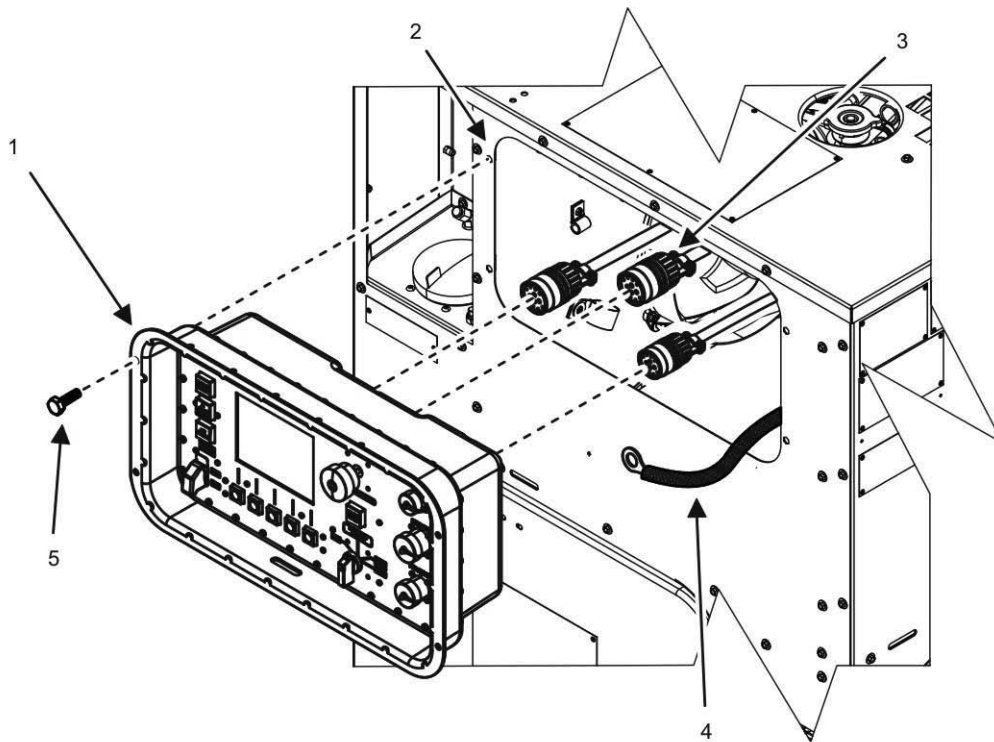


Figure 2. DCS Detail — Front.

CAUTION

It is important to save capture file data from DCS being replaced (WP 0095, General Maintenance). Data can only be accessed using InPower AMMPS and a computer hard drive. If data is accessible, capture file can be used to overlay parameters and maintenance timers from the replaced DCS. If unable to access capture file data, maintenance timers will be reset and some parameters from replaced DCS will be lost. Use latest hard copy records to determine when maintenance actions are due. Failure to comply will cause damage to equipment.

It is important to save log data from DCS being replaced (WP 0095, General Maintenance). The maintenance, operational, and fault logs should be downloaded from the DCS with a USB cable and saved to the hard drive of a computer. Maintenance, operational, and fault logs cannot be uploaded to the new DCS, but can be saved for reference. All logs will be started over with a new DCS. If unable to access logs, use latest hard copy records to access operational, maintenance, and fault events. Failure to comply may cause damage to equipment.

3. Remove four hex socket head screws (Figure 2, Item 5) securing DCS unit (Figure 2, Item 1) to rear body panel (Figure 2, Item 2), and save screws for reuse.
4. Remove DCS unit (Figure 2, Item 1) from rear body panel (Figure 2, Item 2) to expose grounding strap (Figure 2, Item 4) attached to rear of DCS unit (Figure 2, Item 1).
5. Tag and remove three electrical connectors (Figure 2, Item 3) from rear of DCS unit (Figure 2, Item 1).

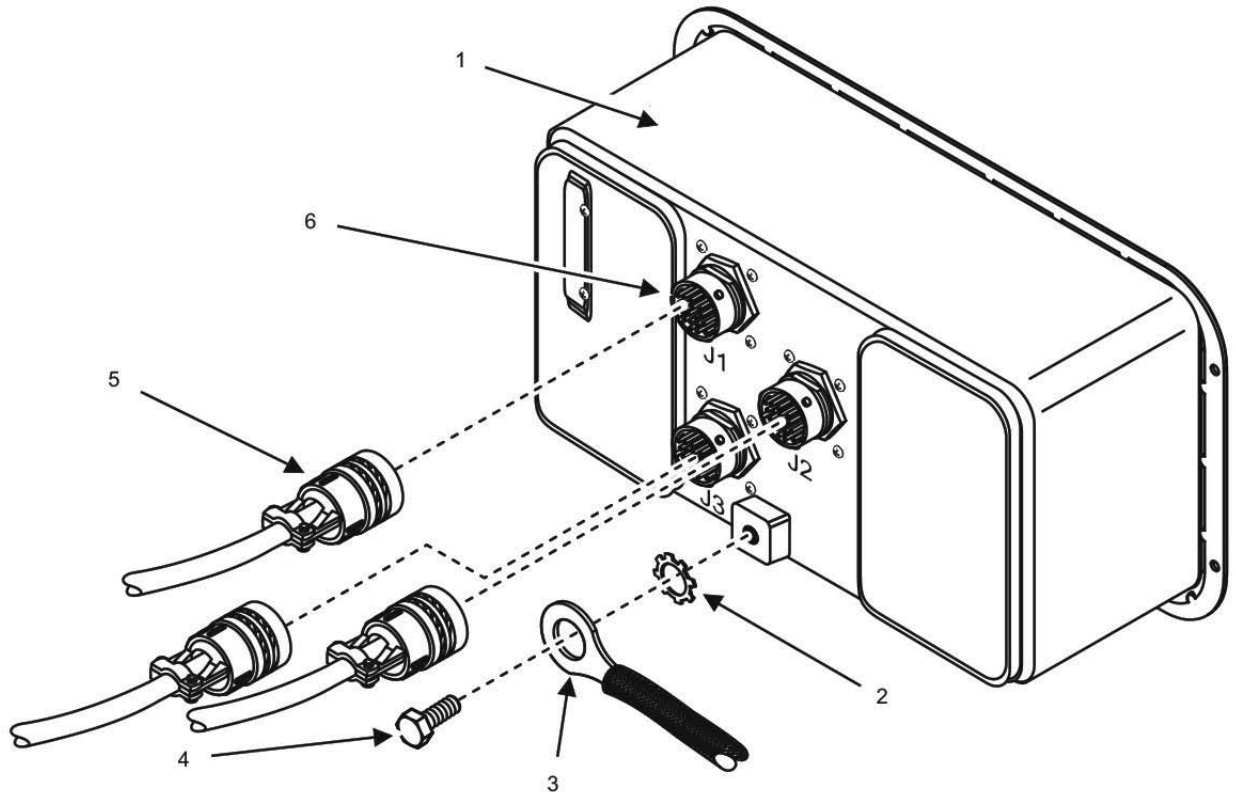


Figure 3. DCS Detail — Rear.

6. Remove bolt (Figure 3, Item 4) and lock washer (Figure 3, Item 2) securing grounding strap (Figure 3, Item 3) to rear of DCS unit (Figure 3, Item 1).
7. Discard lock washer (Figure 3, Item 2) and set bolt (Figure 3, Item 4) aside for reuse.
8. Place DCS unit (Figure 3, Item 1) on a suitable work surface.

END OF TASK

Inspect DCS

1. Inspect DCS door (not shown) and door hinge (not shown) for corrosion or damage, and replace as required (WP 0034, Remove/Install Door).
2. Inspect DCS unit (Figure 3, Item 1) for corrosion or damage, and replace as required (WP 0018, Repair DCS).
3. Inspect DCS front panel for broken switches or other damage, and replace as required (WP 0018, Repair DCS).
4. Inspect electrical connections in rear of DCS unit (Figure 3, Item 6) and DCS electrical connectors in wiring harness (Figure 3, Item 5) for corrosion or other damage and replace unit if damage is found.
5. Inspect bolt (Figure 3, Item 4) for damage, and replace as required.
6. Inspect DCS mounting area on unit rear body panel (Figure 2, Item 2) for damage or corrosion, and replace panel as required (WP 0030, Remove/Install Rear Body Panel).

Install DCS

1. Position DCS unit (Figure 2, Item 1) on rear body panel (Figure 2, Item 2).

NOTE

Prior to installation, apply electrically conductive grease to the electrical connectors (Figure 2, Item 3) to prevent moisture from entering the connectors (Figure 2, Item 3).

2. Attach DCS grounding strap (Figure 3, Item 3) to rear of DCS unit (Figure 3, Item 1) using bolt (Figure 3, Item 4) and new lock washer (Figure 3, Item 2).
3. Install DCS electrical connectors (Figure 3, Item 5) to appropriate electrical connections (Figure 3, Item 6) on back of DCS unit (Figure 3, Item 1) according to identification tags.
4. Remove identification tags from DCS electrical connectors (Figure 3, Item 5).
5. Install four hex socket head screws (Figure 2, Item 5) securing DCS unit (Figure 2, Item 1) to rear body panel (Figure 2, Item 2).
6. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
7. Close left-side door on generator set.
8. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
9. Start engine (TM 9-6115-751-10).
10. Test control panel for proper operation and repair as required (TM 9-6115-751-10). Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
11. Stop engine (TM 9-6115-751-10).

END OF TASK

Adjust Governor Gain**NOTE**

[Governor Gain] has a default of 1 and a range of 0.1 Hz to 10 Hz. Adjusting to higher value increases output at higher ambient temperatures, but also increases instability and can cause hunting problems. A lower value decreases output at lower ambient temperatures, which can help with stability and hunting problems, but also decreases performance.

1. Ensure battery ground cable is installed (WP 0036, Remove/Install Batteries).
2. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
3. Reset [Governor Gain] option on [Adjustments] Screen 2 to default (TM 9-6115-751-10).
4. Start generator set (TM 9-6115-751-10).
5. Apply load and remove load up to rated capacity. Observe frequency fluctuations.
6. Proceed to step 7 if frequency fluctuations are observed or continue normal use of DCS if fluctuations are not observed.
7. Access [Governor Gain] option from [Adjustments] Screen 2 (TM 9-6115-751-10).
8. Adjust [Governor Gain] down or up 0.1 Hz at a time until output, stability, or hunting problem is resolved.
9. Observe frequency fluctuations and continue to adjust [Governor Gain] by applying and removing loads until output, stability, or hunting problem is resolved.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REPAIR DCS

INITIAL SETUP:**Test Equipment**

Test Set, Electronic Systems (WP 0163,
 Maintenance Allocation Chart, Item 31)

Tools and Special Tools

Strap, Wrist, Electrostatic Discharge (WP 0163, Item
 29)

Tool Kit, General Mechanic's (GMTK) (WP 0163,
 Item 38)

Materials/Parts

Gasket, control box (WP 0105, Repair Parts List,
 Figure 5, Item 5)

Ring, sealing (WP 0106, Repair Parts List, Figure 6,
 Item 16)

Switch, battleshort (WP 0106, Figure 6, Item 15)

Switch, emergency stop (WP 0106, Figure 6, Item 4)

Switch, engine control (WP 0106, Figure 6, Item 5)

Washer, lock (WP 0105, Figure 5, Item 2)

Strap, tie-down (WP 0164, Expendable and Durable
 Items List, Item 35)

Personnel Required

91D (1)

Assistant (1)

References

WP 0008, Electrical System Troubleshooting with a
 DCS Code

WP 0017, Remove/Install DCS

WP 0036, Remove/Install Batteries

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10,
 WP 0005)

Engine cool

Special Environmental Conditions

Dry area with minimal dust

Drawings Required

Not Applicable

REPAIR DCS ASSEMBLY**CAUTION**

Due to the use of delicate electronic components, repair of DCS must be performed in a clean environment. Failure to comply may cause damage to equipment.

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

NOTE

Repair of the DCS control panel assembly (Figure 1, Item 1) at field level is limited to replacement of the BATTLESHORT switch, EMERGENCY STOP switch, and engine control switch. Failure of any other component inside the DCS requires DCS replacement (WP 0017, Remove/Install DCS).

Remove DCS Control Panel Assembly

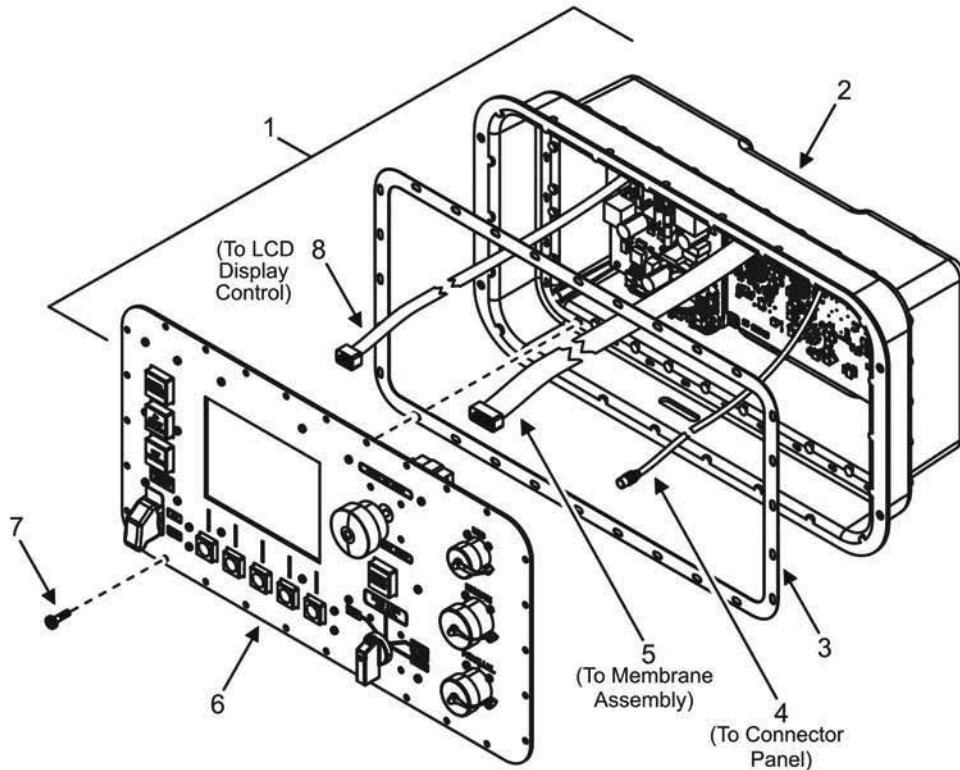


Figure 1. DCS Control Panel and Enclosure.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove negative ground cable from right-hand battery (WP 0036, Remove/Install Batteries).
3. Open DCS door and secure in the fully open position.
4. Remove 28 screws (Figure 1, Item 7) that secure DCS control panel (Figure 1, Item 6) to DCS enclosure (Figure 1, Item 2).
5. Break seal between DCS control panel (Figure 1, Item 6) and DCS enclosure (Figure 1, Item 2) using a putty knife.
6. Lift DCS control panel (Figure 1, Item 6) from DCS enclosure (Figure 1, Item 2) high enough to access three wiring harnesses (Figure 1, Items 4, 5, and 8) that connect DCS control panel (Figure 1, Item 6) to DCS enclosure (Figure 1, Item 2).

CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

NOTE

Prior to removal, tag all electrical wires, cables, and leads for identification. Tags will be used as a guide during installation.

7. Tag and remove three wiring harnesses (Figure 1, Items 4, 5, and 8) that connect DCS control panel (Figure 1, Item 6) to DCS enclosure (Figure 1, Item 2).
8. Unhook clips on wiring harnesses and remove harnesses from DCS control panel (Figure 1, Item 6).
 - a. Tag and remove six-pin wiring harness (Figure 1, Item 4) connected to connector panel control card (not shown) of DCS control panel (Figure 1, Item 6).
 - b. Tag and remove 14-pin wiring harness (Figure 1, Item 8) connected to display control card (not shown) of DCS control panel (Figure 1, Item 6).
 - c. Tag and remove 22-pin wiring harness (Figure 1, Item 5) connected to membrane panel assembly (not shown) of DCS control panel (Figure 1, Item 6).
9. Remove DCS control panel (Figure 1, Item 6) from DCS enclosure (Figure 1, Item 2) and place on a suitable work surface.
10. Remove and discard gasket (Figure 1, Item 3) from DCS control panel (Figure 1, Item 6).
11. Remove residual gasket material from DCS control panel (Figure 1, Item 6) and DCS enclosure (Figure 1, Item 2) using an abrasive pad. Be sure to remove all loose gasket material from components.

END OF TASK

Test/Replace Switches

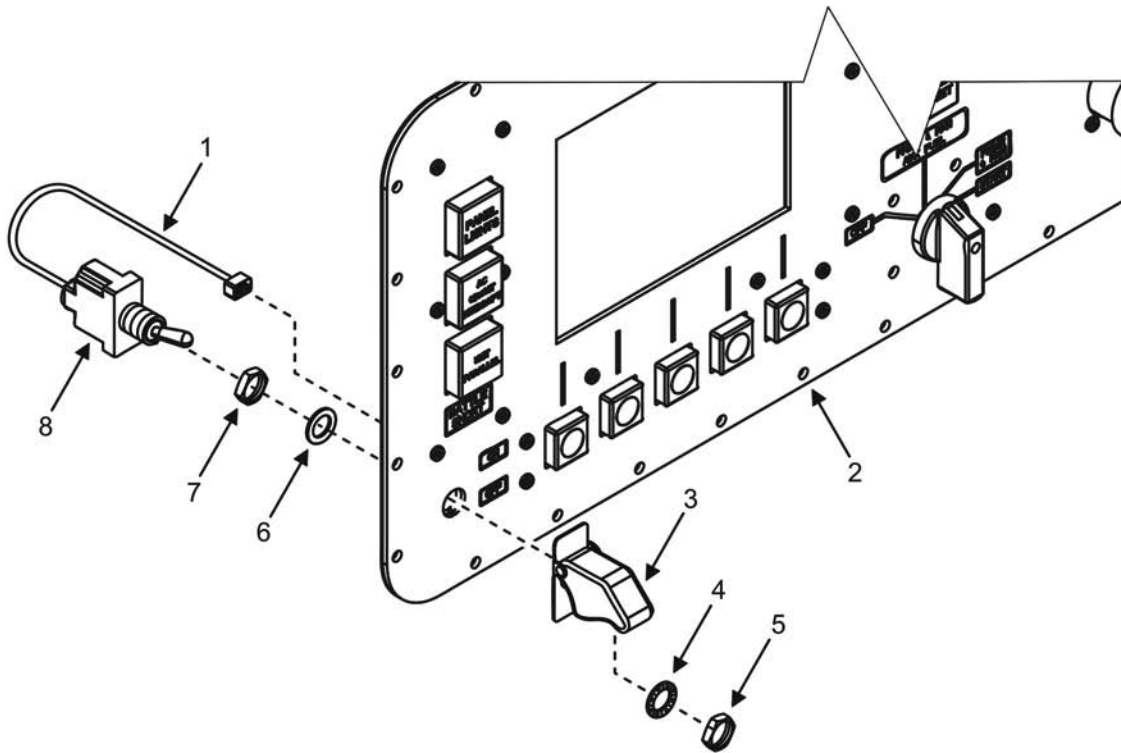


Figure 2. BATTLESHORT Switch.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove DCS control panel assembly and place on a suitable work surface. See Remove DCS Control Panel Assembly task.
3. Test BATTLESHORT switch (Figure 2, Item 8):
 - a. Remove wiring harness (Figure 2, Item 1) from membrane panel assembly (not shown).

NOTE

Continuity should be present when BATTLESHORT switch (Figure 2, Item 8) is in ON position. There should be no continuity when BATTLESHORT switch (Figure 2, Item 8) is in OFF position.

- b. Place BATTLESHORT switch (Figure 2, Item 8) in ON position and test wires P1 (P1/SW-3) and P3 (P3/SW-2) through wiring harness (Figure 2, Item 1) using a multimeter set to test continuity.
- c. Proceed to step d if no continuity is found or step f if continuity is found.
- d. Leave BATTLESHORT switch (Figure 2, Item 8) in ON position and test two terminals on bottom of BATTLESHORT switch (Figure 2, Item 8) using a multimeter set to test continuity.
- e. Repair or replace wiring harness (Figure 2, Item 1) if continuity is found or replace BATTLESHORT switch (Figure 2, Item 8) if no continuity is found (step 4). Retest IAW step b and repair or replace wiring harness (Figure 2, Item 1) as required.
- f. Place BATTLESHORT switch (Figure 2, Item 8) in OFF position and test wires P1 (P1/SW-3) and P3 (P3/SW-2) through wiring harness (Figure 2, Item 1) using a multimeter set to test continuity.
- g. Proceed to step j if no continuity is found or step h if continuity is found.

-
- h. Leave BATTLESHORT switch (Figure 2, Item 8) in OFF position and test two terminals on bottom of BATTLESHORT switch (Figure 2, Item 8) using a multimeter set to test continuity.
 - i. Repair or replace wiring harness (Figure 2, Item 1) if continuity is found or replace BATTLESHORT switch (Figure 2, Item 8) if no continuity is found (step 4). Retest IAW step f and repair or replace wiring harness (Figure 2, Item 1) as required.
 - j. Install wiring harness (Figure 2, Item 1) to membrane panel assembly (not shown).
4. Remove BATTLESHORT switch (Figure 2, Item 8):

CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

NOTE

Prior to removal, tag all electrical wires, cables, and leads for identification. Tags will be used as a guide during installation.

- a. Tag wiring harness (Figure 2, Item 1) from BATTLESHORT switch (Figure 2, Item 8) to membrane panel assembly (not shown) of DCS control panel (Figure 2, Item 2).
 - b. Unhook clip on wiring harness (Figure 2, Item 1) and remove wiring harness (Figure 2, Item 1) from membrane panel assembly (not shown).
 - c. Move BATTLESHORT switch cover (Figure 2, Item 3) on BATTLESHORT switch (Figure 2, Item 8) to open position.
 - d. Remove nut (Figure 2, Item 5) and internal tooth lock washer (Figure 2, Item 4) which secures BATTLESHORT switch (Figure 2, Item 8) to front of DCS control panel (Figure 2, Item 2).
 - e. Discard internal tooth lock washer (Figure 2, Item 4) and sealing ring (Figure 2, Item 6).
 - f. Remove BATTLESHORT switch (Figure 2, Item 8) and BATTLESHORT switch cover (Figure 2, Item 3) from DCS control panel (Figure 2, Item 2).
 - g. Remove nut (Figure 2, Item 7) from BATTLESHORT switch (Figure 2, Item 8).
 - h. Inspect BATTLESHORT switch (Figure 2, Item 8) for signs of obvious damage. Replace as required.
5. Install BATTLESHORT switch (Figure 2, Item 8):
 - a. Align tab on DCS control panel (Figure 2, Item 2) to slot in BATTLESHORT switch (Figure 2, Item 8).
 - b. Position BATTLESHORT switch (Figure 2, Item 8), nut (Figure 2, Item 7), and new sealing ring (Figure 2, Item 6) to mounting location on rear of DCS control panel (Figure 2, Item 2), engaging alignment tab on DCS control panel (Figure 2, Item 2) to slot in BATTLESHORT switch (Figure 2, Item 8).
 - c. Secure BATTLESHORT switch (Figure 2, Item 8) to DCS control panel (Figure 2, Item 2) by installing BATTLESHORT switch cover (Figure 2, Item 3), new internal tooth lock washer (Figure 2, Item 4), and nut (Figure 2, Item 5) to BATTLESHORT switch (Figure 2, Item 8).

CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

Ensure hooks on all wiring harnesses are latched properly after installation. Failure to comply may cause damage to equipment.

NOTE

Identification tags should remain in place until the DCS is completely reassembled and has been tested for proper operation.

- d. Install electrical connector on BATTLESHORT switch (Figure 2, Item 8) to corresponding connector on membrane panel control card (not shown).

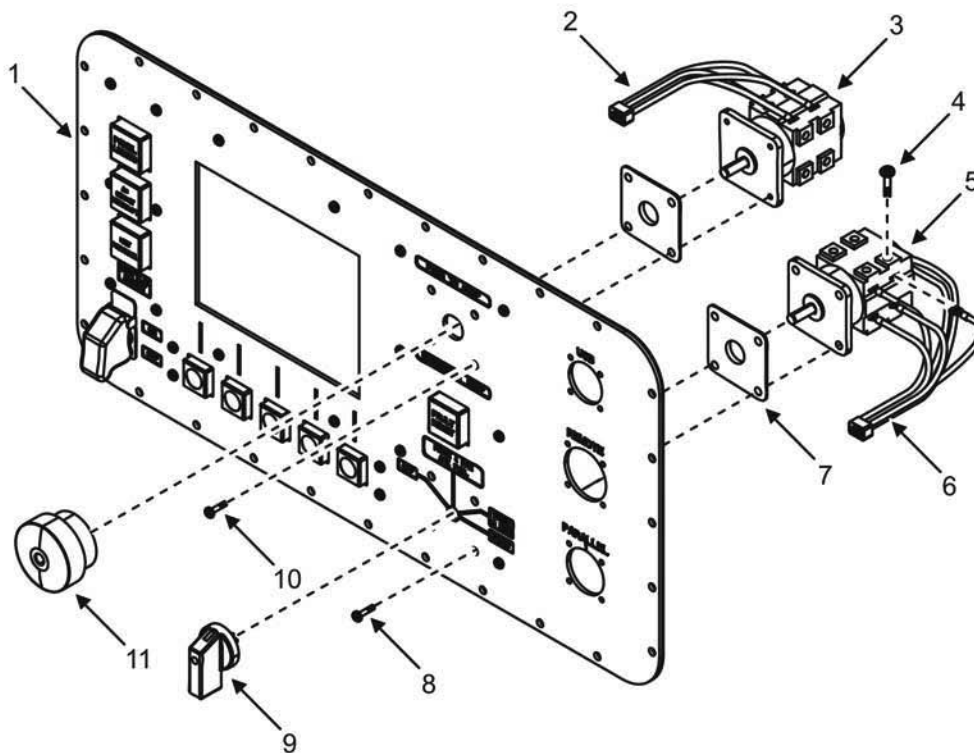


Figure 3. EMERGENCY STOP and Engine Control Switches.

6. Test EMERGENCY STOP switch (Figure 3, Item 3):
 - a. Remove wiring harness (Figure 3, Item 2) from membrane panel assembly (not shown).

NOTE

Continuity should be present when EMERGENCY STOP switch (Figure 3, Item 3) is in extended (off) position. There should be no continuity when EMERGENCY STOP switch (Figure 3, Item 3) is in PUSH TO STOP (on) position.

- b. Pull EMERGENCY STOP switch (Figure 3, Item 3) to extended position (OFF) and test wires to terminals 5 and 6 (P205-1/S202-5 and P205-2/S202-6) through wiring harness (Figure 3, Item 2) using a multimeter set to test continuity.
 - c. Proceed to step d if no continuity is found or step f if continuity is found.
 - d. Leave EMERGENCY STOP switch (Figure 3, Item 3) in extended position (off) and test terminals 5 and 6 on EMERGENCY STOP switch (Figure 3, Item 3) using a multimeter set to test continuity.
 - e. Repair or replace wiring harness (Figure 3, Item 2) if continuity is found or replace EMERGENCY STOP switch (Figure 3, Item 3) if no continuity is found (step 7). Retest IAW step b and repair or replace wiring harness (Figure 3, Item 2) as required.
 - f. Repeat steps a through e for wires to terminals 7 and 8 (P205-4/S202-7 and P205-5/S202-8) and EMERGENCY STOP switch (Figure 3, Item 3) terminals 7 and 8.
 - g. Push EMERGENCY STOP switch (Figure 3, Item 3) to PUSH TO STOP position (on) and test wires to terminals 5 and 6 (P205-1/S202-5 and P205-2/S202-6) through wiring harness (Figure 3, Item 2) using a multimeter set to test continuity.
 - h. Proceed to step i if continuity is found or step k if no continuity is found.
 - i. Leave EMERGENCY STOP switch (Figure 3, Item 3) in PUSH TO STOP position (on) and test terminals 5 and 6 on EMERGENCY STOP switch (Figure 3, Item 2) using a multimeter set to test continuity.
 - j. Repair or replace wiring harness (Figure 3, Item 2) if no continuity is found or replace EMERGENCY STOP switch (Figure 3, Item 3) if continuity is found (step 7). Retest IAW step g and repair or replace wiring harness (Figure 3, Item 2) as required.
 - k. Repeat steps g through j for wires to terminals 7 and 8 (P205-4/S202-7 and P205-5/S202-8) and EMERGENCY STOP switch (Figure 3, Item 3) terminals 7 and 8.
 - l. Install wiring harness (Figure 3, Item 2) to membrane panel assembly (not shown).
7. Remove EMERGENCY STOP switch (Figure 3, Item 3):

NOTE

Sealing gasket, sealing screws, and handle for EMERGENCY STOP switch (Figure 3, Item 3) are available only with a new EMERGENCY STOP switch (Figure 3, Item 3).

- a. Loosen set screw (not shown) that secures handle (Figure 3, Item 11) to EMERGENCY STOP switch (Figure 3, Item 3) on front of DCS control panel (Figure 3, Item 1).
- b. Remove and discard handle (Figure 3, Item 11) from EMERGENCY STOP switch (Figure 3, Item 3).

CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

NOTE

Prior to removal, tag all electrical wires, cables, and leads for identification. Tags will be used as a guide during installation.

- c. Tag wiring harness (Figure 3, Item 2) from EMERGENCY STOP switch (Figure 3, Item 3) to membrane panel assembly (not shown) of DCS control panel (Figure 3, Item 1).
 - d. Unhook clip on wiring harness (Figure 3, Item 2) and remove wiring harness (Figure 3, Item 2) from membrane panel assembly (not shown).
 - e. Remove and discard four mounting screws (Figure 3, Item 10) that secure EMERGENCY STOP switch (Figure 3, Item 3) to front of DCS control panel (Figure 3, Item 1).
 - f. Remove and discard EMERGENCY STOP switch (Figure 3, Item 3) and gasket (Figure 3, Item 7) from rear of DCS control panel (Figure 3, Item 1).
 - g. Tag and remove four wires from EMERGENCY STOP switch (Figure 3, Item 3) by removing screws (Figure 3, Item 4).
8. Install EMERGENCY STOP switch (Figure 3, Item 3):

NOTE

Identification tags should remain in place until the DCS is completely reassembled and has been tested for proper operation.

Apply a thin coat of electrically conductive grease to all electrical connections prior to assembly.

- a. Install four wires of wiring harness (Figure 3, Item 2) to contacts on EMERGENCY STOP switch (Figure 3, Item 3) using tags applied at removal as a guide.
- b. Position new gasket (Figure 3, Item 7) (supplied with new EMERGENCY STOP switch (Figure 3, Item 3)) and new EMERGENCY STOP switch (Figure 3, Item 3) to mounting location on rear of DCS control panel (Figure 3, Item 1) and align the mounting holes.
- c. Secure EMERGENCY STOP switch (Figure 3, Item 3) to DCS control panel (Figure 3, Item 1) by installing four new mounting screws (Figure 3, Item 10) (supplied with new EMERGENCY STOP switch (Figure 3, Item 3)) through front of DCS control panel (Figure 3, Item 1).

CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

Ensure hooks on all wiring harnesses are latched properly after installation. Failure to comply may cause damage to equipment.

- d. Install connector of wiring harness (Figure 3, Item 2) to corresponding connector on membrane panel assembly (not shown).
- e. Install new handle (Figure 3, Item 11) (supplied with new EMERGENCY STOP switch (Figure 3, Item 3)) to EMERGENCY STOP switch (Figure 3, Item 3) and tighten set screw to secure.

9. Test engine control switch (Figure 3, Item 5):
 - a. Remove wiring harness (Figure 3, Item 6) from membrane panel assembly (not shown).

NOTE

Engine control switch will show continuity between SW COMMON (P206-6/S201-1) and one other wire for each corresponding position chosen. When holding between PRIME & RUN and START positions, continuity will be between PRIME/RUN SW (P206-3/S201-6) and ROTARY START SW (P206-4/S201-8).

- b. Turn engine control switch (Figure 3, Item 5) to OFF position and test wires SW COMMON (P206-6/S201-1) and OFF SW (P206-1/S201-2) through wiring harness (Figure 3, Item 6) using a multimeter set to test continuity.
- c. Proceed to step f if continuity is found or step d if no continuity is found.
- d. Test terminals 1 and 2 on engine control switch (Figure 3, Item 5) using a multimeter set to test continuity.
- e. Repair or replace wiring harness (Figure 3, Item 6) if continuity is found or replace engine control switch (Figure 3, Item 5) if no continuity is found (step 10). Retest IAW step b and repair or replace wiring harness (Figure 3, Item 6) as required.
- f. Turn engine control switch (Figure 3, Item 5) to PRIME & RUN AUX FUEL position and test wires SW COMMON (P206-6/S201-1) and PRIME/AUX SW (P206-2/S201-4) through wiring harness (Figure 3, Item 6) using a multimeter set to test continuity.
- g. Proceed to step j if continuity is found or step h if no continuity is found.
- h. Test terminals 1 and 4 on engine control switch (Figure 3, Item 5) using a multimeter set to test continuity.
- i. Repair or replace wiring harness (Figure 3, Item 6) if continuity is found or replace engine control switch (Figure 3, Item 5) if no continuity is found (step 10). Retest IAW step f and repair or replace wiring harness (Figure 3, Item 6) as required.
- j. Turn engine control switch (Figure 3, Item 5) to PRIME & RUN position and test wires SW COMMON (P206-6/S201-1) and PRIME/RUN SW (P206-3/S201-6) through wiring harness (Figure 3, Item 6) using a multimeter set to test continuity.
- k. Proceed to step n if continuity is found or step l if no continuity is found.
- l. Test terminals 1 and 6 on engine control switch (Figure 3, Item 5) using a multimeter set to test continuity.
- m. Repair or replace wiring harness (Figure 3, Item 6) if continuity is found or replace engine control switch (Figure 3, Item 5) if no continuity is found (step 10). Retest IAW step j and repair or replace wiring harness (Figure 3, Item 6) as required.

NOTE

Use of an assistant is required when holding engine control switch in START position to measure continuity. Engine control switch must be held in START position in order to obtain an accurate measurement.

- n. Hold engine control switch (Figure 3, Item 5) in START position and test wires SW COMMON (P206-6/S201-1) and ROTARY START SW (P206-4/S201-8) through wiring harness (Figure 3, Item 6) using a multimeter set to test continuity.
- o. Proceed to step r if continuity is found or step p if no continuity is found.
- p. Test terminals 1 and 8 on engine control switch (Figure 3, Item 5) using a multimeter set to test continuity.
- q. Repair or replace wiring harness (Figure 3, Item 6) if continuity is found or replace engine control switch (Figure 3, Item 5) if no continuity is found (step 10). Retest IAW step n and repair or replace wiring harness (Figure 3, Item 6) as required.

NOTE

When engine control switch (Figure 3, Item 5) is turned slowly from PRIME & RUN to START position, a momentary continuity reading should be obtained. Use of an assistant is required when moving engine control switch (Figure 3, Item 5) between PRIME & RUN and START positions to measure continuity. Engine control switch (Figure 3, Item 5) must be moved to position between PRIME & RUN and START in order to obtain accurate reading.

- r. Move engine control switch (Figure 3, Item 5) back and forth slowly from START to PRIME & RUN and from PRIME & RUN to START while testing wires PRIME/RUN SW (P206-3/S201-6) and ROTARY START SW (P206-4/S201-8) using a multimeter set to test continuity.
 - s. Proceed to step v if continuity is found or step t if no continuity is found.
 - t. Move engine control switch (Figure 3, Item 5) back and forth slowly from START to PRIME & RUN and from PRIME & RUN to START while testing terminals 6 and 8 on engine control switch (Figure 3, Item 5) using a multimeter set to test continuity.
 - u. Repair or replace wiring harness (Figure 3, Item 6) if continuity is found or replace engine control switch (Figure 3, Item 5) if no continuity is found (step 10). Retest IAW step r and repair or replace wiring harness (Figure 3, Item 6) as required.
 - v. Install wiring harness (Figure 3, Item 6) to membrane panel assembly (not shown).
10. Remove engine control switch (Figure 3, Item 5):

NOTE

Sealing gasket, sealing screws, and handle for engine control switch are available only with a new engine control switch.

- a. Loosen set screw (not shown) that secures handle (Figure 3, Item 9) to engine control switch (Figure 3, Item 5) on front of DCS control panel (Figure 3, Item 1).
- b. Remove and discard handle (Figure 3, Item 9) from engine control switch (Figure 3, Item 5).

CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

NOTE

Prior to removal, tag all electrical wires, cables, and leads for identification. Tags will be used as a guide during installation.

- c. Tag wiring harness (Figure 3, Item 6) from engine control switch (Figure 3, Item 5) to membrane panel assembly (not shown) of DCS control panel (Figure 3, Item 1).
- d. Unhook clip on wiring harness (Figure 3, Item 6) and remove wiring harness (Figure 3, Item 6) from membrane panel assembly (not shown).
- e. Remove and discard four mounting screws (Figure 3, Item 8) securing engine control switch (Figure 3, Item 5) to front of DCS control panel (Figure 3, Item 1).
- f. Remove and discard engine control switch (Figure 3, Item 5) and gasket (Figure 3, Item 7) from front of DCS control panel (Figure 3, Item 1).
- g. Tag and remove six wires from engine control switch (Figure 3, Item 5) by removing screws (Figure 3, Item 4).

11. Install engine control switch (Figure 3, Item 5):
 - a. Install six wires of wiring harness (Figure 3, Item 6) to contacts on engine control switch (Figure 3, Item 5) using tags applied at removal as a guide.
 - b. Position new gasket (Figure 3, Item 7) (supplied with new engine control switch (Figure 3, Item 5)) and new engine control switch (Figure 3, Item 5) to mounting location on rear of DCS control panel (Figure 3, Item 1) and align the mounting holes.
 - c. Secure engine control switch (Figure 3, Item 5) to DCS control panel (Figure 3, Item 1) by installing four new mounting screws (Figure 3, Item 8) (supplied with new engine control switch (Figure 3, Item 5)) through front of DCS control panel (Figure 3, Item 1).

CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

Ensure hooks on all wiring harnesses are latched properly after installation. Failure to comply may cause damage to equipment.

NOTE

Identification tags should remain in place until the DCS is completely reassembled and has been tested for proper operation.

Apply a thin coat of electrically conductive grease to all electrical connections prior to assembly.

- d. Install connector of wiring harness (Figure 3, Item 6) to corresponding connector on membrane panel assembly (not shown).
 - e. Install new handle (Figure 3, Item 9) (supplied with new engine control switch (Figure 3, Item 5)) to engine control switch (Figure 3, Item 5) and tighten set screw (not shown) to secure.
12. Install DCS control panel assembly. See Install DCS Control Panel Assembly task.

END OF TASK

Install DCS Control Panel Assembly

1. Remove protective strips from self-adhesive surface of new gasket (Figure 1, Item 3).
2. Align the mounting holes carefully and apply new gasket (Figure 1, Item 3) to rear face of DCS control panel (Figure 1, Item 6).

CAUTION

Do not secure DCS control panel (Figure 1, Item 6) at this time.

3. Position DCS control panel (Figure 1, Item 6) to its mounting location on DCS enclosure (Figure 1, Item 2).
4. Lift DCS control panel (Figure 1, Item 6) far enough from DCS enclosure (Figure 1, Item 2) to allow access to wiring harnesses.

CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

Ensure hooks on all wiring harnesses are latched properly after installation. Failure to comply may cause damage to equipment.

5. Install three wiring harnesses to DCS control panel (Figure 1, Item 6) at the corresponding connectors using tags applied at removal as a guide:
 - a. Install six-pin wiring harness (Figure 1, Item 4) to main control card (not shown).
 - b. Install 22-pin wiring harness (Figure 1, Item 5) to main control card (not shown).
 - c. Install 14-pin wiring harness (Figure 1, Item 8) to power supply control card (not shown).
6. Position DCS control panel (Figure 1, Item 6) to its mounting location on DCS enclosure (Figure 1, Item 2) and align the mounting holes.
7. Secure DCS control panel (Figure 1, Item 6) to DCS enclosure (Figure 1, Item 2) by installing 28 screws (Figure 1, Item 7). Torque 28 screws (Figure 1, Item 7) to 15.9 – 19.5 in/lb (1.8 – 2.2 Nm).
8. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
9. Set engine control switch to PRIME & RUN (TM 9-6115-751-10).
10. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
11. Repair as required.
12. Close DCS door.

END OF TASK

Check DCS Diagnostic LEDs

1. Ensure equipment conditions are met in order presented in initial setup.

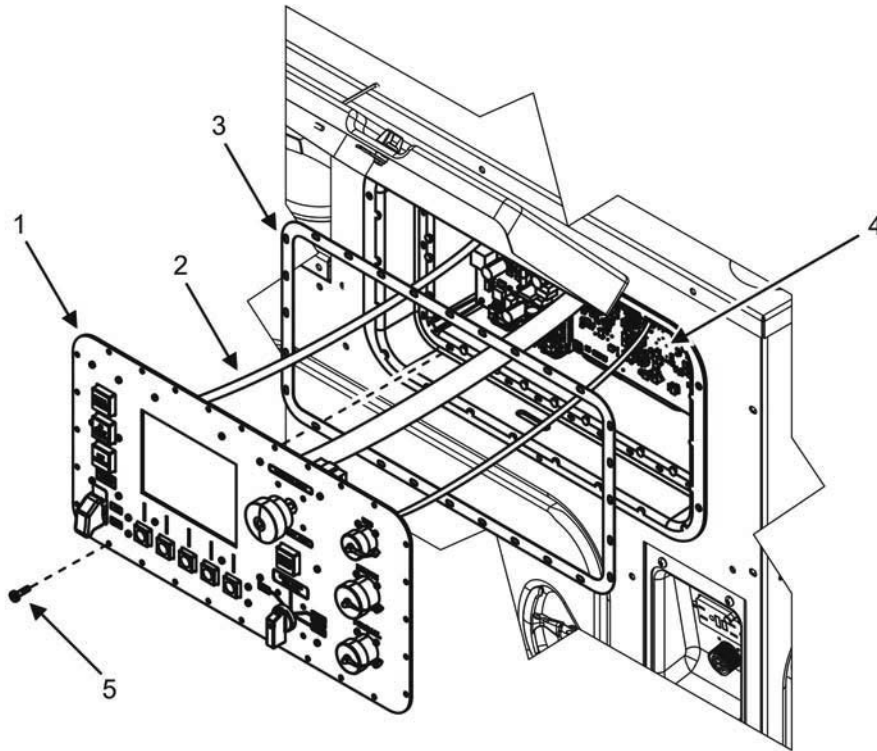


Figure 4. Accessing DCS Diagnostic LEDs.

2. Open DCS door and secure in open position.
3. Remove and discard 28 locking screws (Figure 4, Item 5) securing DCS control panel (Figure 4, Item 1) to DCS enclosure (Figure 4, Item 4).
4. Pull DCS control panel (Figure 4, Item 1) from DCS enclosure (Figure 4, Item 4) far enough to view printed circuit cards in rear of DCS enclosure (Figure 4, Item 4) and on rear of DCS control panel (Figure 4, Item 1).
5. Inspect seal (Figure 4, Item 3) between DCS enclosure (Figure 4, Item 4) and DCS control panel (Figure 4, Item 1) for signs of obvious damage. Remove and discard seal (Figure 4, Item 3) if damaged (WP 0017, Remove/Install DCS).
6. Secure DCS control panel (Figure 4, Item 1) with baling wire in a position that does not put stress on three cables (Figure 4, Item 2) running from DCS enclosure (Figure 4, Item 4) to DCS control panel (Figure 4, Item 1).

NOTE

Several LEDs should illuminate when engine control switch is in the PRIME & RUN position.

7. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
8. Troubleshoot electrical system (WP 0008, Electrical System Troubleshooting with a DCS Code) if LEDs do not illuminate.

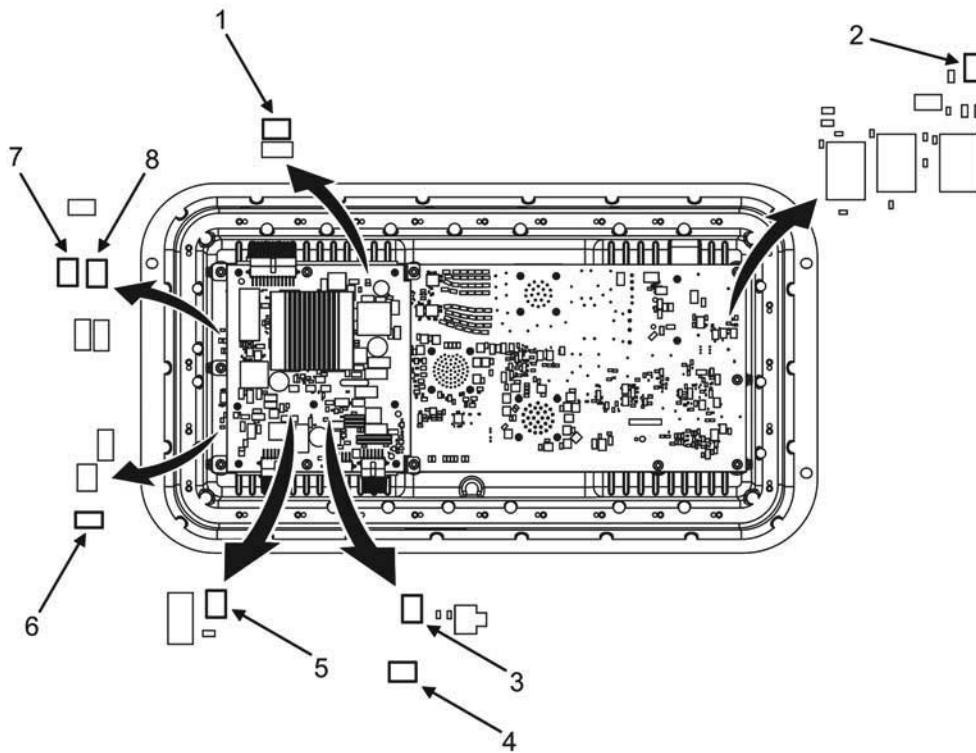


Figure 5. DCS Enclosure LEDs.

- 9. Observe LEDs on printed circuit boards inside DCS enclosure (Figure 4, Item 4).
- 10. Consult Figure 5 and Table 1 for proper function of LEDs.

Table 1. DCS Enclosure LEDs.

LED INDICATOR	DESCRIPTION	BLINK RATE/STATUS	SERVICE STEPS REQUIRED
5216 HEARTBEAT DS200 (Figure 5, Item 8)	Main processor function LED. The color is green.	<ol style="list-style-type: none"> 1. [Normal Mode]: Blinks at 0.5 Hz (1 sec on, 1 sec off) when U206 is running normally with application firmware. 2. [Boot Mode]: Blinks at 2 Hz (0.25 sec on, 0.25 sec off) when U206 is running boot firmware. 3. [OFF Mode]: Not blinking. 4. [Abnormal Mode]: 100% on. 	<ol style="list-style-type: none"> 1.[Normal Mode]: None. 2.[Boot Mode]: Load firmware into controller. Use InPower AMMPS Service Tool software. 3.[OFF Mode]: Check power to the controller. Make sure EMERGENCY STOP is not active. Rotate engine control switch from OFF position. If DS300 is blinking normally and D2300 is not blinking, see step 11. 4.[Abnormal Mode]: See step 11.
COMMON ALARM DS201 (Figure 5, Item 7)	Common alarm LED. The color is red.	LED is active when there is a warning or shutdown fault on the generator set.	Check warning/fault status on DCS. Take appropriate service response. Press FAULT RESET on DCS to clear the fault indicator.

Table 1. DCS Enclosure LEDs — Continued.

LED INDICATOR	DESCRIPTION	BLINK RATE/STATUS	SERVICE STEPS REQUIRED
5213 HEARTBEAT DS300 (Figure 5, Item 6)	Main control co-processor function LED. The color is green.	<ol style="list-style-type: none"> [Normal Mode]: Blinks at 0.5 Hz (1 sec on, 1 sec off) when U206 is running normally with application firmware. [Boot Mode]: Blinks at 2 Hz (0.25 sec on, 0.25 sec off) when U206 is running boot firmware. [OFF Mode]: Not blinking. [Abnormal Mode]: 100% on. 	<ol style="list-style-type: none"> [Normal Mode]: None. [Boot Mode]: Load firmware into controller. Use InPower AMMPS Service Tool software. [OFF Mode]: Check power to the controller. Make sure EMERGENCY STOP is not active. Rotate engine control switch from OFF position. If DS200 is blinking normally and DS300 is not blinking, see step 11. [Abnormal Mode]: See step 11.
DS1100 (Figure 5, Item 2)	Automatic Voltage Regulator (AVR) power supply status LED. The color is green.	If the DCS is powered and running normally, the LED will be active (on). This LED indicates the AVR section of the main board has power.	If the LED is off, check power to the controller. Make sure EMERGENCY STOP is not active. Rotate engine control switch from OFF position. If the LED does not turn on and the processor LEDs are working normally, see step 11.
DS100 (Figure 5, Item 1)	Non-isolated power supply LED. The color is green.	Should be 100% on when the DCS is powered and running normally.	If LED is off, check that DCS is powered normally and EMERGENCY STOP is not active. If DCS is powered normally and LED is inactive, see step 11.
DS101 (Figure 5, Item 5)	Isolated power supply LED. The color is green.	Should be 100% on when the DCS is powered and running normally.	If LED is off, check that DCS is powered normally and EMERGENCY STOP is not active. If DCS is powered normally and LED is inactive, see step 11.
DS200 (Figure 5, Item 4)	DCS control power LED. The color is green.	Should be 100% on when the DCS is powered and running normally. This will be off if the DCS is not powered up and running.	If LED is off, check that DCS is powered normally and EMERGENCY STOP is not active. If DCS is powered normally and LED is inactive, see step 11.
DS201 (Figure 5, Item 3)	Power supply control card heater LED. The color is green.	LED is normally off. This LED goes on when the DCS heater system is active. This will be at extremely low ambient temperatures (-51°F – -33°F (-46°C – -36°C)).	No service steps are required. Normal operation is not affected by this circuit. Only low temperature conditions can verify the operation of this circuit.

11. Replace DCS (WP 0017, Remove/Install DCS) if LEDs do not function IAW Table 1.

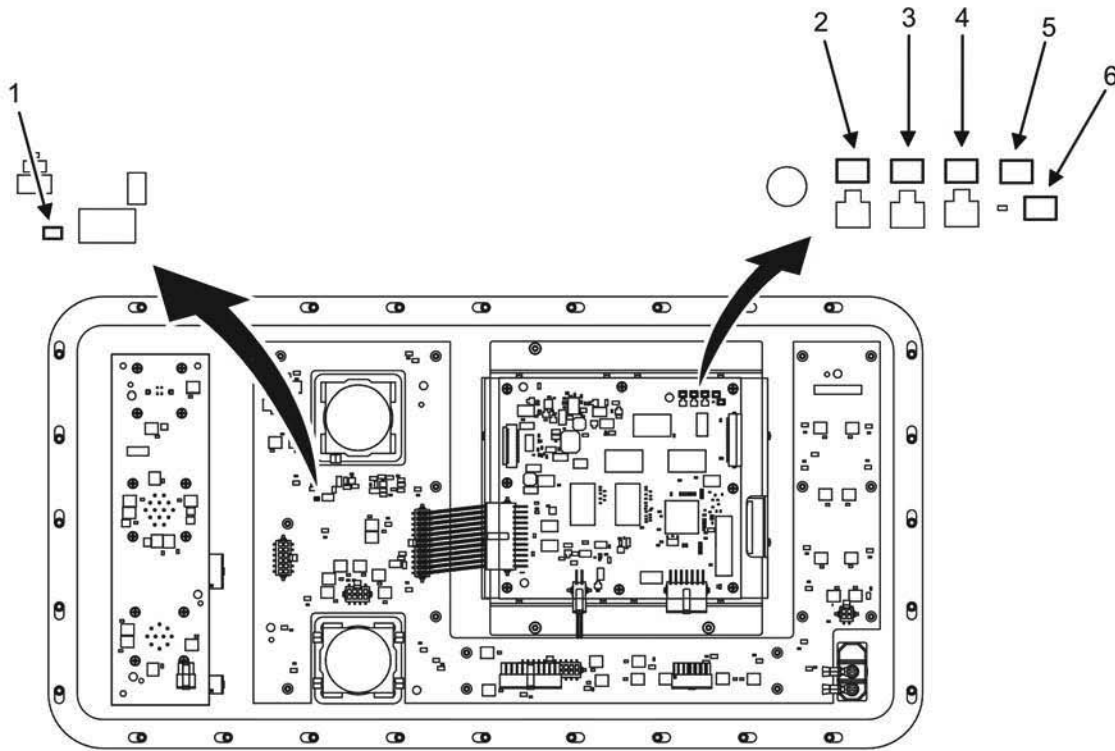


Figure 6. DCS Control Panel LEDs.

12. Observe LEDs on printed circuit boards on rear of DCS control panel (Figure 4, Item 1).
13. Consult Figure 6 and Table 2 for proper function of LEDs.

Table 2. DCS Control Panel LEDs.

LED INDICATOR	DESCRIPTION	BLINK RATE/STATUS	SERVICE STEPS REQUIRED
DS1 (Figure 6, Item 6)	3.3 V DCS power LED. The color is green.	Should be 100% on when the DCS is powered and running normally.	If LED is off, check that DCS is powered normally and EMERGENCY STOP is not active. If DCS is powered normally and LED is inactive, see step 14.
DS2 (Figure 6, Item 2)	Display controller microcontroller status LED. The color is green.	<ol style="list-style-type: none"> 1. [OFF Mode]: LED is off. 2. [Initialization Mode]: Blinks very fast during power-up initialization. 3. [Boot Mode]: Blinks at 2 Hz (0.25 sec on, 0.25 sec off) when U1 is running the boot block firmware. 4. [Normal Mode]: Blinks at 0.5 Hz (1 sec on, 1 sec off) when U1 microcontroller is running the application firmware. 	<ol style="list-style-type: none"> 1. If LED is off, check that DCS is powered normally and EMERGENCY STOP is not active. 2. If device is in initialization mode, wait 10 sec and check again. If system does not leave initialization mode, check for [Boot Mode] and see step 14. 3. If device is in the boot mode, load firmware into controller with InPower AMMPS software loaded on Maintenance Support Device (MSD).

Table 2. DCS Control Panel LEDs — Continued.

LED INDICATOR	DESCRIPTION	BLINK RATE/STATUS	SERVICE STEPS REQUIRED
		5.[Abnormal Mode]: 100% on. This indicates the system is not running and has a fault.	4. Normal mode requires no service actions to this assembly. 5. If device LED is stuck 100% on, see step 14.
DS3 (Figure 6, Item 3)	Display controller main controller communication LED. The color is red.	LED is normally off.	If LED is off, no service action is required. If LED is on, wait 10 sec for LED to turn off as communications initialize. If LED stays on indefinitely, then check the cables between the main controller and the display controller. If LED stays on and cables are ok, see step 14.
DS4 (Figure 6, Item 4)	LCD glass heater LED. The color is green.	LED is normally off. LED goes on when the DCS heater system is active. This will be at extremely low ambient temperatures (-51°F – -4°F (-46°C – -20°C)).	If ambient temperatures are above 32°F (0°C) and this LED is active, check display controller function. Check the cables for a short circuit between wires. See step 14 if LED is always active at temperatures above 32°F (0°C).
DS5 (Figure 6, Item 5)	Display controller heater LED. The color is yellow.	LED is normally off. LED goes on when the DCS heater system is active. This will be at extremely low ambient temperatures (-51°F – -33°F (-46°C – -36°C)).	No service steps are required. Normal operation is not affected by this circuit. Only low-temperature conditions can verify the operation of this circuit.
DS28 (Figure 6, Item 1)	Temperature sense circuitry LED. The color is green.	Should be 100% on when the DCS is powered and running normally.	If LED is off, check that DCS is powered normally and EMERGENCY STOP is not active. If DCS is powered normally and LED is inactive, see step 14.

14. Replace DCS (WP 0017, Remove/Install DCS) if LEDs do not function IAW Table 2.

NOTE

LEDs should go off after DCS powers down when engine control switch is in the OFF position.

- 15. Turn engine control switch to OFF (TM 9-6115-751-10).
- 16. Install new seal (Figure 4, Item 3) to DCS enclosure (Figure 4, Item 4) if old seal was removed. See Install DCS Control Panel Assembly task.
- 17. Position DCS control panel (Figure 4, Item 1) to its mounting location on DCS enclosure (Figure 4, Item 4) and align the mounting holes.
- 18. Secure DCS control panel (Figure 4, Item 1) to DCS enclosure (Figure 4, Item 4) by installing 28 new locking screws (Figure 4, Item 5). Torque 28 locking screws (Figure 4, Item 5) to 15.9 – 19.5 in/lb (1.8 – 2.2 Nm).
- 19. Set engine control switch to PRIME & RUN (TM 9-6115-751-10).
- 20. Start engine and check for proper operation (TM 9-6115-751-10).

21. Repair as required.
22. Close DCS door.

END OF TASK

Remove DCS Door Assembly

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove negative ground cable from right-hand battery (WP 0036, Remove/Install Batteries).
3. Remove top body panel (WP 0028, Remove/Install Top Body Panel).

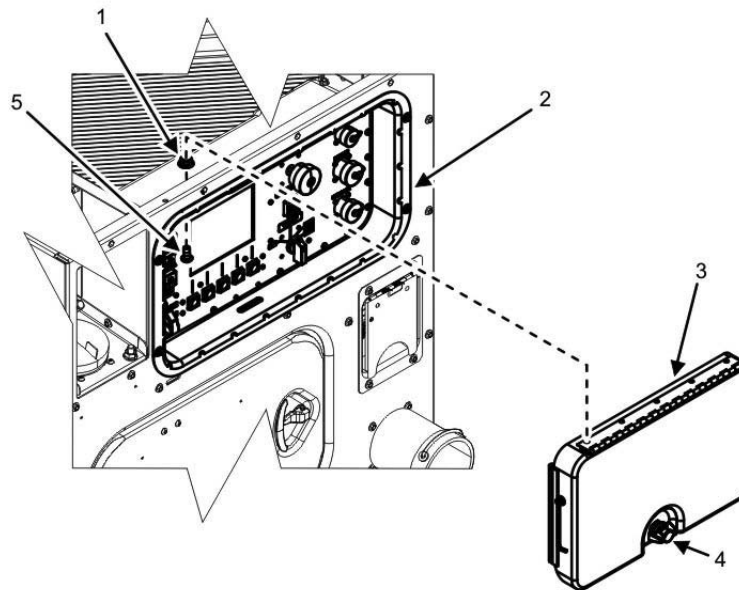


Figure 7. DCS Door — Remove.

4. Support DCS door (Figure 7, Item 3) and remove five nuts (Figure 7, Item 1) and five screws (Figure 7, Item 5) that secure DCS door (Figure 7, Item 3) to DCS enclosure (Figure 7, Item 2).
5. Rotate DCS door latch (Figure 7, Item 4) and remove DCS door (Figure 7, Item 3) from unit.
6. Place DCS door (Figure 7, Item 3) on a suitable work surface.

END OF TASK

Disassemble DCS Door Assembly

1. Remove four screws (Figure 8, Item 8), four nuts (Figure 8, Item 1), and hinge (Figure 8, Item 2), from DCS door (Figure 8, Item 3).
2. Remove one screw (Figure 8, Item 5), one lock nut (Figure 8, Item 7), and door prop (Figure 8, Item 4) from DCS door (Figure 8, Item 3). Discard lock nut (Figure 8, Item 7).
3. Remove two rubber bumpers (Figure 8, Item 6) from edges of DCS door (Figure 8, Item 3).

END OF TASK

Inspect DCS Door Components

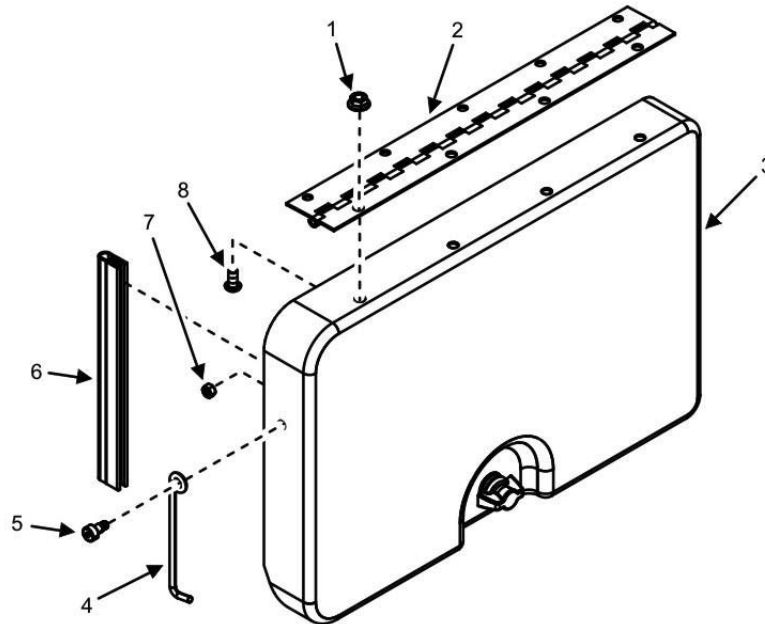


Figure 8. DCS Door — Disassemble.

1. Inspect hinge (Figure 8, Item 2). Replace hinge (Figure 8, Item 2) if bent, corroded, or binding.
2. Inspect door prop (Figure 8, Item 4). Replace door prop (Figure 8, Item 4) if bent, cracked, or broken.
3. Inspect rubber bumpers (Figure 8, Item 6). Replace rubber bumpers (Figure 8, Item 6) if cracked or torn.
4. Inspect DCS door (Figure 8, Item 6). Replace DCS door (Figure 8, Item 3) if punctured, cracked, corroded, or badly bent. Repair minor dents by hammering out.

END OF TASK

Assemble DCS Door Assembly

1. Install two rubber bumpers (Figure 8, Item 6) to the inside edges of DCS door (Figure 8, Item 3).
2. Position prop (Figure 8, Item 4) to its mounting position on outside of DCS door (Figure 8, Item 3) and secure by installing screw (Figure 8, Item 5) and new lock nut (Figure 8, Item 7).
3. Position hinge (Figure 8, Item 2) to DCS door (Figure 8, Item 3) and secure by installing four screws (Figure 8, Item 8) and four nuts (Figure 8, Item 1).

END OF TASK

Install DCS Door Assembly

1. Position DCS door (Figure 7, Item 3) to its mounting position on DCS enclosure (Figure 7, Item 2).
2. Support DCS door (Figure 7, Item 3) while installing five screws (Figure 7, Item 5) and five nuts (Figure 7, Item 1) to secure DCS door (Figure 7, Item 3) to DCS enclosure (Figure 7, Item 2).
3. Close DCS door (Figure 7, Item 3) and secure latch (Figure 7, Item 4).
4. Install top body panel (WP 0028, Remove/Install Top Body Panel).

5. Install battery ground cable (WP 0036, Remove/Install Batteries).
6. Set engine control switch to PRIME & RUN (TM 9-6115-751-10).
7. Start engine and check for proper operation (TM 9-6115-751-10).
8. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL AIR INTAKE HOSE ASSEMBLIES

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Clamp, type CTB (3) (WP 0108, Repair Parts List, Figure 8, Item 6)

Clamp, type CTB (4) (WP 0108, Figure 8, Item 1)

Hose, air (1) (WP 0108, Figure 8, Item 7)

Hose, air 15 kW (1) (WP 0108, Figure 8, Item 17)

Hose, breather, 15 kW (1) (WP 0108, Figure 8, Item 2)

Hose, breather 19 mm ID X 80 mm (1) (WP 0108, Figure 8, Item 4)

Joint, breather (WP 0108, Figure 8, Item 5)

Tube, breather (WP 0108, Figure 8, Item 3)

Grease, electrically conductive (WP 0164, Expendable and Durable Items List, Item 21)

Personnel Required

91D (1)

References

Not Applicable

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL AIR INTAKE HOSE ASSEMBLIES
Remove Air Intake Air Hose Assemblies

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate air intake assembly (Figure 1) attached at unit bulkhead panel.

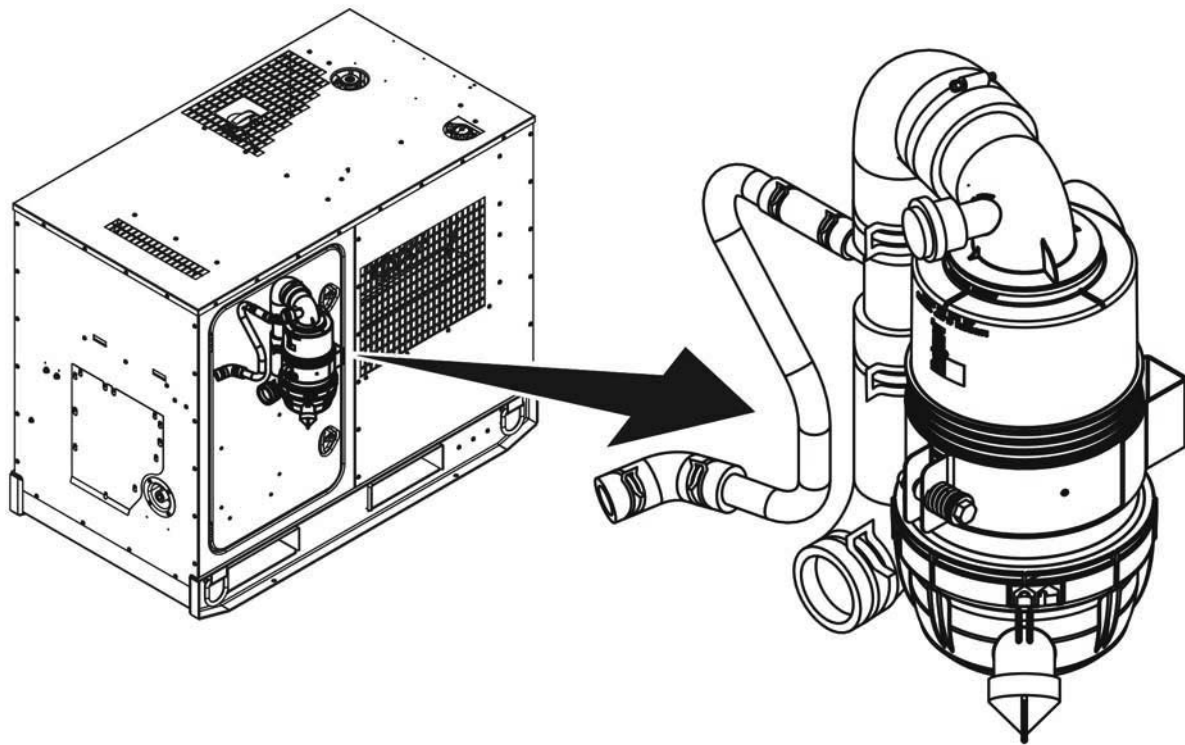
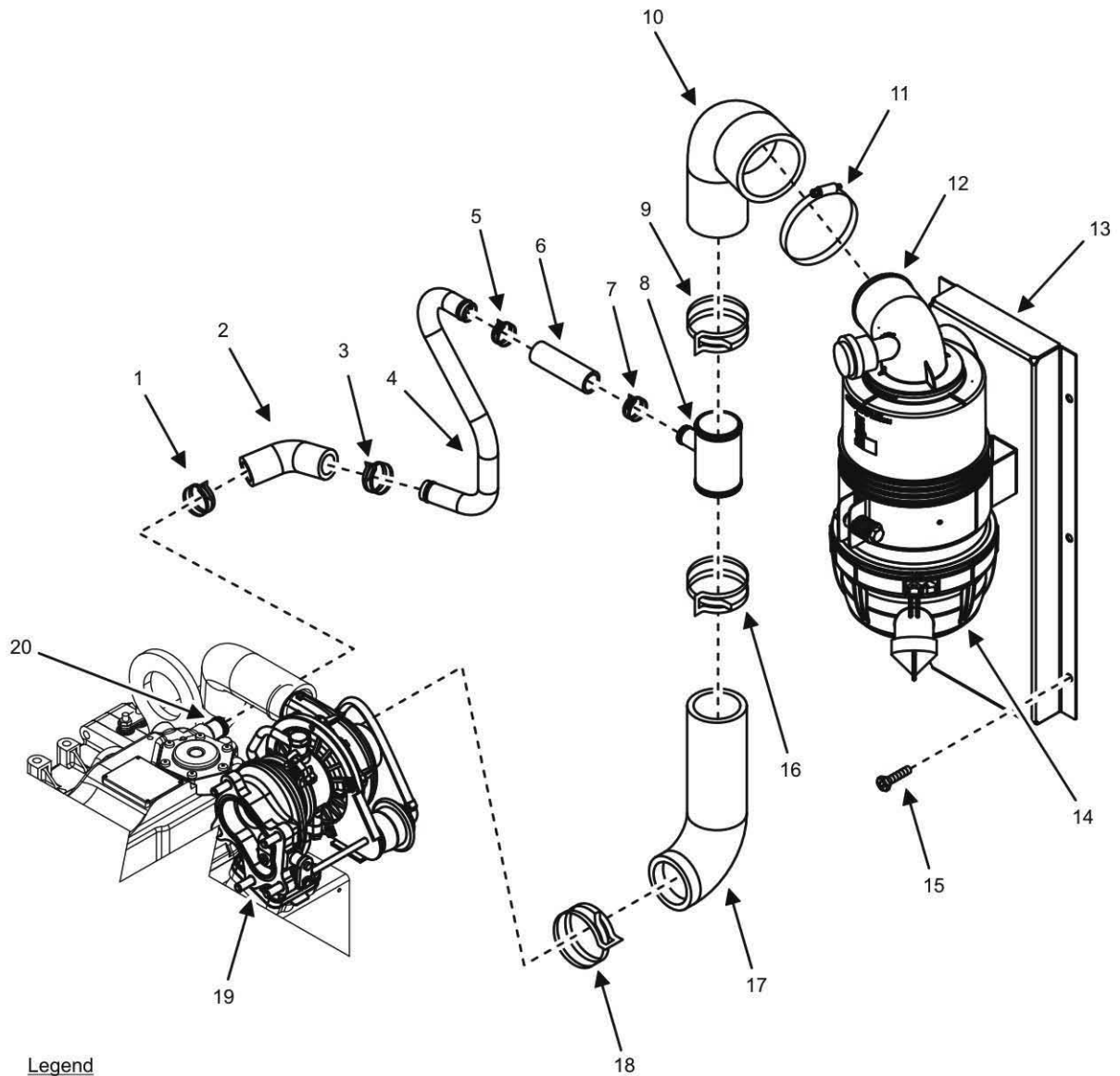


Figure 1. Air Intake Hose Assembly — Location.

3. Loosen clamp (Figure 2, Item 1) securing breather tube (Figure 2, Item 4) and breather hose (Figure 2, Item 2) to valve cover fitting (Figure 2, Item 20).
4. Remove breather hose (Figure 2, Item 2) and clamp (Figure 2, Item 1) from valve cover fitting (Figure 2, Item 20) and discard clamp (Figure 2, Item 1).
5. Loosen hose clamp (Figure 2, Item 11) securing upper air hose (Figure 2, Item 10) to elbow fitting (Figure 2, Item 12) on top of air cleaner assembly (Figure 2, Item 14).
6. Remove upper air hose (Figure 2, Item 10) and hose clamp (Figure 2, Item 11) from elbow fitting (Figure 2, Item 12) on top of air cleaner assembly (Figure 2, Item 14).
7. Loosen and remove clamp (Figure 2, Item 18) securing lower air hose (Figure 2, Item 17) to turbocharger (Figure 2, Item 19).
8. Remove lower air hose (Figure 2, Item 17) and clamp (Figure 2, Item 18) from turbocharger (Figure 2, Item 19), and discard clamp (Figure 2, Item 18).



Legend

- | | |
|-------------------|---------------------------|
| 1. Clamp | 11. Hose Clamp |
| 2. Breather Hose | 12. Elbow Fitting |
| 3. Clamp | 13. Air Plenum |
| 4. Breather Tube | 14. Air Cleaner Assembly |
| 5. Clamp | 15. Hex Socket Head Screw |
| 6. Breather Hose | 16. Clamp |
| 7. Clamp | 17. Air Hose |
| 8. Breather Joint | 18. Clamp |
| 9. Clamp | 19. Turbocharger |
| 10. Air Hose | 20. Valve Cover Fitting |

Figure 2. Air Intake Hose Assembly — Detail.

9. Remove six hex socket head screws (Figure 2, Item 15) securing air plenum (Figure 2, Item 13) to interior bulkhead panel (not shown).
10. Remove air cleaner assembly (Figure 2, Item 14), air plenum (Figure 2, Item 13), and all attached hoses and tubes from unit and place on a suitable work surface.

11. Loosen and slide back clamp (Figure 2, Item 7) on breather hose (Figure 2, Item 6) of breather tube (Figure 2, Item 4) at breather joint (Figure 2, Item 8).
12. Remove breather hose (Figure 2, Item 6) from breather joint (Figure 2, Item 8) and discard clamp (Figure 3, Item 7).
13. Disengage clamps (Figure 2, Items 3, and 5) and remove connecting hoses (Figure 2, Items 2 and 6) from both ends of breather tube (Figure 2, Item 4).
14. Disengage clamps (Figure 2, Items 9 and 16) and remove upper and lower air hoses (Figure 2, Items 10 and 17) from both sides of breather joint (Figure 2, Item 8).
15. Discard all hose clamps.

END OF TASK

Inspect Air Intake Hose Assemblies

1. Inspect all hoses (Figure 2, Items 2, 6, 10, and 17) for damage or deterioration and replace damaged or deteriorated hoses as required.
2. Inspect all hoses (Figure 2, Items 2, 6, 10, and 17) and remove any blockage such as debris, dirt, or kinks, and replace hose if blockage cannot be removed.
3. Inspect breather joint (Figure 2, Item 8) for cracks, corrosion, or other damage. Replace as required.
4. Inspect breather tube (Figure 2, Item 4) for cracks, corrosion, blockage, or other damage. Repair or replace as required.

END OF TASK

Install Air Intake Hose Assemblies

NOTE

Wipe down hoses, parts, and connectors with wiping rag prior to installation.

1. Install connector hoses (Figure 2, Items 2 and 6) and new clamps (Figure 2, Items 3 and 5) on ends of breather tube (Figure 2, Item 4) but do not secure all clamps (Figure 2, Items 3 and 5).
2. Install breather hose (Figure 2, Item 6) and new clamp (Figure 2, Item 7) to breather joint (Figure 2, Item 8) but do not secure clamp (Figure 2, Item 7).
3. Install upper and lower air hoses (Figure 2, Items 10 and 17) and new clamps (Figure 2, Items 9 and 16) to ends of breather joint (Figure 2, Item 8) but do not secure clamps (Figure 2, Items 9 and 16).
4. Install upper air hose (Figure 2, Item 10) and new hose clamp (Figure 2, Item 11) to elbow fitting (Figure 2, Item 12) on top of air cleaner (Figure 2, Item 14) but do not secure hose clamp (Figure 2, Item 11).
5. Install lower air hose (Figure 2, Item 17) and new clamp (Figure 2, Item 18) to turbocharger (Figure 2, Item 19) but do not secure clamp (Figure 2, Item 18).
6. Install breather hose (Figure 2, Item 2) and new clamp (Figure 2, Item 1) to valve cover (Figure 2, Item 20) but do not secure clamp (Figure 2, Item 1).
7. Verify proper seating of all hoses (Figure 2, Items 2, 6, 10, and 17) and alignment of clamps (Figure 2, Items 1, 3, 5, 7, 9, 11, 16, and 18) at each hose fitting.
8. Adjust and secure all hose clamps as needed.

-
9. Install top body panel (WP 0028, Remove/Install Top Body Panel).
 10. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
 11. Close generator set doors.

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

12. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
13. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
14. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
SERVICE AIR CLEANER

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Element, filter (WP 0108, Repair Parts List, Figure 8, Item 10)

Grease, electrically conductive (WP 0164, Expendable and Durable Items List, Item 21)

Rag, wiping (WP 0164, Item 32)

Sealant (WP 0164, Item 33)

Personnel Required

91D (1)

Assistant (1)

References

WP 0019, Remove/Install Air Intake Hose Assemblies

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Air filter restriction indicator shows restricted filter

Battery disconnected (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

SERVICE AIR CLEANER ASSEMBLY**Remove Air Cleaner Filter Element**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door to locate air cleaner (Figure 1).
3. Check air filter restriction indicator (Figure 2, Item 1) to determine if filter element (Figure 2, Item 3) requires replacement.
4. Place a suitable container under dust ejection valve (Figure 2, Item 5) and squeeze dust ejection valve (Figure 2, Item 5) to remove dust from base cover (Figure 2, Item 4).
5. Release lock lever on air cleaner base cover (Figure 2, Item 4) and twist base cover (Figure 2, Item 4) counterclockwise until resistance is felt.
6. Pull base cover (Figure 2, Item 4) straight down to expose filter element (Figure 2, Item 3) and remove base cover (Figure 2, Item 4) from unit.
7. Inspect base cover (Figure 2, Item 4) for damage or corrosion, and replace as required.

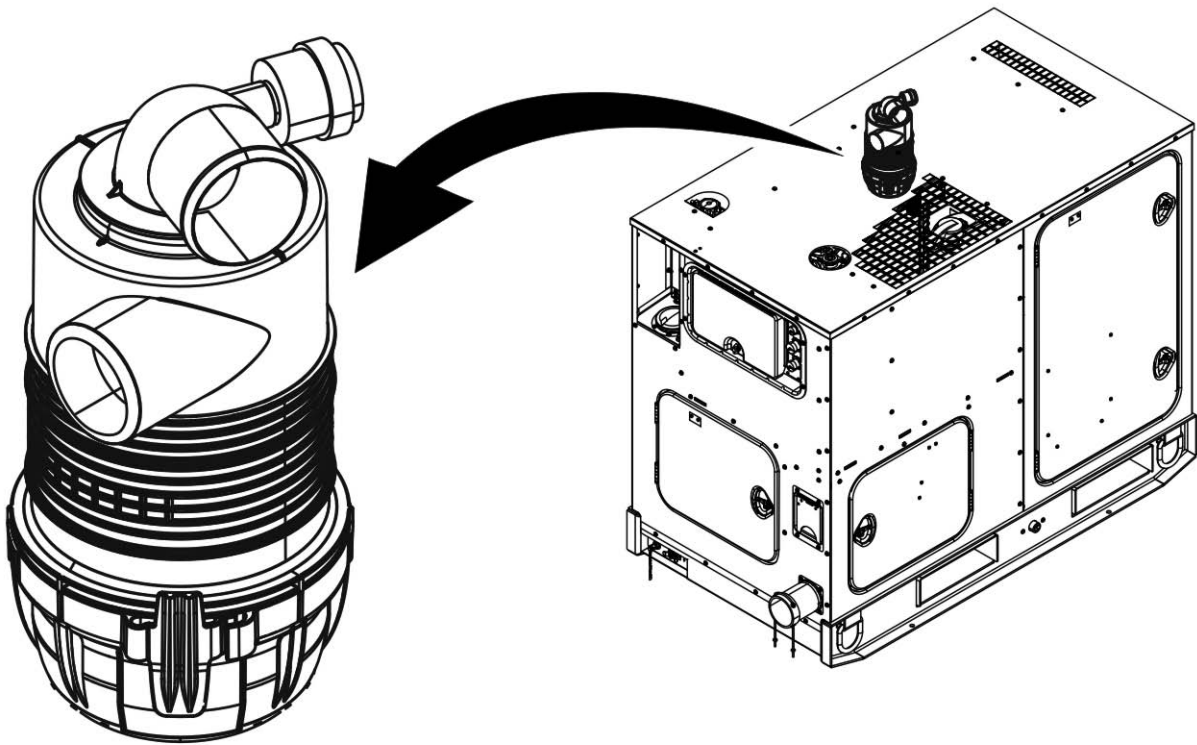


Figure 1. Air Cleaner — Location.

8. Rotate end of filter element (Figure 2, Item 3) in either direction to disengage seal.
9. Remove and discard filter element (Figure 2, Item 3) gently from air cleaner housing (Figure 2, Item 2) by pulling downward.
10. Inspect air cleaner housing (Figure 2, Item 2) for damage or corrosion, and replace as required. See Remove Air Cleaner Assembly task and Install Air Cleaner Assembly task.

END OF TASK

Install Air Cleaner Filter Element

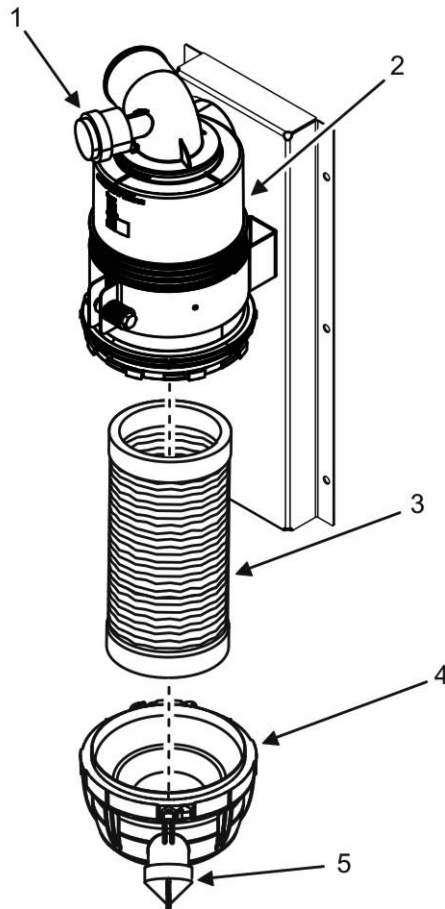


Figure 2. Air Cleaner Assembly.

1. Wipe down hoses, parts, and connectors with wiping rag prior to installation.
2. Insert new filter element (Figure 2, Item 3) into housing and twist in either direction to secure.

NOTE

When base cover (Figure 2, Item 4) is placed on bottom of air cleaner housing (Figure 2, Item 2) and turned clockwise, a click can be heard when the base cover (Figure 2, Item 4) is properly secured.

3. Position base cover (Figure 2, Item 4) at bottom of air cleaner housing (Figure 2, Item 2) and rotate cover clockwise to secure.
4. Reset restriction indicator (Figure 2, Item 1) on air cleaner housing (Figure 2, Item 2) by pushing yellow button on restriction indicator (Figure 2, Item 11).
5. Ensure dust ejection valve (Figure 2, Item 5) is closed.
6. Close left-side door on generator set.

7. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
8. Start engine and check for proper operation (TM 9-6115-751-10).
9. Repair as required.

END OF TASK

Remove Air Cleaner Assembly

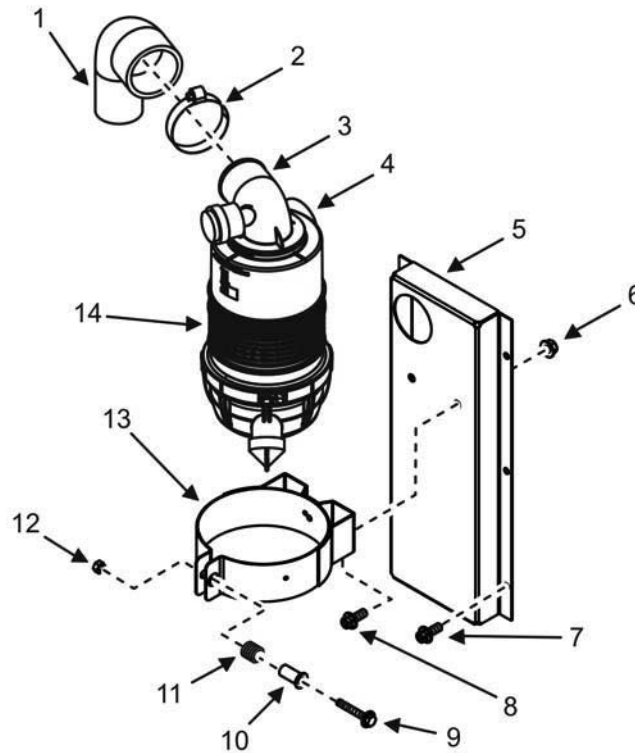


Figure 3. Air Cleaner Assembly — Detail.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Release hose clamp (Figure 3, Item 2) that secures air hose (Figure 3, Item 1) to air cleaner assembly (Figure 3, Item 14) at air outlet (Figure 3, Item 3).
3. Remove six screws (Figure 3, Item 7) securing air plenum (Figure 3, Item 5) to unit internal bulkhead panel (not shown).
4. Remove air cleaner assembly (Figure 3, Item 14) and air plenum (Figure 3, Item 5) from unit as an assembly and place on a suitable work surface.
5. Loosen strap bolt (Figure 3, Item 9), collar (Figure 3, Item 10), spring (Figure 3, Item 11), and nut (Figure 3, Item 12) that secures mounting strap (Figure 3, Item 13) to air cleaner assembly (Figure 3, Item 14).
6. Remove air inlet (Figure 3, Item 4) from air plenum (Figure 3, Item 5).
7. Remove air cleaner assembly (Figure 3, Item 14) from mounting strap (Figure 3, Item 13).
8. Remove two screws (Figure 3, Item 8) and two nuts (Figure 3, Item 6) that secures mounting strap (Figure 3, Item 13) to air plenum (Figure 3, Item 5). Set air cleaner assembly (Figure 3, Item 14), mounting strap (Figure 3, Item 13), and air plenum (Figure 3, Item 5) aside for reuse.

9. Inspect air cleaner assembly (Figure 3, Item 14) and air plenum (Figure 3, Item 5) for damage or corrosion, and replace as required.
10. Inspect hose clamp (Figure 3, Item 2) and screws (Figure 3, Items 7, 8, and 9) for damage or corrosion, and replace as required.

END OF TASK

Inspect Air Cleaner Assembly

1. Inspect air plenum (Figure 3, Item 5) for dents, cracks, or corrosion. Replace air plenum (Figure 3, Item 5) if cracked, badly dented, or badly corroded.
2. Inspect mounting strap (Figure 3, Item 13) for dents, cracks, or corrosion. Replace mounting strap (Figure 3, Item 13) if cracked, badly dented, or badly corroded.
3. Inspect air cleaner assembly (Figure 3, Item 14) for cracks and other signs of obvious damage. Replace air cleaner assembly (Figure 3, Item 14) as required.

END OF TASK

Install Air Cleaner Assembly

1. Wipe down hoses, parts, and connectors with wiping rag prior to installation.
2. Position mounting strap (Figure 3, Item 13) to its mounting location on air plenum (Figure 3, Item 5) and align the mounting holes.

NOTE

When attaching mounting strap (Figure 3, Item 13) to air plenum (Figure 3, Item 5), bolts (Figure 3, Item 8) should be installed from inside the mounting strap (Figure 3, Item 13).

3. Secure mounting strap (Figure 3, Item 13) to air plenum (Figure 3, Item 5) by installing two screws (Figure 3, Item 8) and two nuts (Figure 3, Item 6).
4. Position air cleaner assembly (Figure 3, Item 14) to mounting strap (Figure 3, Item 13) with air inlet (Figure 3, Item 4) positioned in hole of air plenum (Figure 3, Item 5).
5. Tighten mounting strap (Figure 3, Item 13) around air cleaner assembly (Figure 3, Item 14) just enough to hold air cleaner assembly (Figure 3, Item 14) in position by tightening strap bolt (Figure 3, Item 9), collar (Figure 3, Item 10), spring (Figure 3, Item 11), and nut (Figure 3, Item 12).
6. Position air cleaner assembly (Figure 3, Item 14) and air plenum (Figure 3, Item 5) as an assembly to its mounting location on unit bulkhead (not shown).
7. Secure air plenum (Figure 3, Item 5) to interior bulkhead panel (not shown) by installing six screws (Figure 3, Item 7).
8. Rotate air cleaner assembly (Figure 3, Item 14) within mounting strap (Figure 3, Item 13) as necessary to align air outlet (Figure 3, Item 3) with air hose (Figure 3, Item 1).
9. Install air hose (Figure 3, Item 1) to air outlet (Figure 3, Item 3) of air cleaner assembly (Figure 3, Item 14) and secure by installing hose clamp (Figure 3, Item 2).
10. Secure mounting strap (Figure 3, Item 13) by tightening strap bolt (Figure 3, Item 9), bolt (Figure 3, Item 10), spring (Figure 3, Item 11), and nut (Figure 3, Item 12).
11. Install top body panel on generator set (WP 0028, Remove/Install Top Body Panel).
12. Close generator set doors.

13. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
14. Start engine and check for proper operation (TM 9-6115-751-10). Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
15. Repair as required.

END OF TASK

END OF WORK PACKAGE

**FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
SERVICE COOLING SYSTEM**

INITIAL SETUP:**Test Equipment**

Test Kit, Radiator Pressure (WP 0163, Maintenance Allocation Chart, Item 30)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Item 38)

Materials/Parts

Antifreeze, ethylene glycol (WP 0164, Expendable and Durable Items List, Item 2)

Cap set, protective (WP 0164, Item 9)

Cleaning compound, engine cooling system (WP 0164, Item 10)

Distilled water (WP 0164, Item 18)

Rag, wiping (WP 0164, Item 32)

Personnel Required

91D (1)

Assistant (1)

References

MIL-C-10597F (ME)

WP 0024, Remove/Install Radiator Hose and Tube Assemblies

WP 0027, Remove/Install Radiator

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

SERVICE COOLING SYSTEM**WARNING**

- Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.
- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.
- Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Do not open radiator cap unless coolant temperature is below 100°F (38°C). Failure to comply may cause injury or death to personnel.

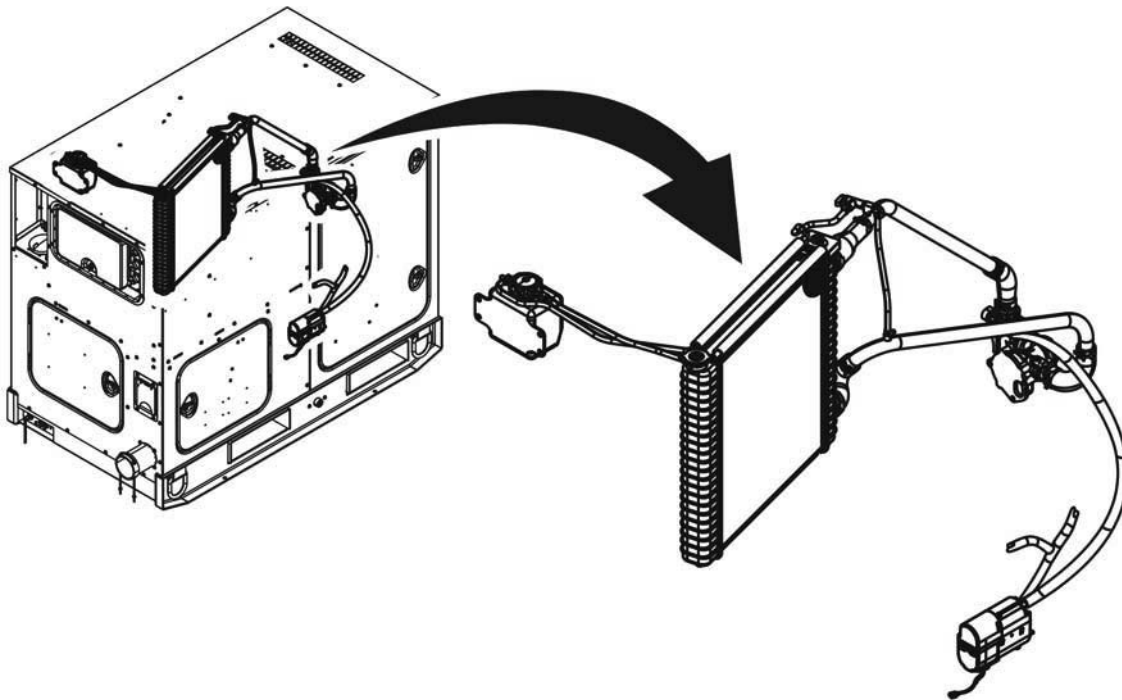
Test Cooling System

Figure 1. Cooling System — Location.

NOTE

Dispose of captured coolant IAW local SOP.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Ensure radiator is properly filled. See Fill Radiator with Engine Coolant task.
3. Locate components of unit cooling system (Figure 1).

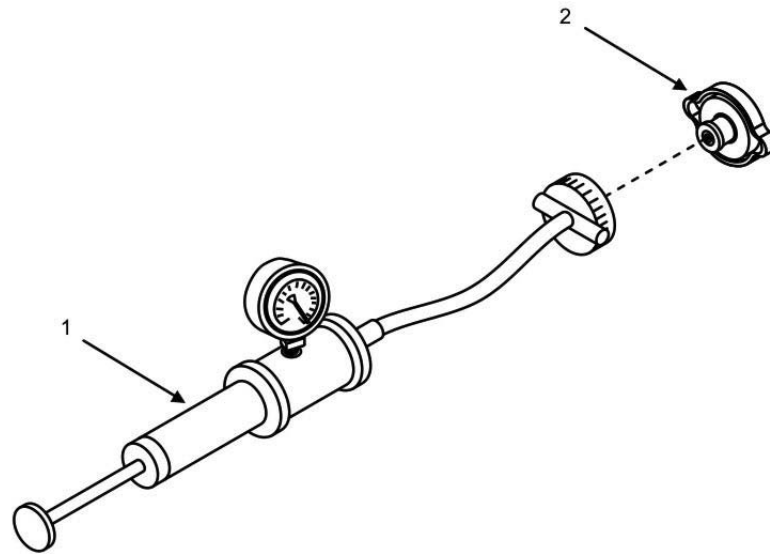


Figure 2. Cooling System Test — Cap.

4. Remove radiator cap (Figure 2, Item 2) from radiator (not shown).
5. Install radiator cap (Figure 2, Item 2) onto a cooling system tester (Figure 2, Item 1).
6. Apply 13 – 17 psi (89 – 117 kPa) to radiator cap (Figure 2, Item 2).
7. Replace radiator cap (Figure 2, Item 2) if relief valve fails to open when pressure is above 15 psi (103 kPa).
8. Remove radiator cap (Figure 2, Item 2) from cooling system tester (Figure 2, Item 1).

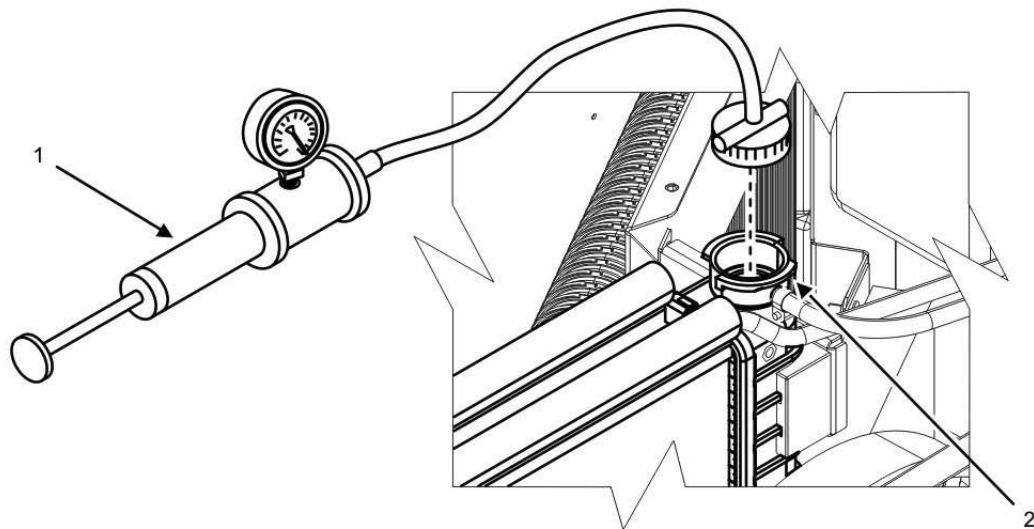


Figure 3. Cooling System Test — Radiator.

-
9. Install cooling system tester (Figure 3, Item 1) to fill port (Figure 3, Item 2) on top of radiator.

CAUTION

Set cooling system testing pressure no higher than 20 psi (138 kPa) to protect water pump seal. Failure to comply may cause damage to equipment.

10. Apply no more than 20 psi (138 kPa) to radiator via fill port (Figure 3, Item 2).

NOTE

If pressure reading drops when pressure is applied to the radiator, the engine cooling system is leaking. Check all parts of cooling system to determine location of the leak.

11. Inspect cooling system for leaks in radiator hoses and around clips (WP 0024, Remove/Install Radiator Hose and Tube Assemblies) if pressure reading drops after applying pressure to radiator (not shown).
12. Remove and replace radiator (not shown) if leaking (WP 0027, Remove/Install Radiator).
13. Remove and replace any hoses or clips (WP 0024, Remove/Install Radiator Hose and Tube Assemblies) where leaks are found.
14. Remove cooling system tester (Figure 3, Item 1) from fill port (Figure 3, Item 2).

CAUTION

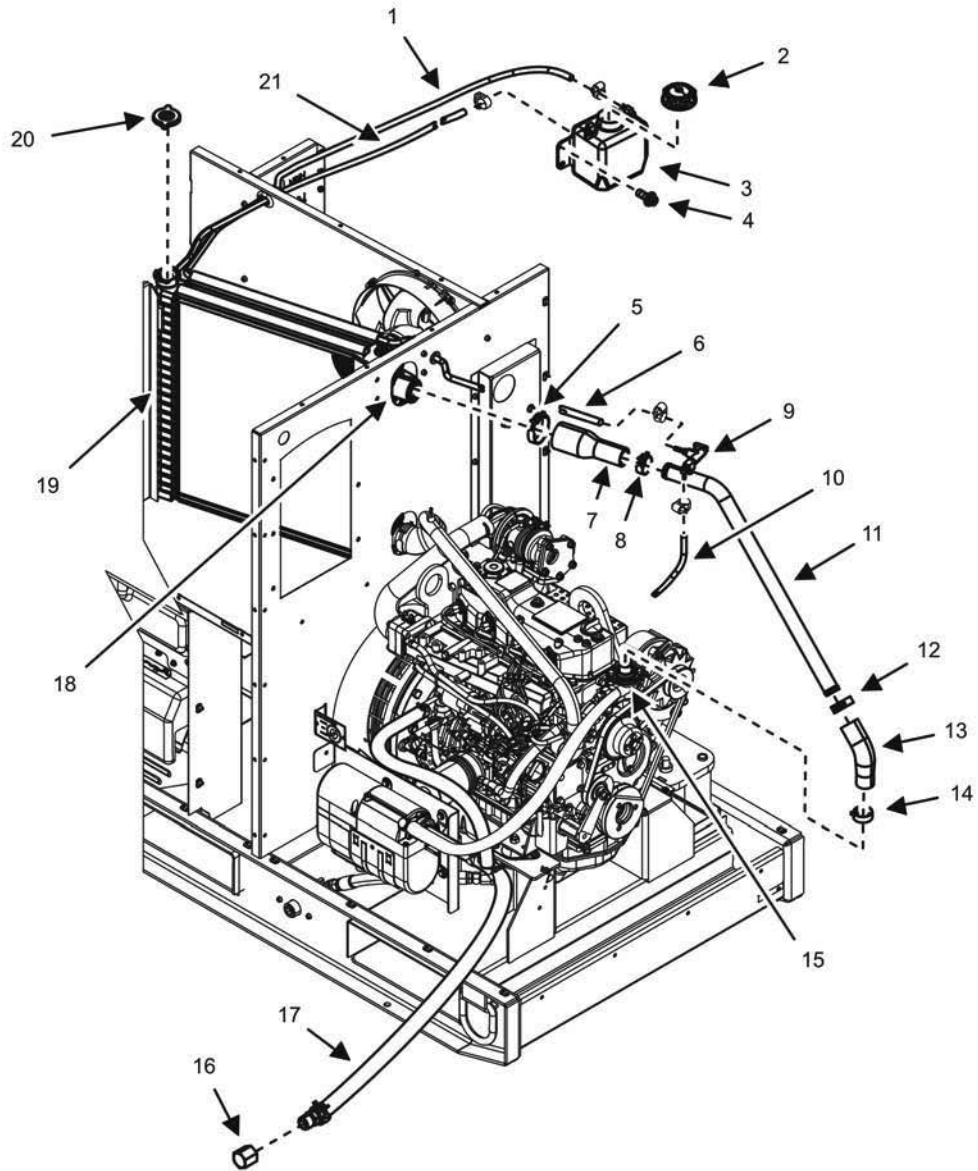
Be sure to close radiator cap securely. If cap is loose or improperly closed, coolant may leak, causing engine to overheat. Failure to comply may cause damage to equipment.

15. Install radiator cap (Figure 2, Item 2) to fill port (Figure 3, Item 2).

END OF TASK

Drain Engine Coolant

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door of unit and locate coolant drain hose (Figure 4, Item 17).



Legend

- | | |
|--------------------------------|----------------------------------|
| 1. Coolant Recovery Hose | 12. Hose Clip |
| 2. Coolant Recovery Bottle Cap | 13. Upper Radiator Flexible Hose |
| 3. Coolant Recovery Bottle | 14. Hose Clip |
| 4. Screw with Captive Washer | 15. Thermostat Housing |
| 5. Hose Clip | 16. Cap |
| 6. Coolant Recovery Hose | 17. Coolant Drain Hose |
| 7. Flex Pipe | 18. Bulkhead Fitting |
| 8. Hose Clip | 19. Radiator |
| 9. Pressure Equalization Valve | 20. Radiator Cap |
| 10. Coolant Recovery Hose | 21. Coolant Recovery Hose |
| 11. Radiator Upper Tube | |

Figure 4. Cooling System.

NOTE

The AMMPS 15 kW generator set is shipped from the factory filled with commercial-grade coolant. The color of the commercial-grade coolant may be different from the Mil-Standard coolant with which you are familiar.

The commercial-grade coolant is compatible with the Mil-Standard coolant specified in this manual. Therefore, Mil-Standard coolant may be used to top-off coolant level prior to the first maintenance interval. Commercial-grade coolant should be drained and replaced with Mil-Standard coolant as directed at the first maintenance interval.

3. Drain coolant from engine:
 - a. Pull coolant drain hose (Figure 4, Item 17) through door opening.
 - b. Remove radiator cap (Figure 4, Item 20).

NOTE

Dispose of captured coolant IAW local SOP.

- c. Place a suitable container (minimum 5-gal capacity) under end of coolant drain hose (Figure 4, Item 17) to capture drained coolant.
 - d. Remove cap (Figure 4, Item 16) from end of coolant drain hose (Figure 4, Item 17) and allow coolant to drain into container.
 - e. Install cap (Figure 4, Item 16) onto end of coolant drain hose (Figure 4, Item 17) when coolant flow has stopped.
 - f. Store coolant drain hose (Figure 4, Item 17) inside unit.
4. Remove upper radiator hose assembly:

NOTE

Residual coolant may drain from flex pipe (Figure 4, Item 7) when removed from bulkhead fitting (Figure 4, Item 18). Dispose of captured coolant IAW local SOP.

- a. Place a suitable container (1 gal (3.78 L) minimum) under flex pipe (Figure 4, Item 7) at bulkhead fitting (Figure 4, Item 18).
 - b. Remove coolant recovery hoses (Figure 4, Item 6 and 10) from pressure equalization valve (Figure 4, Item 9) on upper radiator tube (Figure 4, Item 11).
 - c. Disengage hose clip (Figure 4, Item 5) securing flex pipe (Figure 4, Item 7) to bulkhead fitting (Figure 4, Item 18).
 - d. Remove flex pipe (Figure 4, Item 7) from bulkhead fitting (Figure 4, Item 18).
 - e. Drain coolant from upper radiator tube (Figure 4, Item 11) by bending upper radiator flexible hose (Figure 4, Item 13) at thermostat housing (Figure 4, Item 15) while holding container under open end of hose.
 - f. Disengage hose clip (Figure 4, Item 14) and remove upper radiator flexible hose (Figure 4, Item 13) from thermostat housing (Figure 4, Item 15).
 - g. Remove radiator upper hose and tube assembly (Figure 4, Item 7, 11, and 13) from unit.
 - h. Cap/plug openings in radiator (Figure 4, Item 19), thermostat housing (Figure 4, Item 15), and coolant recovery hoses (Figure 4, Items 6 and 10) to prevent dirt and debris from entering cooling system.
5. Inspect and install upper radiator hose assembly:

- a. Remove residual coolant from hose fitting on radiator (Figure 4, Item 19) with scale remover and wiping rag.
 - b. Loosen two hose clips (Figure 4, Items 8 and 12) and remove upper radiator flexible hose (Figure 4, Item 13) and flex pipe (Figure 4, Item 7) from upper radiator tube (Figure 4, Item 11).
 - c. Inspect upper radiator flexible hose (Figure 4, Item 13), flex pipe (Figure 4, Item 7), and upper radiator tube (Figure 4, Item 11) for damage, deterioration, and/or obstructions.
 - d. Remove any obstructions in upper radiator flexible hose (Figure 4, Item 13) and flex pipe (Figure 4, Item 7), and replace damaged upper radiator tube (Figure 4, Item 11) and upper radiator flexible hose (Figure 4, Item 13) and flex pipe (Figure 4, Item 7) as required.
 - e. Inspect hose clips (Figure 4, Items 5, 8, 12, and 14) for excessive corrosion or signs of damage, and replace as required.
 - f. Remove caps/plugs from hoses and fittings.
 - g. Install radiator upper hose and tube assembly (Figure 4, Items 7, 11, and 13) (WP 0024, Remove/Install Radiator Hose and Tube Assemblies).
6. Inspect and clean coolant recovery bottle:
- a. Place suitable container and wiping rag by coolant recovery bottle (Figure 4, Item 3).
 - b. Remove coolant recovery hoses (Figure 4, Items 1 and 21) from top of coolant recovery bottle (Figure 4, Item 3) and drain excess coolant into suitable container.
 - c. Cap/plug openings in coolant recovery hoses (Figure 4, Items 1 and 21).
 - d. Remove four hex cap screws with captive washers (Figure 4, Item 4) securing coolant recovery bottle (Figure 4, Item 3) to fuel system panel behind fuel filler cap.
 - e. Remove coolant recovery bottle (Figure 4, Item 3) from fuel system panel behind fuel filler cap, and discard coolant IAW local SOP.
 - f. Clean coolant recovery bottle (Figure 4, Item 3) as required.
 - g. Inspect coolant recovery bottle (Figure 4, Item 3) for cracks or other damage, and replace as required.
 - h. Install coolant recovery bottle (Figure 4, Item 3) to fuel system panel behind fuel filler cap using four new screws with captive washers (Figure 4, Item 4).
 - i. Install coolant recovery hoses (Figure 4, Items 1 and 21) to coolant recovery bottle (Figure 4, Item 3).
 - j. Install coolant recovery bottle cap (Figure 4, Item 2) to coolant recovery bottle (Figure 4, Item 3) and secure tightly.
7. Install radiator cap (Figure 4, Item 20) and secure tightly.
8. Complete Clean Radiator Interior task, followed by Fill Radiator with Engine Coolant task if radiator requires flushing.
9. Move to Fill Radiator with Engine Coolant task if radiator (Figure 4, Item 19) does not require flushing.

END OF TASK

Clean Radiator Interior**WARNING**

- Engine cooling system cleaning compound MIL-C-10597F (ME) Cleaning Compound with Conditioner for Engine Cooling Systems will not be used as a routine maintenance procedure each time antifreeze is added or drained from the cooling system. The compound will be used only when necessary to clean heavily rusted or partially clogged cooling systems. Failure to comply may cause injury or death to personnel.
- Engine cleaning compound MIL-C-10597F (ME) for cooling systems is designed to clean the interiors of cooling systems, to neutralize residual cleaning acids, and to coat the interiors with a silicate. Failure to comply may cause injury or death to personnel.

NOTE

The AMMPS 15 kW generator set is shipped from the factory filled with commercial-grade coolant. The color of the commercial-grade coolant may be different from the Mil-Standard coolant with which you are familiar.

The commercial-grade coolant is compatible with the Mil-Standard coolant specified in this manual. Therefore, Mil-Standard coolant may be used to top-off coolant level prior to the first maintenance interval. Commercial-grade coolant should be drained and replaced with Mil-Standard coolant as directed at the first maintenance interval.

Dispose of captured coolant IAW local SOP.

1. Drain engine coolant if not already drained. See Drain Engine Coolant task.
2. Open all drain cocks and remove engine block drain when engine is stopped and temperature of coolant is considerably below 200°F (93°C).
3. Add clean water and, while so doing, start the engine at fast idle (drains open). Flush by continually flooding cooling system with clean water while engine is running for 25 min.
4. Stop engine, close all pet cocks, install engine block drain, refill with clean water, and maintain level in cooling system.
5. Fill cooling system with coolant mixture when cleaning cycle is finished. See Fill Radiator with Engine Coolant task.

END OF TASK**Fill Radiator with Engine Coolant****NOTE**

The AMMPS 15 kW generator set is shipped from the factory filled with commercial-grade coolant. The color of the commercial-grade coolant may be different from the Mil-Standard coolant with which you are familiar.

The commercial-grade coolant is compatible with the Mil-Standard coolant specified in this manual. Therefore, Mil-Standard coolant may be used to top-off coolant level prior to the first maintenance interval. Commercial-grade coolant should be drained and replaced with Mil-Standard coolant as directed at the first maintenance interval.

1. Remove radiator cap (Figure 4, Item 20) from radiator (Figure 4, Item 19).

2. Open pressure equalization valve (Figure 4, Item 9) on upper radiator tube (Figure 4, Item 11) assembly by lifting the pressure equalization valve (Figure 4, Item 9) lever 90 degrees from position shown.

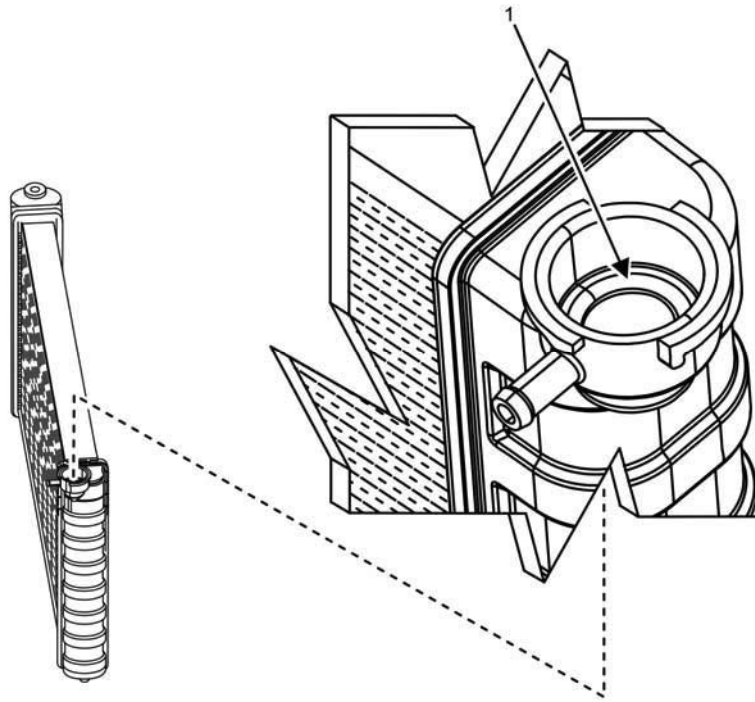


Figure 5. Radiator Fill Port.

NOTE

Pour coolant slowly into the radiator (Figure 4, Item 19) to allow trapped air to escape.

3. Fill radiator (Figure 4, Item 19) with approved mixture of one-half clean water and one-half engine coolant until coolant level reaches narrow opening at the bottom of the filler neck (Figure 5, Item 1).

CAUTION

Be sure to close radiator cap (Figure 4, Item 20) securely. If cap (Figure 4, Item 20) is improperly closed, coolant may leak, causing engine to overheat. Failure to comply may cause damage to equipment.

4. Install radiator cap (Figure 4, Item 20) and tighten securely.
5. Remove coolant recovery bottle cap (Figure 4, Item 2) from coolant recovery bottle (Figure 4, Item 3). Fill coolant recovery bottle (Figure 4, Item 3) with coolant mixture up to level of LOW marking line on fuel system panel behind fuel filler cap.
6. Install coolant recovery bottle cap (Figure 4, Item 2) securely on coolant recovery bottle (Figure 4, Item 3).
7. Return pressure equalization valve (Figure 4, Item 9) lever to original position.
8. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
9. Close generator set doors.
10. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
11. Start engine and run for 5 min (TM 9-6115-751-10).

-
12. Stop engine and let cool (TM 9-6115-751-10).
 13. Open right-side door and remove negative ground cable from right-hand battery (WP 0036, Remove/Install Batteries).
 14. Check coolant level in coolant recovery bottle (Figure 4, Item 3), and add coolant mixture as required to bring level of coolant in coolant recovery bottle (Figure 4, Item 3) to LOW marking line.

CAUTION

Be sure to close radiator cap (Figure 4, Item 20) securely. If cap (Figure 4, Item 20) is loose or improperly closed, coolant may leak, causing engine to overheat. Failure to comply may cause damage to equipment.

15. Close right- and left-side doors on generator set.
16. Install top body panel (WP 0028, Remove/Install Top Body Panel).
17. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
18. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
19. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
20. Inspect cooling system for leaks.
21. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL COOLANT RECOVERY SYSTEM

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Hose, vent, radiator (WP 0110, Repair Parts List, Figure 10, Item 13)

Hose, vent, radiator (WP 0110, Figure 10, Item 15)

Tank, coolant (WP 0110, Figure 10, Item 16)

Antifreeze, ethylene glycol (WP 0164, Expendable and Durable Items List, Item 2)

Rag, wiping (WP 0164, Item 32)

Soap, ivory (WP 0164, Item 34)

Personnel Required

91D (1)

Assistant (1)

References

WP 0021, Service Cooling System

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL COOLANT RECOVERY SYSTEM**WARNING**

- Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.
- Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.
- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.
- Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.

WARNING

- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator set is running. Failure to comply may cause injury or death to personnel.

Remove Coolant Recovery System

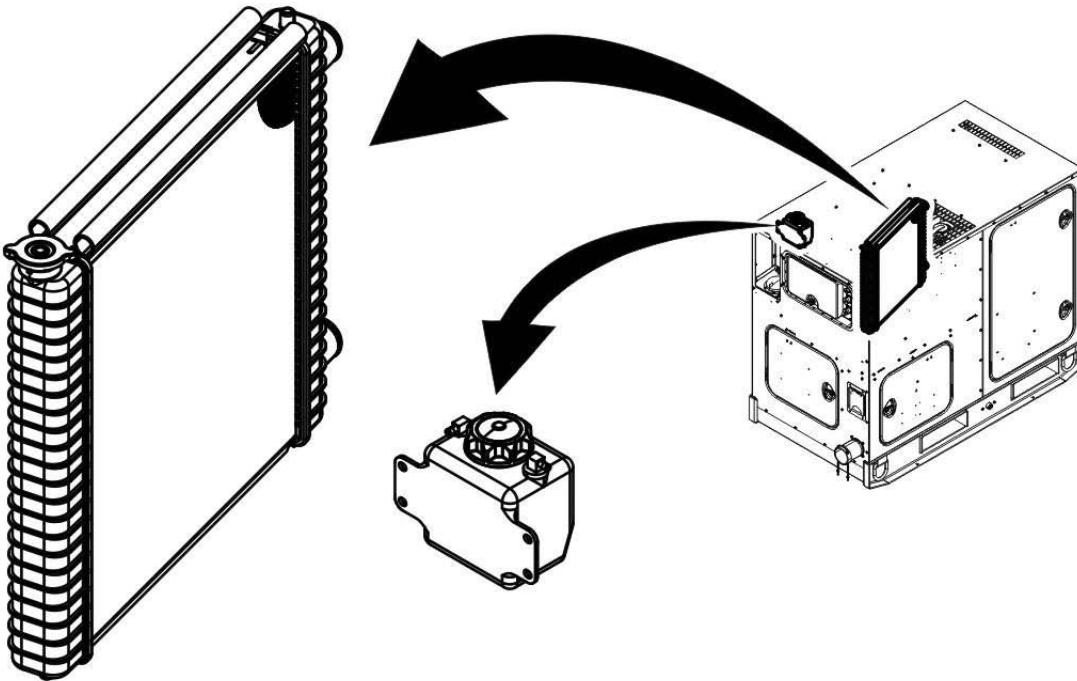


Figure 1. Coolant Recovery System — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate components of coolant recovery system (Figure 1).

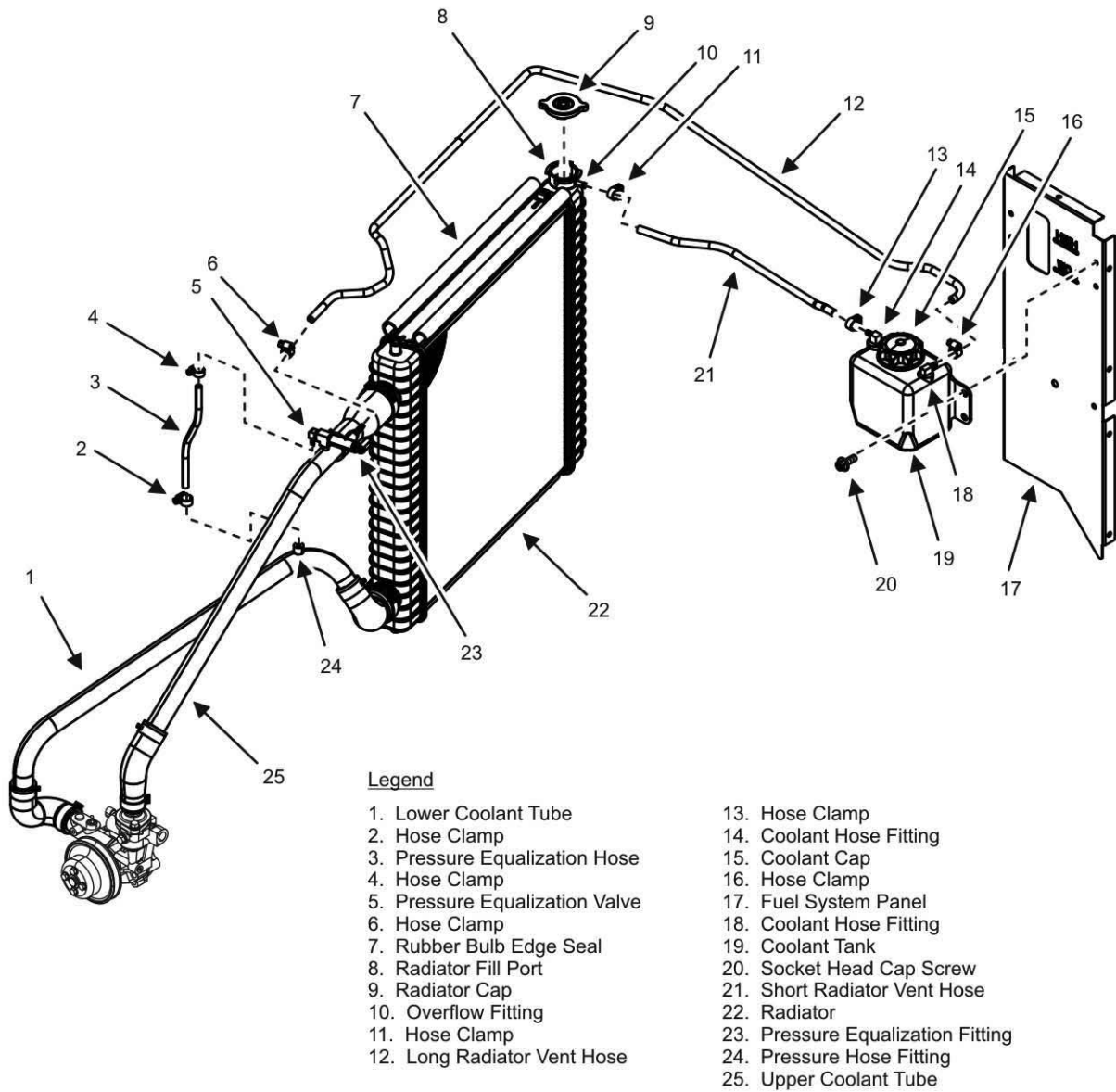


Figure 2. Coolant Recovery System.

3. Place wiping rag over radiator cap (Figure 2, Item 9).
4. Turn radiator cap (Figure 2, Item 9) gently counterclockwise to first détente to relieve residual pressure in cooling system.
5. Turn radiator cap (Figure 2, Item 9) counterclockwise to second détente after pressure is relieved.
6. Remove radiator cap (Figure 2, Item 9) and cover radiator fill port (Figure 2, Item 8).
7. Inspect radiator cap (Figure 2, Item 9) for cracked gasket or other damage and replace as required.

NOTE

Cap/plug all open coolant lines/fittings to prevent dirt and debris from entering the cooling system.

Dispose of captured coolant IAW local SOP.

8. Disengage hose clamps (Figure 2, Items 13 and 16) and remove two radiator vent hoses (Figure 2, Items 12 and 21) from coolant hose fittings (Figure 2, Items 14 and 18) on top of coolant tank (Figure 2, Item 19).
9. Push radiator vent hoses (Figure 2, Items 12 and 21) through fan support panel (not shown) toward radiator (Figure 2, Item 22).
10. Remove four socket head cap screws (Figure 2, Item 20) securing coolant tank (Figure 2, Item 19) to fuel system panel (Figure 2, Item 17) behind fuel filler cap.
11. Remove coolant tank (Figure 2, Item 19) from unit and place on a suitable work surface.
12. Disengage hose clamp (Figure 2, Item 11) from coolant overflow fitting (Figure 2, Item 10) beneath radiator fill port (Figure 2, Item 8) and remove short radiator vent hose (Figure 2, Item 21) and hose clamp (Figure 2, Item 11).
13. Place short radiator vent hose (Figure 2, Item 21) and hose clamp (Figure 2, Item 11) on a suitable work surface.
14. Disengage hose clamp (Figure 2, Item 6) and disconnect long radiator vent hose (Figure 2, Item 12) from pressure equalization fitting (Figure 2, Item 23) of pressure equalization valve (Figure 2, Item 5) on upper coolant tube (Figure 2, Item 25).
15. Insert long radiator vent hose (Figure 2, Item 12) from engine side through opening in bulkhead panel toward radiator (Figure 2, Item 22).
16. Remove rubber bulb edge seal (Figure 2, Item 7) containing long radiator vent hose (Figure 2, Item 12) from top of radiator (Figure 2, Item 22).
17. Extract long radiator vent hose (Figure 2, Item 12) from inside rubber edge bulb seal (Figure 2, Item 7) and place on a suitable work surface.
18. Remove hose clamps (Figure 2, Items 2 and 4) connecting pressure equalization hose (Figure 2, Item 3) to pressure equalization valve (Figure 2, Item 5) on upper coolant tube (Figure 2, Item 25) and pressure hose fitting (Figure 2, Item 24) on lower coolant tube (Figure 2, Item 1).
19. Remove pressure equalization hose (Figure 2, Item 3) from unit and place on a suitable work surface.
20. Inspect all hose clamps (Figure 2, Items 2, 4, 6, 11, 13, and 16) for corrosion, breaks, or other damage, and replace as required.
21. Inspect coolant tank (Figure 2, Item 19) for damage, and replace as required.
22. Inspect radiator vent hoses (Figure 2, Items 12 and 21) for damage and replace as required.

END OF TASK

Install Coolant Recovery System

NOTE

Wipe down hoses, parts, and connectors with wiping rag prior to installation.

1. Position coolant tank (Figure 2, Item 19) to its mounting location on fuel system panel (Figure 2, Item 17) behind fuel filler neck and secure by installing four hex cap screws (Figure 2, Item 20).
2. Install short radiator vent hose (Figure 2, Item 21) and hose clamp (Figure 2, Item 11) to metallic coolant hose fitting (Figure 2, Item 14) on coolant tank (Figure 2, Item 19).
3. Attach free end of short radiator vent hose (Figure 2, Item 21) to coolant overflow fitting (Figure 2, Item 10) beneath radiator fill port (Figure 2, Item 8).
4. Install long radiator vent hose (Figure 2, Item 12) and hose clamp (Figure 2, Item 16) to remaining coolant hose fitting (Figure 2, Item 18) on top of coolant tank (Figure 2, Item 19).

NOTE

Remove all caps/plugs from coolant lines prior to installation.

5. Place free end of long radiator vent hose (Figure 2, Item 12) inside rubber bulb edge seal (Figure 2, Item 7) from top of radiator and deliver long radiator vent hose (Figure 2, Item 12) through length of rubber bulb edge seal (Figure 2, Item 7).
6. Attach rubber bulb edge seal (Figure 2, Item 7) to top of radiator (Figure 2, Item 22), being careful not to damage radiator vent hose (Figure 2, Item 12) inside.
7. Insert free end of long radiator vent hose (Figure 2, Item 12) through bulkhead opening (not shown) beside upper coolant hose (Figure 2, Item 25) and carefully pull long radiator vent hose (Figure 2, Item 21) through opening.
8. Lubricate fitting on pressure equalization valve (Figure 2, Item 5) with liquid soap to facilitate future removal.
9. Attach long radiator vent hose (Figure 2, Item 12) to pressure equalization fitting (Figure 2, Item 23) on pressure equalization valve (Figure 2, Item 5) using hose clamp (Figure 2, Item 6).
10. Place hose clamps (Figure 2, Items 2 and 4) at each end of pressure equalization hose (Figure 2, Item 3).
11. Install pressure equalization hose (Figure 2, Item 3) from pressure equalization valve (Figure 2, Item 5) on upper coolant tube (Figure 2, Item 25) to pressure hose fitting (Figure 2, Item 24) on lower coolant tube (Figure 2, Item 1).
12. Secure hose clamps (Figure 2, Items 2, 4, 6, and 16) on ends of long radiator vent hose (Figure 2, Item 12) and pressure equalization hose (Figure 2, Item 3).
13. Place a mixture of one-half clean water and one-half engine coolant (WP 0021, Service Cooling System) into radiator until mixture covers fins inside radiator.
14. Install and secure radiator cap (Figure 2, Item 9).
15. Place a mixture of one-half clean water and one-half engine coolant (WP 0021, Service Cooling System) into coolant tank until level with COOL line.
16. Install and secure coolant cap (Figure 2, Item 15) on coolant tank (Figure 2, Item 19).
17. Close generator set doors.
18. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).

NOTE

Running the engine will reveal any leaks in the coolant recovery lines.

19. Start engine and run until fan cycles on and off two times (TM 9-6115-751-10).
20. Check for leaks at all coolant hose fittings.
21. Turn engine OFF (TM 9-6115-751-10).
22. Allow engine to cool.
23. Check coolant level and add coolant as required (WP 0021, Service Cooling System).
24. Install top body panel (WP 0028, Remove/Install Top Body Panel).

NOTE

Dispose of captured coolant IAW local SOP.

25. Close generator set doors.
26. Set engine control switch to PRIME & RUN (TM 9-6115-751-10).
27. Start engine and check for leaks and proper operation (TM 9-6115-751-10).
28. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL COOLING FANS

INITIAL SETUP:**Test Equipment**

Not Applicable

References

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Materials/Parts

Fan, engine cooling (WP 0110, Repair Parts List, Figure 10, Item 47)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Cleaning compound, solvent, (WP 0164, Expendable and Durable Items List, Item 11)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Grease, electrically conductive (WP 0164, Item 21)

Special Environmental Conditions

Rag, wiping (WP 0164, Item 32)

Not Applicable

Personnel Required

91D (1)

Drawings Required

Not Applicable

Assistant (1)

REMOVE/INSTALL COOLING FAN**WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- Cooling fan has sharp blades. Use caution and wear gloves when removing or installing fans. Failure to comply may cause injury or death to personnel.

Remove Cooling Fan

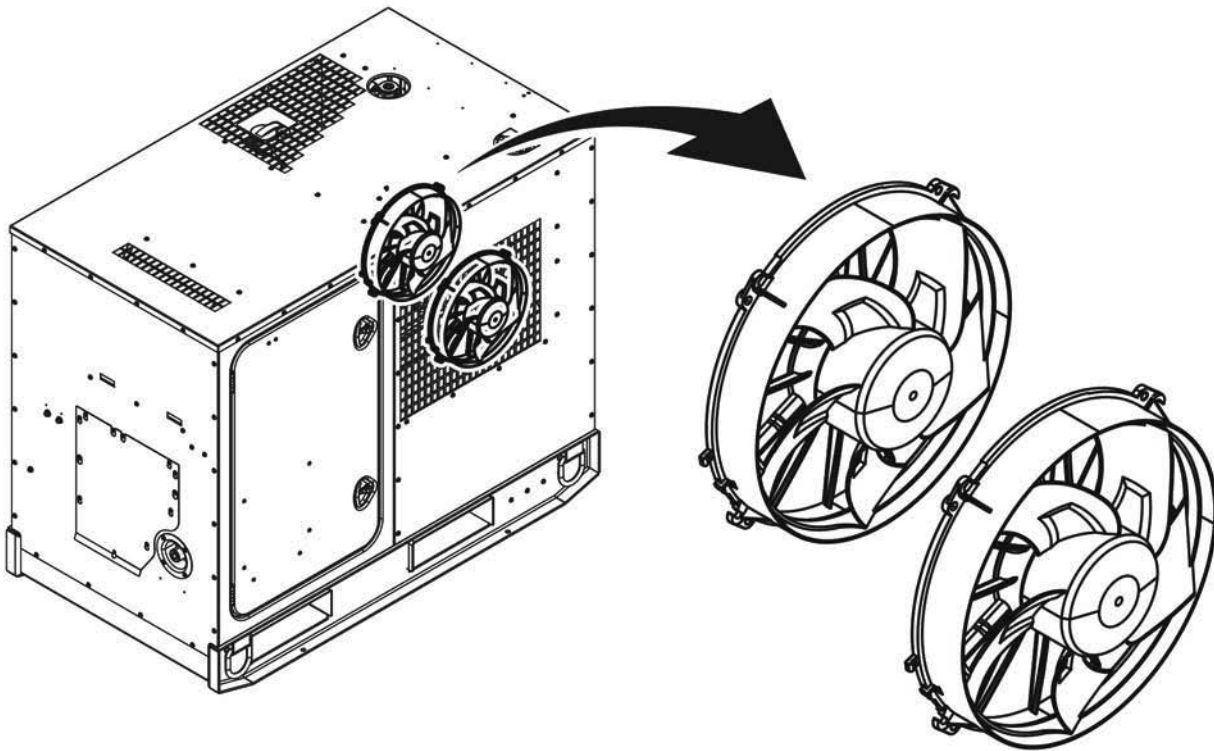


Figure 1. Cooling Fans — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate cooling fans (Figure 1) on left side of unit next to radiator.

NOTE

Two cooling fans are installed in the AMMPS 15 kW generator set. Both cooling fans are removed/installed using the same procedure. The following procedure describes remove and install steps for one cooling fan.

Both fan electrical leads (Figure 2, Item 7) are secured to fan support panel (Figure 2, Item 2) with a hex socket head screw (Figure 2, Item 9) and flange nut (Figure 2, Item 5) that secure lower fan to support panel (Figure 2, Item 2). If removing the upper cooling fan, hex socket head screw (Figure 2, Item 9) and flange nut (Figure 2, Item 5) must be removed from lower cooling fan.

3. Disconnect cooling fan electrical lead (Figure 2, Item 7) from unit wiring harness (Figure 2, Item 8).

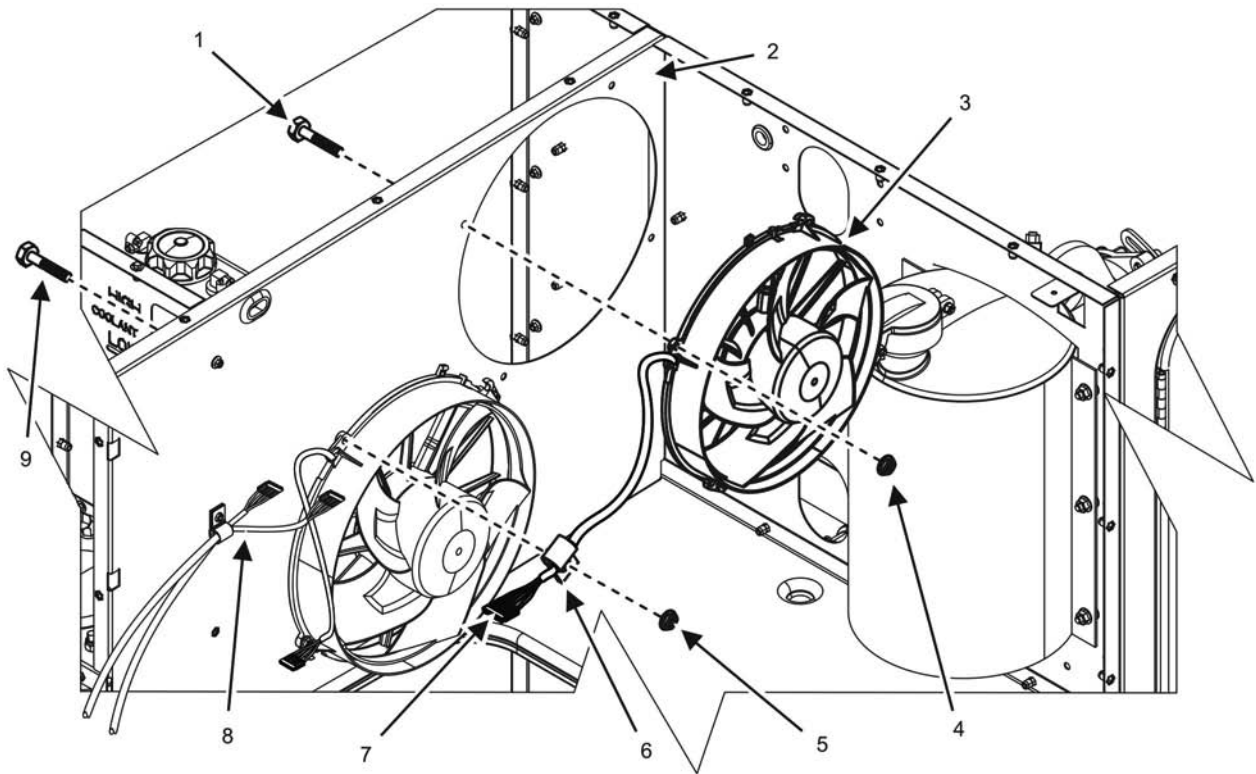


Figure 2. Cooling Fan — Details.

NOTE

One of the four hex socket head screws (Figure 2, Item 1) may also secure P-clamp (Figure 2, Item 6) to fan support panel (Figure 2, Item 2). Note location of P-clamp (Figure 2, Item 6) for installation.

4. Remove four hex socket head screws (Figure 2, Item 1) and four flange nuts (Figure 2, Item 4) securing cooling fan (Figure 2, Item 3) to fan support panel (Figure 2, Item 5).
5. Remove hex socket head screw (Figure 2, Item 9) and flange nut (Figure 2, Item 5) if needed to remove P-clamp (Figure 2, Item 6).
6. 6. Remove cooling fan (Figure 2, Item 3) from unit and place on a suitable work surface.

WARNING

Cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

7. Remove dirt and debris from surface of cooling fan (Figure 2, Item 3) using cleaning solvent and wiping rags

END OF TASK

Inspect Cooling Fan

1. Inspect cooling fan (Figure 2, Item 3) for damage to fan guard and fan blades, and replace cooling fan (Figure 2, Item 3) as required.
2. Inspect electrical leads (Figure 2, Item 7) for cracked insulation, broken wires, or other damage, and replace fan as required.
3. Inspect fan support panel (Figure 2, Item 2) for excessive corrosion or other damage, and replace as required.
4. Inspect hex socket head screws (Figure 2, Items 1 and 9) and flange nuts (Figure 2, Items 4 and 5) for excessive corrosion or damage and replace as required.

END OF TASK**Install Cooling Fan**

1. Position cooling fan (Figure 2, Item 3) on fan support panel (Figure 2, Item 2).
2. Align cooling fan mounting holes with mounting holes in fan support panel (Figure 2, Item 2).
3. Insert electrical lead (Figure 2, Item 7) through P-clamp (Figure 2, Item 6).

NOTE

One of the four hex socket head screws (Figure 2, Item 1) may also secure P-clamp (Figure 2, Item 6) to fan support panel (Figure 2, Item 2). Install P-clamp to noted location.

4. Secure cooling fan (Figure 2, Item 3) to unit fan support panel (Figure 2, Item 2) with four hex socket head screws (Figure 2, Item 1) and four flange nuts (Figure 2, Item 4).
5. Install P-clamp (Figure 2, Item 6) to fan support panel (Figure 2, Item 2) with hex socket head screw (Figure 2, Item 9) and flange nut (Figure 2, Item 9) if installing upper cooling fan.
6. Connect cooling fan electrical lead (Figure 2, Item 7) to unit wiring harness (Figure 2, Item 8) at connector.
7. Install top panel (WP 0028, Remove/Install Top Body Panel).
8. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
9. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
10. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
11. Allow cooling fan to cycle on and off through two cycles to check for proper operation, and repair as required.
12. Close left-side door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL RADIATOR HOSE AND TUBE ASSEMBLIES

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Hose, coolant (WP 0110, Repair Parts List, Figure 10, Item 28)

Hose, coolant (WP 0110, Figure 10, Item 31)

Hose, coolant (WP 0110, Figure 10, Item 39)

Hose, coolant (WP 0110, Figure 10, Item 46)

Tube, coolant (WP 0110, Figure 10, Item 30)

Tube, coolant (WP 0110, Figure 10, Item 45)

Antifreeze, ethylene glycol (WP 0164, Expendable and Durable Items List, Item 2)

Cap set, protective (WP 0164, Item 9)

Cleaning compound, engine cooling system (WP 0164, Item 10)

Grease, electrically conductive (WP 0164, Item 21)

Pan, drain (1) (WP 0164, Item 29)

Materials/Parts

Rag, wiping (2) (WP 0164, Item 32)

Sealant (WP 0164, Item 33)

Personnel Required

91D (1)

Assistant (1)

References

WP 0027, Remove/Install Radiator

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Coolant drained (WP 0021, Service Cooling System)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL RADIATOR HOSE AND TUBE ASSEMBLIES
WARNING

- Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.
- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.

Remove Upper Radiator Hose Assembly

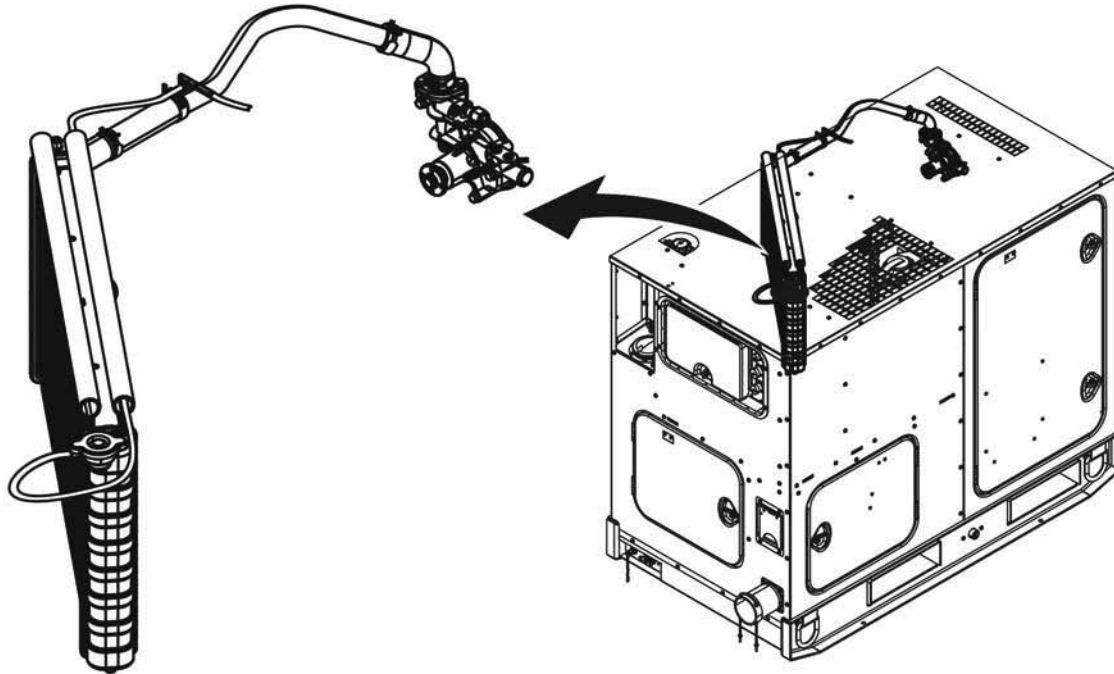


Figure 1. Upper Radiator Hose Assembly — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left- and right-side doors.
3. Locate upper radiator hose assembly (Figure 1).

NOTE

Place a suitable container and/or rags under upper radiator hose assembly (Figure 1) to capture residual coolant when components are removed.

To prevent contamination from entering the cooling system, cap/plug all open coolant hoses, tubes, and ports. This also limits spillage of residual coolant as components are removed.

4. Loosen hose clamp (Figure 2, Item 13) and remove hose (Figure 2, Item 14) from fitting (Figure 2, Item 11) at pressure equalization valve (Figure 2, Item 10) on upper radiator tube (Figure 2, Item 5).
5. Loosen hose clip (Figure 2, Item 8) and remove hose (Figure 2, Item 7) from thermostat housing (Figure 2, Item 9).
6. Loosen hose clip (Figure 2, Item 2) and remove hose (Figure 2, Item 3) from upper port of radiator (Figure 2, Item 1).
7. Remove upper radiator hose assembly (Figure 1) from generator set and place on a suitable work surface.
8. Remove two hose clips (Figure 2, Items 2 and 4) and hose (Figure 2, Item 3) from upper radiator tube (Figure 2, Item 5).

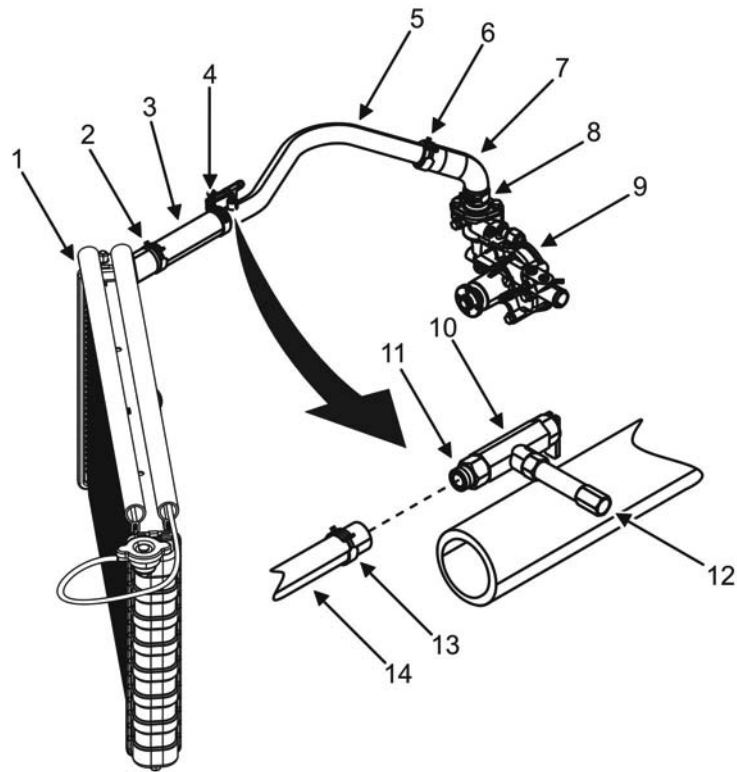


Figure 2. Upper Radiator Hose Assembly.

9. Remove two hose clips (Figure 2, Items 6 and 8) and hose (Figure 2, Item 7) from upper radiator tube (Figure 2, Item 5).
10. Remove pressure equalization valve (Figure 2, Item 10), fitting (Figure 2, Item 11), and plug (Figure 2, Item 12) from upper radiator tube (Figure 2, Item 5).
11. Dispose of captured coolant and soiled rags IAW local SOP.

END OF TASK

Inspect Upper Radiator Hose Assembly

1. Inspect hose clips (Figure 2, Items 2, 4, 6, and 8) and hose clamp (Figure 2, Item 13) for cracks, excessive corrosion, or other signs of obvious damage, and repair or replace as required.
2. Inspect hoses (Figure 2, Items 3 and 7) for firmness, cracks, wear, or other signs of obvious damage, and repair or replace as required.
3. Remove any scale from all hose ends with scale-removing compound and wiping rag prior to installation.
4. Inspect upper radiator tube (Figure 2, Item 5) for cracks, damage, or excessive corrosion, and replace as required.
5. Inspect upper port of radiator (Figure 2, Item 1) for damage and corrosion. Replace radiator (Figure 2, Item 1) if damage or corrosion are found (WP 0027, Remove/Install Radiator).

END OF TASK

Install Upper Radiator Hose Assembly

1. Wipe down hoses (Figure 2, Items 3 and 7), tube (Figure 2, Item 5), hose clamp (Figure 2, Items 13), and hose clips (Figure 2, Items 2, 4, 6, and 8) prior to installation.
2. Remove all caps/plugs prior to installation.
3. Remove any scale from hoses (Figure 2, Items 3 and 7) and tube (Figure 2, Item 5) using scale removing compound and wiping rags.
4. Apply a thin film of coolant to the inside of all hose ends prior to installation.
5. Install hose (Figure 2, Item 3) and two hose clips (Figure 2, Items 2 and 4) to radiator end of upper radiator tube (Figure 2, Item 5).
6. Install hose (Figure 2, Item 7) and two hose clips (Figure 2, Items 6 and 8) to thermostat housing end of upper radiator tube (Figure 2, Item 5).
7. Apply thread sealing compound to threads of tee on upper radiator tube (Figure 2, Item 5) and fitting (Figure 2, Item 11).
8. Install fitting (Figure 2, Item 11) to pressure equalization valve (Figure 2, Item 10).
9. Install pressure equalization valve (Figure 2, Item 10) to tee of upper radiator tube (Figure 2, Item 5).
10. Position upper radiator hose assembly (Figure 1) to its mounting location in generator set and secure by installing hose (Figure 2, Item 3) to upper port of radiator (Figure 2, Item 1) and hose (Figure 2, Item 7) to thermostat housing (Figure 2, Item 9). Secure by installing hose clips (Figure 2, Items 2, 4, 6, and 8) to their final locations.

NOTE

Over-tightened hose clamps may cause hoses to crack and leak.

11. Install hose (Figure 2, Item 14) to pressure equalization valve (Figure 2, Item 10) and secure by tightening hose clamp (Figure 2, Item 13).
12. Fill radiator with engine coolant (WP 0021, Service Cooling System).
13. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
14. Close left- and right-side doors.
15. Set engine control switch to PRIME & RUN (TM 9-6115-751-10).
16. Start engine and check for coolant leaks and proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
17. Repair as required.

END OF TASK

Remove Lower Radiator Hose Assembly

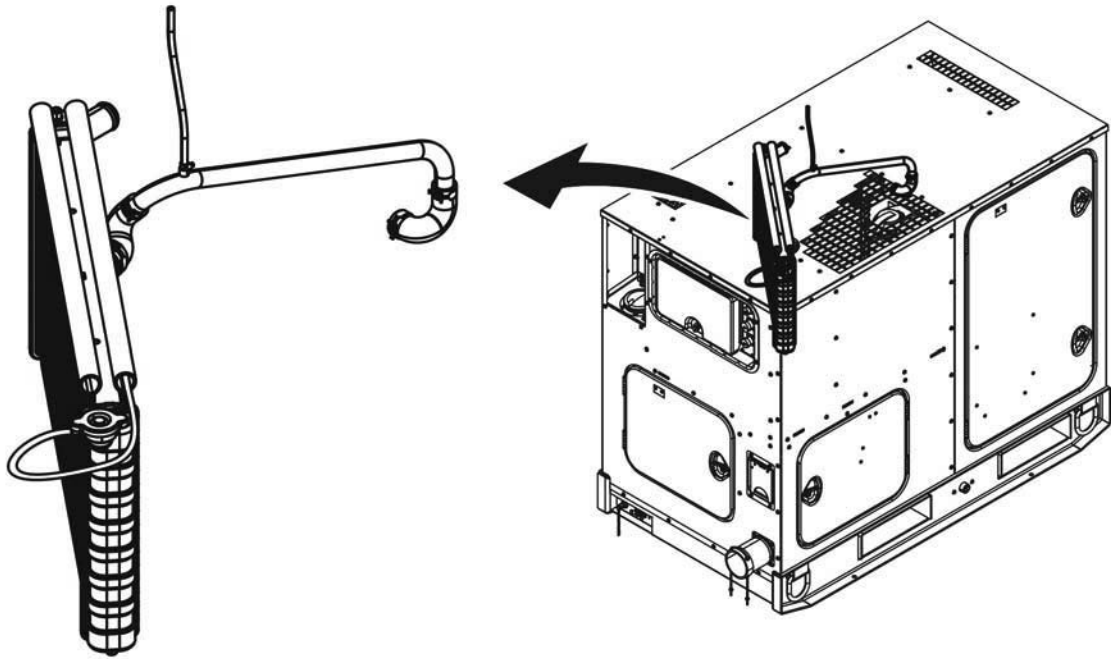


Figure 3. Lower Radiator Hose Assembly — Location.

1. Ensure equipment conditions are met in order presented in initial set up.
2. Open left- and right-side doors.
3. Lower radiator hose assembly (Figure 3).

NOTE

Place a suitable container and or rags under upper radiator hose assembly (Figure 3) to capture residual coolant when components are removed.

To prevent contamination from entering the cooling system, cap/plug all open coolant hoses, tubes, fittings, and ports. This also limits spillage of residual coolant as components are removed.

4. Loosen hose clamp (Figure 4, Item 3) that secures equalization hose (Figure 4, Item 2) to lower radiator tube (Figure 4, Item 5). Remove hose (Figure 4, Item 2) and insulation (Figure 4, Item 1) from lower radiator tube (Figure 4, Item 5).
5. Remove bolt (Figure 4, Item 12), nut (Figure 4, Item 9), and P-clamp (Figure 4, Item 10) securing lower radiator tube (Figure 4, Item 5) to bracket (Figure 4, Item 11).
6. Reposition hose clip (Figure 4, Item 8) that secures hose (Figure 4, Item 7) to water pump (Figure 4, Item 4). Remove hose (Figure 4, Item 7) from water pump (Figure 4, Item 4).
7. Reposition hose clip (Figure 4, Item 13) that secures hose (Figure 4, Item 14) to lower port of radiator (not shown). Remove hose (Figure 4, Item 14) from lower port of radiator (not shown).

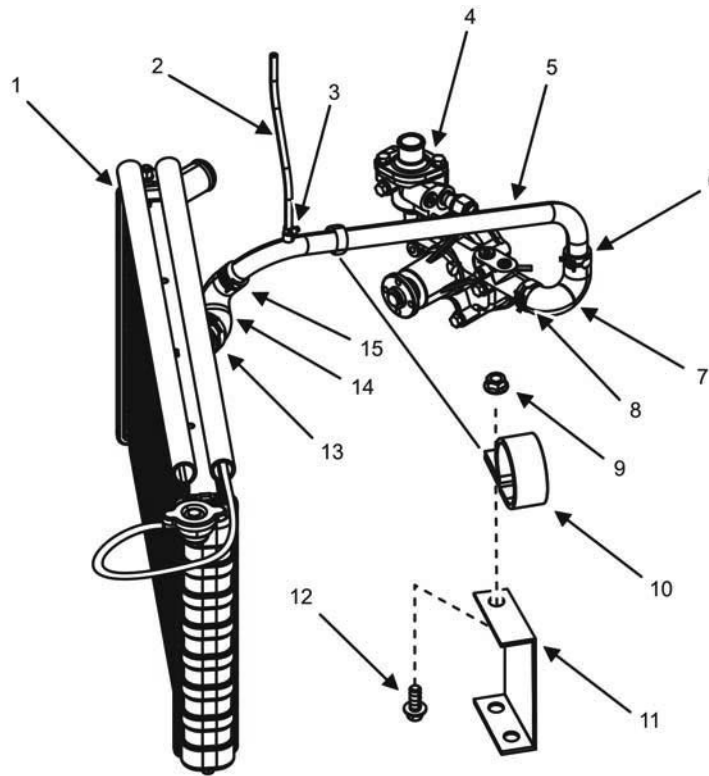


Figure 4. Lower Radiator Hose Assembly.

8. Remove lower radiator hose assembly (Figure 3) from generator set and place on a suitable work surface.
9. Remove four hose clips (Figure 4, Items 6, 8, 13, and 15) and hoses (Figure 4, Item 7 and 14) from lower radiator tube (Figure 4, Item 5).
10. Dispose of captured coolant and soiled rags IAW local SOP.

END OF TASK

Inspect Lower Radiator Hose Assembly

1. Inspect hose clamp (Figure 4, Item 3) and hose clips (Figure 4, Items 6, 8, 13, and 15) for cracks, excessive corrosion, or other signs of obvious damage, and repair or replace components as required.
2. Inspect hoses (Figure 4, Item 7 and 14) for firmness, cracks, wear, or other signs of obvious damage, and repair or replace as required.
3. Remove any scale from ends of hoses (Figure 4, Item 7 and 14) using scale-removing compound and wiping rag prior to installation.
4. Inspect lower radiator tube (Figure 4, Item 5) for cracks, damage, or excessive corrosion, and replace as required.
5. Inspect lower port of radiator (not shown) for damage. Replace radiator (not shown) if damage is found (WP 0027, Remove/Install Radiator).
6. Inspect insulation (Figure 4, Item 1) for tears or fraying. Replace insulation (Figure 4, Item 1) if torn or frayed.

END OF TASK

Install Lower Radiator Hose Assembly

1. Wipe down all components prior to installation.
2. Remove all caps/plugs prior to installation.
3. Apply a thin film of coolant to the inside ends of hoses (Figure 4, Item 7 and 14) prior to installation.
4. Install hose (Figure 4, Item 14) and two clips (Figure 4, Item 13 and 15) to radiator end of lower radiator tube (Figure 4, Item 5).
5. Install hose (Figure 4, Item 7) and two clips (Figure 4, Item 6 and 8) to water pump end of lower radiator tube (Figure 4, Item 5).
6. Position lower radiator hose assembly (Figure 3) to its mounting location on generator set.
7. Align hoses (Figure 4, Items 7 and 14) and lower radiator tube (Figure 4, Item 5) to their proper position on lower port of radiator (not shown) and water pump (Figure 4, Item 4) and secure by repositioning hose clips (Figure 4, Items 6, 8, 13, and 15) in their final locations.

CAUTION

Over-tightened hose clamps may cause hoses to crack and leak. Failure to comply may cause damage to equipment.

8. Install insulation (Figure 4, Item 1) and hose clamp (Figure 4, Item 3) to hose (Figure 4, Item 2) and install hose (Figure 4, Item 2) to lower radiator tube (Figure 4, Item 5).
9. Secure hose (Figure 4, Item 2) to lower radiator tube (Figure 4, Item 5) by tightening hose clamp (Figure 4, Item 3) in its final position.
10. Fill radiator with engine coolant (WP 0021, Service Cooling System).
11. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

12. Set engine control switch to PRIME & RUN (TM 9-6115-751-10).
13. Start engine and check for coolant leaks and proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
14. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL WINTERIZATION KIT COMPONENTS

INITIAL SETUP:**Test Equipment**

Beaker, Laboratory (WP 0163, Maintenance Allocation Chart, Item 6)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Item 38)

Materials/Parts

Heater, assembly (WP 0156, Repair Parts List, Figure 56, Item 2)

Pump, fuel (WP 0156, Figure 56, Item 24)

Antifreeze, ethylene glycol (WP 0164, Item 2)

Cap set, protective (WP 0164, Expendable and Durable Items List, Item 9)

Fuel, diesel (WP 0164, Item 20)

Rag, wiping (WP 0164, Item 32)

Personnel Required

91D (1)

References

WP 0021, Service Cooling System

WP 0036, Remove/Install Batteries

WP 0043, Service Fuel System

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Top body panel removed (WP 0028)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL WINTERIZATION KIT COMPONENTS**WARNING**

- Make sure engine control switch is only set to PRIME & RUN during fuel system checks. Failure to comply may cause injury or death to personnel.
- Never inject fuel near a fire source. Atomized fuel is highly combustible. Fuel pressure is high enough to penetrate skin. Ensure that spray from the injector nozzle is directed away from all personnel. Direct contact with spray can cause skin cell destruction and blood poisoning. Skin and eye protection are required when working in contact with fuel. Failure to comply may cause injury or death to personnel and damage to equipment.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

WARNING

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.
- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.
- When operating, winterization kit has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow winterization kit to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

NOTE

Winterization kit is optional for AMMPS. This WP instructs how to test, remove, and install winterization kit components to an AMMPS unit that is already equipped with a kit.

Test Winterization Kit Fuel Flow

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door and locate coolant heater (Figure 1) attached to unit skid.
3. Place wiping rags under winterization kit fuel line to capture spilled fuel when fuel pump/fuel line is removed.

NOTE

Capture and dispose of spilled fuel IAW local SOP.

4. Loosen hose clamp (not shown) securing fuel line (Figure 2, Item 4) to fuel port (Figure 2, Item 5).
5. Remove fuel line (Figure 2, Item 4) from coolant heater (Figure 2, Item 1).
6. Place open fuel line (Figure 2, Item 4) into graduated cylinder (Figure 2, Item 3).
7. Cap open fuel port on coolant heater (Figure 2, Item 1) to prevent dirt and debris from entering coolant heater (Figure 2, Item 1).
8. Run winterization test through DCS (TM-9-6115-751-10).
9. Allow fuel to flow into graduated cylinder (Figure 2, Item 3) until fuel flow is uniform (approximately 40 sec).

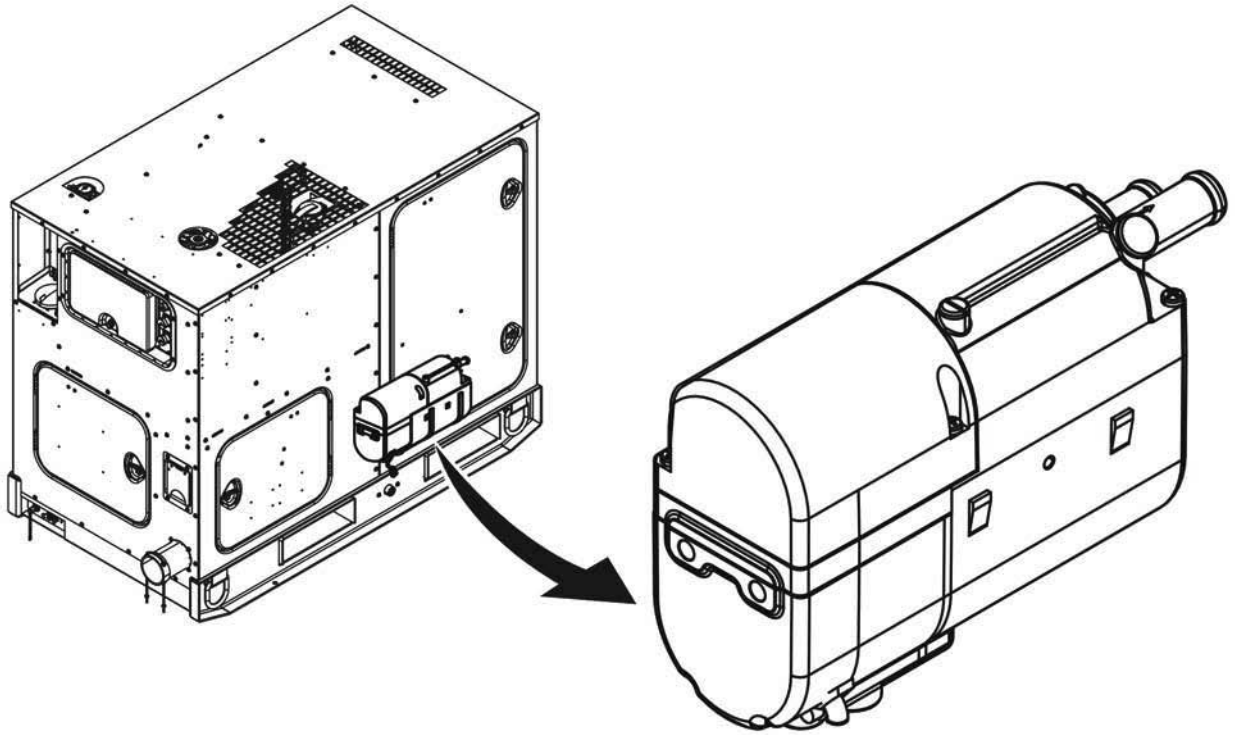


Figure 1. Coolant Heater — Location.

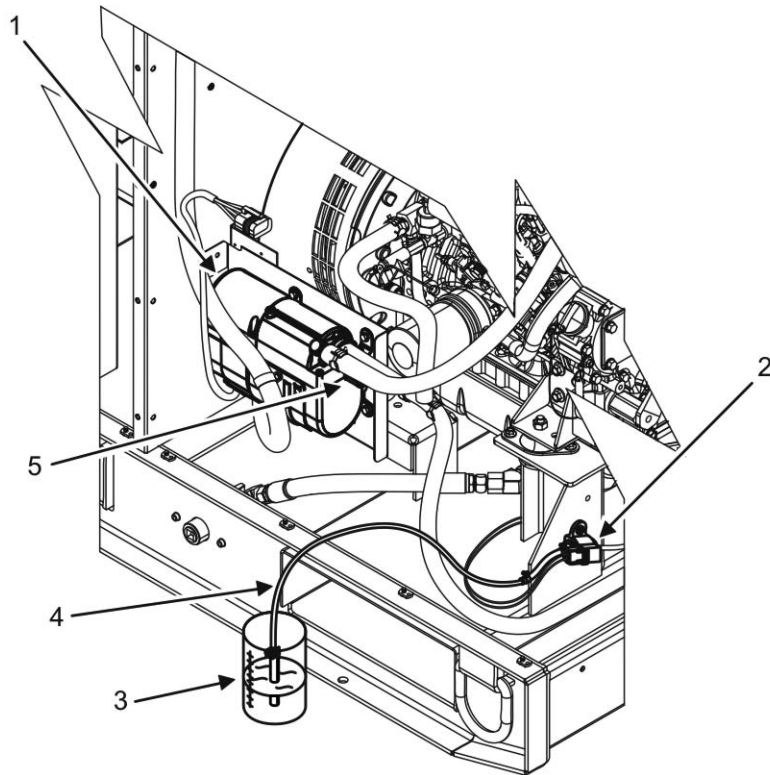


Figure 2. Winterization Kit — Test Fuel Flow.

10. Stop winterization test (TM 9-6115-751-10).
11. Empty captured fuel from graduated cylinder (Figure 2, Item 3) into a suitable container for disposal.
12. Place open fuel line (Figure 2, Item 4) once again into graduated cylinder (Figure 2, Item 3).
13. Run winterization test again through DCS (TM-9-6115-751-10). Allow fuel to flow into graduated cylinder (Figure 2, Item 3) for 90 sec.
14. Stop winterization test (TM 9-6115-751-10).
15. Verify amount of fuel captured in graduated cylinder (Figure 2, Item 3) after 90-sec test. Fuel flow should be between 0.25 oz (7.5 cm³) and 0.29 oz (8.6 cm³).
16. Check fuel line (Figure 2, Item 4) to fuel port (Figure 2, Item 5) for leaks, kinks, and other restrictions if measured fuel flow is less than 0.25 oz (7.5 cm³), and replace fuel line as required.
17. Replace winterization kit fuel pump (Figure 2, Item 2) if measured fuel flow is less than 0.25 oz (7.5 cm³), greater than .29 oz (8.6 cm³), or if no restriction in fuel line is found. See Remove/Install Winterization Kit Fuel Pump task.
18. Connect fuel line (Figure 2, Item 4) to fuel port (Figure 2, Item 5).
19. Position and tighten clamp (not shown) to secure fuel line (Figure 2, Item 4) to fuel port (Figure 2, Item 5) of coolant heater (Figure 2, Item 1).
20. Close right-side door.
21. Install top body panel (WP 0028, Remove/Install Top Body Panel).
22. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
23. Start engine (TM 9-6115-751-10).
24. Verify proper operation of coolant heater (Figure 2, Item 5).
25. Repair as required.
26. Dispose of captured fuel and soiled rags IAW local SOP.

END OF TASK

Remove Winterization Kit Fuel Pump

1. Ensure equipment conditions are met in order presented at initial set up.
2. Open left-side door.
3. Remove negative ground cable from right-hand battery (WP 0036, Remove/Install Batteries).
4. Open right-side door.
5. Remove metal clip (Figure 3, Item 6) and disconnect wiring harness (Figure 3, Item 7) from winterization kit fuel pump (Figure 3, Item 5).

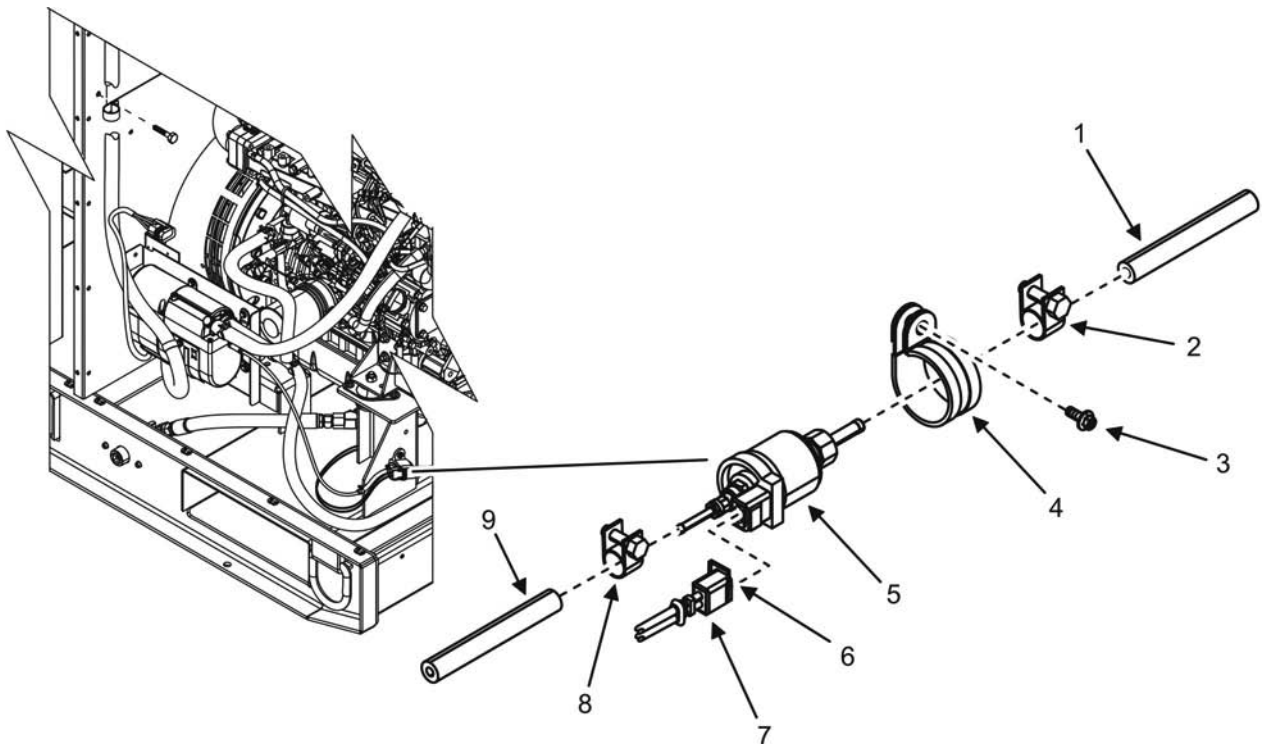


Figure 3. Winterization Kit Fuel Pump – Removal.

NOTE

Capture and dispose of spilled fuel and coolant IAW local SOP.

6. Place a suitable container under winterization kit fuel pump (Figure 3, Item 5) to catch spilled fuel.
7. Loosen screw (Figure 3, Item 3) securing rubber mounting bracket (Figure 3, Item 4) and winterization kit fuel pump (Figure 3, Item 5) to unit skid.
8. Loosen clamps (Figure 3, Items 2 and 8) and disconnect fuel lines (Figure 3, Items 1 and 9) from winterization kit fuel pump (Figure 3, Item 5).
9. Insert caps/plugs into fuel lines (Figure 3, Items 1 and 9) and both ends of winterization kit fuel pump (Figure 3, Item 5).
10. Remove winterization kit fuel pump (Figure 3, Item 5) from rubber mounting bracket (Figure 3, Item 4).
11. Dispose of captured fuel and coolant IAW local SOP.

END OF TASK

Install Winterization Kit Fuel Pump

NOTE

Wipe down hoses, parts, and connectors with wiping rag prior to installation.

1. Inspect rubber mounting bracket (Figure 3, Item 4) securing winterization kit fuel pump (Figure 3, Item 5) to unit skid. Replace rubber mounting bracket (Figure 3, Item 4) if worn or damaged.
2. Slide winterization kit fuel pump (Figure 3, Item 5) into rubber mounting bracket (Figure 3, Item 4).

NOTE

Capture and dispose of spilled fuel and coolant IAW local SOP.

3. Remove caps/plugs from fuel lines (Figure 3, Items 1 and 9) and winterization kit fuel pump (Figure 3, Item 5).
4. Connect fuel lines (Figure 3, Items 1 and 9) to winterization kit fuel pump (Figure 3, Item 5) using clamps (Figure 3, Items 2 and 8).
5. Use screw (Figure 3, Item 3) to secure rubber mounting bracket (Figure 3, Item 4) and winterization kit fuel pump (Figure 3, Item 5) to unit skid.
6. Remove container from under winterization kit fuel pump (Figure 3, Item 5).
7. Dispose of captured fuel IAW local SOP.
8. Connect wiring harness (Figure 3, Item 7) to winterization kit fuel pump (Figure 3, Item 5) using metal clip (Figure 3, Item 6).
9. Close right-side door.
10. Install top body panel (WP 0028).
11. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
12. Ensure unit fuel is at proper operating level (TM 9-6115-751-10).
13. Purge fuel system (WP 0043, Service Fuel System).
14. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
15. Start engine and check for proper operation (TM 9-6115-751-10).
16. Remove coolant heater if coolant is not being heated. See Remove Coolant Heater task.

END OF TASK**Remove Coolant Heater Assembly**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove negative ground cable from right-hand battery (WP 0036, Remove/Install Batteries).
3. Drain cooling system (WP 0021, Service Cooling System).
4. Disconnect coolant heater electrical connector (Figure 4, Item 12) from unit wiring harness (not shown).

NOTE

Capture spilled coolant and dispose of IAW local SOP. Cap/plug all open coolant lines/fittings to prevent dirt and debris from entering the cooling system.

5. Place a suitable container under coolant heater (Figure 4, Item 1) to capture spilled coolant.
6. Loosen hose clamp (Figure 4, Item 5) securing coolant heater outlet hose (Figure 4, Item 4) on coolant heater (Figure 4, Item 1).
7. Loosen hose clamp (Figure 4, Item 2) securing coolant heater inlet hose (Figure 4, Item 3) on coolant heater (Figure 4, Item 1).

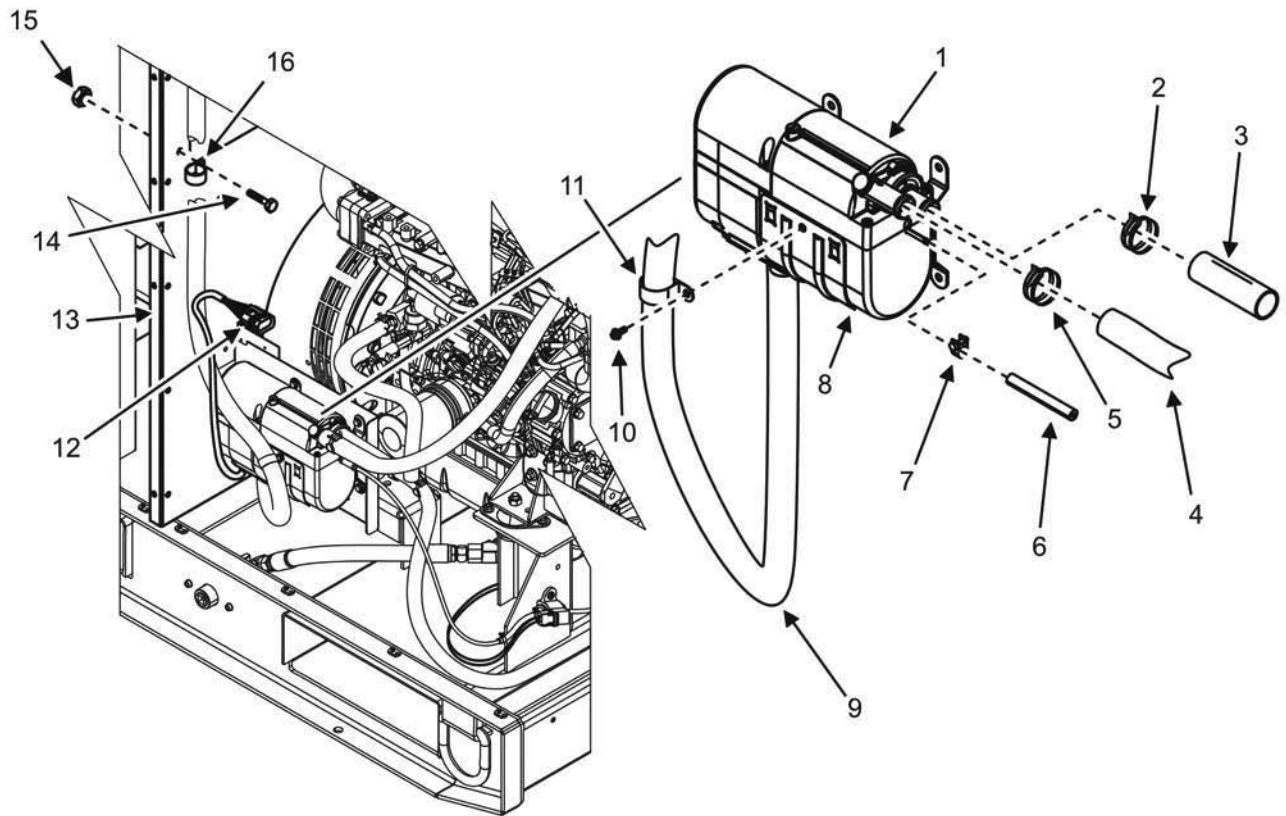


Figure 4. Coolant Heater Assembly Connections.

8. Remove coolant heater outlet hose (Figure 4, Item 4) and coolant heater inlet hose (Figure 4, Item 3) from coolant heater (Figure 4, Item 1).
9. Inspect coolant heater outlet hose (Figure 4, Item 4) and coolant heater inlet hose (Figure 4, Item 3) for damage or cracking, and replace as required.
10. Remove coolant catch container.

NOTE

Capture spilled fuel and dispose of IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

11. Place a suitable fuel catch container under coolant heater (Figure 4, Item 1) to catch spilled fuel.
12. Loosen hose clamp (Figure 4, Item 7) securing heater fuel hose (Figure 4, Item 6) to coolant heater (Figure 4, Item 1).
13. Remove heater fuel hose (Figure 4, Item 6) from coolant heater (Figure 4, Item 1).
14. Cap/plug fuel port on coolant heater (Figure 4, Item 1) to prevent contamination from entering coolant heater (Figure 4, Item 1) and to prevent spills when coolant heater (Figure 4, Item 1) is removed.
15. Remove fuel catch container.
16. Remove screw (Figure 4, Item 10) that secures clamp (Figure 4, Item 11), exhaust tube (Figure 4, Item 9), and coolant heater (Figure 4, Item 1) to coolant heater cradle (Figure 4, Item 8).
17. Remove screw and nut (Figure 4, Items 14 and 15) and clamp (Figure 4, Item 16) that secures exhaust tube (Figure 4, Item 9) to interior bulkhead panel (Figure 4, Item 13).

18. Pull open end of exhaust tube (Figure 4, Item 9) from opening in interior bulkhead panel (Figure 4, Item 13).
19. Loosen but do not remove screw (not shown) behind coolant heater (Figure 4, Item 1) that secures coolant heater (Figure 4, Item 1) to cradle (Figure 4, Item 8).
20. Remove coolant heater (Figure 4, Item 1) with exhaust tube (Figure 4, Item 9) attached from cradle (Figure 4, Item 8) and place on a suitable work surface.
21. Dispose of spilled fluids IAW local SOP.

END OF TASK

Inspect Coolant Heater Assembly

1. Remove clamp (not shown) that secures exhaust tube (Figure 4, Item 9) to coolant heater (Figure 4, Item 1). Remove exhaust tube (Figure 4, Item 9) from coolant heater (Figure 4, Item 1).
2. Inspect exhaust tube (Figure 4, Item 9) and clamps (Figure 4, Item 11 and 16) for signs of obvious damage. Replace damaged components as required.
3. Remove any obstructions from inside exhaust tube (Figure 4, Item 9).
4. Remove caps/plugs from coolant and fuel ports of coolant heater (Figure 4, Item 1).
5. Empty residual coolant and fuel from coolant heater (Figure 4, Item 1) into a suitable container.
6. Replace caps/plugs into coolant and fuel ports of coolant heater (Figure 4, Item 1) to prevent dirt and debris from entering coolant heater (Figure 4, Item 1).
7. Inspect coolant heater (Figure 4, Item 1) for signs of damage.
8. Replace coolant heater (Figure 4, Item 1) if damaged, or save coolant heater (Figure 4, Item 1) for reuse.
7. Dispose of captured fuel and coolant IAW local SOP.

END OF TASK

Install Coolant Heater Assembly

1. Position exhaust tube (Figure 4, Item 9) to its mounting location on coolant heater (Figure 4, Item 1) and secure by installing clamp (not shown).
2. Position coolant heater (Figure 4, Item 1) to its mounting location in cradle (Figure 4, Item 8).
3. Position clamp (Figure 4, Item 11) on exhaust tube (Figure 4, Item 9) to its mounting location on cradle (Figure 4, Item 8) and secure by installing screw (Figure 4, Item 10). Screw (Figure 4, Item 10) also secures coolant heater (Figure 4, Item 1) to cradle (Figure 4, Item 8).
4. Install clamp (Figure 4, Item 16) onto exhaust tube (Figure 4, Item 9) and locate its mounting position on interior bulkhead panel (Figure 4, Item 13). Secure clamp (Figure 4, Item 16) to interior bulkhead panel (Figure 4, Item 13) by installing screw and nut (Figure 4, Items 14 and 15).
5. Tighten screw behind coolant heater (Figure 4, Item 1) that secures coolant heater (Figure 4, Item 1) to cradle (Figure 4, Item 8).

NOTE

Capture spilled fuel/coolant and dispose of IAW local SOP. Remove all caps/plugs from fuel and coolant lines and fittings prior to installation of each fuel or coolant line.

6. Place a suitable container under coolant heater (Figure 4, Item 1) to catch spilled fuel.
7. Remove plug from fuel hose (Figure 4, Item 6).

8. Push fuel hose (Figure 4, Item 6) and hose clamp (Figure 4, Item 7) onto coolant heater (Figure 4, Item 1).
9. Secure fuel hose (Figure 4, Item 6) to coolant heater (Figure 4, Item 1) by tightening hose clamp (Figure 4, Item 7).
10. Remove fuel catch container and dispose of captured fuel IAW local SOP.
11. Place a suitable coolant catch container under coolant heater (Figure 4, Item 1) to catch spilled coolant.
12. Remove plug from coolant heater outlet hose (Figure 4, Item 4).
13. Install coolant heater outlet hose (Figure 4, Item 4) onto coolant heater (Figure 4, Item 1).
14. Secure coolant heater outlet hose (Figure 4, Item 4) to coolant heater (Figure 4, Item 1) by installing hose clamp (Figure 4, Item 5).
15. Remove plug from coolant heater inlet hose (Figure 4, Item 3).
16. Install coolant heater inlet hose (Figure 4, Item 3) onto coolant heater (Figure 4, Item 1).
17. Secure coolant heater inlet hose (Figure 4, Item 3) to coolant heater (Figure 4, Item 1) by installing hose clamp (Figure 4, Item 2).
18. Remove coolant catch container and dispose of captured coolant IAW local SOP.
19. Connect electrical connector (Figure 4, Item 12) from coolant heater (Figure 4, Item 1) to unit wiring harness (not shown).
20. Fill cooling system (WP 0021, Service Cooling System).
21. Install top body panel (WP 0028, Remove/Install Top Body Panel).
22. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
23. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
24. Ensure fluid level is at proper operating level (TM 9-6115-751-10).
25. Purge fuel system (WP 0043, Service Fuel System).
26. Release air through overflow vent line for 5 min before start up (TM 9-6115-751-10).
27. Close generator set doors.
28. Start engine and check for leaks and proper operation (TM 9-6115-751-10).
29. Repair as required.

END OF TASK

Remove Cradle and Bracket

1. Remove coolant heater. See Remove Coolant Heater task.
2. Remove three screws (Figure 5, Items 4 and 7) and two nuts (Figure 5, Item 1) securing coolant heater mounting bracket (Figure 5, Item 3) to unit skid.
3. Place coolant heater mounting bracket (Figure 5, Item 3) on a suitable work surface.
4. Remove four screws (Figure 5, Item 8), and four nuts (Figure 5, Item 5) securing cradle (Figure 5, Item 6) to coolant heater mounting bracket (Figure 5, Item 3).
5. Inspect cradle (Figure 5, Item 6) and coolant heater mounting bracket (Figure 5, Item 3) for signs of obvious damage. Replace cradle (Figure 5, Item 6) and coolant heater mounting bracket (Figure 5, Item 3) if damaged.

END OF TASK

Install Cradle and Bracket

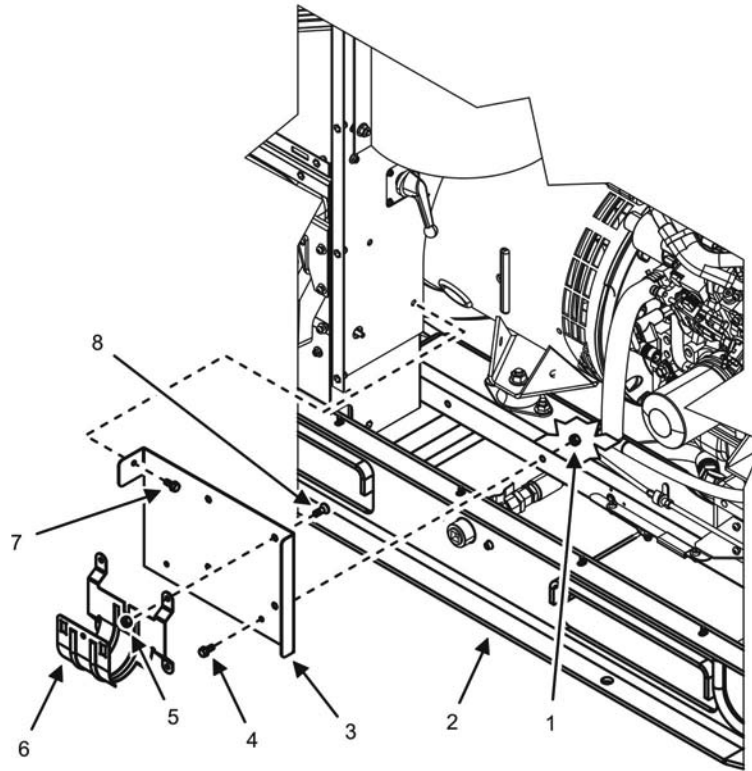


Figure 5. Coolant Heater Mounting Brackets.

1. Position cradle (Figure 5, Item 6) to its mounting location on coolant heater mounting bracket (Figure 5, Item 3) and align the mounting holes.
2. Secure cradle (Figure 5, Item 6) to coolant heater mounting bracket (Figure 5, Item 3) by installing four screws (Figure 5, Item 8) and four nuts (Figure 5, Item 5).
3. Position coolant heater mounting bracket (Figure 5, Item 3) to its mounting location on unit skid (Figure 5, Item 2) and align the mounting holes.
4. Secure coolant heater mounting bracket (Figure 5, Item 3) to unit skid by installing three screws (Figure 5, Items 4 and 7) and two nuts (Figure 5, Item 1). Tighten screws (Figure 5, Items 4 and 7) to 87 – 105 in/lb (10 – 11 Nm).
5. Install coolant heater. See Install Coolant Heater task.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
INSTALL WINTERIZATION KIT

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Tool Kit, Blind, Fastener, Installation (WP 0163, Item, 37)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0163, Item 48)

Materials/Parts

Kit, winterization (WP 0156, Repair Parts List, Figure 56, Item 1)

Alcohol, denatured (WP 0164, Expendable and Durable Items List, Item 1)

Antifreeze, ethylene glycol (WP 0164, Item 2)

Grease, electrically conductive (WP 0164, Item 21)

Rag, wiping (WP 0164, Item 32)

Personnel Required

91D (1)

References

WP 0025, Remove/Install Winterization Kit Components

WP 0043, Service Fuel System

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Right-side panel removed (WP 0032, Remove/Install Right-Side Panel)

Coolant drained (WP 0021, Service Cooling System)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

INSTALL WINTERIZATION KIT**WARNING**

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.
- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.

WARNING

- Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.
- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator set is running. Failure to comply may cause injury or death to personnel.

Install Winterization Kit

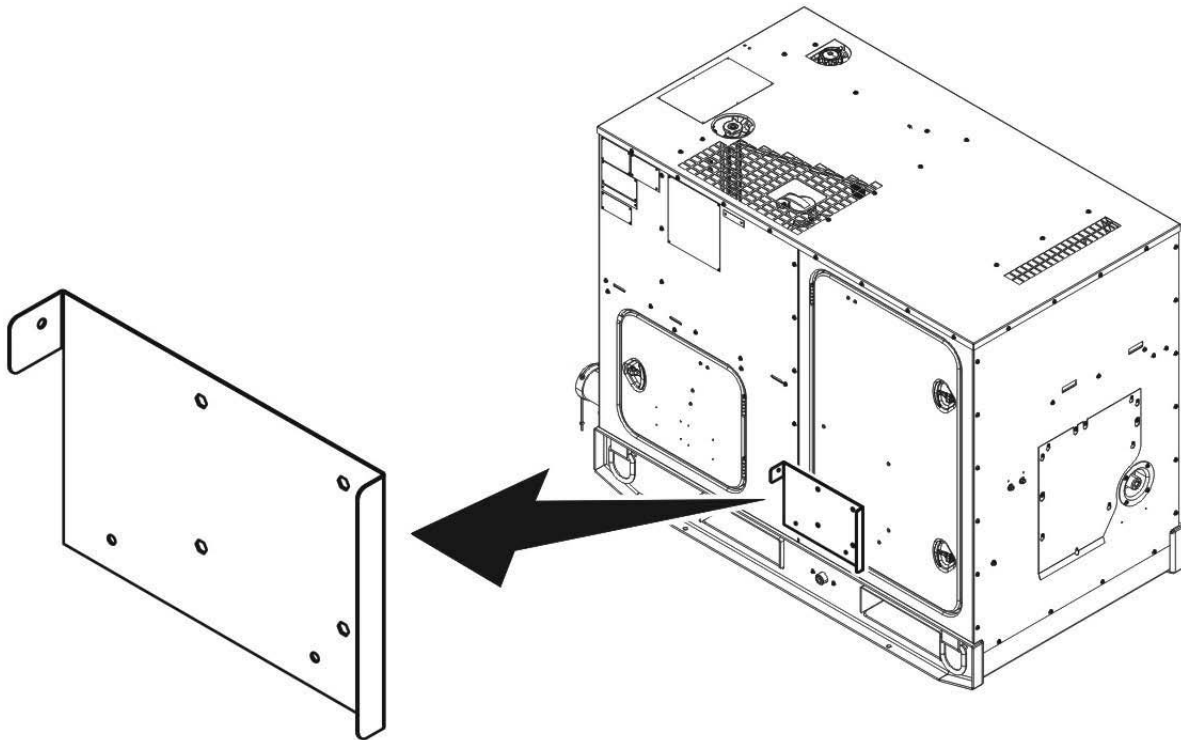


Figure 1. Winterization Kit Mounting Location.

NOTE

Winterization kit is optional for AMMPS generator sets. This WP instructs how to install a winterization kit to an AMMPS generator set that is not equipped with a winterization kit.

1. Ensure equipment conditions are met in order presented in initial setup.

2. Locate winterization kit mounting location on unit skid (Figure 1).

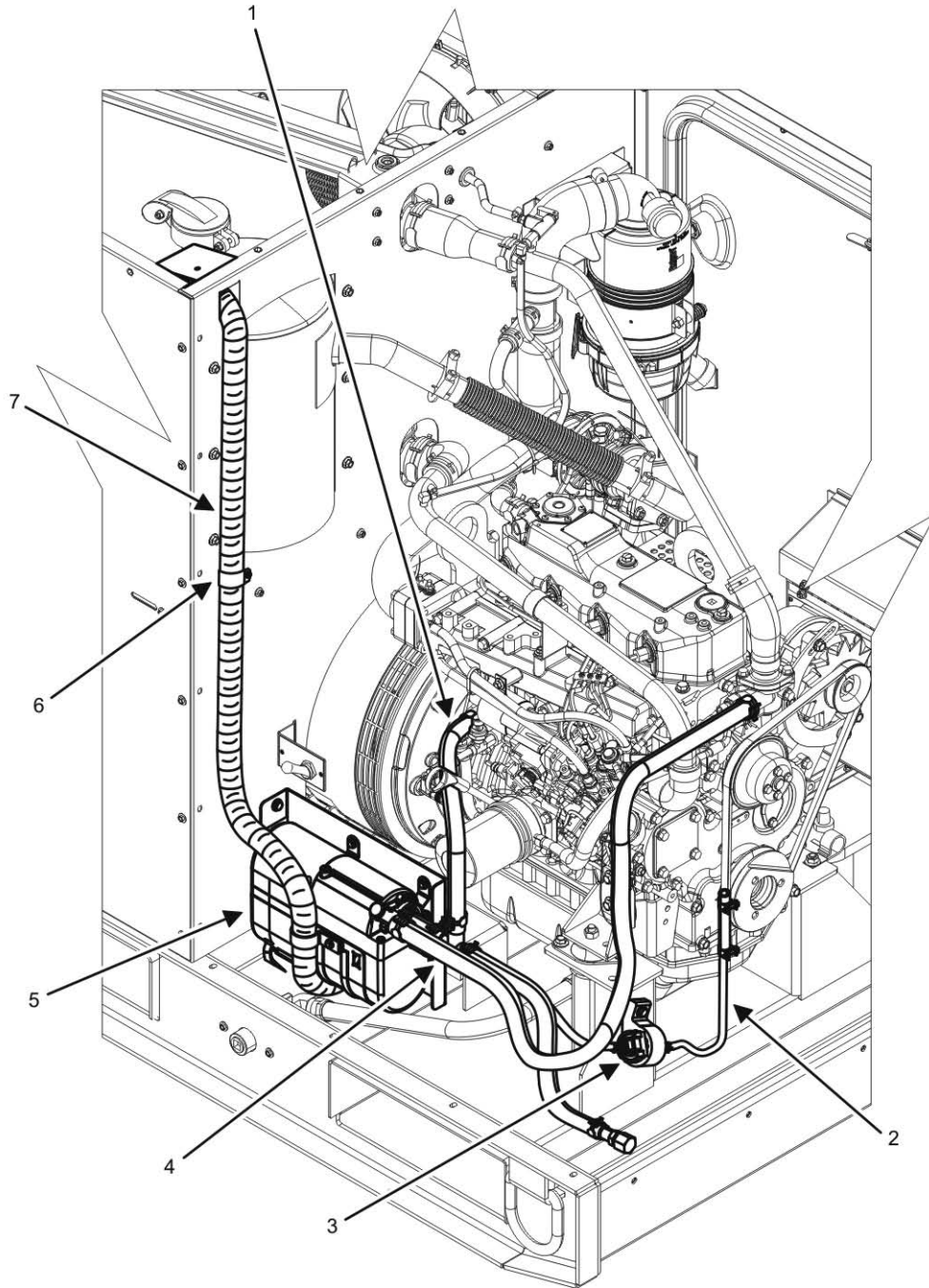


Figure 2. Winterization Kit Assembly.

NOTE

Winterization kit assembly (Figure 2) requires two fuel line assemblies (Figure 2, Item 2). One fuel line (Figure 2, Item 2) connects from the fuel manifold (Figure 3, Item 2) to the winterization kit fuel pump (Figure 2, Item 3). The second fuel line (Figure 2, Item 2) connects the winterization kit fuel pump (Figure 2, Item 3) to the coolant heater (Figure 2, Item 5). Fuel line assembly (Figure 2, Item 2) that connects fuel pump (Figure 2, Item 3) to coolant heater (Figure 2, Item 5) is installed step 9 of this task.

3. Prepare coolant heater fuel line assemblies (Figure 2, Item 2).
 - a. Insert one end of fuel tube (Figure 3, Item 3) into flexible hose (Figure 3, Item 5).

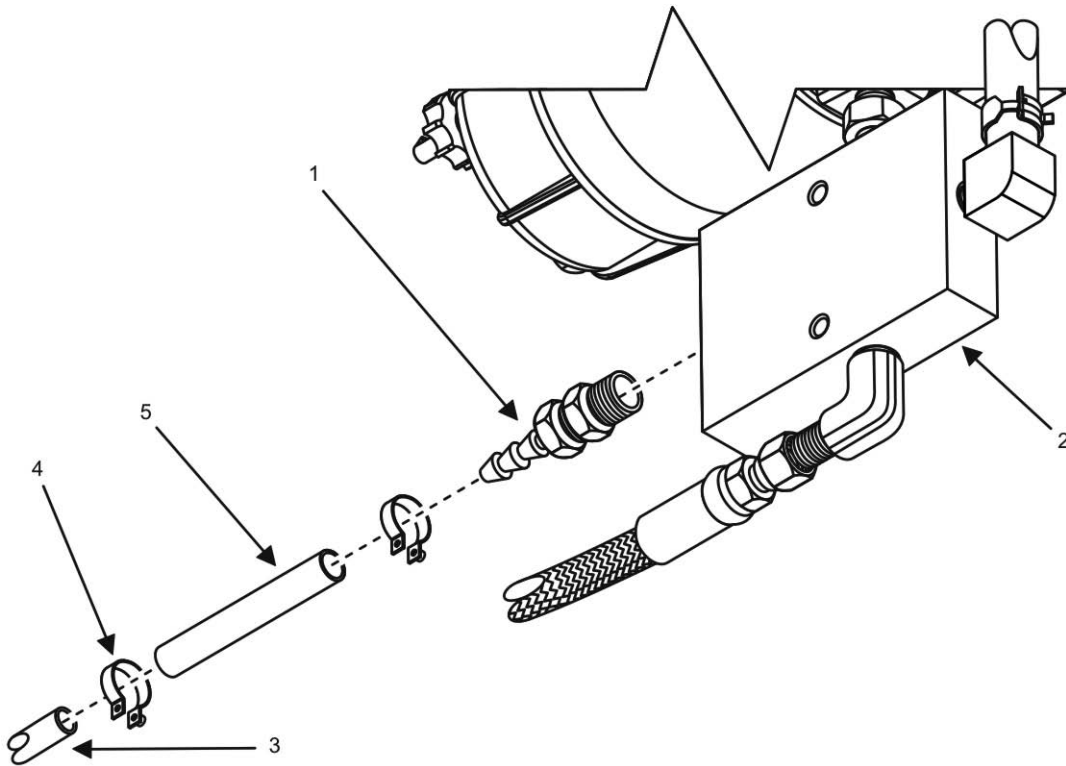


Figure 3. Coolant Heater Fuel Line Assembly.

- b. Secure with hose clamp (Figure 3, Item 4).
- c. Repeat steps 3a and b for other end of fuel tube (Figure 3, Item 3).
- d. Repeat steps 3a through c to assemble a second coolant heater fuel line assembly (Figure 2, Item 2).
- e. Insert hose adaptor (Figure 3, Item 1) into flexible hose (Figure 3, Item 5) and secure with hose clamp (Figure 3, Item 4).

NOTE

Use pipe thread sealant on all pipe threads of hose adaptor (Figure 3, Item 1). Cure time is 30 min to use full system and 72 hr for full strength.

- f. Apply pipe thread sealant to male threads of hose adaptor (Figure 3, Item 1).

NOTE

Capture spilled fuel and dispose of with IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

- g. Remove plug (not shown) from fuel manifold (Figure 3, Item 2).
 - h. Capture spilled fuel.
 - i. Install hose adaptor (Figure 3, Item 1) to fuel manifold (Figure 3, Item 2) and secure to 1 to 1 1/2 turns past finger-tight.
 - j. Reserve second fuel line assembly (Figure 2, Item 2) for installation in step 9.
4. Install coolant heater mounting bracket and coolant heater holder (WP 0025, Remove/Install Winterization Kit Components).

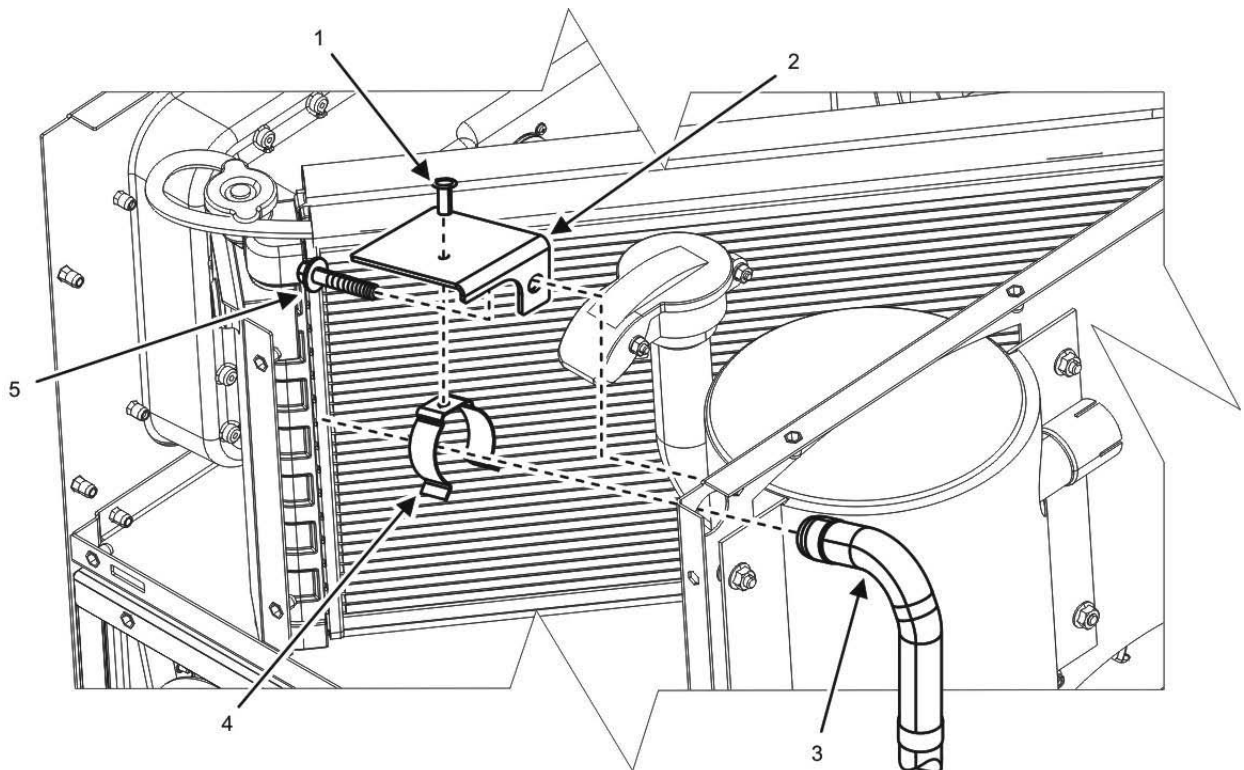


Figure 4. Air Exhaust Tube Bracket — Installation.

NOTE

Air exhaust tube (Figure 2, Item 7) and clamps (Figure 2, Item 6) will be installed during step 9.

5. Prepare air exhaust tube (Figure 2, Item 7).
 - a. Rivet clip (Figure 4, Item 4) to air exhaust tube bracket (Figure 4, Item 2) with blind rivet (Figure 4, Item 1).
 - b. Position air exhaust tube bracket (Figure 4, Item 2) to position on unit bulkhead.
 - c. Secure air exhaust tube bracket (Figure 4, Item 2) to unit bulkhead with mounting screw (Figure 4, Item 5).
 - d. Position air exhaust tube (Figure 2, Item 7) as depicted in Figure 2.
 - e. Insert end of air exhaust tube (Figure 4, Item 3) into clip (Figure 4, Item 4) of air exhaust tube bracket (Figure 4, Item 2).
 - f. Insert air exhaust tube (Figure 2, Item 7) through two clamps (Figure 2, Item 6).

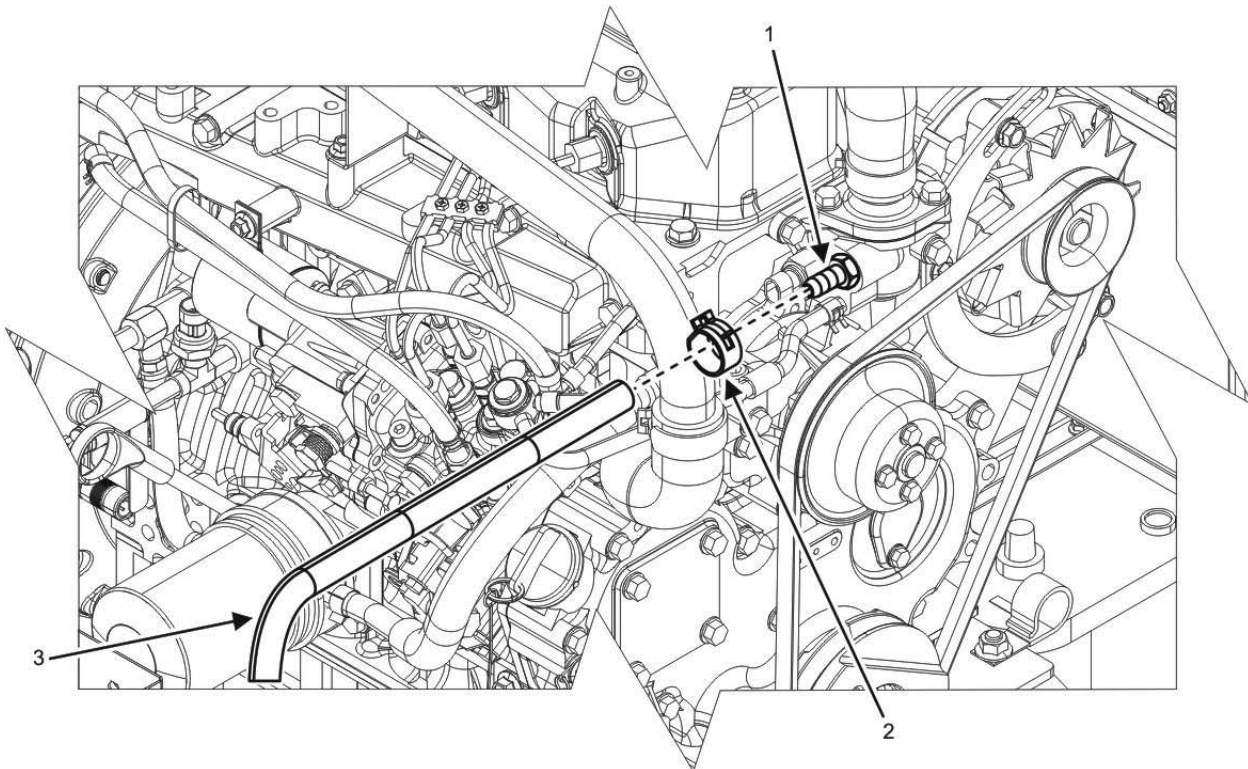


Figure 5. Coolant Heater Outlet Hose Assembly.

6. Prepare coolant heater outlet hose assembly (Figure 2, Item 4).

NOTE

Capture spilled coolant and dispose of IAW local SOP. Cap/plug all open coolant lines/fittings to prevent dirt and debris from entering the cooling system.

- a. Remove plug (not shown) from thermostat housing barb (Figure 5, Item 1).

- b. Install one end of coolant heater outlet hose (Figure 5, Item 3) to thermostat housing barb (Figure 5, Item 1) and secure with clip (Figure 5, Item 2).

NOTE

Other end of coolant heater outlet hose (Figure 5, Item 3) will be installed in step 9 of this task.

- c. Plug open end of coolant heater outlet hose (Figure 5, Item 3) to prevent contamination of cooling system.

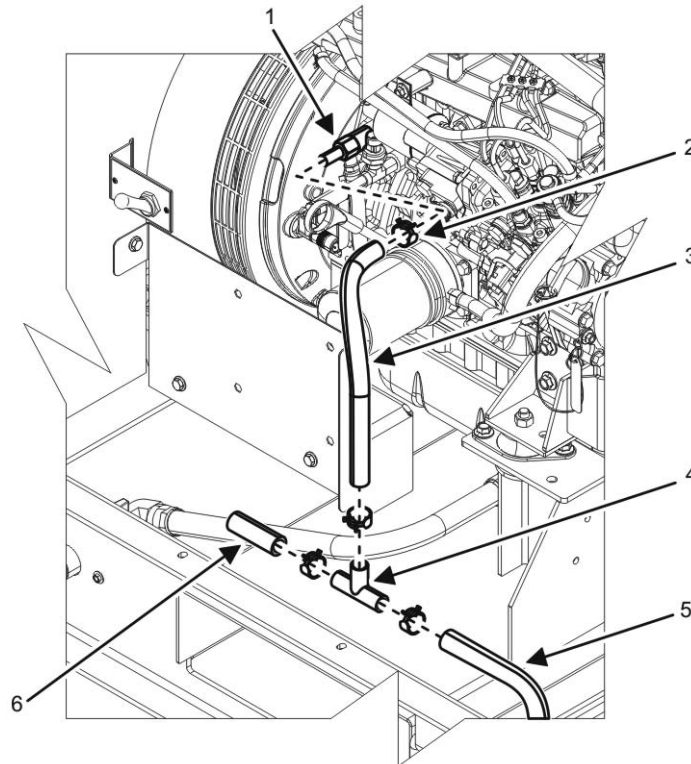


Figure 6. Coolant Heater Inlet Hose Assembly.

7. Prepare coolant heater inlet hose assembly (Figure 2, Item 1).
 - a. Loosen and slide back clip (Figure 6, Item 2) on coolant drain hose (Figure 6, Item 5) away from engine barb fitting (Figure 6, Item 1).
 - b. Remove coolant drain hose (Figure 6, Item 5) from engine barb fitting (Figure 6, Item 1) and cap hose to prevent contamination.
 - c. Install coolant hose (Figure 6, Item 3) to engine barb fitting (Figure 6, Item 1). Secure with clip (Figure 6, Item 2).
 - d. Install T-adaptor (Figure 6, Item 4) (in orientation shown in Figure 6) to open end of coolant hose (Figure 6, Item 3). Secure with clip (Figure 6, Item 2).
 - e. Install coolant drain hose (Figure 6, Item 5) to T-adaptor (Figure 6, Item 4) opening. Secure with clip (Figure 6, Item 2).
 - f. Install coolant hose (Figure 6, Item 6) to last opening of T-adaptor (Figure 6, Item 4). Secure with clip (Figure 6, Item 2).

NOTE

Coolant heater inlet hose assembly (Figure 2, Item 1) will be installed to coolant heater in step 9 of this task.

- g. Cap opening of coolant heater inlet hose assembly (Figure 2, Item 1) to prevent contamination of cooling system.
8. Install coolant heater holder to coolant heater mounting bracket (WP 0025, Remove/Install Winterization Kit Components).
9. Install coolant heater (Figure 2, Item 5) and connect coolant heater inlet and outlet hose assemblies (Figure 2, Items 1 and 4), fuel line assemblies (Figure 2, Item 2), air exhaust tube (Figure 2, Item 7), and electrical connector (not shown) (WP 0025, Remove/Install Winterization Kit Components).
10. Install right-side body panel (WP 0032, Install Right-Side Body Panel).
11. Install top body panel (WP 0028, Install Top Body Panel).

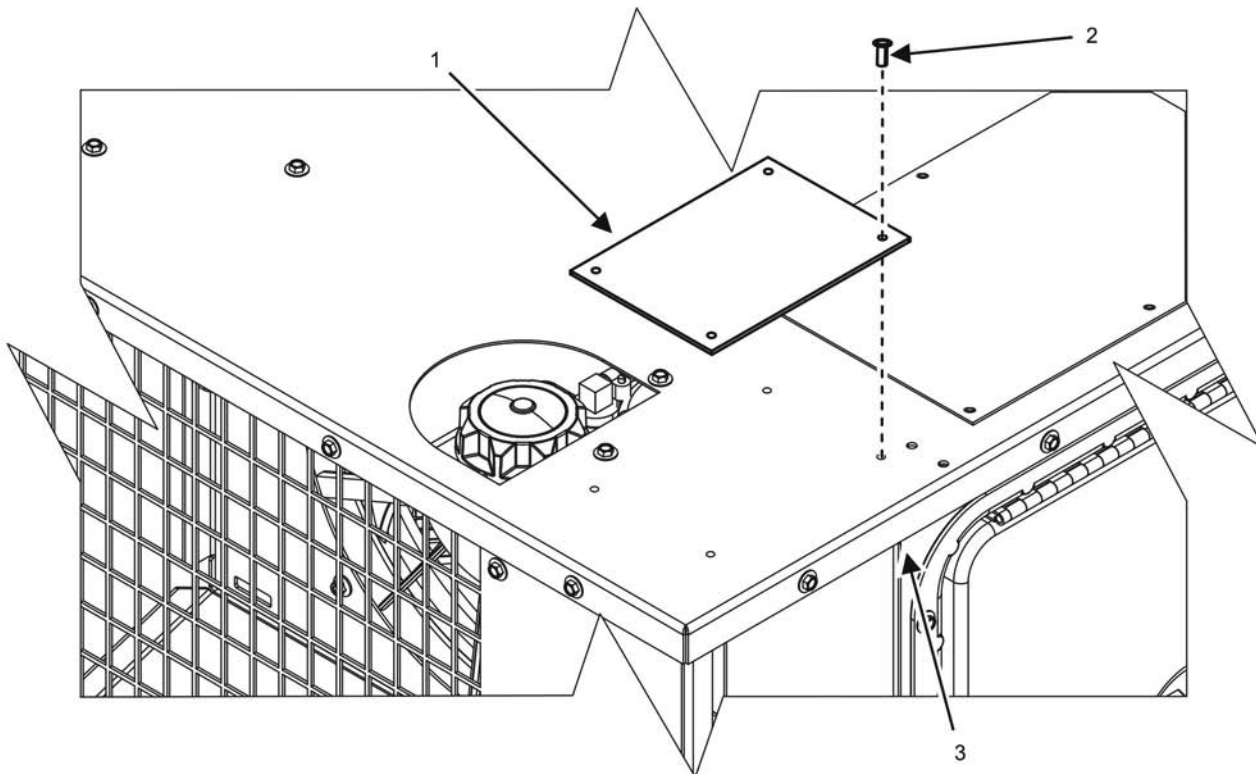


Figure 7. Operating Instructions Plate — Installation.

12. Drill four holes of 3.5 mm diameter in rear left of top body panel (Figure 7, Item 3) using existing holes in operating instructions plate (Figure 7, Item 1) as a guide.
13. Rivet operating instructions plate (Figure 7, Item 1) to rear left corner of top body panel (Figure 7, Item 3) with four blind rivets (Figure 8, Item 2).
14. Fill cooling system (WP 0021, Service Cooling System).
15. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
16. Close and secure generator set doors.

17. Ensure fluid level is at proper operating level (TM 9-6115-751-10).
18. Release air through overflow vent line for 5 min before start-up (TM 9-6115-751-10).
19. Purge fuel system (WP 0043, Service Fuel System).
20. Test winterization kit (WP 0025, Remove/Install Winterization Kit Components).
21. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
22. Start engine and check for proper operation (TM 9-6115-751-10).
23. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL RADIATOR

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Radiator assembly (WP 0110, Repair Part List, Figure 10, Item 9)

Antifreeze, ethylene glycol, (WP 0164, Expendable and Durable Items List, Item 2)

Brush, wire, scratch (WP 0164, Item 8)

Cap set, protective (WP 0164, Item 9)

Distilled water, (WP 0164, Item 18)

Grease, electrically conductive (WP 0164, Item 21)

Pan, drain (WP 0164, Item 29)

Rag, wiping (2) (WP 0164, Item 32)

Soap, ivory (WP 0164, Item 34)

Personnel Required

91D (1)

Assistant (1)

References

WP 0022, Remove/Install Coolant Recovery System

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Cooling system drained (WP 0021, Service Cooling System)

Upper, and lower radiator hoses removed from radiator (WP 0024, Remove/Install Radiator Hose and Tube Assemblies)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL RADIATOR**WARNING**

- Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.
- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.

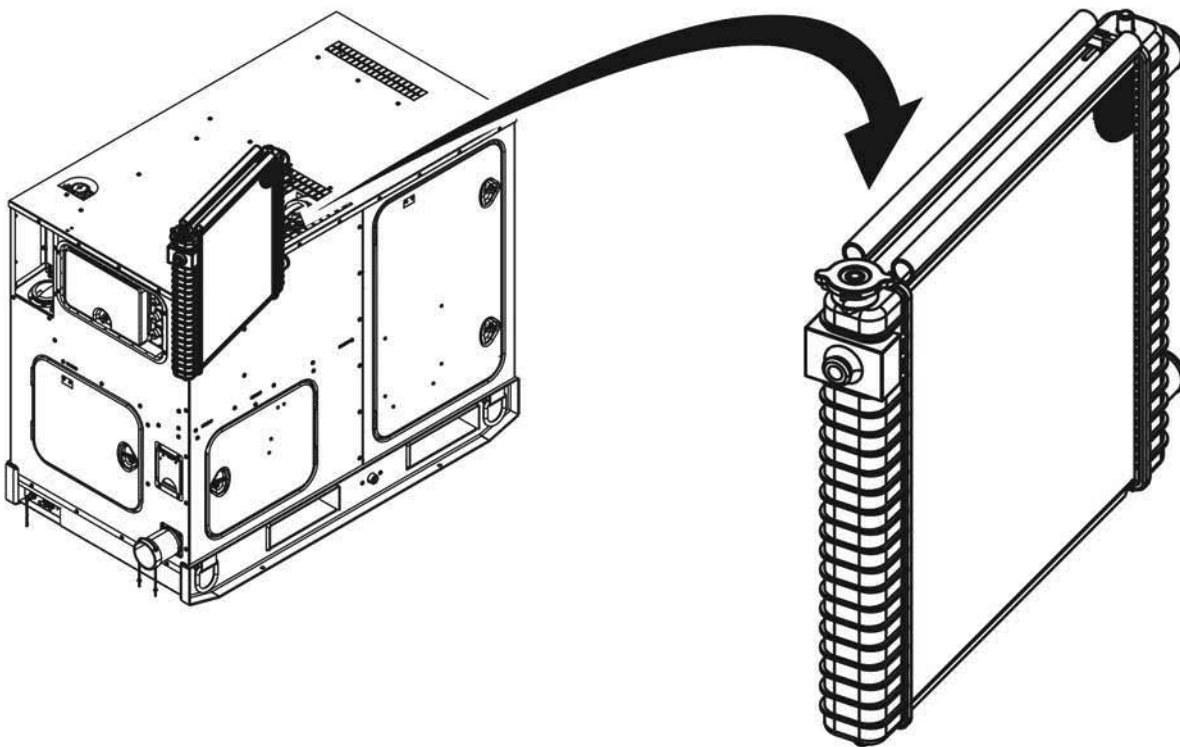
Remove Radiator

Figure 1. Radiator — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate radiator (Figure 1) behind bulkhead panel in top rear of unit.
3. Cap/plug upper and lower radiator ports to minimize spillage of residual coolant when radiator is removed and to prevent contamination from entering the cooling system.
4. Ensure cap (Figure 2, Item 4) is installed on radiator (Figure 2, Item 13).

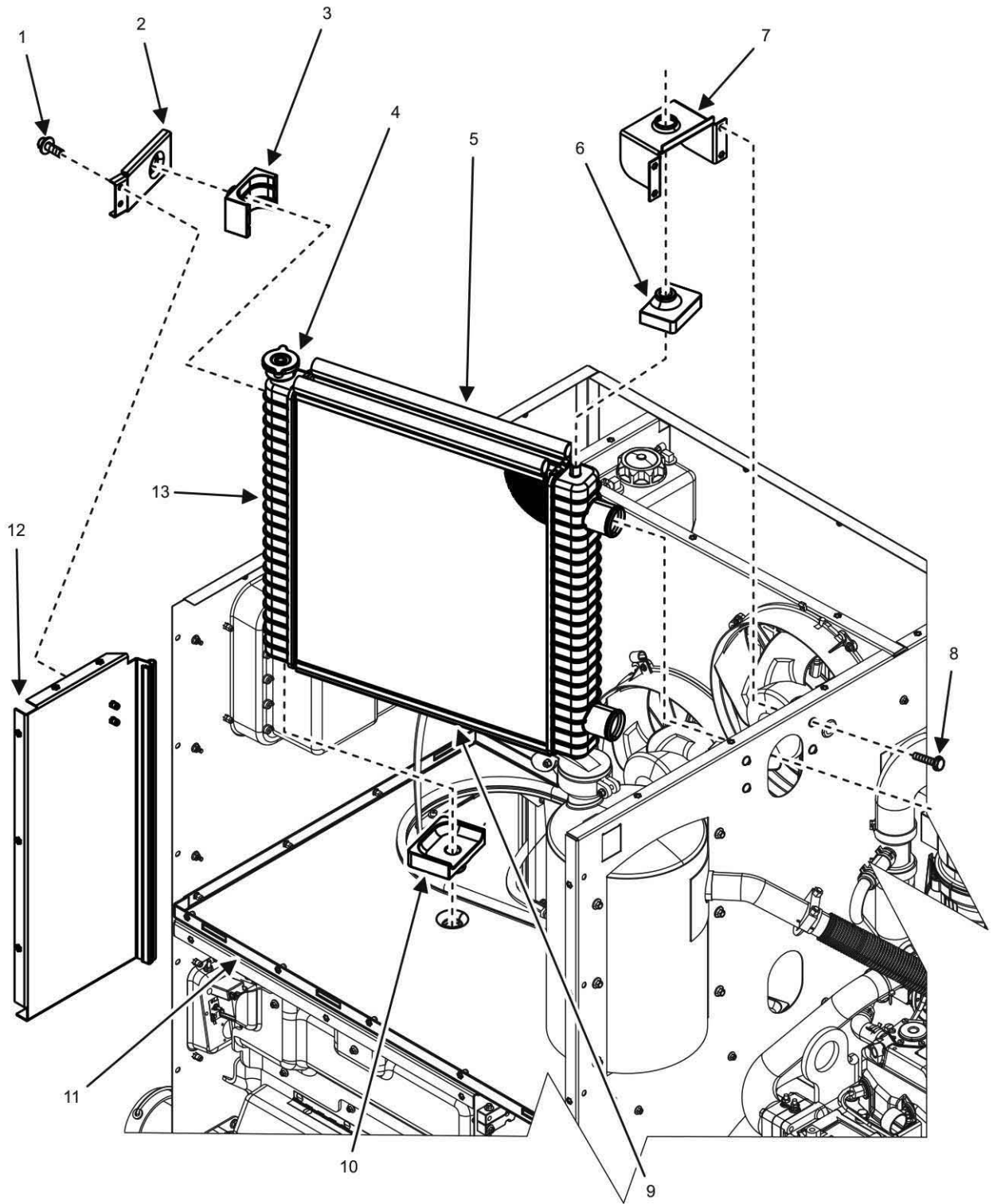


Figure 2. Radiator — Removal.

5. Remove two rubber edge bulb seals (Figure 2, Item 5) from top of radiator (Figure 2, Item 13).
6. Remove long coolant recovery hose (WP 0022, Remove/Install Coolant Recovery System).
7. Remove two screws (Figure 2, Item 1) from rear radiator bracket (Figure 2, Item 2).
8. Remove rear radiator bracket (Figure 2, Item 2) and inspect for corrosion, excessive wear, bends, or breaks and replace as required.
9. Inspect isolator (Figure 2, Item 3) for cracks, breaks, tears, and brittleness. Replace isolator (Figure 2, Item 3) if cracked, broken, torn, or brittle.
10. Remove four screws (Figure 2, Item 8) from front radiator bracket (Figure 2, Item 7).
11. Remove front radiator bracket (Figure 2, Item 7) and inspect for corrosion, excessive wear, bends, or breaks and replace as required.
12. Inspect isolator (Figure 2, Item 6) for cracks, breaks, tears, and brittleness. Replace isolator (Figure 2, Item 6) if cracked, broken, torn, or brittle.

NOTE

Coolant may leak from the fittings on the radiator (Figure 2, Item 13) when the radiator (Figure 2, Item 13) is removed. Dispose of captured or spilled coolant IAW local SOP.

13. Lift radiator (Figure 2, Item 13), with help from assistant, from unit and place on suitable work surface.

END OF TASK

Inspect/Clean Radiator

1. Remove any dirt and debris from radiator (Figure 2, Item 13) exterior using water and a stiff bristle brush..
2. Remove rubber edge bulb seals (Figure 2, Item 9) from bottom of radiator (Figure 2, Item 13).
3. Inspect rubber edge bulb seals (Figure 2, Item 9) on radiator mounting panel (Figure 2, Item 12) for cracks, breaks, tears, and brittleness. Replace rubber edge bulb seal if cracked, broken, torn, or brittle.
4. Inspect radiator (Figure 2, Item 13) exterior for punctures, tears, crushed fins, or damage to hose fittings.
5. Replace radiator (Figure 2, Item 13) if covering is punctured, torn, crushed, or shows signs of excessive wear.
6. Replace radiator (Figure 2, Item 13) if any fittings are cracked or broken.
7. Inspect radiator joints where side tank meet radiator core. Look for signs of leakage at the joints. Replace radiator (Figure 2, Item 13) if leakage is suspected.

END OF TASK

Install Radiator Assembly

1. Ensure rubber edge bulb seals (Figure 2, Items 9) are installed to bottom of radiator (Figure 2, Item 13) and on radiator mounting panel (Figure 2, Item 12) as required.

NOTE

The radiator support panel (Figure 2, Item 11) contains two openings designed to cradle the isolators (Figure 2, Item 10) on the bottom corners of the radiator (Figure 2, Item 13).

Wipe down components with wiping rag prior to installation.

2. Lift radiator (Figure 2, Item 13), with the help of assistant, to its mounting location inside unit with radiator hose fittings extended through openings in interior bulkhead panel.
3. Install isolator (Figure 2, Item 6) onto radiator (Figure 2, Item 13).
4. Place front radiator bracket (Figure 2, Item 7) over isolator (Figure 2, Item 6) and align mounting holes with interior bulkhead panel.
5. Install four screws (Figure 2, Item 8) finger-tight to secure front radiator bracket (Figure 2, Item 7).
6. Position rear radiator bracket (Figure 2, Item 2) with isolator (Figure 2, Item 3) installed against radiator (Figure 2, Item 13) and align mounting holes with radiator mounting panel (Figure 2, Item 12).
7. Install two screws (Figure 2, Item 1) finger-tight through rear radiator bracket (Figure 2, Item 2) into radiator mounting panel (Figure 2, Item 12).
8. Tighten screws (Figure 2, Items 1 and 8) installed in radiator rear and front brackets (Figure 2, Items 2 and 7).

NOTE

Remove all caps/plugs from radiator before installation.

9. Install long coolant recovery hose (WP 0022, Remove/Install Coolant Recovery System).
10. Install rubber edge bulb seals (Figure 2, Item 5) on top of radiator (Figure 2, Item 13).
11. Install upper and lower radiator hoses and tubes (WP 0024, Remove/Install Radiator Hose and Tube Assemblies).

CAUTION

Cooling system must be flushed if new radiator has been installed. Failure to comply may result in damage to equipment.

12. Flush cooling system if new radiator has been installed (WP 0021, Service Cooling System).
13. Fill radiator to proper level with coolant mixture (WP 0021, Service Cooling System).
14. Install top body panel (WP 0028, Remove/Install Top Body Panel).
15. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
16. Close all generator set doors.
17. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
18. Start engine and run until electric fan cycles two times (TM 9-6115-751-10). Apply 100% rated load for 30 minutes or until coolant reaches normal operating temperature (TM 9-6115-751-10).

19. Check for leaks and repair as required.
20. Check coolant level and add coolant as required (TM 9-6115-751-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL TOP BODY PANEL

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163,
Maintenance Allocation Chart, Item 38)

Materials/Parts

Panel, top (WP 0104, Repair Parts List, Figure 4,
Item 2)

Grease, electrically conductive (WP 0164,
Expendable and Durable Items List, Item 21)

Personnel Required

91D (1)

Assistant (1)

References

Not Applicable

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10,
WP 0005)

Engine cool

Battery ground cable removed (WP 0036,
Remove/Install Batteries)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL TOP BODY PANEL**Remove Top Body Panel**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate top body panel (Figure 1).

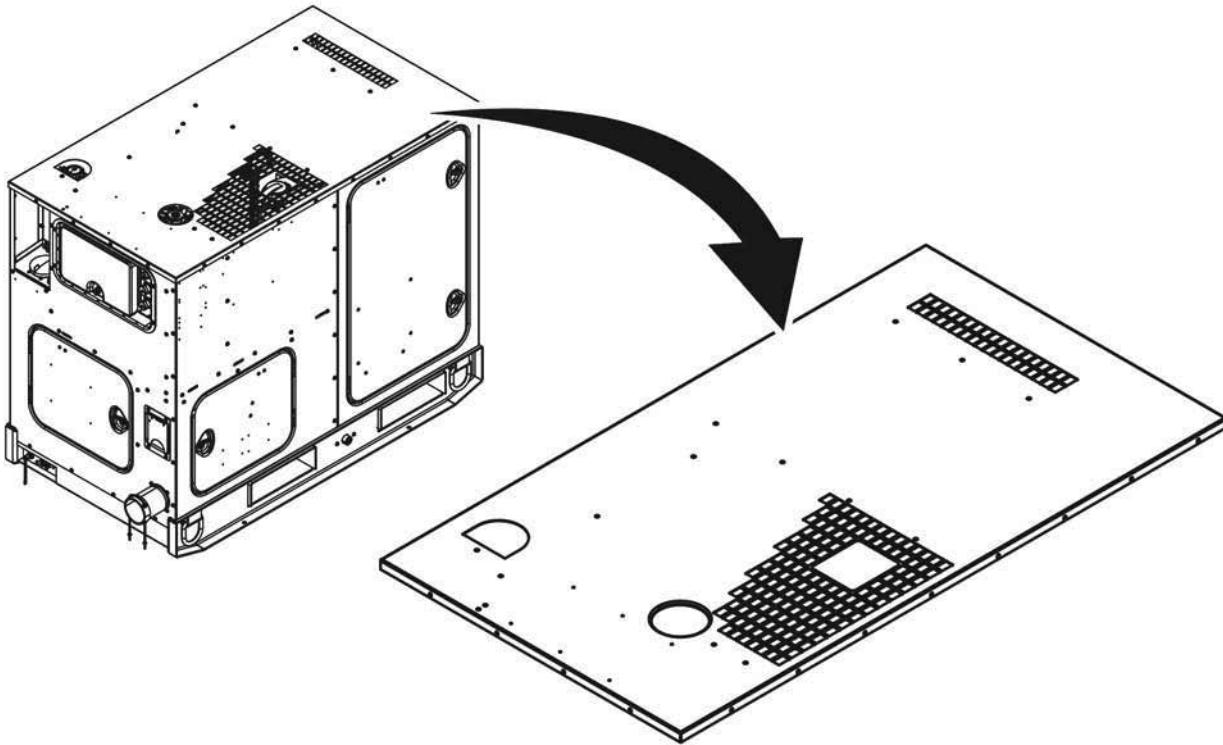


Figure 1. Top Body Panel — Location.

3. Remove 24 screws (Figure 2, Item 6) securing edges of top body panel (Figure 2, Item 3) to perimeter of generator set (Figure 2, Item 8).
4. Remove 13 screws (Figure 2, Item 1) securing top body panel (Figure 2, Item 3) to interior panels (Figure 2, Item 7) of generator set (Figure 2, Item 8).

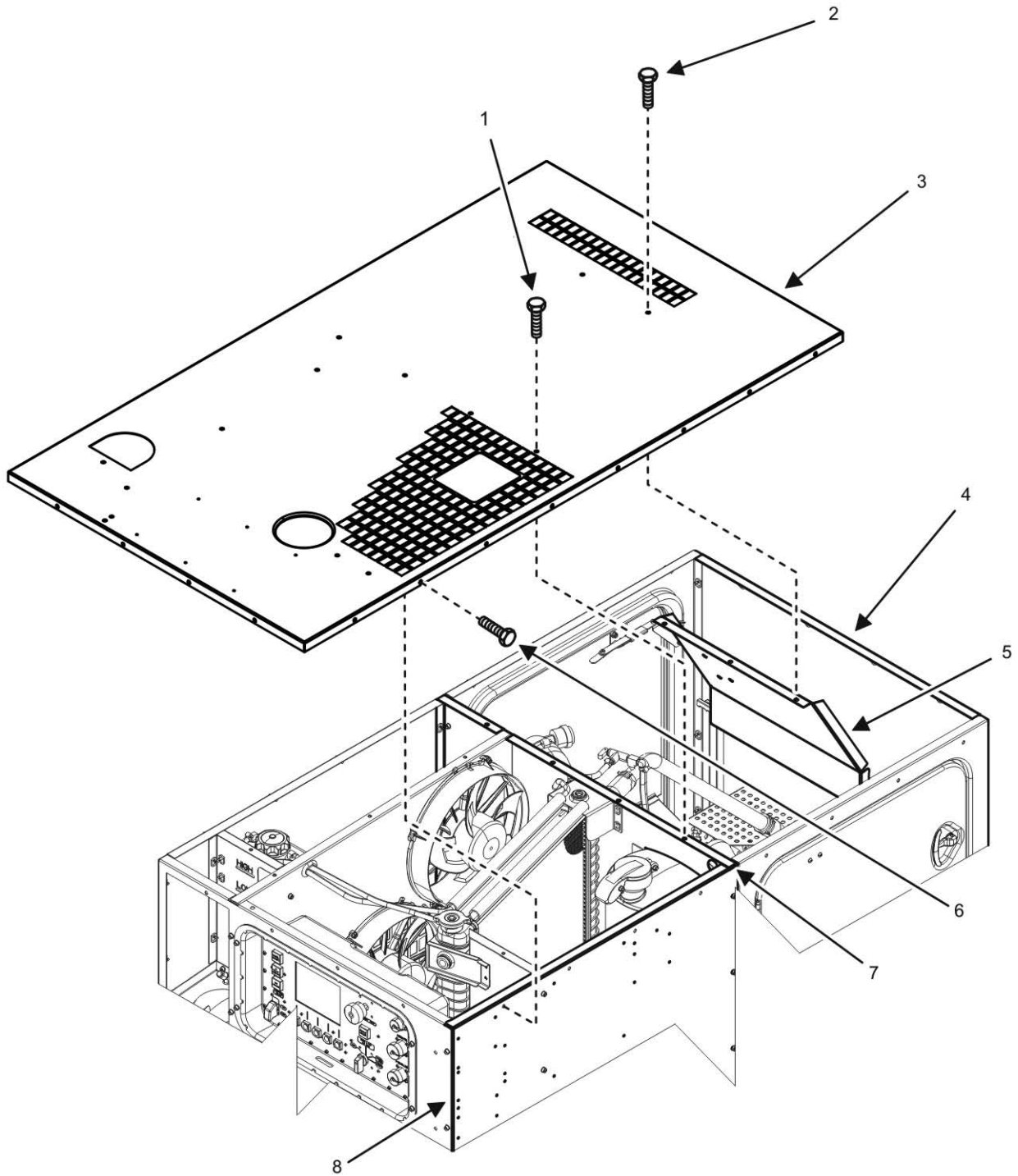


Figure 2. Top Body Panel Removal — Detail.

5. Remove three screws (Figure 2, Item 2) securing the weather shield (Figure 2, Item 5) to the top body panel (Figure 2, Item 3).

NOTE

The top body panel (Figure 2, Item 3) is large and awkward for one person to manage and will require an additional person to remove.

6. Remove top body panel (Figure 2, Item 3) from unit and place on a suitable work surface.

END OF TASK**Inspect Top Body Panel**

1. Inspect top body panel (Figure 2, Item 3) for damage, cracks, or corrosion, and repair minor damage as required.
2. Replace top body panel (Figure 2, Item 3) if cracked or showing major damage.
3. Inspect screws (Figure 2, Items 1, 2, and 6) for damage and replace any that are damaged.
4. Inspect weather shield (Figure 2, Item 5) attached to front body panel (Figure 2, Item 4) for cracks, damage, or corrosion, and repair or replace as required.

END OF TASK**Install Top Body Panel****NOTE**

The top body panel (Figure 2, Item 3) is large and awkward for one person to manage and will require an additional person to install.

1. Position top body panel (Figure 2, Item 3) on generator set (Figure 2, Item 8) and align mounting holes.
2. Open right- or left-side door to access weather shield (Figure 2, Item 5).
3. Align weather shield (Figure 2, Item 5) mounting holes to install and finger-tighten three screws (Figure 2, Item 2) securing weather shield (Figure 2, Item 5) to top body panel (Figure 2, Item 3).
4. Install and finger-tighten 13 screws (Figure 2, Item 1) securing top body panel (Figure 2, Item 3) to interior panels (Figure 2, Item 7) of unit.
5. Install and finger-tighten 24 screws (Figure 2, Item 6) securing top body panel (Figure 2, Item 3) along perimeter of unit.
6. Tighten all screws (Figure 2, Item 1, 2, and 6) installed in steps 3, 4, and 5.
7. Install battery ground cable (WP 0036, Remove/Install Batteries).
7. Close generator set doors.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL FRONT BODY PANEL

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Panel, enclosure, front (WP 0104, Repair Parts List, Figure 4, Item 13)

Cap set, protective (WP 0164, Expendable and Durable Items List, Item 9)

Grease, electrically conductive (WP 0164, Item 21)

Rag, wiping (WP 0164, Item 32)

Strap, tie-down (WP 0164, Item 35)

Personnel Required

91D (1)

Assistant (1)

References

WP 0040, Remove/Install NATO Slave Receptacle

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Batteries disconnected (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Ground rods removed if stowed (TM 9-6115-751-10)

Special Environmental Conditions

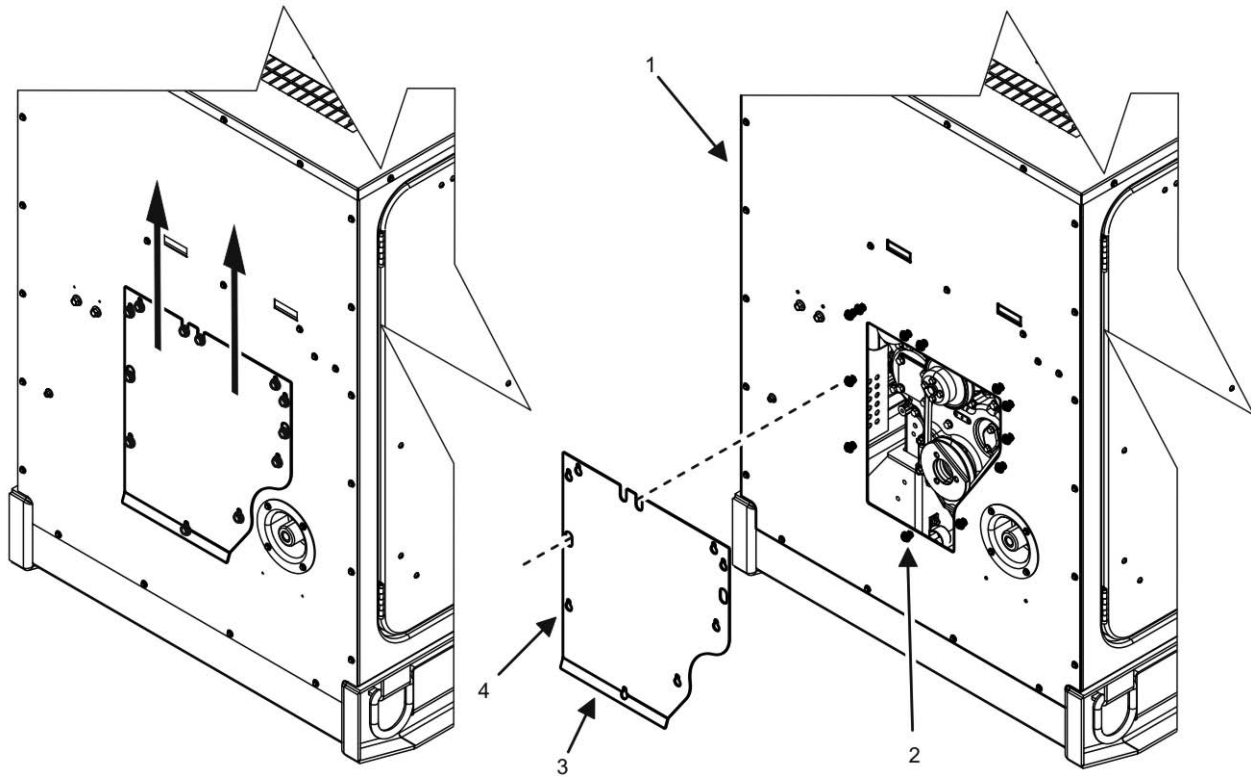
Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL FRONT BODY PANEL**WARNING**

NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.

Remove Access Panel**Figure 1. Access Panel — Removal.**

1. Loosen without removing eight screws (Figure 1, Item 2) of access panel (Figure 1, Item 3).
2. Move access panel (Figure 1, Item 3) upwards until screws (Figure 1, Item 2) are centered in circular part of key-hole openings (Figure 1, Item 4).
3. Remove access panel (Figure 1, Item 3).
4. Inspect access panel (Figure 1, Item 3) for damage and corrosion. Repair or replace as required.

END OF TASK**Install Access Panel**

1. Position access panel's key-hole openings (Figure 1, Item 4) over screws (Figure 1, Item 2) on front panel (Figure 1, Item 1).
2. Slide access panel (Figure 1, Item 3) downwards until narrow portion of key-hole openings (Figure 1, Item 4) rest on screws (Figure 1, Item 2).
3. Tighten eight screws (Figure 1, Item 2).

END OF TASK

Remove Front Body Panel

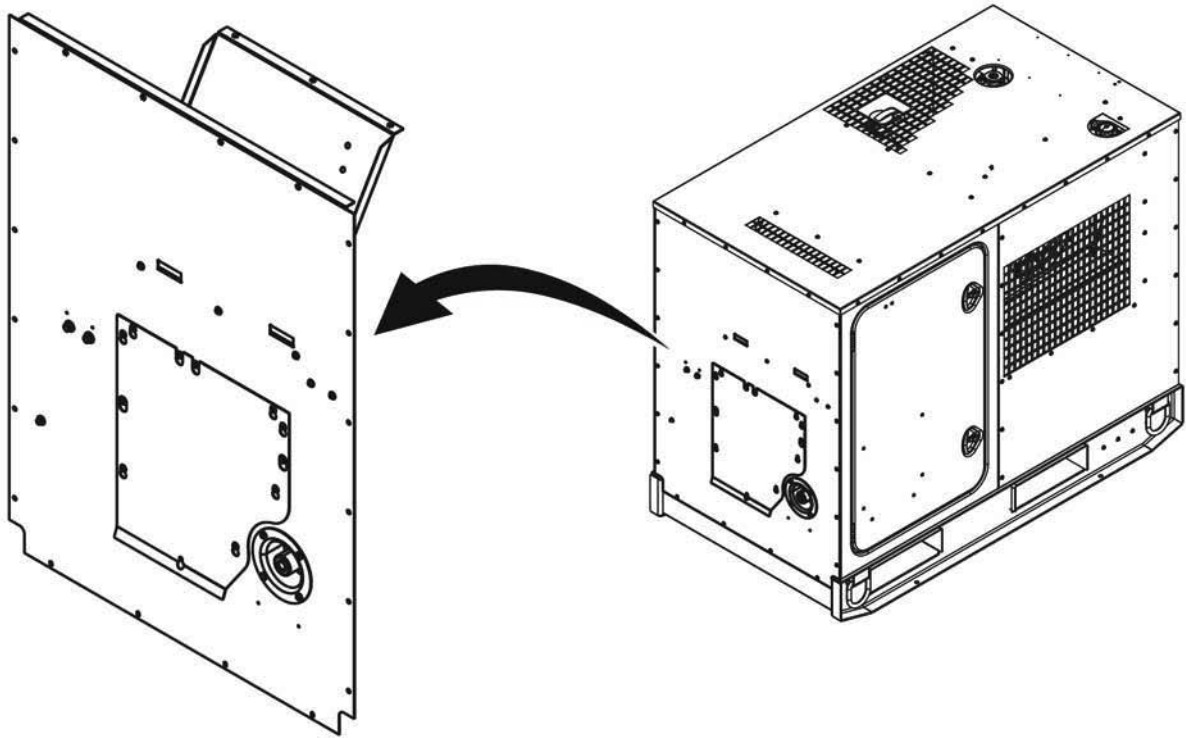


Figure 2. Front Body Panel — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate front body panel (Figure 2).

WARNING

The NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.

3. Tag and remove positive and negative cables from NATO slave receptacle (WP 0040, Remove/Install NATO Slave Receptacle) and set hardware aside for reuse.
4. Open left- and right-side doors of unit.

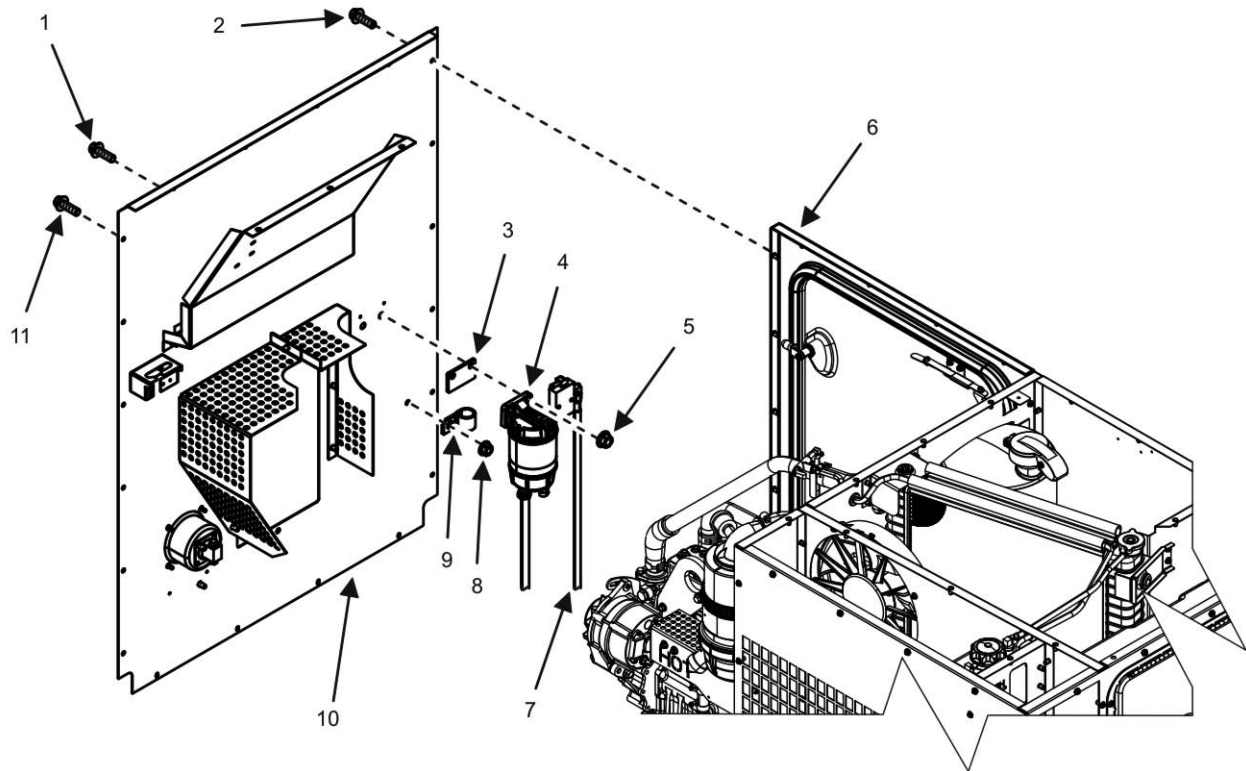


Figure 3. Front Body Panel — Removal.

CAUTION

Wire ties should be used to secure fuel filter/water separator components to generator set. Failure to comply may cause damage to equipment.

5. Remove two nuts (Figure 3, Item 5) and two screws (Figure 3, Item 1) that secure fuel filter/water separator (Figure 3, Item 4) and spacer (Figure 3, Item 3) to front body panel assembly (Figure 3, Item 10).
6. Remove bolt (Figure 3, Item 11), nut (Figure 3, Item 8), and clamp (Figure 3, Item 9) securing fuel hose (Figure 3, Item 7) to front body panel assembly (Figure 3, Item 10).
7. Secure fuel filter/water separator (Figure 3, Item 4) and spacer (Figure 3, Item 3) temporarily to inside of generator set using wire ties as required.

CAUTION

When the front body panel assembly (Figure 3, Item 10) is removed, weather shield, NATO slave receptacle, engine belt shields, and grounding rod storage bracket will remain attached to the panel. Handle the panel carefully when removing. Failure to comply may cause damage to equipment.

NOTE

The access panel does not need to be removed to remove or install the front panel.

8. Remove 16 screws (Figure 3, Item 2) securing perimeter of front body panel assembly (Figure 3, Item 10) to unit (Figure 3, Item 6).
9. Remove front body panel assembly (Figure 3, Item 10) from unit and place on a suitable work surface.

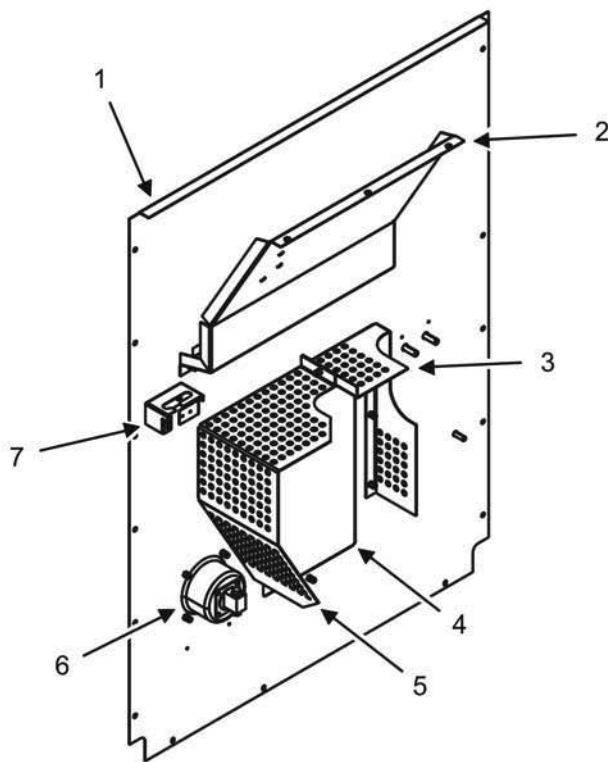
END OF TASK**Inspect Front Body Panel**

Figure 4. Front Body Panel Assembly — Components.

1. Inspect weather shield (Figure 4, Item 2) for signs of obvious damage. Replace weather shield (Figure 4, Item 2) as required.
2. Inspect ground rod bracket (Figure 4, Item 7) for signs of obvious damage. Replace ground rod bracket (Figure 4, Item 7) as required.
3. Inspect NATO slave receptacle (Figure 4, Item 6) for signs of obvious damage. Replace NATO slave receptacle (Figure 4, Item 6) as required (WP 0040, Remove/Install NATO Slave Receptacle).

4. Inspect belt guards (Figure 4, Items 3 and 5) for signs of obvious damage. Replace belt guards (Figure 4, Items 3 and 5) as required.
5. Inspect front body panel (Figure 4, Item 1) for signs of obvious damage. Replace front body panel (Figure 4, Item 1) as required.
6. Inspect access panel (Figure 4, Item 4) for signs of obvious damage. Replace access panel (Figure 4, Item 4) as required. See Remove Access Panel task.

END OF TASK**Install Front Body Panel**

1. Place front body panel (Figure 3, Item 10) at mounting location on generator set and align the mounting holes.
2. Secure front body panel (Figure 3, Item 10) to unit (Figure 3, Item 6) by installing 16 screws (Figure 3, Item 2).
3. Install NATO slave receptacle positive and negative connections (WP 0040, Remove/Install NATO Slave Receptacle).
4. Place ground rods (not shown) into storage location (if not in use) on inside of front body panel (Figure 3, Item 10).
5. Cut and discard wire ties used to temporarily secure fuel filter/water separator (Figure 3, Item 4) and spacer (Figure 3, Item 3) to inside of generator set.
6. Position fuel filter/water separator (Figure 3, Item 4) to its mounting location on front panel (Figure 3, Item 10).
7. Secure fuel filter/water separator (Figure 3, Item 4) and spacer (Figure 3, Item 3) to front panel (Figure 3, Item 10) by installing two screws (Figure 3, Item 1) and two nuts (Figure 3, Item 5).
8. Install bolt (Figure 3, Item 11), nut (Figure 3, Item 8), and clamp (Figure 3, Item 9) to fuel hose (Figure 3, Item 7) and front body panel assembly (Figure 3, Item 10).
9. Install top body panel (WP 0028, Remove/Install Top Body Panel).
10. Connect batteries (WP 0036, Remove/Install Batteries).
11. Close generator set doors.
12. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
13. Start engine and check for proper operation (TM 9-6115-751-10).
14. Repair as required.
15. Dispose of all captured fluids IAW local SOP.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL REAR BODY PANEL

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163,
Maintenance Allocation Chart, Item 38)

Materials/Parts

Panel, rear (WP 0104, Repair Parts List, Figure 4,
Item 39)

Grease, electrically conductive (WP 0164,
Expendable and Durable Items List, Item 21)

Personnel Required

91D (1)

Assistant (1)

References

WP 0034, Remove/Install Door

WP 0059, Remove/Install Convenience Receptacle

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10,
WP 0005)

Engine cool

Battery ground cable removed (WP 0036,
Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install
Top Body Panel)

DCS panel removed (WP 0017, Remove/Install
DCS)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL REAR BODY PANEL**NOTE**

The rear door is attached to rear body panel. Rear body panel may be removed from the unit with or without the door attached. See WP 0034, Remove/Install Door for procedure to remove/install rear door. Throughout the remainder of this procedure, the rear door will be shown as installed in the rear body panel.

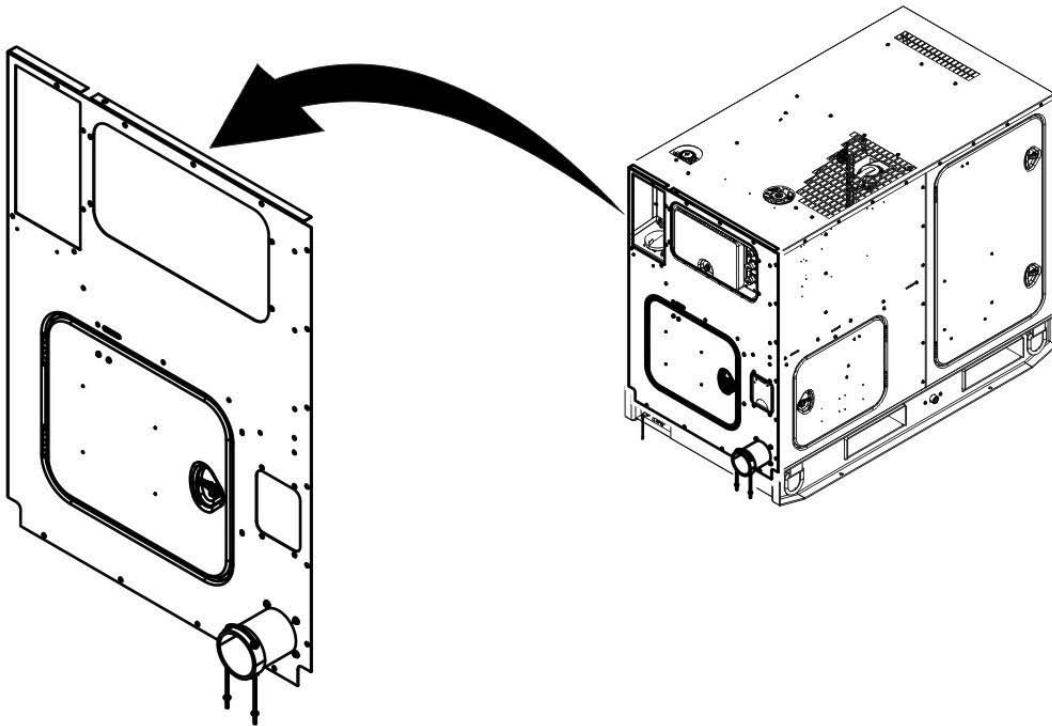
Remove Rear Body Panel

Figure 1. Rear Body Panel — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate rear body panel (Figure 1).
3. Tag and disconnect all output cables (Figure 2, Item 5) from output box (Figure 2, Item 3) (TM 9-6115-751-10) and withdraw cables (Figure 2, Item 5) through cable outlet (Figure 2, Item 4).
4. Remove six screws (Figure 2, Item 1) securing left-side body panel (not shown) to rear body panel (Figure 2, Item 7).
5. Remove six screws (Figure 2, Item 8) securing rear body panel (Figure 2, Item 7) to right-side body panel (Figure 2, Item 2).
6. Remove four screws (Figure 2, Item 6) securing rear body panel (Figure 2, Item 7) to unit skid.

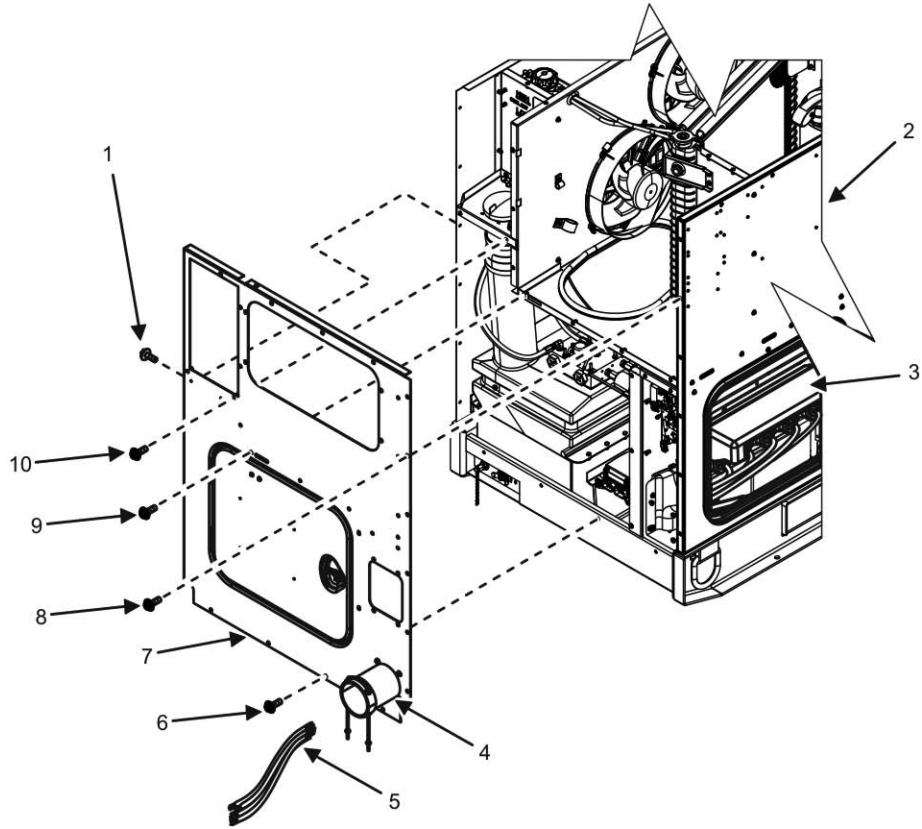


Figure 2. Rear Body Panel — Removal.

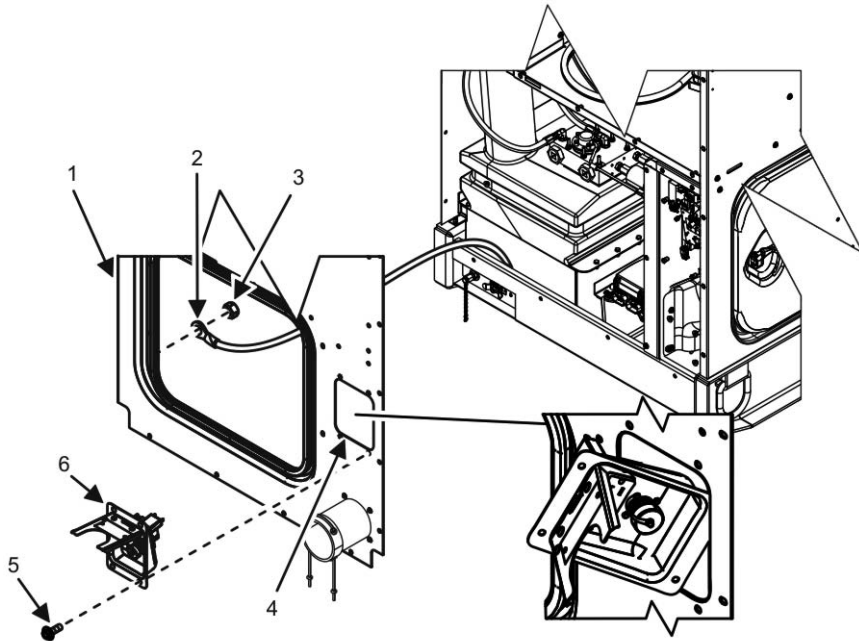


Figure 3. Convenience Receptacle — Removal.

CAUTION

When removing the final screws from the panel, be sure to support the panel and not allow it to fall. Failure to comply may cause damage to equipment.

NOTE

Rear door is shown removed in Figure 3 for clarity.

7. Remove four screws (Figure 3, Item 5) securing convenience receptacle (Figure 3, Item 6) to rear body panel (Figure 3, Item 1).
8. Disengage convenience receptacle (Figure 3, Item 6) from rear body panel (Figure 3, Item 1) carefully so as not to damage or stress electrical connections.
9. Remove four screws (Figure 2, Item 10) securing rear body panel (Figure 2, Item 7) to fuel system panel.
10. Remove 13 screws (Figure 2, Item 9) securing rear body panel (Figure 2, Item 7) to interior panels.
11. Remove rear body panel (Figure 3, Item 1) from unit, passing convenience receptacle (Figure 3, Item 6) diagonally through receptacle opening (Figure 3, Item 4) in rear body panel (Figure 3, Item 1).
12. Remove nut (Figure 3, Item 3) securing ground wire (Figure 3, Item 2) to rear body panel (Figure 3, Item 1).
13. Remove ground wire (Figure 3, Item 2) from rear body panel (Figure 3, Item 1).
14. Place convenience receptacle (Figure 3, Item 6) inside unit to prevent damage.
15. Place rear body panel (Figure 3, Item 1) on suitable work surface.

END OF TASK

Inspect Rear Body Panel

1. Inspect cable outlet (Figure 2, Item 4) for signs of obvious damage and replace as required.
2. Inspect rear body panel (Figure 3, Item 1) for damage or corrosion.
3. Repair minor damage and corrosion to rear body panel (Figure 3, Item 1) as required.
4. Replace rear body panel (Figure 3, Item 1) if major damage or corrosion are present.
5. Inspect convenience receptacle (Figure 3, Item 6) for damage and replace if damaged (WP 0059, Remove/Install Convenience Receptacle).
6. Inspect all mounting hardware and replace as required.

END OF TASK

Install Rear Body Panel

NOTE

The left edge of the rear body panel mounts behind the edge of the left-side body panel. The right edge of the rear body panel mounts in front of the right-side body panel.

1. Place rear body panel (Figure 3, Item 1) on unit passing convenience receptacle (Figure 3, Item 6) diagonally out through receptacle opening (Figure 3, Item 4) in rear body panel (Figure 3, Item 1).
2. Position rear body panel (Figure 3, Item 1) to align the mounting holes.
3. Install ground wire (Figure 3, Item 2) and nut (Figure 3, Item 3) to rear body panel (Figure 3, Item 1).

4. Install and finger-tighten several screws (Figure 2, Items 1, 6, 8, 9, and 10) to secure rear body panel (Figure 2, Item 7) to interior panels.
5. Install and finger-tighten four screws (Figure 3, Item 5) securing convenience receptacle (Figure 3, Item 6) to rear body panel (Figure 3, Item 1).
6. Install and finger-tighten remaining screws (Figure 2, Item 9) securing rear body panel (Figure 2, Item 7) to interior panels.
7. Install and finger-tighten four screws (Figure 2, Item 6) securing rear body panel (Figure 2, Item 7) to unit skid.
8. Install and finger-tighten six screws (Figure 2, Item 8) securing rear body panel (Figure 3, Item 7) to right-side body panel (Figure 2, Item 2).
9. Install and finger-tighten six screws (Figure 2, Item 1) securing left-side body panel to rear body panel (Figure 2, Item 7).
10. Tighten all screws installed in steps 4 – 9.
11. Pass output cables (Figure 2, Item 5) through cable outlet (Figure 2, Item 4) to proper locations in output box (Figure 2, Item 3).
12. Install output cables (Figure 2, Item 5) to their proper locations in output box (Figure 2, Item 3) (TM 9-6115-751-10) using tags/markings installed at removal as a guide.
13. Install DCS control panel (WP 0017, Remove/Install DCS).
14. Install battery ground cable (WP 0036, Remove/Install Batteries).
15. Install top body panel (WP 0028, Remove/Install Top Body Panel).
16. Close generator set doors.
17. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
18. Start engine and check for proper operation (TM 9-6115-751-10).
19. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL LEFT-SIDE BODY PANELS

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Panel, left and right door (WP 0104, Repair Parts List, Figure 4, Item 60)

Panel, left, air intake (WP 0104, Figure 4, Item 62)

Grease, electrically conductive (WP 0164, Expendable and Durable Items List, Item 21)

Personnel Required

91D (1)

Assistant (1)

References

WP 0034, Remove/Install Door

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL LEFT-SIDE BODY PANELS**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

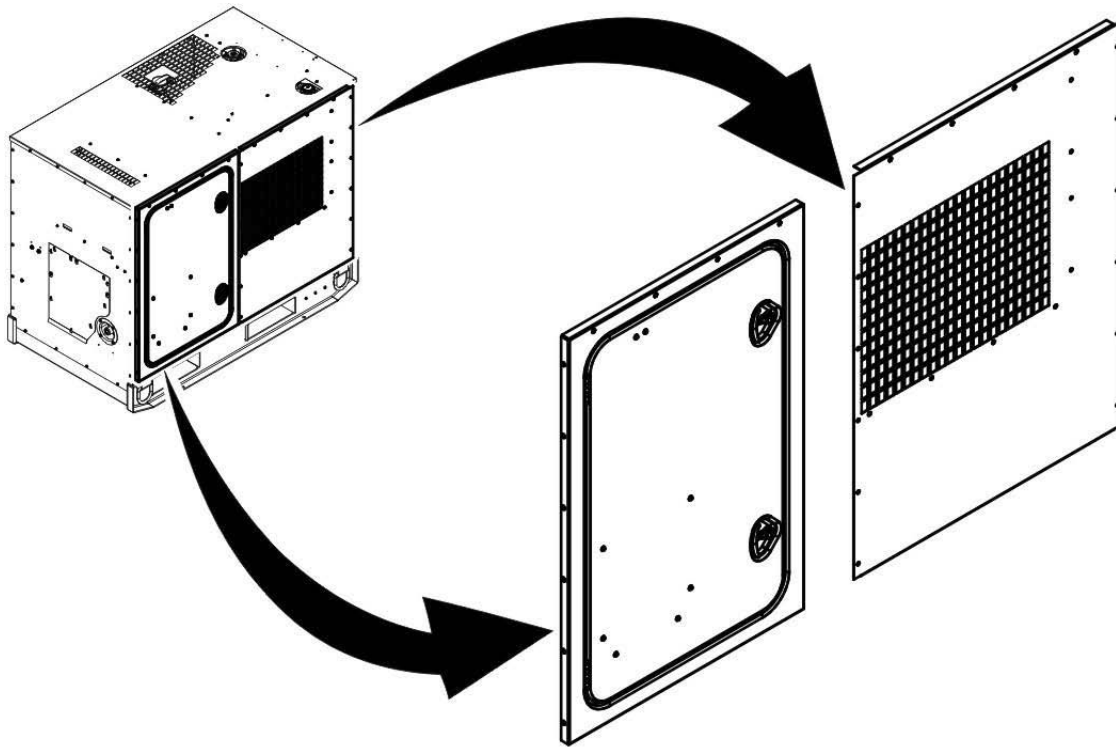
Remove Left-Side Body Panel

Figure 1. Left-Side Body Panels — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate left-side body panels (Figure 1).

NOTE

Left-side body panel must be removed prior to removing left-side door frame. See Remove Left-Side Door Frame task.

3. Remove five screws (Figure 2, Item 12) under left-side body panel (Figure 2, Item 6) securing panel to unit skid (Figure 2, Item 13).
4. Remove six screws (Figure 2, Item 7) securing left-side body panel (Figure 2, Item 6) to rear body panel (Figure 2, Item 4).
5. Remove four screws (Figure 2, Item 8) securing left-side body panel (Figure 2, Item 6) to fuel system panel (Figure 2, Item 3) behind fuel filler cap (Figure 2, Item 5).

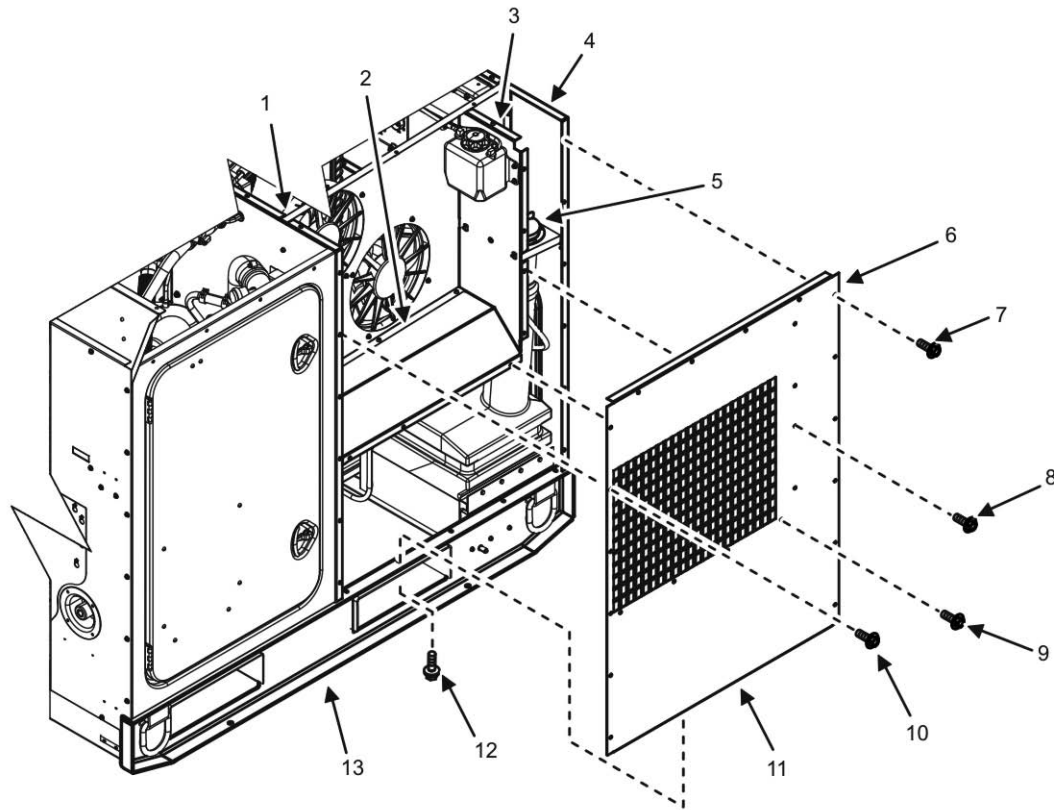


Figure 2. Left-Side Body Panel — Removal.

6. Remove six screws (Figure 2, Item 10) securing left-side body panel (Figure 2, Item 6) to internal bulkhead (Figure 2, Item 1).

CAUTION

The left-side body panel will bend easily. Handle with care. Failure to comply may cause damage to equipment.

7. Remove four screws (Figure 2, Item 9) securing left-side body panel (Figure 2, Item 6) to radiator support panel (Figure 2, Item 2).
8. Remove left-side body panel (Figure 2, Item 6) from unit and place on suitable work surface.

END OF TASK

Inspect Left-Side Body Panel

1. Inspect left-side body panel (Figure 2, Item 6) for damage or corrosion and repair or replace left-side body panel (Figure 2, Item 6) as required.
2. Inspect mounting hardware for damage and replace as required.

END OF TASK

Install Left-Side Body Panel

1. Position left-side body panel (Figure 2, Item 6) at mounting location on unit.

NOTE

Install all body panel screws finger-tight at first to allow repositioning of panel during installation.

If removed, install the left-side door frame before installing the left-side body panel. See Install Left-Side Door Frame task.

2. Install six screws (Figure 2, Item 10) finger-tight to secure left-side body panel (Figure 2, Item 6) to internal bulkhead (Figure 2, Item 1).
3. Install four screws (Figure 2, Item 8) finger-tight to secure left-side body panel (Figure 2, Item 6) to fuel system panel (Figure 2, Item 3) behind fuel filler cap (Figure 2, Item 5).
4. Install four screws (Figure 2, Item 9) finger-tight to secure left-side body panel (Figure 2, Item 6) to radiator support panel (Figure 2, Item 2).
5. Install five screws (Figure 2, Item 12) finger-tight to secure bottom of left-side body panel (Figure 2, Item 6) to unit skid (Figure 2, Item 13).
6. Install six screws (Figure 2, Item 7) finger-tight to secure left-side body panel (Figure 2, Item 6) to rear body panel (Figure 2, Item 4).
7. Tighten all screws installed in left-side body panel (Figure 2, Item 6).
8. Install top body panel (WP 0028, Remove/Install Top Body Panel).
9. Install battery ground cable (WP 0036, Remove/Install Batteries).
10. Close all doors on generator set.

END OF TASK**Remove Left-Side Door Frame****NOTE**

Left-side door is attached to left-side door frame. Left-side door frame may be removed from unit with or without left-side door attached. See WP 0034, Remove/Install Door for procedure to remove and install door.

1. Remove left-side body panel if not already removed. See Remove Left-Side Body Panel task.
2. Open left-side door.
3. Remove six screws (Figure 3, Item 7) securing left-side door frame (Figure 3, Item 3) to front body panel (Figure 3, Item 6).
4. Close left-side door.

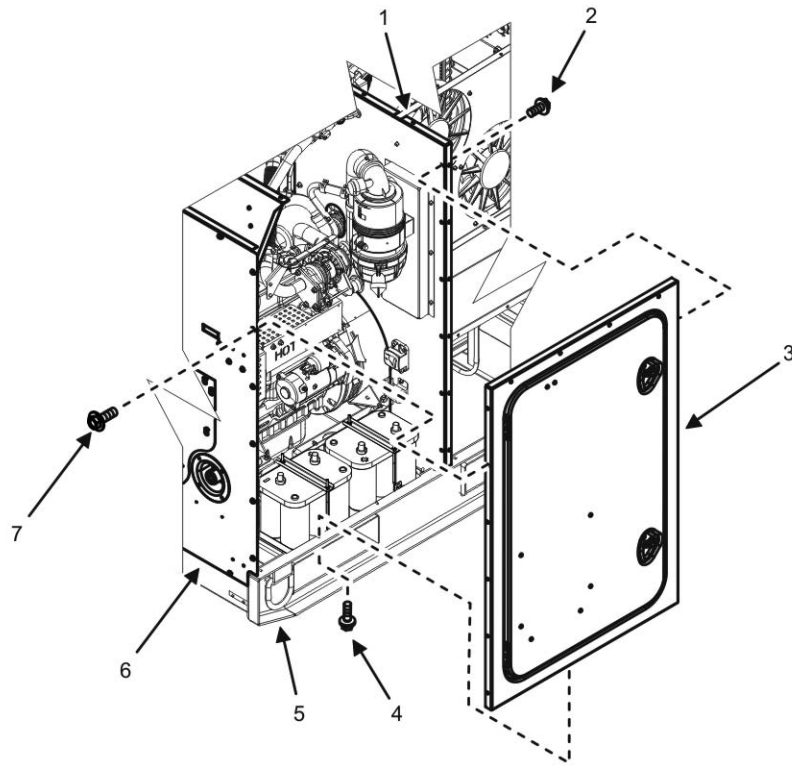


Figure 3. Left-Side Door Frame — Removal.

5. Remove four screws (Figure 3, Item 4) securing bottom of left-side door frame (Figure 3, Item 3) to unit skid (Figure 3, Item 5).
6. Remove six screws (Figure 3, Item 2) securing left-side door frame (Figure 3, Item 3) to unit internal bulkhead panel (Figure 2, Item 1).
7. Remove left-side door frame (Figure 3, Item 3) from generator set and place on a suitable work surface.

END OF TASK

Inspect Left-Side Door Frame

1. Inspect left-side door frame (Figure 3, Item 3) for corrosion or damage.
2. Replace heavily damaged left-side door frame (Figure 3, Item 3) as required.

END OF TASK

Install Left-Side Door Frame**NOTE**

Install all body panel screws finger-tight at first to allow repositioning of panel during installation.

Install left-side door frame (Figure 3, Item 3) prior to installing left-side body panel. See Install Left-Side Body Panel task.

1. Position left-side door frame (Figure 3, Item 3) at mounting location on generator set and align mounting holes.
2. Open left-side door.
3. Install six screws (Figure 3, Item 2) finger-tight to secure left-side door frame (Figure 3, Item 3) to the internal bulkhead panel (Figure 3, Item 1).
4. Close left-side door.
5. Install four screws (Figure 3, Item 4) finger-tight to secure left-side door frame (Figure 3, Item 3) to unit skid (Figure 3, Item 5).

CAUTION

The front body panel should be installed in front of the left-side door frame edge. Failure to comply may cause damage to equipment.

6. Install six screws (Figure 3, Item 7) finger-tight to secure left-side door frame (Figure 3, Item 3) to front body panel (Figure 3, Item 6).
7. Tighten all screws (Figure 3, Items 2, 4, and 7) in left-side door frame (Figure 3, Item 7).
8. Install left-side body panel. See Install Left-Side Body Panel task.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL RIGHT-SIDE BODY PANELS

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Panel, right, output box (WP 0104, Repair Parts List, Figure 4, Item 48)

Panel, left and right door (WP 0104, Figure 4, Item 60)

Grease, electrically conductive (WP 0164 Expendable and Durable Items List, Item 21)

Personnel Required

91D (1)

Assistant (1)

References

WP 0034, Remove/Install Door

WP 0035, Repair Door

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL RIGHT-SIDE BODY PANELS
WARNING

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.

Remove Right-Side Body Panel

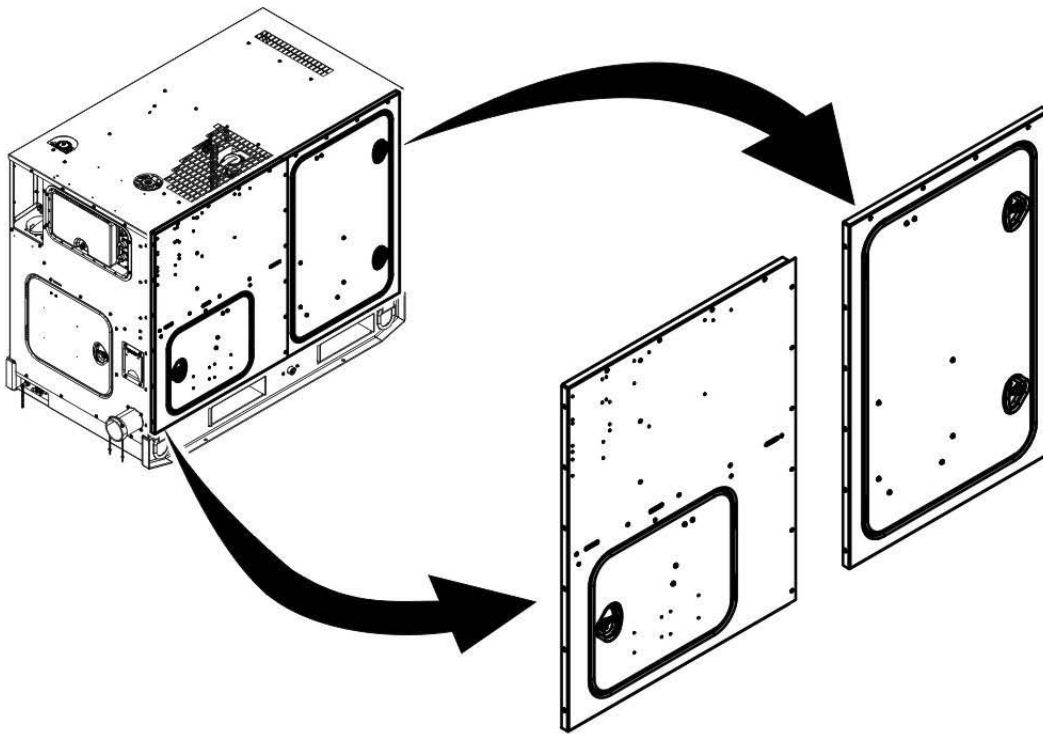


Figure 1. Right-Side Body Panel and Door Frame — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate right-side body panel and door frame (Figure 1).

NOTE

Output terminal door is attached to right-side body panel (Figure 1). Right-side body panel may be removed from the unit with or without door attached. See WP 0034, Remove/Install Door for procedure to remove/install unit access doors. Figure 2 shows the right-side body panel with the door attached.

3. Ensure output box door (Figure 2, Item 6) is closed.
4. Remove six screws (Figure 2, Item 11) joining rear body panel (Figure 2, Item 13) with right-side body panel (Figure 2, Item 2).
5. Remove five screws (Figure 2, Item 9) securing right-side body panel (Figure 2, Item 2) to unit skid (Figure 2, Item 10).

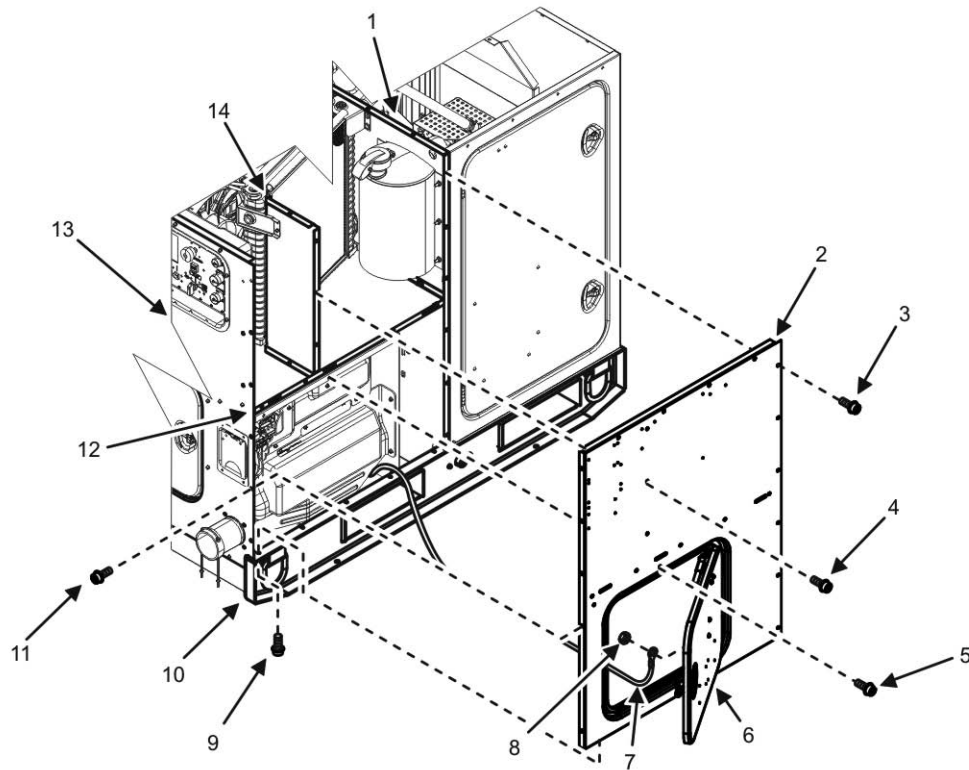


Figure 2. Right-Side Body Panel — Removal.

6. Remove 11 screws (Figure 2, Items 4 and 5) securing right-side body panel (Figure 2, Item 2) to radiator support panel (Figure 2, Item 14) and radiator support tray (Figure 2, Item 12).
7. Remove six screws (Figure 2, Item 3) securing right edge of right-side body panel (Figure 2, Item 2) to bulkhead panel (Figure 2, Item 1).

WARNING

The component being lifted weighs 47 lb (21.3 kg). Two personnel or a suitable lifting device are necessary to lift component. Failure to comply may cause injury or death to personnel.

8. Lift and remove right-side body panel (Figure 2, Item 2) from unit and place close to unit on ground.
9. Remove nut (Figure 2, Item 8) securing ground wire (Figure 2, Item 7) to right-side body panel (Figure 2, Item 2).
10. Remove ground wire (Figure 2, Item 7) from right-side body panel (Figure 2, Item 2).
11. Place right-side body panel (Figure 2, Item 2) on a suitable work surface.

END OF TASK

Inspect Right-Side Body Panel

1. Inspect right-side body panel (Figure 2, Item 2) for damage or corrosion.
2. Repair minor damage or corrosion as required.
3. Replace right-side body panel (Figure 2, Item 2) if substantial damage or corrosion is present.

4. Inspect output box door (Figure 2, Item 6) for damage and proper operation, and repair (WP 0035, Repair Door) or replace (WP 0034, Remove/Install Door) as required.

END OF TASK

Install Right-Side Body Panel

NOTE

If removed, install the right-side door frame before installing the right-side body panel. See Install Right-Side Door Frame task.

The left-hand edge overlap of right-side body panel mounts behind the rear body panel for installation.

1. Position right-side body panel (Figure 2, Item 2) on unit and align mounting holes.
2. Install nut (Figure 2, Item 8) and ground wire (Figure 2, Item 7) to right-side body panel (Figure 2, Item 2).
3. Install and finger-tighten six screws (Figure 2, Item 3) securing right-side body panel (Figure 2, Item 2) to unit interior bulkhead panel (Figure 2, Item 1).
4. Install and finger-tighten 11 screws (Figure 2, Items 4 and 5) securing right-side body panel (Figure 2, Item 2) to radiator support panel (Figure 2, Item 14) and radiator support tray (Figure 2, Item 12).
5. Install and finger-tighten five screws (Figure 2, Item 9) securing right-side body panel (Figure 2, Item 2) to unit skid (Figure 2, Item 10).
6. Install and finger-tighten six screws (Figure 2, Item 11) securing right-side body panel (Figure 2, Item 2) to rear body panel (Figure 2, Item 13).
7. Tighten all screws (Figure 2, Item 3, 4, 5, 9 and 11) installed in right-side body panel (Figure 2, Item 2).

END OF TASK

Remove Right-Side Door Frame

NOTE

Right-side body panel must be removed (see Remove Right-side Body Panel task) before removing the right-side door frame.

Right-side engine access door (Figure 3, Item 6) is attached to right-side door frame (Figure 3, Item 5). Right-side door frame (Figure 3, Item 5) may be removed from the unit with or without door (Figure 3, Item 6) attached. See WP 0034, Remove/Install Door for procedure to remove/install unit access doors.

1. Remove right-side body panel. See Remove Right-Side Body Panel task.

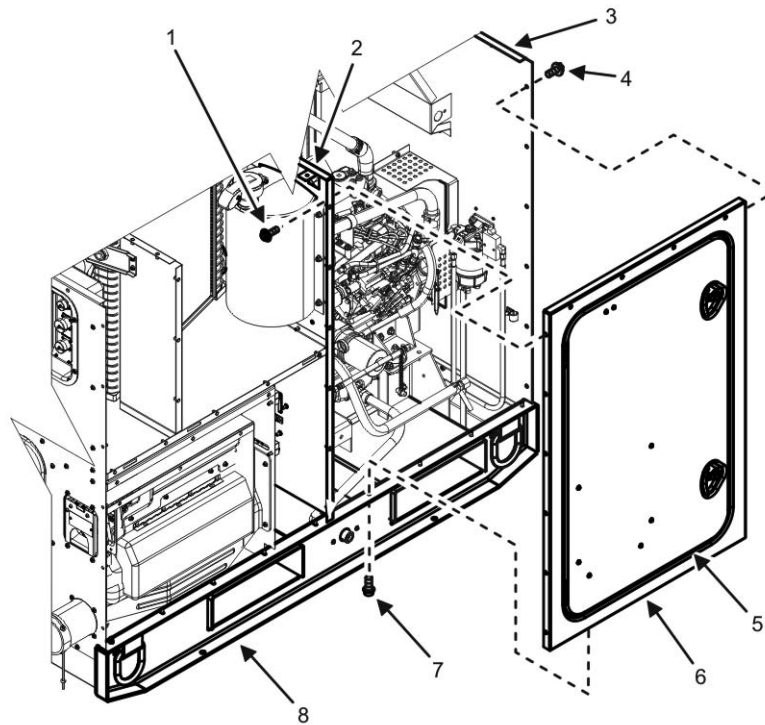


Figure 3. Right-Side Door Frame — Removal.

2. Ensure right-side door (Figure 3, Item 6) is closed.
3. Remove four screws (Figure 3, Item 7) securing right-side door frame (Figure 3, Item 5) to unit skid (Figure 3, Item 8).
4. Remove six screws (Figure 3, Item 1) securing right-side door frame (Figure 3, Item 5) to inside edge of bulkhead panel (Figure 3, Item 2).
5. Remove six screws (Figure 3, Item 4) securing edge of right-side door frame (Figure 3, Item 5) to front body panel (Figure 3, Item 3).

WARNING

The component being lifted weighs 42 lb (21.3 kg). Two personnel or a suitable lifting device are necessary to lift component. Failure to comply may cause injury or death to personnel.

6. Lift and remove right-side door frame (Figure 3, Item 5) and door (Figure 3, Item 6) and place on a suitable work surface.

END OF TASK

Inspect Right-Side Door Frame

1. Inspect right-side door frame (Figure 3, Item 5) for damage.
2. Repair minor damage to right-side door frame (Figure 3, Item 5).
3. Replace right-side door frame (Figure 3, Item 5) if heavily damaged.

4. Inspect door (Figure 3, Item 6) for damage.
5. Replace or repair door as required (WP 0034, Remove/Install Door and WP 0035, Repair Door).

END OF TASK**Install Right-Side Door Frame****NOTE**

Right-side door frame must be installed prior to installation of right-side body panel.

1. Position right-side door frame (Figure 3, Item 5) on unit skid and align mounting holes.
2. Have assistant support right-side door frame (Figure 3, Item 5) during installation.
3. Install and finger-tighten six screws (Figure 3, Item 1) securing right-side door frame (Figure 3, Item 5) to bulkhead panel (Figure 3, Item 2).
4. Install and finger-tighten four screws (Figure 3, Item 7) securing right-side door frame (Figure 3, Item 5) to unit skid (Figure 3, Item 8).

NOTE

The edge of the right-side door frame should be mounted behind the front body panel.

5. Install six screws (Figure 3, Item 4) securing right edge of right-side door frame (Figure 3, Item 5) to front body panel (Figure 3, Item 3).
6. Secure all screws (Figure 3, Items 1, 4, and 7) installed in steps 3 – 5.
7. Install right-side body panel. See Install Right-Side Body Panel task.
8. Verify correct operation of doors on right-side panel and right-side door frame. Repair as required (WP 0035, Repair Door).
9. Close generator set doors.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL INTERIOR BODY PANELS

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Bracket, mounting, right-side (WP 0104, Repair Parts List, Figure 4, Item 66)

Crossmember, enclosure (WP 0104, Figure 4, Item 69)

Duct, air (WP 0104, Figure 4, Item 63)

Panel, radiator (WP 0104, Figure 4, Item 68)

Panel, support (WP 0104, Figure 4, Item 64)

Antifreeze, ethylene glycol (WP 0164, Expendable and Durable Items, Item 2)

Cap set, protective (WP 0164, Item 9)

Grease, electrically conductive (WP 0164, Item 21)

Pan, drain (WP 0164, Item 29)

Rag, wiping (WP 0164, Item 32)

Personnel Required

91D (1)

Assistant (1)

References

WP 0020, Service Air Cleaner

WP 0021, Service Cooling System

WP 0024, Remove and Install Radiator Hose and Tube Assemblies

References

WP 0025, Remove/Install Winterization Kit Components

WP 0027, Remove/Install Radiator

WP 0037, Remove,/Install Main DC Circuit Breaker

WP 0038, Remove/Install Intake Air Heater Relay

WP 0077, Remove/Install Muffler

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Left-side body panel removed (WP 0031, Remove/Install Left-Side Body Panel)

Rear body panel removed (WP 0030, Remove/Install Rear Body Panel)

Fuel filler neck removed from bracket (WP 0052, Remove/Install Fuel Tank Filler Neck)

Remove coolant overflow bottle (WP 0022, Remove/Install Coolant Recovery System)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL INTERIOR BODY PANELS
CAUTION

Individual interior panels (Figure 1) must be removed in sequence as written in this work package and installed in reverse sequence. Failure to comply may cause damage to equipment.

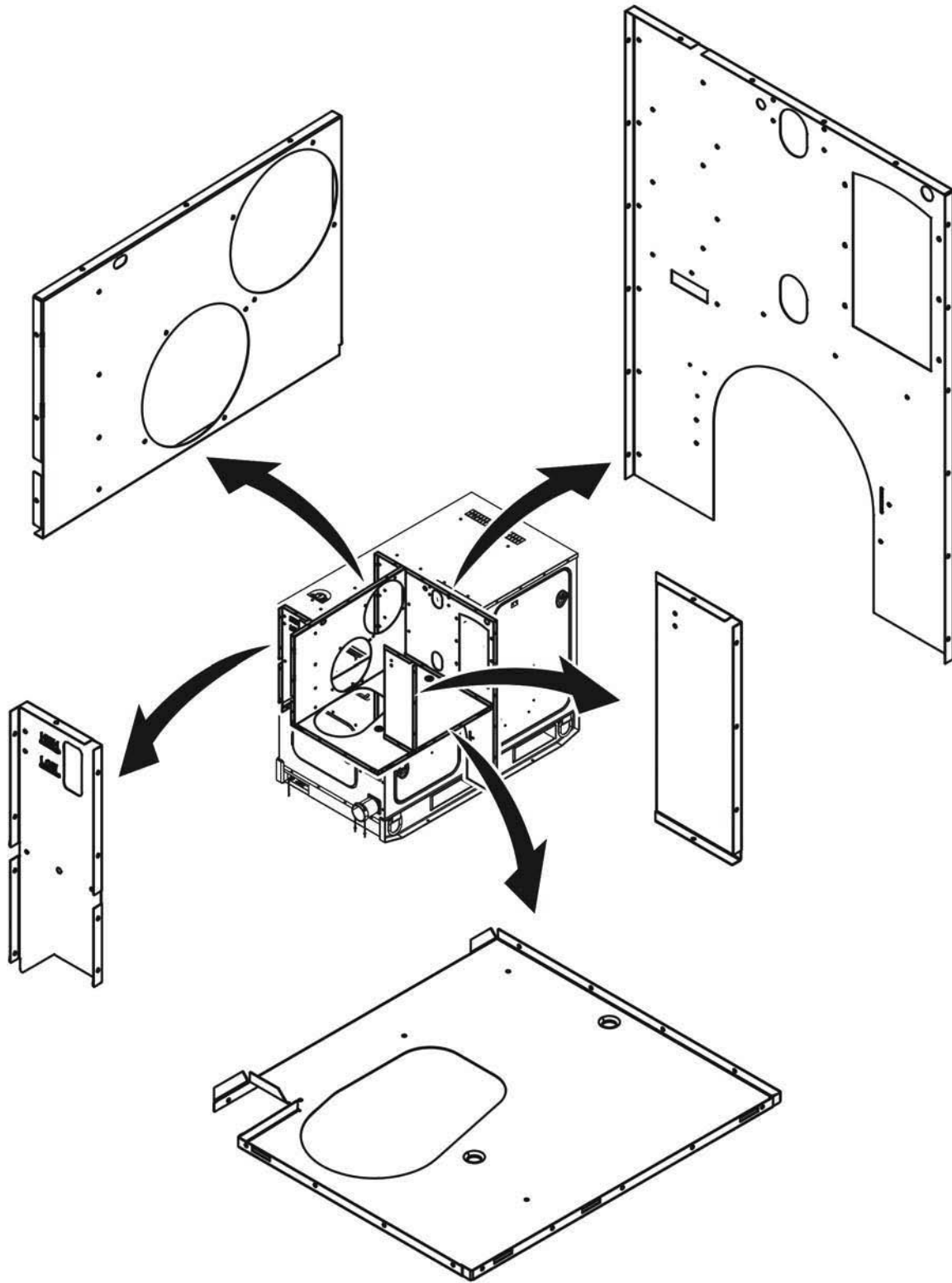


Figure 1. Interior Body Panel — Locations.

Remove Fuel System Panel

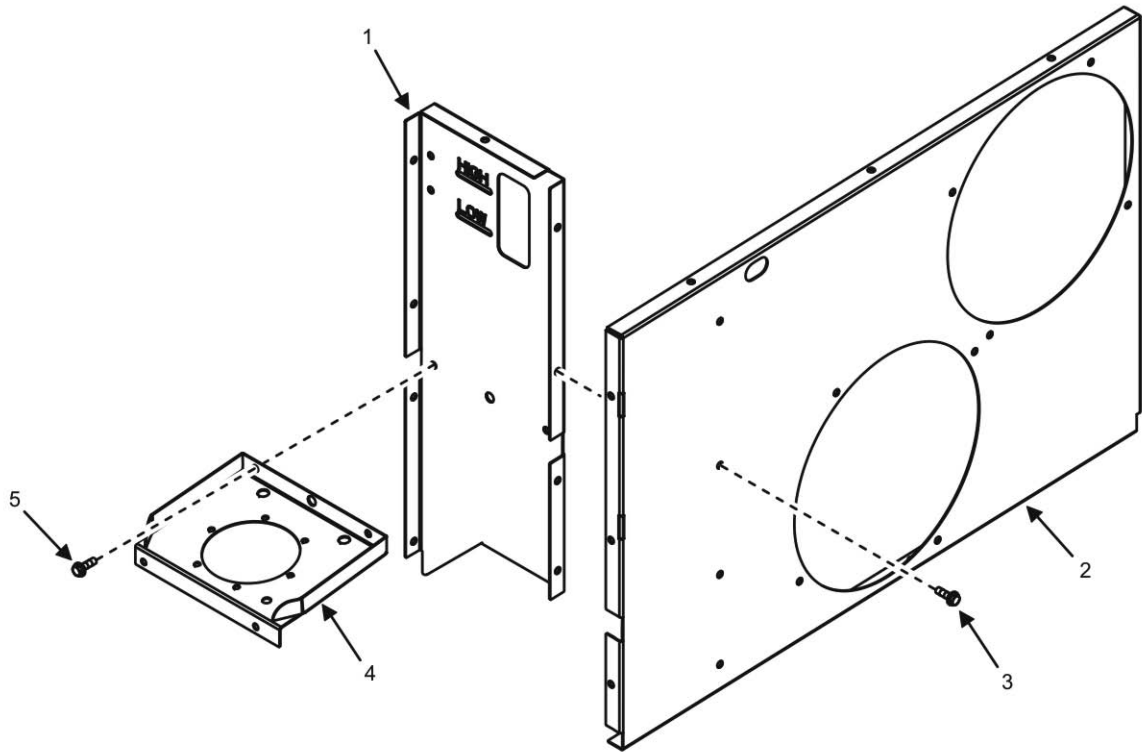


Figure 2. Fuel System Panel — Removal.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove four screws (Figure 2, Item 3) securing fan support panel (Figure 2, Item 2) to fuel system panel (Figure 2, Item 1).
3. Remove two screws (Figure 2, Item 5) securing fuel system bracket (Figure 2, Item 4) to fuel system panel (Figure 2, Item 1).
4. Remove fuel system panel (Figure 2, Item 1) from unit.

END OF TASK

Inspect Fuel System Panel

1. Inspect fuel system panel (Figure 2, Item 1) and fuel system bracket (Figure 2, Item 4) for cracks, damage from heat, and other signs of damage.
2. Replace fuel system panel (Figure 2, Item 1) and fuel system bracket (Figure 2, Item 4) as required.

END OF TASK

Install Fuel System Panel

1. Position fuel system panel (Figure 2, Item 1) in unit, ensuring proper orientation.
2. Secure fuel system panel (Figure 2, Item 1) behind fuel filler cap to fan support panel (Figure 2, Item 2) by installing four screws (Figure 2, Item 3) through fan support panel (Figure 2, Item 2) finger-tight.
3. Secure fuel system panel (Figure 2, Item 1) to fuel system bracket (Figure 2, Item 4) by installing two screws (Figure 2, Item 5) finger-tight.
4. Tighten all screws (Figure 2, Items 3 and 5) installed in steps 2 and 3.
5. Install coolant overflow bottle (WP 0022, Remove/Install Coolant Recovery System).
6. Install fuel filler neck to fuel system bracket (Figure 2, Item 4) (WP 0052, Remove/Install Fuel Tank Filler Neck).
7. Install rear body panel (WP 0030, Remove/Install Rear Body Panel).
8. Install left-side body panel (WP 0031, Remove/Install Left-Side Body Panel).
9. Install top body panel (WP 0028, Remove/Install Top Body Panel).
10. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
11. Close generator set doors.

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

13. Set engine control switch to PRIME & RUN (TM 9-6115-751-10).
14. Start engine and check for proper operation of cooling fans (TM 9-6115-751-10).
15. Repair as required.

END OF TASK**Remove Fan Support Panel****CAUTION**

Individual interior panels (Figure 1) must be removed and installed in sequence as written in this work package and installed in reverse sequence. Failure to comply may cause damage to equipment.

1. Remove fuel system panel. See Remove Fuel System Panel task.
2. Remove electrical harness (Figure 3, Item 10) connector from each of two fans (Figure 3, Item 6).
3. Remove two screws (Figure 3, Item 5) and nuts (Figure 3, Item 12) from rear of fan support panel (Figure 3, Item 1) to release wiring harness clips (Figure 3, Item 2) from radiator side of fan support panel (Figure 3, Item 1). Allow wiring harness (Figure 3, Item 10) to rest on radiator support tray (Figure 3, Item 8).

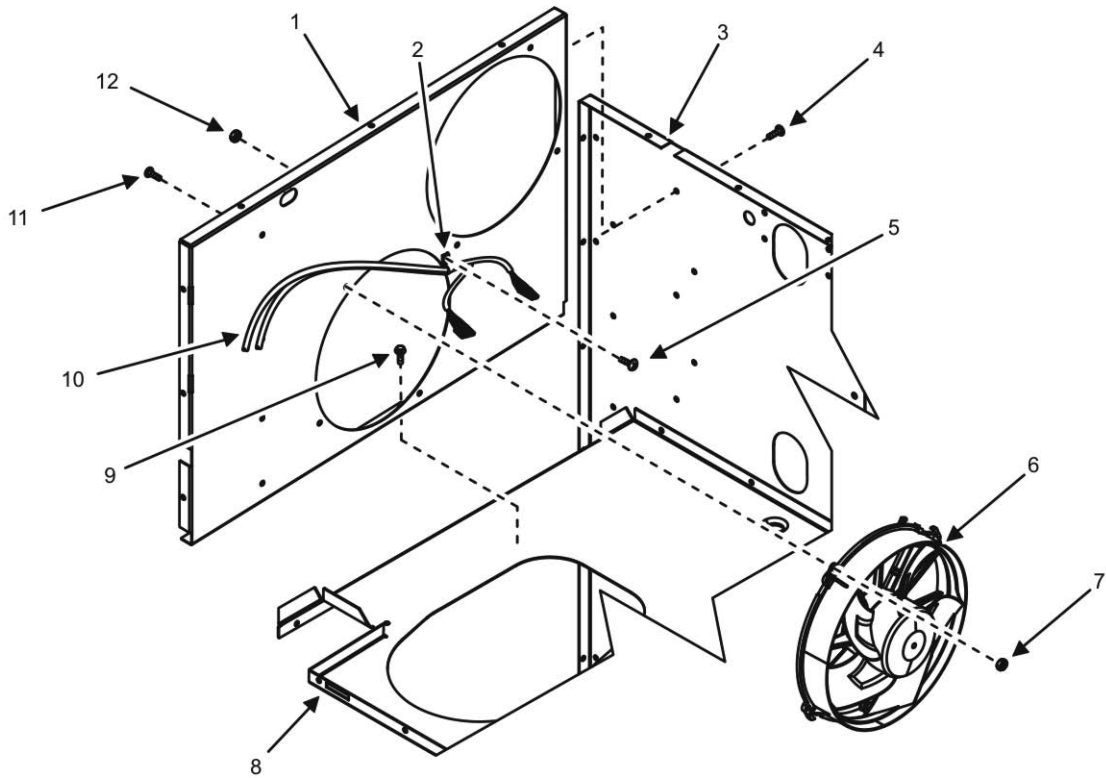


Figure 3. Fan Support Panel — Removal.

4. Remove three screws (Figure 3, Item 4) securing fan support panel (Figure 2, Item 1) to bulkhead panel (Figure 2, Item 3).
5. Remove three screws (Figure 3, Item 9) securing fan support panel (Figure 3, Item 1) to radiator support panel (Figure 3, Item 8).

WARNING

The component being lifted weighs 39 lb (17.7 kg). Two persons or a suitable lifting device are necessary to lift component. Failure to comply may cause injury or death to personnel.

6. Remove fan support panel (Figure 3, Item 1) from unit and place on suitable work surface.

END OF TASK

Inspect Fan Support Panel

1. Remove four screws (Figure 3, Item 11) and four nuts (Figure 3, Item 7) that secure each of two fans (Figure 3, Item 6) to fan support panel (Figure 3, Item 1).
2. Remove two fans (Figure 3, Item 6) from fan support panel (Figure 3, Item 1).
3. Inspect each fan (Figure 3, Item 6) for signs of obvious damage. Replace damaged fans (Figure 3, Item 6) as required.
4. Inspect fan support panel (Figure 3, Item 1) for cracks, damage from heat, and other signs of damage. Replace fan support panel (Figure 3, Item 1) as required.

END OF TASK

Install Fan Support Panel

1. Position each of two fans (Figure 3, Item 6) to its mounting location on fan support tray (Figure 3, Item 1) and secure by installing four screws (Figure 3, Item 10) and four nuts (Figure 3, Item 7).
2. Position fan support panel (Figure 3, Item 1) in unit, ensuring proper orientation and align the mounting holes.

NOTE

Have assistant support fan support panel (Figure 3, Item 1) during installation of panel screws.

3. Secure fan support panel (Figure 3, Item 1) to radiator support tray (Figure 3, Item 8) by installing three screws (Figure 3, Item 9) finger-tight.
4. Secure fan support panel (Figure 3, Item 1) to interior bulkhead panel (Figure 3, Item 3) by installing four screws (Figure 3, Item 4) finger-tight.
5. Position wiring harness (Figure 3, Item 10) to its mounting location on fan support panel (Figure 3, Item 1) and secure by installing two wiring harness clips (Figure 3, Item 2), two screws (Figure 3, Item 5), and two nuts (Figure 3, Item 12) from rear of fan support panel (Figure 3, Item 1).
6. Connect wiring harness (Figure 3, Item 10) connector to each of two fans (Figure 3, Item 6).
7. Install fuel system panel. See Remove Fuel System Panel task.

END OF TASK**Remove Radiator Support Panel****CAUTION**

Individual interior panels (Figure 1) must be removed and installed in sequence as written in this work package and installed in reverse sequence. Failure to comply may result in damage to equipment.

1. Remove fuel system panel. See Remove Fuel System Panel task.
2. Remove fan support panel. See Remove Fan Support Panel task.
3. Remove two screws (Figure 4, Item 8) securing rear radiator bracket (Figure 4, Item 7) to radiator support panel (Figure 4, Item 2). Remove rear radiator bracket (Figure 4, Item 7) from unit.
4. Remove three screws (Figure 4, Item 3) securing radiator support panel (Figure 4, Item 2) to right-side body panel (Figure 4, Item 4).
5. Remove one screw (Figure 4, Item 5) securing radiator support panel (Figure 4, Item 2) to radiator tray (Figure 4, Item 6).

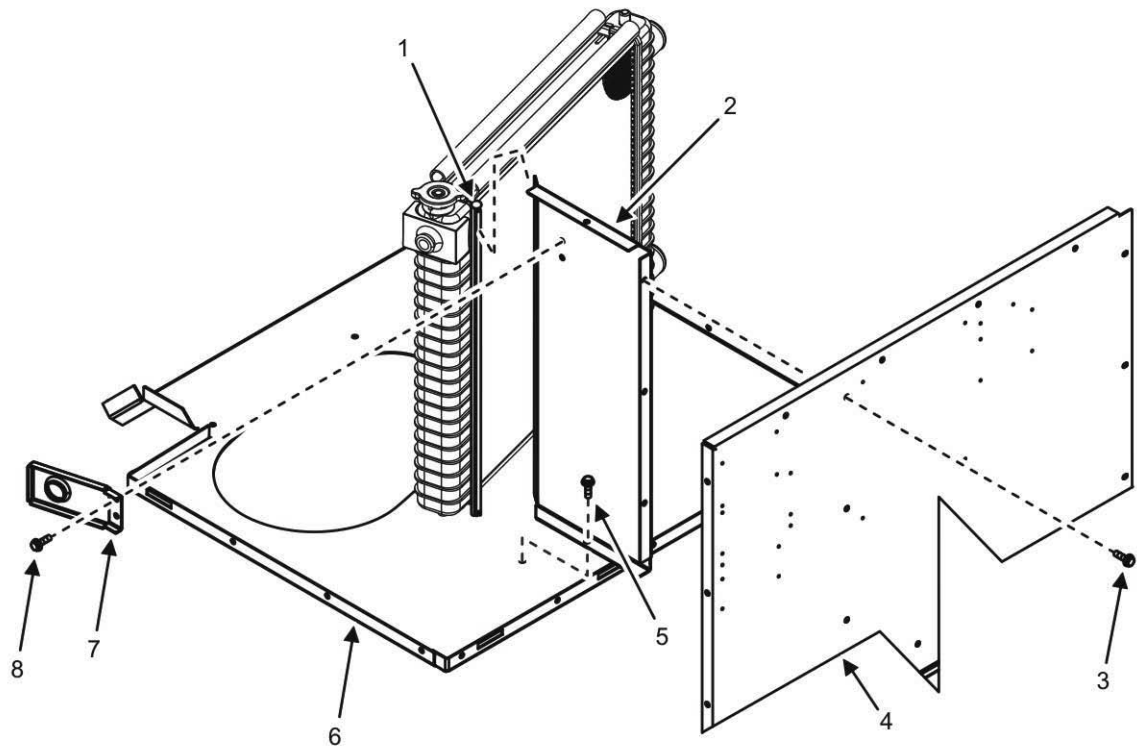


Figure 4. Radiator Support Panel — Removal.

6. Remove radiator support panel (Figure 4, Item 2) from unit and place on a suitable work surface.

END OF TASK

Inspect Radiator Support Panel

1. Remove rubber edge bulb seal (Figure 4, Item 1) from radiator support panel (Figure 4, Item 2).
2. Inspect rubber edge bulb seal (Figure 4, Item 1) for cracks or other damage, and replace as required.
3. Inspect radiator support panel (Figure 4, Item 2) for corrosion, cracks, or other damage, and replace as required.

END OF TASK

Install Radiator Support Panel

1. Install rubber edge bulb seal (Figure 4, Item 1) to radiator support panel (Figure 4, Item 2).
2. Position radiator support panel (Figure 4, Item 2) to mounting location on radiator tray (Figure 4, Item 6) and align the mounting holes.
3. Secure radiator support panel (Figure 4, Item 2) to radiator tray (Figure 4, Item 6) by installing one screw (Figure 4, Item 5) finger-tight.
4. Position radiator support panel (Figure 4, Item 2) to mounting location on right-side body panel (Figure 4, Item 4) and align the mounting holes.
5. Secure radiator support panel (Figure 4, Item 2) to right-side body panel (Figure 4, Item 4) by installing three screws (Figure 4, Item 3) finger-tight.

6. Position rear radiator bracket (Figure 4, Item 7) to mounting location on radiator support panel (Figure 4, Item 2) and align the mounting holes.
7. Secure rear radiator bracket (Figure 4, Item 7) to radiator support panel (Figure 4, Item 2) by installing two screws (Figure 4, Item 8) finger-tight.
8. Tighten screws installed in steps 3, 5, and 8.
9. Install fan support panel. See Install Fan Support Panel task.
10. Install fuel system panel. See Install Fuel System Panel task.

END OF TASK

Remove Radiator Tray

CAUTION

Individual interior panels (Figure 1) must be removed and installed in sequence as written in this work package and installed in reverse sequence. Failure to comply may result in damage to equipment.

1. Remove fuel system panel. See Remove Fuel System Panel task.
2. Remove fan support panel. See Remove Fan Support Panel task.
3. Remove radiator support panel. See Remove Cooler Support Panel task.
4. Drain cooling system (WP 0021, Service Cooling System).
5. Remove radiator hoses (WP 0024, Remove/Install Radiator Hose and Tube Assemblies).
6. Remove front radiator bracket and radiator (WP 0027, Remove/Install Radiator).

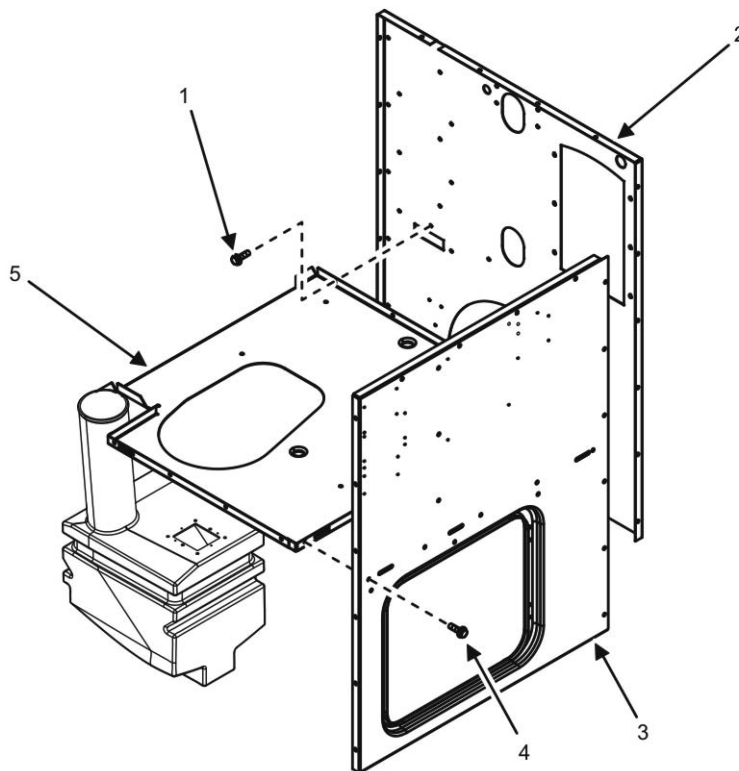


Figure 5. Radiator Support Tray — Removal.

7. Push DCS and cooling fan wiring harnesses (not shown) through cut-out in radiator tray (Figure 5, Item 5) and into bottom of unit skid.
8. Remove four screws (Figure 5, Item 1) securing radiator tray (Figure 5, Item 5) to bulkhead panel (Figure 5, Item 2).
9. Remove five screws (Figure 5, Item 4) that secure radiator tray (Figure 5, Item 5) to right-side body panel (Figure 5, Item 3).

CAUTION

The radiator tray is not very heavy but is large and cumbersome. Assistance may be required to lift it from the generator set. Failure to comply may result in damage to equipment.

10. Remove radiator support tray (Figure 5, Item 5) from unit and place on a suitable work surface.

END OF TASK

Inspect Radiator Support Tray

1. Inspect radiator support tray (Figure 5, Item 5) for cracks, corrosion, damage from heat, or other signs of damage.
2. Repair or replace radiator support tray (Figure 5, Item 5) as required.

END OF TASK

Install Radiator Support Tray**CAUTION**

The radiator tray (Figure 5, Item 5) is not very heavy but is large and cumbersome. Assistance may be required to lift it into its mounting position in the generator set. Failure to comply may result in damage to equipment.

1. Position radiator tray (Figure 5, Item 5) to mounting location in generator set.
2. Install five screws (Figure 5, Item 4) securing radiator support tray (Figure 5, Item 5) to right-side body panel (Figure 5, Item 3) finger-tight.
3. Install four cap screws (Figure 5, Item 1) securing radiator support tray (Figure 5, Item 5) to bulkhead panel (Figure 5, Item 2) finger-tight.
4. Pull DCS and cooling fan wiring harnesses (not shown) up through cut-out in radiator support tray (Figure 5, Item 5).
5. Tighten screws installed in steps 2 and 3.
6. Install radiator and front radiator bracket (WP 0027, Remove/Install Radiator).
7. Install radiator hoses (WP 0024, Remove/Install Radiator Hose and Tube assemblies).
8. Fill cooling system (WP 0021, Service Cooling System).
9. Install radiator support panel. See Remove Radiator Support Panel task.
10. Install fan support panel. See Remove Fan Support Panel task.
11. Install fuel system panel. See Remove Fuel System Panel task.
12. Check and re-fill cooling system as required after start-up (WP 0021, Service Cooling System).

END OF TASK**Remove Bulkhead Panel****CAUTION**

Individual interior panels (Figure 1) must be removed and installed in sequence as written in this work package and installed in reverse sequence. Failure to comply may result in damage to equipment.

1. Remove fuel system panel. See Remove Fuel System Panel task.
2. Remove fan support panel. See Remove Fan Support Panel task.
3. Remove radiator support panel. See Remove Cooler Support Panel task.
4. Remove radiator tray. See Remove Radiator Tray task.

CAUTION

After removing several exterior and interior body panels, the bulkhead panel has only minimal support. Assistance is required to support bulkhead panel during removal. Proceed with bulkhead panel removal carefully. Failure to comply may cause damage to equipment.

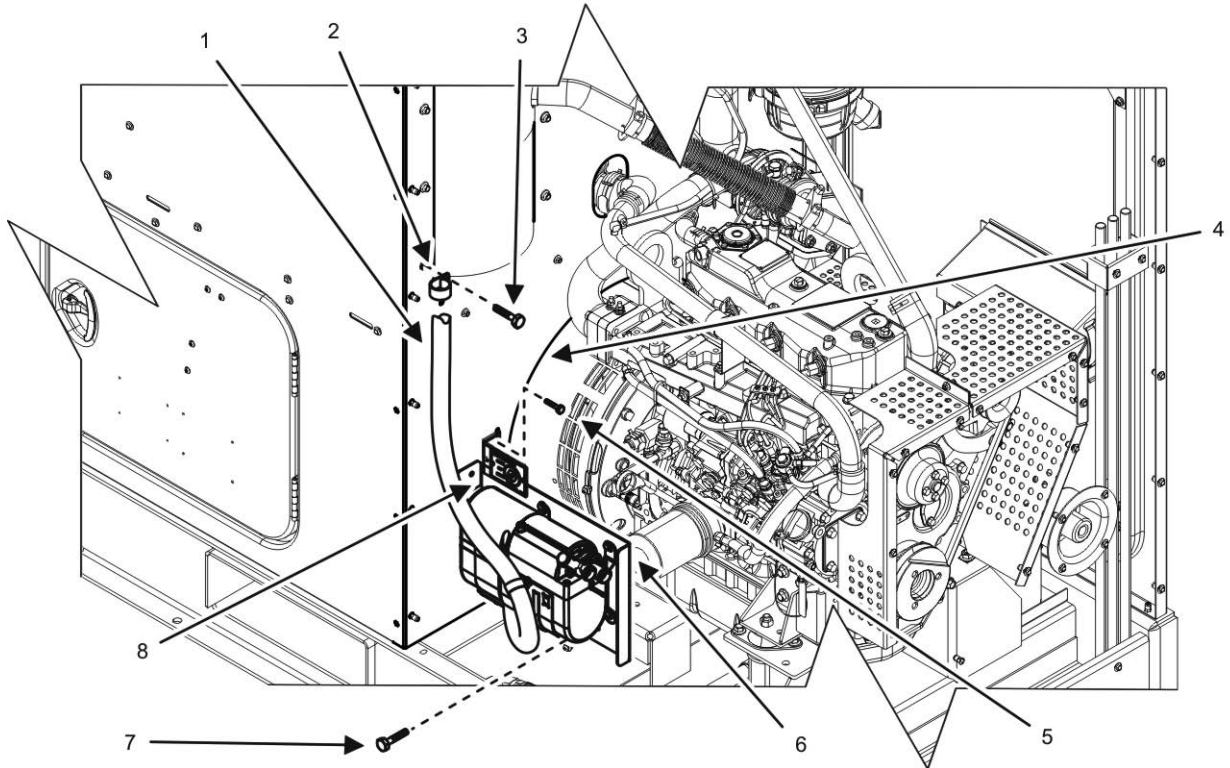


Figure 6. Bulkhead Panel Components — Right-Side.

5. Have assistant support bulkhead panel (Figure 6, Item 4) during removal.
6. Remove muffler (WP 0077, Remove/Install Muffler).
7. Remove screw (Figure 6, Item 5) that secures DEAD CRANK SWITCH (Figure 6, Item 8) to bulkhead panel (Figure 6, Item 4).
8. Inspect DEAD CRANK SWITCH (Figure 6, Item 8) for signs of obvious damage. Replace DEAD CRANK SWITCH (Figure 6, Item 8) as required. Allow DEAD CRANK SWITCH (Figure 6, Item 8) to remain in unit skid.
9. Remove screw (Figure 6, Item 3) and clamp (Figure 6, Item 2) that secures winterization kit exhaust tube (Figure 6, Item 1) to bulkhead panel (Figure 6, Item 4).
10. Remove exhaust tube (Figure 6, Item 1) from bulkhead panel (Figure 6, Item 4). Allow exhaust tube (Figure 6, Item 1) to remain in unit skid.
11. Remove three screws (Figure 6, Item 7) that secure winterization kit (Figure 6, Item 6) to bulkhead panel (Figure 6, Item 4) and unit skid.
12. Inspect winterization kit (Figure 6, Item 6) for signs of obvious damage. Replace winterization kit (Figure 6, Item 6) as required (WP 0025, Remove/Install Winterization Kit Components).
13. Reposition winterization kit (Figure 6, Item 6) within unit skid.

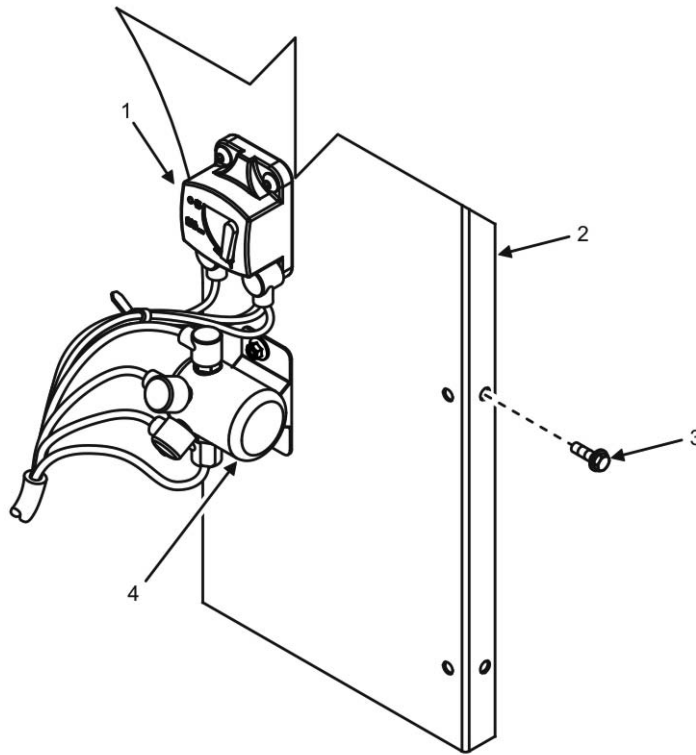


Figure 7. Bulkhead Panel Components — Left-side.

14. Close right-side door.
15. Remove main DC circuit breaker (Figure 7, Item 1) from bulkhead panel (Figure 7, Item 2) (WP 0037, Remove/Install Main DC Circuit Breaker). Allow main DC circuit breaker (Figure 7, Item 1) to remain in unit skid.
16. Remove intake air heater solenoid (Figure 7, Item 4) from bulkhead panel (Figure 7, Item 2) (WP 0038, Remove/Install Intake Air Heater Relay). Allow intake air heater solenoid (Figure 7, Item 4) to remain in unit skid.
17. Remove air cleaner (WP 0020, Service Air Cleaner) from bulkhead panel (Figure 7, Item 2).
18. Close left-side door.
19. Remove six screws (Figure 7, Item 3) that secure bulkhead panel (Figure 7, Item 2) to left-side door frame (not shown).

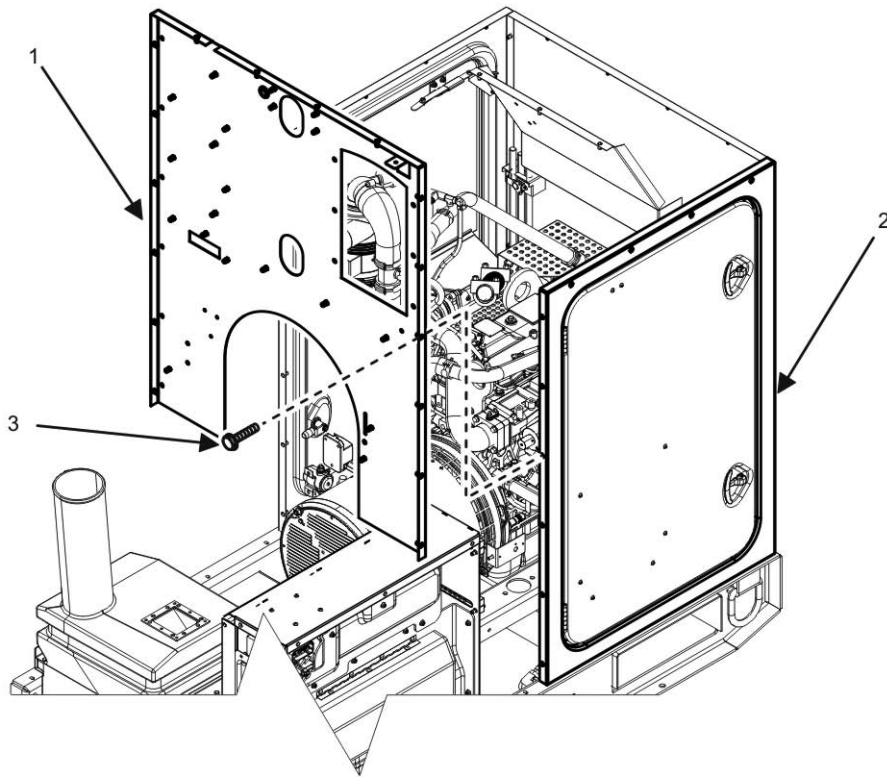


Figure 8. Bulkhead Panel — Removal.

20. Remove six screws (Figure 8, Item 3) that secures bulkhead panel (Figure 8, Item 1) to right-side door frame (Figure 8, Item 2).
21. Lift bulkhead panel (Figure 8, Item 1) from unit and place on suitable work surface.

END OF TASK

Inspect Bulkhead Panel

1. Inspect bulkhead panel (Figure 8, Item 1) for cracks, corrosion, heat damage, or other damage.
2. Repair or replace bulkhead panel (Figure 8, Item 1) as required.

END OF TASK

Install Bulkhead Panel

1. Position bulkhead panel (Figure 8, Item 1) inside generator set, against left and right-side door frames, ensuring proper orientation.

CAUTION

Assistance is required to support bulkhead panel during installation. Bulkhead panel has very little support until several other panels and/or components are attached to it. Proceed with bulkhead installation carefully. Failure to comply may cause damage to equipment.

2. Have assistant support bulkhead panel during installation.

3. Install six screws (Figure 8, Item 3) that secures bulkhead panel to right-side door frame (Figure 8, Item 2) finger-tight.
4. Install six screws (Figure 7, Item 3) that secures bulkhead panel (Figure 7, Item 2) to left-side door frame (not shown) finger-tight.
5. Tighten screws installed in step 3 and 4.
6. Open right-side door.
7. Install air cleaner (WP 0020, Service Air Cleaner) to bulkhead panel (Figure 7, Item 2).
8. Install intake air heater solenoid (Figure 7, Item 4) to bulkhead panel (Figure 7, Item 2) (WP 0038, Remove/Install Intake Air Heater Relay).
9. Install main DC circuit breaker (Figure 7, Item 1) to bulkhead panel (Figure 7, Item 2) (WP 0037, Remove/Install Main DC Circuit Breaker).
10. Open left-side door.
11. Position winterization kit (Figure 6, Item 6) to its mounting location on unit skid bulkhead panel (Figure 6, Item 4) and align the mounting holes.
12. Secure winterization kit (Figure 6, Item 6) to unit skid and bulkhead panel (Figure 6, Item 4) by installing three screws (Figure 6, Item 7) finger-tight.
13. Position winterization kit exhaust tube (Figure 6, Item 1) to its mounting location on bulkhead panel (Figure 6, Item 4) and secure by installing clamp (Figure 6, Item 2) and screw (Figure 6, Item 3).
14. Position DEAD CRANK SWITCH (Figure 6, Item 8) to its mounting location on bulkhead panel (Figure 6, Item 4) and secure by installing screw (Figure 6, Item 5).
15. Install muffler (WP 0077, Remove/Install Muffler).
16. Install radiator support tray. See Remove Radiator Support Panel task.
17. Install radiator support panel. See Remove Cooler Support Panel task.
18. Install cooler support panel. See Remove Cooler Support Panel task.
19. Install fuel system panel. See Remove Fuel System Panel task.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL DOOR

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Brace, door stay, bottom (WP 0104, Repair Parts List, Figure 4, Item 22)

Brace, door stay, top (WP 0104, Figure 4, Item 21)

Bracket, door stay (WP 0104, Figure 4, Item 17)

Bracket, output box door stay (WP 0104, Figure 4, Item 40)

Door, assembly, right and left (WP 0104, Figure 4, Item 51)

Door, output box assembly (WP 0104, Figure 4, Item 45)

Door assembly (WP 0104, Figure 4, Item 29)

Link, door (WP 0104, Figure 4, Item 19)

Materials/Parts

Grease, electrically conductive (WP 0164, Expendable and Durable Items List, Item 21)

Personnel Required

91D (1)

References

WP 0035, Repair Door

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL DOOR**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

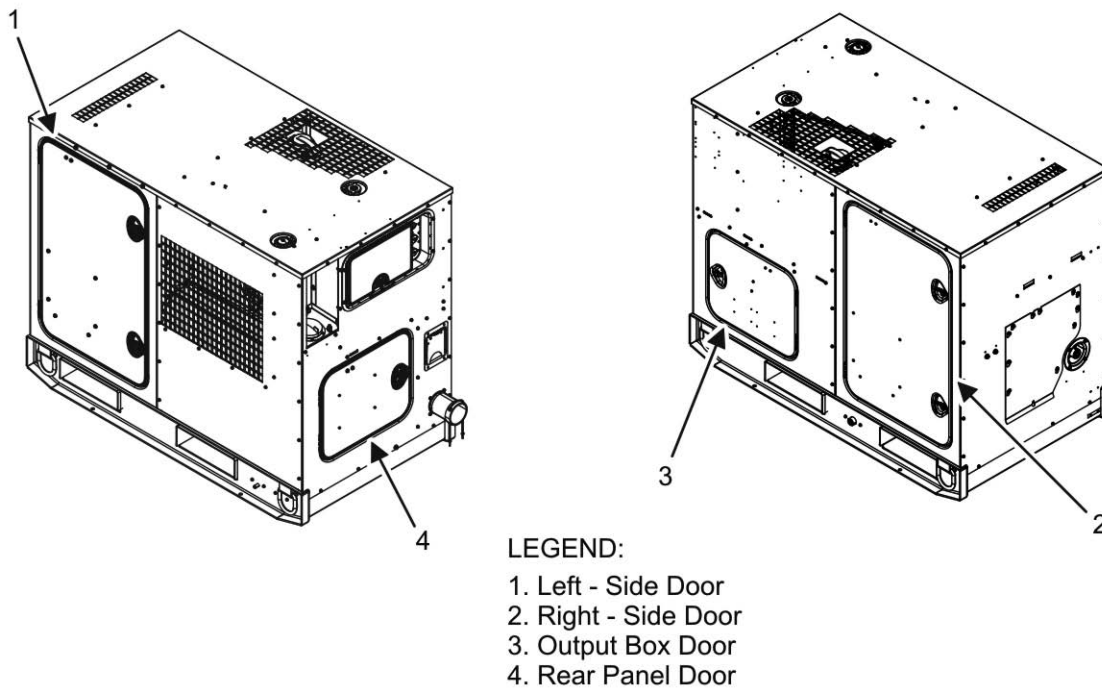


Figure 1. Door — Locations.

NOTE

Four doors (Figure 1) are installed on the AMMPS 15kW generator set. Each door may be removed with its corresponding body panel or frame installed or removed from generator set.

Each door has two hinges. Hinge removal, inspection, and installation procedures are the same for each door.

Doors are closed using one or two latches.

All doors have a door stay with locking link to hold the door in the open position. Door stay brackets are mounted behind the top door hinge and on the door panel.

Remove and install procedures are the same for all hinges and door stays.

Remove Door

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open and support door (Figure 2, Item 1) to be removed.
3. Remove nut (Figure 2, Item 12) and two washers (Figure 2, Items 10 and 11) from hex shoulder bolt (Figure 2, Item 4) securing door stay (Figure 2, Item 9) to door stay bracket (Figure 2, Item 2).
4. Remove four screws (Figure 2, Item 8) and four nuts (Figure 2, Item 3) securing door (Figure 2, Item 1) to two hinges (Figure 2, Item 5) on unit body panel (Figure 2, Item 6).

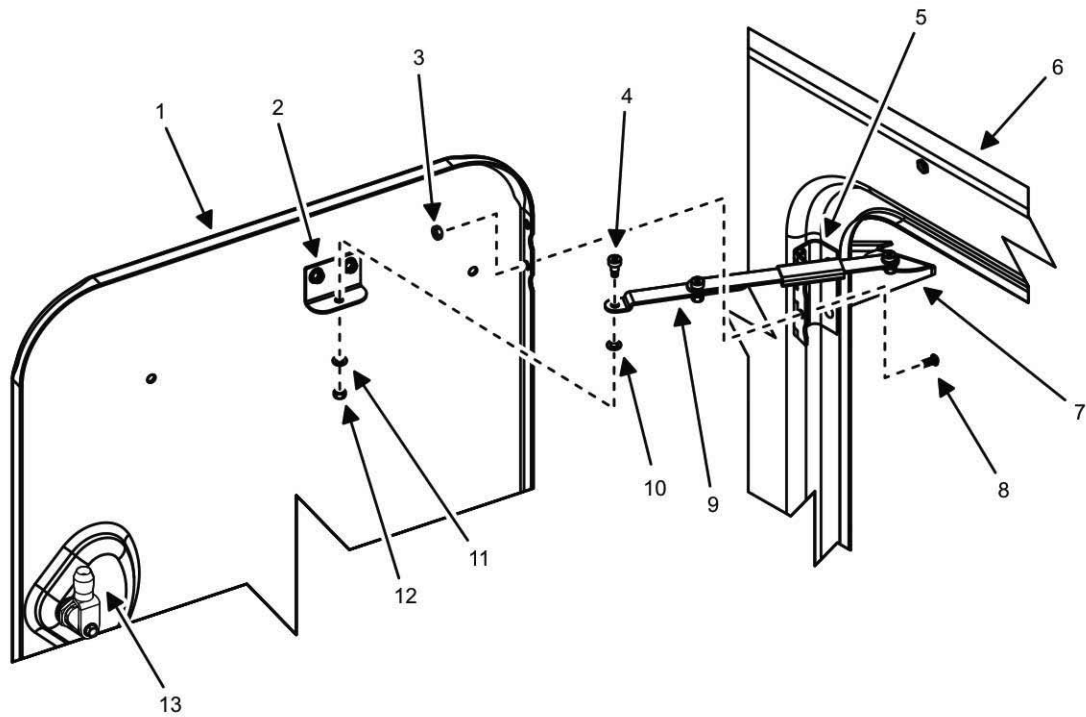


Figure 2. Door — Removal/Installation.

5. Remove door (Figure 2, Item 1) and place on a suitable work surface.

END OF TASK

Inspect Door

1. Inspect door (Figure 2, Item 1) for excessive corrosion or damage, and repair (WP 0035, Repair Door) or replace as required.
2. Inspect hinge(s) (Figure 2, Item 5) for freedom of movement and for excessive corrosion or damage, and repair (WP 0035, Repair Door) or replace as required.
3. Inspect screws (Figure 2, Item 8), washers (Figure 2, Items 10 and 11), and nut (Figure 2, Item 12), for excessive corrosion or damage, and repair (WP 0035, Repair Door) or replace as required.
4. Inspect door stay (Figure 2, Item 9), door stay bracket (Figure 2, Item 2), and body panel stay bracket (Figure 2, Item 7) for excessive corrosion or damage, and repair (WP 0035, Repair Door) or replace as required.
5. Inspect door latch (Figure 2, Item 13) for excessive corrosion or damage and repair (WP 0035, Repair Door) or replace as required.
6. Remove door stay bracket (Figure 2, Item 2) from door (Figure 2, Item 1) if door (Figure 2, Item 1) is being replaced. See Remove Door Stay and Brackets task.
7. Remove body panel stay bracket (Figure 2, Item 7) from unit body panel (Figure 2, Item 6) if unit body panel (Figure 2, Item 6) or body panel stay bracket (Figure 2, Item 7) are being replaced. See Remove Door Stay and Brackets task.

END OF TASK

Install Door

1. Position door (Figure 2, Item 1) to hinges (Figure 2, Item 5) and align mounting holes.
2. Install four screws (Figure 2, Item 8) and four nuts (Figure 2, Item 3) to secure door (Figure 2, Item 1) to two hinges (Figure 2, Item 5) on unit body panel (Figure 2, Item 6).
3. Install hex shoulder bolt (Figure 2, Item 4) and two washers (Figure 2, Items 10 and 11) through door stay (Figure 2, Item 9) and door stay bracket (Figure 2, Item 2), and secure with washer (Figure 2, Item 11) and nut (Figure 2, Item 12).
4. Verify proper operation of door (Figure 2, Item 1), hinges (Figure 2, Item 5), door latch (Figure 2, Item 13), and door stay (Figure 2, Item 9).
5. Repair as required.

END OF TASK

Remove Door Stay and Brackets

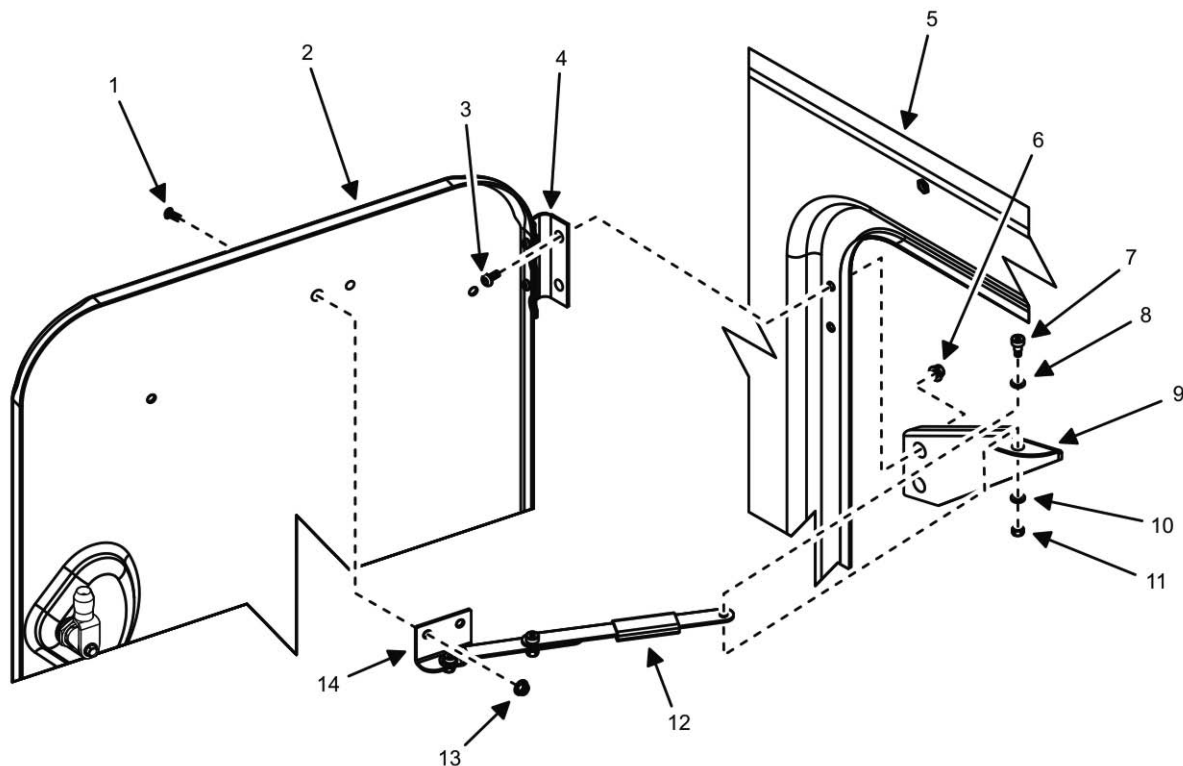


Figure 3. Door Stay, Bracket, and Hinge — Detail.

1. Remove hex head shoulder bolt (Figure 3, Item 7), two washers (Figure 3, Items 8 and 10), and nut (Figure 3, Item 11) and remove door stay (Figure 3, Item 12) from body panel stay bracket (Figure 3, Item 9).
2. Remove two hex socket head screws (Figure 3, Item 3) and two nuts (Figure 3, Item 6) to separate hinge (Figure 3, Item 4) and body panel stay bracket (Figure 3, Item 9) from unit body panel (Figure 3, Item 5).
3. Remove remaining hinge (not shown) by removing two hex socket head screws (Figure 3, Item 3) and two nuts (Figure 3, Item 6), and separate hinge (not shown) from unit body panel (Figure 3, Item 5).
4. Remove two hex socket head screws (Figure 3, Item 1) and nuts (Figure 3, Item 13) securing door stay bracket (Figure 3, Item 14) to inside of door (Figure 3, Item 2).

-
5. Place hinge(s) (Figure 3, Item 4), door stay (Figure 3, Item 12), door stay bracket (Figure 3, Item 14), body panel stay bracket (Figure 3, Item 9), hex socket head screws (Figure 3, Items 1 and 3), and nuts (Figure 3, Items 6 and 13) on a suitable work surface.

END OF TASK**Inspect Door Stay and Brackets**

1. Inspect door stay (Figure 3, Item 12), door stay bracket (Figure 3, Item 14), body panel stay bracket (Figure 3, Item 9) for damage or corrosion, and repair or replace as required.
2. Inspect hinges(s) (Figure 3, Item 4), hex socket head screws (Figure 3, Items 1 and 3), and nuts (Figure 3, Items 6 and 13) for freedom of movement, damage, or corrosion, and repair or replace as required (WP 0035, Repair Door).
3. Repair or replace damaged, broken, or excessively corroded mounting hardware.

END OF TASK**Install Door Stay and Brackets****NOTE**

Two types of body panel stay brackets (Figure 3, Item 9) are available. Be sure to use the correct bracket for the door in question.

1. Position body panel stay bracket (Figure 3, Item 9) and hinge (Figure 3, Item 4) onto unit body panel (Figure 3, Item 5) and align mounting holes.
2. Install hex socket head screws (Figure 3, Item 3) and nuts (Figure 3, Item 6) securing body panel stay bracket (Figure 3, Item 9) and hinge (Figure 3, Item 4) to unit body panel (Figure 3, Item 5).
3. Install remaining hinge (not shown) by installing two hex socket head screws (Figure 3, Item 3) and two nuts (Figure 3, Item 6) to unit body panel (Figure 3, Item 5).
4. Position door stay bracket (Figure 3, Item 14) onto door (Figure 3, Item 2) and align mounting holes. Ensure proper orientation of door stay bracket (Figure 3, Item 14).
5. Install hex socket head screws (Figure 3, Item 1) through door (Figure 3, Item 2) and door stay bracket (Figure 3, Item 14), and secure with two nuts (Figure 3, Item 13).
6. Install hex head shoulder bolt (Figure 3, Item 7), two washers (Figure 3, Items 8 and 10), and nut (Figure 3, Item 11) to secure door stay (Figure 3, Item 12) to body panel stay bracket (Figure 3, Item 9).
7. Verify proper operation of door (Figure 3, Item 2), hinge(s) (Figure 3, Item 4), and door stay (Figure 3, Item 12) by opening and closing door (Figure 3, Item 2) and using door stay (Figure 3, Item 12) to hold door (Figure 3, Item 2) in open position.
8. Repair as required.
9. Install battery ground cable (WP 0036, Remove/Install Batteries).
10. Close all unit doors.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REPAIR DOOR

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Hinge (WP 0104, Repair Parts List, Figure 4, Item 30)

Latch (WP 0104, Figure 4, Item 33)

Grease, electrically conductive (WP 0164, Expendable and Durable Items List, Item 21)

Personnel Required

91D (1)

References

WP 0034, Remove/Install Door

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REPAIR DOOR**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

NOTE

Four doors (Figure 1) are installed on the generator set. Repair of doors is accomplished by replacement of door latch and/or hinges. Door latches and hinges can be replaced with panel installed on the unit or with panel removed.

Replacement procedures for the door latch and hinges are the same for all doors. Procedures are also the same whether door panel is installed or removed from unit.

Remove Latch

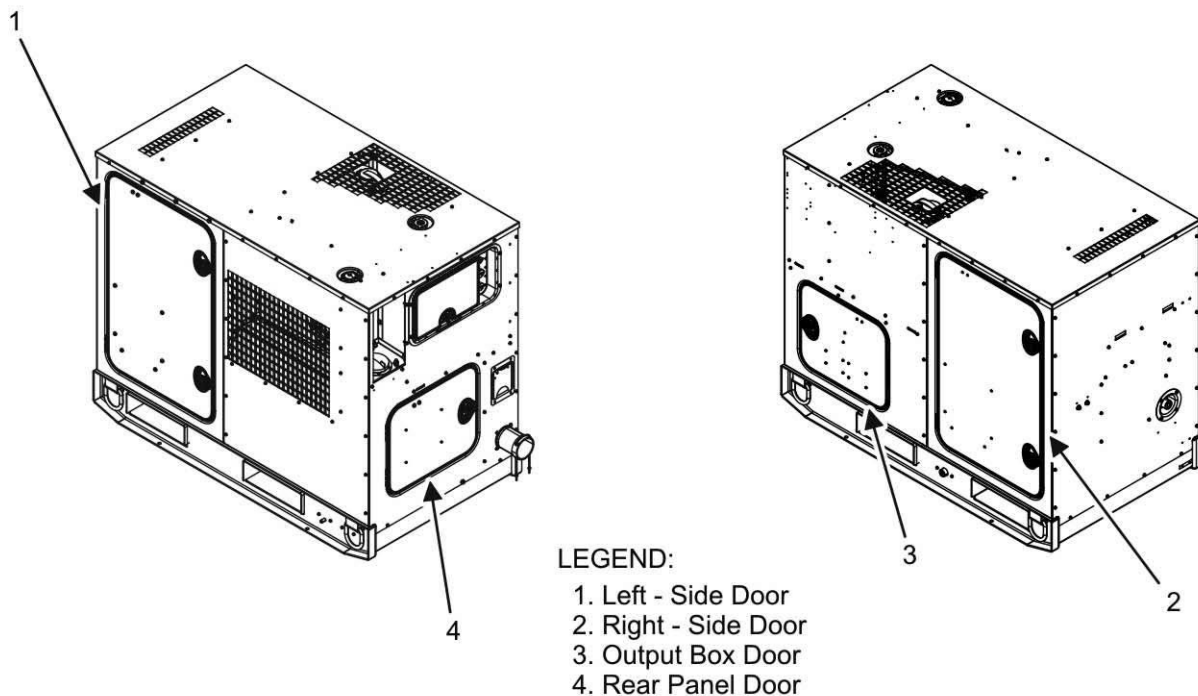


Figure 1. Door Repair — Locations.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate door to be repaired (Figure 1).

NOTE

Separating the inner latch and outer latch components releases a spring inside the outer latch. Ensure that this spring is not lost during removal.

3. Remove bolt (Figure 2, Item 1) securing inner door latch (Figure 2, Item 2) to outer latch pivot mounting (Figure 2, Item 4) and place on a suitable work surface.
4. Disconnect inner door latch (Figure 2, Item 2) and outer latch pivot mounting (Figure 2, Item 4) and remove from door. Place latch parts and spring (Figure 2, Item 3) on a suitable work surface.
5. Remove roll pin (Figure 2, Item 6) securing T-handle (Figure 2, Item 5) to outer latch pivot mounting (Figure 2, Item 4) and place roll pin (Figure 2, Item 6) on a suitable work surface.

6. Remove T-handle (Figure 2, Item 5) from outer latch pivot mounting (Figure 2, Item 4) and place on a suitable work surface.
7. Inspect all door latch parts for corrosion or other damage, and replace as required.

END OF TASK

Install Latch

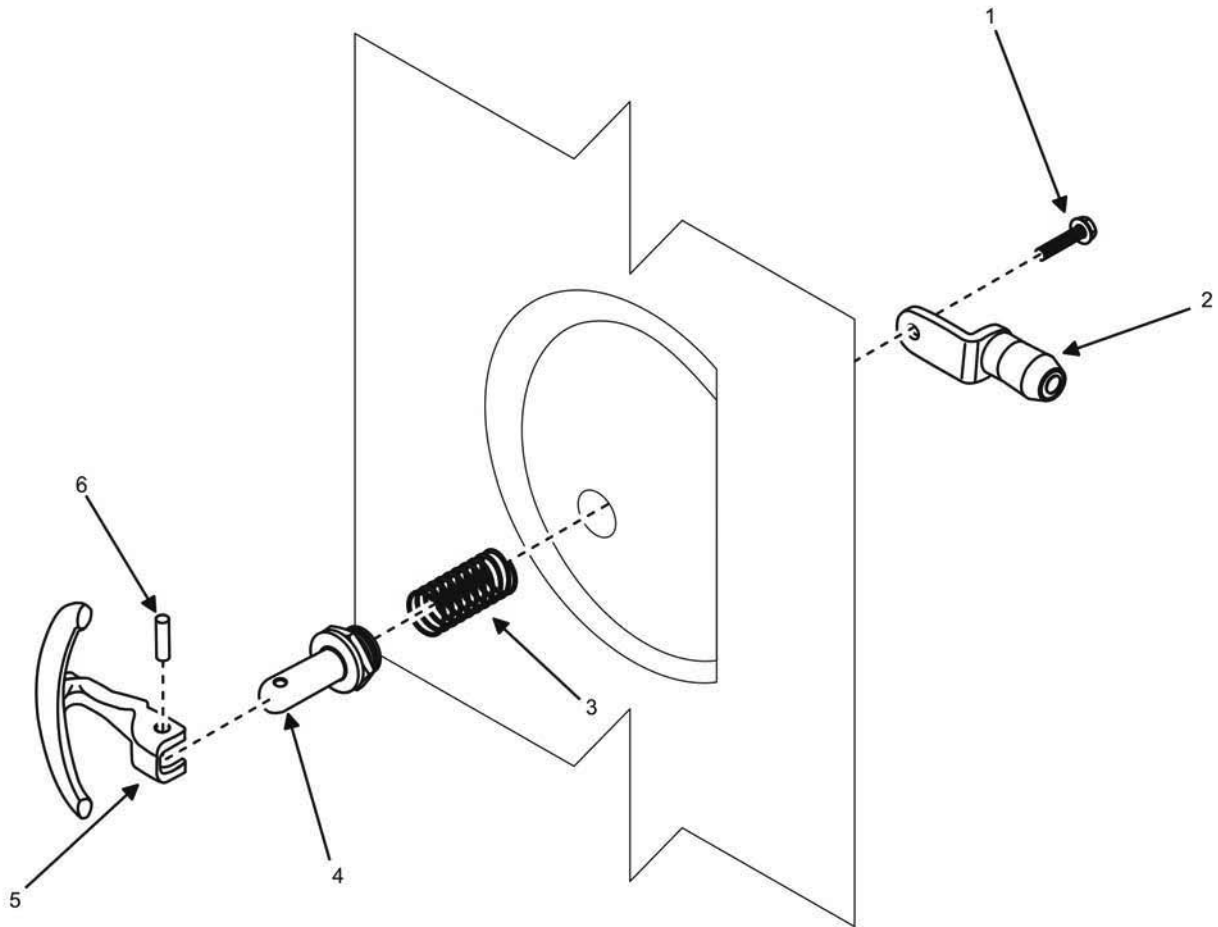


Figure 2. Door Latch Components.

NOTE

If T-handle (Figure 2, Item 5) has been removed from outer latch pivot mounting (Figure 2, Item 4), complete steps 1 through 3 to reassemble outer door latch parts. If T-handle (Figure 2, Item 5) has not been removed, proceed to step 4.

1. Position T-handle (Figure 2, Item 5) to outer latch pivot mounting (Figure 2, Item 4) and align mounting holes.
2. Install roll pin (Figure 2, Item 6) through mounting holes to secure T-handle (Figure 2, Item 5) to outer latch pivot mounting (Figure 2, Item 4).
3. Install spring (Figure 2, Item 3) inside outer latch pivot mounting (Figure 2, Item 4).

4. Position inner door latch (Figure 2, Item 2) and outer latch (Figure 2, Items 4 and 5) parts to their mounting locations on either side of door.
5. Secure inner door latch (Figure 2, Item 2) and outer latch (Figure 2, Items 4 and 5) to door by installing bolt (Figure 2, Item 1).
6. Check door latch for proper operation.
7. Install battery ground cable (WP 0036, Remove/Install Batteries).

END OF TASK

Remove Hinge

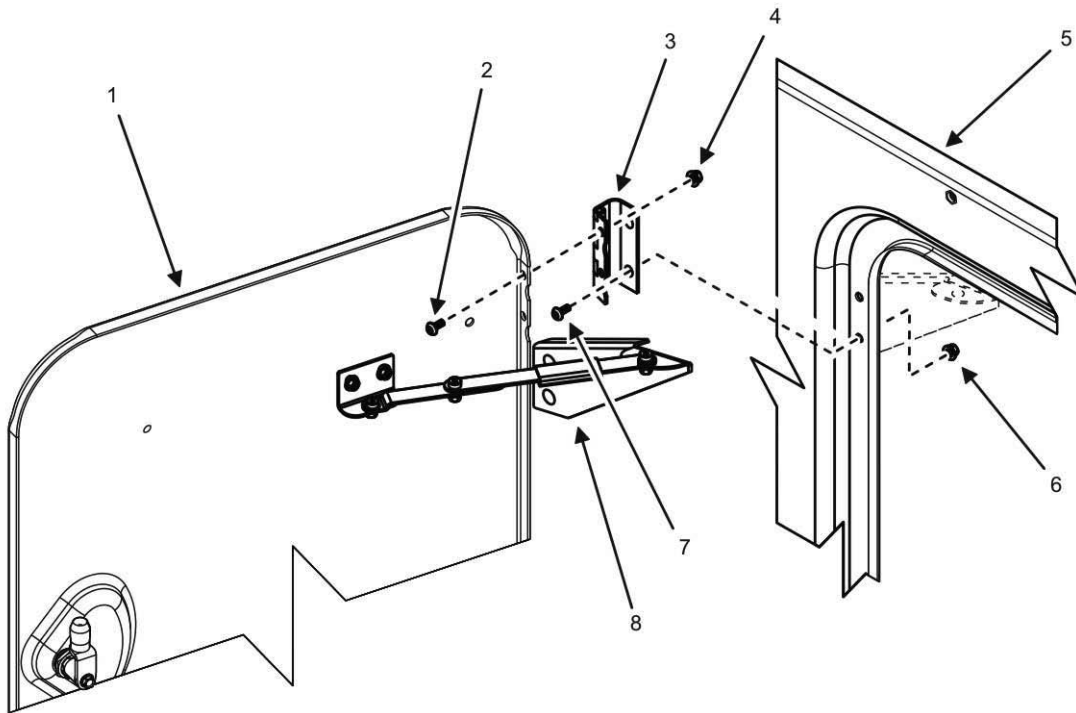


Figure 3. Door Hinge Components.

NOTE

Doors are attached to mounting locations by two hinges. One hinge can be replaced without removing the door from the unit. Remove and install procedures are the same for all hinges unless removing or installing doors with door stay brackets.

For hinges with door stay brackets attached, release bracket from hinge mounting location but leave opposite end of door stay fastened to door.

1. Open door (Figure 3, Item 1) with hinge(s) (Figure 3, Item 3) to be removed.
2. Remove two screws (Figure 3, Item 2) and two nuts (Figure 3, Item 4) securing hinge (Figure 3, Item 3) to door (Figure 3, Item 1).

-
3. Remove two screws (Figure 3, Item 7) and two nuts (Figure 3, Item 6) securing hinge (Figure 3, Item 3), and door stay bracket (Figure 3, Item 8) as required, to body panel (Figure 3, Item 5).
 4. Remove hinge (Figure 3, Item 3) and door (Figure 3, Item 1) from unit and place on a suitable work surface.
 5. Inspect all door and hinge parts for corrosion or other damage, and replace as required.

END OF TASK**Install Hinge**

1. Position hinge (Figure 3, Item 3) to its mounting location on door (Figure 3, Item 1) and align mounting holes.
2. Install hinge (Figure 3, Item 3) to door (Figure 3, Item 1) using two screws (Figure 3, Item 2) and two nuts (Figure 3, Item 4). Finger-tighten.
3. Position door stay bracket (Figure 3, Item 8), as required, by aligning bracket mounting holes with mounting holes in hinge (Figure 3, Item 3) and in body panel (Figure 3, Item 5).
4. Install hinge (Figure 3, Item 3) and door stay bracket (Figure 3, Item 8) to body panel (Figure 3, Item 5) using two screws (Figure 3, Item 7) and two nuts (Figure 3, Item 6). Finger-tighten.
5. Secure all hinge screws (Figure 3, Items 2 and 7) to a torque value of 8 ft/lb (10 – 12 Nm).
6. Verify proper hinge (Figure 3, Item 3) operation by opening and closing door, and repair as needed.
7. Verify proper door stay operation (Figure 3, Item 8), and repair or replace as needed (WP 0034, Remove/Install Door).
8. Repeat Replace Door Hinge task as needed for other hinges.
9. Install battery ground cable (WP 0036, Remove/Install Batteries).
10. Close all generator set doors.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL BATTERIES

INITIAL SETUP:**Test Equipment**

Not Applicable

Personnel Required

91D (1)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Assistant (1)

References

Not Applicable

Materials/Parts

Battery, storage (2) (WP 0102, Repair Parts List, Figure 2, Item 6)

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Brush, battery terminal (WP 0164, Expendable and Durable Items List, Item 7)

Engine cool

Grease, electrically conductive (WP 0164, Item 21)

Special Environmental Conditions

Not Applicable

Rag, wiping (WP 0164, Item 32)

Drawings Required

Not Applicable

REMOVE/INSTALL BATTERIES**WARNING**

- Batteries give off combustible gas. Do not smoke or use open flame when performing maintenance. Failure to comply may cause injury or death to personnel and damage to equipment.
- Battery acid can cause burns to skin and cause eye injury. Wear safety goggles and chemical gloves and avoid acid splash while working on the batteries. Failure to comply may cause injury or death to personnel.
- Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.
- Lifting batteries may cause back strain. Ensure proper lifting techniques are used when lifting batteries. Failure to comply may cause injury or death to personnel.

Remove Batteries

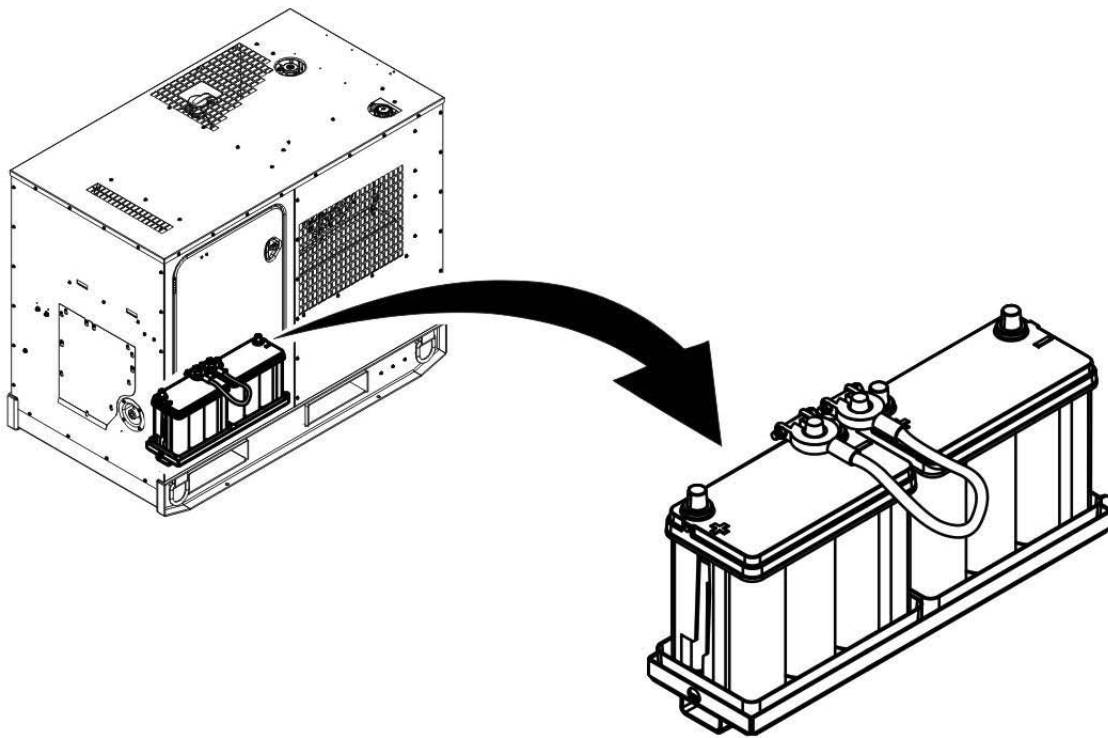


Figure 1. Battery — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door of generator set to locate batteries (Figure 1).

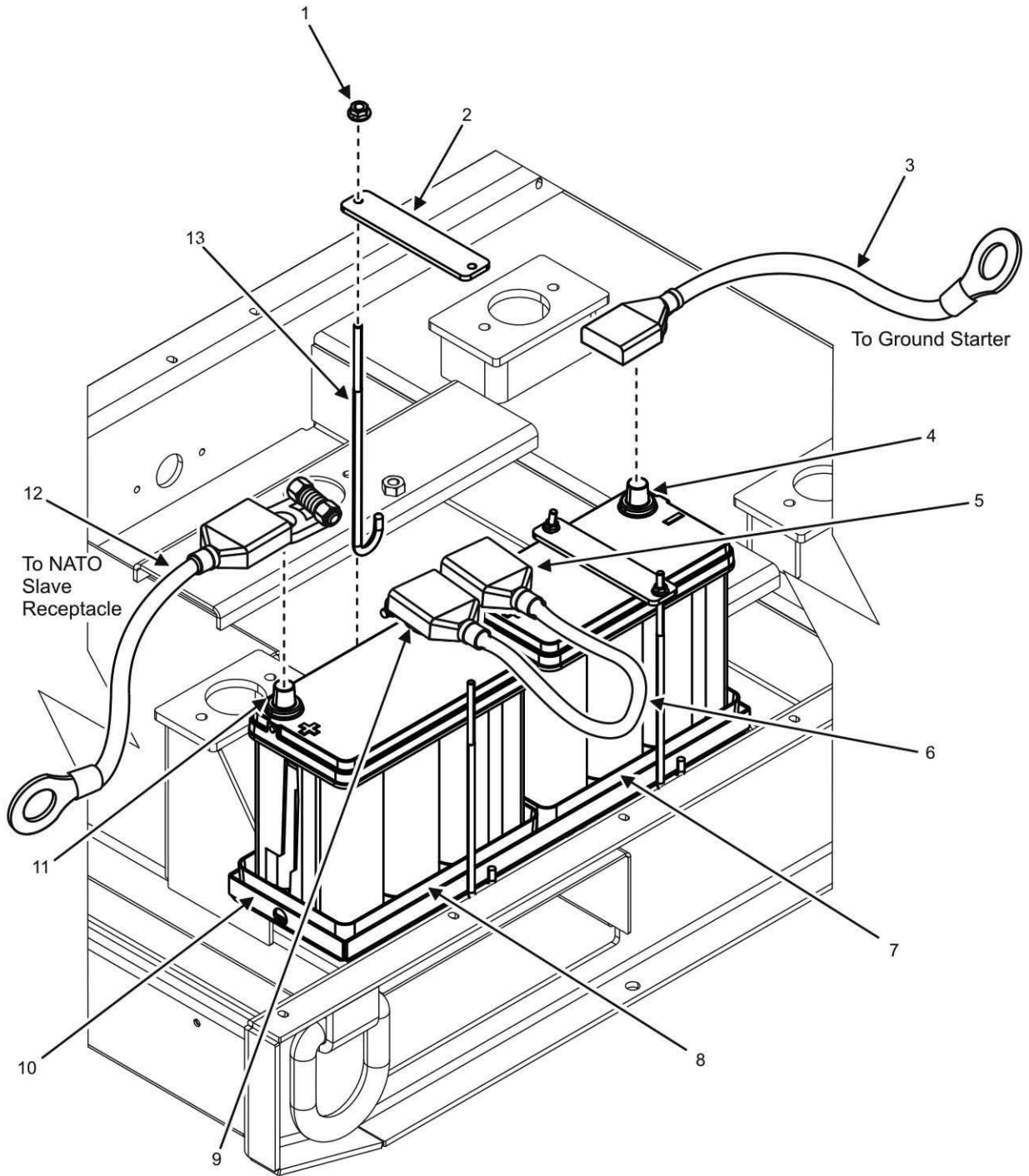


Figure 2. Remove/Install Batteries.

WARNING

The right-hand battery negative lead that connects directly to the grounding stud must be disconnected prior to disconnecting or removing batteries. Follow procedural steps in exact order given for removal and installation. Failure to comply may cause injury or death to personnel.

3. Disconnect battery unit ground cable (Figure 2, Item 3) from negative battery terminal (Figure 2, Item 4) of right-hand battery (Figure 2, Item 7).
4. Disconnect battery jumper cable (Figure 2, Item 6) from negative battery terminal (Figure 2, Item 9) of left-hand battery (Figure 2, Item 8).

NOTE

Sealed lead acid batteries do not leak in normal usage. The battery can be moved out of the tray and tilted to allow movement of left-hand battery (Figure 2, Item 8) for ease of terminal removal.

5. Disconnect battery unit power cable (Figure 2, Item 12) from positive battery terminal (Figure 2, Item 11) of left-hand battery (Figure 2, Item 8).
6. Disconnect battery jumper cable (Figure 2, Item 6) from positive battery terminal (Figure 2, Item 5) of right-hand battery (Figure 2, Item 7).
7. Remove jumper cable (Figure 2, Item 6) from unit.
8. Inspect jumper cable (Figure 2, Item 6) for frayed edges, cracks in insulation, and other obvious signs of damage. Replace as required.
9. Loosen and remove four nuts (Figure 2, Item 1) from four J-hooks (Figure 2, Item 13) securing two battery holders (Figure 2, Item 2) to unit.
10. Inspect nuts (Figure 2, Item 1) for corrosion, excessive wear, and other signs of obvious damage. Replace as required.
11. Remove two battery holders (Figure 2, Item 2) from unit.
12. Inspect battery holders (Figure 2, Item 2) for corrosion, excessive wear, and other signs of obvious damage. Replace as required.

CAUTION

Do not move or lift batteries by the terminal studs. Lift batteries using battery lifting strap if supplied with battery. Failure to comply will cause damage to equipment.

13. Lift and remove two batteries (Figure 2, Items 7 and 8) from unit.
14. Lift and remove two removable battery trays (Figure 2, Item 10) from unit.
15. Clean dirt and debris from removable battery trays (Figure 2, Item 10) with compressed air and wiping rag.
16. Inspect removable battery trays (Figure 2, Item 10) for corrosion, dents, and other signs of obvious damage. Replace as required.
17. Remove four J-hooks (Figure 2, Item 13) from unit.
18. Inspect J-hooks (Figure 2, Item 13) for corrosion, excessive wear, and other signs of obvious damage. Replace as required.
19. Clean dirt and debris from battery compartment with wiping rag.

END OF TASK

Test/Inspect Batteries

1. Inspect batteries (Figure 2, Items 7 and 8) for leaks, cracks, swelling, and corrosion. Replace batteries (Figure 2, Items 7 and 8) as required.
2. Inspect battery terminals (Figure 2, Items 4, 5, 9 and 11) for melting, bends, or other damage. Replace batteries (Figure 2, Items 7 and 8) as required.
3. Ensure equipment conditions are met in order presented in initial setup.
4. Remove dirt and debris from all battery terminals (Figure 2, Items 4, 5, 9, and 11) with serrated nose of lifter-scraper.

NOTE

The DCS provides a constant real-time monitor of battery voltage and current.

5. Test voltage of each battery (Figure 2, Items 7 and 8) with multimeter.

WARNING

Batteries give off combustible gas. Do not smoke or use open flame when performing maintenance. Failure to comply may cause injury or death to personnel and damage to equipment.

CAUTION

When recharging batteries (Figure 2, Items 7 and 8) always use a voltage regulated battery charger and strictly adhere to all limits in Table 1. When first turning on a charger, always watch the ammeter for the first few minutes to verify that each battery (Figure 2, Items 7 and 8) is accepting amperage. Batteries (Figure 2, Items 7 and 8) will get slightly warm during charging. Any battery (Figure 2, Items 7 and 8) that is hot to the touch indicates a malfunction and charging must be stopped immediately. Failure to comply will cause damage to equipment.

NOTE

A completely discharged battery is considered to have 11.2 VDC or less. A deeply discharged battery (10.5 VDC or less) may not accept a charge from a charger. A deeply discharged battery may need to be charged while in parallel with another fully charged 12 VDC automotive battery until deeply discharged battery reaches 10.5 VDC or above. Once deeply discharged battery reaches 10.5 VDC, normal charging procedures can be followed.

6. Charge any battery (Figure 2, Items 7 and 8) with voltage reading less than 12 VDC (Table 1).

Table 1. Charging Recommendations.

CHARGER TYPE	TARGET VOLTAGE RANGE (VDC)	MAXIMUM CURRENT (AMPS)
Regular/Automatic	13.8 to 15.0	10
Float Charge	13.2 to 13.8	1
Constant Voltage Charger	15.6 maximum	No limit as long as battery temperature remains below 125°F (51.7°C)

NOTE

After charging, allow each charged battery (Figure 2, Items 7 and 8) to settle (“rest”) for a minimum of 8 hr. Batteries (Figure 2, Items 7 and 8) should have approximately 12.80 VDC open circuit voltage after charging and settle period.

7. Use a multimeter and check each settled (“rested”) battery (Figure 2, Items 7 and 8) for proper voltage.
8. Use battery (Figure 2, Items 7 and 8) if within specification or attempt recharge, and replace battery (Figure 2, Items 7 and 8) if discharge continues after one additional charging attempt.
9. Ensure batteries are connected. See Install Batteries task.

NOTE

Use of an assistant is required to load test batteries. Batteries should hold proper voltage during a load test of 15 sec.

10. Use a multimeter set to test VDC to measure the voltage of each battery while an assistant positions DEAD CRANK SWITCH in CRANK position for 15 sec (TM 9-6115-751-10).
11. Follow charge procedures (steps 6 through 8) for any battery (Figure 2, Items 7 and 8) that drops below 10 VDC during load test.

END OF TASK**Install Batteries**

1. Insert four J-hooks (Figure 2, Item 13) through openings in battery compartment permanent tray (not shown) beneath removable battery trays (Figure 2, Item 10).

NOTE

Place battery (Figure 2, Items 7 and 8) and removable battery tray (Figure 2, Item 10) in center of permanent tray for ease of installation. Battery and removable battery tray (Figure 2, Item 10) may be placed in position after attaching unit power cable.

2. Place two battery trays (Figure 2, Item 10) into mounting position in unit.

CAUTION

Do not move or lift batteries by the terminal studs. Lift batteries using battery lifting strap if supplied with battery. Failure to comply will cause damage to equipment.

3. Position left-hand battery (Figure 2, Item 8) in removable battery tray (Figure 2, Item 10) with positive terminal facing to the left.
4. Position battery holder (Figure 2, Item 2) across top-center of battery and align holes with two J-hooks (Figure 2, Item 13).
5. Install one nut (Figure 2, Item 1) to each J-hook (Figure 2, Item 13) and hand-tighten both nuts (Figure 2, Item 1).
6. Install right-hand battery (Figure 2, Item 7) using steps 3 through 5.
7. Apply a light coating of electrically conductive grease to all battery terminals (Figure 2, Items 4, 5, 9, and 11).
8. Attach battery unit power cable (Figure 2, Item 12) to positive terminal (Figure 2, Item 11) of left-hand battery (Figure 2, Item 8).

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9. Attach battery jumper cable (Figure 2, Item 6) to positive battery terminal (Figure 2, Item 5) of right-hand battery (Figure 2, Item 7).
 10. Attach battery jumper cable (Figure 2, Item 6) to negative battery terminal (Figure 2, Item 9) of left-hand battery (Figure 2, Item 8).
 11. Adjust position of two battery holders (Figure 2, Item 2) to secure batteries (Figure 2, Items 7 and 8) in position.

CAUTION

Excessive tightening of the battery holder (Figure 2, Item 2) may crack the battery case. Do not over-tighten nuts (Figure 2, Item 1) on J-hooks (Figure 2, Item 12). Failure to comply may cause damage to equipment.

12. Tighten four nuts (Figure 2, Item 1) to secure batteries.
13. Attach battery unit ground cable (Figure 2, Item 3) to negative battery terminal (Figure 2, Item 4) of right-hand battery (Figure 2, Item 7).
14. Close generator set doors.
15. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
16. Start engine and check for proper operation (TM 9-6115-751-10).
17. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL MAIN DC CIRCUIT BREAKER

INITIAL SETUP:**Test Equipment**

Not Applicable

References

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Materials/Parts

Circuit breaker (WP 0102, Repair Parts List, Figure 2, Item 22)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Grease, electrically conductive (WP 0164, Expendable and Durable Items List, Item 21)

Left-side body panel removed (WP 0031, Remove/Install Left-Side Body Panels)

Personnel Required

91D (1)

Special Environmental Conditions

Not Applicable

Assistant (1)

Drawings Required

Not Applicable

REMOVE/INSTALL MAIN DC CIRCUIT BREAKER**WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

The main DC breaker can be tested for continuity while installed or when removed from the unit but must be installed when testing for short to ground. Multimeter readings should be the same as noted below. To test the breaker without removing it from the unit, see Test Main DC Circuit Breaker task.

Remove Main DC Circuit Breaker

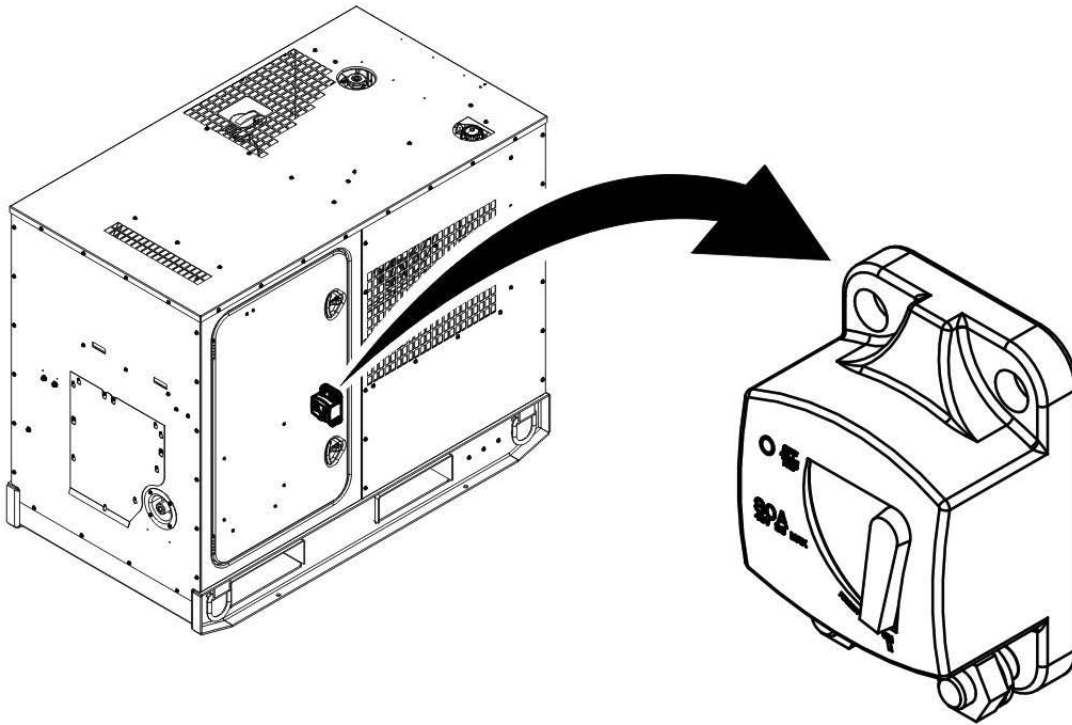


Figure 1. Main DC Circuit Breaker — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door and locate main DC circuit breaker (Figure 1) below air cleaner (not shown) on internal bulkhead panel.
3. Set main DC circuit breaker switch (Figure 2, Item 7) to OFF position.
4. Remove protective caps from wire leads (Figure 2, Items 5 and 12) on both load terminal (Figure 2, Item 10) and line terminal (Figure 2, Item 11) of the main DC circuit breaker (Figure 2, Item 8).
5. Tag and disconnect wire leads (Figure 2, Item 12) attached to load terminal (Figure 2, Item 10) of main DC circuit breaker (Figure 2, Item 8) by removing nut (Figure 2, Item 1) and lock washer (Figure 2, Item 2) securing wire leads (Figure 2, Item 12) to load terminal (Figure 2, Item 10).
6. Tag and disconnect wire lead (Figure 2, Item 5) attached to line terminal (Figure 2, Item 11) of main DC circuit breaker (Figure 2, Item 8) by removing nut (Figure 2, Item 3) and lock washer (Figure 2, Item 4) securing wire lead (Figure 2, Item 5) to line terminal (Figure 2, Item 11).
7. Set mounting hardware aside for reuse.

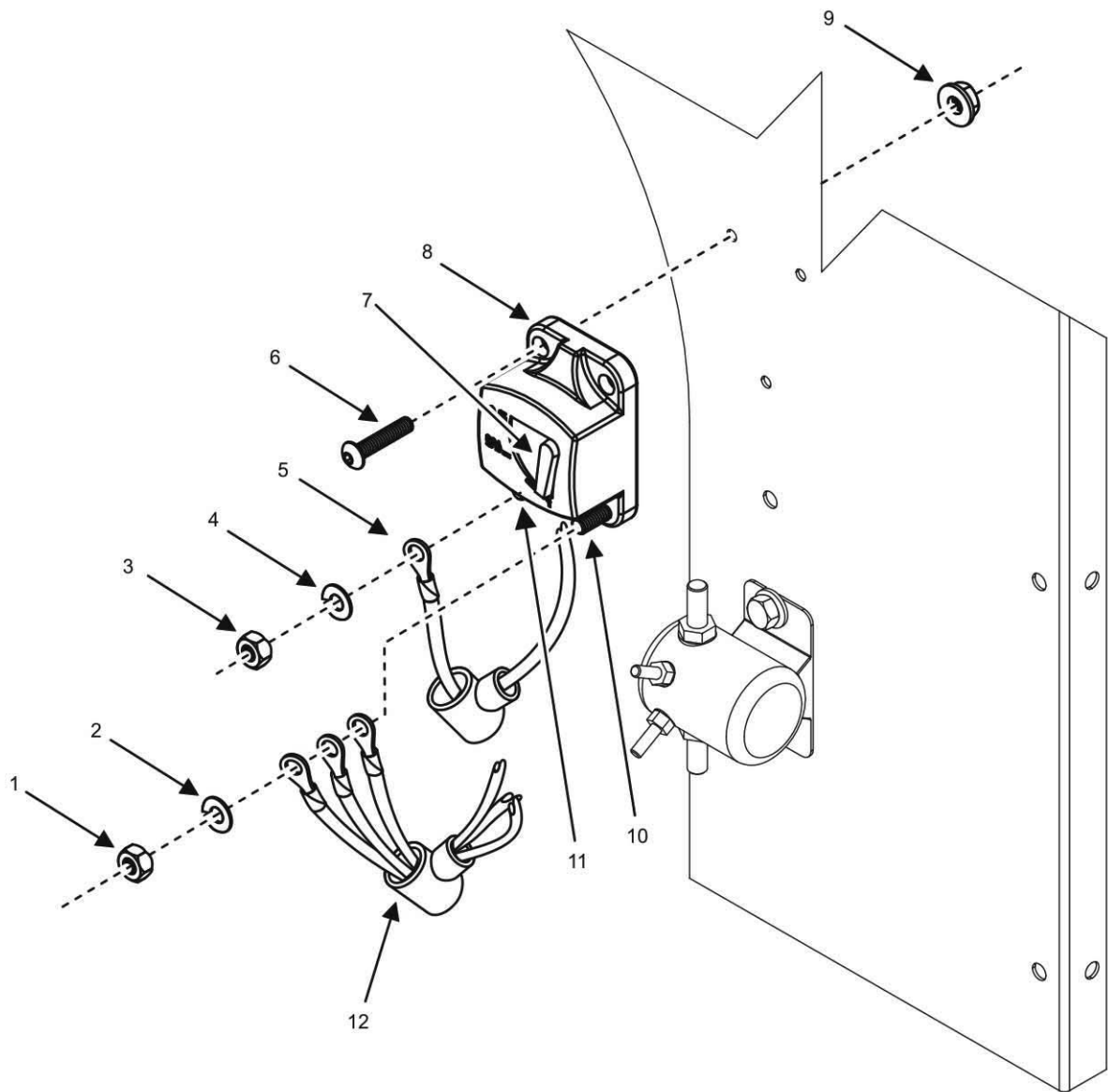


Figure 2. Main DC Circuit Breaker — Removal.

8. Remove three socket head cap screws (Figure 2, Item 6) and three flange nuts (Figure 2, Item 9) securing main DC circuit breaker (Figure 2, Item 8) to interior bulkhead panel, and set mounting hardware aside for reuse.
9. Remove main DC circuit breaker (Figure 2, Item 8) from interior bulkhead panel and place on a suitable work surface.

END OF TASK

Test Main DC Circuit Breaker

1. Inspect main DC circuit breaker (Figure 2, Item 8) for signs of damage or corrosion and replace as required.
2. Test main DC circuit breaker (Figure 3, Item 4) for proper continuity:
 - a. Set multimeter (Figure 3, Item 1) to ohms (Ω) and verify that multimeter (Figure 3, Item 1) is operating correctly by touching multimeter probes (Figure 3, Item 5) together and observing less than approximately 1 Ω on multimeter (Figure 3, Item 1).
 - b. Set main DC circuit breaker switch (Figure 3, Item 3) to ON position.

NOTE

Any multimeter (Figure 3, Item 1) reading greater than approximately 1 Ω during continuity test indicates the main DC circuit breaker (Figure 3, Item 2) is faulty and should be replaced. If main DC circuit breaker (Figure 3, Item 2) fails the continuity test, a short to ground test (see step 3) is not necessary.

- c. Place one probe (Figure 3, Item 5) on each main DC circuit breaker terminal (Figure 3, Item 4) and verify multimeter (Figure 3, Item 1) reading is no greater than approximately 1 Ω .
- d. Replace main DC circuit breaker (Figure 3, Item 2) if multimeter (Figure 3, Item 1) reading is greater than approximately 1 Ω when main DC circuit breaker terminals (Figure 3, Item 4) are tested.

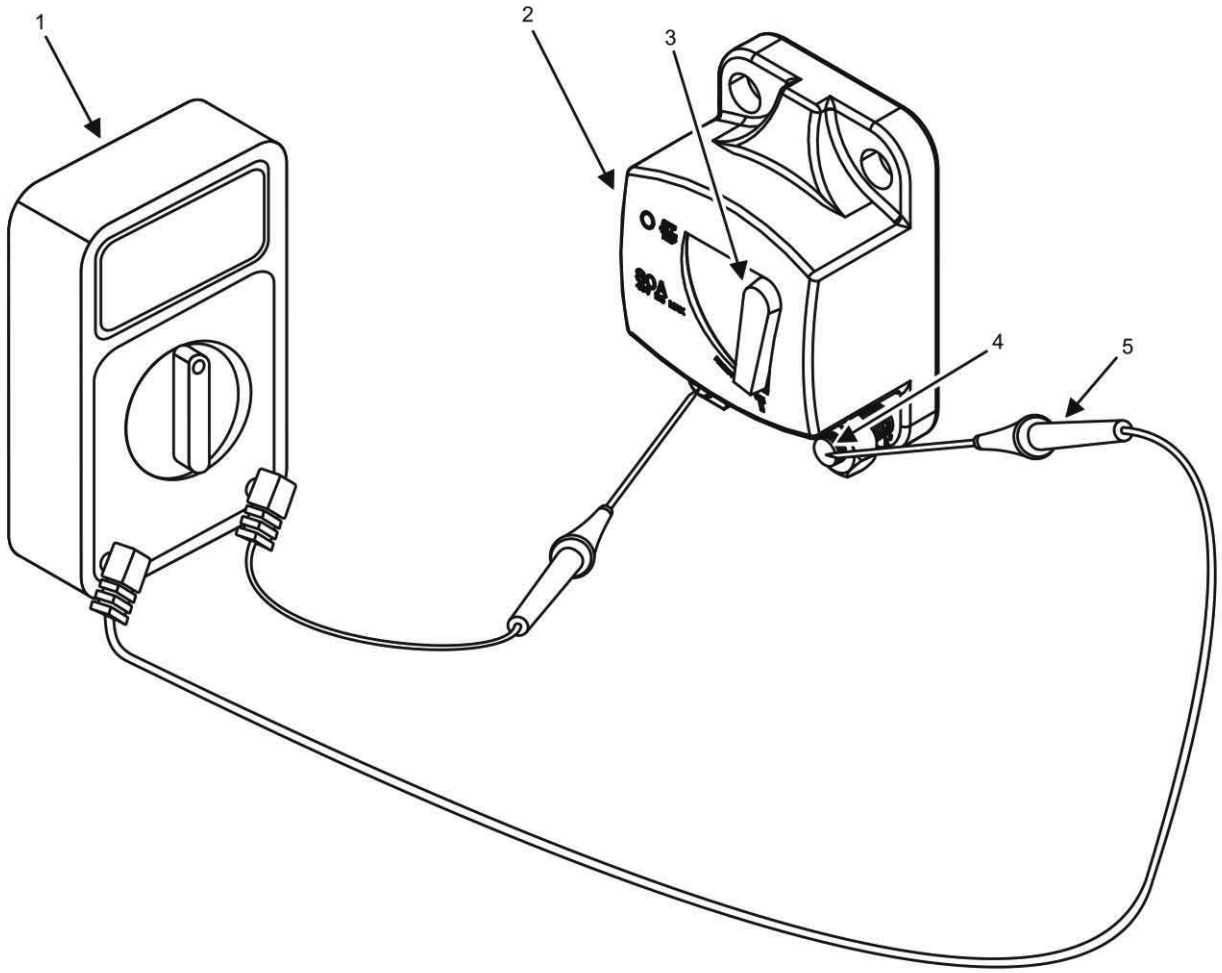


Figure 3. Test Main DC Circuit Breaker — Continuity.

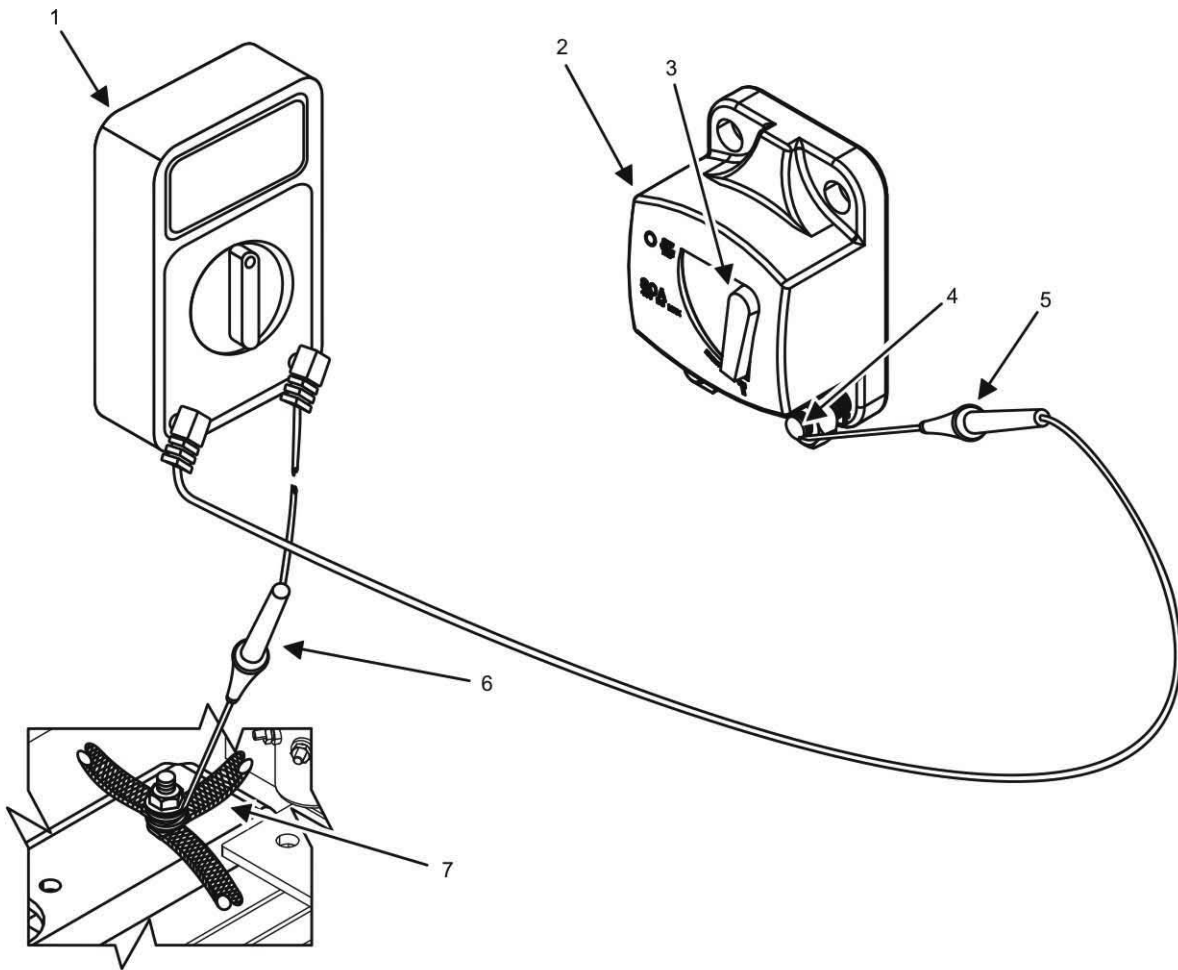


Figure 4. Test Main DC Circuit Breaker — Ground.

NOTE

A short to ground test is not necessary if the main DC circuit breaker (Figure 4, Item 2) failed the continuity test above.

The main DC circuit breaker (Figure 4, Item 2) must be installed when testing for short to ground.

3. Test main DC circuit breaker (Figure 4, Item 2) for short to ground:
 - a. Set multimeter (Figure 4, Item 1) to ohms (Ω).
 - b. Set main DC circuit breaker switch (Figure 4, Item 3) to ON position.
 - c. Place one multimeter probe (Figure 4, Item 5) on either main DC circuit breaker terminal (Figure 4, Item 4) and remaining probe (Figure 4, Item 6) on unit grounding strap (Figure 4, Item 7).
 - d. Replace main DC circuit breaker (Figure 4, Item 4) if multimeter reading is less than 1 megohm ($M\Omega$).

END OF TASK

Install Main DC Circuit Breaker

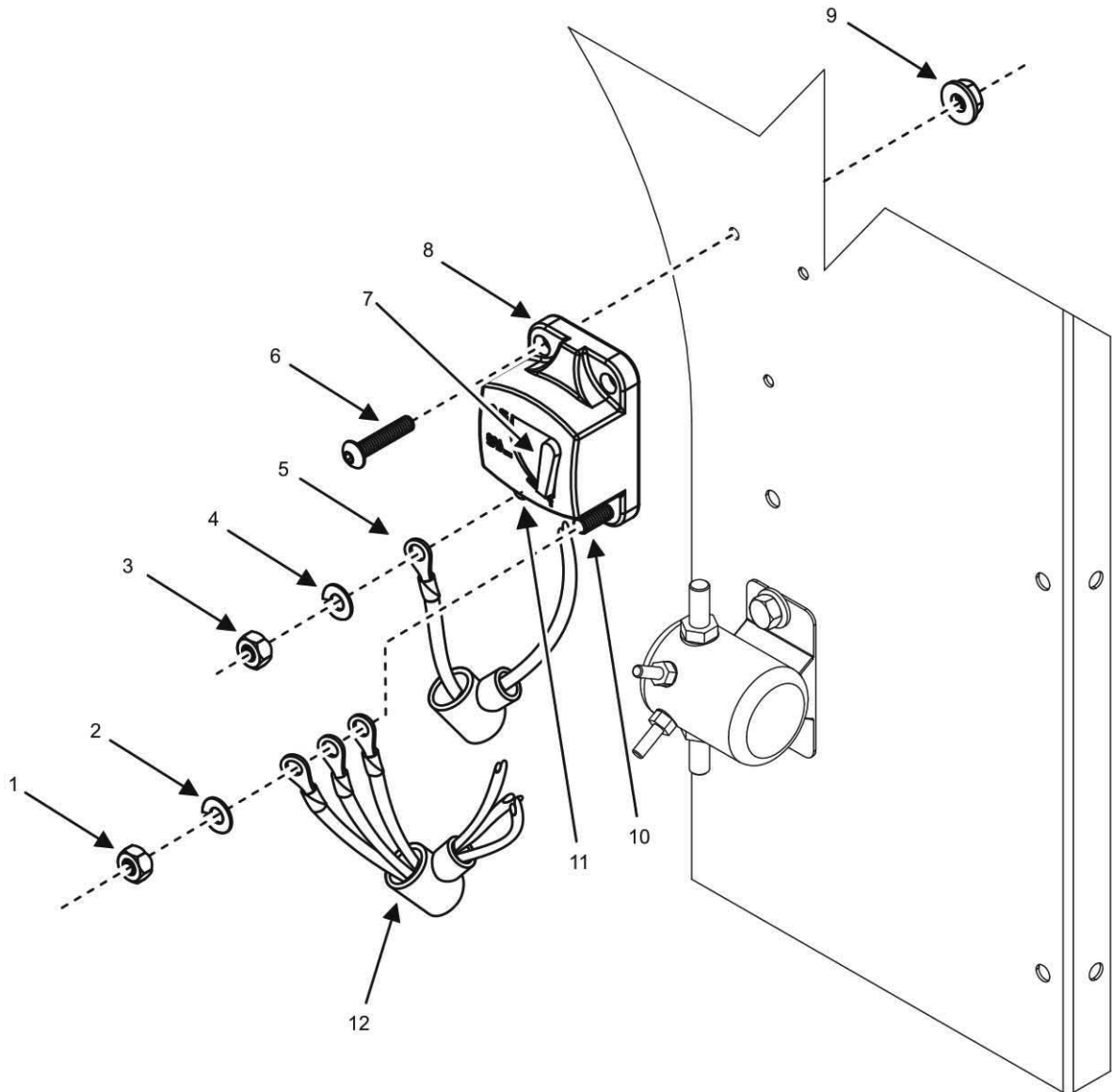


Figure 5. Main DC Circuit Breaker — Installation.

1. Ensure main DC circuit breaker switch (Figure 5, Item 7) is set to OFF/TRIP position.
2. Position main DC circuit breaker (Figure 5, Item 8) at mounting location below air cleaner on internal bulkhead panel.
3. Secure main DC circuit breaker (Figure 5, Item 8) to internal bulkhead panel using three socket head cap screws (Figure 5, Item 6) and three flange nuts (Figure 5, Item 9).
4. Install wire leads (Figure 5, Item 12) to load terminal (Figure 5, Item 10) as indicated by wiring tags, using lock washer (Figure 5, Item 2) and nut (Figure 5, Item 1) to secure wire leads (Figure 5, Item 12) to load terminal (Figure 5, Item 10).

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5. Install wire lead (Figure 5, Item 5) to line terminal (Figure 5, Item 11) as indicated by wiring tags, using lock washer (Figure 5, Item 4) and nut (Figure 5, Item 3) to secure wire lead (Figure 5, Item 5) to line terminal (Figure 5, Item 11).
 6. Place protective caps over main DC circuit breaker wire leads (Figure 5, Items 5 and 12) and terminals (Figure 5, Items 10 and 11).
 7. Verify main DC circuit breaker socket head cap screws (Figure 5, Item 6) and flange nuts (Figure 5, Item 9) are fully secured.
 8. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
 9. Set main DC circuit breaker switch (Figure 5, Item 7) to ON position.
 10. Install left-side body panel (WP 0031, Remove/Install Left-Side Body Panel.)
 11. Close generator set doors.
 12. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
 13. Start engine and check for proper operation.
 14. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL INTAKE AIR HEATER RELAY

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163,
Maintenance Allocation Chart, Item 38)

Materials/Parts

Relay, electromagnetic (WP 0102, Repair Parts List,
Figure 2, Item 20)

Grease, electrically conductive (WP 0164,
Expendable and Durable Items List, Item 21)

Personnel Required

91D (1)

References

WP 0095, General Maintenance

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10,
WP 0005)

Engine cool

Battery ground cable removed (WP 0036,
Remove/Install Batteries)

Left-side body panel removed (WP 0031,
Remove/Install Left-Side Body Panels)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL INTAKE AIR HEATER RELAY**Remove Intake Air Heater Relay**

1. Ensure equipment conditions are met in the order presented in initial setup.
2. Open left-side door and locate intake air heater relay (Figure 1).

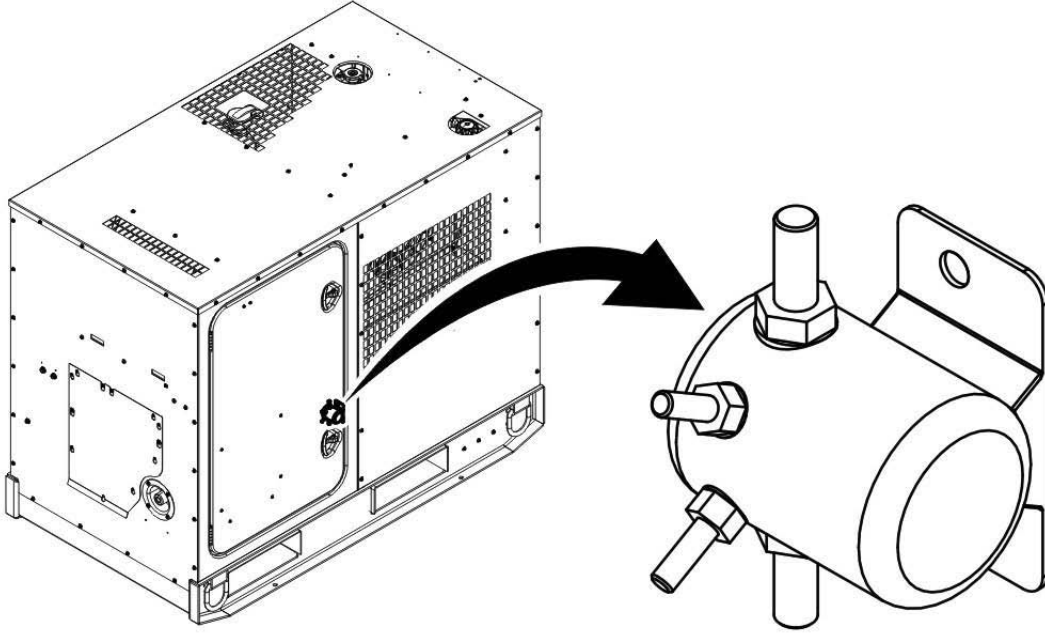


Figure 1. Intake Air Heater Relay — Location.

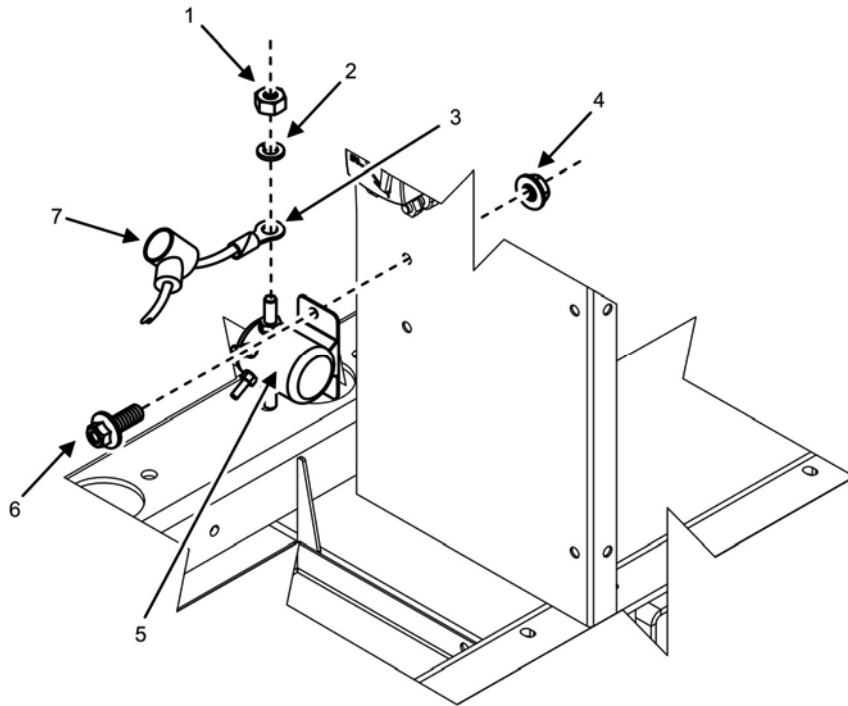


Figure 2. Intake Air Heater Relay — Removal.

NOTE

Four electrical wires are attached to the intake air heater relay. For clarity, only one wire is shown in Figure 2. All four electrical wires are removed using the same procedure. Prior to removal, tag/mark all four electrical wires and the four terminal posts on the intake air heater relay. Tags/markings will be used as a guide at installation.

3. Tag/mark four electrical wires (Figure 2, Item 3) under boots (Figure 2, Item 7) attached to the four terminal posts of intake air heater relay (Figure 2, Item 5).
4. Remove nut (Figure 2, Item 1) and lock washer (Figure 2, Item 2) that secure electrical wire (Figure 2, Item 3) to intake air heater relay (Figure 2, Item 5) terminal post.
5. Remove electrical wire (Figure 2, Item 3) from intake air heater relay (Figure 2, Item 5) terminal post.
6. Repeat steps 4 and 5 for remaining three electrical wires (Figure 2, Item 3).
7. Remove two screws (Figure 2, Item 6) and two nuts (Figure 2, Item 4) that secure intake air heater relay (Figure 2, Item 5) to interior panel of generator set.
8. Remove intake air heater relay (Figure 2, Item 5) from generator set.

END OF TASK

Inspect Intake Air Heater Relay

1. Inspect intake air heater relay (Figure 2, Item 5) for signs of obvious damage.
2. Replace damaged intake air heater relay (Figure 2, Item 5).
3. Inspect four electrical wires (Figure 2, Item 3) for signs of obvious damage.
4. Replace damaged electrical wires (Figure 2, Item 3).

END OF TASK**Install Intake Air Heater Relay**

1. Position intake air heater relay (Figure 2, Item 5) to its mounting position on interior panel and align the mounting holes.
2. Secure intake air heater relay (Figure 2, Item 5) to interior panel by installing two screws (Figure 2, Item 6) and two nuts (Figure 2, Item 4).

NOTE

Four electrical wires are attached to the intake air heater relay. For clarity, only one wire is shown in Figure 2. All four electrical wires are installed using the same procedure. Tags/markings applied to electrical wires (Figure 2, Item 3) during removal should be used as guides during installation. Do not remove any temporary identification tags/markings until installation is complete and equipment is operating properly.

3. Install electrical wire (Figure 2, Item 3) to intake air heater relay (Figure 2, Item 5) using tags/markings applied during removal as a guide.
4. Secure electrical wire (Figure 2, Item 3) to intake air heater relay (Figure 2, Item 5) by installing nut (Figure 2, Item 1) and lock washer (Figure 2, Item 2).
5. Repeat steps 3 and 4 for remaining three electrical wires (Figure 2, Item 3).
6. Install left-side body panel (WP 0031, Remove/Install Left-Side Body Panels).
7. Install battery ground cable (WP 0036, Remove/Install Batteries).
8. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
9. Start engine and check for proper operation (TM 9-6115-751-10).
10. Repair as required.

END OF TASK

Test Intake Air Heater Relay

1. Ensure engine control switch is OFF and engine is cool (TM 9-6115-751-10).
2. Remove battery ground cable (WP 0036, Remove/Install Batteries).

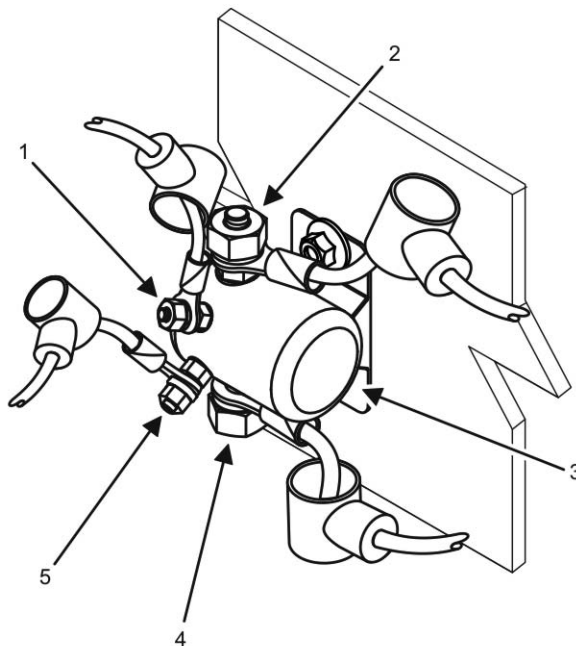


Figure 3. Intake Air Heater Relay — Test.

3. Use a multimeter set to test Ohms (WP 0095, General Maintenance) to check intake air heater relay (Figure 3, Item 3) coil for proper resistance between P2-b terminal (Figure 3, Item 1) and P2-E terminal (Figure 3, Item 5).

NOTE

Intake air heater relay (Figure 3, Item 3) resistance should be approximately 50 to 60 Ohms at 77°F (25°C).

4. Replace intake air heater relay (Figure 3, Item 3) if coil is open (greater than 100,000 Ohms) or shorted (less than 10 Ohms) (Remove Intake Air Heater Relay task).
5. Use a multimeter set to test continuity (WP 0095, General Maintenance) to check for continuity between K18-1 CB201-LOAD terminal (Figure 3, Item 4) and HTR 1 (+) terminal (Figure 3, Item 2) of intake air heater relay (Figure 3, Item 3).
6. Replace intake air heater relay (Figure 3, Item 3) if continuity is found between K18-1 CB201-LOAD terminal (Figure 3, Item 4) and HTR 1 (+) terminal (Figure 3, Item 2). See Remove Intake Air Heater Relay task.
7. Install battery ground cable (WP 0036, Remove/Install Batteries).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL ENGINE WIRING HARNESS

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Wiring harness, engine (WP 0154, Repair Parts List, Figure 54, Item 1)

Strap, tie-down (WP 0164, Expendable and Durable Items List, Item 35)

Personnel Required

91D (1)

Assistant (1)

References

WP 0025, Remove/Install Winterization Kit Components

WP 0057, Remove/Install Output Terminal Board

WP 0095, General Maintenance

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Right-side body panel removed (WP 0032, Remove/Install Right-Side Body Panel)

DSC removed (WP 0017, Remove/Install DCS)

Rear body panel removed (WP 0030, Remove/Install Rear Body Panel)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL ENGINE WIRING HARNESS**Remove Engine Wiring Harness****NOTE**

Tag/mark all electrical connections prior to removal. Tags/markings applied at removal will aide at installation.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate engine wiring harness (Figure 1).
3. Open left-side door.
4. Remove nut (Figure 2, Item 5) from upper mounting stud of starter (Figure 2, Item 4) and remove wire (S10-2/T107) (Figure 2, Item 3).
5. Install nut (Figure 2, Item 5) back onto upper mounting stud of starter (Figure 2, Item 4).

6. Remove nut (Figure 2, Item 8) from D+ stud on back of battery-charging alternator (Figure 2, Item 6) and remove wire (P2-P/G-D+) (Figure 2, Item 7).

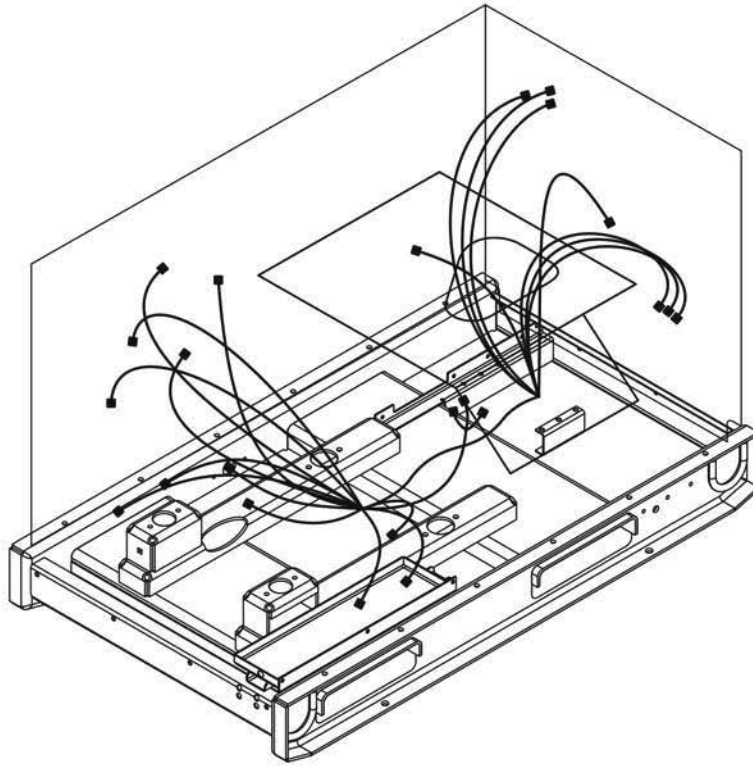


Figure 1. Engine Wiring Harness — Location.

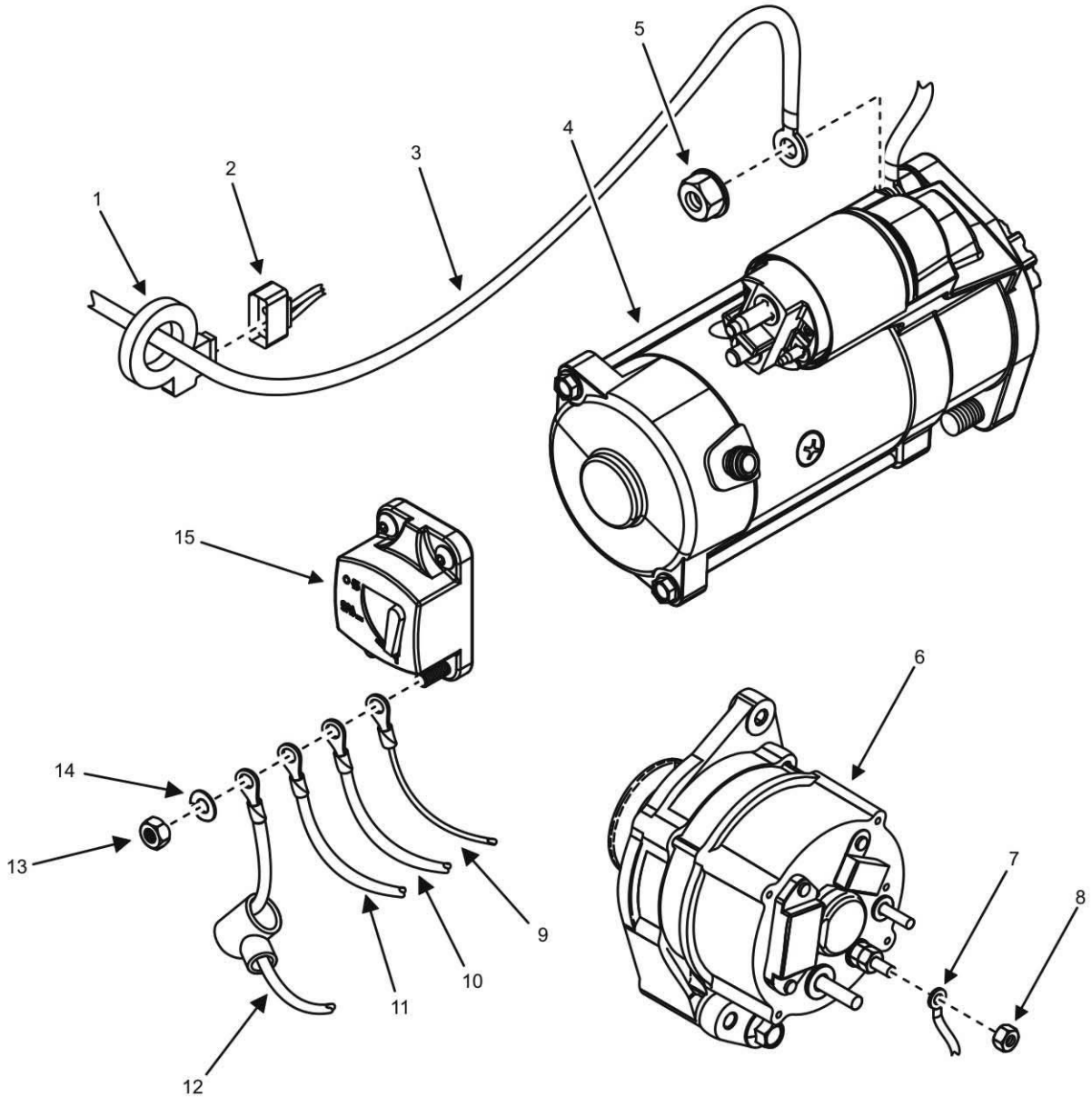


Figure 2. Left-Side Door.

7. Install nut (Figure 2, Item 8) back onto D+ stud on back of battery-charging alternator (Figure 2, Item 6).
8. Remove connector (P5) (Figure 2, Item 2) at battery current sensor (Figure 2, Item 1).
9. Inspect battery current sensor (Figure 2, Item 1) for damage. Remove battery current sensor (Figure 2, Item 1) and wire tie from wire (S10-2/T107) (Figure 2, Item 3) and replace as required.
10. Remove nut (Figure 2, Item 13), lock washer (Figure 2, Item 14) and four wires (Figure 2, Items 9, 10, 11, and 12) from main DC circuit breaker (Figure 2, Item 15).

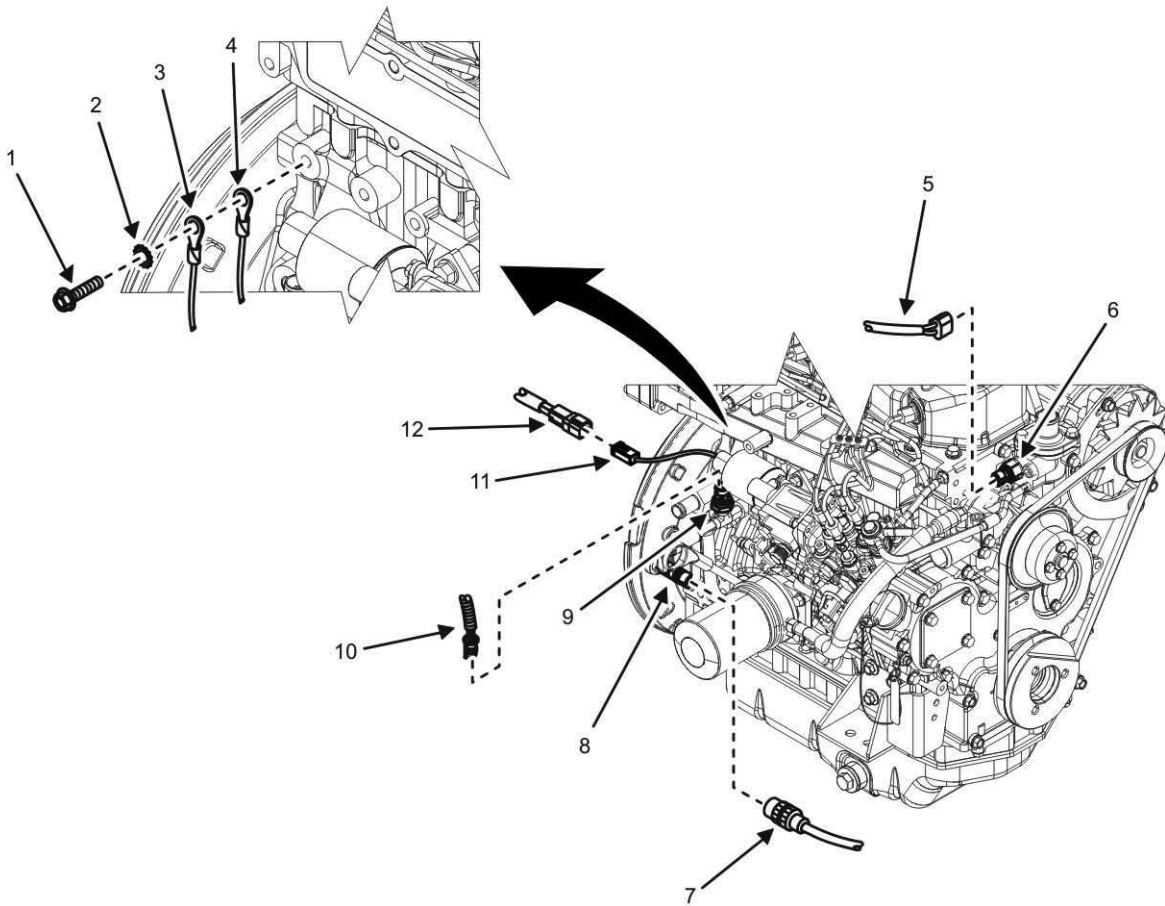
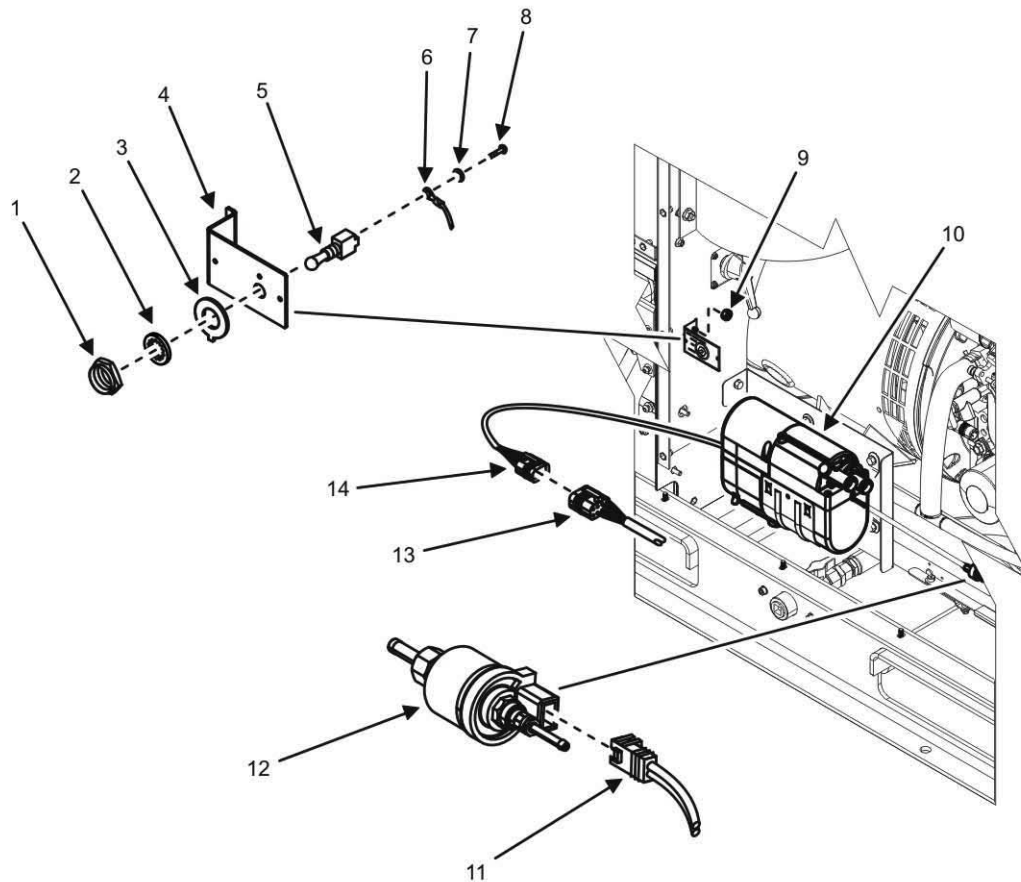


Figure 3. Right-Side Upper.

11. Open right-side door.
12. Remove connector (P35) (Figure 3, Item 5) from coolant temperature sender (Figure 3, Item 6) at top front of engine.
13. Remove connector (P40) (Figure 3, Item 10) from oil pressure sender (Figure 3, Item 9).
14. Remove connector (P37) (Figure 3, Item 12) from governor actuator pigtail (Figure 3, Item 11).
15. Remove bolt (Figure 3, Item 1), washer (Figure 3, Item 2), and two ground wires (Figure 3, Items 3 and 4) from engine.
16. Remove connector (P14) (Figure 3, Item 7) from engine speed sensor (Figure 3, Item 8).
17. Remove nut (Figure 4, Item 9) that secures DEAD CRANK SWITCH assembly to unit skid.
18. Remove nut (Figure 4, Item 1) and washers (Figure 4, Items 2 and 3) that secure switch (Figure 4, Item 5) to bracket (Figure 4, Item 4). Remove switch (Figure 4, Item 5) from bracket (Figure 4, Item 4).
19. Remove DEAD CRANK SWITCH assembly from unit skid to expose three wires (Figure 4, Item 6) on back of DEAD CRANK SWITCH (Figure 4, Item 5).



Legend

- | | |
|--------------------|---------------------------------------|
| 1. Nut | 8. Screw |
| 2. Washer | 9. Nut |
| 3. Washer | 10. Coolant Heater |
| 4. Bracket | 11. Fuel Pump Electrical Connector |
| 5. Switch | 12. Fuel Pump |
| 6. Electrical Lead | 13. Coolant Heater Electric Connector |
| 7. Washer | 14. Pig Tail |

Figure 4. Right-Side Lower.

20. Tag three wires (Figure 4, Item 6) on back of DEAD CRANK SWITCH (Figure 4, Item 5) to aid identification during installation.
21. Remove three screws (Figure 4, Item 8) and three washers (Figure 4, Item 7) that secure three wires (Figure 4, Item 6) to rear of DEAD CRANK SWITCH (Figure 4, Item 5). Set DEAD CRANK SWITCH (Figure 4, Item 5) aside for reuse.
22. Remove connector (P21) (Figure 4, Item 11) from winterization kit fuel pump (Figure 4, Item 12) by depressing metal clip on connector (Figure 4, Item 11).
23. Remove connector (J20C) (Figure 4, Item 13) from pigtail (Figure 4, Item 14) of coolant heater (Figure 4, Item 10) (if installed).

24. Remove connectors (P85 and P90) (Figure 5, Items 3 and 4) from pigtails (Figure 5, Items 2 and 5) on AC generator (Figure 5, Item 1) through rear access door.

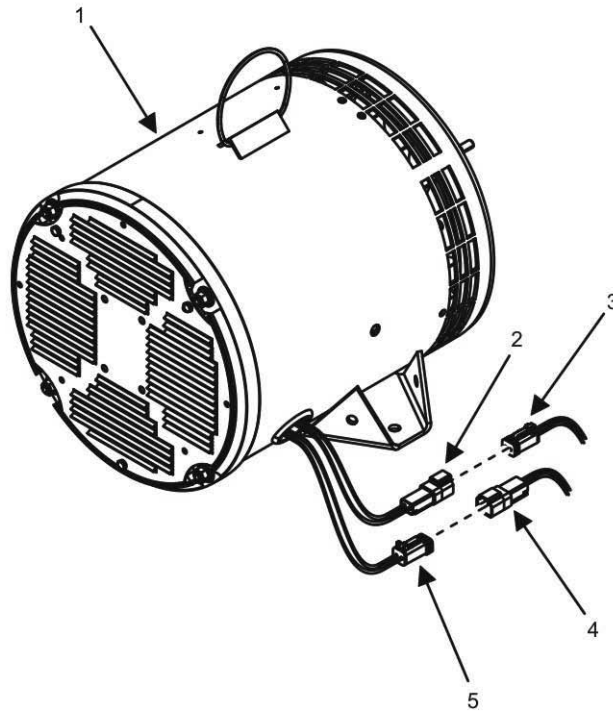


Figure 5. Right-Side Rear — AC Generator.

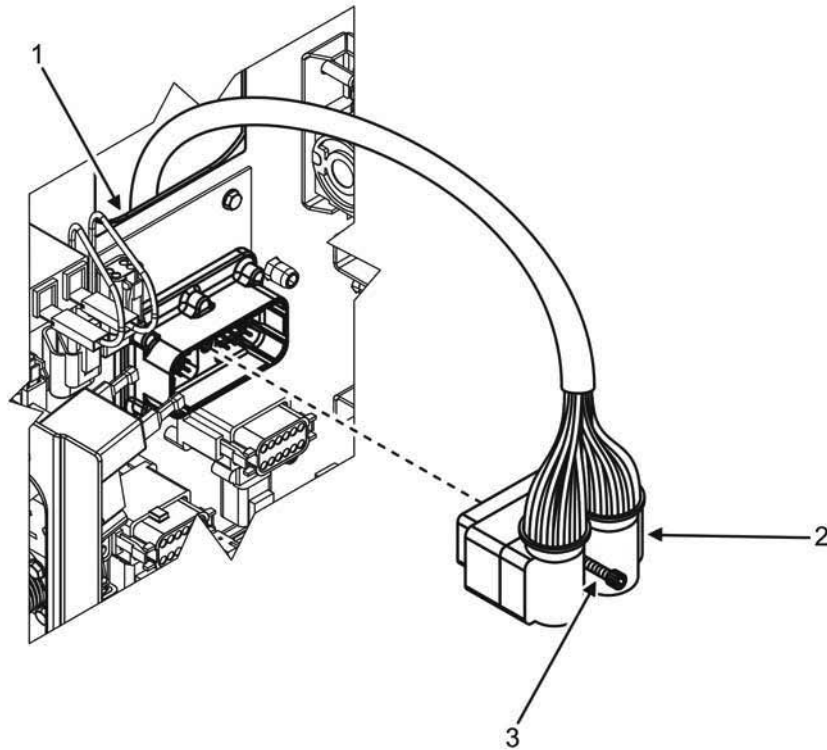


Figure 6. Right-Side Rear — Output Box.

25. Remove output terminal board cover (not pictured) (WP 0057, Remove/Install Output Terminal Board).
26. Loosen screw (Figure 6, Item 3) that secures connector (P500) (Figure 6, Item 2) inside output box. Push connector (P500) (Figure 6, Item 2) through large slot (Figure 6, Item 1) in output box into rear of generator set.

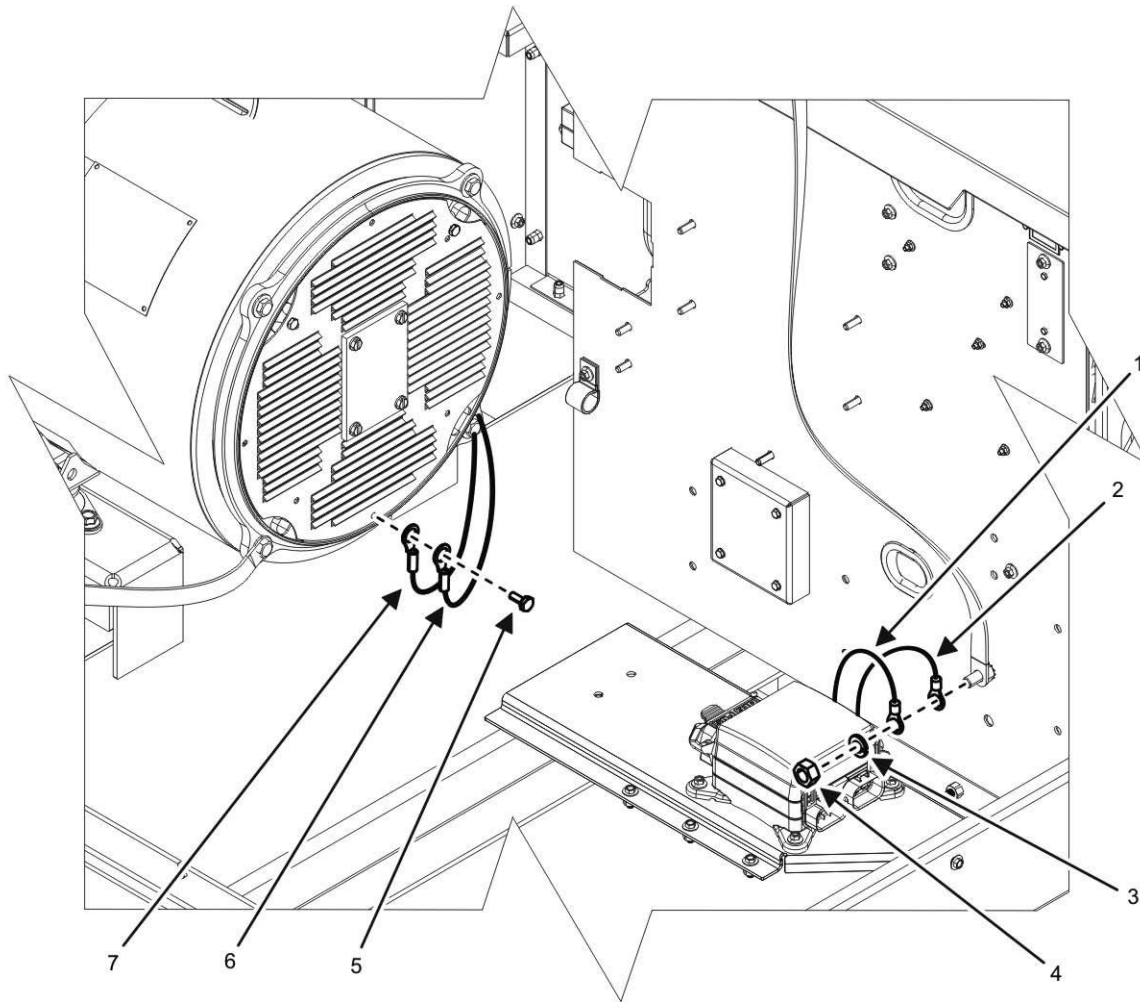


Figure 7. Ground Wires at Output Box and AC Generator.

27. Remove bolt (Figure 7, Item 5) and two ground wires (Figure 7, Item 6 and 7) from rear of AC generator.
28. Remove nut (Figure 7, Item 4), washer (Figure 7, Item 3), and two ground wires (Figure 7, Items 1 and 2) from rear of output box.
29. Remove connector (P96) (Figure 8, Item 2) from pigtail (Figure 8, Item 3) on cooling fans (Figure 8, Item 1) and allow the connector (Figure 8, Item 2) to pass through the slot in radiator support panel into the rear of the generator set.

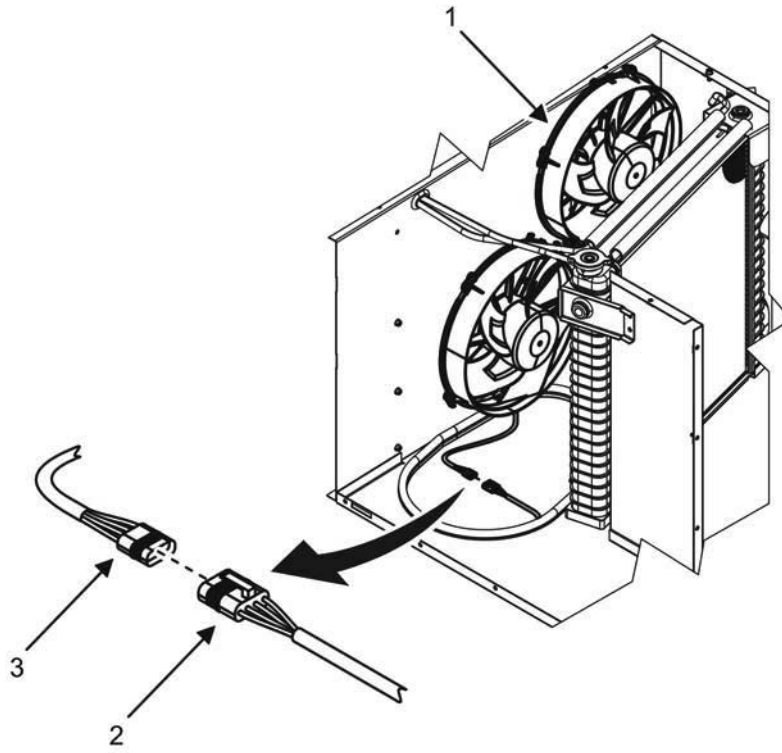


Figure 8. Cooling Fan Connection.

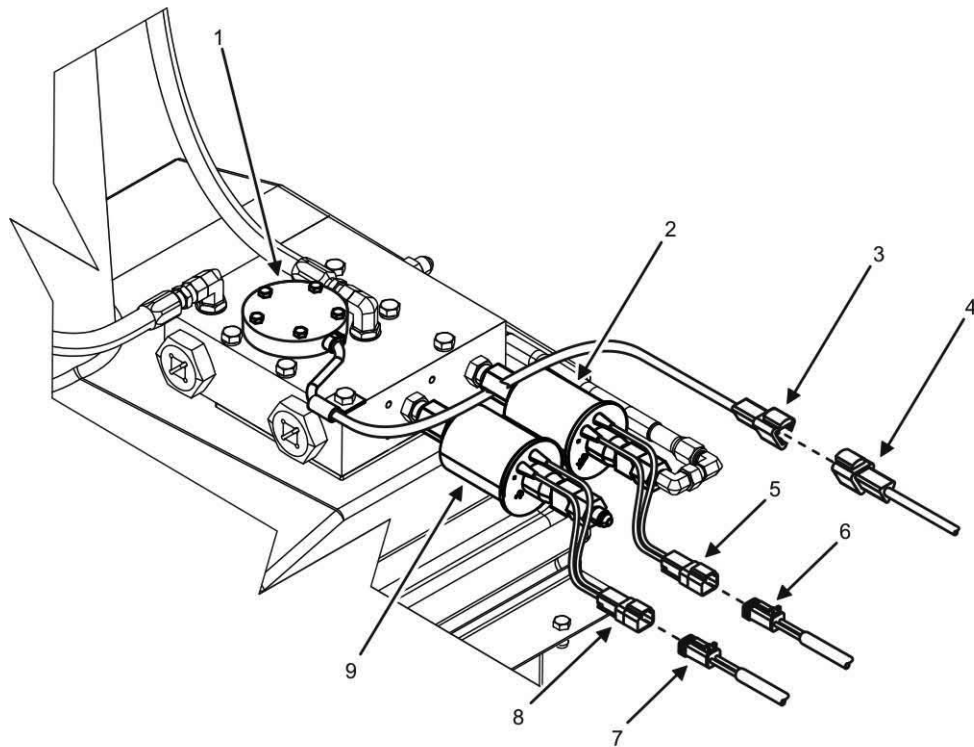


Figure 9. Rear Door — Fuel System.

30. Remove connector (P60) (Figure 9, Item 6) from pigtail (Figure 9, Item 5) on auxiliary fuel pump (Figure 9, Item 2).
31. Remove connector (P70) (Figure 9, Item 4) from pigtail (Figure 9, Item 3) on fuel level sender (Figure 9, Item 1).
32. Remove connector (P65) (Figure 9, Item 7) from pigtail (Figure 9, Item 8) on main fuel pump (Figure 9, Item 9).

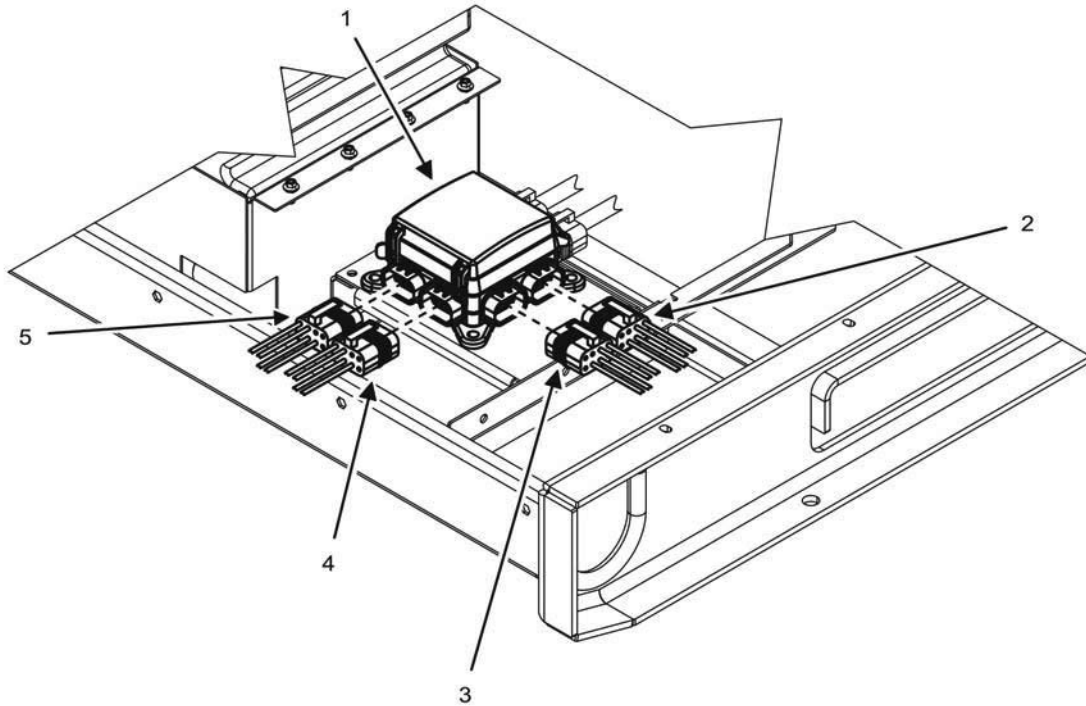


Figure 10. Rear Door — Relay Panel.

33. Remove connector (P5A) (Figure 10, Item 5) from relay panel (Figure 10, Item 1).
34. Remove connector (P5B) (Figure 10, Item 4) from relay panel (Figure 10, Item 1).
35. Remove connector (P5C) (Figure 10, Item 3) from relay panel (Figure 10, Item 1).
36. Remove connector (P5D) (Figure 10, Item 2) from relay panel (Figure 10, Item 1).

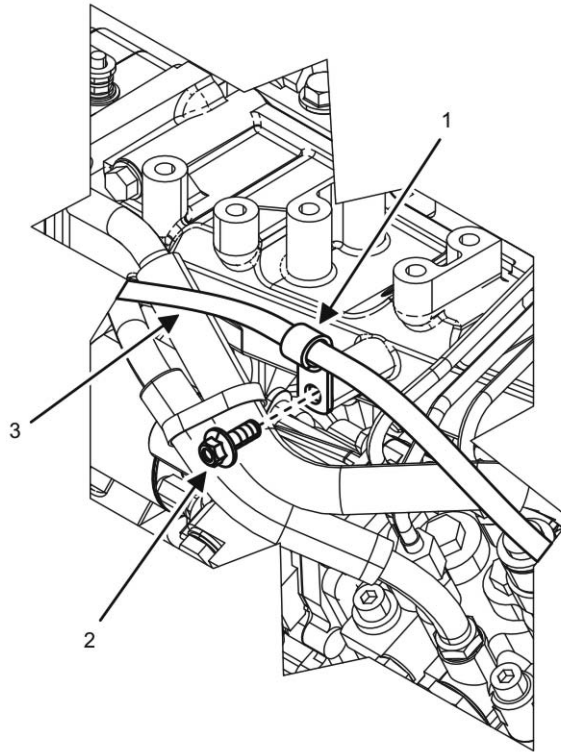


Figure 11. Loop Clamps.

NOTE

In addition to various electrical connectors, the engine wiring harness is attached to the engine in by loop clamps. The loop clamps must be removed from their mounting points before the engine wiring harness can be removed from the generator set.

Four loop clamps are secured in the same manner using a mounting screw and flat washer mounted to an engine boss.

One output box loop clamp is secured by a second nut instead of a mounting screw.

37. Locations of the loop clamps are as follows:
 - a. Exhaust side of engine below starter (starter shown in Figure 2).
 - b. Intake-side of engine at intake manifold (intake-side of engine shown in Figure 3).
 - c. Intake-side of manifold below engine speed sensor (intake-side of engine shown in Figure 3).
 - d. Two loop clamps (Figure 11, Item 2) on rear of output box.
38. Locate three loop clamps (Figure 11, Item 1) securing engine wiring harness (Figure 11, Item 3) to the engine.
39. Remove mounting screw (Figure 11, Item 2) or nut that secures each loop clamp (Figure 11, Item 1) to its mounting location on generator set. Leave clamps attached to wiring harness (Figure 11, Item 3).
40. Remove mounting screw (Figure 11, Item 2) or nut that secures two loop clamps (Figure 11, Item 1) to rear of output box (not shown).

41. Remove engine wiring harness (Figure 1) from unit skid being careful not to entangle harness leads on unit components.
42. Remove loop clamps (Figure 11, Item 1) from engine wiring harness (Figure 1).

END OF TASK

Inspect Engine Wiring Harness

1. Inspect engine wiring harness (Figure 1) for damaged connectors if engine wiring harness (Figure 1) is to be reused.
2. Replace damaged connectors (WP 0095, General Maintenance).

END OF TASK

Install Engine Wiring Harness

1. Position engine wiring harness (Figure 1) to its approximate mounting location in unit skid, spreading branches of engine wiring harness (Figure 1) close to their points of installation.
2. Position loop clamps (Figure 11, Item 1) on engine wiring harness (Figure 1) at approximate mounting locations.
3. Position three loop clamps (Figure 11, Item 1) to mounting bosses on engine at intake manifold, below engine speed sensor, and below starter.
4. Position two loop clamps (Figure 11, Item 1) to rear of output box (not shown).
5. Secure loop clamps (Figure 11, Item 1) to each engine boss by installing mounting screw (Figure 11, Item 2), leaving loop clamp (Figure 11, Item 1) loose enough around engine wiring harness (Figure 11, Item 3) to allow engine wiring harness (Figure 11, Item 3) to slide through loop clamp (Figure 11, Item 1).
6. Secure one loop clamp (Figure 11, Item 1) to rear of output box with mounting screw (Figure 11, Item 2) and one loop clamp to rear of output box with nut (not shown).
7. Move to rear door of generator set.
8. Install connector (P5D) (Figure 10, Item 2) to relay panel (Figure 10, Item 1).
9. Install connector (P5C) (Figure 10, Item 3) to relay panel (Figure 10, Item 1).
10. Install connector (P5B) (Figure 10, Item 4) to relay panel (Figure 10, Item 1).
11. Install connector (P5A) (Figure 10, Item 5) to relay panel (Figure 10, Item 1).
12. Install connector (P65) (Figure 9, Item 7) to main fuel pump (Figure 9, Item 9).
13. Install connector (P70) (Figure 9, Item 4) to fuel level sender (Figure 9, Item 1).
14. Install connector (P60) (Figure 9, Item 6) to auxiliary fuel pump (Figure 9, Item 2).
15. Pull connector (P96) (Figure 8, Item 2) through the slot in radiator support panel up into top rear of the generator set. Install connector (P96) (Figure 8, Item 2) to cooling fans (Figure 8, Item 1).
16. Install bolt (Figure 7, Item 5) and two ground wires (Figure 7, Item 6 and 7) to rear of AC generator.
17. Install nut (Figure 7, Item 4), washer (Figure 7, Item 3), and two ground wires (Figure 7, Items 1 and 2) to rear of output box.
18. Push connector (P500) (Figure 6, Item 2) through large slot (Figure 6, Item 1) into output box. Install connector (P500) (Figure 6, Item 2) to its mounting location in output box. Secure connector (P500) (Figure 6, Item 2) to output box by installing screw (Figure 6, Item 3).
19. Install output terminal board cover (WP 0057, Remove/Install Output Terminal Board)

20. Install connectors (P85 and P90) (Figure 5, Items 3 and 4) to AC generator pigtails (Figure 5, Items 2 and 5).
21. Install three wires (Figure 4, Item 6) to rear of dead crank switch (Figure 4, Item 5) using tags installed during removal as a guide.
22. Install three screws (Figure 4, Item 8) and washers (Figure 4, Item 7) to secure three wires (Figure 4, Item 6) to rear of dead crank switch (Figure 4, Item 5).
23. Position dead crank switch (Figure 4, Item 5) to rear of bracket (Figure 4, Item 4) and secure by installing washers (Figure 4, Items 2 and 3) and nut (Figure 4, Item 1).
24. Position DEAD CRANK SWITCH assembly to its mounting location in unit and secure by installing nut (Figure 4, Item 9).
25. Install connector (J20C) (Figure 4, Item 13) to pigtail (Figure 4, Item 14) of coolant heater (Figure 4, Item 10) (if installed).
26. Install connector (P21) (Figure 4, Item 11) to fuel pump (Figure 4, Item 12) (if installed).
27. Install connector (P14) (Figure 3, Item 7) to engine speed sensor (Figure 3, Item 8).
28. Install connector (P37) (Figure 3, Item 11) to governor actuator pigtail (Figure 3, Item 12).
29. Install connector (P40) (Figure 3, Item 10) to oil pressure sender (Figure 3, Item 9).
30. Install connector (P35) (Figure 3, Item 5) to coolant temperature sender (Figure 3, Item 6).
31. Install two ground wires (Figure 3, Items 3 and 4), bolt (Figure 3, Item 1), and washer (Figure 3, Item 2) to engine.
32. Move to left side of generator set.
33. Install four wires (Figure 2, Items 9, 10, 11, and 12), lock washer (Figure 2, Item 14), and nut (Figure 2, Item 13) to main DC circuit breaker (Figure 2, Item 15).
34. Install battery current sensor (Figure 2, Item 1) to wire (S10-2/T107) (Figure 2, Item 3) and secure with wire tie as required.
35. Install connector (P5) (Figure 2, Item 2) to battery current sensor (Figure 2, Item 1).
36. Remove nut (Figure 2, Item 8) from D+ stud on back of battery-charging alternator (Figure 2, Item 6) and install wire (P2-P/G-D+) (Figure 2, Item 7) onto D+ stud.
37. Install nut (Figure 2, Item 8) back onto D+ stud on back of battery-charging alternator (Figure 2, Item 6).
38. Remove nut (Figure 2, Item 5) from upper mounting stud of starter (Figure 2, Item 4) and install wire (S10-2/T107) (Figure 2, Item 3) to upper mounting stud.
39. Install nut (Figure 2, Item 5) back onto upper mounting stud of starter (Figure 2, Item 4).
40. Pull three connectors (P1, P2 and P3, not shown) up through the slot in radiator support panel into the rear of the generator set.
41. Close left-side door.
42. Install rear body panel (WP 0030, Remove/Install Rear Body Panel).
43. Install DCS (WP 0017, Remove/Install DCS).
44. Install right-side body panel (WP 0032, Remove/Install Right-Side Body Panel).
45. Install top body panel (WP 0028, Remove/Install Top Body Panel).
46. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
47. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).

48. Start generator set and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).

49. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL NATO SLAVE RECEPTACLE

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Connector, receptacle (WP 0102, Repair Parts List, Figure 2, Item 17)

Strap, tie-down (WP 0164, Expendable and Durable Items List, Item 35)

Personnel Required

91D (1)

References

WP 0036, Remove/Install Batteries

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL NATO SLAVE RECEPTACLE**WARNING**

- NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.
- The right-hand battery negative lead that connects directly to the grounding stud must be disconnected prior to disconnecting or removing batteries. Follow procedural steps in exact order given for removal and installation. Failure to comply may cause injury or death to personnel.

Remove NATO Slave Receptacle

1. Ensure equipment conditions are met in the order presented at initial set up.
2. Open right-side door on generator set to locate NATO slave receptacle (Figure 1) and batteries (not shown).

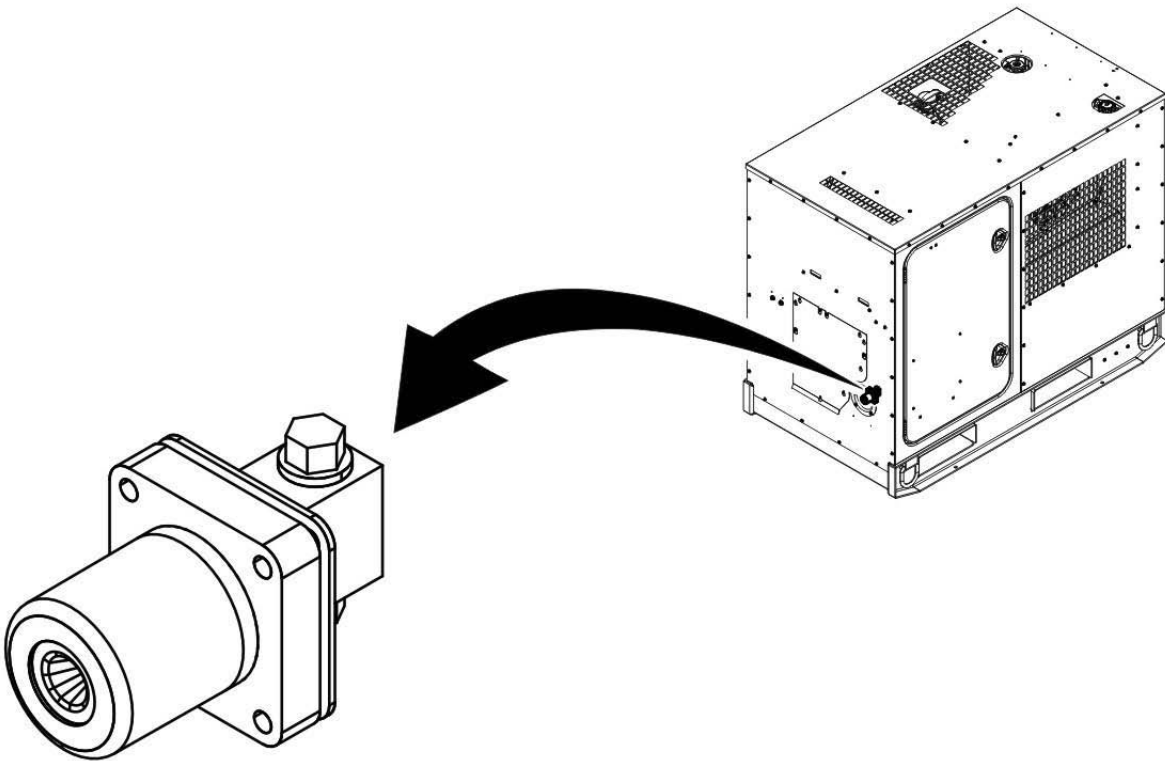


Figure 1. NATO Slave Receptacle — Location.

3. Disconnect cable (not shown) from negative battery terminal of right-hand battery (not shown) (WP 0036, Remove/Install Batteries).
4. Disconnect jumper cable (not shown) from negative battery terminal of left-hand battery (not shown) (WP 0036, Remove/Install Batteries).

NOTE

Before removing the NATO slave receptacle, take note of the orientation of positive (+) and negative (-) connections of the receptacle. Positive (+) and negative (-) symbols are stamped on the NATO slave receptacle terminal ends.

5. Remove bolt (Figure 2, Item 9) and lock washer (Figure 2, Item 10) from negative connection of NATO slave receptacle (Figure 2, Item 1), and remove negative cable (Figure 2, Item 11).
6. Tag and identify negative cable (Figure 2, Item 11) for installation purposes.
7. Remove protective boot (Figure 2, Item 5) to positive side of NATO slave receptacle (Figure 2, Item 1) and discard cable tie.

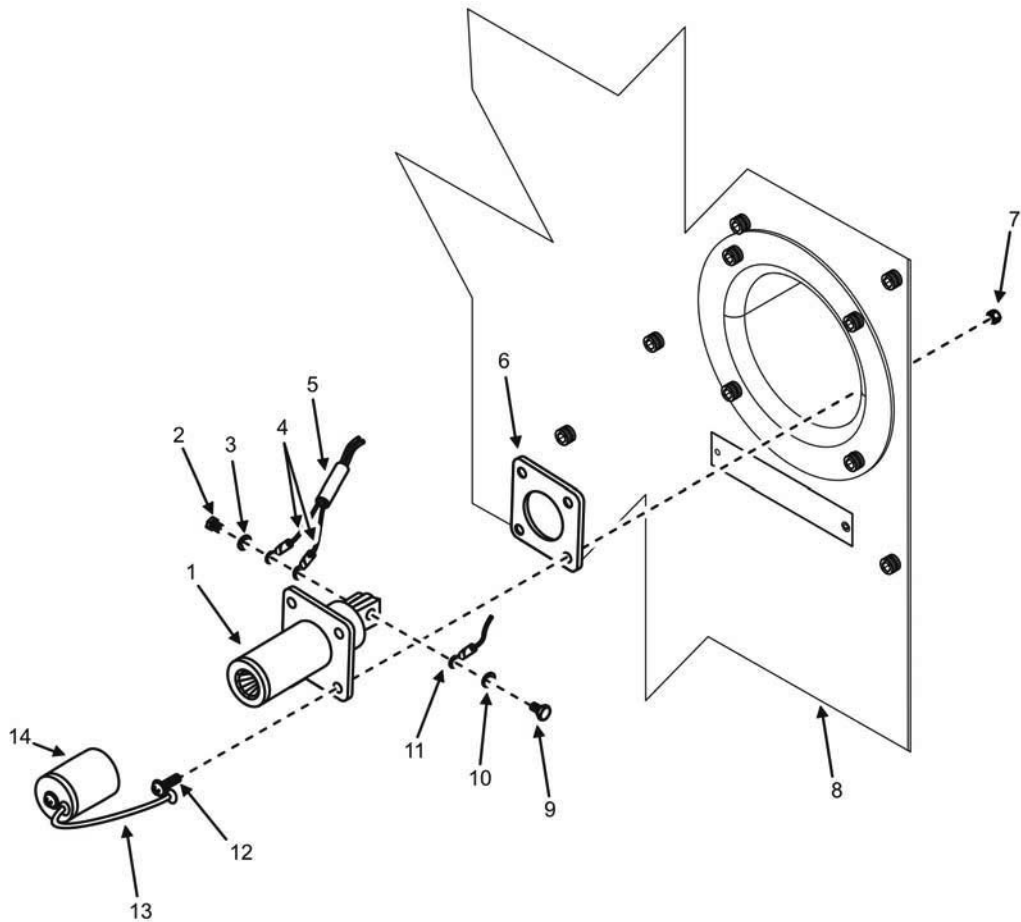


Figure 2. NATO Slave Receptacle — Detail.

8. Move protective boot (Figure 2, Item 5) to expose mounting bolt (Figure 2, Item 2) and lock washer (Figure 2, Item 3).
9. Remove bolt (Figure 2, Item 2) and lock washer (Figure 2, Item 3) from positive connection of NATO slave receptacle (Figure 2, Item 1). Remove two positive cables (Figure 2, Item 4).
10. Tag and identify positive cables (Figure 2, Item 4) for installation purposes.
11. Remove four hex socket head screws (Figure 2, Item 12) and four nuts (Figure 2, Item 7) securing NATO slave receptacle (Figure 2, Item 1) to mounting location in front body panel (Figure 2, Item 8).
12. Remove NATO slave receptacle (Figure 2, Item 1) and gasket (Figure 2, Item 6) from mounting location in front body panel (Figure 2, Item 8) and place on a suitable work surface. Discard gasket (Figure 2, Item 6).
13. Remove protective cap (Figure 2, Item 14) with tether (Figure 2, Item 13) from NATO slave receptacle (Figure 2, Item 1).

END OF TASK

Inspect NATO Slave Receptacle

1. Inspect NATO slave receptacle (Figure 2, Item 1) for obvious signs of heat, corrosion, or other damage.
2. Replace NATO slave receptacle (Figure 2, Item 1) if burned, corroded, or damaged.

3. Inspect NATO slave terminal mounting location in front body panel (Figure 2, Item 8) for cracks or damage, and repair or replace as required.
4. Replace protective cap (Figure 2, Item 14) if damaged or if tether (Figure 2, Item 13) is broken.

END OF TASK

Install NATO Slave Receptacle

1. Install new gasket (Figure 2, Item 6) onto terminal end of NATO slave receptacle (Figure 2, Item 1) and align mounting holes.

NOTE

Orientation of NATO slave receptacle should be the same as it was during disassembly. Negative (-) and positive (+) symbols are stamped on the NATO slave receptacle (Figure 2, Item 1) terminal ends.

2. Position and insert terminal end of NATO slave receptacle (Figure 2, Item 1) through mounting location on front body panel (Figure 2, Item 8) and align mounting holes. Ensure positive and negative terminal ends of NATO slave receptacle (Figure 2, Item 1) are positioned properly.

NOTE

Protective cap tether (Figure 2, Item 13) is attached to lower right-hand hex socket head screw (Figure 2, Item 12).

3. Secure NATO slave receptacle (Figure 2, Item 1) to front body panel (Figure 2, Item 8) by installing four hex socket head screws (Figure 2, Item 12) through NATO slave receptacle (Figure 2, Item 1), gasket (Figure 2, Item 6), and front body panel (Figure 2, Item 8).
4. Install four nuts (Figure 2, Item 7) onto four hex socket head screws (Figure 2, Item 12) and secure NATO slave receptacle (Figure 2, Item 1) to front body panel (Figure 2, Item 8).

NOTE

Negative (-) and positive (+) symbols are stamped on the NATO slave receptacle (Figure 2, Item 1) terminal ends.

5. Position two positive cables (Figure 2, Item 4) onto positive connector of NATO slave receptacle (Figure 2, Item 1). Refer to cable tags installed during removal.
6. Install bolt (Figure 2, Item 2) and lock washer (Figure 2, Item 3) to secure two positive cables (Figure 2, Item 4) to positive connector of NATO slave receptacle (Figure 2, Item 1).
7. Install protective boot (Figure 2, Item 5) to cover mounting bolt (Figure 2, Item 2) and lock washer (Figure 2, Item 3).

NOTE

Negative (-) and positive (+) symbols are stamped on the NATO slave receptacle terminal ends.

8. Position negative cable (Figure 2, Item 11) onto negative connector of NATO slave receptacle (Figure 2, Item 1).

-
9. Install bolt (Figure 2, Item 9) and lock washer (Figure 2, Item 10) to secure negative cable (Figure 2, Item 11) to negative connector of NATO slave receptacle (Figure 2, Item 1) .
 10. Install protective cap (Figure 2, Item 14) on exterior of NATO slave receptacle (Figure 2, Item 1).
 11. Connect jumper cable to negative battery terminal of left-hand battery (WP 0036, Remove/Install Batteries).
 12. Connect ground cable to negative battery terminal of right-hand battery (WP 0036, Remove/Install Batteries).
 13. Close right-side door.
 14. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
 15. Start engine and check for proper operation (TM 9-6115-751-10).
 16. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL RELAY PANEL

INITIAL SETUP:

Test Equipment

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0163, Item 48)

Materials/Parts

Panel, relay (WP 0103, Repair Parts List, Figure 3, Item 1)

Circuit breaker 10, with red button (2) (WP 0103, Figure 3, Item 5)

Circuit breaker 20, with yellow button (5) (WP 0103, Figure 3, Item 3)

Circuit breaker 30, with green button (1) (WP 0103, Figure 3, Item 4)

Relay (4) (WP 0103, Figure 3, Item 2)

Cleaning compound, solvent (WP 0164, Expendable and Durable Items List, Item 11)

Materials/Parts

Grease, electrically conductive (WP 0164, Item 21)

Rag, wiping (WP 0164, Item 32)

Personnel Required

91D (1)

References

WP 0095, General Maintenance

Foldout Pages

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL RELAY PANEL

Remove Relay Panel

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open rear access door and locate relay panel (Figure 1) mounted on skid to right of fuel tank.

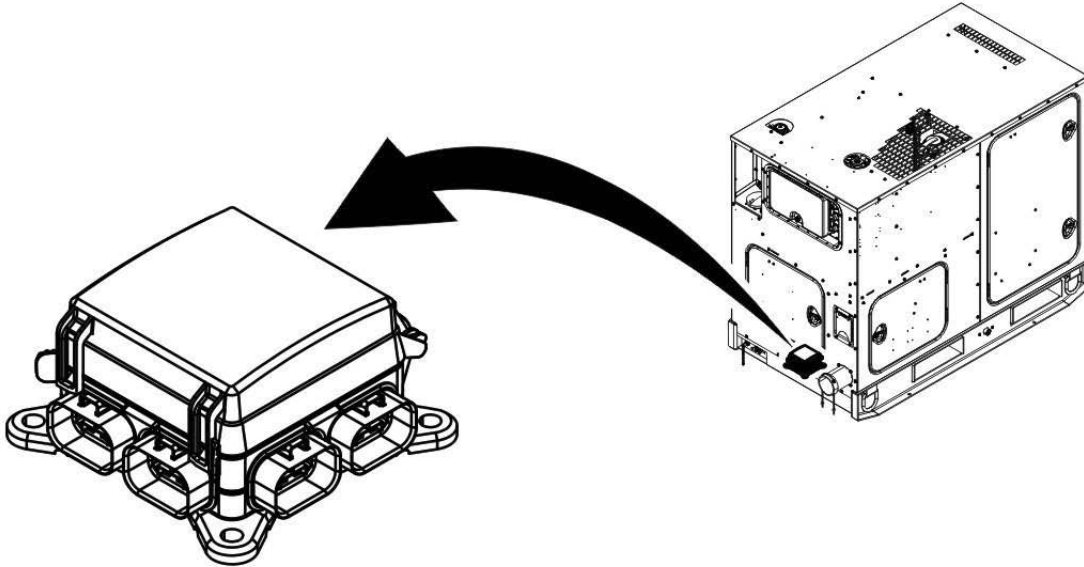


Figure 1. Relay Panel — Location.

NOTE

The six electrical connectors (Figure 2, Items 2, 3, 4, 5, 6, and 8) attached to the relay panel (Figure 2, Item 1) are all uniquely keyed and color coded. Each connector will fit into only one of the outlets on the relay panel (Figure 2, Item 1).

3. Tag and remove six electrical connectors (Figure 2, Items 2, 3, 4, 5, 6, and 8) from relay panel (Figure 2, Item 1).
4. Remove four flare head screws (Figure 2, Item 9) securing relay panel (Figure 2, Item 1) to unit skid (Figure 2, Item 7).

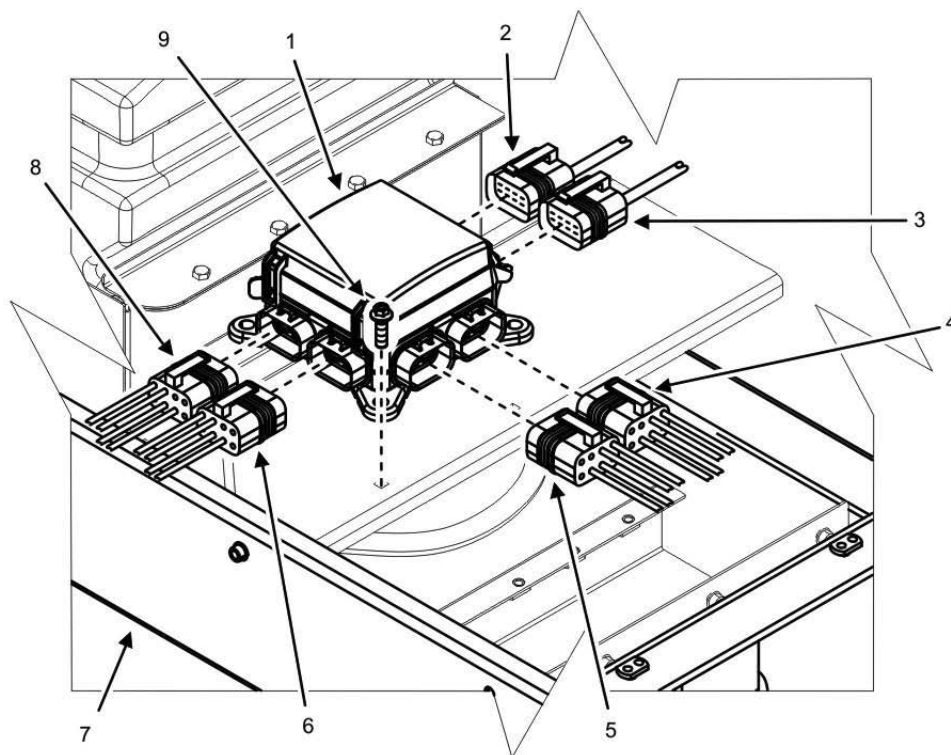


Figure 2. Relay Panel — Removal.

5. Remove relay panel (Figure 2, Item 1) from generator set and place on a suitable work surface.

END OF TASK

Inspect Relay Panel

1. Inspect all relay panel electrical connectors (Figure 2, Items 2, 3, 4, 5, 6, and 8) and wiring harness for signs of damage, and repair or replace damaged electrical connectors (WP 0095, General Maintenance) as required.
2. Inspect relay panel (Figure 2, Item 1) for signs of damage, and replace as required.

END OF TASK

Install Relay Panel

1. Position relay panel (Figure 2, Item 1) to its mounting position on unit skid (Figure 2, Item 7) and secure by installing four flare head screws (Figure 2, Item 9) finger-tight to corner mounting holes.
2. Tighten four flare head screws (Figure 2, Item 9) to 98.4 ± 1.2 in/lb (11.1 ± 1 Nm).

NOTE

Leave all identification tags/markings in place until task is completed and generator set is fully operational.

3. Install six wiring harness connectors (Figure 2, Items 2, 3, 4, 5, 6, and 8) to relay panel (Figure 2, Item 1) using tags/markings applied at removal as a guide.
4. Close rear access door.

5. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
6. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
7. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
8. Repair as required.
9. Remove ID tags from relay panel connectors (Figure 2, Items 2, 3, 4, 5, 6, and 8).

END OF TASK

Service Relay Panel

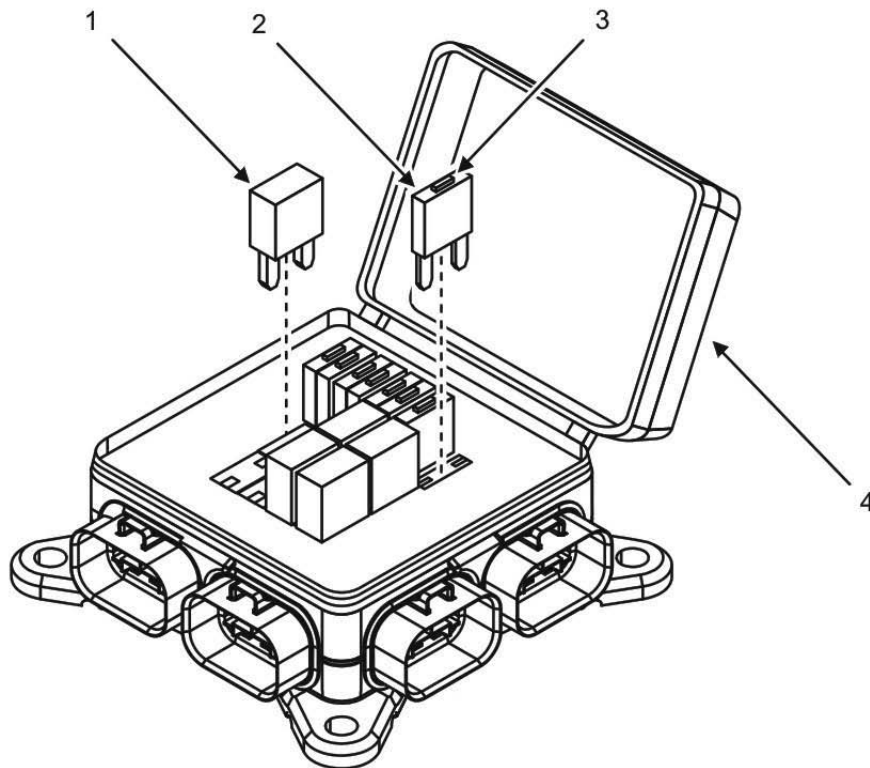


Figure 3. Relay Panel — Internal Layout.

CAUTION

When removing a circuit breaker (Figure 3, Item 2) or relay (Figure 3, Item 1) from the relay panel (Figure 2, Item 2), be careful not to tilt the circuit breaker or relay far enough to damage the contact pins. Failure to comply may cause damage to equipment.

NOTE

Service of the relay panel is accomplished by resetting or replacing a circuit breaker (Figure 3, Item 2) or by replacing a relay (Figure 3, Item 1).

NOTE

The relay panel (Figure 2, Item 2) has the capacity to house eight circuit breakers (Figure 3, Item 2) and eight relays (Figure 3, Item 1). The number of circuit breakers (Figure 3, Item 2)/relays (Figure 3, Item 1) present in the relay panel (Figure 2, Item 2) is determined by the configuration of individual generator sets. A legend on the inside of the relay panel cover (Figure 4) identifies each individual relay and circuit breaker. Foldout Pages provided in the Rear Matter of this manual also identify the circuits protected by each circuit breaker (Figure 3, Item 2) or relay (Figure 3, Item 1).

An overload or short circuit in an electrical circuit may cause a circuit breaker (Figure 3, Item 2) to trip or fail completely. Circuit breakers (Figure 3, Item 2) may be reset or replaced as required. An overloaded electrical circuit may also cause failure of the relay (Figure 3, Item 1) in that circuit. Failed relays (Figure 3, Item 1) must be replaced.

Basic electrical troubleshooting procedures will enable the technician to trace an electrical circuit to a failed circuit breaker (Figure 3, Item 2) or relay (Figure 3, Item 1).

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open rear door and locate relay panel (Figure 3, Item 4).
3. Open relay panel (Figure 3, Item 4) cover.
4. Reset tripped circuit breaker (Figure 3, Item 2):
 - a. Open relay panel (Figure 3, Item 4) cover.

NOTE

A circuit breaker that has been tripped due to a short in the corresponding electrical circuit will be identified by an extended colored plastic indicator (Figure 3, Item 3) on the circuit breaker.

Technicians may only reset a circuit breaker (Figure 3, Item 2) once after it has tripped. If the circuit breaker trips a second time, it must be replaced.

- b. Check circuit breakers (Figure 3, Item 2) for a tripped-condition.
 - c. Press the extended colored plastic indicator (Figure 3, Item 3) to return it to the set position.
 - (1). Continue with generator set operation if circuit breaker (Figure 3, Item 2) remains in the set position.
 - (2). Troubleshoot electrical circuit to determine cause if circuit breaker (Figure 3, Item 2) will not remain in set position. See Foldout Pages.
 - d. Close relay panel (Figure 3, Item 4) cover.
 5. Replace a failed circuit breaker (Figure 3, Item 2):
 - a. Open relay panel (Figure 3, Item 4) cover.

CAUTION

Removing the circuit breaker by tilting it at more than a slight angle may damage circuit breaker contact pins and/or relay panel socket. Failure to comply may cause damage to equipment.

- b. Pull failed circuit breaker (Figure 3, Item 2) from relay panel (Figure 3, Item 4) by tilting the circuit breaker slightly.

CAUTION

Always replace a failed circuit breaker (Figure 3, Item 2) with one of the same value. Replacing a circuit breaker (Figure 3, Item 2) with one of a greater value may result in damage to equipment. Failure to comply may cause damage to equipment.

- c. Insert new circuit breaker (Figure 3, Item 2) into relay panel (Figure 3, Item 4) in the same slot that housed the failed circuit breaker (Figure 3, Item 2).
- 6. Replace a failed relay (Figure 3, Item 1):
 - a. Pull failed relay (Figure 3, Item 1) from relay panel (Figure 3, Item 4) by tilting the circuit breaker slightly.
 - b. Insert new relay (Figure 3, Item 1) into relay panel (Figure 3, Item 4) in the same slot that housed the failed relay (Figure 3, Item 1).

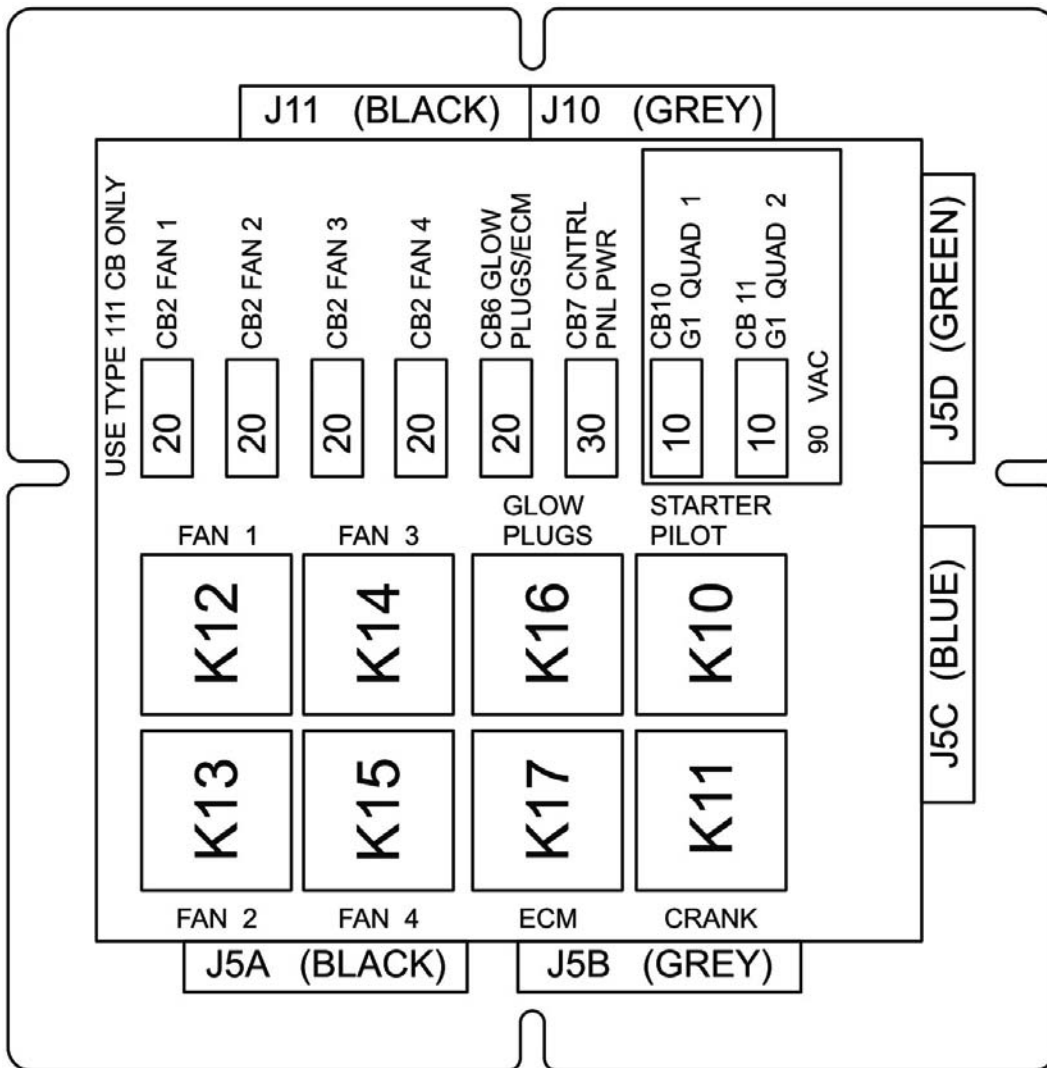


Figure 4. Relay Panel — Legend.

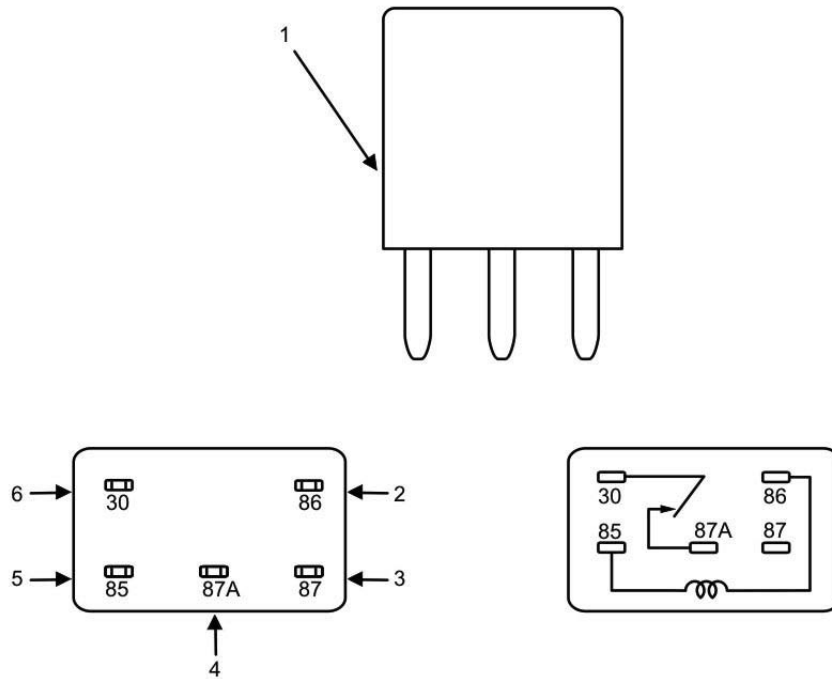


Figure 5. Test Relay.

7. Test a relay (Figure 5, Item 1):
 - a. Hold relay (Figure 5, Item 1) close to ear and shake it vigorously. Replace relay (Figure 5, Item 1) if the internals noticeably rattle.
 - b. Test relay (Figure 5, Item 1) for Ohms and continuity:
 - (1). Set multimeter to read either Ohms or continuity.
 - (2). Place multimeter probes on relay pins as shown in Table 1.
 - (3). Compare multimeter reading with values in Table 1.
 - (4). Retain relay (Figure 5, Item 1) for reuse if multimeter reading matches value in “Good” column.
 - (5). Replace relay (Figure 5, Item 1) if multimeter reading matches value in “Bad” column.

Table 1. Relay Test for Ohms and Continuity.

Test Across Pins	Ohms – Good	Ohms - Bad	Continuity - Good	Continuity - Bad
85 to 86 (Figure 5, Items 5 to 2)	435 – 531 Ohms	Outside range of 435-531 Ohms	n/a	n/a
30 to 87A (Figure 5, Items 6 to 4)	0 Ohm short circuit	Infinity (∞) Ohms Open circuit	positive	negative
30 to 87 (Figure 5, Items 6 to 3)	Infinity (∞) Ohms Open circuit	0 Ohm short circuit	negative	positive

Table 1. Relay Test for Ohms and Continuity — Continued.

Test Across Pins	Ohms – Good	Ohms - Bad	Continuity - Good	Continuity - Bad
85 to 87, 87A, and 30 (Figure 5, Items 5 to 3, 4, and 6)	Infinity (∞) Ohms Open circuit	0 Ohm short circuit	negative	positive
86 to 87, 87A, and 30 (Figure 5, Items 2 to 3, 4, and 6)	Infinity (∞) Ohms Open circuit	0 Ohm short circuit	negative	positive

NOTE

Voltage required to operate relay is 14.4 to 31.9 VDC applied. Check voltage supply source using a multimeter to verify test voltage is within specification.

- c. Apply 24 VDC across pins 30 and 87 (Figure 5) and listen for an audible “click.”
 - (1). Retain relay (Figure 5, Item 1) for reuse if “click” is heard, indicating connection between pins 30 and 87 (Figure 5) is closed.
 - (2). Replace relay (Figure 5, Item 1) if no “click” is heard, indicating connection between pins 30 and 87 (Figure 5) remains open.
8. Close relay panel (Figure 3, Item 4) cover.
9. Close rear door.
10. Install negative ground cable from right-hand battery (WP 0036, Remove/Install Batteries).
11. Close left-side door.
12. Set engine control switch to PRIME & RUN (TM 9-6115-751-10).
13. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
14. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL POWER WIRING HARNESS

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Harness, power (WP 0155, Repair Parts List, Figure 55, Item 1)

Grease, electrically conductive (WP 0164, Expendable and Durable Items List, Item 21)

Personnel Required

91D (1)

References

WP 0095, General Maintenance

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL POWER WIRING HARNESS**Remove Power Wiring Harness**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door to expose exhaust side of engine.
3. Locate power wiring harness (Figure 1).

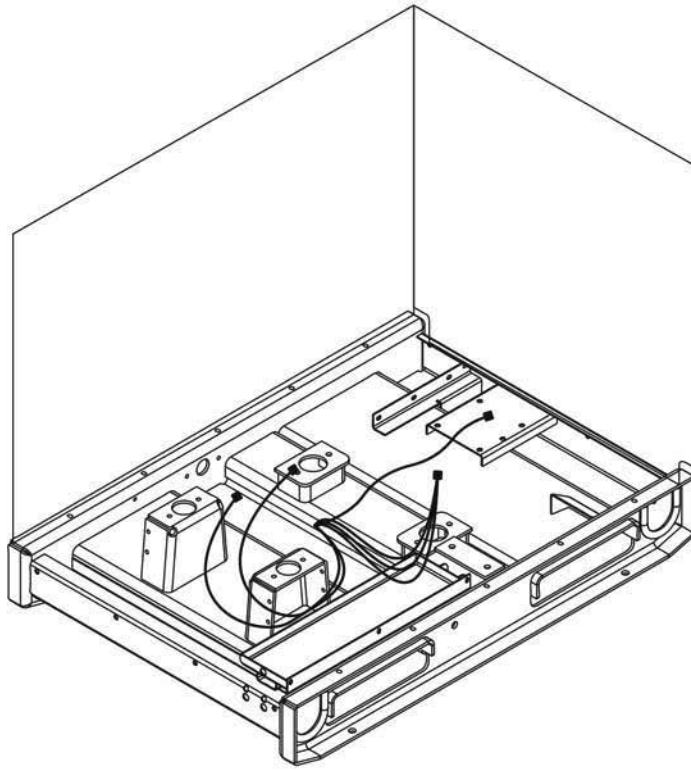


Figure 1. Power Wiring Harness — Location.

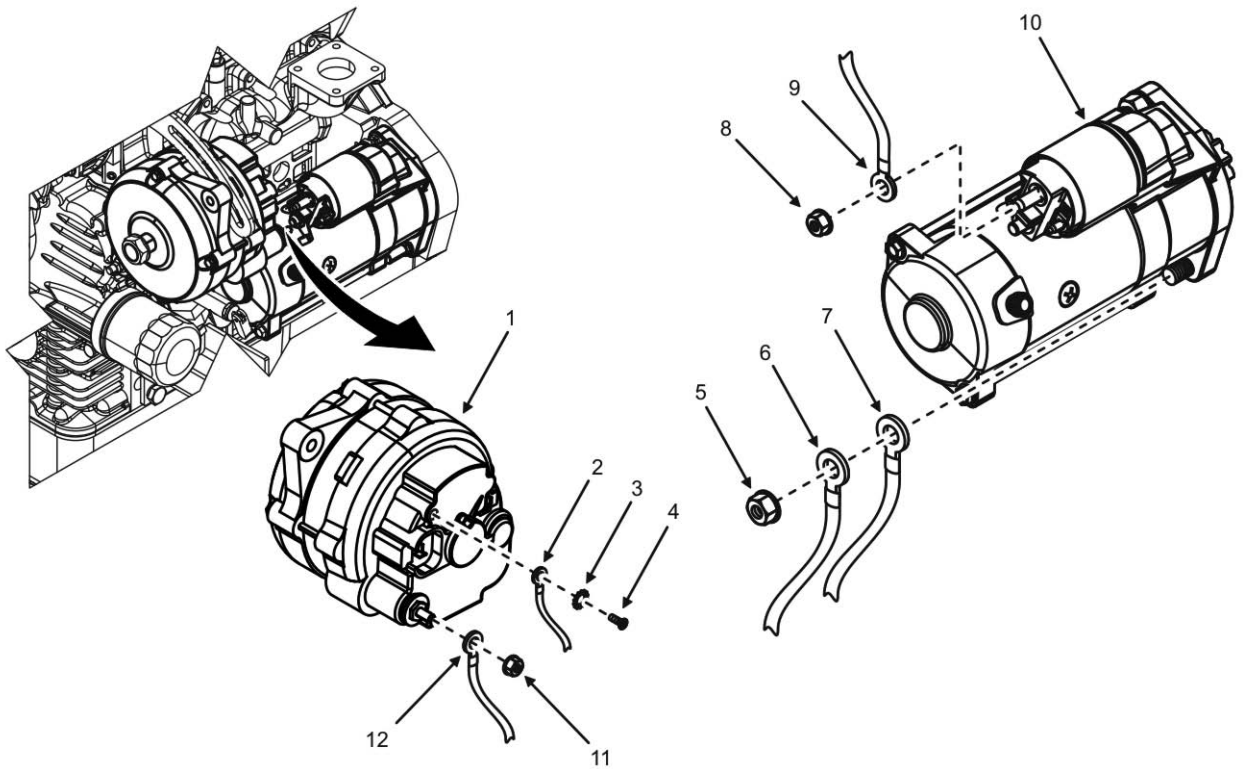


Figure 2. Left-Side Door View.

NOTE

Tag/mark all electrical wires prior to removal. Tags will serve as a guide during installation.

4. Reposition boot on wire (T108) (Figure 2, Item 12) at stud of battery-charging alternator (Figure 2, Item 1) to expose nut (Figure 2, Item 11).
5. Remove nut (Figure 2, Item 11) at stud of battery-charging alternator (Figure 2, Item 1) and remove wire (T108) (Figure 2, Item 12).
6. Remove screw (Figure 2, Item 4) and external tooth washer (Figure 2, Item 3) from rear of battery-charging alternator (Figure 2, Item 1) and remove wire (T109) (Figure 2, Item 2). Discard external tooth washer (Figure 2, Item 3).
7. Reposition boot on wire (T106) (Figure 2, Item 9) at upper solenoid stud of starter (Figure 2, Item 10) to expose nut (Figure 2, Item 8).
8. Remove nut (Figure 2, Item 8) at upper solenoid stud of starter (Figure 2, Item 10) and remove wire (T106) (Figure 2, Item 9).
9. Reposition boot on wire (T120) (Figure 2, Item 6) at lower mounting stud of starter (Figure 2, Item 10) to expose nut (Figure 2, Item 5).
10. Remove nut (Figure 2, Item 5) at lower mounting stud of starter (Figure 2, Item 10), and remove two wires (T120) (Figure 2, Items 6 and 7).

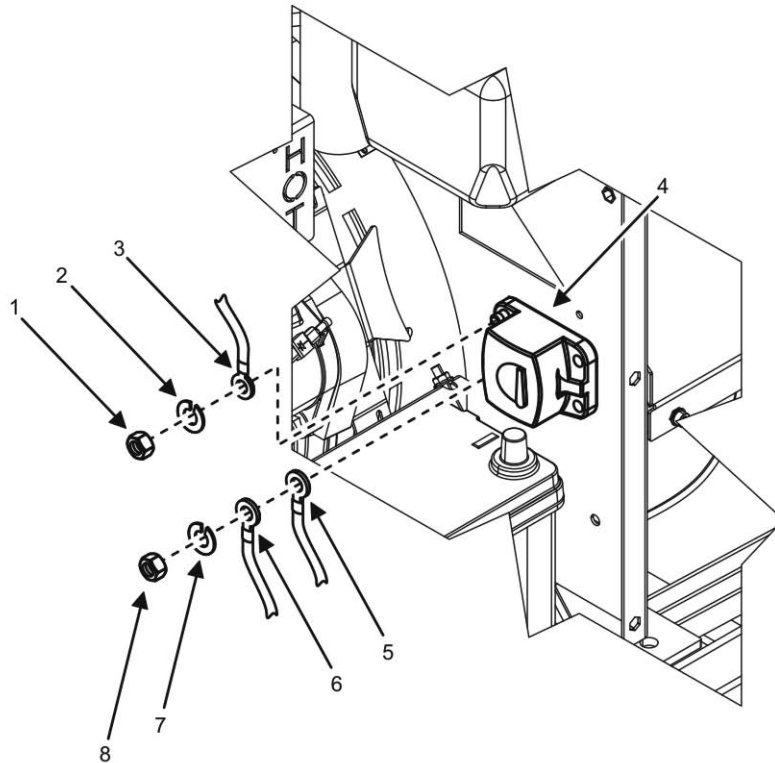


Figure 3. Main DC Circuit Breaker.

11. Reposition boot on wire (CB 201-Load) (Figure 3, Item 6) at lower terminal (load) of main DC circuit breaker (Figure 3, Item 4) to expose nut (Figure 3, Item 8).
12. Remove nut (Figure 3, Item 8) and lock washer (Figure 3, Item 7) at lower terminal (load) of main DC circuit breaker (Figure 3, Item 4) and remove two wires (CB 201-Load) (Figure 3, Items 5 and 6). Discard lock washer (Figure 3, Item 7).

13. Reposition boot on wire (CB 201-Line) (Figure 3, Item 3) at upper terminal (line) of main DC circuit breaker (Figure 3, Item 4) to expose nut (Figure 3, Item 1).
14. Remove nut (Figure 3, Item 1) and lock washer (Figure 3, Item 2) at upper terminal (line) of main DC circuit breaker (Figure 3, Item 4) and remove wire (CB 201-Line) (Figure 3, Item 3). Discard lock washer (Figure 3, Item 2).

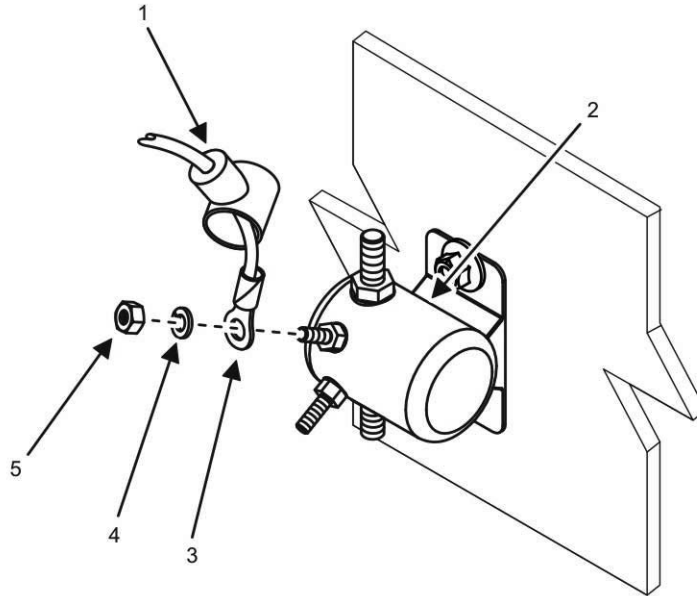


Figure 4. Intake Air Heater Relay.

NOTE

Two of the four wires attached to the intake air heater relay are from the power wiring harness. For clarity, only one wire is shown in Figure 4. Both electrical wires are removed using the same procedure. Wires are identified by manufacturer's marks applied at the factory. Prior to removal, tag/mark the two terminal posts from which wires will be removed. Tags/markings will be used as a guide at installation.

15. Determine the two wires from the power wiring harness attached to the intake air heater relay by using the manufacture's markings on the wires. Wires to be removed in this task are marked "K18-24V" and "K18-07S".
16. Re-position boot (Figure 4, Item 1) and remove nut (Figure 4, Item 5) and lock washer (Figure 4, Item 4) that secure electrical wire (K18-24V) (Figure 4, Item 3) to intake air heater relay (Figure 4, Item 2) terminal post. Discard lock washer (Figure 2, Item 4).
17. Remove electrical wire (Figure 4, Item 3) from intake air heater relay (Figure 4, Item 2) terminal post.
18. Repeat steps 16 and 17 to remove wire (K18-07S) from intake air heater relay (Figure 4, Item 2) terminal post.
19. Remove nut (Figure 5, Item 1) and lock washer (Figure 5, Item 2) that secures electrical wire (HTR1, GRID HEATER1, B+) (Figure 5, Item 3) to intake air heater (Figure 5, Item 4). Discard lock washer (Figure 5, Item 2).

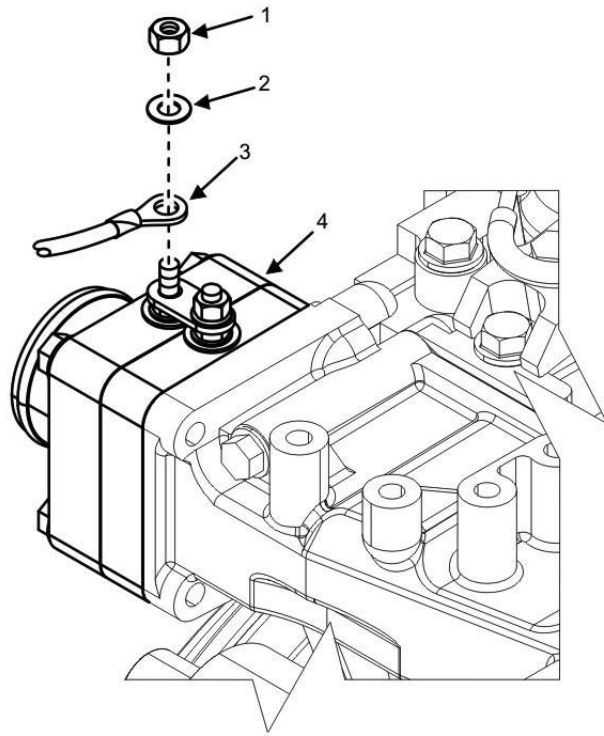


Figure 5. Intake Air Heater.

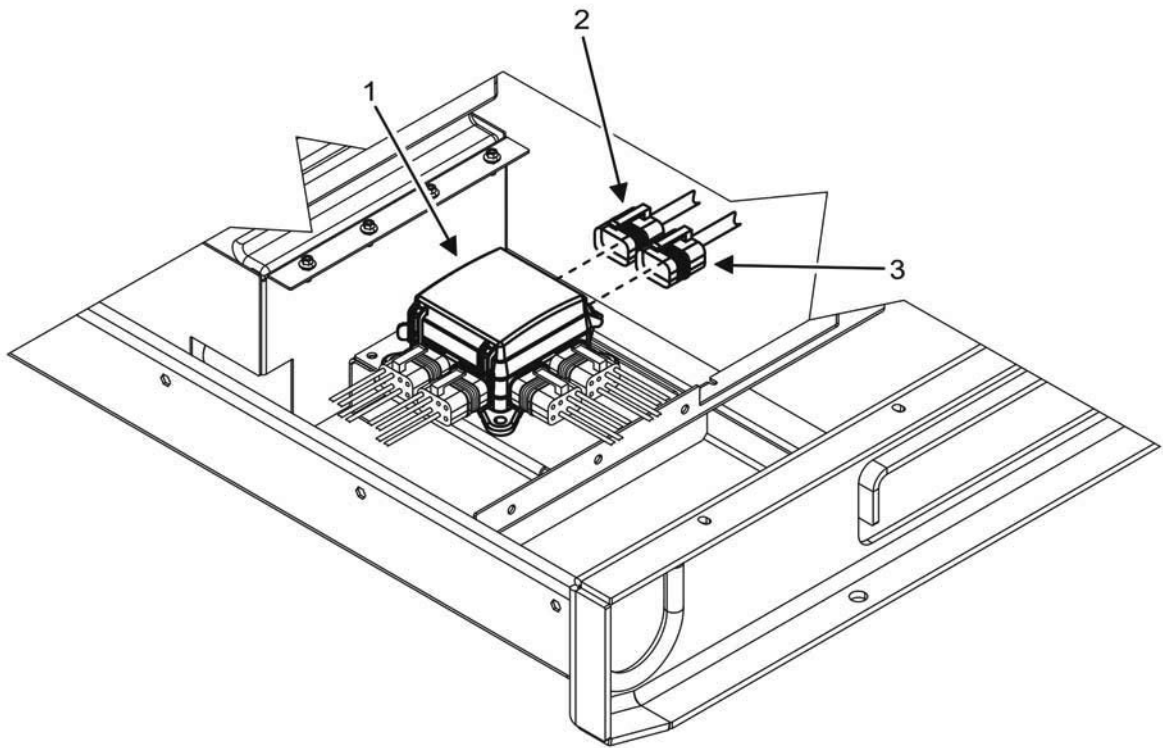


Figure 6. Relay Panel Connectors.

20. Open rear door.
21. Remove connector (P10) (Figure 6, Item 2) from relay panel (Figure 6, Item 1).
22. Remove connector (P11) (Figure 6, Item 3) from relay panel (Figure 6, Item 1).
23. Remove power wiring harness (Figure 1) from unit skid being careful not to entangle harness leads on unit components.

END OF TASK

Inspect Power Wiring Harness

1. Inspect power wiring harness (Figure 1) for damaged connectors and sheathing if harness is to be reused.
2. Repair damaged electrical connectors (WP 0095, General Maintenance).
3. Replace damaged sheathing as required.

END OF TASK

Install Power Wiring Harness

1. Position power wiring harness (Figure 1) to its approximate mounting location in unit skid, spreading branches of harness close to their points of installation.
2. Move to rear door of generator set.

NOTE

Tags/markings applied to electrical wires during removal should remain in place until all components are installed and equipment is operating properly.

3. Install connector (P11) (Figure 6, Item 3) to relay panel (Figure 6, Item 1).
4. Install connector (P10) (Figure 6, Item 2) to relay panel (Figure 6, Item 1).
5. Close rear door.
6. Position electrical wire (HTR1, GRID HEATER1, B+) (Figure 5, Item 3) to intake air heater (Figure 5, Item 4) and secure by installing new lock washer (Figure 5, Item 2) and nut (Figure 5, Item 1).
7. Position wire (K18-07S) (Figure 4, Item 3) to its mounting location on intake air heater relay (Figure 4, Item 2) using the tags/markings applied during removal as a guide.
8. Secure wire (K18-07S) (Figure 4, Item 3) to intake air heater relay (Figure 4, Item 2) by installing new lock washer (Figure 4, Item 4) and nut (Figure 4, Item 5).
9. Repeat steps 7 and 8 to install wire (K18-24V) to intake air heater relay (Figure 4, Item 2).
10. Position wire (CB 201-Line) (Figure 3, Item 3) to upper terminal of main DC circuit breaker (Figure 3, Item 4) and secure by installing new lock washer (Figure 3, Item 2) and nut (Figure 3, Item 1).
11. Reposition boot on wire (CB 201-Line) (Figure 3, Item 3) to cover nut (Figure 3, Item 1).
12. Position two wires (CB 201-Load) (Figure 3, Items 5 and 6) to lower terminal of main DC circuit breaker (Figure 3, Item 4) and secure by installing new lock washer (Figure 3, Item 7) and nut (Figure 3, Item 8).
13. Reposition boot on wire (CB 201-Load) (Figure 3, Item 6) to cover nut (Figure 3, Item 8).
14. Install two wires (T120) (Figure 2, Items 6 and 7) to lower mounting stud of starter (Figure 2, Item 10) and secure by installing nut (Figure 2, Item 5).
15. Reposition boot on wire (T120) (Figure 2, Item 6) to cover nut (Figure 2, Item 5) on lower mounting stud of starter (Figure 2, Item 10).

-
16. Install wire (T106) (Figure 2, Item 9) to upper solenoid stud of starter (Figure 2, Item 10) and secure by installing nut (Figure 3, Item 8).
 17. Reposition boot on wire (T106) (Figure 2, Item 9) to cover nut (Figure 2, Item 8) on upper solenoid stud of starter (Figure 2, Item 10).
 18. Install wire (T109) (Figure 2, Item 2) to rear of battery-charging alternator (Figure 2, Item 1) and secure by installing new external tooth washer (Figure 2, Item 3) and screw (Figure 2, Item 4).
 19. Install wire (T108) (Figure 2, Item 12) to stud of battery-charging alternator (Figure 2, Item 1) and secure by installing nut (Figure 2, Item 11).
 20. Reposition boot on wire (T-108) (Figure 2, Item 12) to cover nut (Figure 2, Item 11) on stud of battery-charging alternator (Figure 2, Item 1).
 21. Close left-side door.
 22. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
 23. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
 24. Start engine and check for proper operation (TM 9-6115-751-10).
 25. Repair as required.
 26. Remove all temporary identification tags applied to electrical components.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
SERVICE FUEL SYSTEM

INITIAL SETUP:**Test Equipment**

Beaker, Laboratory (WP 0163, Maintenance Allocation Chart, Item 6)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Item 38)

Tool Set, SATS, Base (WP 0163, Item 39)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0163, Item 46)

Materials/Parts

Cap set, protective (WP 0164, Expendable and Durable Items List, Item 9)

Detergent, general purpose (WP 0164, Item 17)

Fuel, diesel (WP 0164, Item 20)

Grease, electrically conductive (WP 0164, Item 21)

Pan, drain (WP 0164, Item 29)

Rag, wiping (WP 0164, Item 32)

Personnel Required

91D (1)

Assistant (1)

References

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

WP 0036, Remove/Install Batteries

WP 0039, Remove/Install Engine Wiring Harness

WP 0044, Remove/Install Fuel Pump, Main/Auxiliary

WP 0045, Remove/Install Fuel Manifold

WP 0046, Remove/Install Fuel Filter/Water Separator

WP 0047, Replace Fuel Filter/Water Separator Element

WP 0095, General Maintenance

Foldout Pages

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

SERVICE FUEL SYSTEM**WARNING**

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

WARNING

- Make sure engine control switch is only set to PRIME & RUN during fuel system checks. Failure to comply may cause injury or death to personnel.
- Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.
- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator set is running. Failure to comply may cause injury or death to personnel.

Purge Fuel Lines

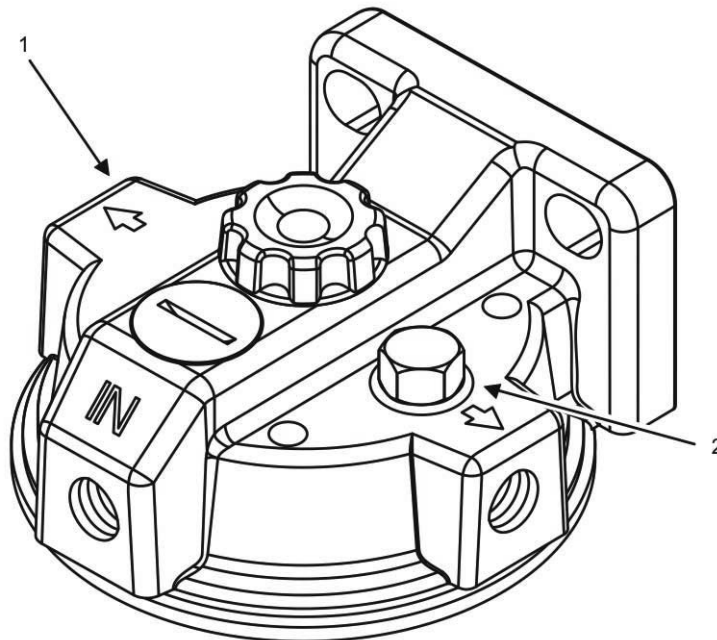


Figure 1. Air Bleed Vent Plug.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door.

3. Locate air bleed vent plug (Figure 1, Item 2) on fuel filter/water separator head (Figure 1, Item 1).
4. Place suitable container and shop rags under and around air bleed vent plug (Figure 1 Item 2).
5. Remove dirt and debris on fuel filter/water separator head (Figure 1 Item 1) to prevent contamination of fuel system.

NOTE

Capture spilled fuel and dispose of IAW local SOP.

6. Remove air bleed vent plug (Figure 1, Item 2) from fuel filter/water separator head (Figure 1, Item 1).

NOTE

The use of an assistant is required for the following procedure.

7. Turn engine control switch to PRIME & RUN (using assistant) to pump fuel (TM 9-6115-751-10).
8. Observe fuel flow for evidence of air in the fuel line as indicated by bubbles, frothy appearance, or breaks in flow.
9. Turn engine control switch to OFF (using assistant) when evidence of air in fuel no longer appears for 2 – 3 sec (TM 9-6115-751-10).
10. Install air bleed vent plug (Figure 1, Item 2) to fuel filter/water separator head (Figure 1, Item 1).
11. Close right-side door.
12. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
13. Start engine and check for leaks and proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
14. Disposal of captured fuel IAW local SOP.

END OF TASK

Check Fuel Flow

1. Ensure equipment conditions are met in order presented in initial setup
2. Check fuel level. Add fuel to fuel tank if empty (Fill Fuel Tank task).
3. Purge fuel lines (Purge Fuel Lines task).
4. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10) and listen to confirm fuel pump operation.
5. Continue to step 12 if fuel pump activates.
6. Ensure electrical connector is attached to main fuel pump if fuel pump does not activate (WP 0044, Remove/Install Fuel Pump, Main/Auxiliary).

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

7. Disconnect main fuel pump connector (P65) and use a multimeter set to test VDC to check electrical connector pins for 24 VDC $\pm 10\%$ if electrical connector is attached but main fuel pump is not operating (WP 0095, General Maintenance).
8. Replace main fuel pump if voltage is within 24 VDC $\pm 10\%$ range (WP 0044, Remove/Install Fuel Pump, Main/Auxiliary).

9. Use wiring diagrams and troubleshoot electrical wires P2-N and P2-V for opens or shorts if voltage is outside 24 VDC \pm 10% range (Foldout Pages).
10. Repair or replace wiring if a short or open is found (WP 0095, General Maintenance and WP 0039, Remove/Install Engine Wiring Harness).
11. Test and replace DCS as required if no short or open is found (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).
12. Turn engine control switch to OFF (TM 9-6115-751-10).
13. Remove fuel supply hose at fuel injection pump (WP 0046, Remove/Install Fuel Filter/Water Separator).
14. Place open end of fuel supply hose into suitable container of at least 16 oz (500 mL) to catch pumped fuel.

NOTE

The use of an assistant is required for the following procedure.

15. Turn engine control switch to PRIME & RUN (using assistant) for approximately 15 sec to pump fuel through fuel supply hose (TM 9-6115-751-10).
16. Turn engine control switch to OFF (TM 9-6115-751-10).
 - a. Install fuel supply hose and proceed to step 24 if fuel flow volume is approximately 12 oz (355 mL) after 15 sec (WP 0046, Remove/Install Fuel Filter/Water Separator).
 - b. Install fuel supply hose and remove fuel supply line from IN port of fuel filter/water separator if no fuel exits fuel supply hose or volume is less than approximate value in step a (WP 0046, Remove/Install Fuel Filter/Water Separator).
17. Place open end of fuel supply line into suitable container to catch pumped fuel.
18. Turn engine control switch to PRIME & RUN (using assistant) for approximately 15 sec to pump fuel through fuel supply line (TM 9-6115-751-10).
19. Turn engine control switch to OFF (TM 9-6115-751-10).
 - a. If fuel flow volume is approximately 12 oz (355 mL) after 15 sec, replace fuel filter/water separator element, install fuel supply line, and proceed to step 24 (WP 0046, Remove/Install Fuel Filter/Water Separator and WP 0047, Remove/Install Fuel Filter/Water Separator Element).
 - b. If no fuel exits fuel supply line or volume is less than specification when engine control switch is turned to PRIME & RUN, service strainers in fuel manifold. See Service Fuel Strainers task.
20. Turn engine control switch to PRIME & RUN (using assistant) for approximately 15 sec to pump fuel through fuel supply line again (TM 9-6115-751-10).
21. Turn engine control switch to OFF (TM 9-6115-751-10).
 - a. Install fuel supply line and proceed to step 24 if fuel flow volume is approximately 12 oz (355 mL) after 15 sec (WP 0046, Remove/Install Fuel Filter/Water Separator).
 - b. If no fuel exits fuel supply line at fuel filter/water separator or volume is less than specification when engine control switch is turned to PRIME & RUN, inspect fuel manifold fuel pickup tube for signs of damage or restriction. Replace or repair as required (WP 0045, Remove/Install Fuel Manifold).
22. Turn engine control switch to PRIME & RUN (using assistant) for approximately 15 sec to pump fuel through fuel supply line again (TM 9-6115-751-10).
23. Turn engine control switch to OFF (TM 9-6115-751-10).
 - a. Install fuel supply line and proceed to step 24 if fuel flow volume is approximately 12 oz (355 mL) after 15 sec (WP 0046, Remove/Install Fuel Filter/Water Separator).
 - b. If no fuel exits fuel supply line at fuel filter/water separator or volume is less than specification when engine control switch is turned to PRIME & RUN, install fuel supply line, replace main fuel pump, and

proceed to step 24 (WP 0044, Remove/Install Fuel Pump, Main/Auxiliary and WP 0046, Remove/Install Fuel Filter/Water Separator).

NOTE

Wipe down all fuel lines, parts, and fittings with wiping rag prior to installation.

24. Close right-side door.
25. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
26. Start engine and check for leaks and proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
27. Repeat steps 1 through 26 if engine stops.
28. Dispose of fuel IAW local SOP.

END OF TASK

Drain Fuel Tank

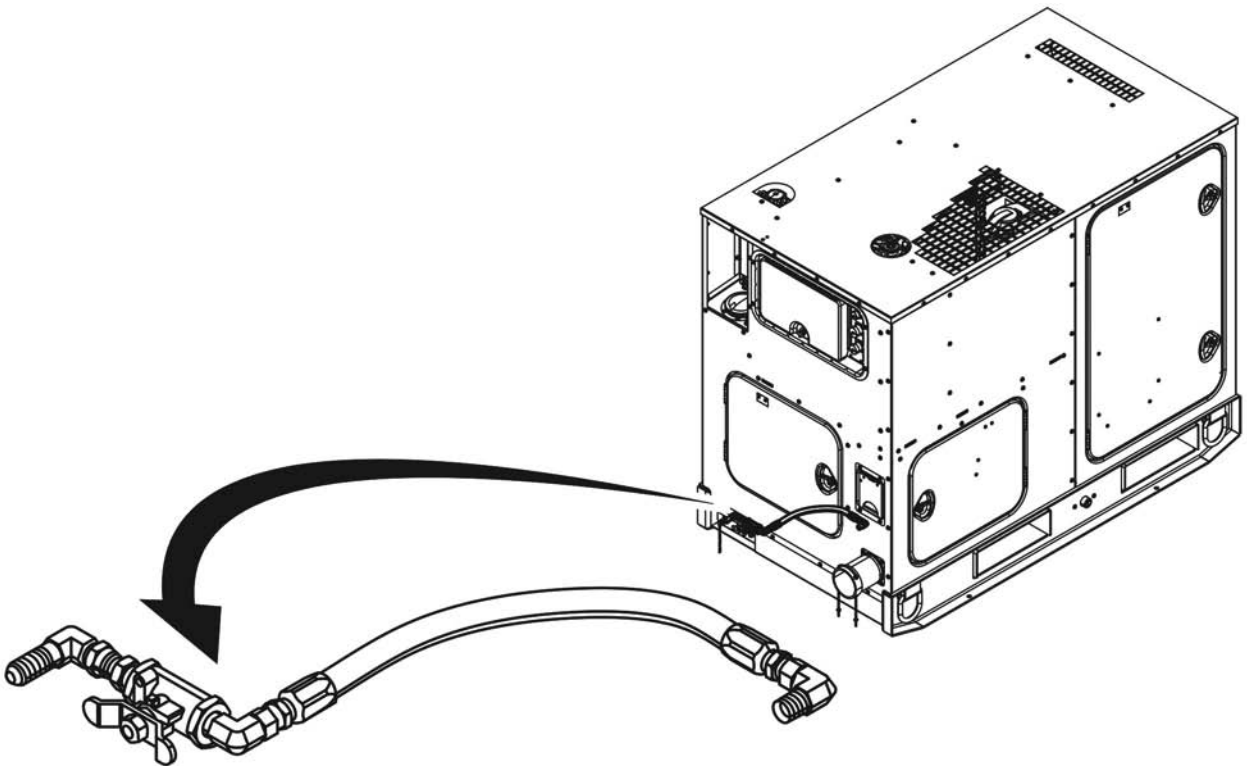


Figure 2. Fuel Drain — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate fuel drain assembly (Figure 2).
3. Remove any dirt and debris around fuel drain outlet cap (Figure 3, Item 4).
4. Place suitable container under fuel drain outlet (Figure 3, Item 1) to catch drained fuel.
5. Remove fuel drain outlet cap (Figure 3, Item 4) from fuel drain outlet (Figure 3, Item 1) in center of rear of unit skid.

-
6. Obtain auxiliary fuel line (Figure 3, Item 3) from accessory box on inside of right-side access door.
 7. Connect auxiliary fuel line (Figure 3, Item 3) to fuel drain outlet (Figure 3, Item 1).
 8. Remove fuel filler cap (Figure 4, Item 2) from fuel filler neck (Figure 4, Item 1).
 9. Open ball valve (Figure 3, Item 2) by rotating lever until it is 180 degrees to fuel flow.

NOTE

Capture spilled fuel and dispose of IAW local SOP.

10. Close ball valve (Figure 3, Item 2) when flow of fuel stops by rotating lever until it is 90 degrees from direction of fuel flow.
11. Remove auxiliary fuel line (Figure 3, Item 3) from fuel drain outlet (Figure 3, Item 1) and ensure auxiliary fuel line (Figure 3, Item 3) is drained IAW SOP.
12. Replace fuel drain outlet cap (Figure 3, Item 4) on fuel drain outlet (Figure 3, Item 1).

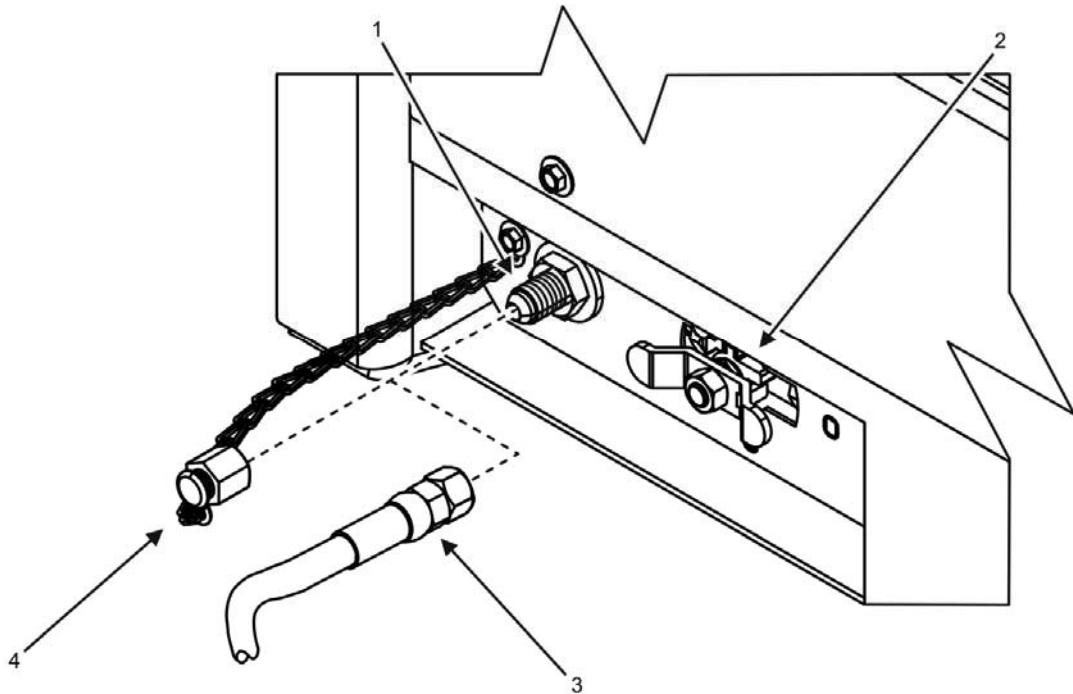


Figure 3. Fuel Drain — Detail.

13. Wipe down auxiliary fuel line (Figure 3, Item 3) and store it in accessory box on inside of right-side access door.
14. Clean fuel drain outlet (Figure 3, Item 1) area of fuel and dirt.
15. Dispose of captured fuel and soiled rags IAW local SOP.
16. Replace fuel filler cap (Figure 4, Item 2) to previous orientation.

END OF TASK

Fill Fuel Tank**WARNING**

Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (fuel fill static ground). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate ESD. Fire and possible explosion can result. Failure to comply may cause injury or death to personnel.

NOTE

Note orientation of fuel cap before removal to aid in installation.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove fuel filler cap (Figure 4, Item 2).

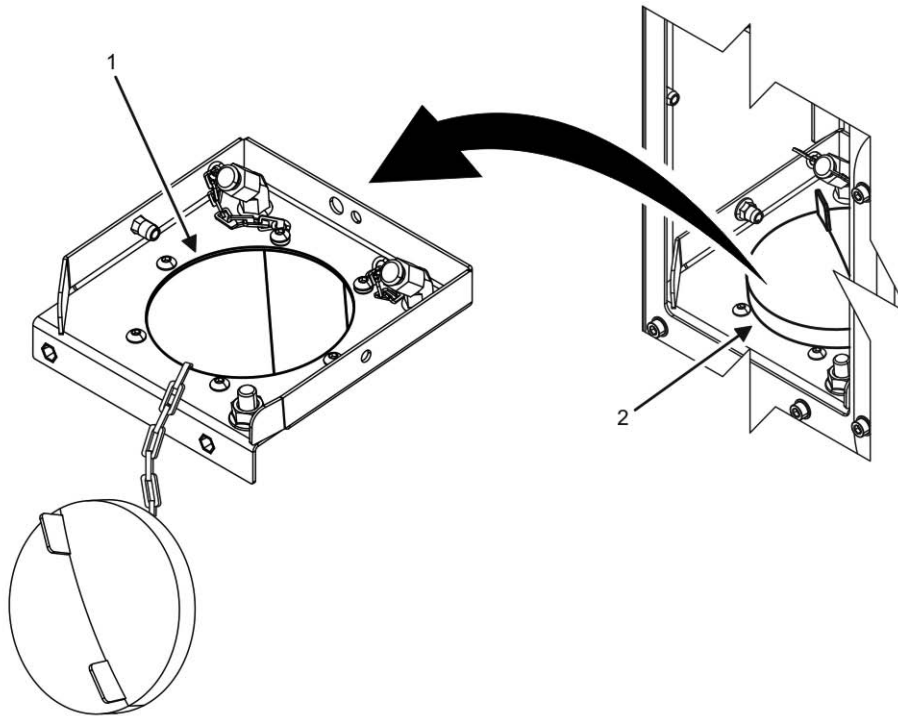


Figure 4. Fuel Filler — Location.

3. Ensure ball valve (Figure 3, Item 2) is securely closed and 90 degrees from direction of fuel flow.
4. Add approved fuel into fuel filler opening (Figure 4, Item 1) until the level of fuel is at the top of the fuel tank.

NOTE

Capture and dispose of spilled fluid IAW local SOP.

5. Replace fuel filler cap (Figure 4, Item 2) to previous orientation.

END OF TASK

Service Fuel Strainers

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door.
3. Remove negative ground cable from right-hand battery (WP 0036, Remove/Install Batteries).
4. Open rear door and locate fuel strainer plugs (Figure 5, Item 1) on fuel manifold (Figure 5, Item 4).
5. Remove fuel strainer plugs (Figure 5, Item 1) from fuel manifold (Figure 5, Item 4).
6. Discard fuel strainer plugs (Figure 5, Item 1) with O-ring (Figure 5, Item 2).
7. Remove strainers (Figure 5, Item 3) from fuel manifold (Figure 5, Item 4).

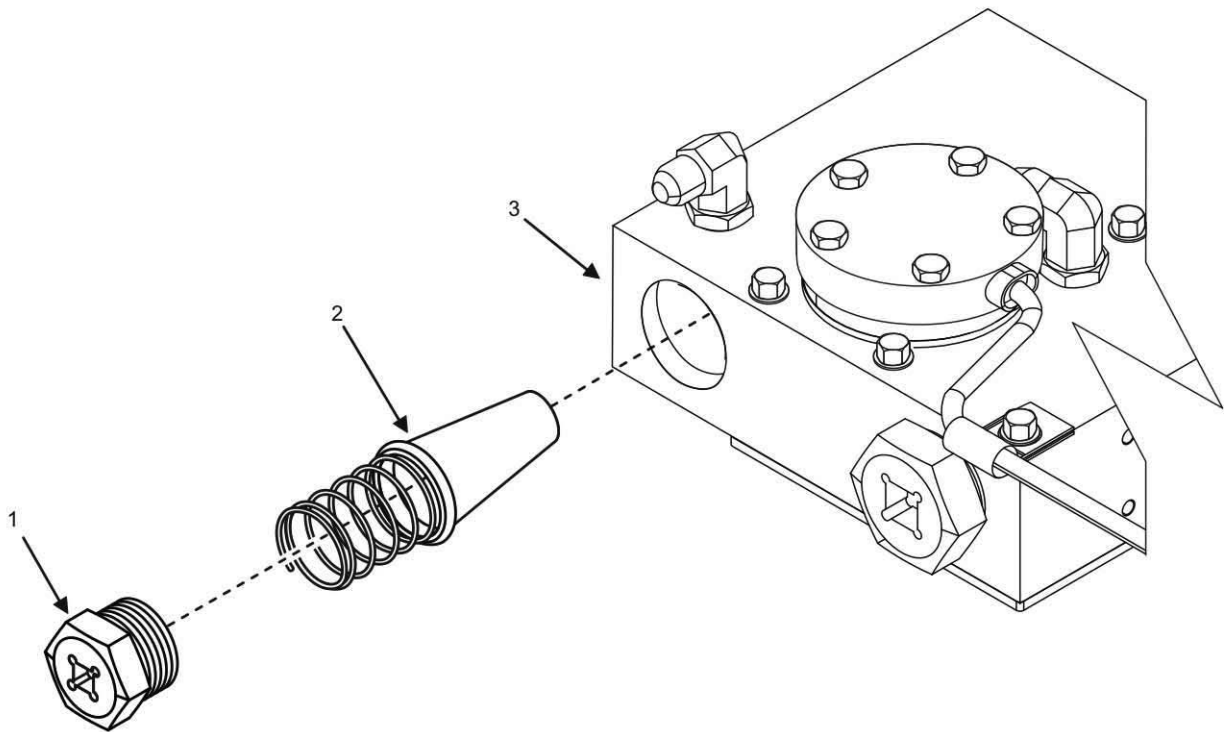


Figure 5. Fuel Strainer — Detail.

8. Remove any dirt, debris, or blockages and clean strainers with detergent.
9. Inspect strainers for holes, tears, and other signs of obvious damage and replace if required.
10. Install strainers (Figure 5, Item 2) to fuel manifold (Figure 5, Item 3).
11. Install new fuel strainer plugs (Figure 5, Item 1) to fuel manifold (Figure 5, Item 3). Tighten plugs to 18 – 22 ft/lb (24 – 30 Nm).
12. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
13. Close generator set doors.

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

14. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
15. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
16. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL FUEL PUMP, MAIN/AUXILIARY

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Crowfoot Attachment Set, Socket Wrench, Flare Nut, Standard (WP 0163, Maintenance Allocation Chart, Item 13)

Tool Kit, General Mechanic's (GMTK) (WP 0163, Item 38)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0163, Item 46)

Materials/Parts

Pump, fuel, electric (2) (WP 0112, Repair Parts List, Figure 12, Item 10)

Cap set, protective (WP 0164, Expendable and Durable Items List, Item 9)

Grease, electrically conductive (WP 0164, Item 21)

Rag, wiping (2) (WP 0164, Item 32)

Sealant (WP 0164, Item 33)

Tag, marker (WP 0164, Item 36)

Personnel Required

91D (1)

Assistant (1)

References

WP 0043, Service Fuel System

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL FUEL PUMP, MAIN/AUXILIARY**WARNING**

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

Remove Fuel Pump

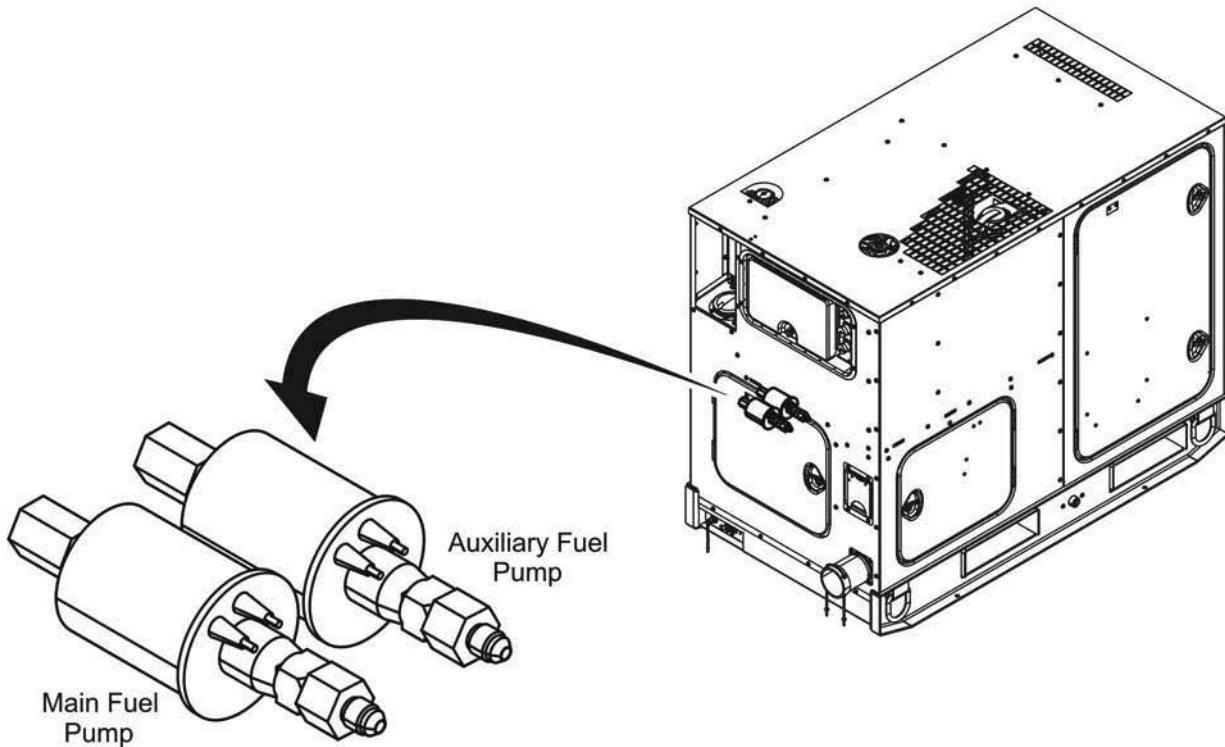


Figure 1. Fuel Pump — Location.

1. Ensure equipment conditions are met in order presented in initial setup.

NOTE

Removing the main fuel pump and the auxiliary fuel pump require the same procedure. Fuel supply line connects main fuel pump to fuel filter/water separator. An auxiliary fuel line attaches auxiliary fuel pump to fuel manifold.

2. Locate fuel pump to be removed (Figure 1) through interior panel gap.
3. Tag electrical connectors (Figure 2, Item 2) to facilitate installation if removing both fuel pumps.
4. Disconnect electrical connectors (Figure 2, Item 2) from unit wiring harness connector (Figure 2, Item 3).
5. Inspect electrical connectors (Figure 2, Item 2) for fraying and other signs of obvious damage and replace as required.
6. Open rear panel door.

NOTE

Capture and dispose of spilled fuel IAW local SOP. Cap/plug open fuel lines to prevent dirt and debris from entering the fuel system.

7. Place suitable catch container and wiping rag under fuel pumps (Figure 2, Item 6) to capture spilled fuel.

NOTE

Two wrenches are required to separate this fitting.

8. Disconnect fitting of fuel supply line (Figure 2, Item 4) from fuel pump male fitting (Figure 2, Item 5). Cap/plug line to prevent dirt and debris from entering the fuel system.
9. Inspect fuel supply line (Figure 2, Item 4) for obvious signs of damage. Replace fuel supply line (Figure 2, Item 4) as required.
10. Loosen fuel pump fitting (Figure 2, Item 7) from fuel manifold connector fitting (Figure 2, Item 8).
11. Remove fuel pump (Figure 2, Item 6) from manifold (Figure 2, Item 1) by turning fuel pump fitting (Figure 2, Item 7) counterclockwise.

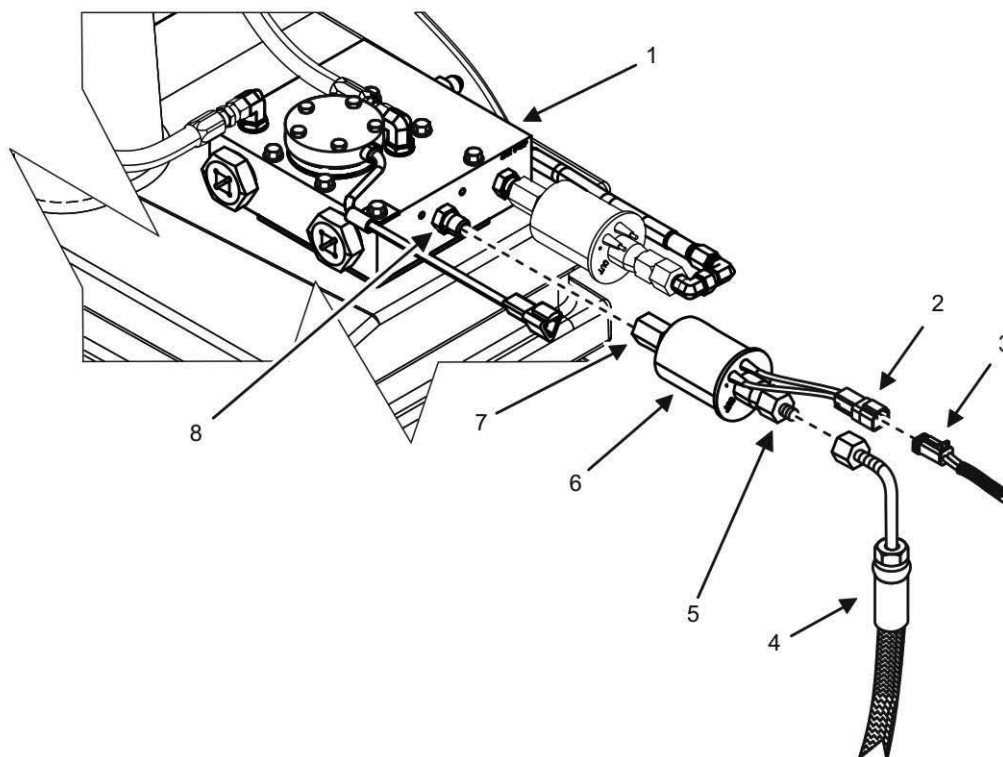


Figure 2. Fuel Pump — Detail.

12. Place fuel pump (Figure 2, Item 6) on suitable work surface.
13. Remove old thread sealant from fuel manifold connector fitting (Figure 2, Item 8) and fuel pump male fitting (Figure 2, Item 5).

END OF TASK**Inspect Fuel Pump**

1. Inspect fuel pump fitting (Figure 2, Item 7) for cracks and other obvious signs of damage. Replace pump as required.
2. Inspect fuel pump male fitting (Figure 2, Item 5) for cracks and other obvious signs of damage. Replace pump as required.

3. Inspect fuel pump (Figure 2, Item 6) for wear and other signs of obvious damage and replace as required.
4. Inspect fuel manifold connector fitting (Figure 2, Item 8) for signs of obvious damage and replace as required.

END OF TASK

Install Fuel Pump

CAUTION

Be sure to install fuel pump (Figure 2, Item 6) in proper direction relative to fuel flow. The flow from this pump is outward. Failure to comply may cause damage to equipment.

NOTE

Installing the main fuel pump and the auxiliary fuel pump require the same procedure. Fuel supply line connects main fuel pump to fuel filter/water separator. An auxiliary fuel line attaches auxiliary fuel pump to fuel manifold.

Capture and dispose of spilled fluid IAW local SOP. Remove all caps/plugs from fuel lines/fittings prior to installation of each fuel line.

Wipe down fuel line, pump, and fittings with wiping rag prior to installation.

Sealant cure time is 30 min to use fuel system and 72 hr for full strength.

1. Apply thread sealant to fuel manifold connector fitting (Figure 2, Item 8) and fuel pump male fitting (Figure 2, Item 5).
2. Position fuel pump (Figure 2, Item 6) to fuel manifold connector fitting (Figure 2, Item 8) and finger-tighten.
3. Tighten fuel pump fitting (Figure 2, Item 7) an extra one and one-half turns.
4. Position fuel supply line (Figure 2, Item 4) to fuel pump male fitting (Figure 2, Item 5) and finger-tighten fuel pump male fitting (Figure 2, Item 5).
5. Tighten fuel pump male fitting (Figure 2, Item 5) to a torque value of 132 – 147 in/lb (15 – 16 Nm).
6. Remove tags from electrical connectors (Figure 2, Item 2) if necessary.
7. Connect fuel pump electrical connector (Figure 2, Item 2) to unit wiring harness connector (Figure 2, Item 3).
8. Purge fuel system (WP 0043, Service Fuel System).
9. Close generator set doors.
10. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
11. Start engine and check for proper operation. Apply 100% rated load for 30 minutes or until coolant reaches normal operating temperature (TM 9-6115-751-10).
12. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL FUEL MANIFOLD

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Torque Tube, 5-75 FT-LB (WP 0163, Item 41)

Torque Wrench Head End, 1/4" X 3/8" Drive, 5/8" (WP 0163, Item 42)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0163, Item 46)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0163, Item 48)

Materials/Parts

Gasket (WP 0112, Repair Parts List, Figure 12, Item 2)

Gasket (WP 0111, Repair Parts List, Figure 11, Item 42)

Manifold, fuel (WP 0112, Figure 12, Item 15)

Pipe, fuel (WP 0112, Figure 12, Item 12)

Tube, fuel (2), (WP 0112, Figure 12, Item 11)

Washer, sealing (6) (WP 0111, Figure 11, Item 39)

Brush, acid swabbing (WP 0164, Expendable and Durable Items List, Item 6)

Brush, wire, scratch (WP 0164, Item 8)

Cap set, protective (WP 0164, Item 9)

Cleaning compound, solvent (WP 0164, Item 11)

Compound, sealing (WP 0164, Item 15)

Materials/Parts

Grease, electrically conductive (WP 0164, Item 21)

Pan, drain (WP 0164, Item 29)

Primer sealing compound (WP 0164, Item 31)

Rag, wiping (WP 0164, Item 32)

Sealant (WP 0164, Item 33)

Tag, marker (WP 0164, Item 36)

Personnel Required

91D (1)

References

WP 0043, Service Fuel System

WP 0044, Remove/Install Fuel Pump, Main/Auxiliary

WP 0049, Remove/Install Fuel Level Sensor

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Fuel tank drained to half-capacity (TM 9-6115-751-10)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL FUEL MANIFOLD**WARNING**

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.
- Follow tag index procedure performed during removal task for assembly of fuel manifold. Failure to comply may cause injury or death to personnel or damage to equipment.

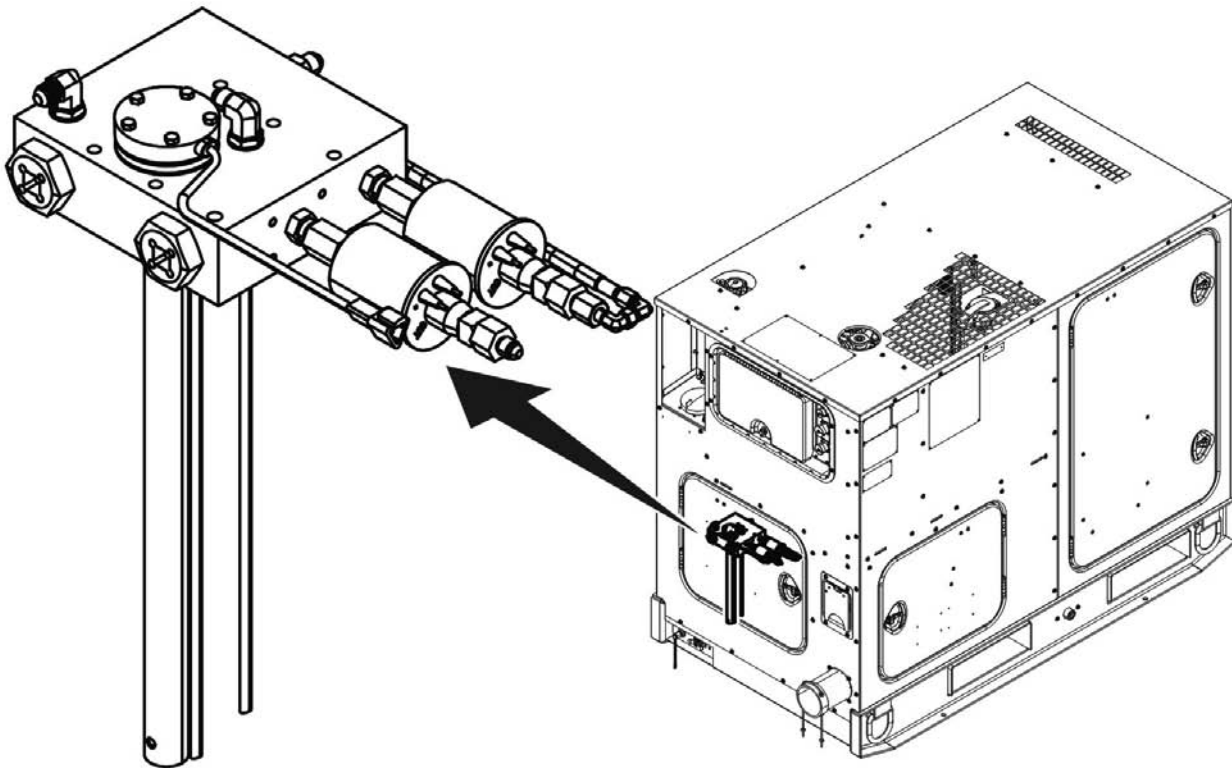
Remove Fuel Manifold Assembly

Figure 1. Fuel Manifold Assembly — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate fuel manifold assembly (Figure 1).
3. Disconnect electrical connector (Figure 2, Item 9) from engine wiring harness (Figure 2, Item 8).

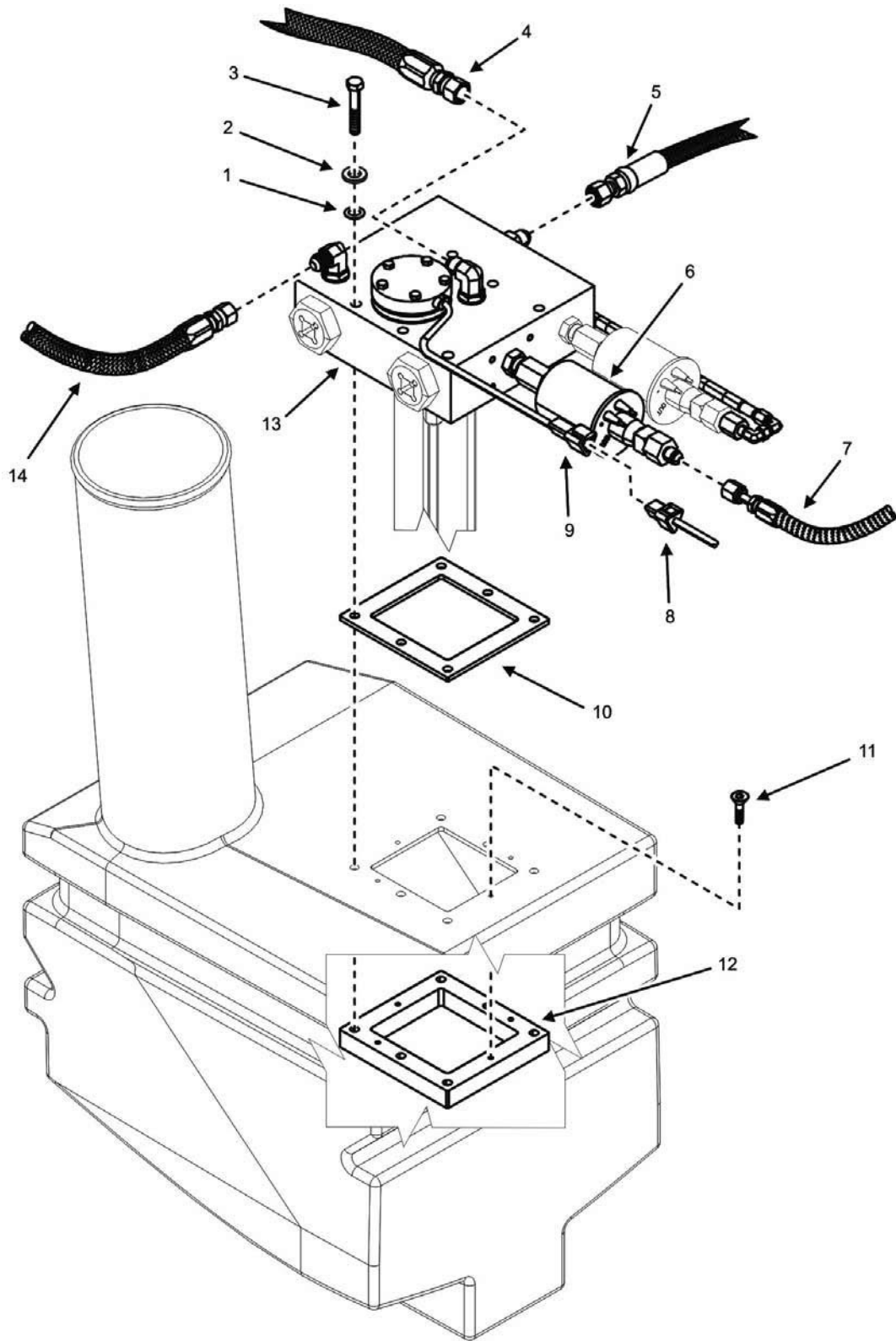


Figure 2. Fuel Manifold Assembly — Removal.

NOTE

Capture spilled fuel and dispose of IAW local SOP. Dispose of soiled rags IAW local SOP.

To prevent contamination from entering the fuel system, cap/plug all open fuel lines and fittings.

4. Remove fuel supply line (Figure 2, Item 7) from main fuel pump (Figure 2, Item 6).
5. Place wiping rags around auxiliary fuel intake and vent lines (Figure 2, Items 14 and 4) on fuel manifold assembly (Figure 2, Item 13) to capture spilled fuel when lines are removed.
6. Remove auxiliary fuel intake line (Figure 2, Item 14) from fuel manifold assembly (Figure 2, Item 13).
7. Inspect auxiliary fuel intake line (Figure 2, Item 14) for obvious damage and replace as required.
8. Remove auxiliary fuel vent line (Figure 2, Item 4) from fuel manifold assembly (Figure 2, Item 13).
9. Inspect auxiliary fuel vent line (Figure 2, Item 4) for obvious damage and replace as required.
10. Remove fuel return line (Figure 2, Item 5) from fuel manifold assembly (Figure 2, Item 12).
11. Inspect fuel return line (Figure 2, Item 5) for obvious damage and replace as required.
12. Remove six screws (Figure 2, Item 3), flat washers (Figure 2, Item 2), and sealing washers (Figure 2, Item 1) that secure fuel manifold assembly (Figure 2, Item 13) to fuel tank.
13. Discard six sealing washers (Figure 2, Item 1).
14. Remove fuel manifold assembly (Figure 2, Item 13) from fuel tank and place on a suitable work surface.
15. Remove fuel manifold assembly gasket (Figure 2, Item 10) from fuel tank. Discard fuel manifold assembly gasket (Figure 2, Item 10).
16. Inspect gasket retainer (Figure 2, Item 12) inside fuel tank for signs of obvious damage. Replace gasket retainer (Figure 2, Item 12) as required.
 - a. Remove two flat screws (Figure 2, Item 11) while supporting gasket retainer (Figure 2, Item 12).
 - b. Tilt and remove gasket retainer (Figure 2, Item 12) through fuel tank opening.

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

17. Remove any residual gasket material from fuel tank and fuel manifold assembly (Figure 2, Item 13) using solvent, brush, and rags.
18. Cover hole in fuel tank to prevent dirt and debris from contaminating the fuel system.

END OF TASK

Disassemble Fuel Manifold Assembly

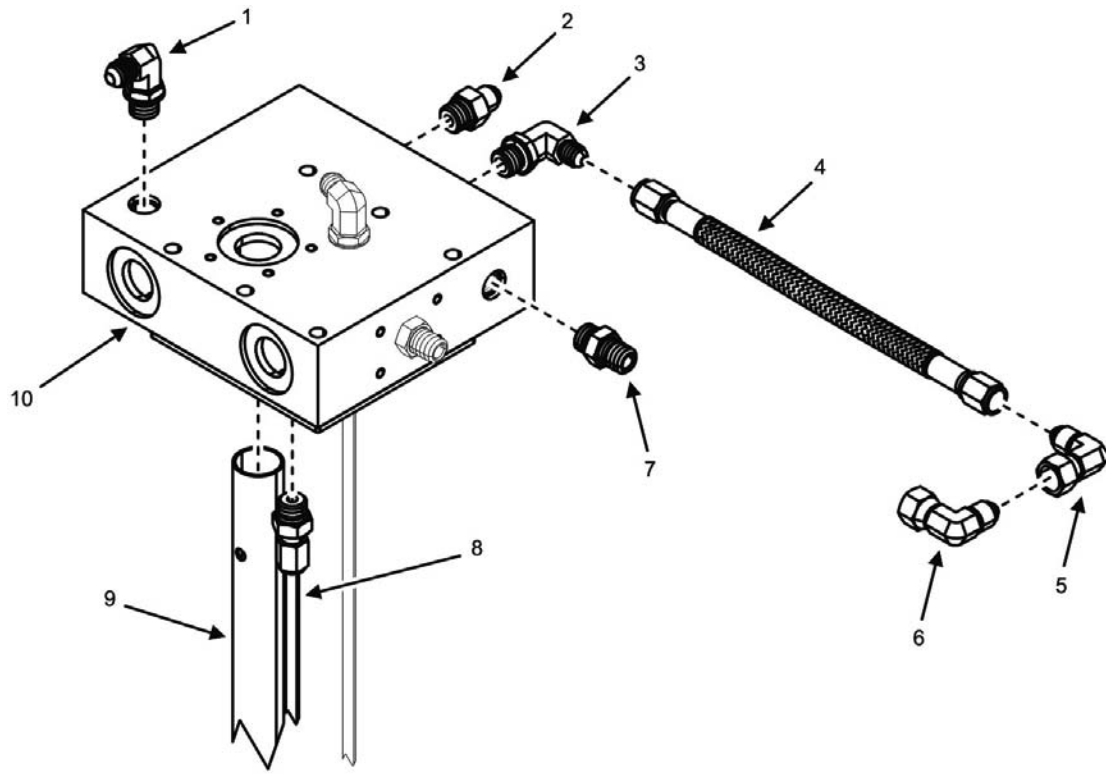


Figure 3. Fuel Manifold Assembly — Components.

1. Remove main and auxiliary fuel pumps (WP 0044, Remove/Install Fuel Pump, Main/Auxiliary).
2. Remove fuel level sensor (WP 0049, Remove/Install Fuel Level Sensor).
3. Remove fuel strainers (WP 0043, Service Fuel System).
4. Disconnect fuel auxiliary line (Figure 3, Item 4) from fuel manifold (Figure 3, Item 10).
5. Inspect fuel auxiliary line (Figure 3, Item 4) for obvious signs of damage and replace as required.
6. Inspect two elbow fittings (Figure 3, Items 5 and 5) on fuel auxiliary line (Figure 3, Item 4) for obvious signs of damage and replace damaged elbow fitting (Figure 3, Items 5 and 6) as required.
7. Remove two fuel supply tubes (Figure 3, Item 8) from fuel manifold (Figure 3, Item 10).
8. Inspect two fuel supply tubes (Figure 3, Item 8) for obvious signs of damage and replace as required or save for reuse.
9. Remove two pump fittings (Figure 3, Item 7) from fuel manifold (Figure 3, Item 10).
10. Inspect two pump fittings (Figure 3, Item 7) for obvious signs of damage and replace as required or save for reuse.

NOTE

Note orientation of auxiliary fuel elbows (Figure 3, Item 1) before removal to aid in installation.

11. Remove two auxiliary fuel elbows (Figure 3, Item 1) from fuel manifold (Figure 3, Item 10).
12. Inspect two auxiliary fuel elbows (Figure 3, Item 1) for obvious signs of damage. Replace as required or save for reuse.

13. Remove elbow (Figure 3, Item 3) from fuel manifold assembly (Figure 2, Item 13).
14. Inspect elbow (Figure 3, Item 3) for obvious signs of damage. Replace as required or save for reuse.
15. Remove straight fitting (Figure 3, Item 2) from fuel manifold assembly (Figure 2, Item 13).
16. Inspect straight fitting (Figure 3, Item 2) for obvious signs of damage. Replace as required or save for reuse.

END OF TASK**Inspect Fuel Manifold****NOTE**

Fuel tube (Figure 3, Item 9) is permanently attached to fuel manifold (Figure 3, Item 10) at assembly. If either part is damaged, both parts must be replaced.

1. Inspect fuel manifold (Figure 3, Item 10) and fuel tube (Figure 3, Item 9) for cracks, leaks, and other signs of obvious damage. If either part is damaged, replace fuel manifold (Figure 3, Item 10) and fuel tube (Figure 3, Item 9).
2. Remove any residual sealant from fuel manifold ports and all fittings that will be reused at assembly.

END OF TASK**Assemble Fuel Manifold Assembly****NOTE**

Wipe down fuel lines, parts, and fittings with wiping rag prior to installation.

If replacing fuel manifold (Figure 3, Item 10), new fuel tube (Figure 3, Item 9) must be assembled to new fuel manifold (Figure 3, Item 10) using primer and adhesive. Cure time for this process is 24 hr before the assembly can be exposed to fuel.

1. Apply primer and adhesive to mounting surfaces of fuel tube (Figure 3, Item 9) and fuel manifold (Figure 3, Item 10).
2. Insert fuel tube (Figure 3, Item 9) into fuel manifold (Figure 3, Item 10).
3. Remove any beads of adhesive from inside fuel tube (Figure 3, Item 9) and fuel manifold (Figure 3, Item 10). Adhesive must cure 24 hr before contact with fuel.

NOTE

To provide proper seal against fuel leaks, apply thread sealant to pipe threads of all fittings prior to assembly. Thread sealant must cure for 30 min before fuel manifold can be exposed to fuel.

4. Apply thread sealant to pipe threads of straight fitting (Figure 3, Item 2).
5. Install straight fitting (Figure 3, Item 2) to fuel manifold (Figure 3, Item 10) to a torque value of 20 ft/lb (27 Nm).
6. Apply thread sealant to pipe threads of elbow (Figure 3, Item 3).
7. Install elbow (Figure 3, Item 3) to proper orientation on fuel manifold (Figure 3, Item 10) to a torque value of 20 ft/lb (27 Nm).
8. Apply thread sealant to pipe threads of two auxiliary fuel elbows (Figure 3, Item 1).
9. Install two auxiliary fuel elbows (Figure 3, Item 1) to proper orientation on fuel manifold (Figure 3, Item 10) to a torque value of 20 ft/lb (27 Nm).

10. Apply thread sealant to pipe threads of two pump fittings (Figure 3, Item 7).
11. Install two pump fittings (Figure 3, Item 7) to fuel manifold (Figure 3, Item 10) to a torque value of 20 ft/lb (27 Nm).
12. Apply thread sealant to pipe threads of two fuel supply tubes (Figure 3, Item 8).
13. Install fuel supply tubes (Figure 3, Item 8) to fuel manifold (Figure 3, Item 10) to a torque value of 20 ft/lb (27 Nm).

NOTE

To provide proper seal against fuel leaks, apply thread sealant to pipe threads of all fittings prior to assembly. Sealant must cure for 30 min before fuel manifold can be exposed to fuel. Torque value for fittings is 10 – 12 ft/lb (14– 17 Nm).

14. Apply thread sealant to pipe threads of two elbow fittings (Figure 3, Items 5 and 6) if removed.
15. Install two elbow fittings (Figure 3, Items 5 and 6) to fuel auxiliary line (Figure 3, Item 4) as required.
16. Install fuel auxiliary line (Figure 3, Item 4) to fuel manifold (Figure 3, Item 10) assembly.
17. Install fuel plugs and strainers (WP 0043, Service Fuel System).
18. Install fuel level sensor (WP 0049, Remove/Install Fuel Level Sensor).
19. Install fuel pumps (WP 0044, Remove/Install Fuel Pump, Main/Auxiliary).

END OF TASK

Install Fuel Manifold Assembly

NOTE

Wipe down fuel lines, parts, and fittings with wiping rag prior to installation.

1. Install gasket retainer (Figure 2, Item 12) if removed.
 - a. Insert gasket retainer (Figure 2, Item 12) through opening in fuel tank and align mounting holes.
 - b. Install two flat screws (Figure 2, Item 11) through mounting holes in tank to secure gasket retainer (Figure 2, Item 12) to inside fuel tank.
 - c. Tighten flat screws (Figure 2, Item 11) to 8 – 10 in/lb (0.90 – 1.13 Nm).
2. Position new fuel manifold gasket (Figure 2, Item 10) on top of fuel tank and align mounting holes.
3. Position fuel manifold assembly (Figure 2, Item 13) to top of fuel tank and gasket (Figure 2, Item 10) and align mounting holes.
4. Secure fuel manifold assembly (Figure 2, Item 13) to fuel tank by installing six screws (Figure 2, Item 3) with flat washers (Figure 2, Item 2) and six new sealing washers (Figure 2, Item 1) through fuel manifold assembly (Figure 2, Item 13) and gasket retainer (Figure 2, Item 12).
5. Tighten six screws (Figure 2, Item 3) in a cross pattern to a torque value of 43 – 47 in/lb (5 Nm).
6. Install auxiliary fuel vent line (Figure 2, Item 4) to elbow on fuel manifold assembly (Figure 2, Item 13). Tighten to 177 – 194 in/lb (20 – 22 Nm).
7. Install auxiliary fuel intake line (Figure 2, Item 14) to elbow on fuel manifold assembly (Figure 2, Item 13). Tighten to 177 – 194 in/lb (20 – 22 Nm).
8. Install fuel return line (Figure 2, Item 5) to fuel manifold assembly (Figure 2, Item 13).
9. Install fuel supply line (Figure 2, Item 7) to main fuel pump (Figure 2, Item 6).

10. Connect electrical connector (Figure 2, Item 9) to engine wiring harness (Figure 2, Item 8).
11. Fill fuel tank (WP 0043, Service Fuel System).
12. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
13. Purge fuel system (WP 0043, Service Fuel System).
14. Dispose of captured fuel and soiled rags IAW local SOP.
15. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
16. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
17. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL FUEL FILTER/WATER SEPARATOR ASSEMBLY

INITIAL SETUP:**Test Equipment**

Not Applicable

Personnel Required

91D (1)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Wrench, Oil Filter, Strap (WP 0163, Item 44)

References

WP 0047, Replace Fuel Filter/Water Separator Element

Materials/Parts

Filter, element (WP 0113, Repair Parts List, Figure 13, Item 7)

Separator, fuel-water (WP 0113, Figure 13, Item 6)

Cap set, protective (WP 0164, Expendable and Durable Items List, Item 9)

Grease, electrically conductive (WP 0164, Item 21)

Rag, wiping (2) (WP 0164, Item 32)

Sealant (WP 0164, Item 33)

Tag, marker (WP 0164, Item 36)

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL FUEL FILTER/WATER SEPARATOR ASSEMBLY**WARNING**

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

Remove Fuel Filter/Water Separator Assembly

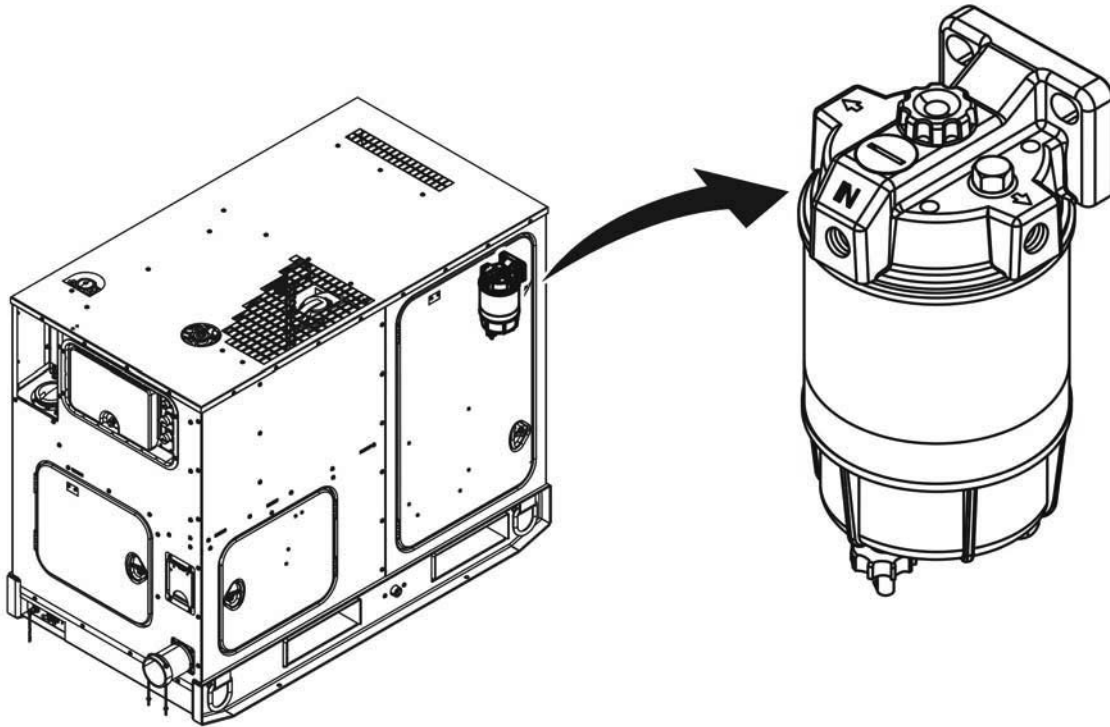


Figure 1. Fuel Filter/Water Separator Assembly — Location.

NOTE

Capture spilled fuel and dispose of with IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

Tag and identify fuel lines and hoses after removal of each line to aid with installation.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate fuel filter/water separator assembly through right-side door (Figure 1).
3. Place suitable container and wiping rag under fuel filter/water separator assembly (Figure 2, Item 1) to catch spilled fuel.
4. Rotate drain valve (Figure 2, Item 10) on bottom of water bowl (Figure 3, Item 6) clockwise to open.
5. Allow fuel to drain into container until flow stops.
6. Rotate fuel drain valve (Figure 2, Item 10) counterclockwise to close.
7. Remove dirt and debris from fuel filter/water separator head (Figure 3, Item 7) to prevent contamination of fuel system.

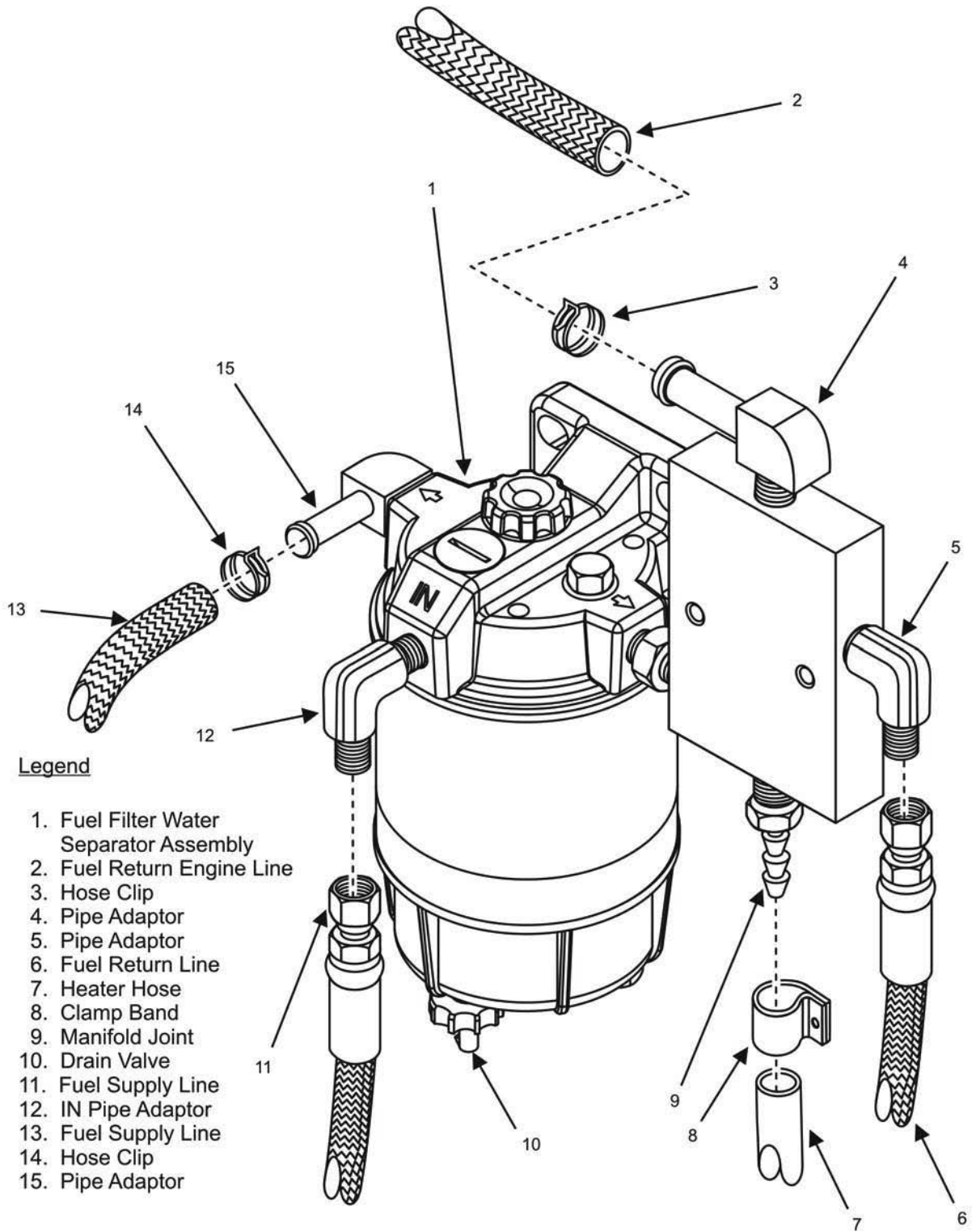


Figure 2. Fuel Filter/Water Separator — Detail.

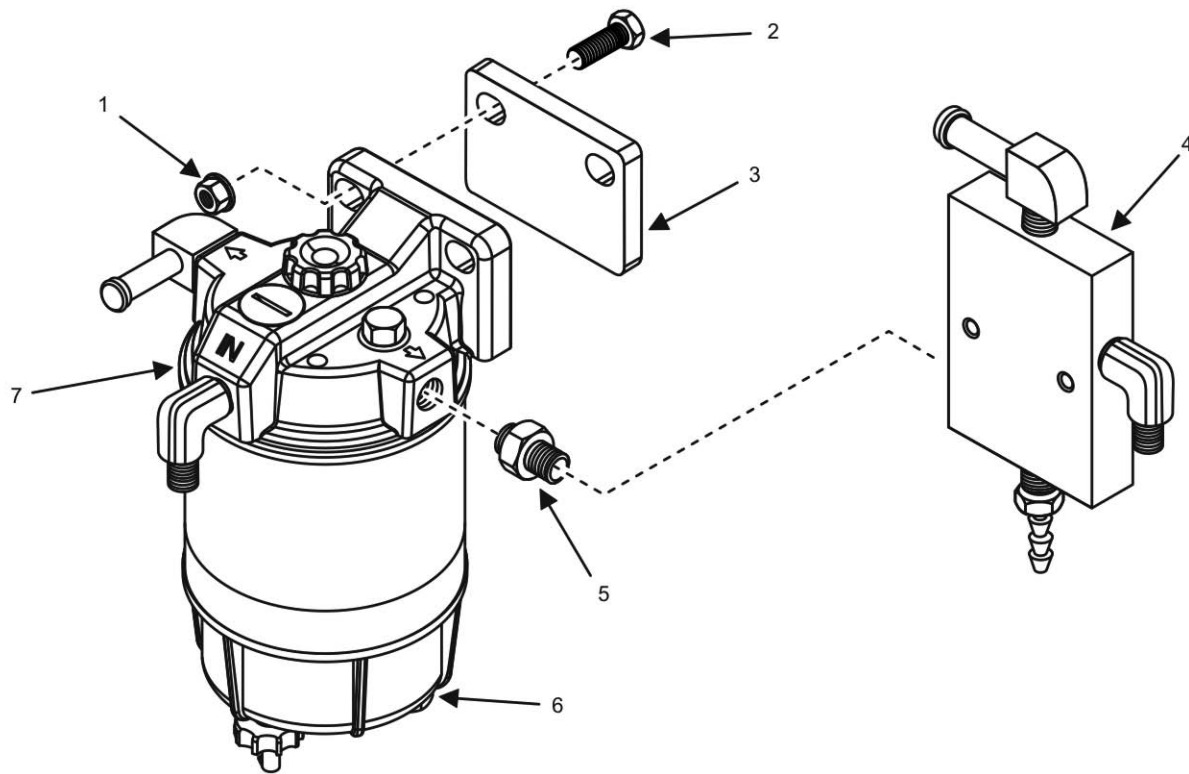


Figure 3. Fuel Filter/Water Separator — Removal.

8. Remove two screws (Figure 3, Item 2) and two nuts (Figure 3, Item 1) securing fuel filter/water separator head (Figure 3, Item 7) and spacer (Figure 3, Item 3) to front body panel. Place spacer (Figure 3, Item 3) on a suitable work surface.
9. Reposition fuel filter/water separator head (Figure 3, Item 7) to gain access to fuel lines to be removed.
10. Disconnect fuel supply line (Figure 2, Item 11) at IN pipe adaptor (Figure 2, Item 12). Cap/plug fuel supply line (Figure 2, Item 11) and IN pipe adaptor (Figure 2, Item 12) to prevent dirt and debris from entering fuel system.
11. Inspect fuel supply line (Figure 2, Item 11) for obvious signs of damage and replace as required.
12. Loosen and slide back hose clip (Figure 2, Item 14) on fuel supply engine line (Figure 2, Item 13) away from pipe adaptor (Figure 2, Item 15).
13. Remove fuel supply engine line (Figure 2, Item 13) from pipe adaptor (Figure 2, Item 15). Cap/plug fuel supply engine line (Figure 2, Item 13) and pipe adaptor (Figure 2, Item 15) to prevent dirt and debris from entering fuel system.
14. Inspect fuel supply engine line (Figure 2, Item 13) for cracks and other signs of obvious damage and replace as required.
15. Loosen and slide back hose clip (Figure 2, Item 3) on fuel return engine line (Figure 2, Item 2) away from pipe adaptor (Figure 2, Item 4).
16. Remove fuel return engine line (Figure 2, Item 2) from pipe adaptor (Figure 2, Item 4). Cap/plug fuel return engine line (Figure 2, Item 2) and pipe adaptor (Figure 2, Item 4) to prevent dirt and debris from entering fuel system.
17. Inspect fuel return engine line (Figure 2, Item 4) for cracks and other signs of obvious damage and replace as required.

NOTE

Winterization kit is optional for AMMPS. Removal of heater hose (Figure 2, Item 7) is only necessary if winterization kit is installed in unit.

18. Loosen and slide clamp band (Figure 2, Item 8) on heater hose (Figure 2, Item 7) away from manifold joint (Figure 2, Item 9).
19. Remove heater hose (Figure 2, Item 7) from manifold joint (Figure 2, Item 9). Cap/plug heater hose (Figure 2, Item 7) and manifold joint (Figure 2, Item 9) to prevent dirt and debris from entering fuel system.
20. Inspect heater hose (Figure 2, Item 7) and clamp bands (Figure 2, Item 8) for obvious signs of damage and replace as required.
21. Disconnect fuel return line (Figure 2, Item 6) at pipe adaptor (Figure 2, Item 5). Cap/plug fuel return line (Figure 2, Item 6) and pipe adaptor (Figure 2, Item 5) to prevent dirt and debris from entering fuel system.
22. Inspect fuel return line (Figure 2, Item 6) for obvious signs of damage and replace as required.
23. Remove fuel filter/water separator manifold (Figure 3, Item 4) from fuel filter/water separator head (Figure 3, Item 7).

NOTE

If the fuel filter/water separator requires replacement, continue with steps 24 and 25. Otherwise, continue to Inspect Fuel Filter/Water Separator Assembly task.

24. Remove pipe adaptors (Figure 2, Items 4, 5, and 15), manifold joint (Figure 2, Item 9), and IN pipe adaptor (Figure 2, Item 12) from fuel filter/water separator head (Figure 3, Item 7) and fuel filter/water separator manifold (Figure 3, Item 4).
25. Remove pipe nipple (Figure 3, Item 5) that connects fuel filter/water separator head (Figure 3, Item 7) to fuel filter/water separator manifold (Figure 3, Item 4).

END OF TASK**Inspect Fuel Filter/Water Separator Assembly**

1. Inspect fuel filter/water separator assembly (Figure 2, Item 1) for obvious signs of damage and replace as required.
2. Inspect pipe adaptors (Figure 2, Items 4, 5, and 15), manifold joint (Figure 2, Item 9), and IN pipe adaptor (Figure 2, Item 12) for obvious signs of damage and replace as required.
3. Inspect fuel filter/water separator manifold (Figure 3, Item 4) for obvious signs of damage and replace as required.
4. Inspect screws (Figure 3, Item 2) and nuts (Figure 3, Item 1) for obvious signs of damage and replace as required.

END OF TASK**Install Fuel Filter/Water Separator Assembly**

1. Replace fuel filter/water separator element prior to installation (WP 0047, Replace Fuel Filter/water Separator Element).

NOTE

Use pipe thread sealant on all pipe threads of pipe adaptors (Figure 2, Items 4, 5, and 15), manifold joint (Figure 2, Item 9), IN pipe adaptor (Figure 2, Item 12), and pipe nipple Figure 3, Item 5). Cure time is 30 min to use full system and 72 hr for full strength.

2. Apply pipe thread sealant to pipe adaptors ((Figure 2, Items 4, 5, and 15), manifold joint (Figure 2, Item 9), and IN pipe adaptor (Figure 2, Item 12), and pipe nipple (Figure 3, Item 5).

NOTE

Continue with steps 3 through 5 if installation of pipe adaptors (Figure 2, Items 4, 5, and 15), manifold joint (Figure 2, Item 9), and IN pipe adaptor (Figure 2, Item 12) is required. Otherwise, continue to step 6.

3. Install (Figure 2, Items 4, 5, and 15), manifold joint (Figure 2, Item 9), and IN pipe adaptor (Figure 2, Item 12), to fuel filter/water separator head (Figure 3, Item 7) and fuel filter/water separator manifold (Figure 3, Item 4) if required.
4. Apply pipe thread sealant to pipe nipple (Figure 3, Item 5) connecting fuel filter/water separator manifold (Figure 3, Item 4) to fuel filter/water separator head (Figure 3, Item 7).
5. Install pipe nipple (Figure 3, Item 5) to fuel filter/water separator head (Figure 3, Item 7).
6. Install fuel filter/water separator manifold (Figure 3, Item 4) to fuel filter/water separator head (Figure 3, Item 7) at pipe nipple (Figure 3, Item 5).

NOTE

Place a suitable container under fuel filter/water separator assembly to catch spilled fuel. Dispose of captured fuel IAW local SOP.

Remove all caps/plugs from fuel lines/fittings prior to installation of each fuel line.

Wipe down fuel lines, fuel filter/water separator assembly, and fittings with wiping rag prior to installation.

Identification tags should remain in place until the fuel system is completely reassembled and has been tested for proper operation.

7. Connect fuel return line (Figure 2, Item 6) to pipe adaptor (Figure 2, Item 5).
8. Connect fuel supply line (Figure 2, Item 11) at IN pipe adaptor (Figure 2, Item 12) on fuel filter/water separator head (Figure 3, Item 7).
9. Install fuel supply engine line (Figure 2, Item 13) to pipe adaptor (Figure 2, Item 15). Secure with hose clip (Figure 2, Item 14).
10. Connect fuel return engine line (Figure 2, Item 13) to pipe adaptor (Figure 2, Item 15). Secure with hose clip (Figure 2, Item 14).

NOTE

Winterization kit is optional for AMMPS. Installation of heater hose (Figure 2, Item 7) is only necessary if winterization kit is installed in unit.

11. Install heater hose (Figure 2, Item 7) to manifold joint (Figure 2, Item 9).

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12. Slide and position one clamp band (Figure 2, Item 8) on heater hose (Figure 2, Item 7) at manifold joint (Figure 2, Item 9).
 13. Secure clamp band (Figure 2, Item 8) over heater hose (Figure 2, Item 7) and manifold joint (Figure 2, Item 9).
 14. Position fuel filter/water separator assembly (Figure 2, Item 1) and fuel filter/water separator manifold (Figure 3, Item 4) to mounting location on front body panel.
 15. Secure fuel filter/water separator head (Figure 3, Item 7) to front body panel with two screws (Figure 3, Item 2) and two nuts (Figure 3, Item 1).
 16. Close right-side door.
 17. Install battery ground cable (WP 0036, Remove/Install Batteries).
 18. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
 19. Start engine and check for proper operation and leaks. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
 20. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REPLACE FUEL FILTER/WATER SEPARATOR ELEMENT

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Wrench, Oil Filter, Strap (WP 0163, Item 44)

Materials/Parts

Filter, element (WP 0113, Repair Parts List, Figure 13, Item 7)

Fuel, diesel (WP 0164, Expendable and Durable Items List, Item 20)

Grease, electrically conductive (WP 0164, Item 21)

Rag, wiping (12) (WP 0164, Item 32)

Personnel Required

91D (1)

References

WP 0043, Service Fuel System

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REPLACE FUEL FILTER/WATER SEPARATOR ELEMENT
WARNING

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

Remove Fuel Filter/Water Separator Element

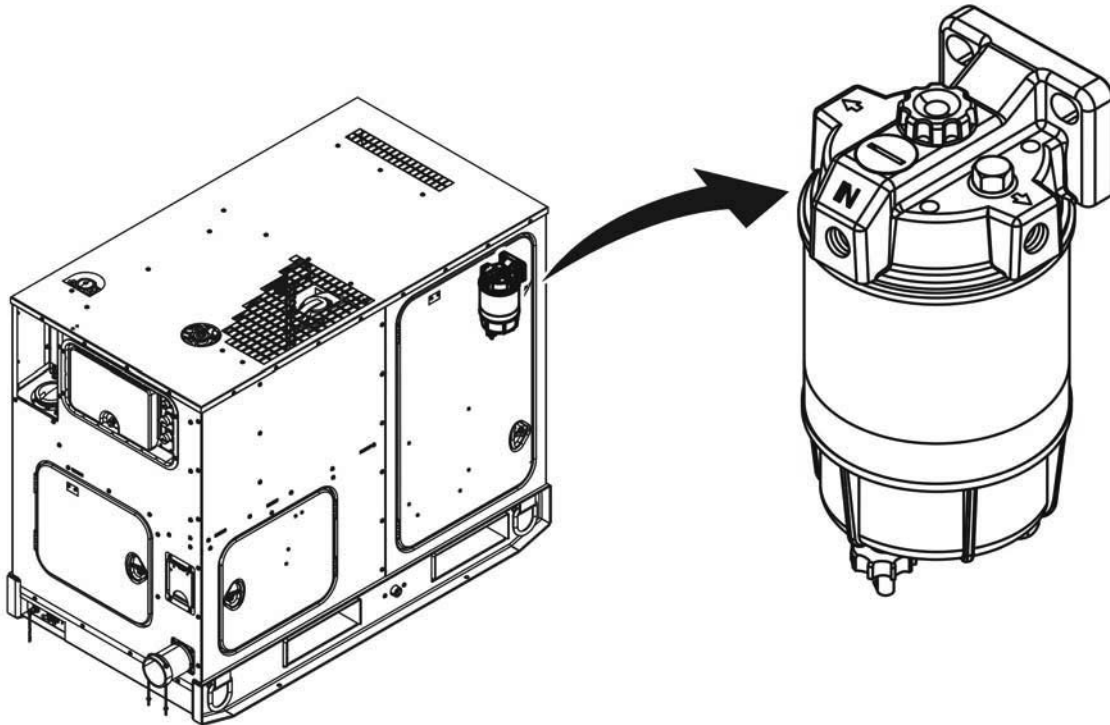


Figure 1. Fuel Filter/Water Separator — Location.

NOTE

Capture spilled fuel and dispose of with IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate fuel filter/water separator element (Figure 1) attached to fuel filter/water separator head on front panel next to right-side door.
3. Rotate drain valve (Figure 2, Item 4) on bottom of water bowl (Figure 2, Item 3) clockwise to open.
4. Allow fuel to drain into container until flow stops.
5. Rotate drain valve (Figure 2, Item 4) counterclockwise to close.
6. Place drain pan and wiping rag under fuel filter/water separator element (Figure 2, Item 2).
7. Remove dirt and debris from area around fuel filter/water separator element (Figure 2, Item 2) to prevent contamination.
8. Rotate fuel filter/water separator element (Figure 2, Item 2) counterclockwise to remove fuel filter/water separator element (Figure 2, Item 2) from fuel filter/water separator head (Figure 2, Item 1) using filter wrench.

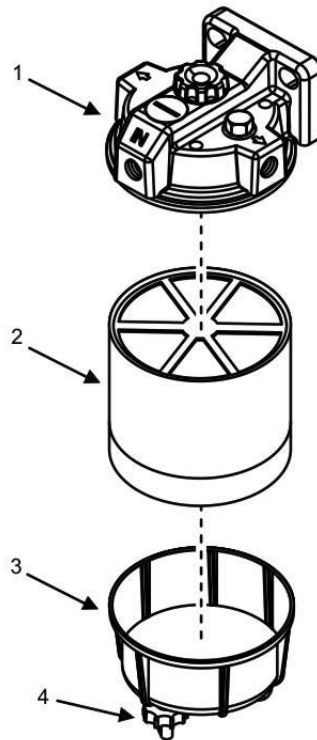


Figure 2. Fuel Filter/Water Separator — Detail.

9. Disconnect water bowl (Figure 2, Item 3) from fuel filter/water separator element (Figure 2, Item 2).

NOTE

It may be necessary to remove fuel filter/water separator assembly to gain leverage to remove fuel filter/water separator element from fuel filter/water separator head.

10. Remove fuel filter/water separator element (Figure 2, Item 2) and gaskets (not shown) from fuel filter/water separator head (Figure 2, Item 1).
11. Remove any remaining gasket residue from fuel filter/water separator head (Figure 2, Item 1) and water bowl (Figure 2, Item 3).
12. Inspect water bowl (Figure 2, Item 3) for cracks, leaks, and other signs of obvious damage. Replace as required or set aside for reuse.
13. Discard fuel filter/water separator element (Figure 2, Item 2) and gaskets (not shown) IAW local SOP.
14. Remove dirt and fuel from gasket mating surface at mounting locations on fuel filter/water separator head (Figure 2, Item 1) and water bowl (Figure 2, Item 3).
15. Discard captured fuel and soiled rags IAW local SOP.

END OF TASK

Install Fuel Filter/Water Separator Element**NOTE**

Wipe down fuel lines, manifold, and fittings with wiping rag prior to installation.

1. Place drain pan under mounting location for fuel filter/water separator element (Figure 2, Item 2).

NOTE

Element gaskets (not shown) are included with fuel filter/water separator element (Figure 2, Item 2).

2. Apply light film of clean diesel fuel to new fuel filter/water separator element gaskets (not shown).
3. Fill new fuel filter/water separator element (Figure 2, Item 2) to level of the mounting threads with approved diesel fuel.
4. Position new fuel filter/water separator element (Figure 2, Item 2) on fuel filter/water separator head (Figure 2, Item 1).
5. Secure water bowl (Figure 2, Item 3) to bottom of fuel filter/water separator element (Figure 2, Item 2).
6. Rotate fuel filter/water separator element (Figure 2, Item 2) clockwise until gasket makes contact with fuel filter/water separator head (Figure 2, Item 1).
7. Rotate fuel filter/water separator element (Figure 2, Item 2) an additional three-fourths of a turn clockwise to secure.
8. Remove fuel catch container from unit. Dispose of captured fuel IAW local SOP.
9. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
10. Purge fuel system (WP 0043, Service Fuel System).
11. Close generator set doors.
12. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
13. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
14. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL FUEL HOSES AND CLAMP BANDS

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Hose, fuel 5 mm ID (2) (WP 0156, Repair Parts List, Figure 56, Item 21)

Hose, fuel 5/32" ID (WP 0156, Figure 56, Item 27)

Line, fuel (WP 0111, Repair Parts List, Figure 11, Item 22)

Line, fuel (WP 0111, Figure 11, Item 23)

Line, fuel (WP 0111, Figure 11, Item 52)

Line, fuel (WP 0113, Repair Parts List, Figure 13, Item 16)

Line, fuel (WP 0113, Figure 13, Item 18)

Tube, flexible (WP 0156, Figure 56, Item 23)

Cap set, protective (WP 0164, Expendable and Durable Items List, Item 9)

Grease, electrically conductive (WP 0164, Item 21)

Materials/Parts

Pan, drain (WP 0164, Item 29)

Rag, wiping (2) (WP 0164, Item 32)

Personnel Required

91D (1)

Assistant (1)

References

WP 0033, Remove/Install Interior Body Panels

WP 0043, Service Fuel System

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL FUEL HOSES AND CLAMP BANDS
WARNING

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.
- Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.

WARNING

- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator set is running. Failure to comply may cause injury or death to personnel.

Remove Fuel Hose Assembly

NOTE

Figure 1 displays the routing of the generator set fuel hoses except for the fuel tank drain valve assembly. Table 1 identifies the name of the fuel hose and the specific equipment conditions required to remove and install the fuel hose.

Table 1. Fuel Hoses — Location.

FIGURE 1 FIND #	HOSE	EQUIPMENT CONDITIONS
1	Auxiliary Fuel Intake Line	Radiator support panel removed (WP 0033, Remove/Install Interior Body Panels)
2	Auxiliary Fuel Vent Line	Radiator support panel removed (WP 0033, Remove/Install Interior Body Panels)
3	Fuel Supply Engine Line	Right-side door opened
4	Fuel Return Engine Line	Right-side door opened
5	Fuel Return Line	Rear and right-side doors opened
6	Drain Hose	Right-side door opened
7	Heater Hose	Right-side door opened
8	Fuel Supply Line	Rear and right-side doors opened

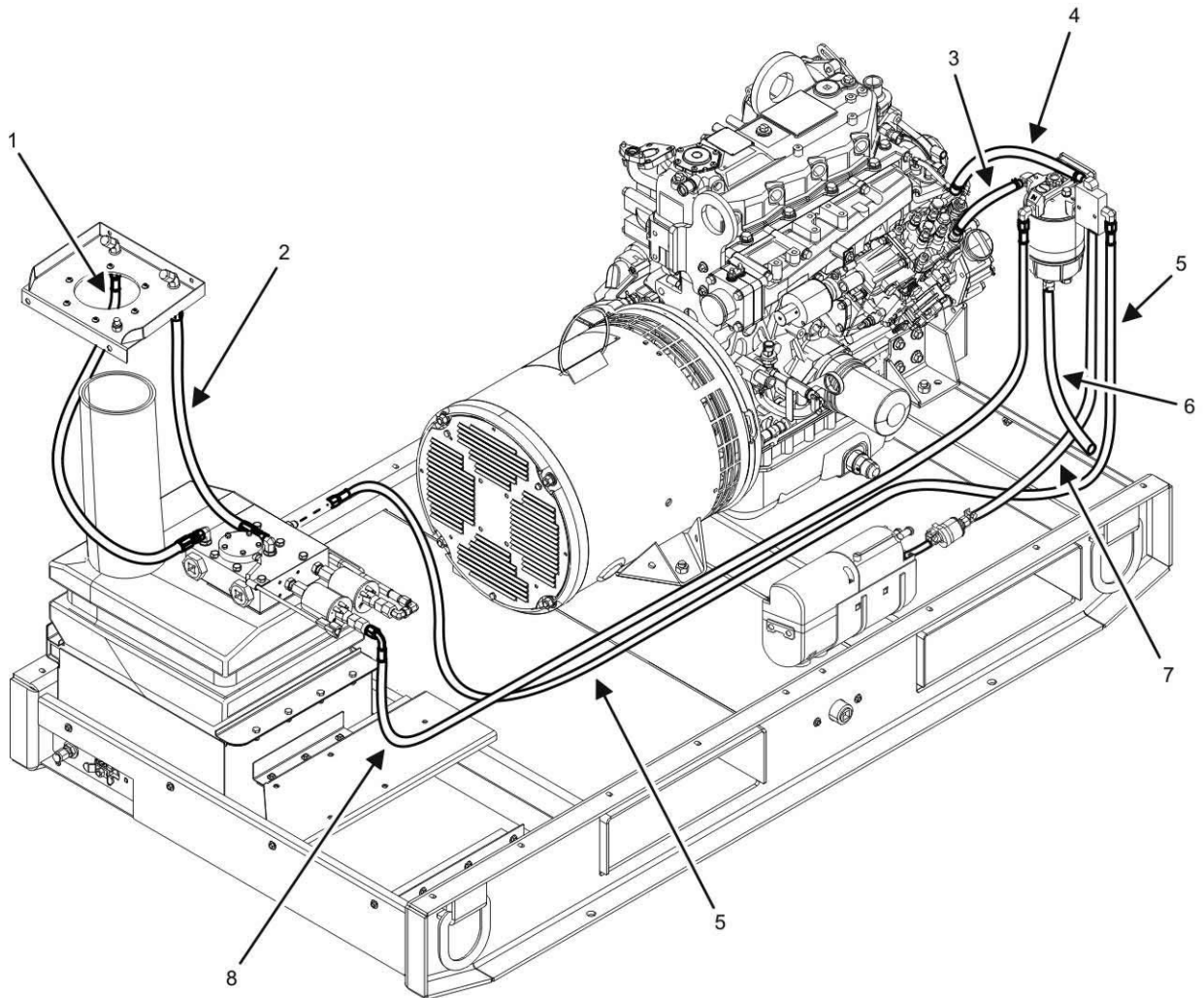


Figure 1. Fuel Hoses — Location.

NOTE

Unit has numerous fuel lines utilizing three attachment methods. Fuel line assemblies are removed and installed using the same procedure according to their attachment method.

Capture and dispose of spilled fluids IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

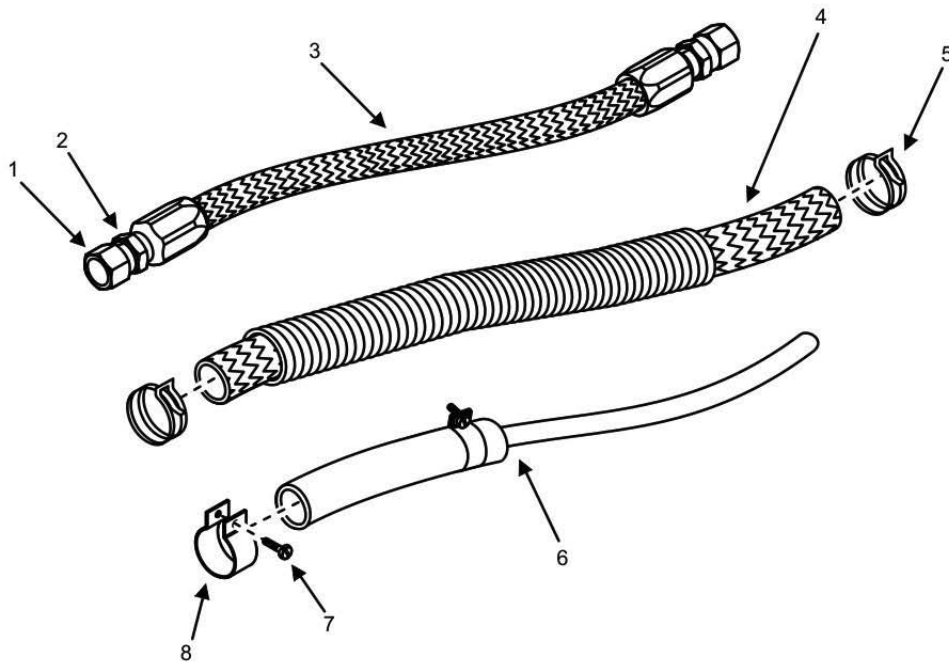


Figure 2. Fuel Hoses.

1. Ensure equipment conditions are met in order presented in initial setup and Table 1.
2. Locate fuel hose assembly to be removed (Figure 1).
3. Place drain pan and wiping rags under fuel hose to catch spilled fuel.

NOTE

Secure lock fitting (Figure 2, Item 2) while loosening fitting (Figure 2, Item 1).

4. Remove fuel hose assembly (Figure 2, Item 3) from component fitting (not shown).
5. Remove opposite end of fuel hose assembly (Figure 2, Item 3) from component fitting (not shown).
6. Remove fuel hose assembly (Figure 2, Item 3) from unit.
7. Inspect fuel hose assembly (Figure 2, Item 3) for cracks, wear, and other obvious signs of damage and replace as required.

END OF TASK

Install Fuel Hose Assembly**NOTE**

The unit has numerous fuel lines utilizing three attachment methods. Fuel line assemblies are removed and installed using the same procedure according to their attachment method.

Capture and dispose of spilled fluid IAW local SOP. Remove cap/plug from fuel lines/fittings before installation.

Wipe down fuel lines, parts, and fittings with wiping rag prior to installation.

1. Place drain pan and wiping rags under fuel hose to catch spilled fuel.
2. Remove caps/plugs from fuel fittings.

NOTE

Secure lock fitting (Figure 2, Item 2) while tightening fitting (Figure 2, Item 1).

3. Install fuel hose assembly (Figure 2, Item 3) to fitting on applicable device (not shown) and finger-tighten.
4. Route fuel hose assembly (Figure 2, Item 3) to fuel filter component (not shown).
5. Install fuel hose assembly (Figure 2, Item 3) to adapter on fuel filter component (not shown) and finger-tighten.
6. Tighten both ends of fuel hose assembly (Figure 2, Item 3).
7. Remove drain pan and wiping rags from unit.
8. Install radiator support panel if removed (WP 0033, Remove/Install Interior Body Panels).
9. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
10. Purge fuel system (WP 0043, Service Fuel System).
11. Close all generator set doors.
12. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
13. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
14. Repair as required.

END OF TASK**Remove Fuel Hose with Hose Clips****NOTE**

The unit has numerous fuel lines utilizing three attachment methods. Fuel line assemblies are removed and installed using the same procedure according to their attachment method.

Capture and dispose of spilled fluids IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

1. Ensure equipment conditions are met in order presented in initial setup and Table 1.
2. Locate fuel hose (Figure 2, Item 4) to be removed.
3. Place drain pan and wiping rags under fuel hose (Figure 2, Item 4) to catch spilled fuel.

4. Expand and slide hose clip (Figure 2, Item 5) away from component fitting (not shown).
5. Remove fuel hose (Figure 2, Item 4) from component fitting (not shown).
6. Repeat steps 4 and 5 for opposite end of fuel hose (Figure 2, Item 4).
7. Remove fuel hose (Figure 2, Item 4) from unit.
8. Inspect hose clip (Figure 2, Item 5) for excessive corrosion and other obvious signs of damage and replace as required.
9. Inspect hose for cracks, wear, and other obvious signs of damage and replace as required.

END OF TASK

Install Fuel Hose with Hose Clips

NOTE

Unit has numerous fuel lines utilizing three attachment methods. Fuel line assemblies are removed and installed using the same procedure according to their attachment method.

Capture and dispose of spilled fluid IAW local SOP. Remove cap/plug from fuel lines/fittings before installation.

Wipe down fuel lines, parts, and fittings with wiping rag prior to installation.

1. Place drain pan and wiping rags under fuel hose (Figure 2, Item 4) to catch spilled fuel.
2. Install fuel hose (Figure 2, Item 4) to component fitting (not shown).
3. Expand and position hose clip (Figure 2, Item 5) over component fitting (not shown) and release.
4. Route opposite end of fuel hose (Figure 2, Item 4) to destination component fitting (not shown).
5. Repeat steps 2 and 3 for opposite end of fuel hose (Figure 2, Item 4).
6. Remove drain pan and wiping rags from unit.
7. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
8. Purge fuel system (WP 0043, Service Fuel System).
9. Close all generator set doors.
10. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
11. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
12. Repair as required.

END OF TASK

Remove Fuel Hose with Clamp Bands**NOTE**

The unit has numerous fuel lines utilizing three attachment methods. Fuel line assemblies are removed and installed using the same procedure according to their attachment method.

Capture and dispose of spilled fluid IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

Winterization kit is optional for AMMPS generator sets. Removal of coolant heater fuel hose is only necessary if winterization kit is installed.

1. Ensure equipment conditions are met in order presented in initial setup and Table 1.
2. Locate fuel hose (Figure 2, Item 6) to be removed.
3. Place drain pan and wiping rags under fuel hose (Figure 2, Item 6) to catch spilled fuel.
4. Loosen clamp band screw (Figure 2, Item 7) on clamp band (Figure 2, Item 8) nearest the component (not shown).
5. Slide clamp band (Figure 2, Item 8) away from component fitting (not shown).
6. Remove fuel hose (Figure 2, Item 6) from component fitting (not shown).
7. Repeat steps 4 through 6 for opposite end of fuel hose (Figure 2, Item 6).
8. Remove fuel hose (Figure 2, Item 6) from unit.
9. Inspect clamp bands (Figure 2, Item 8) for excessive corrosion and other signs of obvious damage and replace as required.
10. Inspect fuel hose (Figure 2, Item 6) for cracks, wear, and other obvious signs of damage and replace as required.

END OF TASK**Install Fuel Hose with Clamp Bands****NOTE**

The unit has numerous fuel lines utilizing three attachment methods. Fuel line assemblies are removed and installed using the same procedure according to their attachment method.

Capture and dispose of spilled fluid IAW local SOP. Capture and dispose of spilled fluid IAW local SOP.

Winterization kit is optional for AMMPS. Installation of heater fuel hose is only necessary if winterization kit is installed in unit.

Wipe down fuel lines, parts, and fittings with wiping rag prior to installation.

1. Place drain pan and wiping rags under fuel hose to catch spilled fuel.
2. Install fuel hose (Figure 2, Item 6) onto component fitting (not shown).
3. Slide and position clamp band (Figure 2, Item 8) over component fitting (not shown).
4. Tighten clamp band screw (Figure 2, Item 7) and secure fuel hose (Figure 2, Item 6) to component fitting (not shown).
5. Repeat steps 2 through 4 for opposite end of fuel hose (Figure 2, Item 6)

6. Remove drain pan and wiping rags from unit.
7. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
8. Purge fuel system (WP 0043, Service Fuel System).
9. Close all generator set doors.
10. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
11. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
12. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL FUEL LEVEL SENSOR

INITIAL SETUP:

Test Equipment

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Gasket (WP 0112, Repair Parts List, Figure 12, Item 2)

Sensor, fuel level (WP 0112, Figure 12, Item 3)

Washer, sealing (0111, Repair Parts List, Figure 11, Item 39)

Cap set, protective (WP 0164, Expendable and Durable Items List, Item 9)

Cleaning compound, solvent (WP 0164, Item 11)

Fuel, diesel (WP 0164, Item 20)

Grease, electrically conductive (WP 0164, Item 21)

Pan, drain (1) (WP 0164, Item 29)

Primer, sealing compound (WP 0164, Item 31)

Rag, wiping (4) (WP 0164, Item 32)

Materials/Parts

Sealant (WP 0164, Item 33)

Personnel Required

91D (1)

Assistant (1)

References

WP 0043, Service Fuel System

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL FUEL LEVEL SENSOR

WARNING

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (fuel fill static ground). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate Electrostatic Discharge (ESD). Fire and possible explosion can result. Failure to comply may cause injury or death to personnel.
- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

Remove Fuel Level Sensor

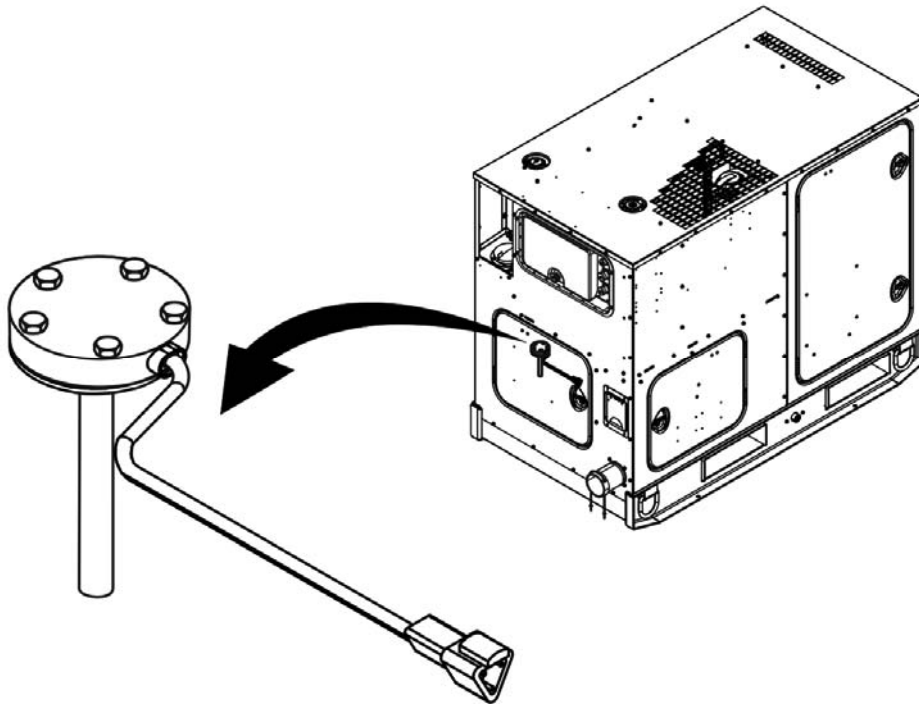


Figure 1. Fuel Level Sensor — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate fuel level sensor (Figure 1) on top of fuel tank manifold (Figure 2, Item 4).
3. Disconnect fuel level sensor (Figure 2, Item 1) electrical connector (Figure 2, Item 3) from unit wiring harness connector (not shown).

NOTE

Capture and dispose of spilled fuel IAW local SOP. Cap/plug all openings to prevent dirt and debris from entering the fuel system.

4. Remove dirt and debris from around fuel level sensor (Figure 2, Item 1).
5. Remove screw (Figure 2, Item 8), flat washer (Figure 2, Item 7), and sealing washer (Figure 2, Item 6) that secure electrical connector clamp (Figure 2, Item 5) to fuel tank manifold (Figure 2, Item 4).
6. Discard sealing washer (Figure 2, Item 6).

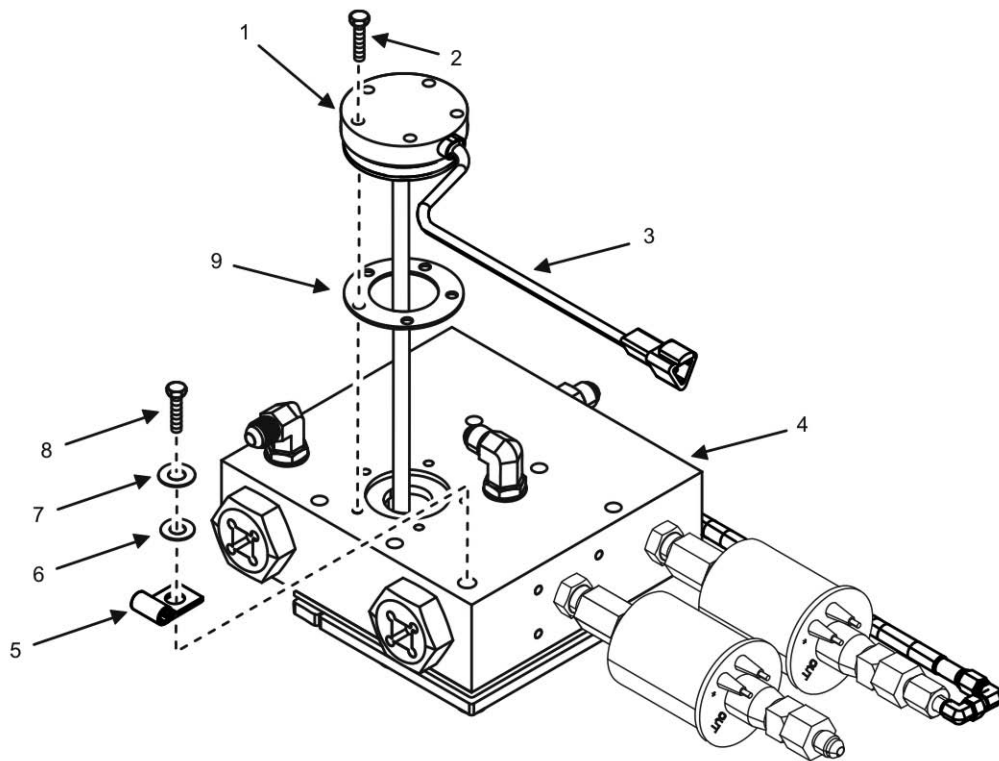


Figure 2. Fuel Level Sensor — Detail.

7. Remove clamp (Figure 2, Item 5) from fuel tank manifold (Figure 2, Item 4).
8. Remove five machine screws (Figure 2, Item 2) securing fuel level sensor (Figure 2, Item 1) to top of fuel tank manifold (Figure 2, Item 4).

NOTE

Note orientation of fuel level sensor (Figure 2, Item 1) prior to removal to aid in installation.

9. Remove fuel level sensor (Figure 2, Item 1) and rubber gasket (Figure 2, Item 9) from fuel tank manifold (Figure 2, Item 4).
10. Discard rubber gasket (Figure 2, Item 9).

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

11. Clean fuel tank manifold (Figure 2, Item 4) of any remaining gasket residue using dry cleaning solvent and wiping rag.
12. Cover fuel tank manifold (Figure 2, Item 4) opening to prevent dirt and debris from entering fuel system.

END OF TASK

Inspect Fuel Level Sensor

1. Inspect fuel level sensor (Figure 2, Item 1) for cracks and other signs of obvious damage and replace as required.
2. Inspect fuel level sensor (Figure 2, Item 1) electrical connector (Figure 2, Item 3) for cut/broken wire or worn insulation. Replace fuel level sensor (Figure 2, Item 1) if wires are cut or broken or if insulation is excessively worn.

END OF TASK**Install Fuel Level Sensor****NOTE**

Capture and dispose of spilled fuel IAW local SOP.

Wipe down fuel lines, manifold, and fittings with wiping rag prior to installation.

1. Remove all dirt, debris, and old gasket residue from fuel level sensor (Figure 2, Item 1) mounting area on fuel tank.
2. Align new rubber gasket (Figure 2, Item 9) with mounting holes on fuel tank manifold (Figure 2, Item 4).
3. Position fuel level sensor (Figure 2, Item 1) on fuel tank manifold (Figure 2, Item 4) and align mounting holes. Ensure proper orientation.

NOTE

Follow all manufacturers' instructions for primer and sealant application.

4. Apply primer and sealant to five machine screws (Figure 2, Item 2).
5. Install five machine screws (Figure 2, Item 2) and secure fuel level sensor (Figure 2, Item 1) to fuel tank manifold (Figure 2, Item 4).
6. Position clamp (Figure 2, Item 5) to mounting hole on fuel tank manifold (Figure 2, Item 4).
7. Secure clamp (Figure 2, Item 5) to fuel tank manifold (Figure 2, Item 4) with screw (Figure 2, Item 8), flat washer (Figure 2, Item 7) and new sealing washer (Figure 2, Item 6).
8. Connect fuel level sensor (Figure 2, Item 1) electrical connector (Figure 2, Item 3) to unit wiring harness connector (not shown).
9. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
10. Purge fuel system (WP 0043, Service Fuel System).
11. Dispose of spilled fuel and soiled rags IAW local SOP.
12. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
13. Start engine and check for proper operation.
14. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL FUEL TANK

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Crowfoot Attachment Set, Socket Wrench, Flare Nut, Standard (WP 0163, Maintenance Allocation Chart, Item 13)

Tool Kit, General Mechanic's (GMTK) (WP 0163, Item 38)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0163, Item 47)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0163, Item 48)

Materials/Parts

Connector, hose, bulk (WP 0111, Repair Parts List, Figure 11, Item 37)

Gasket (WP 0111, Figure 11, Item 42)

Tank, fuel (WP 0111, Repair Parts List, Figure 11, Item 36)

Washer, sealing (6) (WP 0111, Figure 11, Item 39)

Alcohol, denatured (WP 0164, Expendable and Durable Items List, Item 1)

Cap set, protective (WP 0164, Item 9)

Detergent, general purpose (WP 0164, Item 17)

Distilled water, (WP 0164, Item 18)

Fuel, diesel (WP 0164, Item 20)

Pan, drain (WP 0164, Item 29)

Rag, wiping (WP 0164, Item 32)

Sealant (WP 0164, Item 33)

Personnel Required

91D (1)

Assistant (1)

References

Not Applicable

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Rear body panel removed (WP 0030, Remove/Install Rear Body Panel)

Left-side body panel removed (WP 0031, Remove/Install Left-Side Body Panel)

Radiator support panel removed (WP 0033, Remove/Install Interior Body Panels)

Fuel tank drained (WP 0043, Service Fuel System)

Fuel tank filler neck removed (WP 0052, Remove/Install Fuel Tank Filler Neck)

Fuel manifold removed (WP 0045, Remove/Install Fuel Manifold)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL FUEL TANK**WARNING**

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

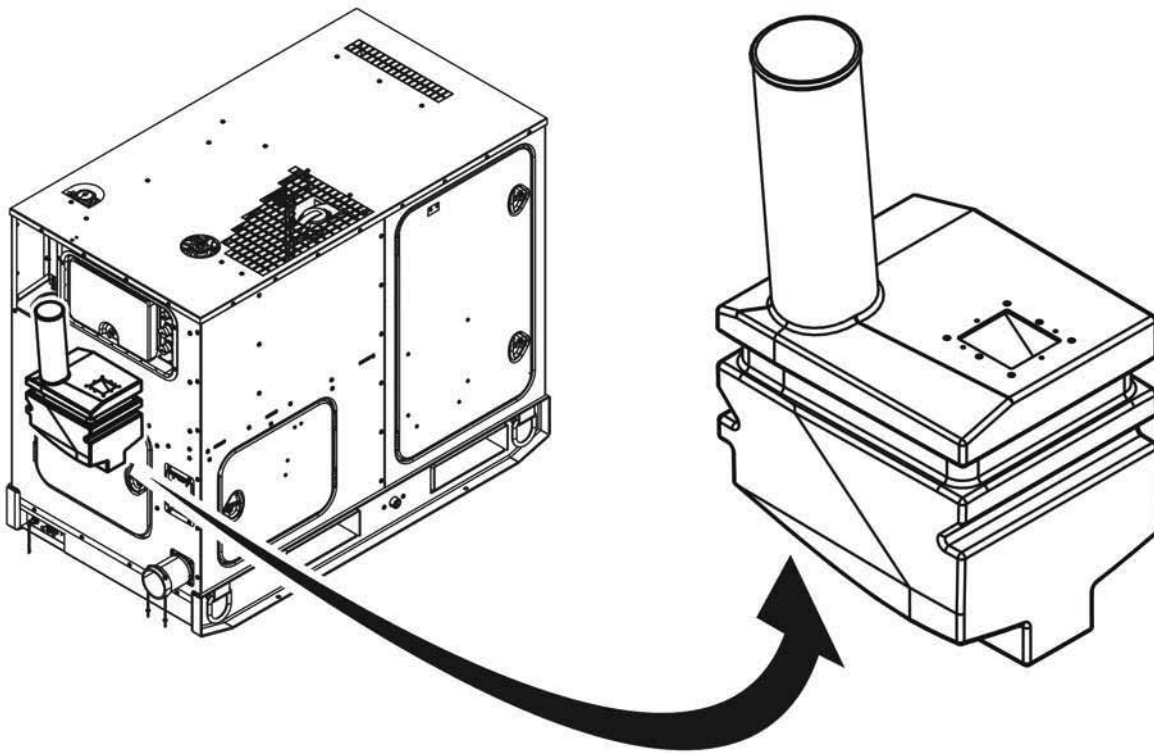
Remove Fuel Tank

Figure 1. Fuel Tank — Location.

1. Ensure equipment conditions are met in order presented in initial setup
2. Locate fuel tank (Figure 1).

NOTE

Capture spilled fuel and dispose of IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

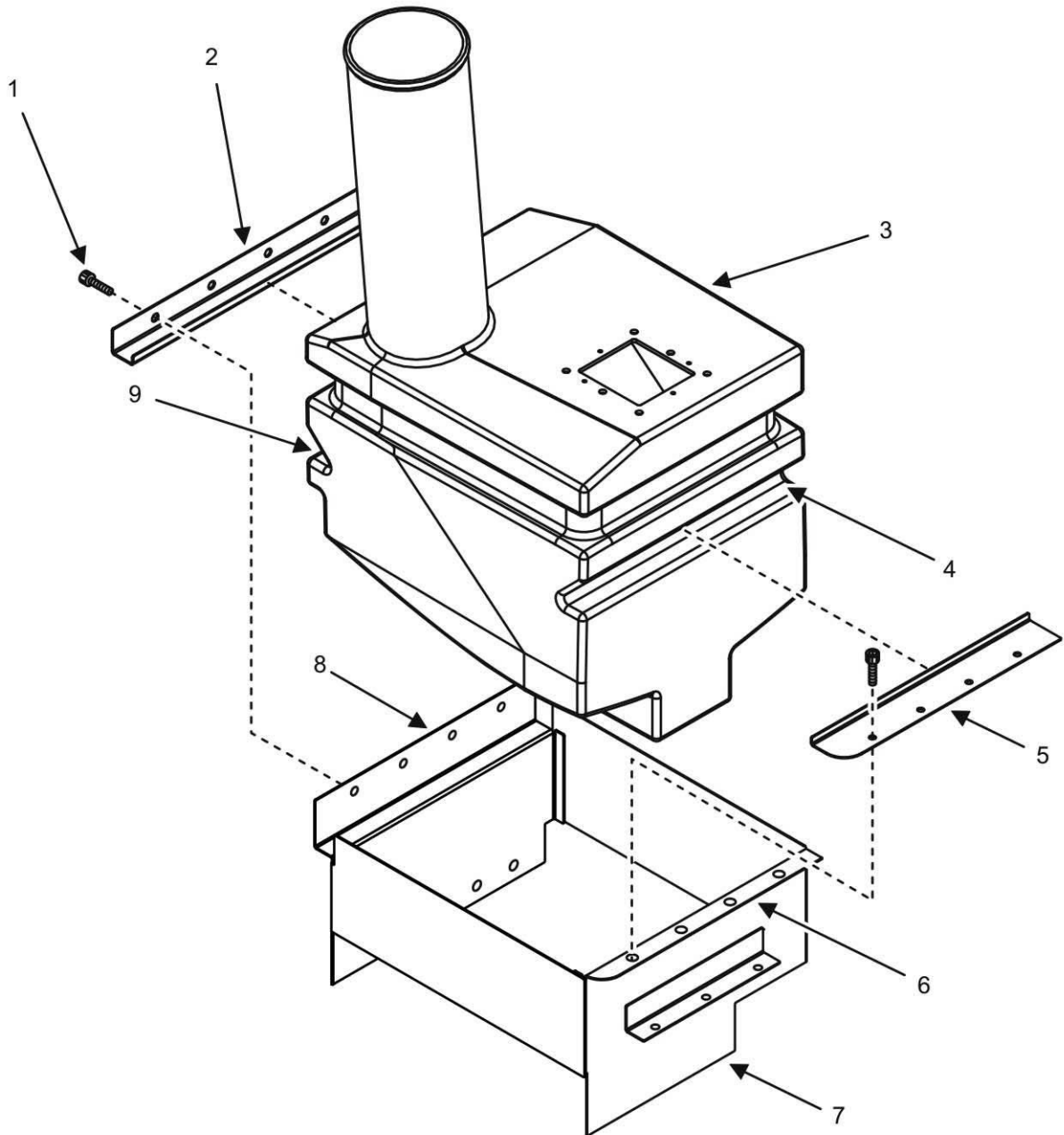


Figure 2. Fuel Tank Mounting Brackets.

3. Locate mounting brackets (Figure 2, Items 2 and 5) on left- and right-sides of fuel tank (Figure 2, Item 3) that secure fuel tank (Figure 2, Item 3) to fuel tank support (Figure 2, Item 7).
4. Remove eight hex flange screws (Figure 2, Item 1) from left- and right-sides of fuel tank mounting brackets (Figure 2, Items 2 and 5).

5. Remove mounting brackets (Figure 2, Items 2 and 5) and save for reuse.
6. Inspect mounting brackets (Figure 2, Items 2 and 5) and hardware for obvious damage, and replace as required.

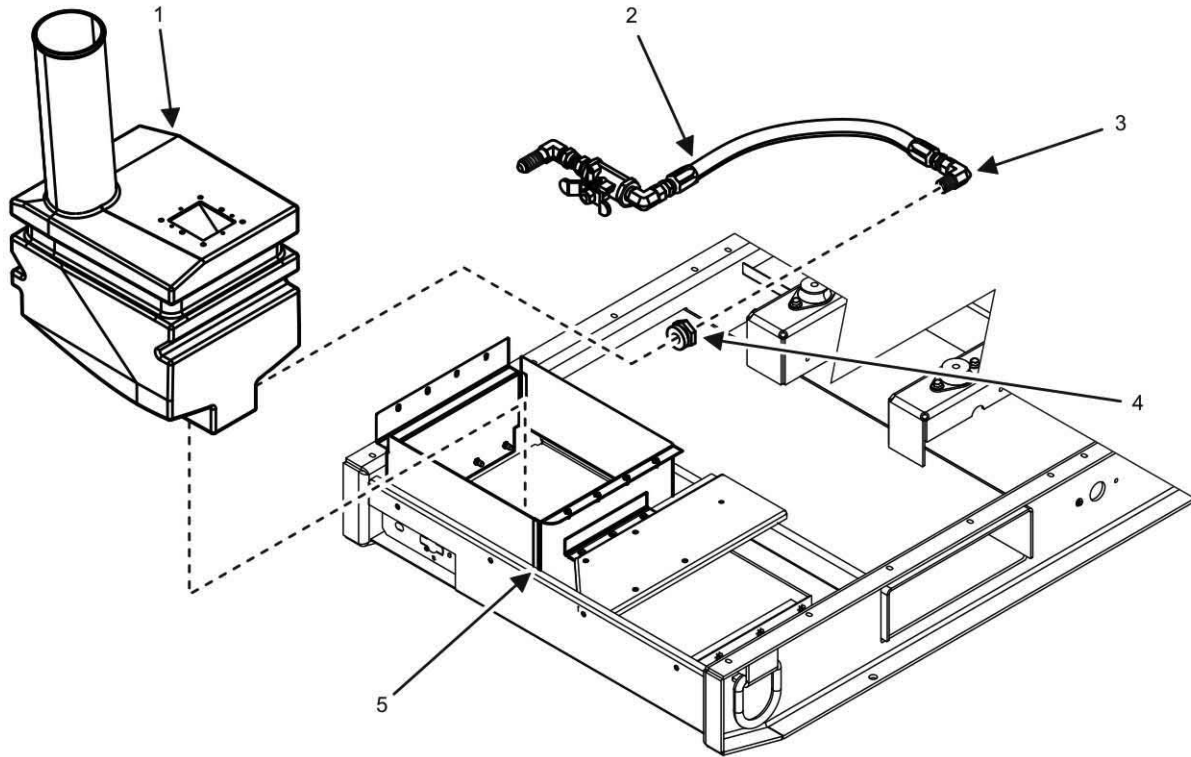


Figure 3. Fuel Tank — Removal.

7. Lift fuel tank (Figure 3, Item 1) with fuel tank drain valve assembly (Figure 3, Item 2) attached from unit.
8. Inspect fuel tank support (Figure 3, Item 5) for damage and replace as required.
9. Loosen and remove tube elbow fitting (Figure 3, Item 3) on fuel tank drain valve assembly (Figure 3, Item 2) at bulk hose connector (Figure 3, Item 4) in fuel tank (Figure 3, Item 1).
10. Inspect fuel tank drain valve assembly (Figure 3, Item 2) for cracks, wear, and other signs of obvious damage. Replace as required.
11. Remove bulk hose connector (Figure 3, Item 4) from fuel tank (Figure 3, Item 1). Discard bulk hose connector (Figure 3, Item 4).

END OF TASK

Inspect Fuel Tank

1. Inspect fuel tank (Figure 2, Item 3) for damage, leaks, or cracks.
2. Replace fuel tank (Figure 2, Item 3) if damaged, leaking, or cracked.

END OF TASK

Clean Fuel Tank

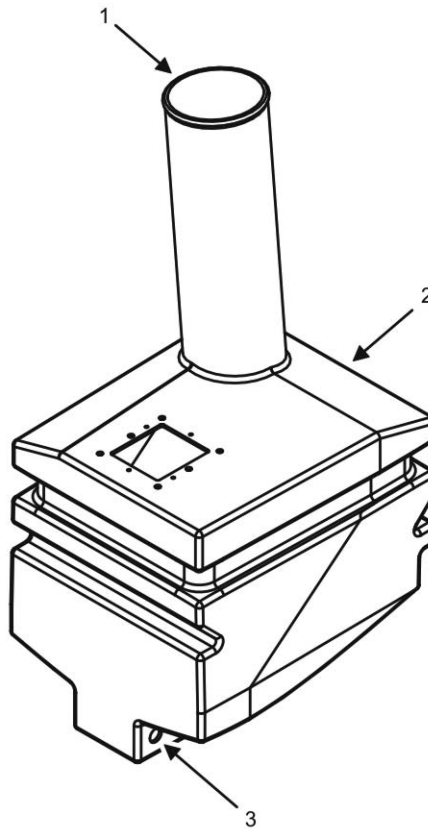


Figure 4. Clean Fuel Tank.

1. Place drain pan under the fuel tank (Figure 4, Item 2).
2. Cap/plug fuel tank outlet (Figure 4, Item 3).
3. Drain any residual fuel.
4. Fill the fuel tank (Figure 4, Item 2) to three-fourths capacity with solution of 16 oz general purpose detergent and 1 gal water through the fuel filler neck opening (Figure 4, Item 1).
5. Agitate fuel tank (Figure 4, Item 2) manually for 10 min.
6. Turn fuel tank (Figure 4, Item 2) upside down and drain solution through fuel filler neck opening (Figure 4, Item 1).
7. Fill fuel tank (Figure 4, Item 2) to three-fourths full capacity with clean water through fuel filler neck opening (Figure 4, Item 1).
8. Agitate fuel tank (Figure 4, Item 2) manually for 10 min.
9. Turn fuel tank (Figure 4, Item 2) upside down and drain water through fuel filler neck opening (Figure 4, Item 1).
10. Pour 16 oz denatured alcohol into fuel tank (Figure 4, Item 2) through fuel filler neck opening (Figure 4, Item 1).
11. Distribute alcohol over interior of fuel tank (Figure 4, Item 2) by manual rotation.
12. Remove cap/plug from fuel tank outlet (Figure 4, Item 3).

13. Drain any remaining alcohol through fuel tank outlet (Figure 4, Item 3).
14. Allow fuel tank (Figure 4, Item 2) to dry for 2 hr.

END OF TASK

Install Fuel Tank

NOTE

Capture spilled fuel and dispose of IAW local SOP. Remove all caps/plugs prior to installation.

Wipe down fuel lines, manifold, and fittings with wiping rag prior to installation.

1. Install new bulk hose connector (Figure 3, Item 3) to fuel tank (Figure 3, Item 1).
2. Tighten bulk hose connector (Figure 3, Item 3) to torque value 35 – 44 in/lb (4 – 5 Nm).
3. Position fuel tank (Figure 3, Item 1) into fuel tank support (Figure 3, Item 5).

NOTE

Pipe thread sealant cure time is 30 min to use fuel system and 72 hr for full strength.

4. Apply pipe thread sealant to tube elbow fitting (Figure 3, Item 3) of fuel tank drain valve assembly (Figure 3, Item 2).

NOTE

When disconnected from fuel tank (Figure 2, Item 3), fuel tank drain valve assembly (Figure 3, Item 2) rests on the unit skid.

5. Locate fuel tank drain valve assembly (Figure 3, Item 2) in unit skid and pull assembly through fuel tank support (Figure 2, Item 7).
6. Install tube elbow fitting (Figure 3, Item 3) of fuel tank drain valve assembly (Figure 3, Item 2) to bulk hose connector (Figure 3, Item 4).
7. Position fuel tank (Figure 2, Item 3) into fuel tank support (Figure 2, Item 7).
8. Ensure that left and right-side protrusions (Figure 2, Items 4 and 9) on fuel tank (Figure 2, Item 3) are resting inside bracket edges (Figure 2, Items 6 and 8) of fuel tank support (Figure 2, Item 7).

NOTE

Capture spilled fuel and dispose of IAW local SOP. Remove all caps/plugs prior to installation.

9. Position fuel tank mounting brackets (Figure 2, Items 2 and 5) over support lips (Figure 2, Items 6 and 8) of fuel tank (Figure 2, Item 3).
10. Install eight hex flange screws (Figure 2, Item 1) to fasten left- and right-side mounting brackets (Figure 2, Items 2 and 5) to fuel tank support (Figure 2, Item 7). Finger-tighten.
11. Secure hex flange screws (Figure 2, Item 1) to torque value 87 – 105 in/lb (10 – 12 Nm).
12. Install fuel manifold (WP 0045, Remove/Install Fuel Manifold).
13. Install fuel tank filler neck (WP 0052, Remove/Install Fuel Tank Filler Neck).
14. Install radiator support panel (WP 0033, Remove/Install Interior Panels).
15. Install left-side body panel (WP 0031, Remove/Install Left-Side Body Panels).

-
16. Install rear body panel (WP 0030, Remove/Install Rear Body Panel).
 17. Connect negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).

WARNING

Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (fuel fill static ground). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate ESD. Fire and possible explosion can result. Failure to comply may cause injury or death to personnel.

18. Add a small amount of fuel to fuel tank for test after pipe thread sealant has cured.
19. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
20. Purge fuel system (WP 0043, Service Fuel System).
21. Start engine and check for fuel leaks and proper operation (TM 9-6115-751-10).
22. Stop engine, repair any leaks, and then start engine again to check leak repairs. Repeat as needed until all leaks have been repaired.
23. Fill fuel tank to proper level (WP 0043, Service Fuel System).
24. Close generator set doors.
25. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
26. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
27. Repair as required.
28. Dispose of captured fuel and soiled wiping rags IAW local SOP.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL FUEL TANK DRAIN VALVE ASSEMBLY

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Crowfoot Attachment Set, Socket Wrench, Flare Nut, Standard (WP 0163, Item 13)

Tool kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0163, Item 46)

Materials/Parts

Connector, bulkhead (WP 0111, Repair Parts List, Figure 11, Item 51)

Fitting, tube elbow (2) (WP 0111, Figure 11, Item 45)

Line, fuel (WP 0111, Figure 11, Item 52)

Valve, ball (WP 0111, Figure 11, Item 46)

Cap set, protective (WP 0164, Expendable and Durable Items List, Item 9)

Fuel, diesel (WP 0164, Item 20)

Grease, electrically conductive (WP 0164, Item 21)

Pan, drain (WP 0164, Item 29)

Materials/Parts

Rag, wiping (4) (WP 0164, Item 32)

Sealant (WP 0164, Item 33)

Personnel Required

91D (1)

Assistant (1)

References

WP 0043, Service Fuel System

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Fuel tank removed (WP 0050, Remove/Install Fuel Tank)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL FUEL TANK DRAIN VALVE ASSEMBLY**WARNING**

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

Remove Fuel Tank Drain Valve Assembly

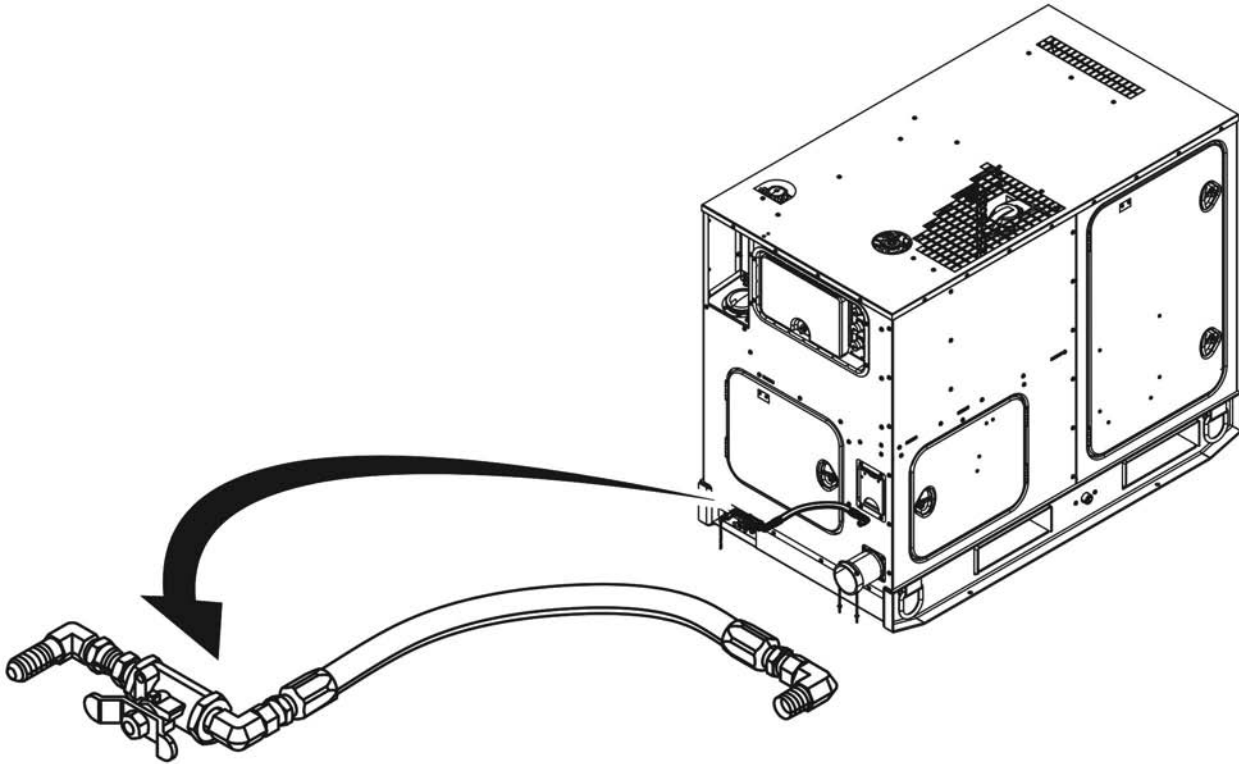


Figure 1. Fuel Tank Drain Valve — Location.

NOTE

Removal of the fuel tank requires the disconnection of the fuel tank drain valve assembly from the fuel tank at tube elbow fitting and bulkhead fitting. Fuel tank must be removed and disconnected from fuel tank drain valve assembly prior to beginning this task.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate fuel tank (Figure 1).
3. Remove any dirt and debris from around bulkhead connector (Figure 2, Item 12) and fuel drain cap (Figure 2, Item 9).

NOTE

Capture and dispose of spilled fuel IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

4. Remove fuel drain cap (Figure 2, Item 9) from bulkhead connector (Figure 2, Item 12).

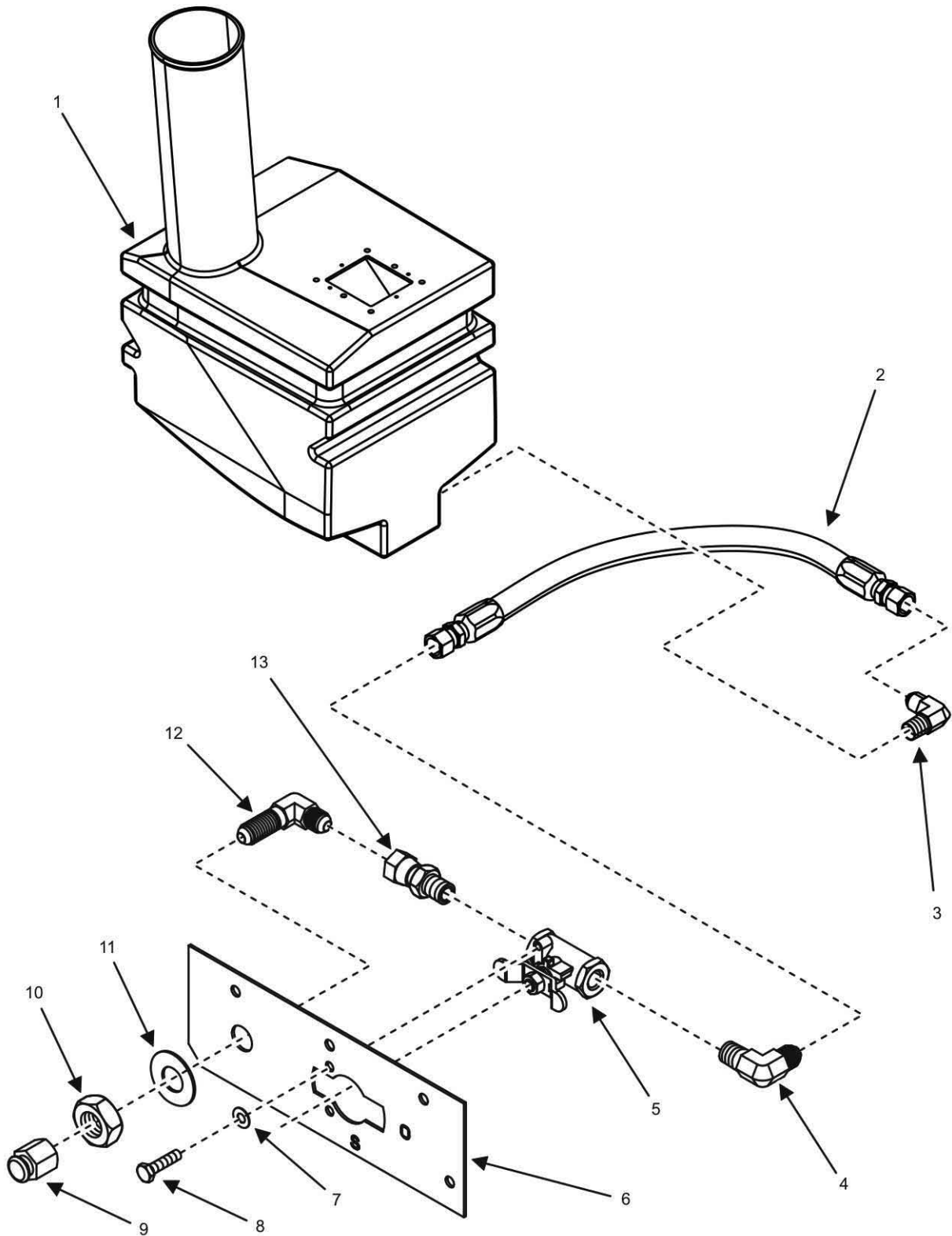


Figure 2. Fuel Tank Drain Valve — Detail.

NOTE

Note orientation of tube elbow fittings (Figure 2, Items 3 and 4) and ball valve (Figure 2, Item 5) before removal to aid in installation.

5. Remove nut (Figure 2, Item 10) and flat washer (Figure 2, Item 11) securing bulkhead connector (Figure 2, Item 12) to rear of skid.
6. Remove two screws (Figure 2, Item 8) and washers (Figure 2, Item 7) securing ball valve (Figure 2, Item 5) to ball valve plate (Figure 2, Item 6).
7. Open ball valve lever to slide ball valve (Figure 2, Item 5) through opening of ball valve plate (Figure 2, Item 6).
8. Remove fuel drain assembly (Figure 1) from unit and place on suitable work surface.
9. Disconnect bulkhead connector (Figure 2, Item 12) from assembly at coupling adaptor (Figure 2, Item 13).
10. Disconnect coupling adaptor (Figure 2, Item 13) from assembly at ball valve (Figure 2, Item 5).
11. Disconnect ball valve (Figure 2, Item 5) from assembly at tube elbow fitting (Figure 2, Item 4).
12. Disconnect tube elbow fitting (Figure 2, Item 4) from assembly at fuel line (Figure 2, Item 2).
13. Disconnect fuel line (Figure 2, Item 2) from tube elbow fitting (Figure 2, Item 3).
14. Place fuel drain assembly parts on suitable work surface.

END OF TASK

Inspect Fuel Tank Drain Valve Assembly

1. Inspect tube elbow fittings (Figure 2, Items 3 and 4) for cracks, worn threads, excessive corrosion, and other signs of obvious damage. Replace tube elbow fittings (Figure 2, Items 3 and 4) as required.
2. Inspect fuel line (Figure 2, Item 2) for frayed cover, cracks, kinks, and other signs of obvious damage. Replace fuel line (Figure 2, Item 2) as required.
3. Inspect ball valve (Figure 2, Item 5) for cracks, broken/damaged handle, restricted handle movement, excessive corrosion, and other signs of obvious damage. Replace ball valve (Figure 2, Item 5) as required.
4. Inspect coupling adaptor (Figure 2, Item 13) for worn threads, excessive corrosion, cracks, and other signs of obvious damage. Replace coupling adaptor (Figure 2, Item 13) as required.
5. Inspect bulkhead connector (Figure 2, Item 12) for worn threads, excessive corrosion, cracks, and other signs of obvious damage. Replace bulkhead connector (Figure 2, Item 12) as required.
6. Inspect flat washer (Figure 2, Item 11) for dents, cracks, and other signs of obvious damage. Replace flat washer (Figure 2, Item 11) as required.
7. Inspect nut (Figure 2, Item 10) for worn threads, excessive corrosion, and other signs of obvious damage. Replace nut (Figure 2, Item 10) as required.
8. Inspect fuel drain cap (Figure 2, Item 9) and chain (not shown) for cracks, excessive corrosion, and other signs of obvious damage. Replace as required.
9. Inspect bulkhead fitting (on tank) for worn threads, excessive corrosion, and other signs of obvious damage. Replace as required.

END OF TASK

Install Fuel Tank Drain Valve Assembly**NOTE**

Wipe down fuel lines, parts, and fittings with wiping rag prior to installation.

Thread pipe sealant must cure for 30 min before exposure to fuel and 72 hr for full strength.

1. Apply thread pipe sealant to threads of tube elbow fitting (Figure 2, Item 3).
2. Connect tube elbow fitting (Figure 2, Item 3) to fuel line (Figure 2, Item 4).
3. Apply thread pipe sealant to threads of tube elbow fitting (Figure 2, Item 4).
4. Connect tube elbow fitting (Figure 2, Item 4) to assembly at fuel line (Figure 2, Item 2).
5. Tighten fuel line (Figure 2, Item 2) fittings to 151 – 185 in/lb (17 – 21 Nm).
6. Connect ball valve (Figure 2, Item 5) to assembly at tube elbow fitting (Figure 2, Item 4).
7. Apply thread pipe sealant to threads of coupling adaptor (Figure 2, Item 13).
8. Connect coupling adaptor (Figure 2, Item 13) to assembly at ball valve (Figure 2, Item 5).
9. Connect bulkhead connector (Figure 2, Item 12) to assembly at coupling adaptor (Figure 2, Item 13).

NOTE

Installation of the fuel tank (Figure 2, Item 1) connects of the fuel tank drain valve assembly to the fuel tank at tube elbow fitting (Figure 2, Item 3) and bulkhead fitting (on tank). Fuel tank (Figure 2, Item 1) must be installed and connected to fuel tank drain valve assembly for complete reassembly.

10. Install fuel tank (WP 0050, Remove/Install Fuel Tank).
11. Insert bulkhead connector (Figure 2, Item 12) through skid.
12. Insert ball valve (Figure 2, Item 5) through skid/ball valve mounting plate.
13. Install two screws (Figure 2, Item 8) and washers (Figure 2, Item 7) to secure ball valve (Figure 2, Item 5) to ball valve plate (Figure 2, Item 6).
14. Tighten screws (Figure 2, Item 8) to 62 – 75 in/lb (7 – 9 Nm).
15. Install flat washer (Figure 2, Item 11) and nut (Figure 2, Item 10) to bulkhead connector (Figure 2, Item 12).
16. Tighten nut (Figure 2, Item 10) to 221 – 273 in/lb (25 – 28 Nm).
17. Install fuel drain cap (Figure 2, Item 9) to bulkhead connector (Figure 2, Item 12).
18. Ensure ball valve (Figure 2, Item 5) is in closed position (handle perpendicular to body of valve).
19. Install fuel tank (WP 0050, Remove/Install Fuel tank).
20. Add fuel once pipe thread compound has set (WP 0043, Service Fuel System).
21. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
22. Purge fuel system (WP 0043, Service Fuel System).
23. Close generator set doors.
24. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
25. Start engine and check for fuel leaks and proper operation.

26. Repair as required

27. Dispose of captured fuel and soiled cleaning rags IAW local SOP.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL FUEL TANK FILLER NECK

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Hammer, Hand, Soft Face, Dead Blow (WP 0163, Maintenance Allocation Chart, Item 16)

Tool Kit, General Mechanic's (GMTK) (WP 0163, Item 38)

Wrench, Torque, Click, Ratcheting, 3/8" drive, 75 FT-LB (WP 0163, Item 46)

Wrench, Torque, Dial, 3/8" drive, 300 IN-LB (WP 0163, Item 48)

Materials/Parts

Clamp (2) (WP 0111, Repair Parts List, Figure 11, Item 20)

Coupling, hose (WP 0111, Figure 11, Item 21)

Module, fuel filler (WP 0111, Figure 11, Item 24)

Tube, fuel fill (WP 0111, Figure 11, Item 25)

Washer, lock M10 external tooth (WP 0111, Figure 11, Item 27)

Cap set, protective (WP 0164, Expendable and Durable Items List, Item 9)

Fuel, diesel (WP 0164, Item 20)

Grease, electrically conductive (WP 0164, Item 21)

Pan, drain (WP 0164, Item 29)

Materials/Parts

Rag, wiping (WP 0164, Item 32)

Tag, marker (WP 0164, Item 36)

References

Not Applicable

Personnel Required

91D (1)

Assistant (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Fuel tank drained to half-capacity (WP 0043, Service Fuel System)

Rear body panel removed (WP 0030, Remove/Install Rear Body Panel)

Left-side body panel removed (WP 0031, Remove/Install Left-Side Body Panel)

Special Environmental Conditions

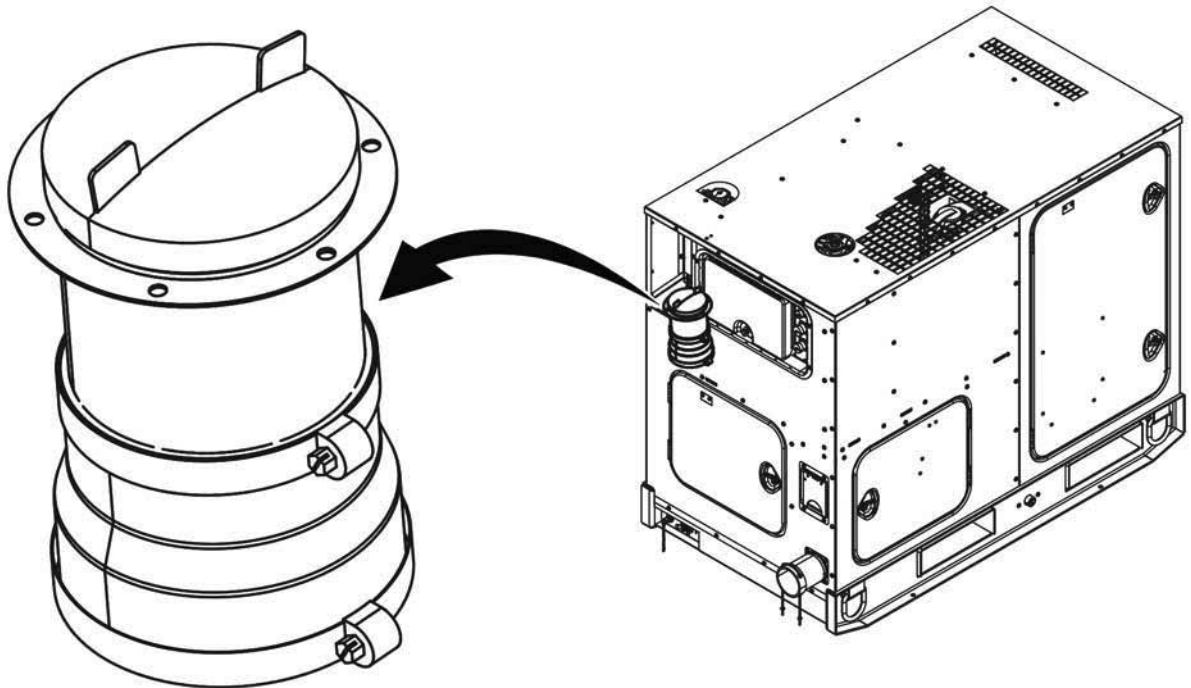
Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL FUEL TANK FILLER NECK**WARNING**

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (fuel fill static ground). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate ESD. Fire and possible explosion can result. Failure to comply may cause injury or death to personnel.

Remove Fuel Tank Filler Neck**Figure 1. Fuel Tank Filler Neck — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.

NOTE

Note orientation of fuel cap before removal to aid in installation.

2. Locate fuel tank filler neck on top of fuel tank (Figure 1).
3. Remove bolt (Figure 2, Item 6), external tooth lock washer (Figure 2, Item 8), and nut (Figure 2, Item 1) that secure ground cables (Figure 2, Items 4 and 7) to fuel system bracket.
4. Discard external tooth lock washer (Figure 2, Item 8).
5. Remove screw (Figure 2, Item 2), external tooth lock washer (Figure 2, Item 3), and nut (Figure 2, Item 5) that secure ground cable (Figure 2, Item 4) to fuel system bracket.
6. Discard external tooth lock washer (Figure 2, Item 3).
7. Remove fuel filler cap (Figure 3, Item 1) and strainer (Figure 3, Item 2) from fuel tank filler neck (Figure 3, Item 3).
8. Inspect fuel filler cap (Figure 3, Item 1) and chain for damage and replace as required.

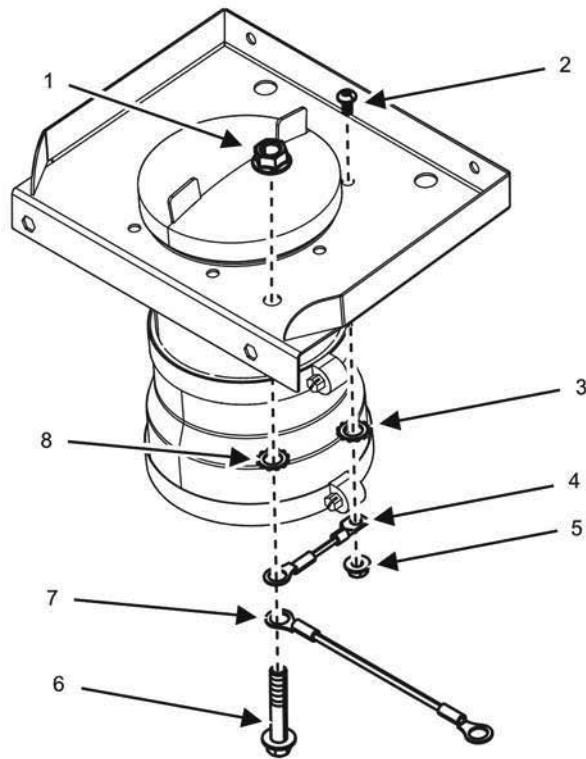


Figure 2. Fuel Tank Filler Neck Ground Cable — Removal.

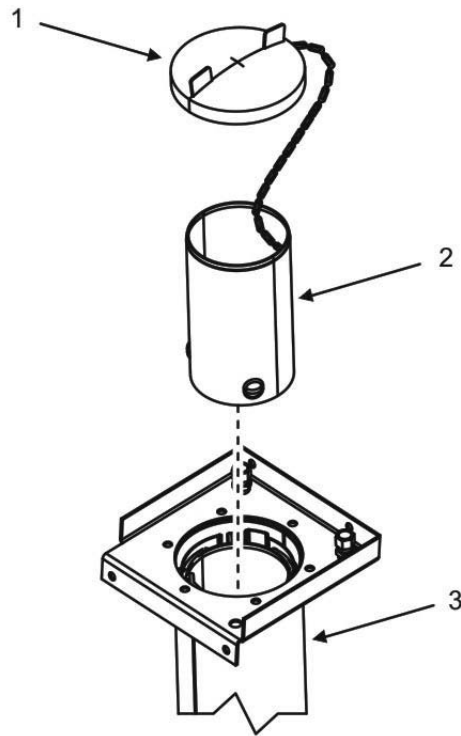


Figure 3. Fuel Cap and Strainer — Removal.

9. Inspect strainer (Figure 3, Item 2) for damage and replace as required.
10. Cover opening in fuel tank filler neck (Figure 3, Item 3) to prevent dirt and debris from entering fuel system.

NOTE

Two wrenches may be required to disconnect the auxiliary fuel lines. Tag and mark the lines for proper reinstallation.

Capture and dispose of spilled fuel IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system

11. Disconnect auxiliary fuel intake line (Figure 4, Item 6) from fuel system bracket (Figure 4, Item 2). Cap/plug line to prevent dirt and debris from entering fuel system.
12. Remove two screws (Figure 4, Item 11) securing edges of fuel system bracket (Figure 4, Item 2) to interior panels of generator set.

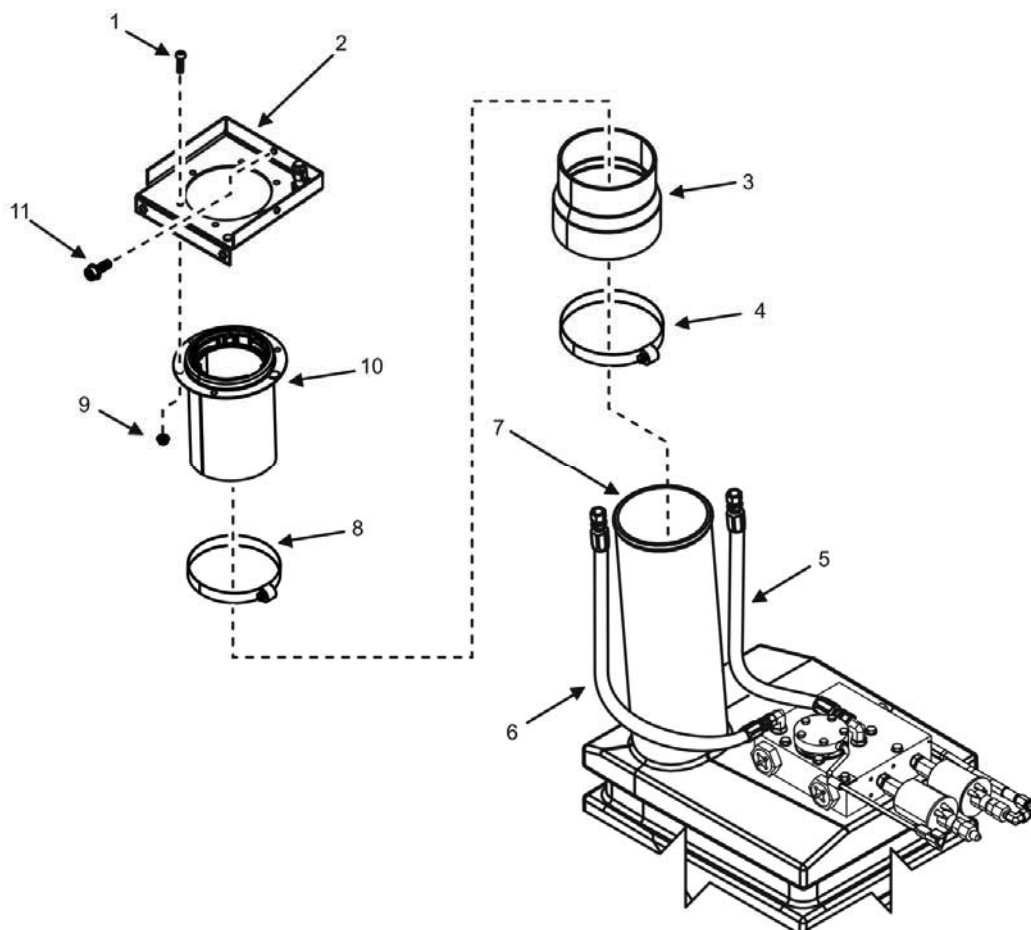


Figure 4. Fuel Tank Filler Neck — Detail.

13. Loosen and slide hose clamps (Figure 4, Items 4 and 8) and fuel tank collar (Figure 4, Item 3) away from fuel tank opening (Figure 4, Item 7).

NOTE

The fuel tank filler neck (Figure 4, Item 10) fits snugly over the fuel tank opening (Figure 4, Item 7). Light percussion from a rubber mallet will assist with the removal of the fuel tank filler neck (Figure 4, Item 10).

14. Remove fuel tank filler neck (Figure 4, Item 10), fuel system bracket (Figure 4, Item 2), hose clamps (Figure 4, Items 4 and 8), and fuel tank collar (Figure 4, Item 3) from unit and place on a suitable work surface.
15. Cover top of fuel tank opening (Figure 4, Item 7) to prevent dirt and debris from entering fuel system.
16. Remove hose clamps (Figure 4, Items 4 and 8) and fuel tank collar (Figure 4, Item 3) from fuel tank filler neck (Figure 4, Item 10).
17. Disconnect auxiliary vent line (Figure 4, Item 5) from fuel system bracket (Figure 4, Item 2). Cap/plug line to prevent dirt and debris from entering fuel system.

NOTE

Chains for the auxiliary fuel line caps (not shown) are secured by two of the six cap screws (Figure 4, Item 1) securing the fuel system bracket (Figure 4, Item 2) to the fuel tank filler neck (Figure 4, Item 10). Note the location of chains to aid in reinstallation.

18. Remove five remaining cap screws (Figure 4, Item 1) and nuts (Figure 4, Item 9) securing fuel system bracket (Figure 4, Item 2) to fuel tank filler neck (Figure 4, Item 10) and set aside for reuse.

END OF TASK**Inspect Fuel Filler Neck**

1. Inspect fuel tank filler neck (Figure 4, Item 10) for splits, cracks, or brittleness, and replace as required.
2. Inspect fuel tank collar (Figure 4, Item 3) for splits, cracks, or brittleness that would allow fuel to escape, and replace as required.
3. Inspect hose clamps (Figure 4, Items 4 and 8) for damage or corrosion, and replace as required.
4. Inspect fuel system bracket (Figure 4, Item 2) for damage or corrosion, and replace as required.

END OF TASK**Install Fuel Tank Filler Neck****NOTE**

Capture and dispose of spilled fuel IAW local SOP. Remove all caps/plugs and tags from fuel lines/fittings prior to installation of each fuel line.

Wipe down fuel lines, manifold, and fittings with wiping rag prior to installation.

1. Position top and bottom hose clamps (Figure 4, Items 4 and 8) to fuel tank collar (Figure 4, Item 3).
2. Slide fuel tank collar (Figure 4, Item 3) and hose clamps (Figure 4, Items 4 and 8) onto fuel tank filler neck (Figure 4, Item 10).

NOTE

The fuel tank filler neck (Figure 4, Item 10) snugly fits over the fuel tank opening (Figure 4, Item 7). Light percussion from a rubber mallet will assist with positioning the fuel tank filler neck (Figure 4, Item 10).

3. Install fuel tank collar (Figure 4, Item 3) and fuel tank filler neck (Figure 4, Item 10) assembly to top of fuel tank opening (Figure 4, Item 7).
4. Secure both hose clamps (Figure 4, Items 4 and 8) on fuel tank collar (Figure 4, Item 3).
5. Secure fuel tank filler neck (Figure 4, Item 10) to fuel tank opening (Figure 4, Item 7) by tightening hose clamps (Figure 4, Items 4 and 8) to 70 – 77 in/lb (8 – 9 Nm).
6. Install ground cable (Figure 2, Item 4) to fuel system bracket with screw (Figure 2, Item 2), external tooth lock washer (Figure 2, Item 3), and nut (Figure 2, Item 5). Tighten screw to 87 – 105 in/lb (10 – 12 Nm).

NOTE

Chains for the auxiliary fuel line caps (not shown) are secured by two of the six cap screws (Figure 4, Item 1) securing the fuel system bracket (Figure 4, Item 2) to the fuel tank filler neck (Figure 4, Item 10). Chains must be secured to the same location as removed before tightening cap screws (Figure 4, Item 1).

7. Install fuel system bracket (Figure 4, Item 2) to fuel tank filler neck (Figure 4, Item 10) with remaining five cap screws (Figure 4, Item 1) and nuts (Figure 4, Item 9) tightened to a torque value of 87 – 105 in/lb (10 – 12 Nm).
8. Connect auxiliary vent line (Figure 4, Item 5) to fuel system bracket (Figure 4, Item 2).
9. Install two screws (Figure 4, Item 11) to secure edges of fuel system bracket (Figure 4, Item 2) to interior panel of generator set.
10. Install auxiliary fuel intake line (Figure 4, Item 6) to fuel system bracket (Figure 4, Item 2).
11. Ensure both hose clamps (Figure 4, Items 4 and 8) on fuel tank collar (Figure 4, Item 3) are tightly secured.
12. Install strainer (Figure 3, Item 2).
13. Install fuel filler cap (Figure 3, Item 1).
14. Secure ground cable (Figure 2, Item 7) to fuel system bracket (Figure 4, Item 2) by installing bolt (Figure 2, Item 6), new external tooth lock washer (Figure 2, Item 8), and nut (Figure 2, Item 1).
15. Torque nut (Figure 2, Item 1) to 19 – 23 ft/lb (25 – 31 Nm).
16. Install left-side body panel (WP 0031, Remove/Install Left-Side Body Panel).
17. Install rear body panel from generator set (WP 0030, Remove/Install Rear Body Panel).
18. Install negative ground cable to right-side battery (WP 0036, Remove/Install Batteries).
19. Purge fuel system (WP 0043, Service Fuel System).
20. Fill fuel tank to proper level (TM 9-6115-751-10).
21. Dispose of captured fuel IAW local SOP.
22. Close generator set doors.
23. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10)
24. Start engine and check for proper operation.
25. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL 50/60 HZ AC GENERATOR ASSEMBLY

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0163, Item 46)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0163, Item 47)

Materials/Parts

Generator assembly, 15 KW, 50/60 HZ (WP 0123, Repair Parts List, Figure 23, Item1)

Isolator, vibration, generator mount (2) (WP 0122, Repair Parts List, Figure 22 Item 7)

Washer, lock (4) (WP 0123, Figure 23, Item 19)

Antifreeze, ethylene glycol (WP 0164, Expendable and Durable Items, Item 2)

Cap set, protective (WP 0164, Item 9)

Cleaning compound, solvent (WP 0164, Item 11)

Distilled water (WP 0164, Item 18)

Fuel, diesel (WP 0164, Item 20)

Grease, electrically conductive (WP 0164, Item 21)

Pan, drain (WP 0164, Item 29)

Penetrating oil (WP 0164, Item 30)

Rag, wiping (WP 0164, Item 32)

Materials/Parts

Strap, tie-down (WP 0164, Item 35)

Tag, marker (WP 0164, Item 36)

Personnel Required

91D (1)

Assistant (2)

References

WP 0058, Remove/Install Voltage Selection Board

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Interior bulkhead panel removed (WP 0033, Remove/Install Interior Body Panels)

Fuel tank removed (WP 0050, Remove/Install Fuel Tank)

Starter removed (WP 0072, Remove/Install Starter)

Engine speed sensor removed (WP 0081, Remove/Install Engine Speed Sensor)

Relay panel removed (WP 0041, Remove/Install Relay Panel)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL 50/60 HZ AC GENERATOR ASSEMBLY**WARNING**

- AC generator assembly weighs approximately 252 – 262 lb (114 – 119 kg). Use suitable lifting device with capacity to lift the weight of assembly. Do not stand or put arms, legs, or any body part under hoisted load. Failure to comply may cause injury or death to personnel.
- Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

Remove AC Generator Assembly (UOC 98J)**NOTE**

To assist during installation, tag all electrical wires and connectors prior to removal.

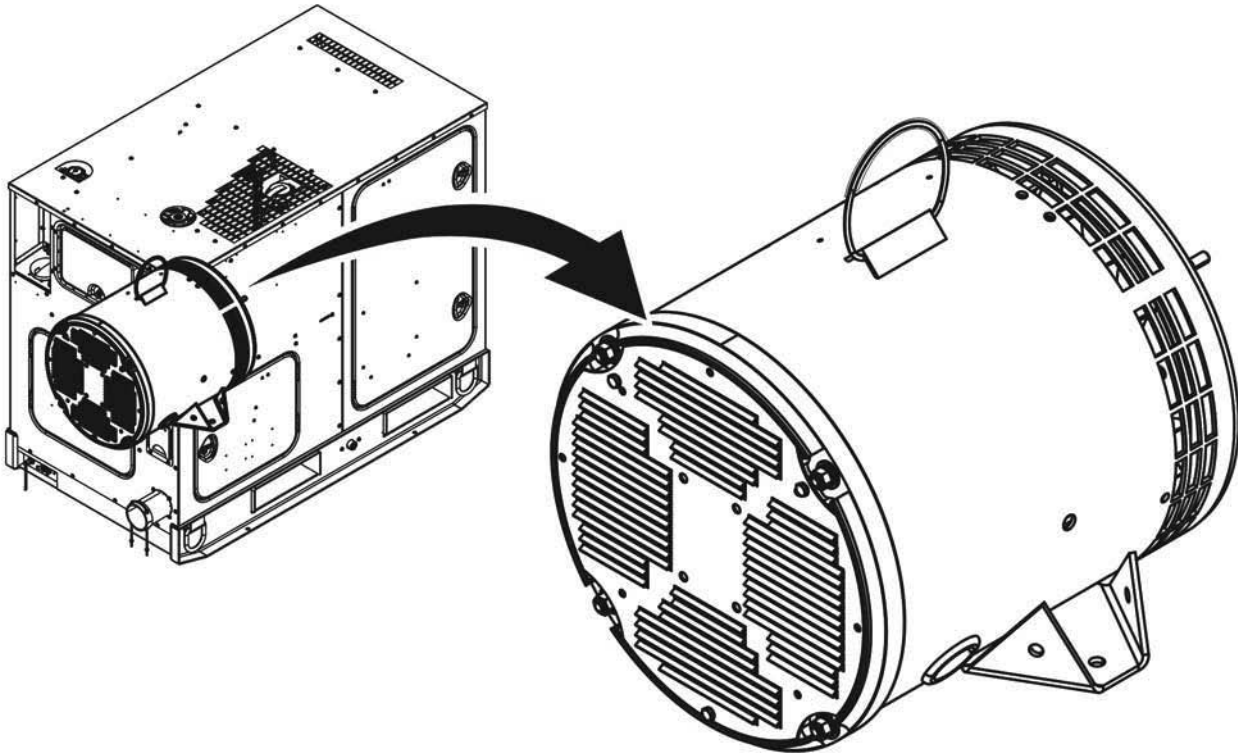


Figure 1. 50/60 Hz AC Generator — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate 50/60 Hz AC generator (Figure 1).

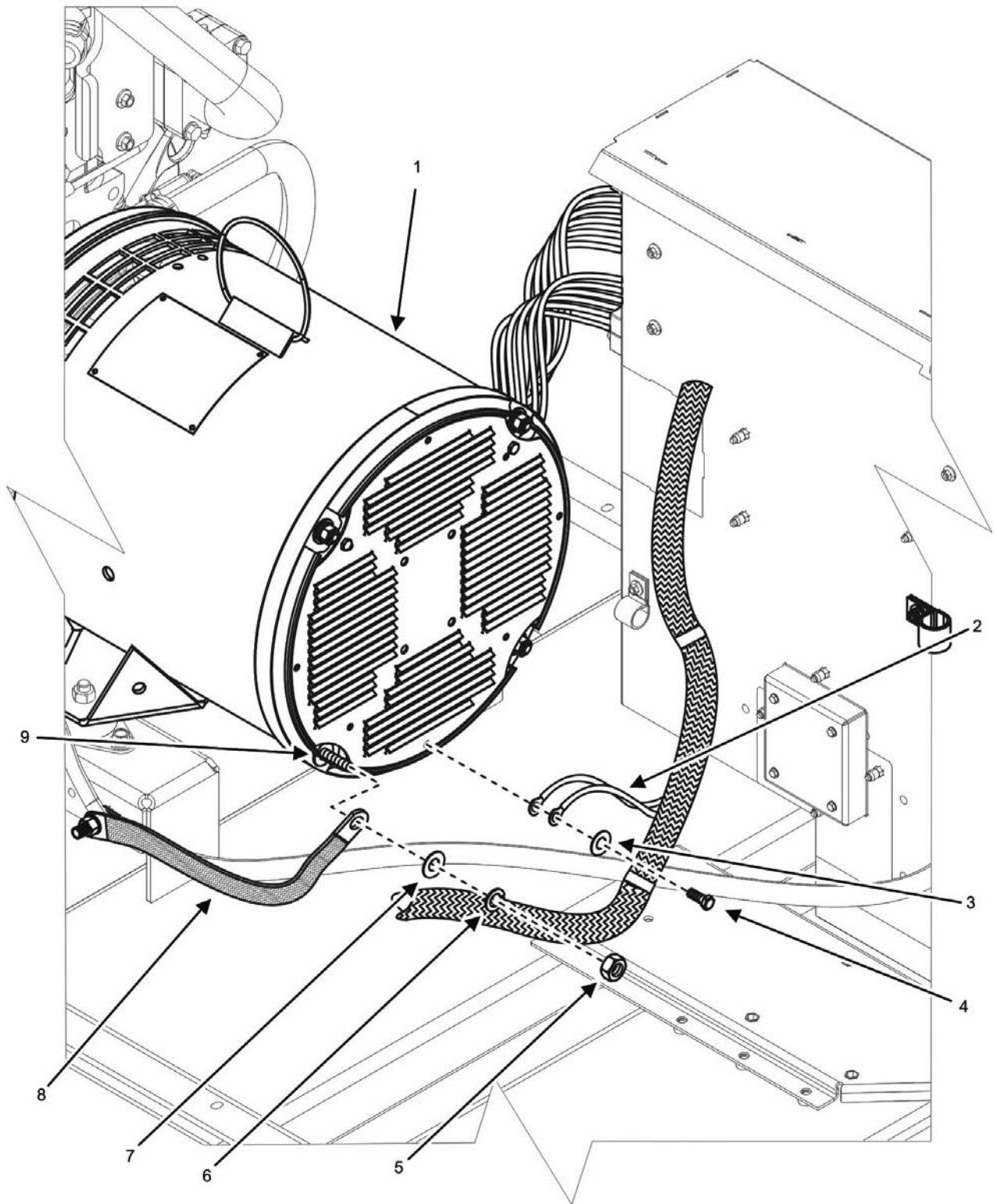


Figure 2. 50/60 Hz AC Generator — Rear.

3. Remove nut (Figure 2, Item 5), lock washer (Figure 2, Item 6), washer (Figure 2, Item 7), and ground strap (Figure 2, Item 8) from through-bolt (Figure 2, Item 9) at rear of AC generator (Figure 2, Item 1). Discard lock washer. (Figure 2, Item 6).
4. Remove screw (Figure 2, Item 4), washer (Figure 2, Item 3), and two wire leads (Figure 2, Item 2) from rear of AC generator (Figure 2, Item 1). Tag two wire leads (Figure 2, Item 2) for identification at installation.

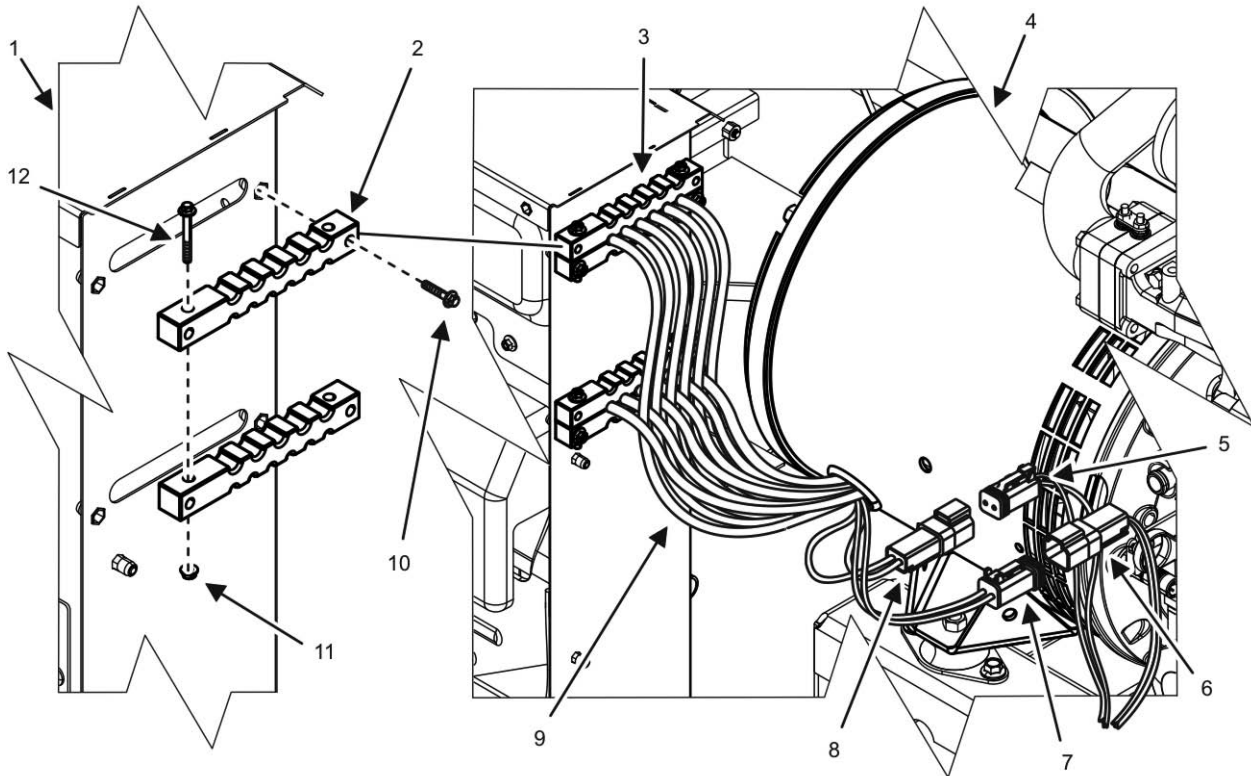


Figure 3. 50/60 Hz AC Generator Wiring — Removal.

5. Remove four screws (Figure 3, Item 10) and two finger retainer assemblies (Figure 3, Item 3) from front edge of output box (Figure 3, Item 1).
6. Remove two screws (Figure 3, Item 12), two nuts (Figure 3, Item 11), and two finger retainers (Figure 3, Item 2) from six wire leads (Figure 3, Item 9).
7. Repeat steps 5 and 6 to remove the second finger retainer assembly (Figure 3, Item 3) from the remaining six wire leads (Figure 3, Item 9).
8. Tag and remove 12 wire leads (Figure 3, Item 9) from generator (Figure 3, Item 4) at voltage selection board in output box (Figure 3, Item 1) (WP 0058, Remove/Install Voltage Selection Board).
9. Tag and disconnect wiring harness connector P90 (Figure 3, Item 5) at female connector (Figure 3, Item 8).
10. Tag and disconnect wiring harness connector P85 (Figure 3, Item 6) at male connector (Figure 3, Item 7).

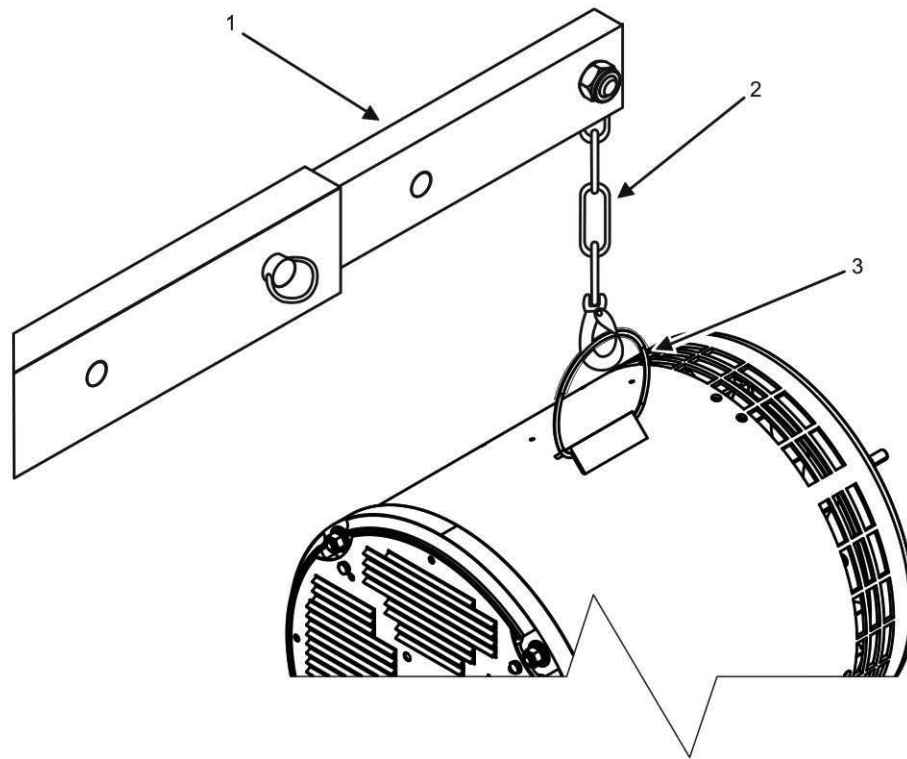


Figure 4. 50/60 Hz AC Generator Lift.

11. Attach suitable lifting device (Figure 4, Item 1) with at least a 1,000-lb (454-kg) capacity to AC generator lift ring (Figure 4, Item 3).
12. Raise lifting device (Figure 4, Item 1) to remove slack in chain/sling (Figure 4, Item 2).
13. Place wooden block (not shown) under engine to support engine when AC generator (Figure 2, Item 1) is removed.

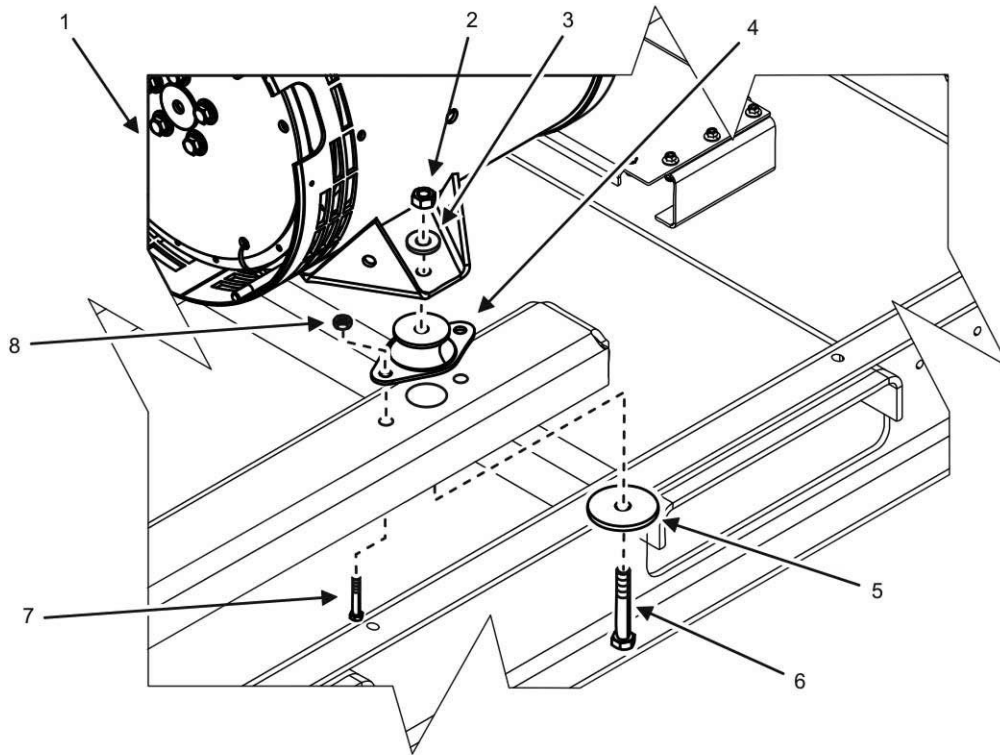


Figure 5. 50/60 Hz AC Generator — Removal.

14. Remove mounting screw (Figure 5, Item 6), snubbing washer (Figure 5, Item 5), flat washer (Figure 5, Item 3), and nut (Figure 5, Item 2) securing AC generator (Figure 5, Item 1) to left-side vibration isolator (Figure 5, Item 4).
15. Remove mounting screw (Figure 5, Item 6), snubbing washer (Figure 5, Item 5), flat washer (Figure 5, Item 3), and nut (Figure 5, Item 2) securing AC generator (Figure 5, Item 1) to right-side vibration isolator (Figure 5, Item 4).

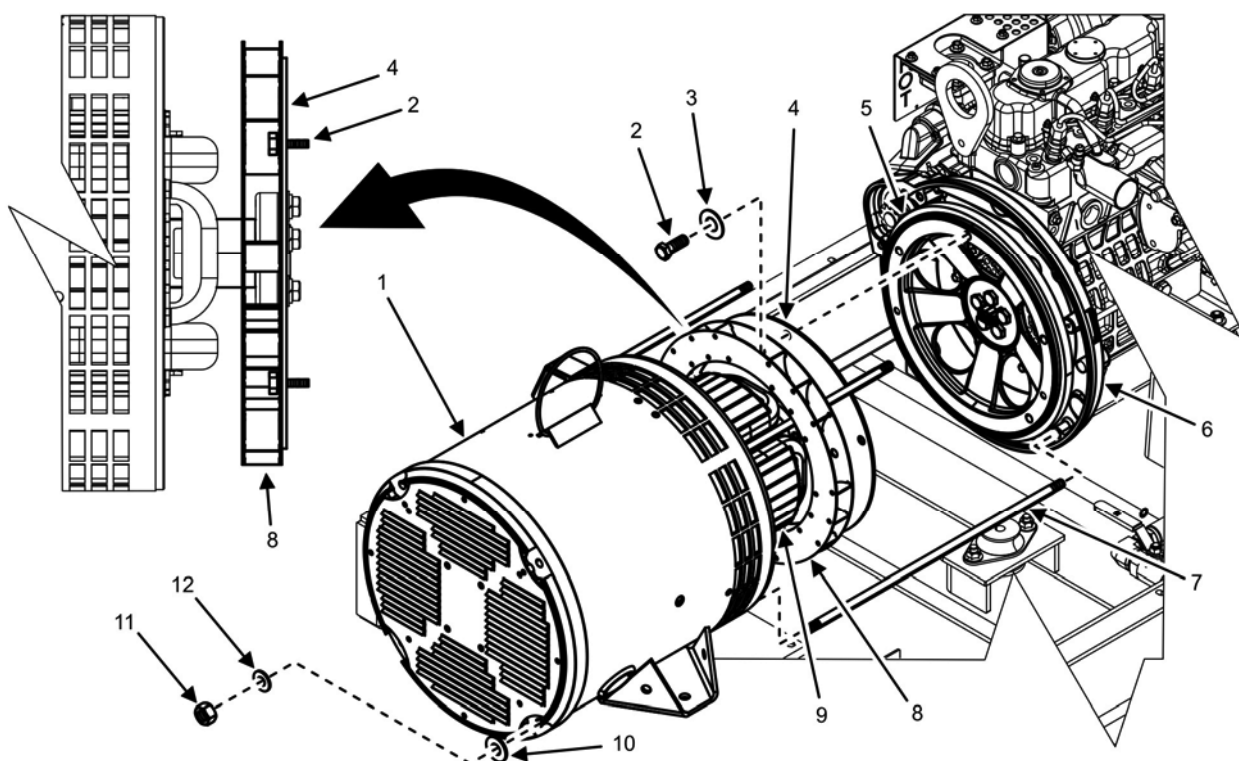


Figure 6. 50/60 Hz AC Generator and Engine Separation.

16. Remove four nuts (Figure 6, Item 11), four lock washers (Figure 6, Item 12), and four flat washers (Figure 6, Item 10) securing through-bolts (Figure 6, Item 7) on end bell of AC generator stator (Figure 6, Item 1). Discard lock washers (Figure 6, Item 12).
17. Install two nuts (Figure 6, Item 11) to one through-bolt (Figure 6, Item 7) without washers.
18. Loosen through-bolt (Figure 6, Item 7) by turning inner nut (Figure 6, Item 11) until through-bolt (Figure 6, Item 7) detaches from flywheel housing (Figure 6, Item 6).
19. Repeat steps 17 and 18 for remaining three through-bolts (Figure 6, Item 7).
20. Raise AC generator assembly slightly using the lifting device (Figure 4, Item 1) and slide generator stator (Figure 6, Item 1) to expose fan (Figure 6, Item 8), drive plate (Figure 6, Item 4), and engine flywheel (Figure 6, Item 5) connection.
21. Place AC generator stator (Figure 6, Item 1) on a suitable work surface and remove lifting device.

CAUTION

Proper installation of AC generator fan (Figure 6, Item 8) affects cooling air flow. Maintain the orientation of fan (Figure 6, Item 8) and drive plate (Figure 6, Item 4) for proper installation. Use wire ties to maintain the orientation of fan (Figure 6, Item 8) and drive plate (Figure 6, Item 4) in at least two places as screws (Figure 6, Item 2) are removed. Failure to comply may cause damage to equipment.

22. Support AC generator rotor (Figure 6, Item 9) with a wooden block and suitable lifting device at the ball bearing to allow rotation of rotor (Figure 6, Item 9).
23. Remove one screw (Figure 6, Item 2) and one washer (Figure 6, Item 3) securing fan (Figure 6, Item 8) and drive plate (Figure 6, Item 4) to engine flywheel (Figure 6, Item 5).
24. Secure fan (Figure 6, Item 8) to drive plate (Figure 6, Item 4) using wire tie to maintain proper orientation of components.
25. Rotate engine harmonic balancer hex cap screw clockwise (viewed from water pump end of engine) using socket and breaker bar to gain access to the remaining four screws (Figure 6, Item 2) as required.
26. Pull AC generator rotor (Figure 6, Item 9) to the rear, free of engine using lifting device.

NOTE

If AC generator rotor (Figure 6, Item 9) refuses to separate from engine, perform steps 27 through 29.

27. Saturate area where engine flywheel (Figure 6, Item 5) and drive plate (Figure 6, Item 4) are connected with penetrating oil.
28. Allow penetrating oil to soak for 1 hr.
29. Strike point of contact between engine flywheel (Figure 6, Item 5) and drive plate (Figure 6, Item 4) using a hammer and brass drift around circumference of flywheel until two components break free.

CAUTION

Be aware of generator set components, such as the output box, while maneuvering the AC generator rotor (Figure 6, Item 9). Failure to comply may cause damage to equipment.

30. Remove AC generator rotor (Figure 6, Item 9) from unit skid using suitable lifting device (Figure 4, Item 1).
31. Place AC generator rotor (Figure 6, Item 9) on a suitable work surface.
32. Remove lifting device (Figure 4, Item 1) from AC generator rotor (Figure 6, Item 9).
33. Remove two screws (Figure 5, Item 7) and two nuts (Figure 5, Item 8) securing left-side vibration isolator (Figure 5, Item 4) to skid. Discard vibration isolator (Figure 5, Item 4).
34. Remove two screws (Figure 5, Item 7) and two nuts (Figure 5, Item 8) securing right-side vibration isolator (Figure 5, Item 4) to skid. Discard vibration isolator (Figure 5, Item 4).
35. Remove any remaining vibration isolator (Figure 5, Item 4) residue from mounts with dry cleaning solvent and wiping rag.

NOTE

Perform step 36 only if the AC generator assembly is to be returned for repair.

36. Ensure through-bolts (Figure 6, Item 7), flat washers (Figure 6, Item 10), lock washers (Figure 6, Item 12), and nuts (Figure 6, Item 11) are returned to the repair facility with the AC generator assembly.

END OF TASK**Inspect AC Generator Assembly (UOC 98J)**

1. Inspect AC generator assembly for damage and replace as required.
2. Inspect left and right AC generator mounts on skid for indications of structural weakness. Replace skid as required.
3. Inspect all areas of skid for damage, corrosion, cracks, or other indications of structural weakness. Replace skid as required.

END OF TASK**Install AC Generator Assembly (UOC 98J)**

1. Clean mounting area, hardware, and surrounding skid area of dirt, debris, and grease using wiping rags and dry cleaning solvent.
2. Dispose of wiping rags IAW local SOP.
3. Apply a thin coat of multipurpose grease to mounting surfaces of drive plate (Figure 6, Item 4), fan (Figure 6, Item 8), and engine flywheel (Figure 6, Item 5) to minimize formation of galvanic corrosion between components.
4. Position new vibration isolators (Figure 5, Item 4) to left- and right-side generator and skid mount.
5. Secure left- and right-side vibration isolators (Figure 5, Item 4) with two screws (Figure 5, Item 7) and two nuts (Figure 5, Item 8) to skid. Tighten nuts to 35 – 42 ft/lb (48 – 57 Nm).

NOTE

Perform step 6 only if a new or refurbished AC generator is being installed.

6. Remove any material used to prevent the rotor from contacting the generator housing during shipment.
7. Attach suitable lifting device (Figure 4, Item 1) with chain/sling (Figure 4, Item 2) to AC generator rotor (Figure 6, Item 9) at ball bearing.
8. Position AC generator rotor (Figure 6, Item 9) to its approximate mounting location on unit skid.
9. Align AC generator rotor (Figure 6, Item 9) with engine flywheel (Figure 6, Item 5).
10. Rotate engine harmonic balancer hex cap screw clockwise (as viewed from water pump end of engine) using socket and breaker bar to align mounting holes in AC generator drive plate (Figure 6, Item 4), fan (Figure 6, Item 8), and engine flywheel (Figure 6, Item 5) to allow installation of screw (Figure 6, Item 2).
11. Install one screw (Figure 6, Item 2) and washer (Figure 6, Item 3) finger-tight to secure drive plate (Figure 6, Item 4), fan (Figure 6, Item 8), and engine flywheel (Figure 6, Item 5) in the proper orientation.
12. Cut and discard wire ties installed during removal procedure to maintain orientation of AC generator drive plate (Figure 6, Item 4), fan (Figure 6, Item 8), and engine flywheel (Figure 6, Item 5) as they are presented.
13. Install remaining four screws (Figure 6, Item 2) and four washers (Figure 6, Item 3) finger-tight.
14. Torque screws (Figure 6, Item 2) to 39 – 46 ft/lb (53 – 63 Nm).

15. Support AC generator rotor (Figure 6, Item 1) at ball bearing using a wooden block and remove the lifting device.
16. Attach a suitable lifting device to AC generator stator (Figure 6, Item 1) and position AC generator stator (Figure 6, Item 1) to AC generator rotor (Figure 6, Item 9).
17. Slide AC generator stator (Figure 6, Item 1) over AC generator rotor (Figure 6, Item 9) toward engine to completely cover AC generator rotor (Figure 6, Item 9).
18. Lower AC generator (Figure 5, Item 1) slowly, using lifting device (Figure 4, Item 1), until mounting holes on AC generator mounts align with mounting holes on vibration isolators (Figure 5, Item 4).
19. Insert mounting screw (Figure 5, Item 6) with snubbing washer (Figure 5, Item 5) through new vibration isolators (Figure 5, Item 4) on generator skid mounts to align mounting holes.
20. Install flat washers (Figure 5, Item 3) and nuts (Figure 5, Item 2) to generator mounting screws (Figure 5, Item 6) loosely.
21. Install two nuts (Figure 6, Item 11) to one through-bolt (Figure 6, Item 7).
22. Install through-bolt (Figure 6, Item 7) through AC generator (Figure 6, Item 1) by turning outer nut (Figure 6, Item 11) until through-bolt (Figure 6, Item 7) secures generator housing to flywheel housing (Figure 6, Item 6).
23. Remove two nuts (Figure 6, Item 11) from through-bolt (Figure 6, Item 7) once installed to flywheel housing (Figure 6, Item 6).
24. Repeat steps 21 through 23 to install remaining three through-bolts (Figure 6, Item 7).
25. Install nut (Figure 6, Item 11), new lock washer (Figure 6, Item 12), and flat washer (Figure 6, Item 10) to four through-bolts (Figure 6, Item 7).
26. Tighten four nuts (Figure 6, Item 11) to 17-21 ft/lb (23-29 Nm).
27. Remove supporting block (not shown) from under engine.
28. Remove lifting device (Figure 4, Item 1) from AC generator assembly.

NOTE

Use tags applied to electrical wires and connectors during removal to aide in installation. Identification tags should remain in place until generator is completely reassembled and has been tested for proper operation.

29. Apply a thin coat of electrically conductive grease to all electrical connections prior to installation.
30. Connect wiring harness connector P85 (Figure 3, Item 6) to male connector (Figure 3, Item 7).
31. Connect wiring harness connector P90 (Figure 3, Item 5) to female connector (Figure 3, Item 8).
32. Connect 12 wire leads (Figure 3, Item 9) to voltage selection board in output box (Figure 3, Item 1) (WP 0058, Remove/Install Voltage Selection Board).
33. Install two finger retainers (Figure 3, Item 2) around six wire leads (Figure 3, Item 9) that exit the lower cutout in the output box (Figure 3, Item 1) and secure by installing two screws (Figure 3, Item 12) and two nuts (Figure 3, Item 11).
34. Install two finger retainers (Figure 3, Item 2) around six wire leads (Figure 3, Item 9) that exit the upper cutout in the output box (Figure 3, Item 1) and secure by installing two screws (Figure 3, Item 12) and two nuts (Figure 3, Item 11).
35. Position finger retainer assembly (Figure 3, Item 3) to it mounting location on output box (Figure 3, Item 1) and secure by installing two screws (Figure 3, Item 10).
36. Repeat step 36 to install the second finger retainer assembly (Figure 3, Item 3).
37. Install two wire leads (Figure 2, Item 2) to rear of AC generator (Figure 2, Item 1) using tags installed at removal as a guide.

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38. Secure wire leads (Figure 2, Item 2) by installing screw (Figure 2, Item 4) and washer (Figure 2, Item 3) finger-tight.
 39. Install ground strap (Figure 2, Item 8) to through-bolt (Figure 2, Item 9) at rear of AC generator (Figure 2, Item 1) and secure by installing nut (Figure 2, Item 5), new lock washer (Figure 2, Item 6), and washer (Figure 2, Item 7) finger-tight.
 40. Tighten nut (Figure 2, Item 5) to 17-21ft/lb (23-29 Nm).
 41. Tighten screw (Figure 2, Items 4) to 20 in/lb (20.5 Nm).
 42. Install and adjust engine speed sensor (WP 0081, Remove/Install Engine Speed Sensor).
 43. Install starter (WP 0072, Remove/Install Starter).
 44. Install fuel tank (WP 0050, Remove/Install Fuel Tank).
 45. Install interior body panels (WP 0033, Remove/Install Interior Body Panels).
 46. Install relay panel (WP 0041, Remove/Install Relay Panel).
 47. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
 48. Start engine, check for proper operation, and repair as required. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
 49. Check all fluid levels and fill as required (TM 9-6115-751-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL 400 HZ AC GENERATOR ASSEMBLY

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0163, Item 46)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0163, Item 47)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0163, Item 48)

Materials/Parts

Generator assembly, 15kW, 400 Hz (WP 0124, Repair Parts List, Figure 24, Item 1)

Isolator, vibration, generator mount (2) (WP 0122, Repair Parts List, Figure 22, Item 7)

Washer, lock (WP 0124, Figure 24, Item 12)

Antifreeze, ethylene glycol (WP 0164, Expendable and Durable Items, Item 2)

Cap set, protective (WP 0164, Item 9)

Cleaning compound, solvent (WP 0164, Item 11)

Distilled water, (WP 0164, Item 18)

Grease, electrically conductive (WP 0164, Item 21)

Pan, drain (WP 0164, Item 29)

Penetrating oil (WP 0164, Item 30)

Materials/Parts

Rag, wiping (WP 0164, Item 32)

Tag, marker (WP 0164, Item 36)

Personnel Required

91D (1)

Assistant (2)

References

WP 0058, Remove/Install Voltage Selection Board

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Negative battery cable disconnected (WP 0036, Remove/Install Batteries)

Interior bulkhead panel removed (WP 0033, Remove/Install Interior Body Panels)

Fuel tank removed (WP 0050, Remove/Install Fuel Tank)

Engine speed sensor removed (WP 0081, Remove/Install Engine Speed Sensor)

Relay panel removed (WP 0041, Remove/Install Relay Panel)

Special Environmental Conditions

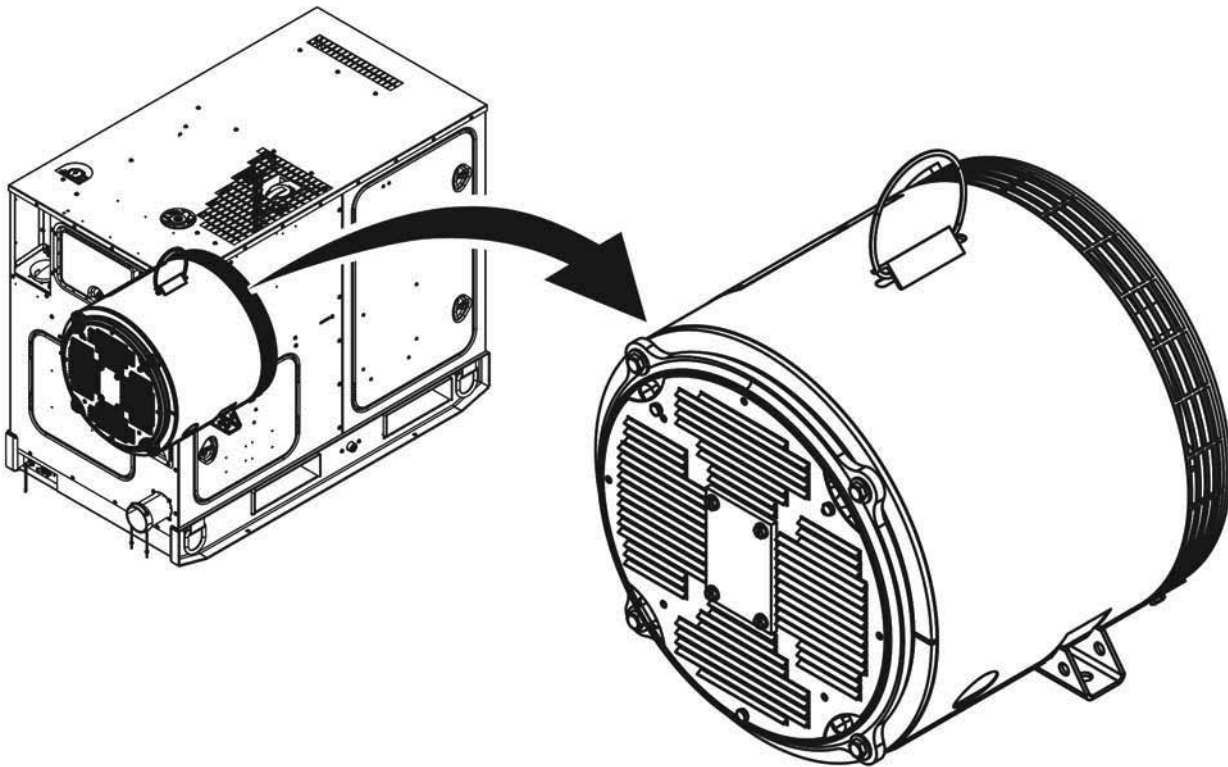
Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL 400 HZ AC GENERATOR (UOC 98K)**WARNING**

- AC generator assembly weighs approximately 252 – 262 lb (114 – 119 kg). Use suitable lifting device with capacity to lift the weight of assembly. Do not stand or put arms, legs, or any body part under hoisted load. Failure to comply may cause injury or death to personnel.
- Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

Remove 400 Hz AC Generator Assembly**Figure 1. 400 Hz AC Generator — Location.****NOTE**

To assist during installation, tag all electrical wires and connectors prior to removal.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate AC generator (Figure 1).

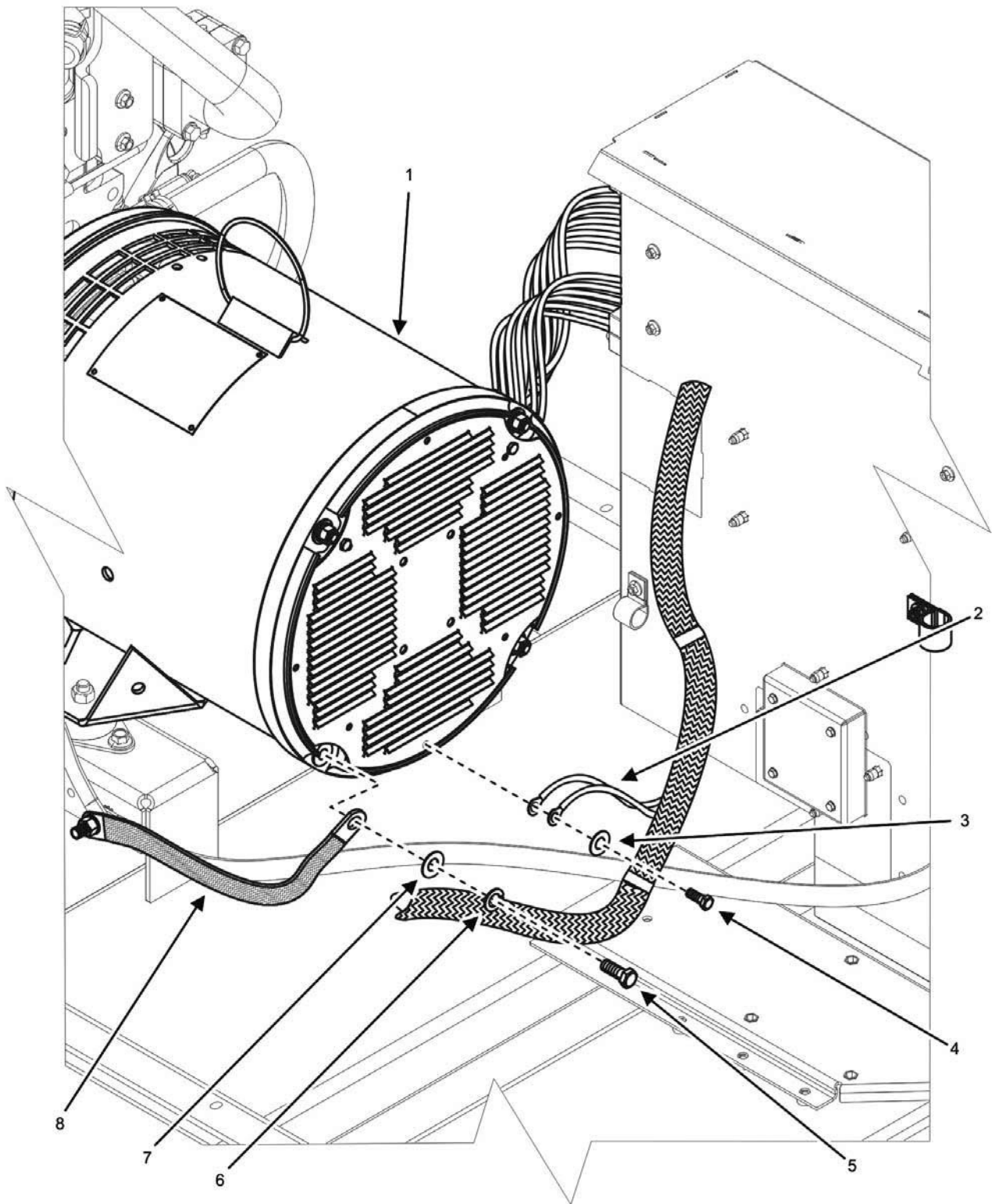


Figure 2. 400 Hz AC Generator — Rear.

3. Remove screw (Figure 2, Item 5), lock washer (Figure 2, Item 6), washer (Figure 2, Item 7), and ground strap (Figure 2, Item 8) from rear of AC generator (Figure 2, Item 1). Discard lock washer (Figure 2, Item 6).

4. Remove screw (Figure 2, Item 4), washer (Figure 2, Item 3), and two wire leads (Figure 2, Item 2) from rear of AC generator (Figure 2, Item 1). Tag two wire leads (Figure 2, Item 2) for identification at installation.

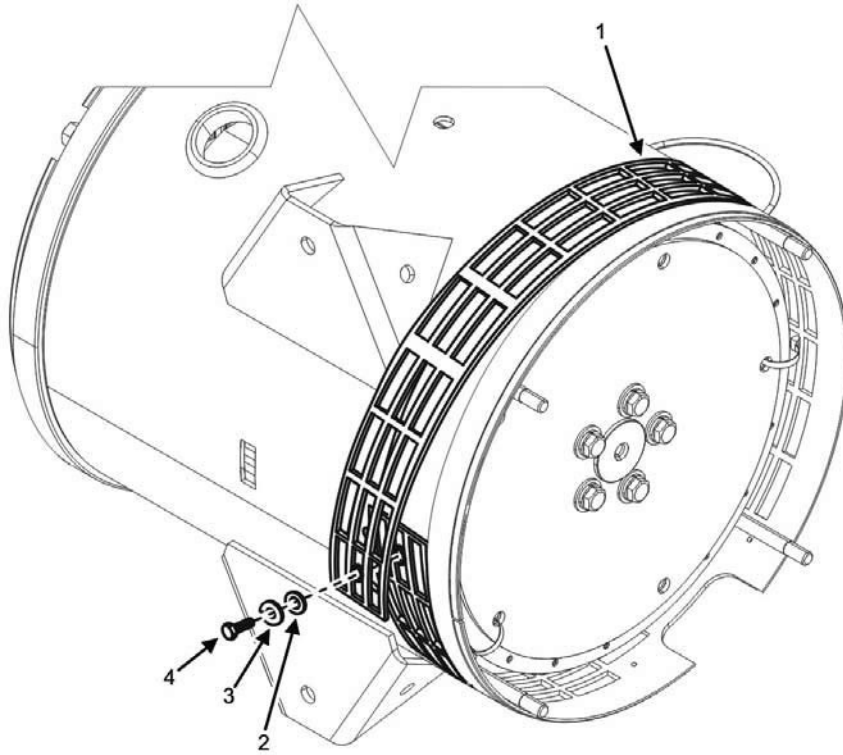


Figure 3. 400 Hz AC Generator Screen — Removal.

NOTE

The 400 Hz AC generator in Figure 3 is shown removed from the skid and rotated to show the mounting hardware for screen (Figure 3, Item 1) located on underside of 400 Hz AC generator.

5. Remove screw (Figure 3, Item 4), lock washer (Figure 3, Item 3), flat washer (Figure 3, Item 2), and screen (Figure 3, Item 1) from AC generator. Discard lock washer (Figure 3, Item 3).
6. Inspect screen (Figure 3, Item 1) for signs of obvious damage. Replace screen (Figure 3, Item 1) as required.
7. Remove four screws (Figure 4, Item 10) and two finger retainer assemblies (Figure 4, Item 3) from front edge of output box (Figure 4, Item 1).
8. Remove two screws (Figure 4, Item 12), two nuts (Figure 4, Item 11), and two finger retainers (Figure 4, Item 2) from six wire leads (Figure 4, Item 9).
9. Repeat steps 7 and 8 to remove the second finger retainer assembly (Figure 4, Item 3) from the remaining six wire leads (Figure 4, Item 9).
10. Tag and remove 12 wire leads (Figure 4, Item 9) from generator (Figure 4, Item 4) at voltage selection board in output box (Figure 4, Item 1) (WP 0058, Remove/Install Voltage Selection Board).
11. Tag and disconnect wiring harness connector P90 (Figure 4, Item 5) at female connector (Figure 4, Item 8).
12. Tag and disconnect wiring harness connector P85 (Figure 4, Item 6) at male connector (Figure 4, Item 7).

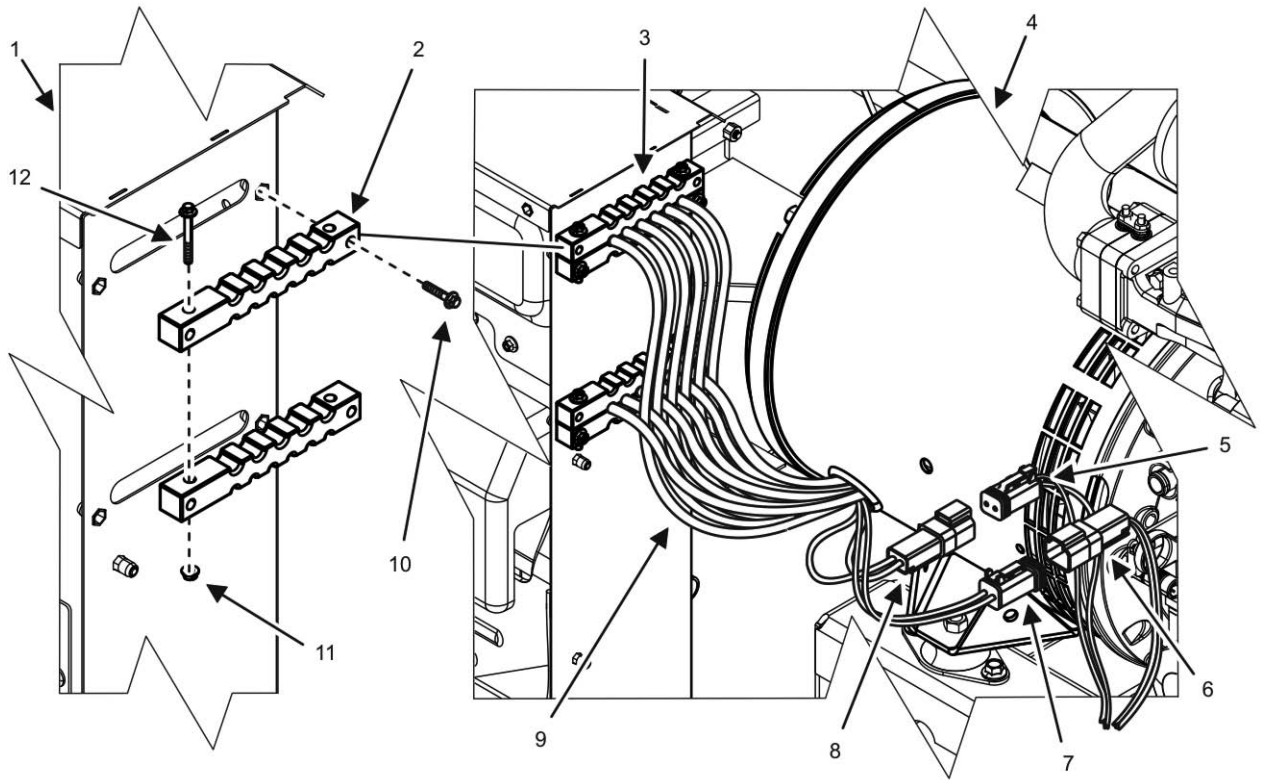


Figure 4. 400 Hz AC Generator Wiring — Removal.

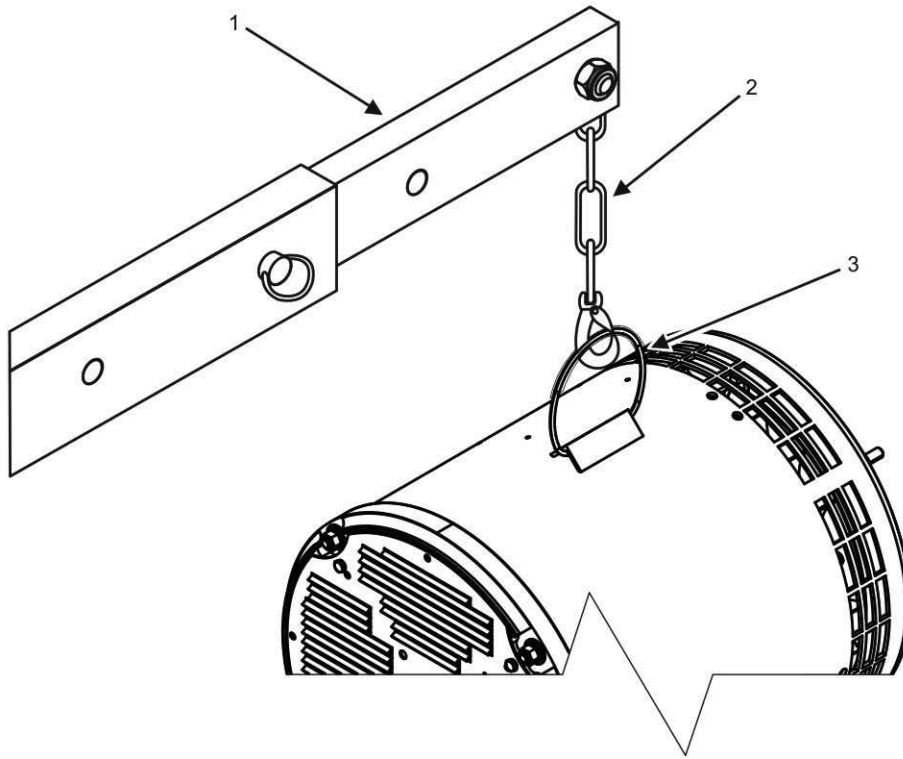


Figure 5. 400 Hz AC Generator Lift.

13. Attach suitable lifting device (Figure 5, Item 1) with at least a 1,000-lb (454-kg) capacity to AC generator lift ring (Figure 5, Item 3).
14. Raise lifting device (Figure 5, Item 1) to remove slack in chain/sling (Figure 5, Item 2).
15. Place wooden block (not shown) under engine to support engine when AC generator is removed.

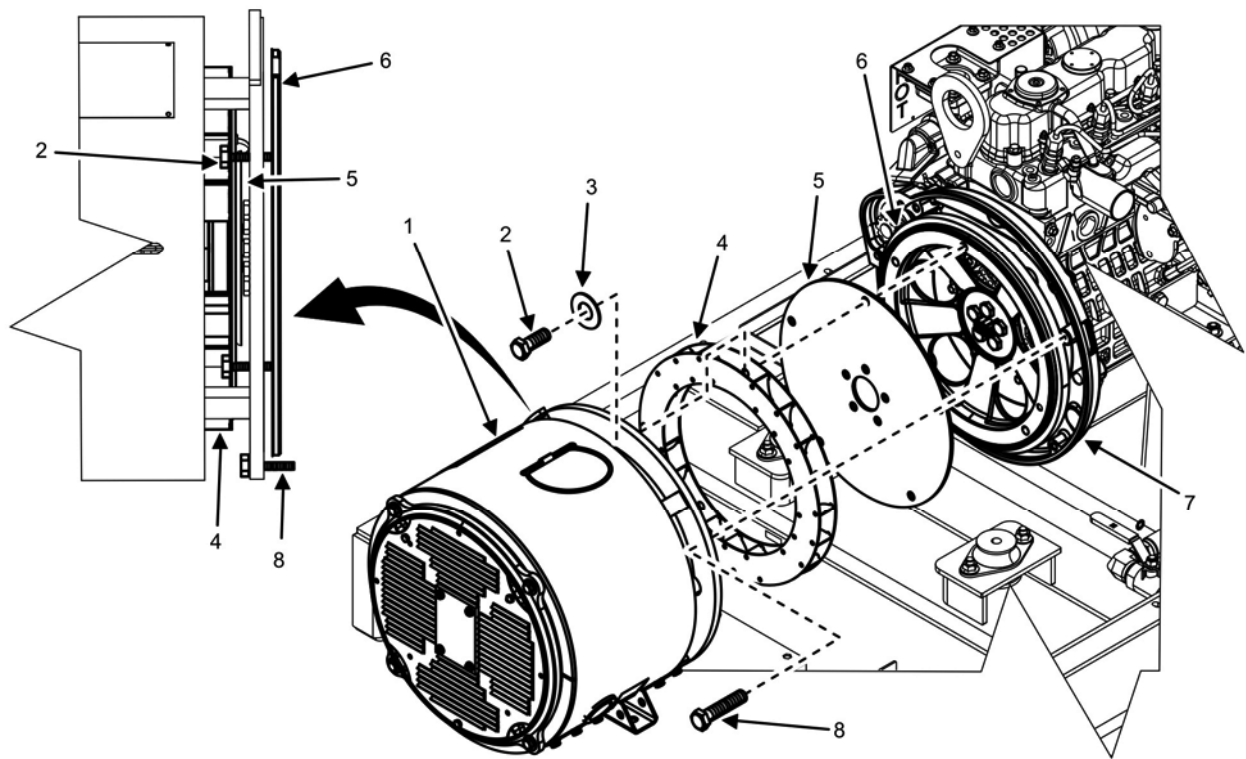


Figure 6. 400 Hz AC Generator and Engine Separation.

16. Rotate engine harmonic balancer hex cap screw clockwise (viewed from water pump end of engine) using socket and breaker bar to gain access to one screw (Figure 6, Item 2) through slot in AC generator (Figure 6, Item 1) case.
17. Remove one screw (Figure 6, Item 2) and one washer (Figure 6, Item 3) securing fan (Figure 6, Item 4) and drive plate (Figure 6, Item 5) to engine flywheel (Figure 6, Item 6) through slot in AC generator case opened by removal of screen (Figure 3, Item 1).

CAUTION

Proper installation of AC generator fan affects cooling air flow. Use wire ties to maintain the orientation of fan and drive plate in at least two places as mounting screws are removed. Failure to comply may result in damage to equipment.

18. Secure generator fan (Figure 6, Item 4) to drive plate (Figure 6, Item 5) using wire tie to maintain proper orientation of components.
19. Rotate engine harmonic balancer hex cap screw clockwise (viewed from water pump end of engine) using socket and breaker bar to access the remaining four screws (Figure 6, Item 2) through slots in AC generator case.

20. Remove remaining four screws (Figure 6, Item 2) and four washers (Figure 6, Item 3) securing fan (Figure 6, Item 4) and drive plate (Figure 6, Item 5) to engine flywheel (Figure 6, Item 6).
21. Remove four screws (Figure 6, Item 8) securing AC generator (Figure 6, Item 1) to engine flywheel housing (Figure 6, Item 7).

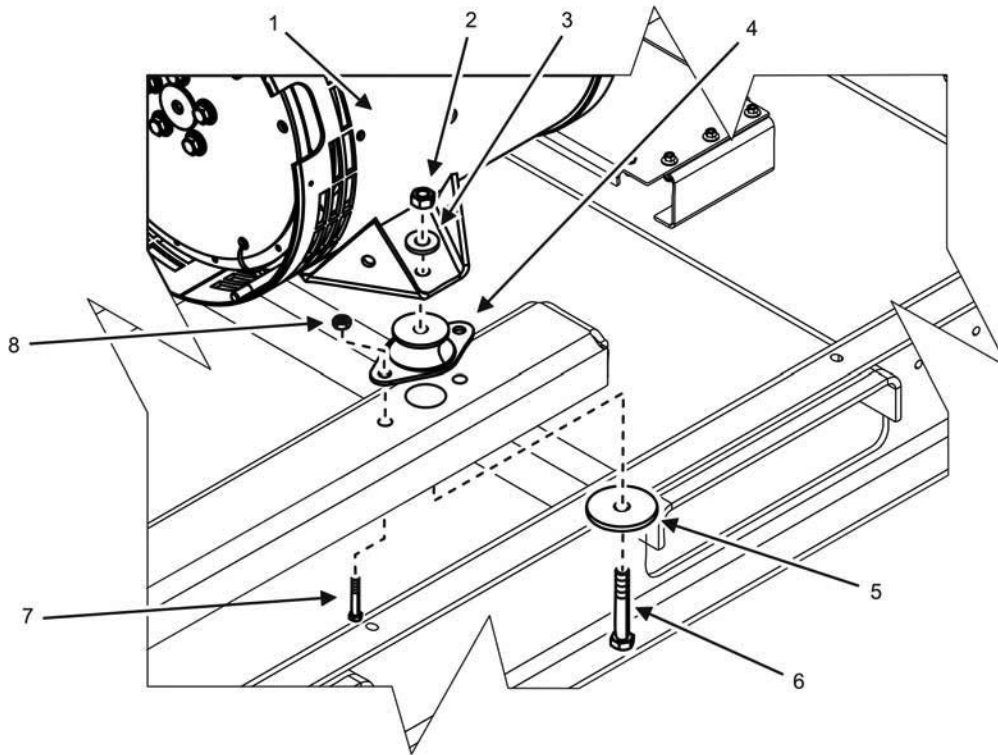


Figure 7. 400 Hz AC Generator — Removal.

22. Remove screw (Figure 7, Item 6), snubbing washer (Figure 7, Item 5), flat washer (Figure 7, Item 3), and nut (Figure 7, Item 2) securing AC generator (Figure 7, Item 1) to left-side vibration isolator (Figure 7, Item 4).
23. Pull AC generator (Figure 7, Item 1) to the rear, free of engine using lifting device.

NOTE

If AC generator rotor refuses to separate from engine, perform steps 24 through 26 to separate engine and rotor.

24. Saturate area where engine flywheel (Figure 6, Item 6) and drive plate (Figure 6, Item 5) are connected with penetrating oil.
25. Allow penetrating oil to soak for 1 hr.
26. Strike point of contact between engine flywheel (Figure 6, Item 6) and drive plate (Figure 6, Item 5) using a hammer and brass drift around circumference of flywheel (Figure 6, Item 6) until two components break free.

CAUTION

Be aware of generator set components, such as the output box, while maneuvering the AC generator (Figure 7, Item 1). Failure to comply may result in damage to equipment.

27. Remove AC generator (Figure 7, Item 1) from unit skid using suitable lifting device (Figure 5, Item 1).
28. Place AC generator (Figure 7, Item 1) on a suitable work surface.
29. Remove lifting device (Figure 5, Item 1) from AC generator lift ring (Figure 7, Item 1).
30. Remove two screws (Figure 7, Item 7) and nuts (Figure 7, Item 8) securing vibration isolator (Figure 7, Item 4) to skid. Discard vibration isolator (Figure 7, Item 4).
31. Remove two screws (Figure 7, Item 7) and nuts (Figure 7, Item 8) securing right-side vibration isolator (Figure 7, Item 4) to skid. Discard vibration isolator (Figure 7, Item 4).
32. Remove any remaining vibration isolator (Figure 7, Item 4) residue from mounts with dry cleaning solvent and wiping rag.
33. Install screen (Figure 3, Item 1) over AC generator and secure by installing screw (Figure 3, Item 4), new lock washer (Figure 3, Item 3), and flat washer (Figure 3, Item 2).

CAUTION

AC generator must be transported resting on the end bell. In this position, the rotor cannot slide out of the housing. Also, stabilize the rotor within the housing to prevent contact between the two components. Failure to do so may result in damage to equipment.

34. Place AC generator in its shipping container resting on the end bell.
35. Insert wooden wedges or similar soft material to stabilize the rotor inside the housing to prevent damage during shipment.

END OF TASK**Inspect 400 Hz AC Generator Assembly**

1. Inspect AC generator (Figure 7, Item 1) for damage and replace as required.
2. Inspect left and right AC generator mounts on skid (Figure 7, Item 1) for indications of structural weakness. Replace skid as required.
3. Inspect skid for damage, corrosion, cracks, or other indications of structural weakness. Replace skid as required.

END OF TASK

Install 400 Hz AC Generator Assembly

1. Clean mounting area, hardware, and surrounding skid area of dirt, debris, and grease using wiping rags and dry cleaning solvent.
2. Dispose of wiping rags IAW local SOP.
3. Apply a thin coat of multipurpose grease to mounting surfaces of drive plate (Figure 6, Item 5), fan (Figure 6, Item 4), and engine flywheel (Figure 6, Item 6) to minimize formation of galvanic corrosion between components.
4. Position new vibration isolators (Figure 7, Item 4) to left- and right-side generator and skid mount.
5. Secure left- and right-side vibration isolators (Figure 7, Item 4) with two screws (Figure 7, Item 7) and two nuts (Figure 7, Item 8) to skid. Tighten four nuts to 35 – 42 ft/lb (48 – 57 Nm).

NOTE

Perform steps 6 and 7 only if a new or refurbished 400 Hz AC generator is being installed.

6. Remove screw (Figure 3, Item 4), lock washer (Figure 3, Item 3), flat washer (Figure 3, Item 2), and screen (Figure 3, Item 1) from AC generator. Discard lock washer (Figure 3, Item 3).
7. Remove any material used to prevent the rotor from contacting the generator housing during shipping.
8. Attach suitable lifting device (Figure 5, Item 1) with chain (Figure 5, Item 2) to lift ring (Figure 5, Item 3) of AC generator (Figure 7, Item 1).
9. Position AC generator (Figure 7, Item 1) at its approximate mounting location on unit skid.
10. Insert screw (Figure 7, Item 6) with snubbing washer (Figure 7, Item 5) through new vibration isolators (Figure 7, Item 4) on generator skid mounts to align mounting holes.
11. Lower AC generator (Figure 7, Item 1) slowly, using lifting device (Figure 5, Item 1), until mounting holes on AC generator mounts align with mounting screws (Figure 7, Item 6).
12. Install flat washer (Figure 7, Item 3) and nut (Figure 7, Item 2) to each of two screws (Figure 7, Item 6) positioned in step 10 finger-tight.
13. Align AC generator (Figure 6, Item 1) with engine flywheel (Figure 6, Item 6).
14. Install four screws (Figure 6, Item 8) securing AC generator (Figure 6, Item 1) to flywheel housing (Figure 6, Item 7). Torque screws (Figure 6, Item 8) to 35 – 42 ft/lb (to 48 – 57 Nm).
15. Rotate engine harmonic balancer hex cap screw clockwise (as viewed from front of engine) using socket and breaker bar to align a mounting holes in AC generator drive plate (Figure 6, Item 5), fan (Figure 6, Item 4), and engine flywheel (Figure 6, Item 6) near the top of AC generator housing to ease installation of screw (Figure 6, Item 2).
16. Install screw (Figure 6, Item 2) without washer (Figure 6, Item 3) finger-tight.
17. Continue to rotate the crankshaft to align the remaining mounting holes one at a time near the top of AC generator housing.
18. Cut and discard wire ties installed during removal procedure to maintain orientation of AC generator drive plate (Figure 6, Item 5), fan (Figure 6, Item 4), and engine flywheel (Figure 6, Item 6) as they are presented.
19. Install remaining four screws (Figure 6, Item 2) and four washers (Figure 6, Item 3) finger-tight.
20. Continue to rotate the crankshaft to position the first mounting screw (Figure 6, Item 2) that does not have a washer near the top of AC generator housing.
21. Remove the first mounting screw (Figure 6, Item 2) and re-install mounting screw (Figure 6, Item 2) this time with a washer (Figure 6, Item 3).

22. Rotate crankshaft again to position screws (Figure 6, Item 2) near the top of AC generator housing and tighten screws (Figure 6, Item 2) to 39 – 46 ft/lb (53 – 63 Nm).
23. Tighten nuts (Figure 7, Item 2) installed in step 12 to 39 – 46 ft/lb (53 – 63 Nm).
24. Remove supporting wooden block (not shown) from under engine.
25. Remove lifting device (Figure 5, Item 1) from lift ring (Figure 5, Item 3) on AC generator (Figure 5, Item 1).

NOTE

Use tags applied to electrical wires and connectors during removal to aide in installation. Identification tags should remain in place until generator is completely reassembled and has been tested for proper operation.

26. Apply a thin coat of electrically conductive grease to all electrical connections prior to installation.
27. Connect wiring harness connector P85 (Figure 4, Item 6) to male connector (Figure 4, Item 7).
28. Connect wiring harness connector P90 (Figure 4, Item 5) to female connector (Figure 4, Item 8).
29. Connect 12 wire leads (Figure 4, Item 9) to voltage selection board in output box (Figure 4, Item 1) (WP 0058, Remove/Install Voltage Selection Board).
30. Install two finger retainers (Figure 4, Item 2) around six wire leads (Figure 4, Item 9) that exit the lower cutout in the output box (Figure 4, Item 1) and secure by installing two screws (Figure 4, Item 12) and two nuts (Figure 4, Item 11).
31. Install two finger retainers (Figure 4, Item 2) around six wire leads (Figure 4, Item 9) that exit the upper cutout in the output box (Figure 4, Item 1) and secure by installing two screws (Figure 4, Item 12) and two nuts (Figure 4, Item 11).
32. Position finger retainer assembly (Figure 4, Item 3) to its mounting location on output box (Figure 4, Item 1) and secure by installing two screws (Figure 4, Item 10).
33. Repeat step 32 to install the second finger retainer assembly (Figure 4, Item 3).
34. Install screen (Figure 3, Item 1) over AC generator and secure by installing screw (Figure 3, Item 4), new lock washer (Figure 3, Item 3), and flat washer (Figure 3, Item 2).
35. Install two wire leads (Figure 2, Item 2) to rear of AC generator (Figure 2, Item 1) using tags installed at removal as a guide.
36. Secure wire leads (Figure 2, Item 2) by installing screw (Figure 2, Item 4) and washer (Figure 2, Item 3) finger-tight.
37. Install ground strap (Figure 2, Item 8) to rear of AC generator (Figure 2, Item 1) and secure by installing screw (Figure 2, Item 5), new lock washer (Figure 2, Item 6), and washer (Figure 2, Item 7) finger-tight.
38. Tighten screw (Figure 2, Item 4) to torque value of 20 in/lb (2.5 Nm).
39. Tighten screw (Figure 2, Item 5) to torque value of 35-42 ft/lb (48-57 Nm).
40. Install and adjust engine speed sensor (WP 0081, Remove/Install Engine Speed Sensor).
41. Install fuel tank (WP 0050, Remove/Install Fuel Tank).
42. Install interior body panels (WP 0033, Remove/Install Interior Body Panels).
43. Install relay panel (WP 0041, Remove/Install Relay Panel).
44. Connect negative battery cable (WP 0036, Remove/Install Batteries).

45. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
46. Start engine, check for proper operation and repair as required. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
47. Check all fluid levels and top-up as required (TM 9-6115-751-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
TEST AC GENERATOR

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0163, Item 47)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0163, Item 48)

Materials/Parts

Bearing, rotor (WP 0123, Repair Parts List, Figure 23, Item 27)

Bearing, rotor (WP 0124, Repair Parts List, Figure 24, Item 19)

O-ring (1) (WP 0123, Figure 23, Item 5)

O-ring (1) (WP 0124, Figure 24, Item 33)

Exciter, rotor (WP 0123, Figure 23, Item 28)

Exciter, rotor (WP 0124, Figure 24, Item 20)

Nut, self-locking (13) (WP 0117, Repair Parts List, Figure 17, Item 14)

Nut, plain assembled (8) (WP 0123, Figure 23, Item 26)

Nut, plain assembled (8) (WP 0124, Figure 24, Item 18)

Rectifier, positive (WP 0123, Figure 23, Item 29)

Rectifier, positive (WP 0124, Figure 24, Item 24)

Rectifier, negative (1) (WP 0123, Figure 23, Item 30)

Rectifier, negative (1) (WP 0124, Figure 24, Item 21)

Resistor, voltage sensitive (1) (WP 0123, Figure 23, Item 24)

Resistor, voltage sensitive (1) (WP 0124, Figure 24, Item 16)

Materials/Parts

Stator, exciter (1) (WP 0123, Figure 23, Item 7)

Stator, exciter (1) (WP 0124, Figure 24, Item 35)

Resistor, voltage sensitive (1) (WP 0124, Figure 23, Item 16)

Washer, lock (9) (WP 0123, Figure 23, Item 19)

Washer, lock (10) (WP 0124, Figure 24, Item 12)

Washer, lock (4) (WP 0123, Figure 23, Item 31)

Washer, lock (4) (WP 0124, Figure 24, Item 23)

Washer, lock (4) (WP 0123, Figure 123, Item 8)

Washer, lock (4) (WP 0124, Figure 24, Item 36)

Cleaning compound, solvent (WP 0164, Expendable and Durable Items List, Item 11)

Rag, wiping (WP 0164, Item 32)

Personnel Required

91D (1)

Assistant (1)

References

Not Applicable

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Left-side body panel removed (WP 0031, Remove/Install Left-Side Body Panel)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

TEST AC GENERATOR**NOTE**

This WP is for testing 50/60 and 400 Hz AC generators. The first part of the procedure is for 50/60 Hz AC generators and the second part is for 400 Hz AC generators.

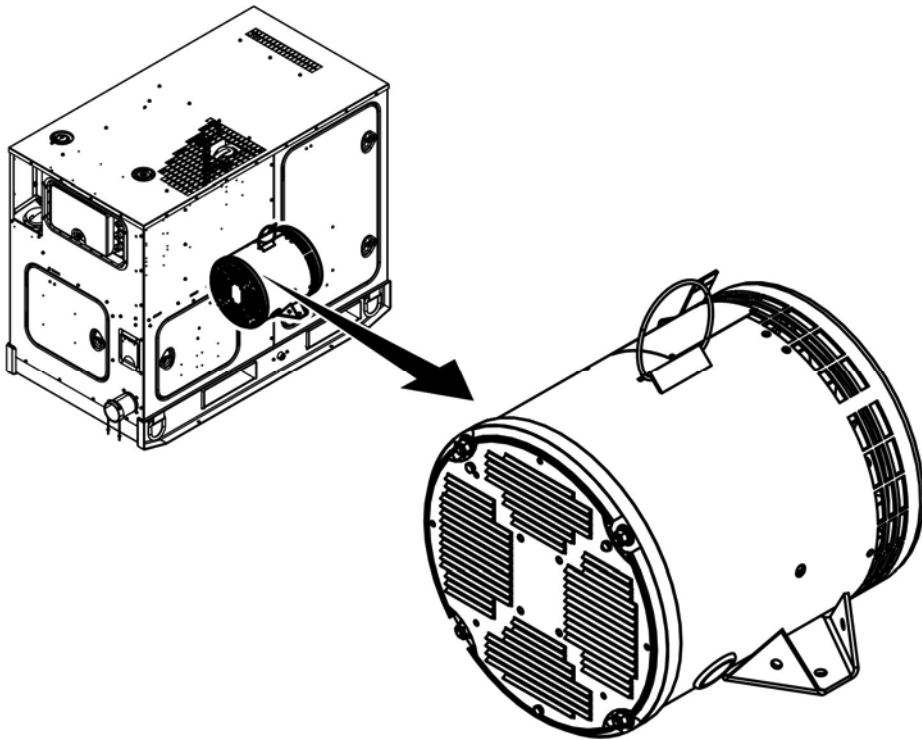
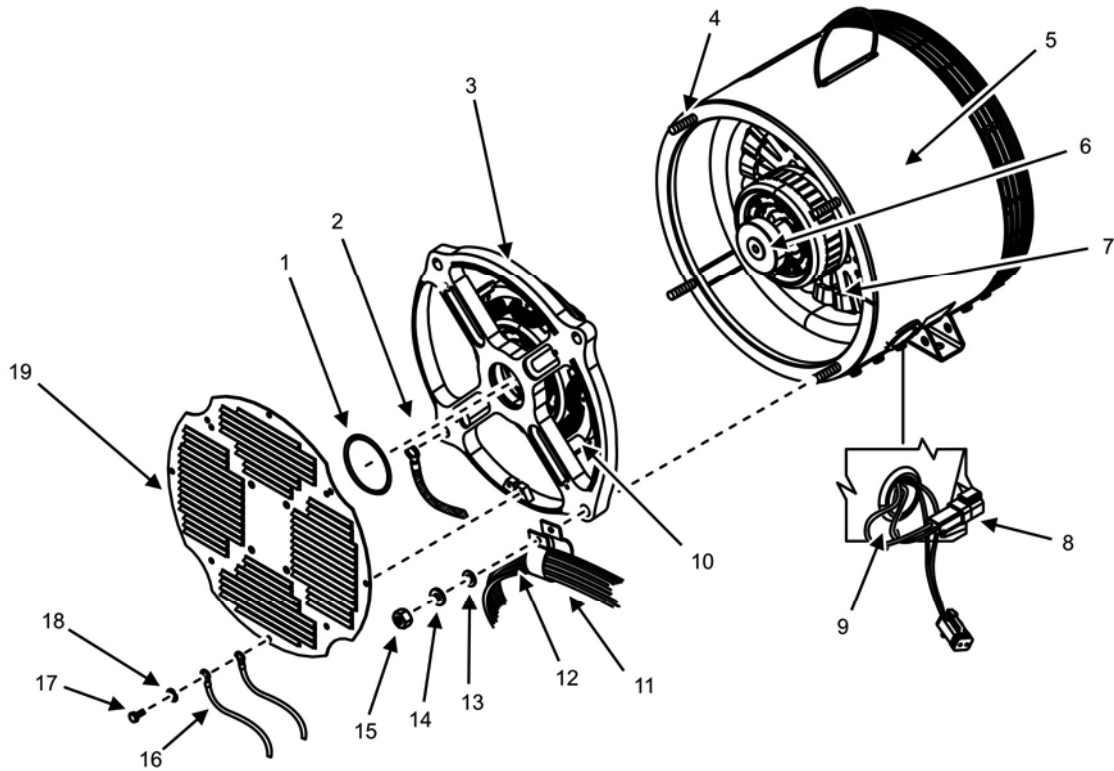
TEST 50/60 HZ AC GENERATOR**Remove End Bell**

Figure 1. 50/60 Hz AC Generator — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate AC generator on generator set skid (Figure 1).



Legend

- | | |
|----------------------------|---------------------------------|
| 1. O-Ring Packing | 11. Generator Output Wires |
| 2. Ground Strap | 12. Generator Output Wire Clamp |
| 3. End Bell | 13. Washer |
| 4. Through-Bolts | 14. Lock Washer |
| 5. Generator Stator | 15. Nut |
| 6. Bearing | 16. Shielded Wire Terminals |
| 7. Generator Rotor | 17. Screw |
| 8. P90 Plug | 18. External Tooth Lock Washer |
| 9. Wire Port | 19. End Bell Cover |
| 10. Exciter Stator Winding | |

Figure 2. 50/60 Hz Generator End Bell — Removal.

3. Place tag or mark on end bell cover (Figure 2, Item 19) and end bell (Figure 2, Item 3) to note relative position of end bell cover (Figure 2, Item 19) to end bell (Figure 2, Item 3).
4. Note location of shielded wire terminals (Figure 2, Item 16) to aid with installation.
5. Remove three screws (Figure 2, Item 17) and three external tooth lock washers (Figure 2, Item 18) that attach end bell cover (Figure 2, Item 19) and shielded wire terminals (Figure 2, Item 16) to end bell (Figure 2, Item 3).
6. Discard external tooth lock washers (Figure 2, Item 18).
7. Set end bell cover (Figure 2, Item 19) aside on suitable work surface.

8. Place tag or mark on end bell (Figure 2, Item 3) and generator stator (Figure 2, Item 5) to note relative position of end bell (Figure 2, Item 3) to generator stator (Figure 2, Item 5).
9. Remove four nuts (Figure 2, Item 15), four lock washers (Figure 2, Item 14), and four washers (Figure 2, Item 13) from through-bolts (Figure 2, Item 4). Discard lock washers (Figure 2, Item 14).
10. Note location of ground strap (Figure 2, Item 2) to aid with installation. Remove ground strap (Figure 2, Item 2).
11. Note location of generator output wires (Figure 2, Item 11) and generator output wire clamp (Figure 2, Item 12) to aid with installation. Remove generator output wires (Figure 2, Item 11) and generator output wire clamp (Figure 2, Item 12).
12. Place tag or mark on P90 wiring plug (Figure 2, Item 8) wires to indicate the length that wires extend from generator stator (Figure 2, Item 5).
14. Disconnect P90 wiring plug (Figure 2, Item 8) at generator output wire clamp (Figure 2, Item 12).
15. Withdraw P90 wiring plug (Figure 2, Item 8) connected to the exciter stator winding (Figure 2, Item 10) through wire port in generator stator (Figure 2, Item 9).

CAUTION

End bell (Figure 2, Item 3) can be removed safely with a pry bar by applying force evenly and alternately to opposite sides of the end bell (Figure 2, Item 3). Failure to comply may cause damage to equipment.

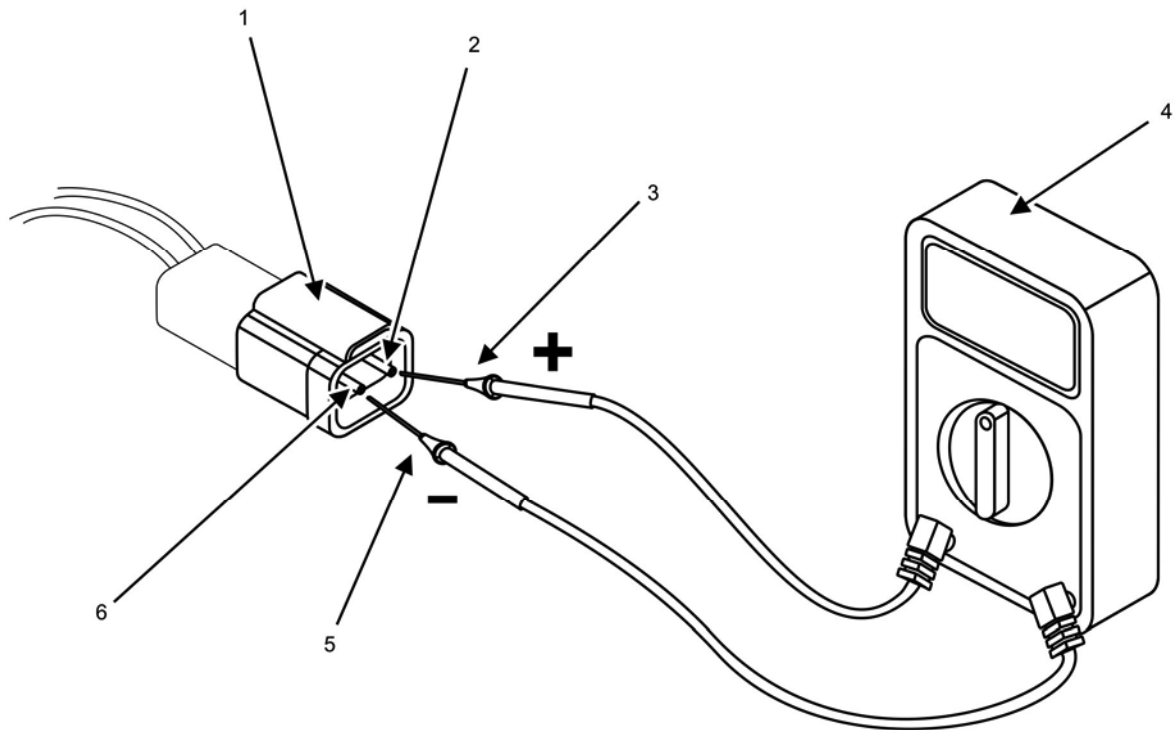
Use extreme caution when removing end bell (Figure 2, Item 3) from generator stator (Figure 2, Item 5). End bell (Figure 2, Item 3) is awkward to handle while using tools to remove and must be removed without any exciter stator winding (Figure 2, Item 10) contact with the generator rotor (Figure 2, Item 7). Failure to comply will cause damage to equipment.

NOTE

Assistance is required to perform step 16.

16. Remove end bell (Figure 2, Item 3) and exciter stator winding (Figure 2, Item 10) and place on a suitable work surface.
17. Remove O-ring packing (Figure 2, Item 1) from end bell (Figure 2, Item 3) and discard.
18. Inspect end bell cover (Figure 2, Item 19), end bell (Figure 2, Item 3), and exciter stator winding (Figure 2, Item 10) for signs of metal fractures or fatigue, damaged threads, loose or broken wires, damaged insulation, excessive heat, and/or odor of burned insulation. Replace as required.

END OF TASK

Test Exciter Stator Winding**Figure 3. Test 50/60 Hz Exciter Stator Winding — Detail.**

1. Select Ohms resistance function on multimeter (Figure 3, Item 4).
2. Touch either meter probe (Figure 3, Item 3 or 5) to either pin (Figure 3, Item 2 or 6) of P90 wiring plug (Figure 3, Item 1).
3. Touch second meter probe (Figure 3, Item 3 or 5) to second pin (Figure 3, Item 2 or 6) of P90 wiring plug (Figure 3, Item 1).
4. Observe and record value of resistance.
5. Touch either meter probe (Figure 3, Item 3 or 5) to either pin (Figure 3, Item 2 or 6) of P90 wiring plug (Figure 3, Item 1).
6. Touch second meter probe (Figure 3, Item 3 or 5) to a bare metal area (ground) of exciter stator winding (Figure 2, Item 10) frame.
7. Measure and record value of insulation resistance.

NOTE

The resistance value of the exciter stator winding (Figure 2, Item 10) obtained in step 4 should be 12.12 Ohms (Ω) \pm 10%. A resistance value of zero indicates a shorted exciter stator winding (Figure 2, Item 10), and a resistance value of infinity indicates an open exciter stator winding (Figure 2, Item 10).

The insulation resistance value of exciter stator winding (Figure 2, Item 10) to ground obtained in step 7 should be at least 1 megohm (M Ω).

8. Compare the resistance values obtained in step 4 and step 7 to specifications to determine if exciter stator winding (Figure 2, Item 10) is serviceable.
 - a. Proceed to Replace Exciter Stator Winding task if step 8 indicates that exciter stator winding (Figure 2, Item 10) is not serviceable.
 - b. Set end bell (Figure 2, Item 3) and exciter stator winding (Figure 2, Item 10) aside for installation if serviceable.

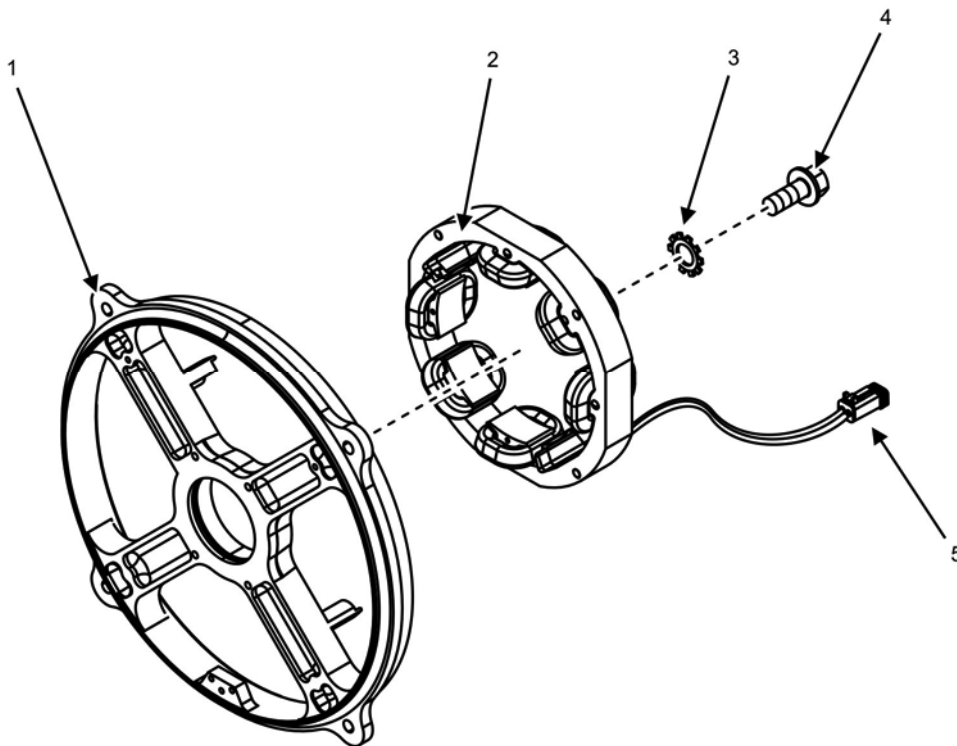
END OF TASK**Replace Exciter Stator Winding**

Figure 4. 50/60 Hz Exciter Stator Winding — Removal.

1. Note orientation of P90 wiring plug (Figure 4, Item 5) to aid with installation.
2. Remove four bolts (Figure 4, Item 4) and four external tooth lock washers (Figure 4, Item 3) that attach exciter stator winding (Figure 4, Item 2) to end bell (Figure 4, Item 1).
3. Discard lock washers (Figure 4, Item 3).

-
4. Remove exciter stator winding (Figure 4, Item 2) from end bell (Figure 4, Item 1).
 5. Examine machined surfaces of end bell (Figure 4, Item 1) for corrosion, dirt, and debris where exciter stator winding (Figure 4, Item 2) makes contact. Clean as required.
 6. Perform Test Exciter Stator Winding task on new exciter stator winding (Figure 4, Item 2).
 7. Examine mating surface of new exciter stator winding (Figure 4, Item 2) visually where it will contact end bell (Figure 4, Item 1).
 8. Remove any material from the surface of exciter stator winding (Figure 4, Item 2) that will interfere with mating surfaces of end bell (Figure 4, Item 1).
 9. Place exciter stator winding (Figure 4, Item 2) onto end bell (Figure 4, Item 1) using correct P90 wiring plug (Figure 4, Item 5) orientation noted in step 1.
 10. Align holes in exciter stator winding (Figure 4, Item 2) with matching holes in end bell (Figure 4, Item 1).
 11. Install four bolts (Figure 4, Item 4) and four new external tooth lock washers (Figure 4, Item 3) to attach exciter stator winding (Figure 4, Item 2) to end bell (Figure 4, Item 1).
 12. Tighten four bolts (Figure 4, Item 4) to torque value of 8 ft/lb (10 Nm).
 13. Set end bell (Figure 4, Item 1) and exciter stator winding (Figure 4, Item 2) aside for installation.

END OF TASK**Inspect Rectifier and Surge Suppressor**

1. Inspect rectifier plates (Figure 5, Items 2 and 5) for signs of corrosion, heat, or other damage. Replace as required.
2. Inspect surge suppressor (Figure 6, Item 6) for signs of corrosion, heat, or other damage. Replace as required.

END OF TASK

Test Rectifier

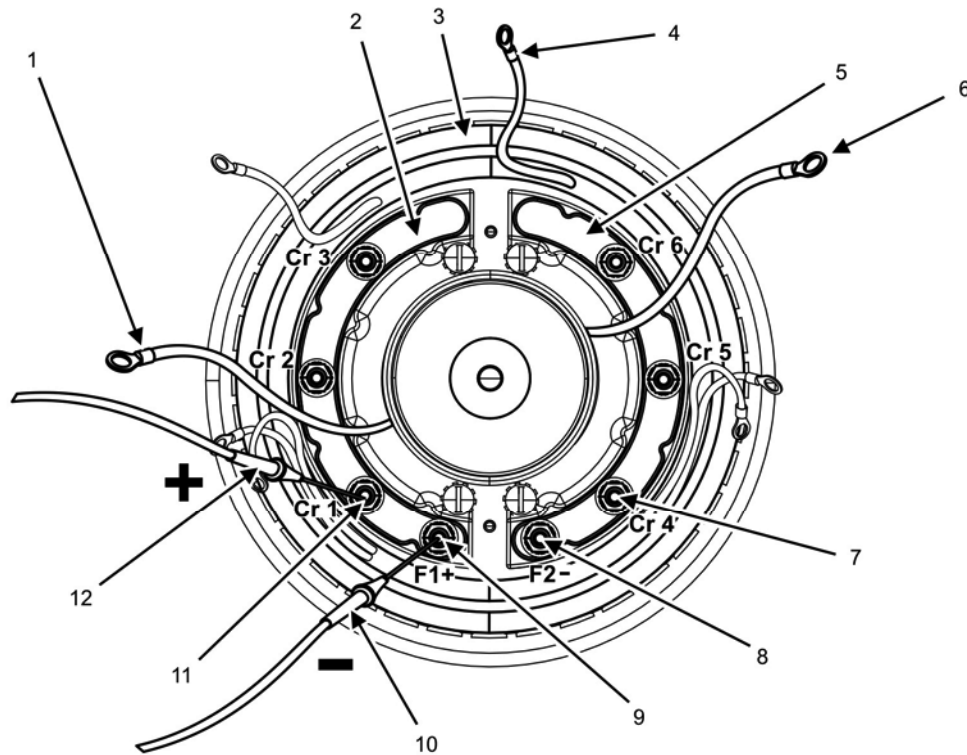


Figure 5. 50/60 Hz Test Rectifier, Exciter and Generator Rotor.

CAUTION

Both F1+ and F2- rectifier plates (Figure 5, Items 2 and 5) must be replaced if either rectifier plate (Figure 5, Items 2 or 5) or any diode fails testing. Failure to comply may cause damage to equipment.

If F1+ and F2- rectifier plates (Figure 5, Items 2 and 5) and Cr1 through Cr6 diodes are not marked as shown in Figure 5, it is imperative that each is identified before it is removed and marked or tagged according to Figure 5. Failure to comply may cause damage to equipment.

1. Mark or tag orientation of each rectifier plate (Figure 5, Items 2 and 5).

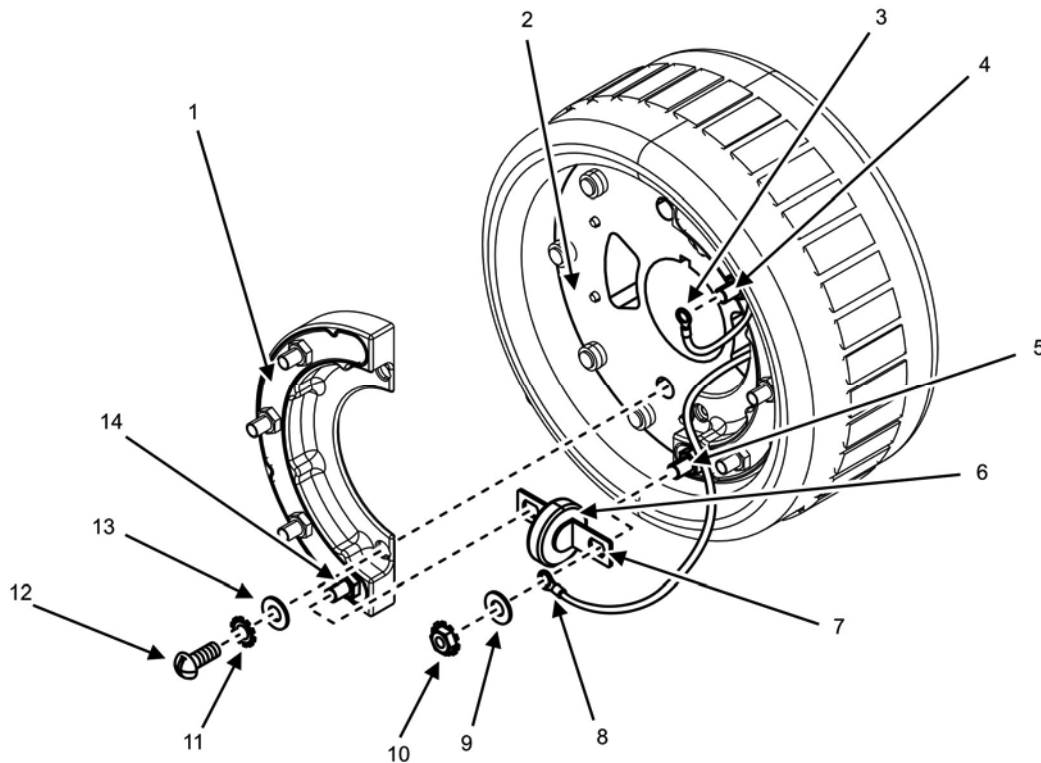


Figure 6. 50/60 Hz Rectifier Removal — Detail.

2. Mark or tag each wire (Figure 6, Items 3 and 8) as it is removed from diode and terminal studs (Figure 6, Items 4 and 5) to aid with installation.
3. Remove nut with captive external tooth lock washer (Figure 6, Item 10) and flat washer (Figure 6, Item 9) from F1+ terminal stud (Figure 6, Item 14).
4. Remove nut with captive external tooth lock washer (Figure 6, Item 10) and flat washer (Figure 6, Item 9) from F2- terminal stud (Figure 6, Item 5).
5. Discard two nuts with captive external tooth lock washers (Figure 6, Item 10).
6. Remove surge suppressor (Figure 6, Item 6) and place on suitable surface for testing.
7. Remove F1+ generator rotor wire (Figure 5, Item 1) from F1+ terminal (Figure 5, Item 9).
8. Remove F2- generator rotor wire (Figure 5, Item 6) from F2- terminal (Figure 5, Item 8).
9. Remove nut with captive external tooth lock washer (Figure 6, Item 10), flat washer (Figure 6, Item 9), and exciter rotor wire (Figure 5, Item 4) from diode Cr1 (Figure 5, Item 11).
10. Repeat step 9 for remaining diodes.
11. Discard six nuts with captive external tooth lock washers (Figure 6, Item 10).
12. Select Ohms resistance function on multimeter (Figure 3, Item 4).
13. Touch negative meter probe (Figure 5, Item 10) to F1+ terminal (Figure 5, Item 9) and positive meter probe (Figure 5, Item 12) to diode Cr1 (Figure 5, Item 11). Observe and record resistance value.
14. Touch positive meter probe (Figure 5, Item 12) to F1+ terminal (Figure 5, Item 9) and negative meter probe (Figure 5, Item 10) to diode Cr1 (Figure 5, Item 11). Observe and record resistance value.
15. Repeat steps 13 and 14 for remaining diodes of F1+ rectifier plate (Figure 5, Item 2).

16. Touch negative meter probe (Figure 5, Item 10) to F2- terminal (Figure 5, Item 8) and positive meter probe (Figure 5, Item 12) to diode Cr4 (Figure 5, Item 7). Observe and record resistance value.
17. Touch positive meter probe (Figure 5, Item 12) to F2- terminal (Figure 5, Item 8) and negative meter probe (Figure 5, Item 10) to diode Cr4 (Figure 5, Item 7). Observe and record resistance value.
18. Repeat steps 16 and 17 for remaining diodes of F2- rectifier plate (Figure 5, Item 5).

NOTE

Resistance value obtained in step 13 and step 17 should be $2.74 \text{ M}\Omega \pm 10\%$, and resistance value obtained in step 14 and step 16 should be greater than $27 \text{ M}\Omega$.

Resistance value obtained in step 14 and step 16 will typically be infinite resistance.

19. Compare resistance values obtained in steps 13 through 18 to specifications to determine if rectifier plates (Figure 5, Items 2 and 5) are serviceable.

NOTE

Rectifier plates (Figure 5, Items 2 and 5) may remain attached to exciter rotor (Figure 5, Item 3) unless further tests reveal the need to remove rectifier plates (Figure 5, Items 2 and 5).

20. Proceed to Test Surge Suppressor task if rectifier is serviceable.
21. Proceed to Replace Rectifier task if rectifier is not serviceable.

END OF TASK

Test Surge Suppressor

1. Select Ohms resistance function on multimeter (Figure 3, Item 4).
2. Touch positive meter probe (Figure 3, Item 3) to either connection point (Figure 6, Item 7) of surge suppressor (Figure 6, Item 6).
3. Touch negative meter probe (Figure 3, Item 5) to opposite connection point of surge suppressor (Figure 6, Item 6). Observe and note resistance value.
4. Reverse points of contact with meter probes (Figure 3, Items 3 and 5). Observe and note resistance value.

NOTE

Resistance value of surge suppressor (Figure 6, Item 6) should be equal when measured front-to-back and back-to-front. An acceptable value is greater than $1 \text{ M}\Omega$, and measured value will typically be infinite resistance.

5. Compare the resistance values obtained in step 3 and step 4 to specifications to determine if surge suppressor (Figure 6, Item 6) is serviceable.
6. Set surge suppressor (Figure 6, Item 6) aside for installation if serviceable or replace as required.

END OF TASK

Replace Rectifier

1. Remove two screws (Figure 6, Item 12), two external tooth lock washers (Figure 6, Item 11), two flat washers (Figure 6, Item 13), and F1+ rectifier plate (Figure 5, Item 2) from exciter rotor (Figure 5, Item 3).
2. Discard external tooth lock washers (Figure 6, Item 11).
3. Repeat steps 1 and 2 for F2- rectifier plate (Figure 5, Item 5).

4. Inspect mounting surface of exciter rotor (Figure 5, Item 3) where rectifier plates (Figure 5, Items 2 and 5) were attached and clean as required.
5. Perform Test Rectifier task, steps 12 through 19 on new rectifier plates (Figure 5, Items 2 and 5).
6. Align holes in F1+ rectifier plate (Figure 5, Item 2) with holes in exciter rotor (Figure 5, Item 3) using orientation noted in Test Rectifier task, step 1.
7. Install two flat washers (Figure 6, Item 13), two new external tooth lock washers (Figure 6, Item 11), and two screws (Figure 6, Item 12) to attach F1+ rectifier plate (Figure 6, Item 1) to exciter rotor (Figure 6, Item 2).
8. Repeat steps 6 and 7 for F2- rectifier plate (Figure 5, Item 5).

END OF TASK

Test Exciter Rotor Winding

NOTE

Exciter rotor wires (Figure 5, Item 4) are paired according to a specific order. The order of pairs is Cr1 to Cr4, Cr2 to Cr5, and Cr3 to Cr6.

1. Identify each of six numbered exciter rotor wire (Figure 5, Item 4) terminals.
2. Select Ohms resistance function on multimeter (Figure 3, Item 4).
3. Touch either meter probe (Figure 3, Item 3 or 5) to exciter rotor wire (Figure 5, Item 4) terminal identified as Cr1.
4. Touch second meter probe (Figure 3, Items 3 or 5) to exciter rotor wire (Figure 5, Item 4) terminal identified as Cr4.
5. Observe and record value of resistance.
6. Repeat steps 3 through 5 for remaining ordered pairs of exciter rotor wires (Figure 5, Item 4).
7. Touch either meter probe (Figure 3, Item 3 or 5) to exciter rotor wire (Figure 5, Item 4) terminal tagged or marked as Cr1.
8. Touch second meter probe to bare metal area (ground) of exciter rotor (Figure 5, Item 3).
9. Observe and record value of resistance.
10. Repeat steps 7 through 9 for remaining exciter rotor wires (Figure 5, Item 4) terminals tagged or marked as Cr 2 and Cr3.

NOTE

Resistance values obtained in steps 3 through 6 should be $0.5 \Omega \pm 10\%$. Accuracy of a multimeter is unreliable when measuring values lower than 1Ω . A measurement value greater than 1Ω or with a $\pm 10\%$ variance for any pair of wires indicates a defective exciter rotor (Figure 6, Item 2).

Resistance values obtained in step 7 through 10 of each wire to ground should be at least $1 M\Omega$.

11. Compare resistance values obtained in steps 3 through 6 and steps 7 through 10 to specifications to determine if exciter rotor (Figure 6, Item 2) is serviceable.
12. Proceed to Test Generator Rotor Winding task if exciter rotor (Figure 5, Item 3) is serviceable.

END OF TASK

Test Generator Rotor Winding

1. Identify generator rotor winding wires tagged or marked F1+ (Figure 5, Item 1) and F2- (Figure 5, Item 6).
2. Select Ohms resistance function on multimeter (Figure 3, Item 4).
3. Touch either meter probe (Figure 3, Item 3 or 5) to F1+ generator rotor wire (Figure 5, Item 1) terminal.
4. Touch second meter probe (Figure 3, Items 3 or 5) to F2- generator rotor wire (Figure 5, Item 6) terminal.
5. Observe and record value of resistance.
6. Touch either meter probe (Figure 3, Item 3 or 5) to F1+ generator rotor wire (Figure 5, Item 1) terminal.
7. Touch second meter probe (Figure 3, Item 3 or 5) to bare metal area (ground) of generator rotor (Figure 2, Item 7).
8. Observe and record value of resistance.

NOTE

Resistance value obtained in steps 3 through 5 should be $2.68 \Omega \pm 10\%$. Measurement value of infinity indicates an open generator rotor winding.

Resistance value obtained in step 6 through 8 of generator rotor winding to ground should be at least 1 M Ω .

9. Compare resistance values obtained in steps 3 through 5 and steps 6 through 8 to specifications to determine if generator rotor winding is serviceable.
10. Proceed to Test Generator Stator Winding task if generator rotor winding is serviceable.

END OF TASK

Test Generator Stator Winding

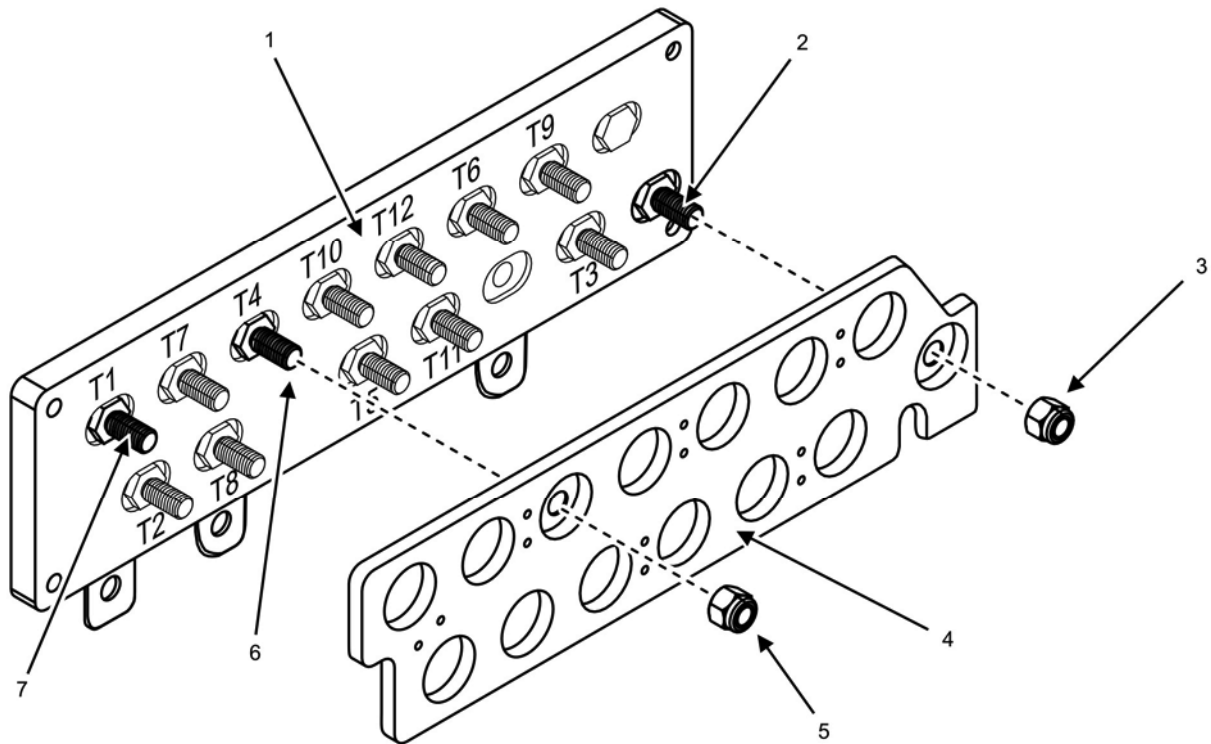


Figure 7. Test 50/60 Hz Generator Stator Winding.

NOTE

Generator stator output wire connections and T1 through T12 markings are not visible from the front of voltage selection board. T1 through T12 markings are shown for identifying generator stator output wire connections from the front. The order of stator output wire connections is: T1 – T4, T2 – T5, T3 – T6, T7 – T10, T8 – T11, and T9 – T12.

1. Note voltage selected on voltage selection moveable board (Figure 7, Item 4) to aid with installation.
2. Remove 12 lock nuts (Figure 7, Item 5) that engage electrical reconnection studs (Figure 7, Items 6 and 7) of voltage selection board (Figure 7, Item 1).
3. Remove one lock nut (Figure 7, Item 3) that engage mechanical reconnection stud (Figure 7, Item 2) of voltage selection board (Figure 7, Item 1).
4. Discard lock nuts (Figure 7, Items 3 and 5).
5. Remove voltage selection moveable board (Figure 7, Item 4) and set aside for installation.
6. Select Ohms resistance function on multimeter (Figure 3, Item 4).
7. Touch either meter probe (Figure 3, Item 3 or 5) to reconnection stud marked T1 (Figure 7, Item 7).
8. Touch second meter probe (Figure 3, Item 3 or 5) to reconnection stud marked T4 (Figure 7, Item 6).
9. Observe and record value of resistance.
10. Repeat steps 7 through 9 for remaining reconnection studs.
11. Touch either meter probe (Figure 3, Item 3 or 5) to reconnection stud marked T1 (Figure 7, Item 7).

12. Touch second meter probe (Figure 3, Item 3 or 5) to bare metal area (ground) of generator stator (Figure 2, Item 5).
13. Observe and record value of resistance.
14. Repeat steps 11 through 13 for reconnection studs marked T2, T3, T7, T8, and T9.

NOTE

Resistance values obtained in steps 7 through 9 should be $0.154 \Omega \pm 10\%$. Accuracy of a multimeter is unreliable when measuring values lower than 1Ω . Measurement value of infinity or more than 1Ω for any pair of wires indicates a defective generator stator (Figure 2, Item 5).

Resistance values obtained in steps 11 through 14 of each reconnection stud to ground should be at least $1 M\Omega$.

15. Compare resistance values obtained in steps 7 through 9 and steps 11 through 14 to specifications to determine if generator stator (Figure 2, Item 5) is serviceable.

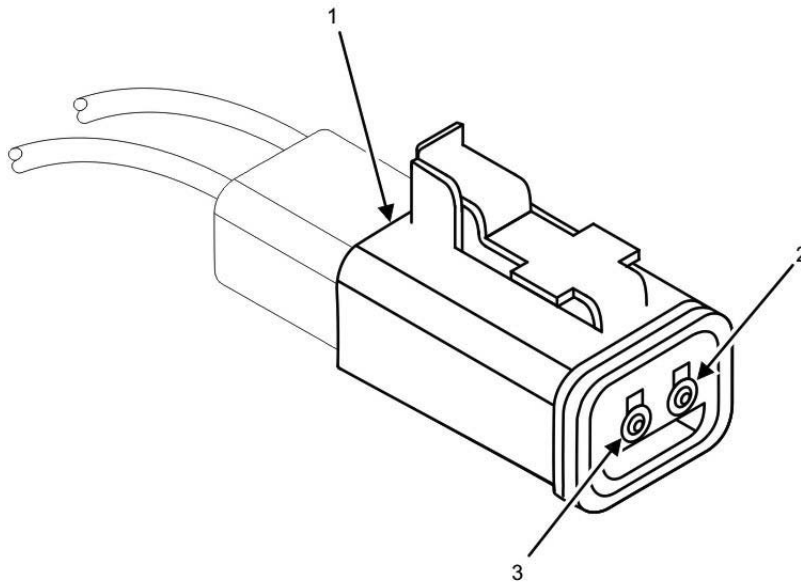


Figure 8. Test 50/60 Hz Generator Stator Q1/Q2 Winding — Detail.

16. Locate and disconnect Q1/Q2 wiring plug (Figure 8 Item 1) at wire port in generator stator (Figure 2, Item 9).
17. Select Ohms resistance function on multimeter (Figure 3, Item 4).
18. Touch either meter probe (Figure 3, Item 3 or 5) to either wiring plug (Figure 8, Item 1) connector (Figure 8, Item 2 or 3).
19. Touch second meter probe (Figure 3, Item 3 or 5) to second wiring plug (Figure 8, Item 1) connector (Figure 8, Item 2 or 3).
20. Observe and record value of resistance.
21. Touch either meter probe (Figure 3, Item 3 or 5) to either wiring plug (Figure 8, Item 1) connector (Figure 8, Item 2 or 3).
22. Touch second meter probe (Figure 3, Item 3 or 5) to bare metal area (ground) of generator stator (Figure 2, Item 5).
23. Observe and record value of resistance.

NOTE

Resistance value obtained in steps 15 through 17 should be $0.967 \Omega \pm 10\%$. Accuracy of a multimeter is unreliable when measuring values lower than 1Ω . Measurement value of infinity or greater than 1Ω for any pair of wires indicates a defective generator stator (Figure 2, Item 5).

Resistance value obtained in steps 18 through 20 to ground should be at least $1 M\Omega$.

24. Compare resistance values obtained in steps 15 through 17 and steps 18 through 20 to specifications to determine if generator stator (Figure 2, Item 5) is serviceable.
25. Complete Assemble Voltage Selection Board task if generator stator (Figure 2, Item 5) is serviceable.

END OF TASK**Assemble Voltage Selection Board**

1. Place voltage selection front board (Figure 7, Item 4) onto voltage selection board (Figure 7, Item 1) at voltage selected position noted in Test Generator Stator Winding, step 1.
2. Position 13 new lock nuts (Figure 7, Items 3 and 5) onto reconnection studs (Figure 7, Items 2 and 7).
3. Tighten nuts (Figure 7, Items 3 and 5) to torque value of 1.8-2.2 ft/lb (2.5-3 Nm).

END OF TASK

Inspect Bearing

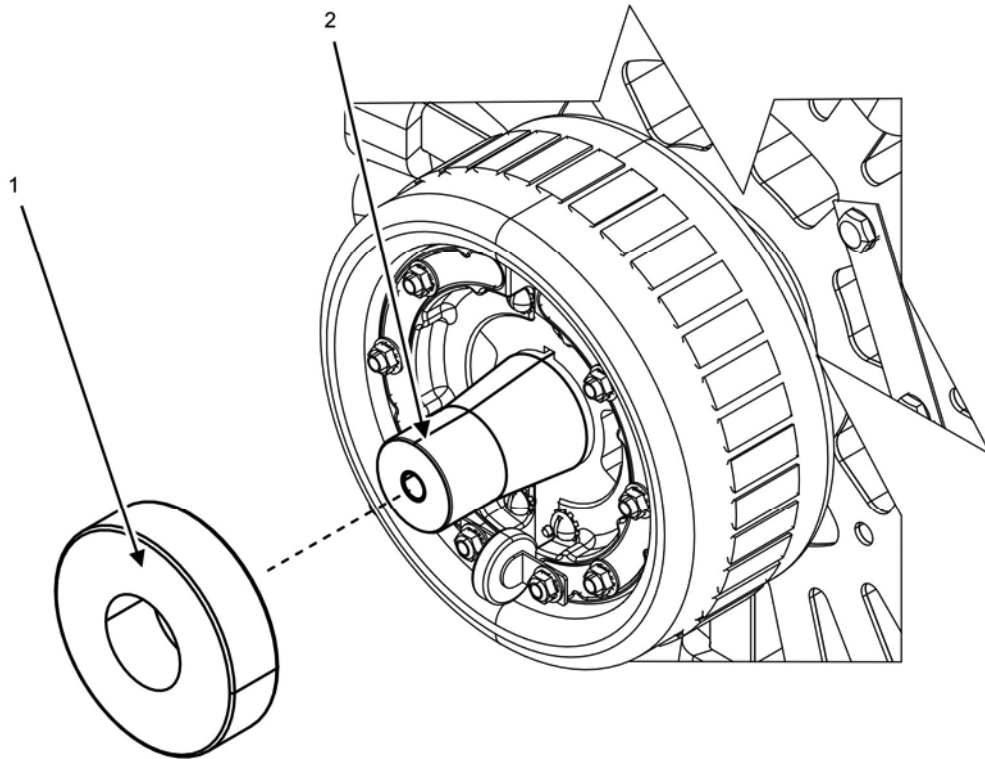


Figure 9. 50/60 Hz Generator Bearing Removal — Detail.

1. Examine bearing (Figure 9, Item 1) for discoloration and corrosion that are signs of heat and contamination damage.
2. Touch outer race of bearing (Figure 9, Item 1) lightly with fingertips and rotate slowly in a back-and-forth motion to feel and listen for any signs of roughness and/or lack of lubrication.
3. Proceed to Replace Bearing task if any signs of damage are found or if bearing (Figure 9, Item 1) does not rotate freely.

END OF TASK

Replace Bearing

1. Attach bearing puller to bearing (Figure 9, Item 1).

CAUTION

When a bearing (Figure 9, Item 1) is removed for any reason, always install a new bearing (Figure 9, Item 1). Failure to comply may cause damage to equipment.

2. Remove bearing (Figure 9, Item 1) from generator rotor shaft (Figure 9, Item 2).
3. Clean bearing surface of generator rotor shaft (Figure 9, Item 2).
4. Press new bearing (Figure 9, Item 1) onto generator rotor shaft (Figure 9, Item 2).

END OF TASK

Install End Bell

1. Perform Test Surge Suppressor task on new surge suppressor (Figure 6, Item 6).
2. Place surge suppressor (Figure 6, Item 6) onto F1+ terminal stud (Figure 6, Item 14) and F2- terminal stud (Figure 6, Item 5).
3. Place F1+ generator rotor wire (Figure 5, Item 1) onto F1+ terminal stud (Figure 5, Item 9).
4. Install flat washer (Figure 6, Item 9) and new nut with captive external tooth lock washer (Figure 6, Item 10) onto F1+ terminal stud (Figure 6, Item 14).
5. Place F2- generator rotor wire (Figure 5, Item 6) onto F2- terminal stud (Figure 5, Item 8).
6. Install flat washer (Figure 6, Item 9) and new nut with captive external tooth lock washer (Figure 6, Item 10) onto F2- terminal stud (Figure 6, Item 5).
7. Place exciter rotor wire (Figure 5, Item 4) tagged or marked Cr1 onto diode tagged or marked Cr1 (Figure 5, Item 11).
8. Install flat washer (Figure 6, Item 9) and new nut with captive external tooth lock washer (Figure 6, Item 10) onto diode tagged or marked Cr1 (Figure 5, Item 11).
9. Repeat steps 7 through 8 for remaining exciter rotor wires (Figure 5, Item 4) and diodes marked Cr2 through Cr6.
10. Remove tags or marks that will interfere with generator operation.
11. Install new O-ring packing (Figure 2, Item 1) into end bell (Figure 2, Item 3).
12. Insert P90 wiring plug (Figure 2, Item 8) through wire port in generator stator (Figure 2, Item 9).

CAUTION

Use extreme caution when installing end bell (Figure 2, Item 3) onto generator stator (Figure 2, Item 5). End bell (Figure 2, Item 3) is awkward to handle and must be installed without any exciter stator winding (Figure 2, Item 10) contact with the generator rotor (Figure 2, Item 7). Failure to comply will cause damage to equipment.

13. Align tag or mark on end bell (Figure 2, Item 3) with corresponding tag or mark on generator stator (Figure 2, Item 5).
14. Push end bell (Figure 2, Item 3) mating surface evenly into matching machined surface of generator stator (Figure 2, Item 5).

NOTE

End bell (Figure 2, Item 3) may resist installation onto bearing (Figure 2, Item 6). Use a tool that will not damage end bell (Figure 2, Item 3) to tap various points around outside of bearing mating surface until end bell (Figure 2, Item 3) machined surface makes contact with generator stator (Figure 2, Item 5) machined surface.

15. Examine area between end bell (Figure 2, Item 3) machined surface and generator stator (Figure 2, Item 5) machined surface to ensure distance is even.
16. Install four washers (Figure 2, Item 13) and four nuts (Figure 2, Item 15) without lock washers (Figure 2, Item 14) onto through-bolts (Figure 2, Item 4).
17. Tighten each nut (Figure 2, Item 15) gradually in crisscross sequence using the same number of turns each time for each nut (Figure 2, Item 15) to draw the end bell (Figure 2, Item 3) onto generator stator (Figure 2, Item 5).
18. Verify end bell (Figure 2, Item 3) machined surface has fully engaged generator stator (Figure 2, Item 5) machined surface.

19. See Remove End Bell task, steps 9, 15, and 16 if end bell (Figure 2, Item 3) machined surface does not fully engage the generator stator (Figure 2, Item 5) machined surface. Repeat steps 14 through 19 as required.
20. Loosen four nuts (Figure 2, Item 15) that attach end bell (Figure 2, Item 3) to generator stator (Figure 2, Item 5) one-half to three-quarters turn.
21. Remove lower two nuts (Figure 2, Item 15) and two washers (Figure 2, Item 13) that attach end bell (Figure 2, Item 3) to generator stator (Figure 2, Item 5).
22. Install ground strap (Figure 2, Item 2) according to location noted in Remove End Bell task, step 11.
23. Install generator output wires (Figure 2, Item 11) and generator output wire clamp (Figure 2, Item 12) according to location noted in Remove End Bell task, step 12.
24. Install two washers (Figure 2, Item 13), two new lock washers (Figure 2, Item 14), and two nuts (Figure 2, Item 15) onto lower two through-bolts (Figure 2, Item 4).
25. Remove upper two nuts (Figure 2, Item 15) and two washers (Figure 2, Item 13) that attach end bell (Figure 2, Item 3) to generator stator (Figure 2, Item 5).
26. Install two washers (Figure 2, Item 13), two new lock washers (Figure 2, Item 14), and two nuts (Figure 2, Item 15) onto upper two through-bolts (Figure 2, Item 4).
27. Tighten four nuts (Figure 2, Item 15) to torque value of 17-21 ft/lb (23-29 Nm).
28. Remove tags or marks that will interfere with generator operation.
29. Pull excess P90 wiring plug (Figure 2, Item 8) wire from wire port in generator stator (Figure 2, Item 9) to length tagged or marked in Remove End Bell task, step 13.
30. Align holes in end bell cover (Figure 2, Item 19) with matching holes in end bell (Figure 2, Item 3).
31. Install upper two screws (Figure 2, Item 17) and two new external tooth lock washers (Figure 2, Item 18) to loosely attach end bell cover (Figure 2, Item 19) to end bell (Figure 2, Item 3).
32. Install screw (Figure 2, Item 17), new external tooth lock washer (Figure 2, Item 18), and two shielded wire terminals (Figure 2, Item 16) according to location noted in Remove End Bell task, step 4 into lower end bell cover (Figure 2, Item 19) hole.
33. Tighten three screws (Figure 2, Item 17) to torque value of 20 in/lb (20.5 Nm).
34. Remove tags or marks that will interfere with generator operation.
35. Connect P90 wiring plug (Figure 2, Item 8) at generator output wire clamp (Figure 2, Item 12).
36. Install left-side body panel (WP 0031, Remove/Install Left-Side Body Panel).
37. Close generator set doors.
36. Set engine control switch to PRIME & RUN (TM 9-6115-751-10).
37. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
38. Repair as required.

END OF TASK

TEST 400 HZ AC GENERATOR

Remove End Bell

1. Ensure equipment conditions are met in order presented in initial setup.

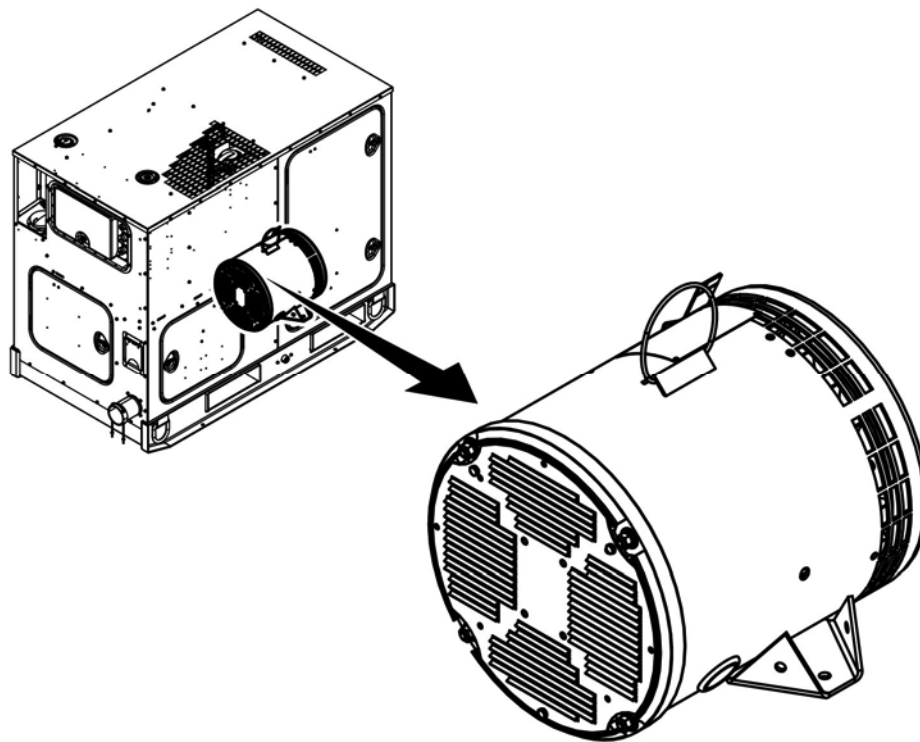
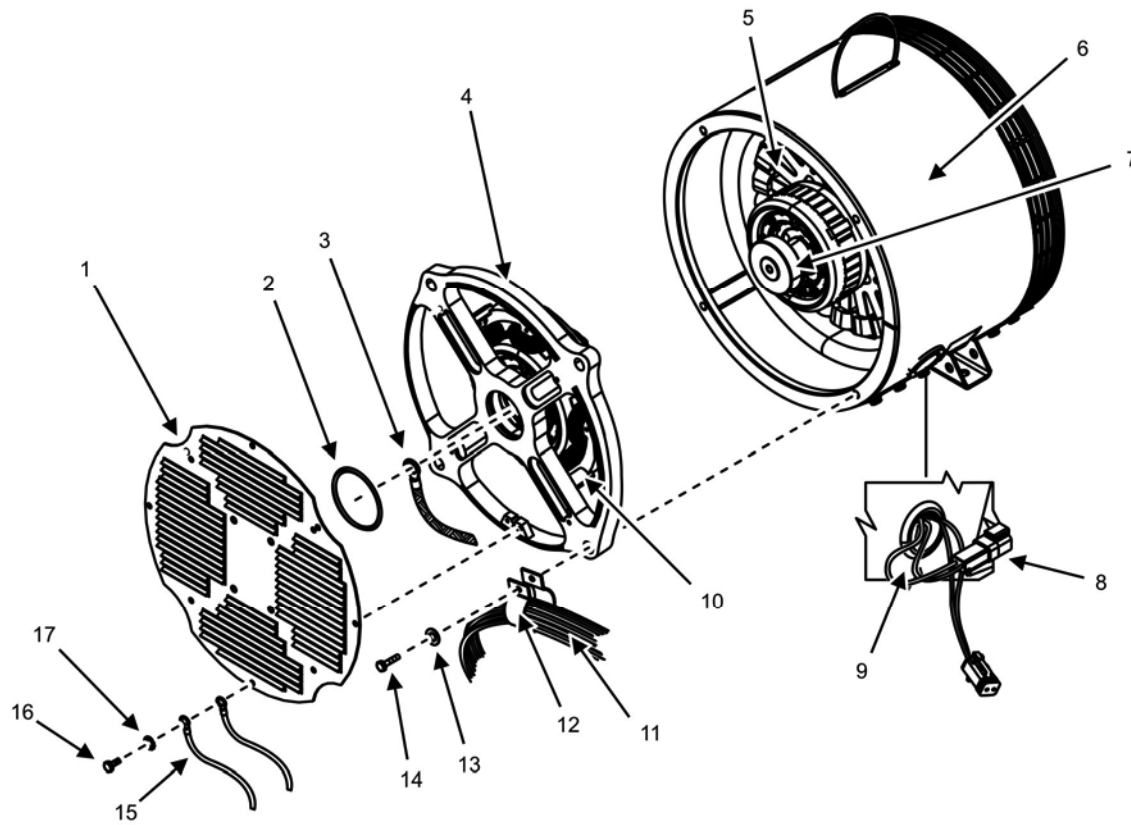


Figure 10. 400 Hz AC Generator — Location.

2. Locate AC generator on generator set skid (Figure 10).



Legend

- | | |
|---------------------|---------------------------------|
| 1. End Bell Cover | 10. Exciter Stator Winding |
| 2. O-Ring Packing | 11. Generator Output Wires |
| 3. Ground Strap | 12. Generator Output Wire Clamp |
| 4. End Bell | 13. Washer |
| 5. Generator Rotor | 14. Bolt |
| 6. Generator Stator | 15. Shielded Wire Terminals |
| 7. Bearing | 16. Screw |
| 8. P90 Plug | 17. External Tooth Lock Washer |
| 9. Wire Port | |

Figure 11. 400 Hz generator End Bell — Removal.

3. Place tag or mark on end bell cover (Figure 11, Item 1) and end bell (Figure 11, Item 4) to note relative position of end bell cover (Figure 11, Item 1) to end bell (Figure 11, Item 4).
4. Note location of shielded wire terminals (Figure 11, Item 15) to aid with installation.
5. Remove three screws (Figure 11, Item 16) and three external tooth lock washers (Figure 11, Item 17) that attach end bell cover (Figure 11, Item 1) and shielded wire terminals (Figure 11, Item 15) to end bell (Figure 11, Item 4).
6. Discard three external tooth lock washers (Figure 11, Item 17).
7. Set end bell cover (Figure 11, Item 1) aside on suitable work surface for inspection.

8. Place tag or mark on end bell (Figure 11, Item 4) and generator stator (Figure 11, Item 6) to note relative position of end bell (Figure 11, Item 4) to generator stator (Figure 11, Item 6).
9. Note location of ground strap (Figure 11, Item 3) to aid with installation.
10. Note location of generator output wires (Figure 11, Item 11) and generator output wire clamp (Figure 11, Item 12) to aid with installation.
11. Remove four bolts (Figure 11, Item 14) and four washers (Figure 11, Item 13) that attach end bell (Figure 11, Item 4) to generator stator (Figure 11, Item 6).
12. Place tag or mark on P90 wiring plug (Figure 11, Item 8) wires to indicate the length that wires extend from generator stator (Figure 11, Item 6).
13. Disconnect P90 wiring plug (Figure 11, Item 8) located at generator output wire clamp (Figure 11, Item 12).
14. Withdraw P90 wiring plug (Figure 11, Item 8) connected to the exciter stator winding (Figure 11 Item 10) through wire port in generator stator (Figure 11, Item 6).

CAUTION

End bell (Figure 11, Item 4) can be removed safely with a pry bar by applying force evenly and alternately to opposite sides of the end bell (Figure 11, Item 4). Failure to comply may cause damage to equipment.

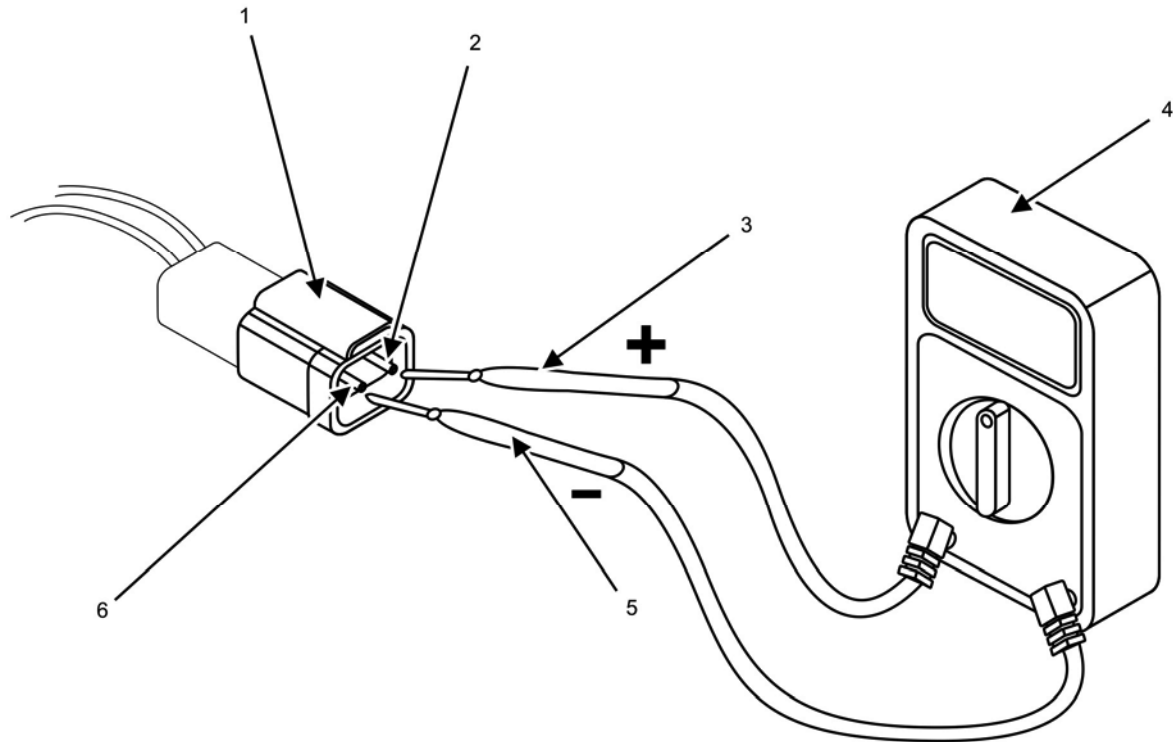
Use extreme caution when removing end bell (Figure 11, Item 4) from generator stator (Figure 11, Item 6). End bell (Figure 11, Item 4) is awkward to handle while using tools to remove and must be removed without any exciter stator winding (Figure 11, Item 10) contact with the generator rotor (Figure 11, Item 5). Failure to comply will cause damage to equipment.

NOTE

Assistance is required to perform step 15.

15. Remove end bell (Figure 11, Item 4) and exciter stator winding (Figure 11, Item 10) and place on a suitable work surface.
16. Remove O-ring packing (Figure 11, Item 2) from end bell (Figure 11, Item 4) and discard.
17. Inspect end bell cover (Figure 11, Item 1), end bell (Figure 11, Item 4), and exciter stator winding (Figure 11, Item 10) for signs of metal fractures or fatigue, damaged threads, loose or broken wires, damaged insulation, excessive heat, and/or odor of burned insulation. Replace as required.

END OF TASK

Test Exciter Stator Winding**Figure 12. Test 400 Hz Exciter Stator Winding — Detail.**

1. Select Ohms resistance function on multimeter (Figure 12, Item 4).
2. Touch either meter probe (Figure 12, Item 3 or 5) to either pin (Figure 12, Item 2 or 6) of P90 wiring plug (Figure 12, Item 1).
3. Touch second meter probe (Figure 12, Item 3 or 5) to second pin (Figure 12, Item 2 or 6) of P90 wiring plug (Figure 12, Item 1).
4. Observe and record value of resistance.
5. Touch either meter probe (Figure 12, Item 3 or 5) to either pin (Figure 12, Item 2 or 6) of P90 wiring plug (Figure 12, Item 1).
6. Touch second meter probe (Figure 12, Item 3 or 5) to a bare metal area (ground) of exciter stator winding (Figure 11, Item 10).
7. Measure and record value of insulation resistance.

NOTE

Resistance value of exciter stator winding (Figure 11, Item 10) obtained in step 4 should be $12.12 \Omega \pm 10\%$. A resistance value of zero indicates a shorted exciter stator winding (Figure 11, Item 10) and a resistance value of infinity indicates an open exciter stator winding (Figure 11, Item 10).

Insulation resistance value of exciter stator winding (Figure 11, Item 10) to ground obtained in step 7 should be at least 1 M Ω .

8. Compare resistance values obtained in step 4 and step 7 to specifications to determine if exciter stator winding (Figure 11, Item 10) is serviceable.
 - a. Proceed to Replace Exciter Stator Winding task if exciter stator winding (Figure 11, Item 10) is not serviceable.
 - b. Set end bell (Figure 11, Item 4) and exciter stator winding (Figure 11, Item 10) aside for installation if serviceable.

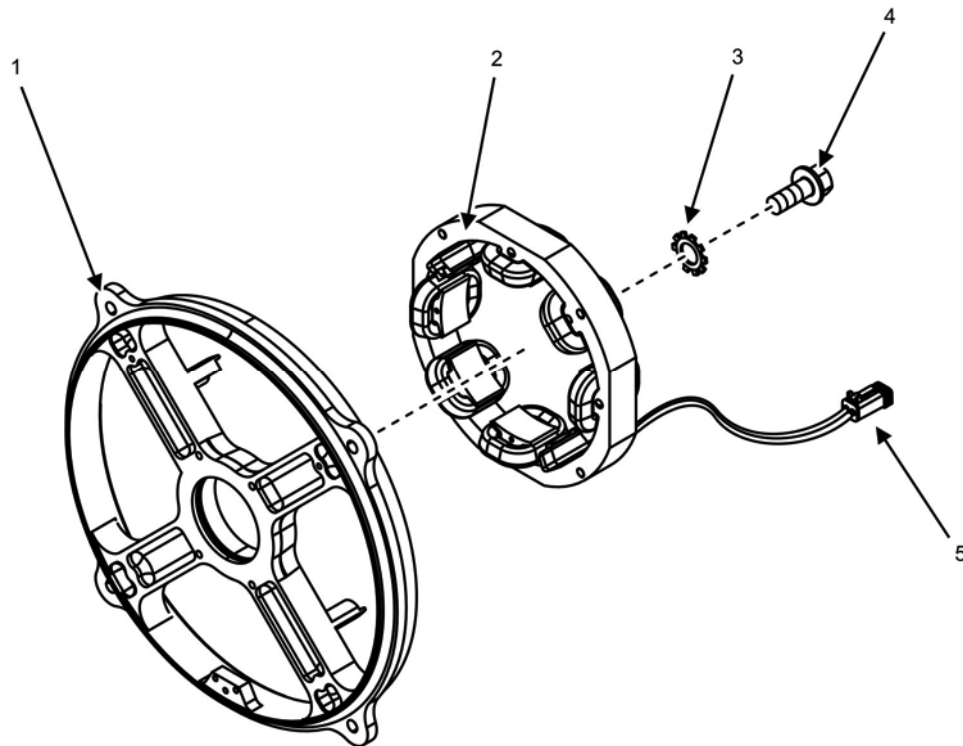
END OF TASK**Replace Exciter Stator Winding**

Figure 13. 400 Hz Exciter Stator Winding — Removal.

1. Note orientation of P90 wiring plug (Figure 13, Item 5) to aid with installation.
2. Remove four bolts (Figure 13, Item 4) and four external tooth lock washers (Figure 13, Item 3) that attach exciter stator winding (Figure 13, Item 2) to end bell (Figure 13, Item 1).
3. Discard four external tooth lock washers (Figure 13, Item 3).
4. Remove exciter stator winding (Figure 13, Item 2) from end bell (Figure 13, Item 1).

-
14. Examine machined surfaces of end bell (Figure 13, Item 1) for corrosion, dirt, and debris where exciter stator winding (Figure 13, Item 2) makes contact. Clean as required.
 15. Perform Test Exciter Stator Winding task on new exciter stator winding (Figure 13, Item 2).
 16. Examine mating surface of new exciter stator winding (Figure 13, Item 2) visually where it will contact end bell (Figure 13, Item 1).
 17. Remove any material from the surface of exciter stator winding (Figure 13, Item 2) that will interfere with mating surfaces of end bell (Figure 13, Item 1).
 18. Place exciter stator winding (Figure 13, Item 2) onto end bell (Figure 13, Item 1) using correct P90 wiring plug (Figure 13, Item 5) orientation noted in step 1.
 19. Align holes in exciter stator winding (Figure 13, Item 2) with matching holes in end bell (Figure 13, Item 1).
 20. Install four bolts (Figure 13, Item 4) and four new external tooth lock washers (Figure 13, Item 3) to attach exciter stator winding (Figure 13, Item 2) to end bell (Figure 13, Item 1).
 21. Tighten four bolts (Figure 13, Item 4) to torque value of 8 ft/lb (10 Nm).
 22. Set end bell (Figure 13, Item 1) and exciter stator winding (Figure 13, Item 2) aside for installation.

END OF TASK**Inspect Rectifier and Surge Suppressor**

1. Inspect rectifier plates (Figure 14, Items 2 and 5) for signs of corrosion, heat, or other damage. Replace as required.
2. Inspect surge suppressor (Figure 15, Item 6) for signs of corrosion, heat, or other damage. Replace as required.

END OF TASK

Test Rectifier

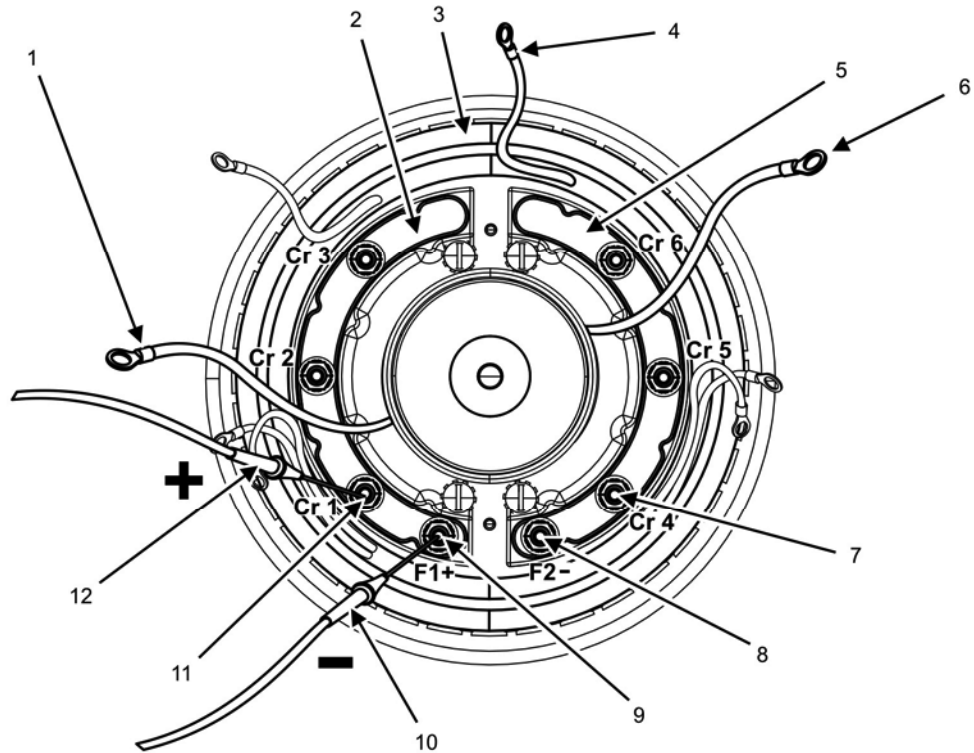


Figure 14. Test 400 Hz Rectifier, Exciter and Generator Rotor.

CAUTION

Both F1+ and F2- rectifier plates (Figure 14, Items 2 and 5) must be replaced if either rectifier plate (Figure 14, Items 2 or 5) or any diode fails testing. Failure to comply may cause damage to equipment.

If the F1+ and F2- rectifier plates (Figure 14, Items 2 and 5) and Cr1 through Cr6 diodes are not marked as shown in Figure 14, it is imperative that each is identified before it is removed and marked or tagged according to Figure 14. Failure to comply may cause damage to equipment.

1. Mark or tag orientation of each rectifier plate (Figure 14, Items 2 and 5).

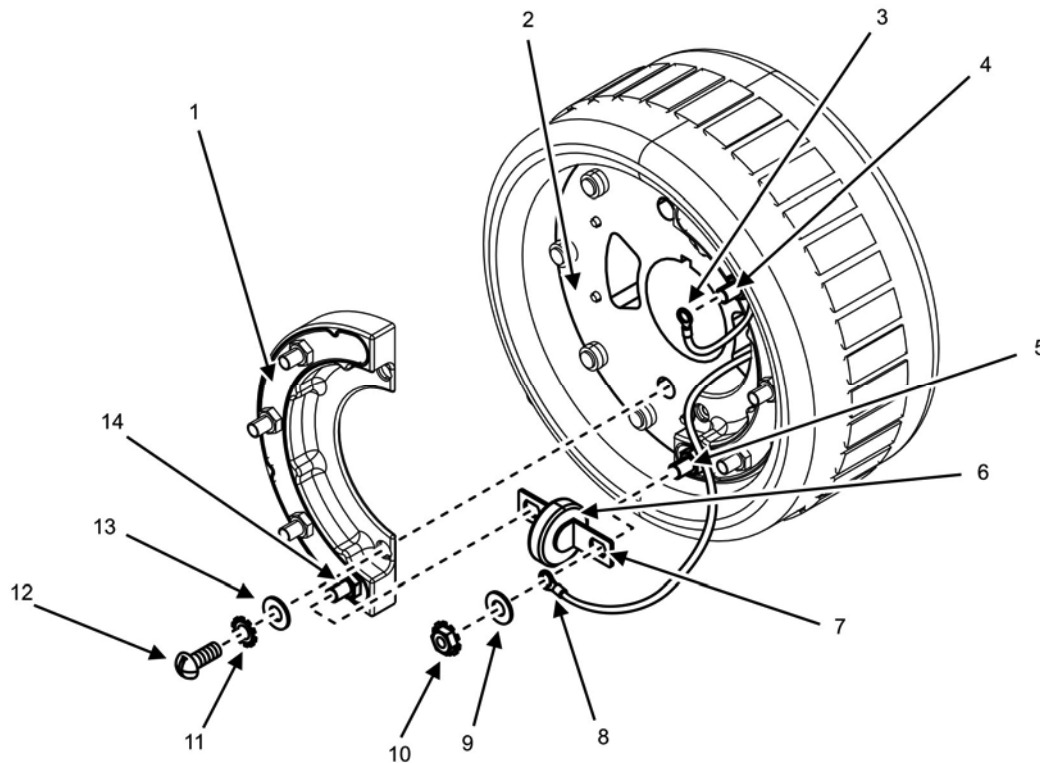


Figure 15. 400 Hz Rectifier Removal — Detail.

2. Mark or tag each wire (Figure 15, Items 3 and 8) as it is removed from diode and terminal studs (Figure 15, Items 4 and 5) to aid with installation.
3. Remove nut with captive external tooth lock washer (Figure 15, Item 10) and flat washer (Figure 15, Item 9) from terminal F1+ (Figure 15, Item 14).
4. Remove nut with captive external tooth lock washer (Figure 15, Item 10) and flat washer (Figure 15, Item 9) from F2- terminal stud (Figure 15, Item 5).
5. Discard nuts with captive external tooth lock washers (Figure 15, Item 10).
6. Remove surge suppressor (Figure 15, Item 6) and place on suitable surface for testing.
7. Remove F1+ generator rotor wire (Figure 14, Item 1) from F1+ terminal stud (Figure 14, Item 9).
8. Remove F2- generator rotor wire (Figure 14, Item 6) from F2- terminal stud (Figure 14, Item 8).
9. Remove nut with captive external tooth lock washer (Figure 15, Item 10), flat washer (Figure 15, Item 9), and exciter rotor wire (Figure 15, Item 3) from diode Cr1 (Figure 14, Item 11).
10. Repeat step 9 for remaining diodes.
11. Discard nuts with captive external tooth lock washers (Figure 15, Item 10).
12. Select Ohms resistance function on multimeter (Figure 12, Item 4).
13. Touch negative meter probe (Figure 14, Item 10) to F1+ terminal stud (Figure 14, Item 9) and positive meter probe (Figure 14, Item 12) to diode Cr1 (Figure 14, Item 11). Observe and record resistance value.
14. Touch positive meter probe (Figure 14, Item 12) to F1+ terminal stud (Figure 14, Item 9) and negative meter probe (Figure 14, Item 10) to diode Cr1 (Figure 14, Item 11). Observe and record resistance value.
15. Repeat steps 13 and 14 for remaining diodes of F1+ rectifier plate (Figure 14, Item 2).

16. Touch negative meter probe (Figure 14, Item 10) to F2- terminal stud (Figure 14, Item 8) and positive meter probe (Figure 14, Item 12) to diode Cr4 (Figure 14, Item 7). Observe and record resistance value.
17. Touch positive meter probe (Figure 14, Item 12) to F2- terminal stud (Figure 14, Item 8) and negative meter probe (Figure 14, Item 10) to diode Cr4 (Figure 14, Item 7). Observe and record resistance value.
18. Repeat steps 16 and 17 for remaining diodes of F2- rectifier plate (Figure 14, Item 5).

NOTE

Resistance value obtained in step 13 and step 17 should be $2.74 \text{ M}\Omega \pm 10\%$, and resistance value obtained in step 14 and step 16 should be greater than $27 \text{ M}\Omega$.

Resistance value obtained in step 14 and step 16 will typically be infinite resistance.

19. Compare resistance values obtained in steps 13 through 18 to specifications to determine if rectifier plates (Figure 14, Items 2 and 5) are serviceable.

NOTE

Rectifier plates (Figure 14, Items 2 and 5) may remain attached to exciter rotor (Figure 14, Item 3) unless further tests reveal the need to remove rectifier plates (Figure 14, Items 2 and 5).

20. Proceed to Test Surge Suppressor task if rectifier is serviceable.
21. Proceed to Replace Rectifier task if rectifier is not serviceable.

END OF TASK

Test Surge Suppressor

1. Select Ohms resistance function on multimeter (Figure 12, Item 4).
2. Touch positive meter probe (Figure 12, Item 3) to either connection point (Figure 15, Item 7) of surge suppressor (Figure 15, Item 6).
3. Touch negative meter probe (Figure 12, Item 5) to opposite connection point of surge suppressor (Figure 15, Item 6). Observe and note resistance value.
4. Reverse points of contact with meter probes (Figure 12, Items 3 and 5). Observe and note resistance value.

NOTE

Resistance value of surge suppressor (Figure 15, Item 6) should be equal when measured front-to-back and back-to-front. An acceptable value is greater than $1 \text{ M}\Omega$, and measured value will typically be infinite resistance.

5. Compare resistance values obtained in step 3 and step 4 to specifications to determine if surge suppressor (Figure 15, Item 6) is serviceable.
6. Set surge suppressor (Figure 15, Item 6) aside for installation if serviceable or replace as required.

END OF TASK

Replace Rectifier

1. Remove two screws (Figure 15, Item 12), two external tooth lock washers (Figure 15, Item 11), two flat washers (Figure 15, Item 13), and F1+ rectifier plate (Figure 15, Item 1) from exciter rotor (Figure 15, Item 2).
2. Discard external tooth lock washers (Figure 15, Item 11).
3. Repeat steps 1 and 2 for F2- rectifier plate (Figure 14, Item 5).
4. Inspect mounting surface of exciter rotor (Figure 15, Item 2) where rectifier plates (Figure 14, Items 2 and 5) were attached and clean as required.
5. Perform Test Rectifier task, steps 12 through 19 on new rectifier plates (Figure 14, Items 2 and 5).
6. Align holes in F1+ rectifier plate (Figure 15, Item 1) with holes in exciter rotor (Figure 15, Item 2) using orientation noted in Test Rectifier task, step 1.
7. Install two flat washers (Figure 15, Item 13), two new external tooth lock washers (Figure 15, Item 11), and two screws (Figure 15, Item 12) to attach F1+ rectifier plate (Figure 15, Item 1) to exciter rotor (Figure 15, Item 2).
8. Repeat steps 6 and 7 for F2- rectifier plate (Figure 14, Item 5).

END OF TASK**Test Exciter Rotor Winding****NOTE**

Exciter rotor wires (Figure 14, Item 4) are paired according to a specific order. The order of pairs is Cr1 to Cr4, Cr2 to Cr5, and Cr3 to Cr6.

1. Identify each of six numbered exciter rotor wire (Figure 14, Item 4) terminals.
2. Select Ohms resistance function on multimeter (Figure 12, Item 4).
3. Touch either meter probe (Figure 12, Item 3 or 5) to exciter rotor wire (Figure 14, Item 4) terminal identified as Cr1.
4. Touch second meter probe (Figure 12, Item 3 or 5) to exciter rotor wire (Figure 14, Item 4) terminal identified as Cr4.
5. Observe and record value of resistance.
6. Repeat steps 3 through 5 for remaining ordered pairs of exciter rotor wires (Figure 14, Item 4).
7. Touch either meter probe (Figure 12, Item 3 or 5) to exciter rotor wire (Figure 14, Item 4) terminal tagged or marked as Cr1.
8. Touch second meter probe (Figure 12, Item 3 or 5) to bare metal area (ground) of exciter rotor (Figure 14, Item 3).
9. Observe and record value of resistance.
10. Repeat steps 7 through 9 for remaining exciter rotor wire (Figure 14, Item 4) terminals tagged or marked as Cr2 and Cr3.

NOTE

Resistance values obtained in steps 3 through 6 should be $0.564 \Omega \pm 10\%$. Accuracy of a multimeter is unreliable when measuring values lower than 1Ω . Measurement value of infinity or greater than 1Ω or with a $\pm 10\%$ variance for any pair of wires indicates a defective exciter rotor (Figure 14, Item 3).

Resistance values obtained in steps 7 through 10 of each wire to ground should be at least $1 \text{ M}\Omega$.

11. Compare resistance values obtained in steps 3 through 6 and steps 7 through 10 to specifications to determine if exciter rotor (Figure 14, Item 3) is serviceable.
12. Proceed to Test Generator Rotor Winding task if exciter rotor (Figure 14, Item 3) is serviceable.

END OF TASK**Test Generator Rotor Winding**

1. Identify generator rotor winding wires tagged or marked F1+ (Figure 14, Item 1) and F2- (Figure 14, Item 6).
2. Select Ohms resistance function on multimeter (Figure 12, Item 4).
3. Touch either meter probe (Figure 12, Item 3 or 5) to F1+ generator rotor wire (Figure 14, Item 1) terminal.
4. Touch second meter probe (Figure 12, Item 3 or 5) to F2- generator rotor wire (Figure 14, Item 6) terminal.
5. Observe and record value of resistance.
6. Touch either meter probe (Figure 12, Item 3 or 5) to F1+ generator rotor wire (Figure 14, Item 1) terminal.
7. Touch second meter probe (Figure 12, Item 3 or 5) to bare metal area (ground) of generator rotor (Figure 11, Item 5).
8. Observe and record value of resistance.

NOTE

Resistance value obtained in steps 3 through 5 should be $2.68 \Omega \pm 10\%$. Measurement value of infinity indicates an open generator rotor winding.

Resistance value obtained in steps 6 through 8 of generator rotor winding to ground should be at least $1 \text{ M}\Omega$.

9. Compare resistance values obtained in steps 3 through 5 and steps 6 through 8 to specifications to determine if generator rotor winding is serviceable.
10. Proceed to Test Generator Stator Winding task if generator rotor winding is serviceable.

END OF TASK

Test Generator Stator Winding

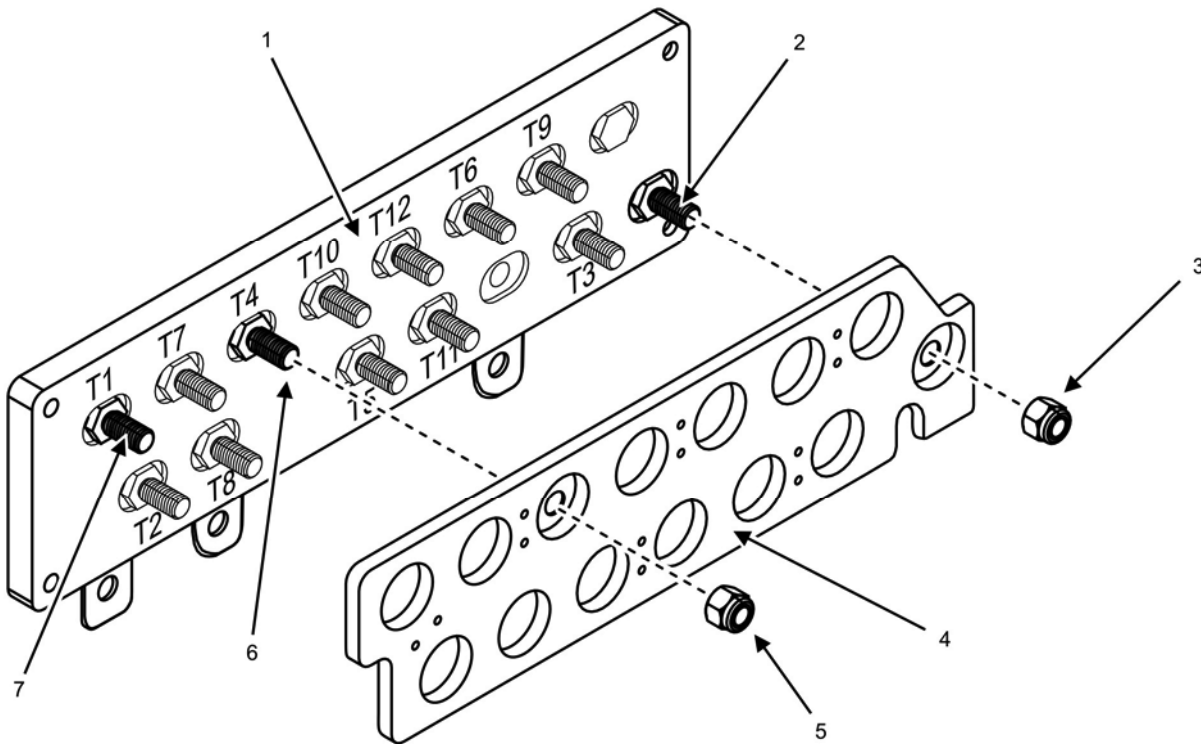


Figure 16. Test 400 Hz Generator Stator Winding.

NOTE

Generator stator output wire connections and T1 through T12 markings are not visible from the front of voltage selection board (Figure 16, Item 1). T1 through T12 markings are shown for identifying generator stator output wire connections from the front. The order of stator output wire connections is: T1 – T4, T2 – T5, T3 – T6, T7 – T10, T8 – T11, and T9 – T12.

1. Note voltage selected on voltage selection moveable board (Figure 16, Item 4) to aid with installation.
2. Remove 12 lock nuts (Figure 16, Item 5) that engage electrical reconnection studs (Figure 16, Item 6 and 7) of voltage selection board (Figure 16, Item 1).
3. Remove one lock nut (Figure 16, Item 3) that engage mechanical reconnection stud (Figure 16, Item 2) of voltage selection board (Figure 16, Item 1).
4. Discard lock nuts (Figure 16, Item 3 and 5).
5. Remove voltage selection moveable board (Figure 16, Item 4) and set aside for installation.
6. Select Ohms resistance function on multimeter (Figure 12, Item 4).
7. Touch either meter probe (Figure 12, Item 3 or 5) to reconnection stud marked T1 (Figure 16, Item 7).
8. Touch second meter probe (Figure 12, Item 3 or 5) to reconnection stud marked T4 (Figure 16, Item 6).
9. Observe and record value of resistance.
10. Repeat steps 7 through 9 for remaining reconnection studs.
11. Touch either meter probe (Figure 12, Item 3 or 5) to reconnection stud marked T1 (Figure 16, Item 7).

12. Touch second meter probe (Figure 12, Item 3 or 5) to bare metal area (ground) of generator stator (Figure 11, Item 6).
13. Observe and record value of resistance.
14. Repeat steps 11 through 13 for reconnection studs marked T2, T3, T7, T8, and T9.

NOTE

Resistance values obtained in steps 7 through 9 should be $0.154 \Omega \pm 10\%$. Accuracy of a multimeter is unreliable when measuring values lower than 1Ω . Measurement value of infinity or more than 1Ω for any pair of wires indicates a defective generator stator (Figure 11, Item 6).

Resistance values obtained in steps 11 through 14 of each reconnection stud to ground should be at least $1 M\Omega$.

15. Compare resistance values obtained in steps 7 through 9 and steps 11 through 14 to specifications to determine if generator stator (Figure 11, Item 6) is serviceable.

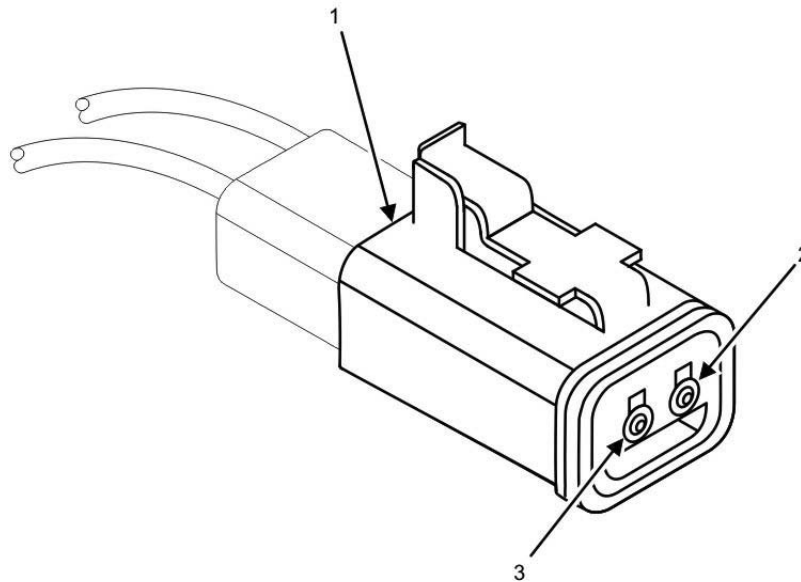


Figure 17. Test 400 Hz Generator Stator Q1/Q2 Winding — Detail.

16. Locate and disconnect Q1/Q2 wiring plug (Figure 17 Item 1) at wire port in generator stator (Figure 11, Item 9).
17. Select Ohms resistance function on multimeter (Figure 12, Item 4).
18. Touch either meter probe (Figure 12, Item 3 or 5) to either wiring plug (Figure 17, Item 1) connector (Figure 17, Item 2 or 3).
19. Touch second meter probe (Figure 12, Item 3 or 5) to second wiring plug (Figure 17, Item 1) connector (Figure 17, Item 2 or 3).
20. Observe and record value of resistance.
21. Touch either meter probe (Figure 12, Item 3 or 5) to either wiring plug (Figure 17, Item 1) connector (Figure 17, Item 2 or 3).

-
22. Touch second meter probe (Figure 12, Item 3 or 5) to bare metal area (ground) of generator stator (Figure 2, Item 5).
 23. Observe and record value of resistance.

NOTE

Resistance value obtained in steps 15 through 17 should be $0.967 \Omega \pm 10\%$. Accuracy of a multimeter is unreliable when measuring values lower than 1Ω . Measurement value of infinity or greater than 1Ω for any pair of wires indicates a defective generator stator (Figure 2, Item 5).

Resistance value obtained in steps 18 through 20 to ground should be at least $1 \text{ M}\Omega$.

24. Compare resistance values obtained in steps 15 through 17 and steps 18 through 20 to specifications to determine if generator stator (Figure 11, Item 6) is serviceable.
25. Complete Assemble Voltage Selection Board task if generator stator (Figure 11, Item 6) is serviceable.

END OF TASK

Assemble Voltage Selection Board

1. Place voltage selection front board (Figure 16, Item 4) onto voltage selection board (Figure 16, Item 1) at voltage selected position noted in Test Generator Stator Winding, step 1.
2. Position 13 new lock nuts (Figure 16, Items 3 and 5) onto reconnection studs (Figure 16, Items 2, 6, and 7).
3. Tighten nuts (Figure 16, Item 3 and 5) to torque value of $1.8 - 2.2 \text{ ft/lb}$ ($2.5 - 3 \text{ Nm}$).

END OF TASK

Inspect Bearing

1. Examine bearing (Figure 18, Item 1) for discoloration and corrosion that are signs of heat and contamination damage.
2. Touch outer race of bearing (Figure 18, Item 1) lightly with fingertips and rotate slowly in a back-and-forth motion to feel and listen for any signs of roughness and/or lack of lubrication.

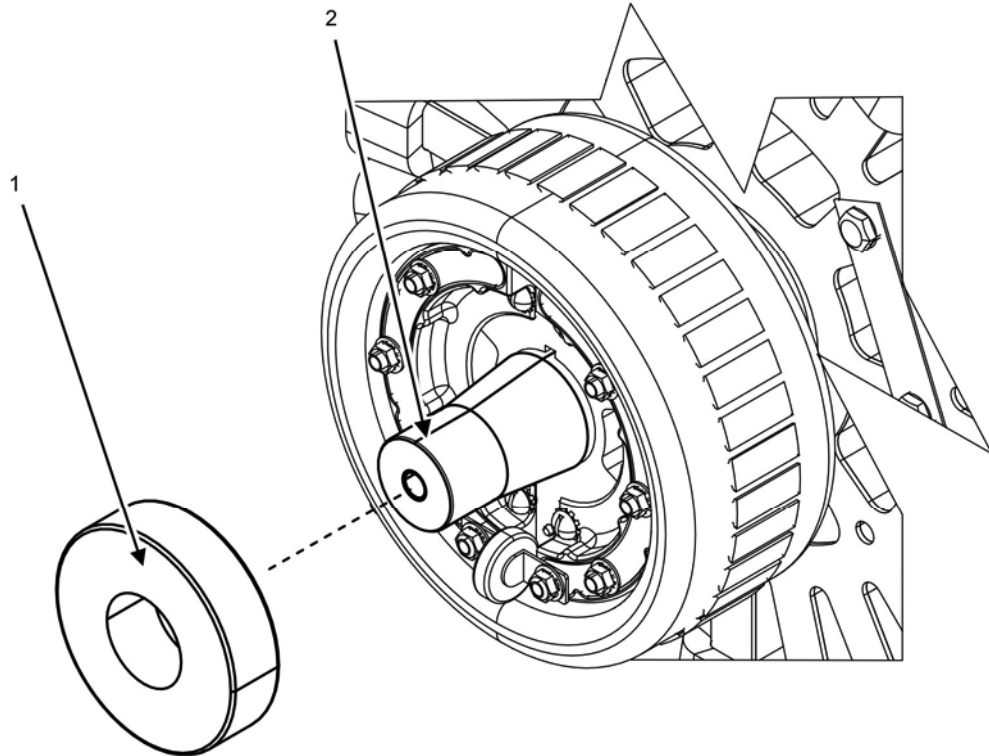


Figure 18. 400 Hz Generator Bearing Removal — Detail.

3. Proceed to Replace Bearing task if any signs of damage appear or if bearing (Figure 18, Item 1) does not rotate freely.

END OF TASK

Replace Bearing

1. Attach bearing puller to bearing (Figure 18, Item 1).

CAUTION

When a bearing (Figure 18, Item 1) is removed for any reason, always install a new bearing (Figure 18, Item 1). Failure to comply may cause damage to equipment.

2. Remove bearing (Figure 18, Item 1) from generator rotor shaft (Figure 18, Item 2).
3. Clean bearing surface of generator rotor shaft (Figure 18, Item 2).

4. Press new bearing (Figure 18, Item 1) onto generator rotor shaft (Figure 18, Item 2).

END OF TASK

Install End Bell

1. Perform Test Surge Suppressor task on new surge suppressor (Figure 15, Item 6).
2. Place surge suppressor (Figure 15, Item 6) onto F1+ terminal stud (Figure 15, Item 14) and F2- terminal stud (Figure 15, Item 5).
3. Place F1+ generator rotor wire (Figure 14, Item 1) onto F1+ terminal stud (Figure 14, Item 9).
4. Install flat washer (Figure 15, Item 9) and new nut with captive external tooth lock washer (Figure 15, Item 10) onto F1+ terminal stud (Figure 15, Item 14).
5. Place F2- generator rotor wire (Figure 14, Item 6) onto F2- terminal stud (Figure 14, Item 8).
6. Install flat washer (Figure 15, Item 9) and new nut with captive external tooth lock washer (Figure 15, Item 10) onto F2- terminal stud (Figure 15, Item 5).
7. Place exciter rotor wire (Figure 14, Item 4) tagged or marked Cr1 onto diode tagged or marked Cr1 (Figure 14, Item 11).
8. Install flat washer (Figure 15, Item 9) and new nut with captive external tooth lock washer (Figure 15, Item 10) onto diode tagged or marked Cr1 (Figure 14, Item 11).
9. Repeat steps 7 through 8 for remaining exciter rotor wires (Figure 14, Item 4) and diodes marked Cr2 through Cr6.
10. Remove tags or marks that will interfere with generator operation.
11. Install new O-ring packing (Figure 11, Item 2) into end bell (Figure 11, Item 4).
12. Insert P90 wiring plug (Figure 11, Item 8) through wire port in generator stator (Figure 11, Item 9).

CAUTION

Use extreme caution when installing end bell (Figure 11, Item 4) onto generator stator (Figure 11, Item 6). End bell (Figure 11, Item 4) is awkward to handle and must be installed without any exciter stator winding (Figure 11, Item 10) contact with the generator rotor (Figure 11, Item 5). Failure to comply will cause damage to equipment.

13. Align tag or mark on end bell (Figure 11, Item 4) with corresponding tag or mark on generator stator (Figure 11, Item 6).
14. Push end bell (Figure 11, Item 4) mating surface evenly into matching machined surface of generator stator (Figure 11, Item 6).

NOTE

End bell (Figure 11, Item 4) may resist installation onto bearing (Figure 11, Item 7). Use a tool that will not damage end bell (Figure 11, Item 4) to tap various points around outside of bearing mating surface until end bell (Figure 11, Item 4) machined surface makes contact with generator stator (Figure 11, Item 6) machined surface.

15. Examine area between end bell (Figure 11, Item 4) machined surface and generator stator (Figure 11, Item 6) machined surface to ensure distance is even.
16. Insert four bolts (Figure 11, Item 14) and four washers (Figure 11, Item 13) into each mounting hole until threads are engaged with generator stator (Figure 11, Item 6).

17. Tighten each bolt (Figure 11, Item 14) gradually in crisscross sequence using the same number of turns each time for each bolt (Figure 11, Item 14) to draw end bell (Figure 11, Item 4) into the generator stator (Figure 11, Item 6).
18. Verify end bell (Figure 11, Item 4) machined surface has fully engaged generator stator (Figure 11, Item 6).
19. Use Remove End Bell task, steps 10 through 15 if end bell (Figure 11, Item 4) machined surface does not fully engage the generator stator (Figure 10, Item 6) machined surface. Repeat steps 13 through 18 as required.
20. Loosen four bolts (Figure 11 Item 14) that attach end bell (Figure 11, Item 4) to generator stator (Figure 11, Item 6) one-half to three-quarters turn.
21. Remove lower two bolts (Figure 11, Item 14) and two washers (Figure 11, Item 13) that attach end bell (Figure 11, Item 4) to generator stator (Figure 11, Item 6).
22. Install ground strap (Figure 11, Item 3) according to location noted in Remove End Bell task, step 9.
23. Install generator output wires (Figure 11, Item 11) and generator output wire clamp (Figure 11, Item 12) according to location noted in Remove End Bell task, step 10.
24. Reinstall lower two bolts (Figure 11, Item 14) and two washers (Figure 11, Item 13) that attach end bell (Figure 11, Item 4) to generator stator (Figure 11, Item 6).
25. Tighten four bolts (Figure 11, Item 14) to torque value of 35-42 ft/lb (48-57 Nm).
26. Pull excess P90 wiring plug (Figure 10, Item 8) wire from wire port in generator stator (Figure 10, Item 9) to length tagged or marked in Remove End Bell task, step 12.
27. Align holes in end bell cover (Figure 11, Item 1) with matching holes in end bell (Figure 11, Item 4).
28. Install upper two screws (Figure 11, Item 16) and two new external tooth lock washers (Figure 11, Item 17) to loosely attach end bell cover (Figure 11, Item 1) to end bell (Figure 11, Item 4).
29. Install screw (Figure 11, Item 16), new external tooth lock washer (Figure 11, Item 17), and two shielded wire terminals (Figure 11, Item 15) according to location noted in Remove End Bell task, step 4 into lower end bell cover (Figure 11, Item 1) hole.
30. Tighten three screws (Figure 11, Item 16) to torque value of 20 in/lb (20.5 Nm).
31. Remove tags or marks that will interfere with generator operation.
32. Connect P90 wiring plug (Figure 11, Item 8) generator output wire clamp (Figure 11, Item 12).
33. Install left-side body panel (WP 0031, Remove/Install Left-Side Body Panel).
34. Close generator set doors.
39. Set engine control switch to PRIME & RUN (TM 9-6115-751-10).
40. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
41. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL CONTACTOR

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0163, Item 48)

Materials/Parts

Contactor, electrical (1) (WP 0115, Repair Parts List, Figure 15, Item 4)

Nut, lock, M6 brass (3) (WP 0115, Figure 15, Item 8)

Grease, electrically conductive (WP 0164, Expendable and Durable Items, Item 21)

Personnel Required

91D (1)

Assistant (1)

References

WP 0057, Remove/Install Output Terminal Board

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Right-side body panel removed (WP 0032, Remove/Install Right-Side Panel)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL CONTACTOR**Remove Contactor**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate contactor (Figure 1).
3. Remove cable entry guard and output terminal board (WP 0057, Remove/Install Output Terminal Board).

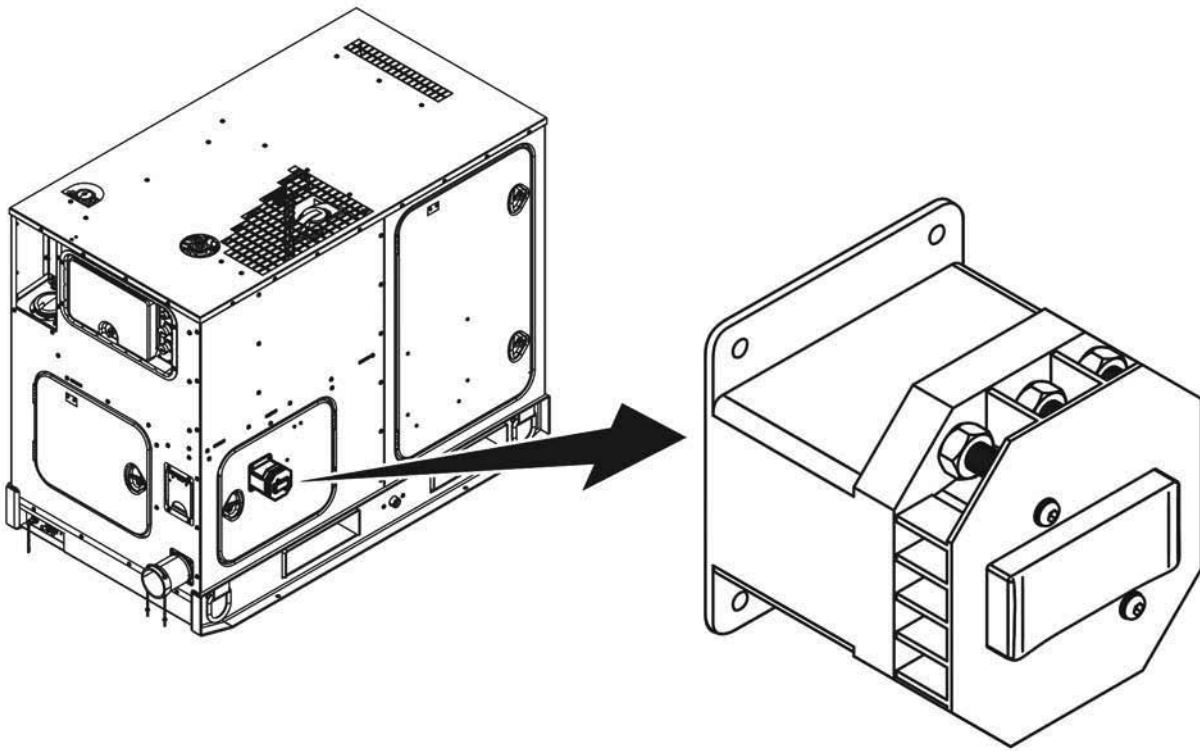


Figure 1. Contactor — Location.

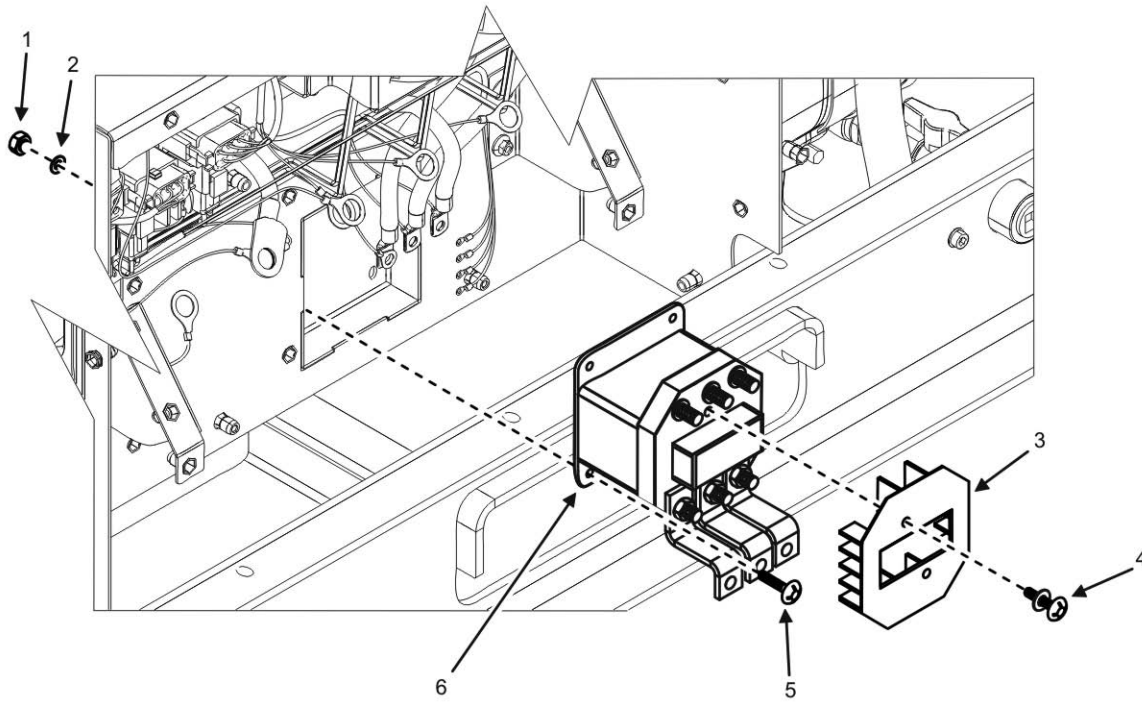


Figure 2. Contactor — Details.

4. Remove two screws and captive flat washers (Figure 2, Item 4) securing contactor cover (Figure 2, Item 3).
5. Remove contactor cover (Figure 2, Item 3).

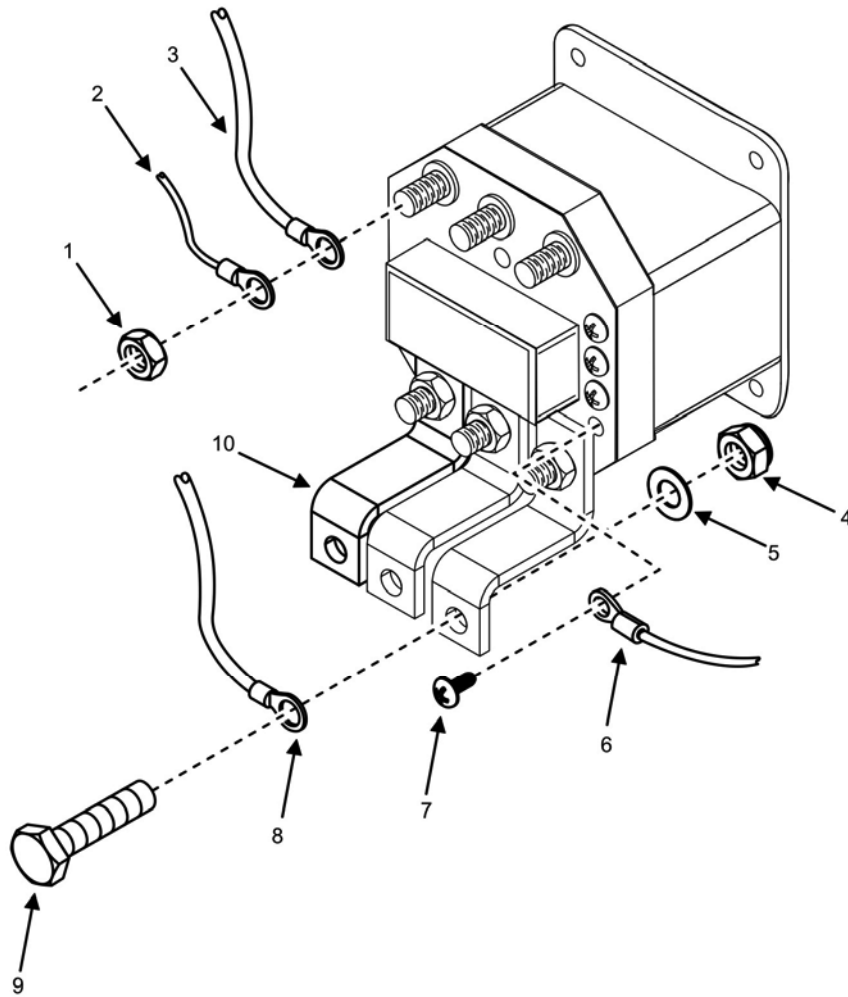


Figure 3. Contactor Wire — Removal.

NOTE

Prior to disassembly, tag all electrical wires, cables, and leads for identification. Tags will be used as a guide during reassembly.

Contactor is labeled (Figure 4). Label each wire according to the location label on the contactor to aid in installation.

6. Tag electrical leads (Figure 3, Items 3 and 8) and wiring harness electrical leads (Figure 3, Items 2 and 6) on contactor (Figure 2, Item 6) according to location labels on contactor (Figure 4).
7. Remove three hex nuts (Figure 3, Item 1) securing electrical leads (Figure 3, Items 2 and 3) to top studs on contactor (Figure 2, Item 6).
8. Remove electrical leads (Figure 3, Items 2 and 3) from contactor (Figure 2, Item 6).
9. Remove three screws (Figure 3, Item 9), flat washers (Figure 3, Item 5), and lock nuts (Figure 3, Item 4) securing electrical leads (Figure 3, Item 8) to busbars (Figure 3, Item 10) on bottom studs of contactor (Figure 2, Item 6).
10. Remove electrical leads (Figure 3, Item 8) from contactor (Figure 2, Item 6).

11. Discard lock nuts (Figure 3, Item 4).
12. Tag four wiring harness electrical leads (Figure 3, Item 6) on contactor (Figure 2, Item 6).
13. Remove four screws (Figure 3, Item 7) securing wiring harness electrical leads (Figure 3, Item 6) to contactor (Figure 2, Item 6)
14. Inspect electrical leads (Figure 3, Items 3 and 8) and wiring harness electrical leads (Figure 3, Items 2 and 6) for damage and replace leads or harnesses as required.

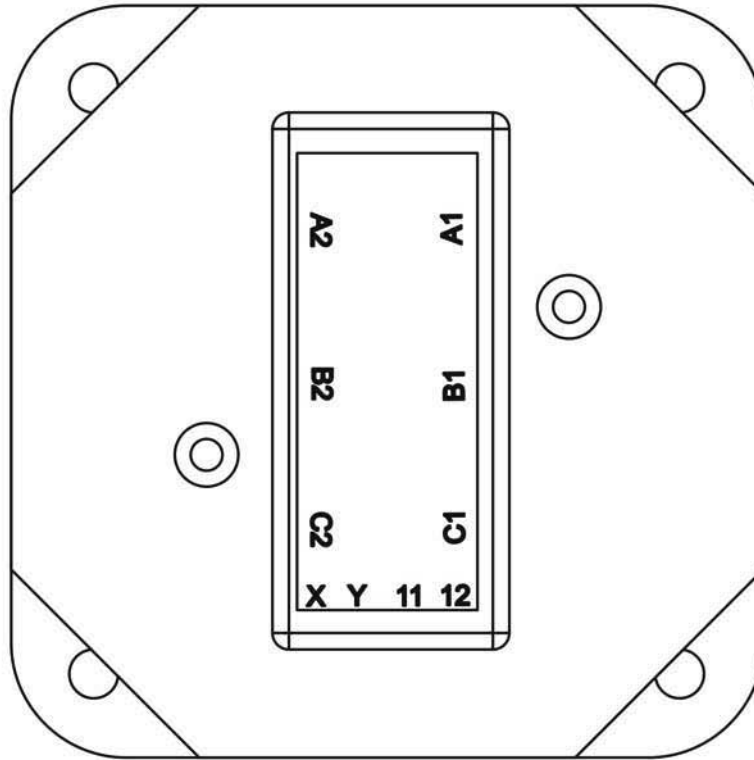


Figure 4. Contactor Wire Labels.

15. Remove four screws (Figure 2, Item 5), four washers (Figure 2, Item 2), and four hex flange nuts (Figure 2, Item 1) that secure contactor (Figure 2, Item 6) to output box.
16. Remove contactor (Figure 2, Item 6) from output box and place on a suitable work surface.

END OF TASK

Inspect Contactor

1. Inspect contactor cover (Figure 2, Item 3) for cracks and damage and replace contactor (Figure 2, Item 6) as required.
2. Inspect two contactor cover screws (Figure 2, Item 4) for worn threads and damaged captive flat washer (Figure 2, Item 4) and other signs of obvious damage and replace contactor (Figure 2, Item 6) as required.
3. Inspect contactor (Figure 2, Item 6) for signs of obvious damage and replace as required.

4. Inspect busbars (Figure 3, Item 10) for cracks, corrosion, and other signs of obvious damage and replace as required.
5. Inspect all mounting hardware and replace as required.

END OF TASK

Test Contactor

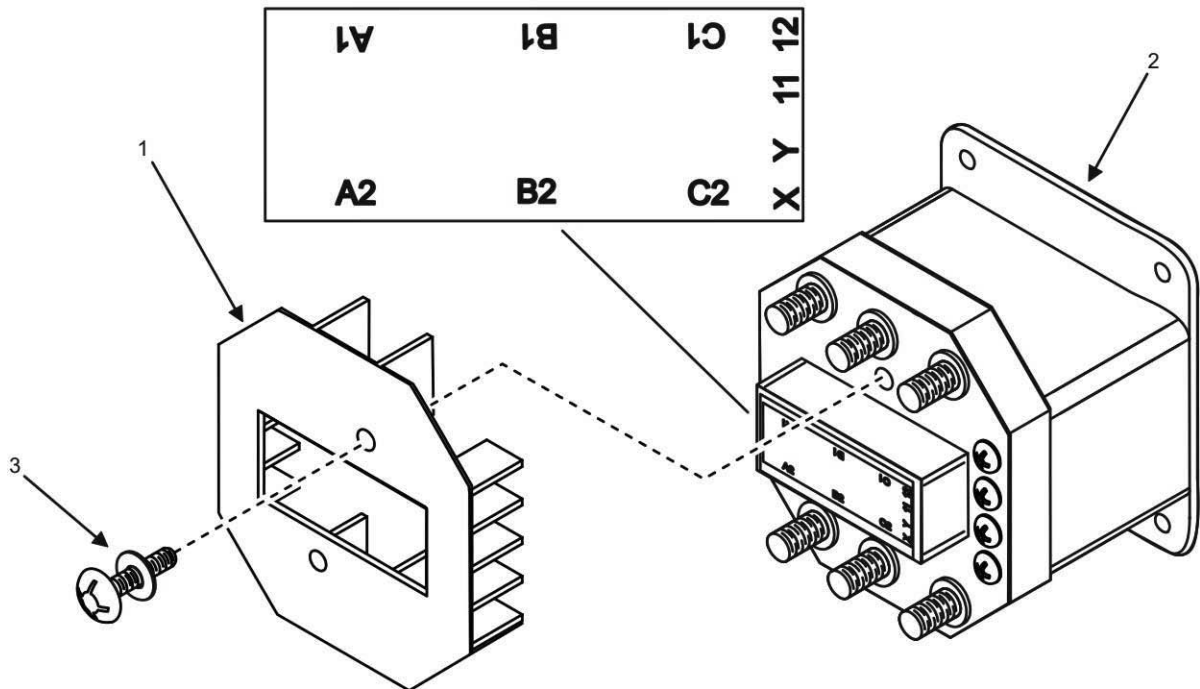


Figure 5. Contactor — Terminals.

1. Remove contactor (Figure 5, Item 2). See Remove Contactor task.
2. Remove two screws and captive washers (Figure 5, Item 3) securing contactor cover (Figure 5, Item 1) to contactor (Figure 5, Item 2) if not already removed.
3. Remove contactor cover (Figure 5, Item 1) if not already removed.

NOTE

Terminals A1 through C1 (Figure 5) are for the wiring from the voltage selection board and A2 through C2 (Figure 5) are for the output box terminal wires. Terminals X and Y (Figure 5) are for the wires that energize the contactor coil. Terminals 11 and 12 (Figure 5) are for wires for the auxiliary contact.

4. Measure the resistance between each terminal of the input side of contactor (Figure 5, Item 2) (Terminals A1 through C1) and output side of contactor (Figure 5, Item 2) (Terminals A2 through C2). Ensure resistance between any two terminals is infinite or high (approximately 100,000 Ohms (Ω) or more).
5. Replace contactor (Figure 5, Item 2) if a low (10 Ω or less) or zero Ω value is obtained. See Install Contactor task.

NOTE

Resistance reading between terminals X and Y should be $47 \Omega \pm 10\%$.

6. Measure the resistance between terminals X and Y (Figure 5) using a multimeter set to test resistance.
7. Replace contactor (Figure 5, Item 2) if reading is outside of specification. See Install Contactor task.
8. Measure for continuity between terminals 11 and 12 (Figure 5) and between each terminal and ground using a multimeter set to test continuity.
9. Replace contactor (Figure 5, Item 5) if continuity is found. See Install Contactor task.

NOTE

Any continuity measurement between wires A1, B1 and C1 with wires installed to contactor terminals A1 through C1 will result in continuity through the voltage selection board. Ensure wires are removed when checking for continuity between terminals A1, B1, and C1 to obtain proper measurement.

10. Measure resistance between each contactor terminal (11, 12, A1, A2, B1, B2, C1, and C2) (Figure 5) using a multimeter set to test resistance. Ensure resistance between any two terminals is infinite or high.
11. Replace contactor (Figure 5, Item 2) if a low or zero Ω value is obtained. See Install Contactor task.
12. Measure resistance between terminal X and each terminal (11, 12, A1, A2, B1, B2, C1, and C2) (Figure 5) using a multimeter set to test resistance. Ensure resistance between X and any other terminal is infinite or high.
13. Replace contactor (Figure 5, Item 2) if resistance is low or zero Ω . See Install Contactor task.
14. Measure resistance between terminal Y and each terminal (11, 12, A1, A2, B1, B2, C1, and C2) (Figure 5) using a multimeter set to test resistance. Ensure resistance between Y and any other terminal is infinite or high.
15. Replace contactor (Figure 5, Item 2) if resistance is low or zero Ω . See Install Contactor task.

END OF TASK**Install Contactor**

1. Position contactor (Figure 2, Item 6) to mounting location in output box and align the mounting holes.
2. Secure contactor (Figure 2, Item 6) to mounting location in output box by installing four screws (Figure 2, Item 5), four washers (Figure 2, Item 2), and four hex flange nuts (Figure 2, Item 1). Tighten nuts to 25 – 31 in/lb (3 – 4 Nm).

NOTE

Identification tags should remain in place until the output box is completely reassembled and has been tested for proper operation.

Apply a thin coat of electrically conductive grease to all electrical connections prior to assembly.

When more than one electrical lead is connected to a contactor stud, the electrical lead with the heaviest terminal lug shall be installed closest to the contactor (Figure 2, Item 6) with the following electrical leads terminal lugs progressively decreasing in size.

3. Install three appropriately-tagged electrical leads (Figure 3, Item 3) and wiring harness electrical leads (Figure 3, Item 2) to top studs of contactor (Figure 2, Item 6) using tags and identification labels on contactor (Figure 4).
4. Secure three electrical leads (Figure 3, Item 3) and wiring harness electrical leads (Figure 3, Item 2) with hex nuts (Figure 3, Item 1). Torque to 92 – 112 in/lb (10 – 13 Nm).
5. Position three appropriately-tagged electrical leads (Figure 3, Item 8) to matching location on contactor (Figure 2, Item 6).
6. Install each electrical lead (Figure 3, Item 8) to busbar (Figure 3, Item 10) with screw (Figure 3, Item 9), flat washer (Figure 3, Item 5), and new lock nut (Figure 3, Item 4).
7. Tighten screws (Figure 3, Item 9) to 22 – 25 in/lb (3 Nm).
8. Position wiring harness electrical leads (Figure 3, Item 6) to contactor (Figure 2, Item 6) using tags from removal.
9. Install wiring harness electrical leads (Figure 3, Item 6) to contactor (Figure 2, Item 6) with four screws (Figure 3, Item 7)
10. Position contactor cover (Figure 2, Item 3) over contactor (Figure 2, Item 6).
11. Secure contactor cover (Figure 2, Item 3) with two screws with captive flat washers (Figure 2, Item 4).
12. Install cable entry guard and output terminal board (WP 0057, Remove/Install Output Terminal Board).
13. Install right-side body panel (WP 0032, Remove/Install Right-Side Panel).
14. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
15. Close generator set doors.
16. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
17. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
18. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL OUTPUT TERMINAL BOARD

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0163, Item 46)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0163, Item 48)

Materials/Parts

Connection, board (WP 0116, Repair Parts List, Figure 16, Item 10)

Nut, lock (5) (WP 0116, Figure 16, Item 15)

Nut, plain, clinch (4) (WP 0116, Figure 16, Item 9)

Terminal, stud (5) (WP 0116, Figure 16, Item 18)

Brush, wire, scratch (WP 0164, Expendable and Durable Items List, Item 8)

Grease, electrically conductive (WP 0164, Item 21)

Tag, marker (WP 0164, Item 36)

Personnel Required

91D (1)

Assistant (1)

References

Not Applicable

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Right-side panel removed (WP 0032, Remove/Install Right-Side Body Panel)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL OUTPUT TERMINAL BOARD
Remove Output Terminal Board

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove four screws (not shown) securing upper output box guard (not shown) over output box.
3. Remove upper output box guard (not shown) from output box.
4. Remove six screws (not shown) securing lower output box guard (not shown) and access door (not shown) over output box.

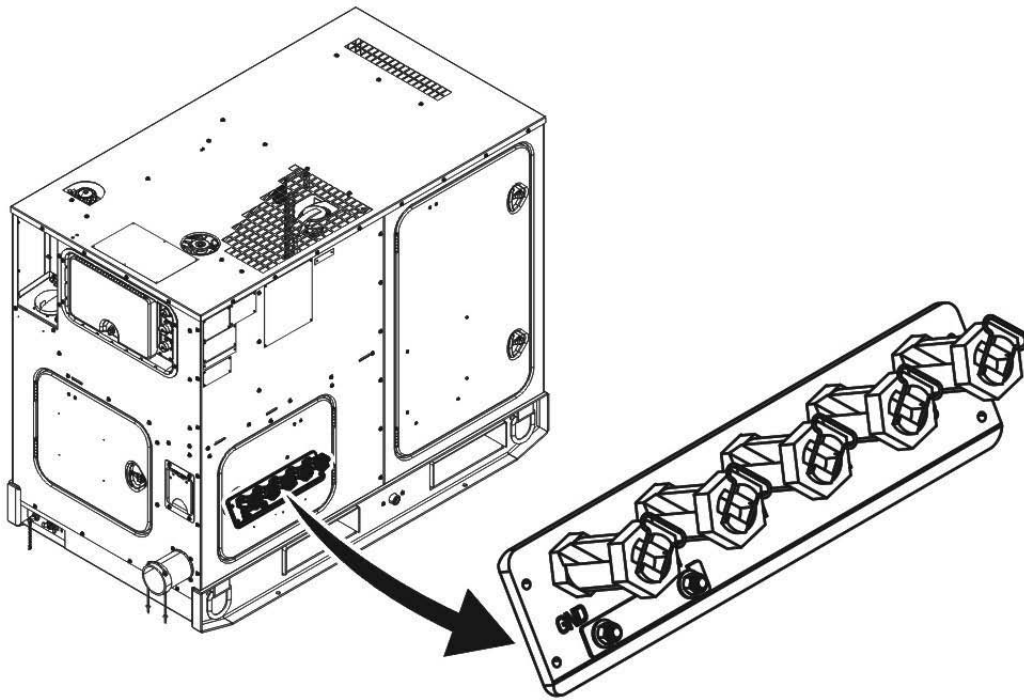


Figure 1. Output Terminal Board — Location.

5. Remove lower output box guard (not shown) and access door (not shown) from output box.
6. Locate output terminal board in output box (Figure 1).

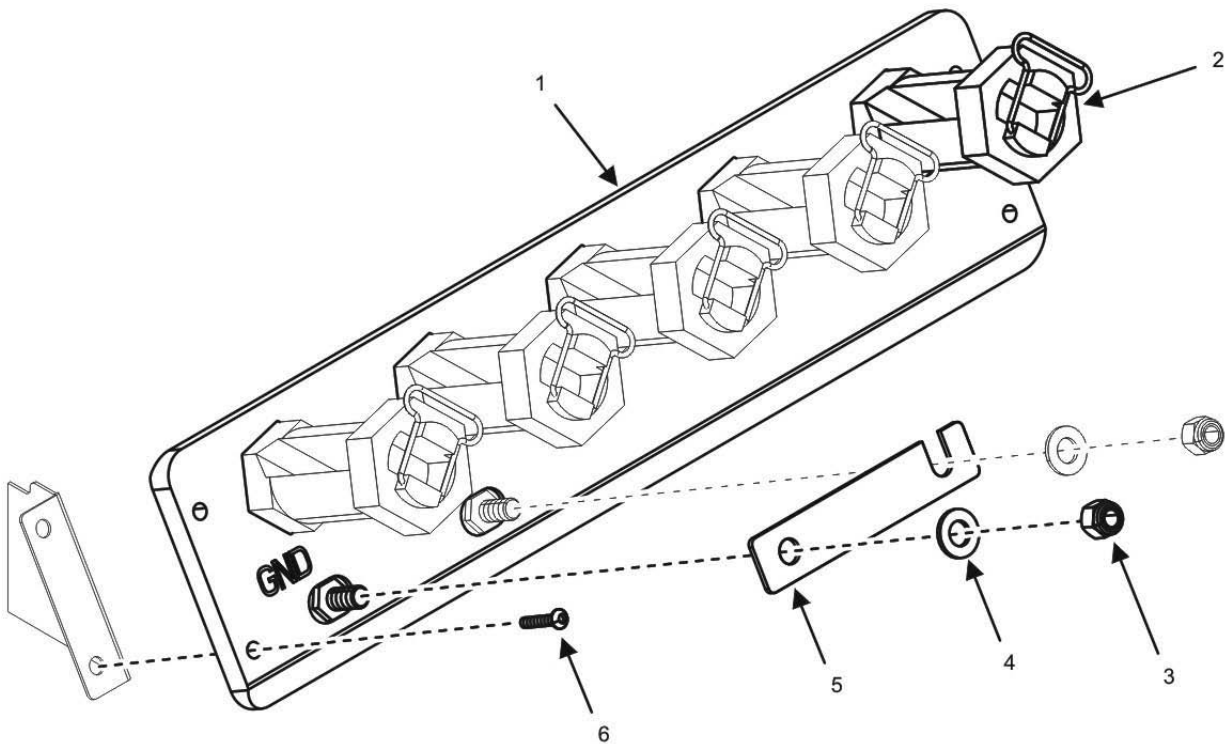


Figure 2. Output Terminal Board — Detail.

7. Remove four screws (Figure 2, Item 6) securing output terminal board (Figure 2, Item 1) to output box.
8. Position output terminal board (Figure 2, Item 1) to access underside of board.

NOTE

Five large terminal studs (Figure 2, Item 2) are secured to the output terminal board (Figure 2, Item 1). Some terminal studs (Figure 2, Item 2) may have multiple wires (Figure 3, Item 10). Neutral (N) terminal stud also secures wire (not shown) from convenience receptacle to rear of output terminal board (Figure 2, Item 1). Ground (GND) terminal stud also secures grounding straps (not shown).

The procedure for removing wires (Figure 3, Item 10) is the same for all five terminal studs (Figure 3, Item 3). GND and N terminal stud positions have ground busbars (Figure 3, Item 5) installed to the rear and a neutral busbar (Figure 2, Item 5) installed to the front of the output terminal board (Figure 2, Item 1). To aid installation, tag all wires and connectors prior to removal.

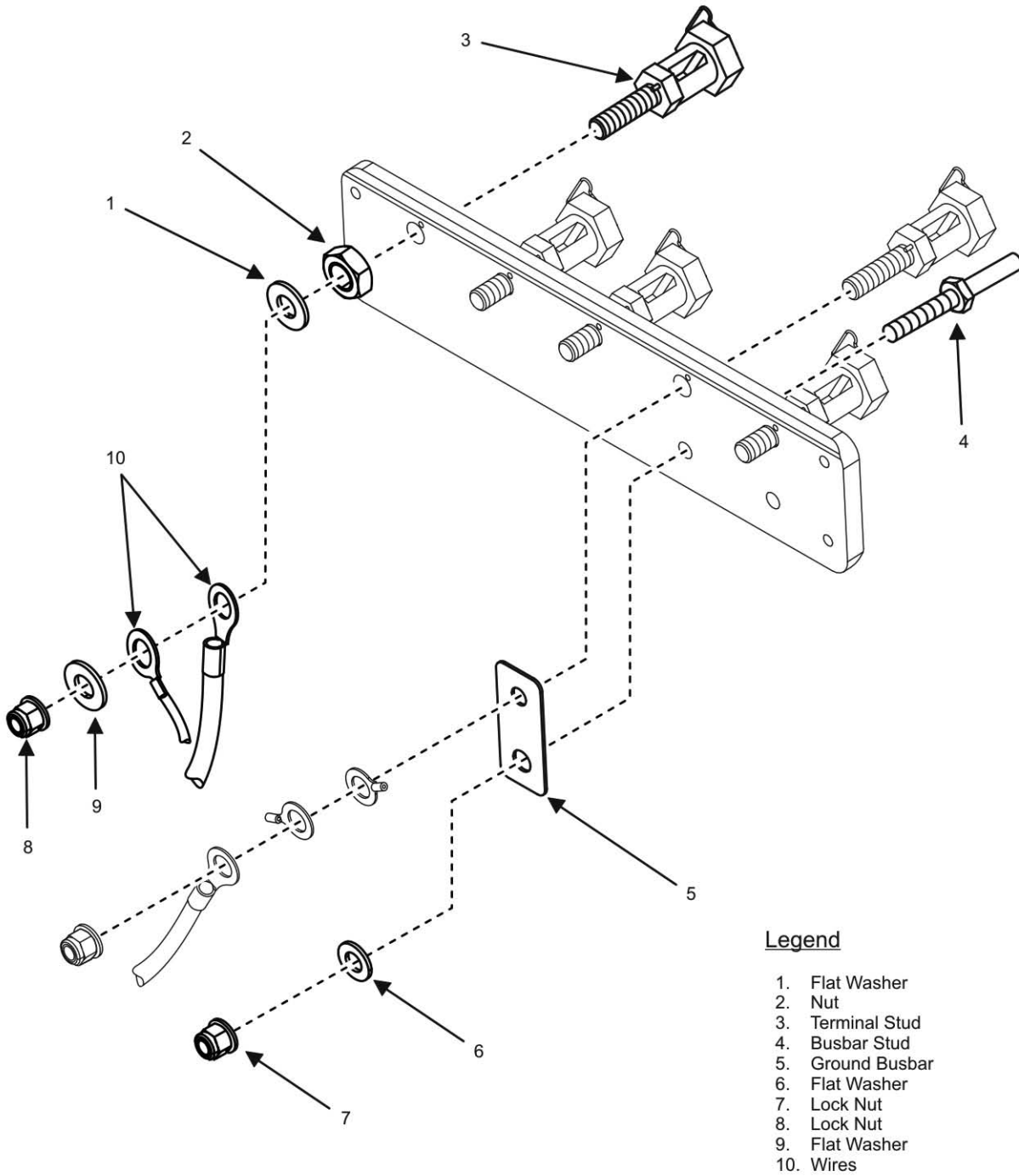
9. Tag all wires (Figure 3, Item 10) according to their terminal stud (Figure 2, Item 2) (Figure 3, Item 3) location on output terminal board (Figure 2, Item 1).
10. Remove nylon lock nut (Figure 3, Item 8) and flat washer (Figure 3, Item 9) securing terminal stud (Figure 3, Item 3) to output terminal board (Figure 2, Item 1). Discard nylon lock nut (Figure 3, Item 8).
11. Remove wires (Figure 3, Item 10) and flat washers (Figure 3, Item 1) from terminal stud (Figure 3, Item 3).
12. Repeat steps 10 and 11 for all remaining terminal studs (Figure 3, Item 3) and wires (Figure 3, Item 10) on output terminal board (Figure 2, Item 1).
13. Remove nut (Figure 3, Item 2) securing terminal stud (Figure 3, Item 3) to output terminal board (Figure 2, Item 1).
14. Repeat step 13 for all remaining terminal studs (Figure 3, Item 3) on output terminal board (Figure 2, Item 1).
15. Remove terminal studs (Figure 2, Item 2) (Figure 3, Item 3) from output terminal board (Figure 2, Item 1).

NOTE

Figure 3 is shown from the rear of the terminal board to aid in visualization.

16. Remove two GND busbar lock nuts (Figure 3, Item 7) and two flat washers (Figure 3, Item 6) that secure ground busbars (Figure 3, Item 5) on rear of output terminal board (Figure 2, Item 1).
17. Discard lock nuts (Figure 3, Item 7).
18. Remove output terminal board (Figure 2, Item 1) from output box and place on a suitable work surface.
19. Remove lock nuts (Figure 2, Item 3) and flat washers (Figure 2, Item 4) that secure neutral busbar (Figure 2, Item 5) to front of output terminal board (Figure 2, Item 1).
20. Discard lock nuts (Figure 2, Item 3).
21. Remove terminal studs (Figure 3, Item 3) from output terminal board (Figure 2, Item 1).

END OF TASK



Legend

- 1. Flat Washer
- 2. Nut
- 3. Terminal Stud
- 4. Busbar Stud
- 5. Ground Busbar
- 6. Flat Washer
- 7. Lock Nut
- 8. Lock Nut
- 9. Flat Washer
- 10. Wires

Figure 3. Output Terminal Board Detail — Reverse Side.

Inspect Output Terminal Board

1. Inspect output terminal board (Figure 2, Item 1) for cracks or other damage. Replace as required.
2. Inspect all nuts, washers, and screws for obvious signs of damage and replace as required.
3. Inspect terminal studs (Figure 2, Item 2) for damage or corrosion.
4. Inspect wires (Figure 3, Item 10) for fraying, cracks, or corrosion. Repair or replace as required.
5. Remove minor corrosion from wires (Figure 3, Item 10) using wire brush.
6. Inspect ground busbars (Figure 3, Item 5) and neutral busbar (Figure 2, Item 5) for damage and replace as required.

END OF TASK

Install Output Terminal Board

1. Install two busbar studs (Figure 3, Item 4) through output terminal board (Figure 2, Item 1).
2. Install neutral busbar (Figure 2, Item 5) to two busbar studs (Figure 3, Item 4) on front of output terminal board (Figure 2, Item 1).
3. Install two flat washers (Figure 2, Item 4) and two new lock nuts (Figure 2, Item 3) to secure neutral busbar (Figure 2, Item 5) to front of output terminal board (Figure 2, Item 1).
4. Install two ground busbars (Figure 3, Item 5) to two busbar studs (Figure 3, Item 4) on rear of output terminal board (Figure 2, Item 1).
5. Install two flat washers (Figure 3, Item 6) and two new lock nuts (Figure 3, Item 7) to secure ground busbars (Figure 3, Item 5) to rear of output terminal board (Figure 2, Item 1).

NOTE

Five large terminal studs (Figure 2, Item 2) are secured to the output terminal board (Figure 2, Item 1). Some terminal studs (Figure 2, Item 2) may have multiple wires (Figure 3, Item 10). N terminal stud also secures wire (not shown) from convenience receptacle to rear of output terminal board (Figure 2, Item 1). GND terminal stud also secures grounding straps (not shown) to rear of output terminal board (Figure 2, Item 1).

The procedure for installing wires (Figure 3, Item 10) is the same for all five terminal studs (Figure 3, Item 3). GND and N terminal stud positions have ground busbars (Figure 3, Item 5) installed to the rear and a neutral busbar (Figure 2, Item 5) installed to the front of the output terminal board (Figure 2, Item 1).

6. Insert terminal stud (Figure 2, Item 2) through opening in front of output terminal board (Figure 2, Item 1).
7. Install nut (Figure 3, Item 2) to attach output terminal stud (Figure 3, Item 3) to output terminal board (Figure 2, Item 1).
8. Tighten each nut (Figure 3, Item 2) to 27 – 33 ft/lb (36 – 44 Nm).
9. Install flat washer (Figure 3, Item 1) to back of output terminal stud (Figure 3, Item 3).

NOTE

When more than one wire (Figure 3, Item 10) is connected to a terminal stud (Figure 3, Item 3), the wire (Figure 3, Item 10) with the heaviest terminal lug shall be installed closest to the output terminal board (Figure 2, Item 1) with the following wires' (Figure 3, Item 10) terminal lugs progressively decreasing in size.

10. Install appropriately-tagged wires (Figure 3, Item 10) over back of output terminal stud (Figure 3, Item 3).
11. Install flat washer (Figure 3, Item 9) over wires (Figure 3, Item 10) and output terminal stud (Figure 3, Item 3).
12. Install new nylon lock nut (Figure 3, Item 8) over wires (Figure 3, Item 10).
13. Tighten nylon lock nut (Figure 3, Item 8) to a torque value of 27 – 33 ft/lb (36 – 44 Nm).
14. Repeat steps 6 through 13 to attach all remaining terminal studs (Figure 2, Item 2) (Figure 3, Item 3) and wires (Figure 3, Item 10) to output terminal board (Figure 2, Item 1).

NOTE

Two wrenches are required to tighten lock nuts (Figure 3, Item 8).

15. Tighten ground busbar (Figure 3, Item 5) lock nuts (Figure 3, Item 7) to a torque value of 124 – 159 in/lb (14 – 18 Nm)
16. Position output terminal board (Figure 2, Item 1) to output box.
17. Secure output terminal board (Figure 2, Item 1) to output box with four screws (Figure 2, Item 6).
18. Tighten screws (Figure 2, Item 6) to 87 – 105 in/lb (10 – 12 Nm).
19. Position output box lower guard (not shown) and access door (not shown) over output box.
20. Install six screws (not shown) securing lower output box guard (not shown) and access door (not shown) over output box.
21. Position upper output box guard (not shown) and access door (not shown) over output box.
22. Install upper output box guard (not shown) over output box with four screws (not shown).
23. Tighten screws (not shown) securing upper and lower output box guards (not shown) to 87 – 105 in/lb (10 – 12 Nm).
24. Install right-side body panel (WP 0032, Remove/Install Right-Side Body Panel).
25. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
26. Close generator set doors.
27. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
28. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
29. Repair as required.
30. Remove identification tags.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL VOLTAGE SELECTION BOARD

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0163, Item 47)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0163, Item 48)

Materials/Parts

Nut, lock 3/8-16 UNC-28(3) (WP 0117, Repair Parts List, Figure 17, Item 53)

Reconnection board (WP 0117, Figure 17, Item 5)

Brush, wire, scratch (WP 0164, Expendable and Durable Items List, Item 8)

Grease, electrically conductive (WP 0164, Item 21)

Tags, marker (WP 0164, Item 36)

Personnel Required

91D (1)

Assistant (1)

References

Not Applicable

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Right-side body panel removed (WP 0032, Remove/Install Right-Side Body Panel)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL VOLTAGE SELECTION BOARD**Remove Voltage Selection Board**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove four screws (not shown) securing upper output box guard (not shown) over output box.
3. Remove upper output box guard (not shown) from output box.
4. Locate voltage selection board in output box (Figure 1).

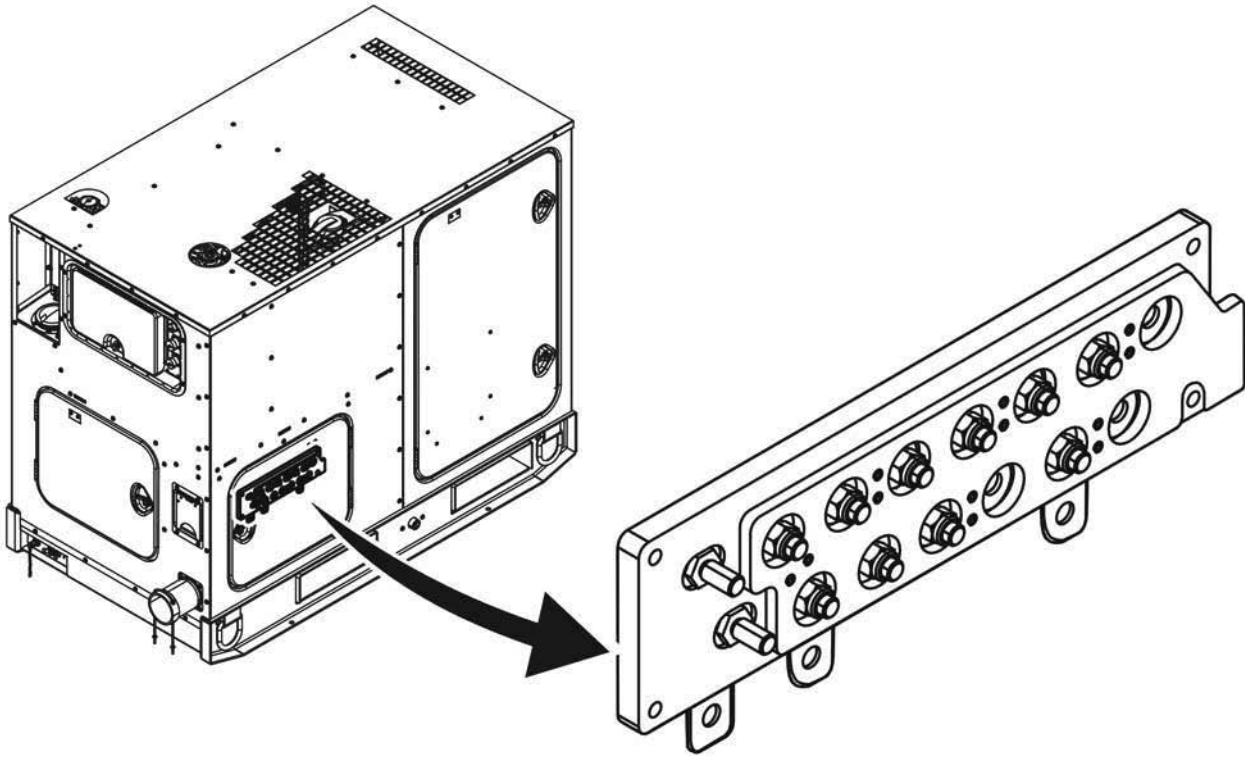


Figure 1. Voltage Selection Board — Location.

5. Tag three contactor electrical leads (Figure 2, Item 5).
6. Remove bolts (Figure 2, Item 4), flat washers (Figure 2, Item 6), and lock nuts (Figure 2, Item 7) that secure contactor electrical leads (Figure 2, Item 5) to voltage selection board (Figure 2, Item 3).
7. Discard lock nuts (Figure 2, Item 7).
8. Remove four screws (Figure 2, Item 2) that secure voltage selection board (Figure 2, Item 3) to spacers (Figure 2, Item 1) mounted inside of output box.

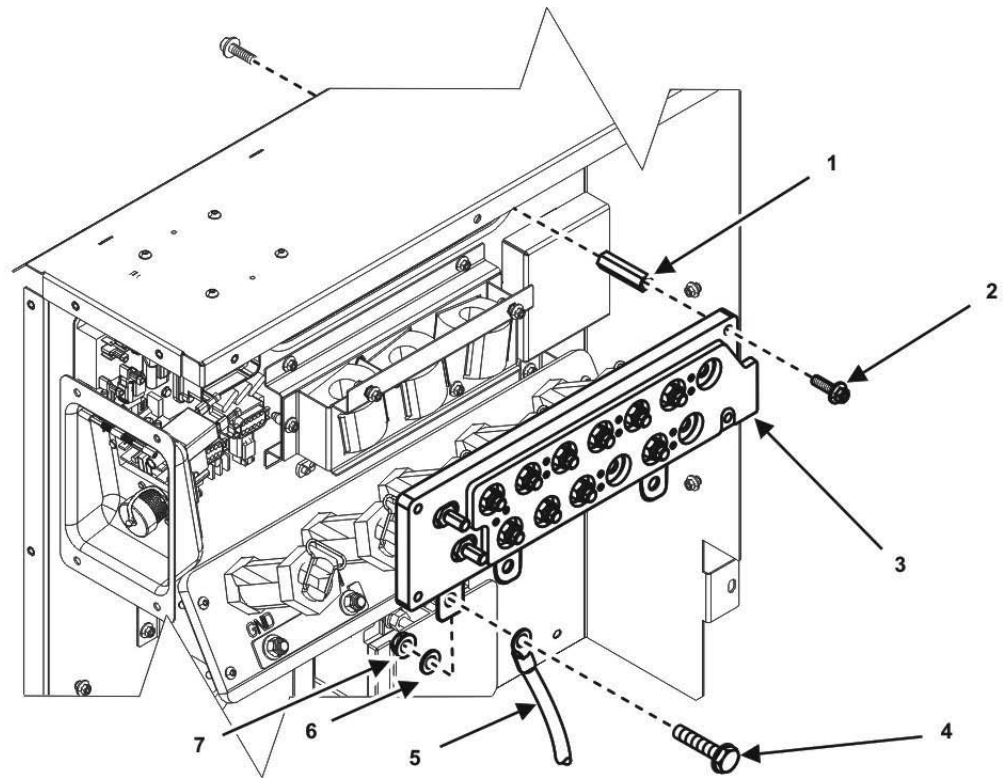


Figure 2. Voltage Selection Board — Removal.

9. Reposition and support voltage selection board (Figure 2, Item 3) to gain access to electrical leads (Figure 3, Items 2, 4, 5, 7, and 10) on the reverse side of voltage selection board (Figure 2, Item 3).

NOTE

Voltage selection board (Figure 2, Item 3) is engraved with location labels. Tag each wire according to location labels as shown in Figure 4.

10. Tag GND terminal electrical lead (Figure 3, Item 2) according to location label on voltage selection board (Figure 5).
11. Remove lock nut (Figure 3, Item 1) attaching GND terminal electrical lead (Figure 3, Item 2) to voltage selection board (Figure 2, Item 3).
12. Remove GND terminal electrical lead (Figure 3, Item 2) from voltage selection board (Figure 2, Item 3).
13. Tag relay electrical lead (Figure 3, Item 5) and AC generator electrical lead (Figure 3, Item 4) according to location label on voltage selection board (Figure 4).
14. Remove lock nut (Figure 3, Item 1) and flat washer (Figure 3, Item 8) attaching relay electrical lead (Figure 3, Item 5) and AC generator electrical lead (Figure 3, Item 4) to voltage selection board (Figure 2, Item 3).

Legend

- 1. Lock Nut
- 2. GND Terminal Electrical Lead
- 3. Reconnection Stud
- 4. AC Generator Electrical Lead
- 5. Relay Electrical Lead
- 6. Busbar
- 7. AC Generator Electrical Lead
- 8. Flat Washer
- 9. Nut
- 10. Printed Circuit Board Module Electrical Lead

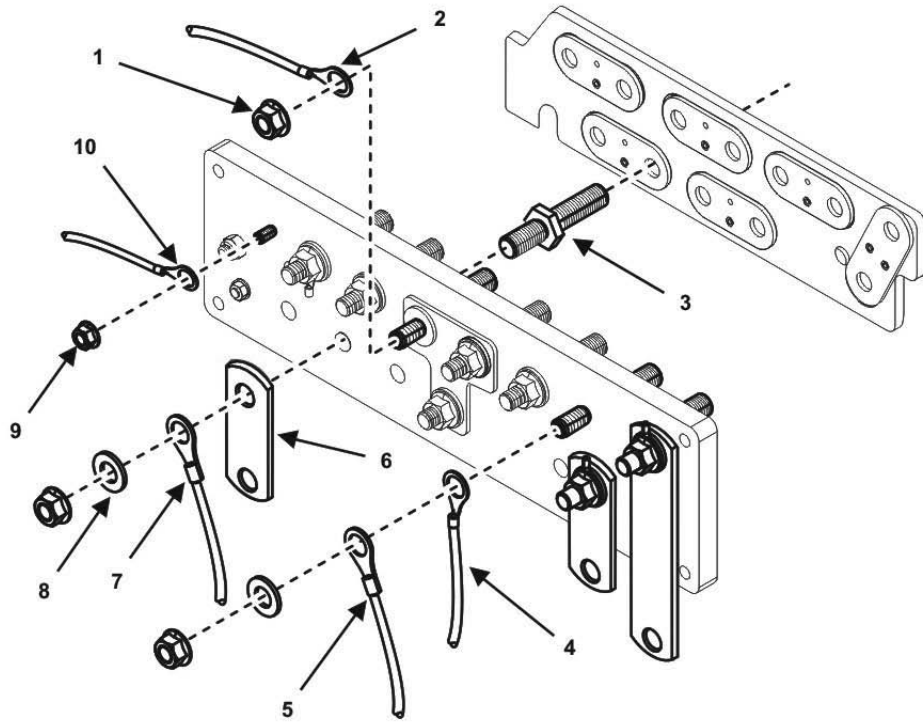


Figure 3. Voltage Selection Board Wiring — Removal.

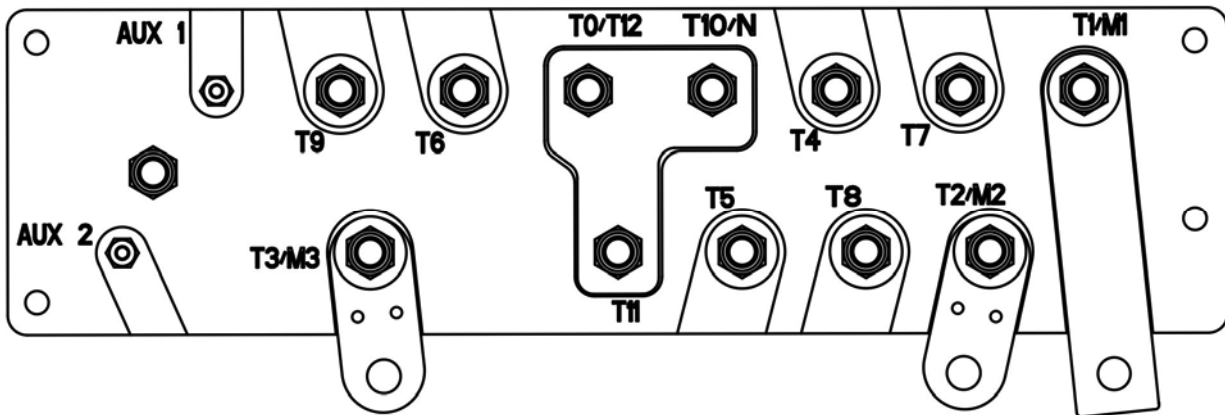


Figure 4. Voltage Selection Board Wiring Labels.

15. Remove relay electrical lead (Figure 3, Item 5) and AC generator electrical lead (Figure 3, Item 4) from voltage selection board (Figure 2, Item 3)
16. Tag remaining AC generator electrical leads (Figure 3, Item 7) according to locations on voltage selection board (Figure 4).

NOTE

Three of the lock nuts (Figure 3, Item 1) removed in step 17 also secure three busbars (Figure 3, Item 6). Tag or mark busbars (Figure 3, Item 6) locations to aid in installation.

17. Remove lock nuts (Figure 3, Item 1) and flat washers (Figure 3, Item 8) attaching AC generator electrical leads (Figure 3, Item 7) to voltage selection board (Figure 2, Item 3).
18. Remove AC generator electrical leads (Figure 3, Item 7) from voltage selection board (Figure 2, Item 3).
19. Tag printed circuit board module electrical leads (Figure 3, Item 10) according to location labels on voltage selection board (Figure 4).
20. Remove nuts (Figure 3, Item 9) attaching printed circuit board module electrical leads (Figure 3, Item 10) to voltage selection board (Figure 2, Item 3).
21. Remove printed circuit board module electrical leads (Figure 3, Item 10) from voltage selection board (Figure 2, Item 3).
22. Remove voltage selection board (Figure 2, Item 3) from output box and place on a suitable work surface.
23. Discard lock nuts (Figure 3, Item 1).

END OF TASK**Inspect Voltage Selection Board**

1. Inspect voltage selection board (Figure 2, Item 3) for cracks or other signs of obvious damage.
2. Repair voltage selection board (Figure 2, Item 3) as required. See Disassemble Voltage Selection Board task.
3. Inspect three reconnection board busbars (Figure 3, Item 6) for cracks and other obvious signs of damage.
4. Replace reconnection board busbars (Figure 3, Item 6) as required.

END OF TASK**Disassemble Voltage Selection Board****NOTE**

Repairing the voltage selection board (Figure 2, Item 3) requires disassembly of the board and replacement of damaged parts. Note the proper orientation of the voltage selection front board (Figure 5, Item 3) and voltage selection rear board (Figure 5, Item 6) for assembly.

1. Remove and discard remaining lock nuts (Figure 5, Items 4 and 7) and flat washers (Figure 5, Item 1) on voltage selection front board (Figure 5, Item 3) and voltage selection rear board (Figure 5, Item 6).
2. Remove thirteen reconnection studs (Figure 5, Item 5) and two auxiliary studs (Figure 5, Item 2) from voltage selection board (Figure 2, Item 3).
3. Separate voltage selection front board (Figure 5, Item 3) and voltage selection rear board (Figure 5, Item 6).
4. Inspect voltage selection front board (Figure 5, Item 3) for damaged or loose busbars, cracks, and other obvious signs of damage and replace as required.
5. Inspect voltage selection rear board (Figure 5, Item 6) for cracks and other obvious signs of damage and replace as required.

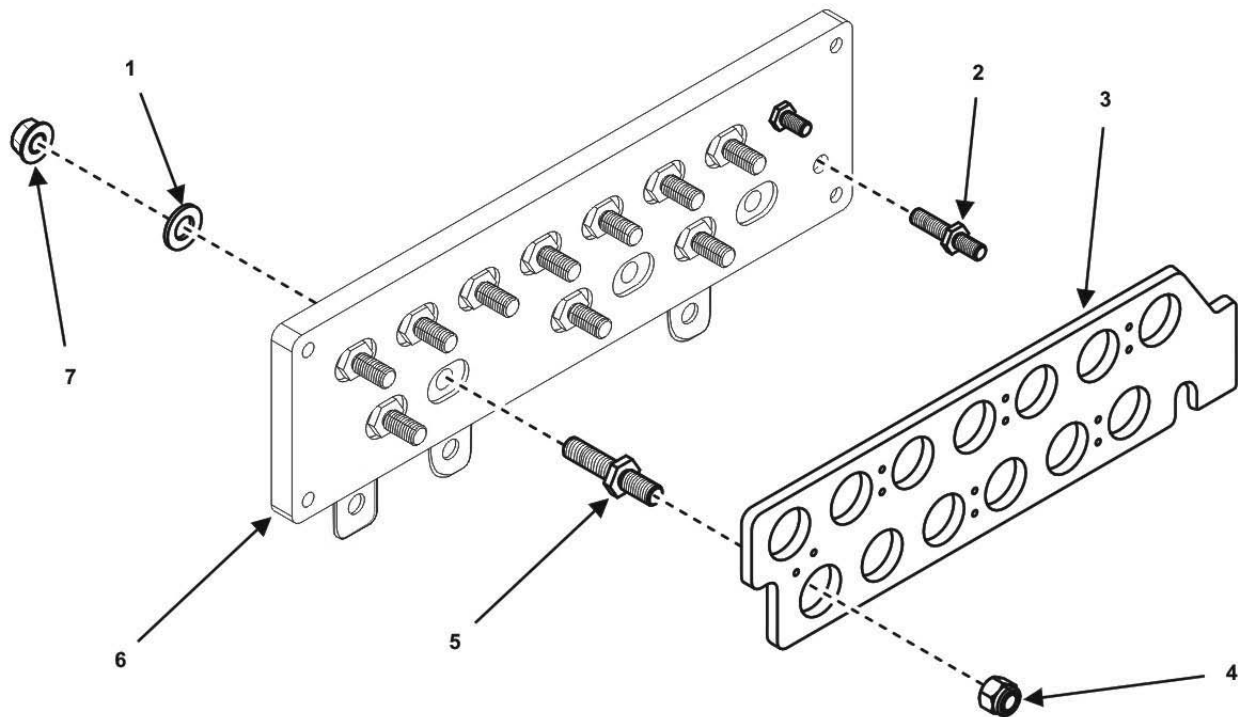


Figure 5. Voltage selection Board Disassembly.

6. Inspect thirteen reconnection studs (Figure 5, Item 5) and two auxiliary studs (Figure 5, Item 2) for damaged or worn threads and replace as required.

END OF TASK

Assemble Voltage Selection Board

1. Position voltage selection front board (Figure 5, Item 3) and voltage selection rear board (Figure 5, Item 6).
2. Ensure voltage selection front board (Figure 5, Item 3) and voltage selection rear board (Figure 5, Item 6) are correctly configured.
3. Insert thirteen reconnection studs (Figure 5, Item 5) and two auxiliary studs (Figure 5, Item 2) through voltage selection front board (Figure 5, Item 3) and voltage selection rear board (Figure 5, Item 6).
4. Install new lock nuts (Figure 5, Item 4) to voltage selection front board (Figure 5, Item 4).

END OF TASK

Install Voltage Selection Board

1. Position three busbars (Figure 3, Item 6) to locations on voltage selection board (Figure 2, Item 3).
2. Position printed circuit board module electrical leads (Figure 5, Item 10) to previously tagged locations on voltage selection board (Figure 2, Item 3).
3. Install printed circuit board module electrical leads (Figure 3, Item 10) with nuts (Figure 3, Item 9).
4. Tighten nuts (Figure 3, Item 9) to 12 – 16 in/lb (1 – 2 Nm)

NOTE

When more than one electrical lead is connected to a stud on voltage selection board (Figure 2, Item 3), the electrical lead with the heaviest terminal lug shall be installed closest to the voltage selection board (Figure 2, Item 3) with the following electrical leads terminal lugs progressively decreasing in size.

5. Position AC generator electrical lead (Figure 3, Item 4) and relay electrical lead (Figure 3, Item 5) to previously tagged location on voltage selection board (Figure 2, Item 3).
6. Install AC generator electrical lead (Figure 3, Item 4) and relay electrical lead (Figure 3, Item 5) with flat washer (Figure 3, Item 8) and new lock nut (Figure 3, Item 1).
7. Position GND electrical lead (Figure 3, Item 2) to previously tagged location on voltage selection board (Figure 2, Item 3).
8. Install GND electrical lead (Figure 3, Item 2) with new lock nut (Figure 3, Item 1).
9. Position AC generator electrical leads (Figure 3, Item 7) to previously tagged locations on voltage selection board (Figure 2, Item 3).
10. Install AC generator electrical leads (Figure 3, Item 7) with flat washer (Figure 3, Item 8) and new lock nut (Figure 3, Item 1).
11. Install remaining lock nut (Figure 3, Item 1) to reconnection stud (Figure 3, Item 3) on voltage selection rear board (Figure 5, Item 6).

NOTE

To tighten lock nuts (Figure 5, Items 4 and 7), one lock nut must be secured while tightening other lock nut on opposite end of reconnection stud (Figure 5, Item 5). Two wrenches are required to tighten lock nuts (Figure 5, Items 4 and 7).

12. Tighten lock nuts (Figure 5, Item 4) to 124 – 159 in/lb (14 – 18 Nm).
13. Tighten lock nuts (Figure 5, Item 7) to 124 – 159 in/lb (14 – 18 Nm).
14. Position voltage selection board (Figure 2, Item 3) to spacers (Figure 2, Item 1) in output box.
15. Install voltage selection board (Figure 2, Item 3) to spacers (Figure 2, Item 1) with four screws (Figure 2, Item 2). Tighten screws (Figure 2, Item 2) to 87 – 105 in/lb (10 – 12 Nm).
16. Position three contactor electrical leads (Figure 2, Item 5) to previously tagged locations on voltage selection board (Figure 2, Item 3).
17. Install contactor electrical leads (Figure 2, Item 5) with three bolts (Figure 2, Item 4), flat washers (Figure 2, Item 6), and new lock nuts (Figure 2, Item 7).
18. Tighten each bolt (Figure 2, Item 4) to 124 – 159 in/lb (14 – 18 Nm).
19. Install five screws (not shown) and nut (not shown) securing output box lower guard (not shown) and access door (not shown) over output box.
20. Position output box upper guard (not shown) and access door (not shown) over output box.
21. Install upper output box guard (not shown) over output box with four screws (not shown).
22. Tighten screws (not shown) securing upper output box guard (not shown) to 87 – 105 in/lb (10 – 12 Nm).
23. Install right-side body panel (WP 0032, Remove/Install Right-Side Body Panel).
24. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
25. Close generator set doors.
26. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).

27. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
28. Repair as required.
29. Remove identification tags.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL CONVENIENCE RECEPTACLE

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Screwdriver, Torx, T20, 3" Long (WP 0163, Maintenance Allocation Chart, Item 23)

Tool Kit, General Mechanic's (GMTK) (WP 0163, Item 38)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0163, Item 47)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0163, Item 48)

Materials/Parts

Boot, terminal circuit breaker (WP 0119, Repair Parts List, Figure 19, Item 28)

Interrupter, ground fault 400 Hz (WP 0019, Figure 19, Item 31)

Receptacle, duplex (WP 0119, Figure 19, Item 15)

Receptacle, duplex (WP 0119, Figure 19, Item 16)

Washer, lock, 1/4 ext tooth (WP 0119, Figure 19, Item 10)

Washer, lock, #8, external tooth (WP 0119, Figure 19, Item 2)

Materials/Parts

Grease, electrically conductive (WP 0164, Expendable and Durable Items List, Item 21)

Tag, marker (WP 0164, Item 36)

Personnel Required

91D (1)

References

WP 0032, Remove/Install Right-Side Body Panel

WP 0057, Remove/Install Output Terminal Board

WP 0062, Remove/Install Printed Circuit Board Module

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL CONVENIENCE RECEPTACLE**WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

Remove Convenience Receptacle Housing

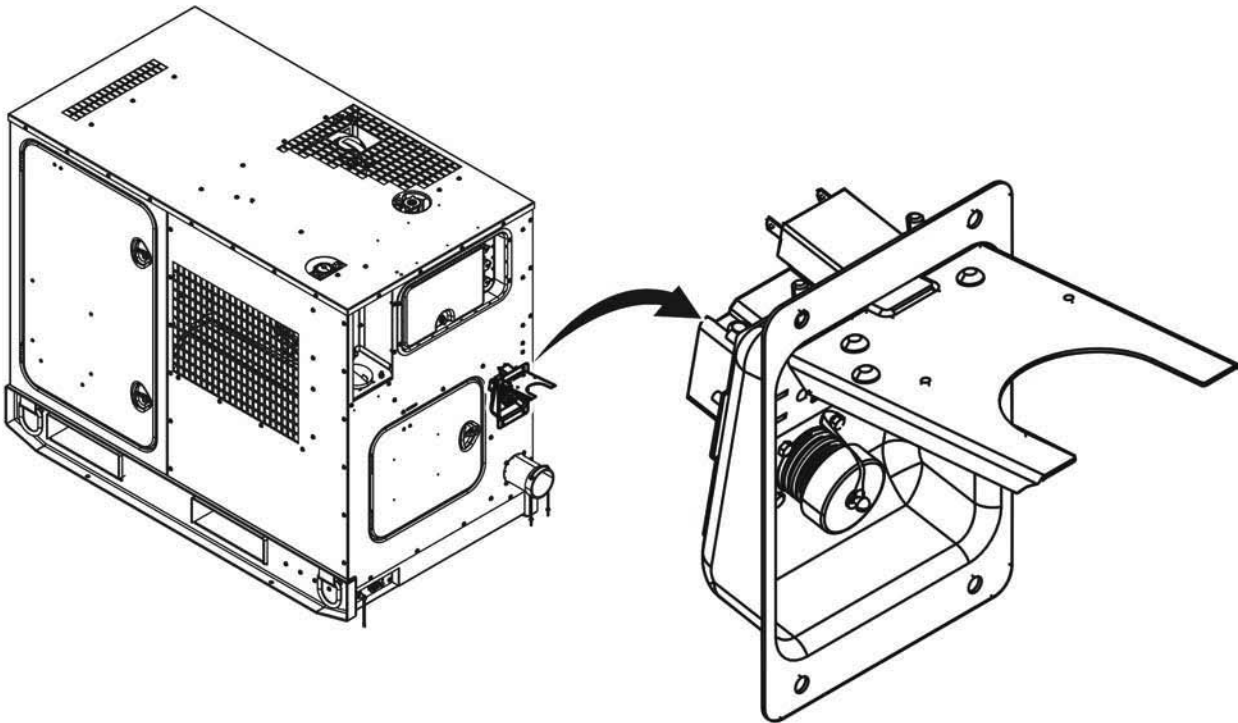


Figure 1. Convenience Receptacle — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate convenience receptacle (Figure 1) on rear of generator set.
3. Remove four screws (not shown) that secure upper output box guard (not shown) over output box.
4. Remove upper output box guard from output box.
5. Remove four screws (Figure 3, Item 10) securing convenience receptacle housing (Figure 3, Item 9) to rear panel.
6. Position convenience receptacle housing (Figure 3, Item 9) to gain access to wiring on rear of housing.

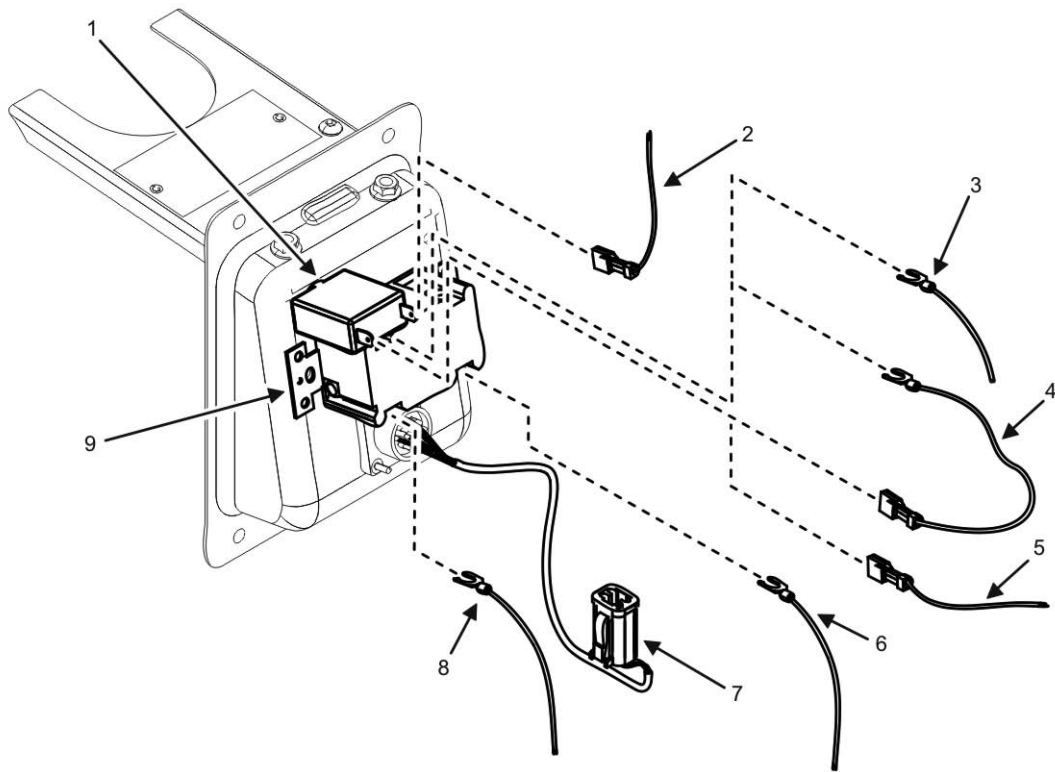


Figure 2. Convenience Receptacle Rear — Removal.

NOTE

To assist installation, tag all wires and connectors prior to removal.

7. Loosen green captive screw (not shown) and tag and remove GND wire (Figure 2, Item 6) from convenience receptacle (Figure 2, Item 9).
8. Loosen captive silver-colored screw (not shown) and tag and remove N wire (Figure 2, Item 8) from convenience receptacle (Figure 2, Item 9).

NOTE

Perform step 9 only for 50/60 Hz generator set. Proceed to steps 10 and 11 for 400 Hz generator set.

9. Tag and remove UOC 98J relay wire (Figure 2, Item 2) from rear of circuit breaker (Figure 2, Item 1).
10. Loosen captive brass-colored screw (not shown) and remove UOC 98K tagged L1 wire (Figure 2, Item 3) from convenience receptacle (Figure 2, Item 9).
11. Tag and remove UOC 98K relay wire (Figure 2, Item 5) from rear of circuit breaker (Figure 2, Item 1).
12. Tag and disconnect switch box contactor receptacle wiring harness (Figure 2, Item 7) at printed circuit board module (not shown) (WP 0063, Remove/Install Printed Circuit Board Module).
13. Remove convenience receptacle housing (Figure 3, Item 9) from rear panel and place on suitable surface.

Disassemble Convenience Receptacle Housing

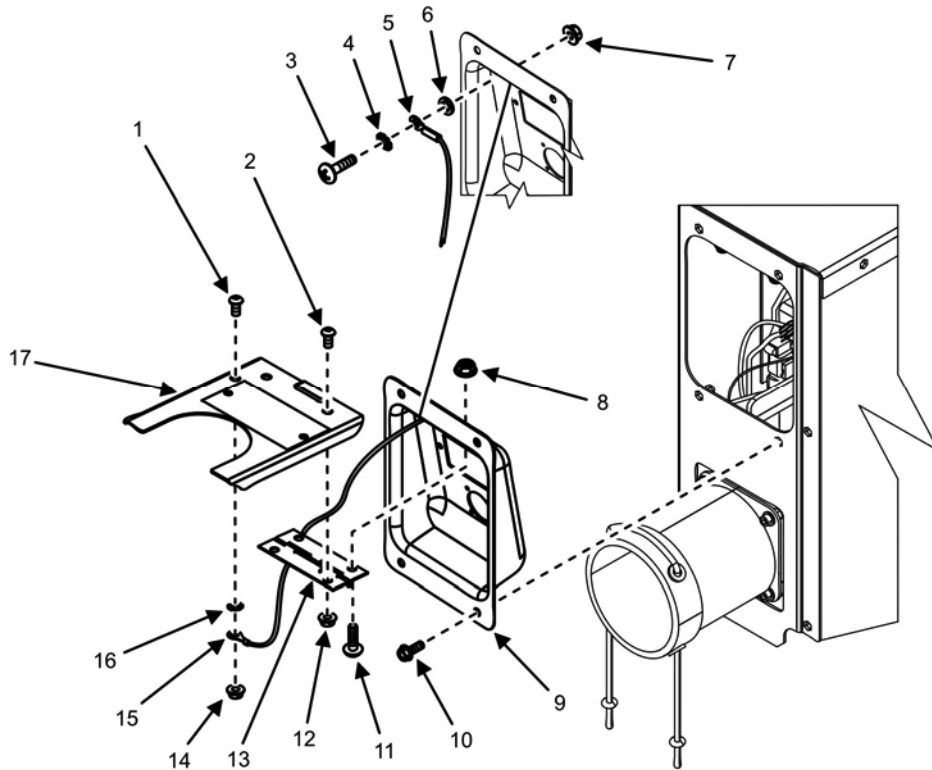


Figure 3. Convenience Receptacle — Removal.

1. Remove screw (Figure 3, Item 3), external tooth lock washer (Figure 3, Item 4), flat washer (Figure 3, Item 6), and nut (Figure 3, Item 7) that secure ground strap (Figure 3, Item 5) to back of convenience receptacle housing (Figure 3, Item 9).
2. Discard external tooth lock washer (Figure 3, Item 4).
3. Remove screw (Figure 3, Item 1), external tooth lock washer (Figure 3, Item 16), and nut (Figure 3, Item 14) that secure ground strap (Figure 3, Item 15) to convenience receptacle housing cover (Figure 3, Item 17).
4. Discard external tooth lock washer (Figure 3, Item 16).
5. Remove two screws (Figure 3, Item 11) and two nuts (Figure 3, Item 8) that secure convenience receptacle housing cover (Figure 3, Item 17) and hinge (Figure 3, Item 13) to convenience receptacle housing (Figure 3, Item 9).
6. Remove two screws (Figure 3, Item 2) and two nuts (Figure 3, Item 12) that attach convenience receptacle housing cover (Figure 3, Item 17) to hinge (Figure 3, Item 13).

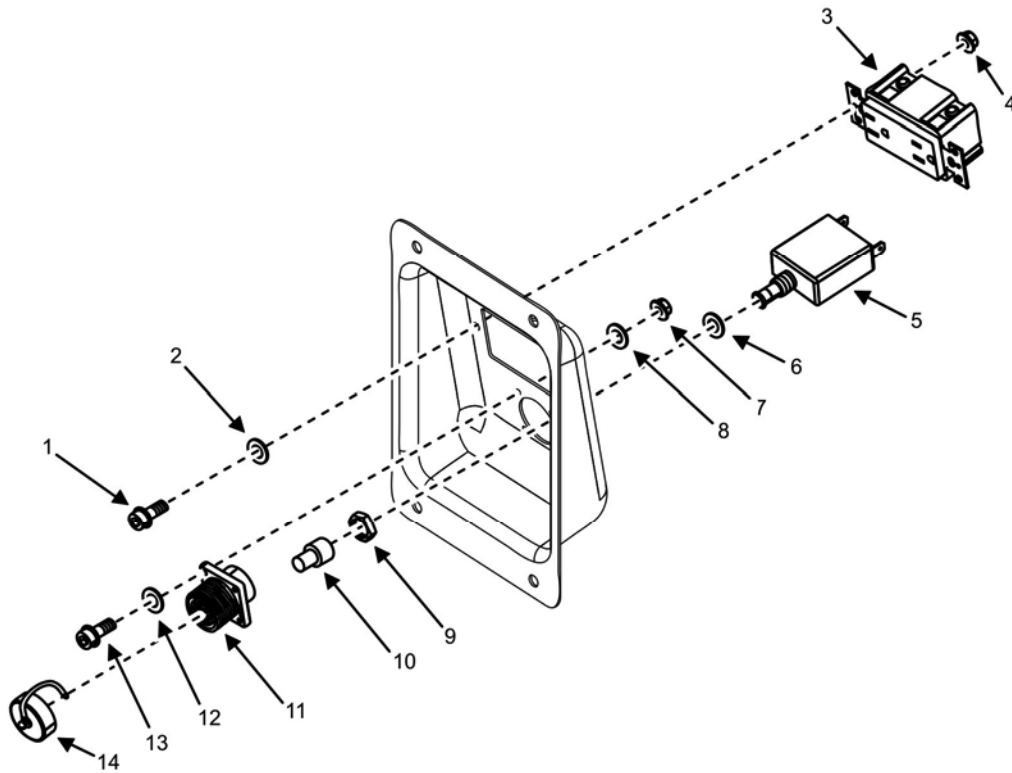


Figure 4. Convenience Receptacle Components — Removal.

7. Remove four nuts (Figure 4, Item 7) and four flat washers (Figure 4, Item 8) that secure switch box contactor receptacle (Figure 4, Item 11) and cap (Figure 4, Item 14) to convenience receptacle housing (Figure 3, Item 9).
8. Remove four screws (Figure 4, Item 13) and four flat washers (Figure 4, Item 12) that secure switch box contactor receptacle (Figure 4, Item 11) and cap (Figure 4, Item 14) to convenience receptacle housing (Figure 3, Item 9).
9. Remove switch box contactor receptacle (Figure 4, Item 11) and cap (Figure 4, Item 14) from convenience receptacle housing (Figure 3, Item 9).
10. Remove circuit breaker boot (Figure 4, Item 10), mounting nut (Figure 4, Item 9), and washer (Figure 4, Item 6) that secure circuit breaker (Figure 4, Item 5) to convenience receptacle housing (Figure 3, Item 9).
11. Discard circuit breaker boot (Figure 4, Item 10).
12. Reposition circuit breaker (Figure 4, Item 5) to allow access to electrical wiring on convenience receptacle (Figure 2, Item 9).

NOTE

Proceed to steps 13 – 14 for 50/60 Hz generator set. Proceed to step 15 for 400 Hz generator set.

13. Loosen screw (not shown) and tag and remove UOC 98J jumper wire (Figure 2, Item 4) from convenience receptacle (Figure 2, Item 9).
14. Tag and remove UOC 98J jumper wire (Figure 2, Item 4) from rear of circuit breaker (Figure 2, Item 1).

15. Remove two screws (Figure 4, Item 1), two flat washers (Figure 4, Item 2), and two flange nuts (Figure 4, Item 4) that secure convenience receptacle (Figure 4, Item 3) to convenience receptacle housing (Figure 3, Item 9).
16. Remove convenience receptacle (Figure 4, Item 3) from convenience receptacle housing (Figure 3, Item 9).

END OF TASK

Inspect Convenience Receptacle

1. Inspect convenience receptacle housing (Figure 3, Item 9) for dents, cracks, or other signs of damage and replace as required.
2. Inspect convenience receptacle housing cover (Figure 3, Item 17) for dents, cracks, or other signs of damage. Replace as required.
3. Inspect hinge (Figure 3, Item 13) for functionality and replace as required.
4. Inspect switch box contactor receptacle (Figure 4, Item 11) for signs of damage and replace as required.
5. Inspect switch box contactor receptacle wiring harness (Figure 2, Item 7) for frayed wires and other signs of damage. Replace switch box contactor receptacle (Figure 4, Item 11) as required.
6. Inspect convenience receptacle (Figure 4, Item 3) for cracks and damage and replace as required.
7. Inspect circuit breaker (Figure 4, Item 5) for cracks and damage and replace as required.
8. Inspect all wires for damage and replace as required
9. Inspect all mounting hardware and replace as required.

END OF TASK

Assemble Convenience Receptacle Housing

1. Position convenience receptacle (Figure 4, Item 3) to mounting position on convenience receptacle housing (Figure 3, Item 9).
2. Secure convenience receptacle (Figure 4, Item 3) to convenience receptacle housing (Figure 3, Item 9) by installing two screws (Figure 4, Item 1), two flat washers (Figure 4, Item 2), and two flange nuts (Figure 4, Item 4). Tighten flange nuts (Figure 4, Item 4) to 25 – 39 in/lb (3 – 6 Nm).

NOTE

Perform steps 3 – 4 only for 50/60 Hz generator. Proceed to step 5 for 400 Hz generator.

3. Install UOC 98J jumper wire (Figure 2, Item 4) to rear of circuit breaker (Figure 2, Item 1).
4. Install UOC 98J jumper wire (Figure 2, Item 4) from circuit breaker (Figure 2, Item 1) to screw (not shown) of convenience receptacle (Figure 2, Item 9). Tighten screw (not shown).
5. Position circuit breaker (Figure 4, Item 5) to mounting position on convenience receptacle housing (Figure 3, Item 9).
6. Secure circuit breaker (Figure 4, Item 5) to convenience receptacle housing (Figure 3, Item 9) by installing washer (Figure 4, Item 6), mounting nut (Figure 4, Item 9), and new circuit breaker boot (Figure 4, Item 10).
7. Position switch box contactor receptacle (Figure 4, Item 11) and cap (Figure 4, Item 14) to mounting position on convenience receptacle housing (Figure 3, Item 9).
8. Install switch box contactor receptacle (Figure 4, Item 11) with four screws (Figure 4, Item 13) and four flat washers (Figure 4, Item 12) to front of switch box contactor receptacle (Figure 4, Item 11).

9. Install four washers (Figure 4, Item 8) and four nuts (Figure 4, Item 7) to rear of switch box contactor receptacle (Figure 4, Item 11). Tighten four nuts (Figure 4, Item 7).
10. Install two screws (Figure 3, Item 2) and two nuts (Figure 3, Item 12) that attach convenience receptacle housing cover (Figure 3, Item 17) and hinge (Figure 3, Item 13). Tighten screws (Figure 3, Item 2) to 87 – 105 in/lb (10 – 12 Nm).
11. Install two screws (Figure 3, Item 11) and two nuts (Figure 3, Item 8) that secure convenience receptacle housing cover (Figure 3, Item 17) and hinge (Figure 3, Item 13) to convenience receptacle housing (Figure 3, Item 9). Tighten screws (Figure 3, Item 11) to 87 – 105 in/lb (10 – 12 Nm).
12. Install screw (Figure 3, Item 1), new external tooth lock washer (Figure 3, Item 16), and nut (Figure 3, Item 14) that secure ground strap (Figure 3, Item 15) to convenience receptacle housing cover (Figure 3, Item 17). Tighten screws (Figure 3, Item 1) to 87 – 105 in/lb (10 – 12 Nm).
13. Install screw (Figure 3, Item 3), new external tooth lock washer (Figure 3, Item 4), flat washer (Figure 3, Item 6), and nut (Figure 3, Item 7) that secure ground strap (Figure 3, Item 5) to back of convenience receptacle housing (Figure 3, Item 9). Tighten screws (Figure 3, Item 3) to 25 – 39 in/lb (3 – 4 Nm).

END OF TASK

Install Convenience Receptacle Housing

1. Position convenience receptacle housing (Figure 3, Item 9) to mounting position on rear panel.

NOTE

Use tags installed on electrical wires and connectors prior to removal as a guide at installation. Remove tags once components have been installed.

2. Connect switch box contactor receptacle wiring harness (Figure 2, Item 7) to printed circuit board using identification tags installed during removal as a guide (WP 0063, Remove/Install Printed Circuit Board Module).

NOTE

Perform step 3 only for 50/60 Hz generator. Proceed to steps 4 – 5 for 400 Hz generator.

3. Install UOC 98J relay wire (Figure 2, Item 2) to rear of circuit breaker (Figure 2, Item 1).
4. Install UOC 98K tagged L1 wire (Figure 2, Item 3) to captive brass-colored screw (not shown) of convenience receptacle (Figure 2, Item 9). Tighten brass-colored screw (not shown).
5. Install UOC 98K relay wire (Figure 2, Item 5) to circuit breaker (Figure 2, Item 1).
6. Install N wire (Figure 2, Item 8) to captive silver-colored screw (not shown) of convenience receptacle (Figure 2, Item 9) using identification tags installed during removal as a guide. Tighten silver-colored screw (not shown).
7. Install GND wire (Figure 2, Item 6) to green captive screw (not shown) of convenience receptacle (Figure 2, Item 9) using identification tags installed during removal as a guide. Tighten green captive screw (not shown).
8. Secure convenience receptacle housing (Figure 3, Item 9) to rear panel by installing four screws (Figure 3, Item 10).
9. Position upper output box guard (not shown) over output box.
10. Secure upper output box guard (not shown) with four screws (not shown).
11. Tighten four screws (not shown) to 87 – 105 in/lb (10 – 12 Nm).
12. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
13. Close generator set doors.

14. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
15. Start engine and check for proper operation (TM 9-6115-751-10).
16. Repair as required.

END OF TASK

Remove Convenience Receptacle Relay and/or Current Transformer

NOTE

Figure 5 shows output box on its side to aid in visualization.

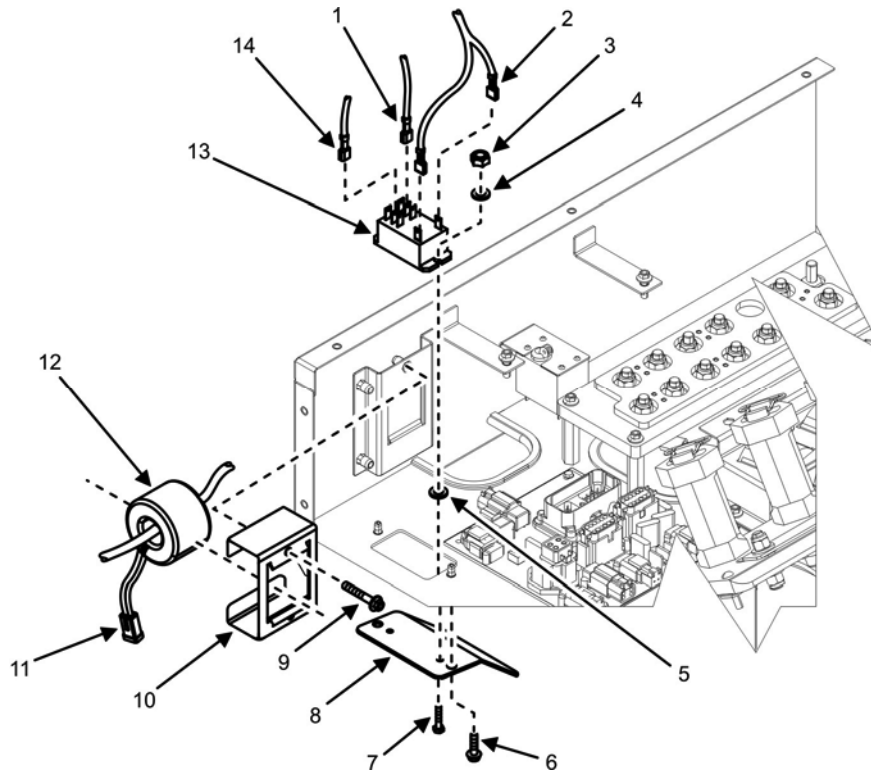


Figure 5. Convenience Receptacle Relay and Current Transformer — Removal.

1. Remove right-side body panel (WP 0033, Remove/Install Right-Side Body Panels).
2. Open rear access door.
3. Tag and remove relay wire (Figure 5, Item 14) from current transformer (Figure 5, Item 12).
4. Tag and remove voltage selection board wire (Figure 5, Item 1) from relay (Figure 5, Item 13).
5. Tag and remove transformer electrical harness (Figure 5, Item 11) from printed circuit board module (not shown).

CAUTION

Current transformer (Figure 5, Item 12) is polarity sensitive indicated by a dot on one end of the transformer. The current transformer (Figure 5, Item 12) must be installed using the same polarity as it was removed. Failure to install the current transformer (Figure 5, Item 12) using correct polarity may cause damage to equipment.

6. Observe and note polarity of current transformer (Figure 5, Item 12) before removal.
7. Remove two screws (Figure 5, Item 9) securing transformer bracket (Figure 5, Item 10) to output box.
8. Remove current transformer (Figure 5, Item 12) and transformer bracket (Figure 5, Item 10) from output box and place on suitable surface.
9. Tag and remove relay wire (Figure 5, Item 14) from relay (Figure 5, Item 13).
10. Tag and remove relay electrical harness (Figure 5, Item 2) from relay (Figure 5, Item 13).
11. Remove two screws (Figure 5, Item 6) that attach GFI bracket (Figure 5, Item 8) to mounting panel in output box.
12. Remove two screws (Figure 5, Item 7), two washers (Figure 5, Item 5), two nuts (Figure 5, Item 3), and two washers (Figure 5, Item 4) securing relay (Figure 5, Item 13) to GFI bracket (Figure 5, Item 8).
13. Position GFI bracket (Figure 5, Item 8) to prevent strain on GFI (Figure 8, Item 5) wires.
14. Remove relay (Figure 5, Item 13) and place on suitable surface.

END OF TASK

Test Convenience Receptacle Relay and Current Transformer

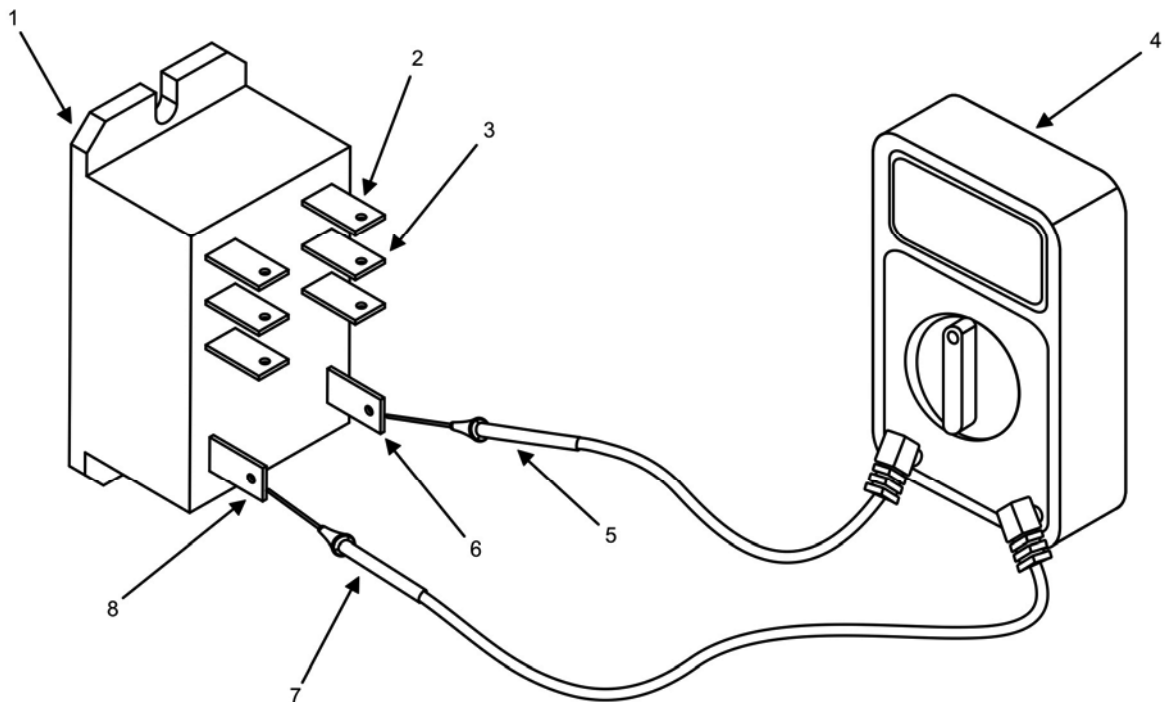


Figure 6. Convenience Receptacle Relay — Test.

1. Inspect relay (Figure 6, Item 1) for signs of damage, evidence of heat, or odor of burned insulation. Replace as required.
2. Place relay (Figure 6, Item 1) in a position that exposes all terminals.
3. Select Ohms function on multimeter (Figure 6, Item 4).
4. Touch either meter probe (Figure 6, Item 7 or 5) to relay terminal (Figure 6, Item 6).
5. Touch second meter probe (Figure 6, Item 7 or 5) to second relay terminal (Figure 6, Item 8).
6. Observe and note value of resistance.
7. Touch either meter probe (Figure 6, Item 7 or 5) to relay terminal (Figure 6, Item 2).
8. Touch second meter probe (Figure 6, Item 7 or 5) to relay terminal (Figure 6, Item 3).
9. Observe and note value of resistance.

NOTE

Resistance value obtained in step 5 should be $350 \Omega \pm 10\%$. Resistance value obtained in step 8 should be infinity.

10. Compare resistance values obtained in step 5 and step 8 to specifications to determine if relay (Figure 6, Item 1) requires replacement. Replace as required.

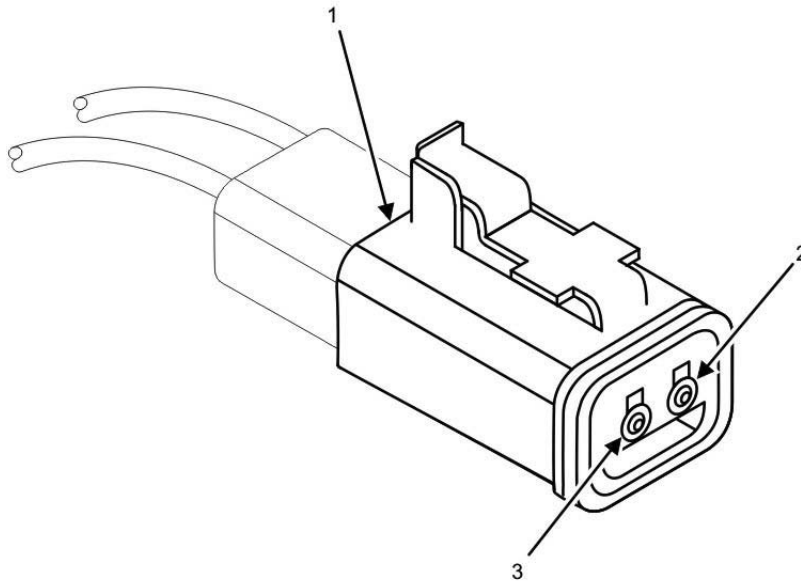


Figure 7. Convenience Receptacle Current Transformer — Test.

11. Inspect current transformer (Figure 5, Item 12) and wiring plug (Figure 7, Item 1) for signs of damage, evidence of heat, odor of burned insulation, frayed wires, and missing wiring plug components. Replace as required.
12. Touch either meter probe (Figure 6, Item 7 or 5) to either wiring plug (Figure 7, Item 1) connector (Figure 7, Item 2 or 3).
13. Touch second meter probe (Figure 6, Item 7 or 5) to wiring plug (Figure 7, Item 1) connector (Figure 7, Item 2 or 3).
14. Observe and note value of resistance.

NOTE

Resistance value obtained in step 12 should be $0.8 \Omega \pm 10\%$. Accuracy of a multimeter is unreliable when measuring values lower than 1Ω . A measurement value greater than 2Ω indicates a defective current transformer (Figure 5, Item 12).

15. Compare resistance value obtained in step 12 to specifications to determine if current transformer (Figure 5, Item 12) requires replacement. Replace as required.

END OF TASK**Install Convenience Receptacle Relay and/or Current Transformer**

1. Perform Test Convenience Receptacle Relay and Current Transformer task if either relay (Figure 5, Item 13) or current transformer (Figure 5, Item 12) are new replacements.
2. Position relay (Figure 5, Item 13) to mounting location on GFI bracket (Figure 5, Item 8).
3. Install two screws (Figure 5, Item 7), two washers (Figure 5, Item 5), two nuts (Figure 5, Item 3), and two washers (Figure 5, Item 4) to attach relay (Figure 5, Item 13) to GFI bracket (Figure 5, Item 8). Tighten two screws (Figure 5, Item 7).
4. Install and tighten two screws (Figure 5, Item 6) that attach GFI bracket (Figure 5, Item 8) to mounting panel in output box.
5. Install relay electrical harness (Figure 5, Item 2) to relay (Figure 5, Item 13) using identification tags installed during removal as a guide.
6. Install voltage selection board wire (Figure 5, Item 1) to relay (Figure 5, Item 13) using identification tags installed during removal as a guide.
7. Position transformer bracket (Figure 5, Item 10) and current transformer (Figure 5, Item 12), using correct polarity noted during removal, to mounting location on output box panel.
8. Install and tighten two screws (Figure 5, Item 9) to attach transformer bracket (Figure 5, Item 10) to output box.
9. Install relay wire (Figure 5, Item 14) through opening in current transformer (Figure 5, Item 12).
10. Install relay wire (Figure 5, Item 14) to relay (Figure 5, Item 13).
11. Install transformer electrical harness (Figure 5, Item 11) into printed circuit board module (not shown).
12. Install right-side body panel (WP 0033, Remove/Install Right-Side Body Panels).
13. Close rear access door.
14. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
15. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
16. Start engine and check for proper operation (TM 9-6115-751-10).
17. Repair as required.

END OF TASK

Remove UOC 98K 400 Hz Convenience Receptacle GFI

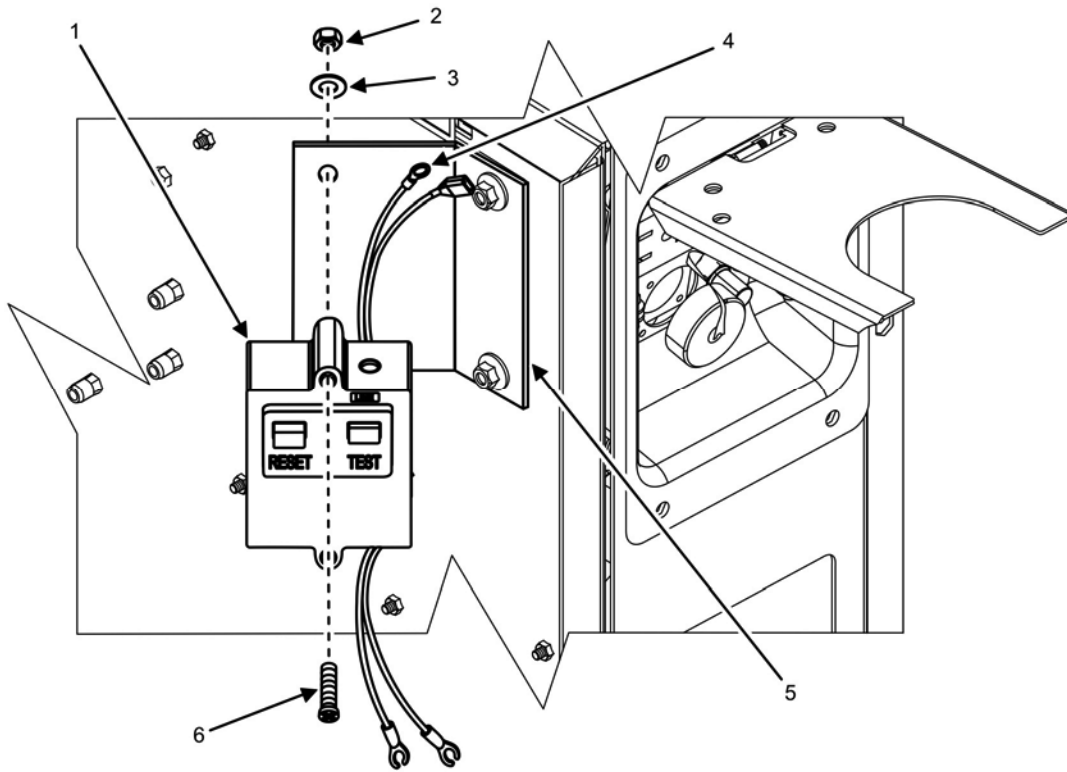


Figure 8. Convenience Receptacle Components GFI — Removal.

NOTE

The UOC 98K (400 Hz) utilizes a separate GFI (Figure 8, Item 1) located on the rear of the output box. UOC 98J (50/60 Hz) utilizes a GFCI on the convenience receptacle (Figure 2, Item 9).

Tag all wires and connectors prior to removal as a guide at installation.

1. Open rear access door.
2. Tag and disconnect two wires (Figure 2, Items 3 and 8) of GFI (Figure 8, Item 1) from convenience receptacle (Figure 2, Item 9) and one UOC 98K relay wire (Figure 2, Item 5) of GFI (Figure 8, Item 1) from rear of circuit breaker (Figure 2, Item 1). See Remove Convenience Receptacle Housing and Disassemble Convenience Receptacle Housing tasks.
3. Remove wire (Figure 8, Item 4) of GFI (Figure 8, Item 1) from N terminal stud (WP 0059, Remove/Install Output Terminal Board).
4. Withdraw four wires through output box opening.
5. Remove two screws (Figure 8, Item 6), two flat washers (Figure 8, Item 3), and two nuts (Figure 8, Item 2) from GFI (Figure 8, Item 5).
6. Remove GFI (Figure 8, Item 1) from mounting bracket (Figure 8, Item 5).
7. Inspect GFI (Figure 8, Item 1) and replace as required.

END OF TASK

Install UOC 98K 400 Hz Convenience Receptacle GFI**NOTE**

The UOC 98K (400 Hz) utilizes a separate GFI (Figure 8, Item 1) located on the rear of the output box. UOC 98J (50/60 Hz) utilizes a GFCI on the convenience receptacle (Figure 2, Item 9).

Use tags installed on wires and connectors prior to removal as a guide at installation. Remove tags once unit has been reassembled and tested for proper operation.

1. Position GFI (Figure 8, Item 1) to mounting bracket (Figure 8, Item 4) and align mounting holes.
2. Insert two screws (Figure 8, Item 6) through GFI (Figure 8, Item 1) into mounting bracket (Figure 8, Item 5).
3. Install two flat washers (Figure 8, Item 3) and two nuts (Figure 8, Item 2) to rear of GFI (Figure 8, Item 1). Tighten two nuts (Figure 8, Item 2).
4. Insert four wires of GFI (Figure 8, Item 1) through output box opening.
5. Install two wires (Figure 2, Items 3 and 8) to convenience receptacle (Figure 2, Item 9) and one UOC 98K relay wire (Figure 2, Item 5) to rear of circuit breaker (Figure 2, Item 1) according to tags. See Install Convenience Receptacle Housing and Assemble Convenience Receptacle Housing tasks.
6. Install wire (Figure 8, Item 4) to N terminal stud (WP 0059, Remove/Install Output Terminal Board).
7. Close rear access door of generator set.
8. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
9. Turn engine control switch to PRIME & RUN (TM-6115-751-10).
10. Start engine and check for proper operation (TM-6115-751-10).
11. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL TRANSFORMERS

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0163, Item 47)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0163, Item 48)

Materials/Parts

Transformer, current (3) (WP 0120, Repair Parts List, Figure 20, Item 4)

Grease, electrically conductive (WP 0164, Expendable and Durable Items List, Item 21)

Personnel Required

91D (1)

References

Not Applicable

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Right-side body panel removed (WP 0032, Remove/Install Right-Side Panel)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL TRANSFORMERS**Remove Transformers**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove four screws (not shown) securing upper output box guard (not shown) over output box.
3. Remove upper output box guard (not shown) from output box.
4. Remove six screws (not shown) securing lower output box guard (not shown) and access door (not shown) over output box.

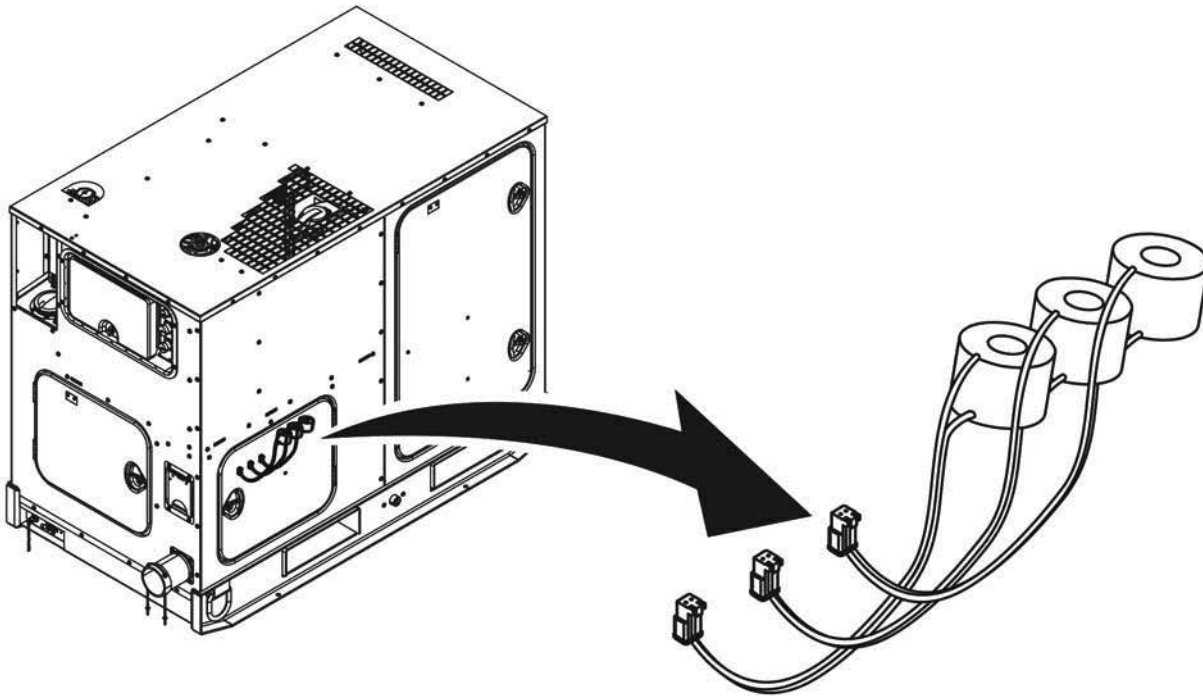


Figure 1. Transformers — Location.

5. Remove lower output box guard (not shown) and access door (not shown) from output box.
6. Locate transformers (Figure 1).
7. Remove two short screws (Figure 2, Item 9) and two long screws (Figure 2, Item 7) that secure transformer top bracket (Figure 2, Item 8) to transformer bottom bracket (Figure 2, Item 1).
8. Remove transformer top bracket (Figure 2, Item 8) from output box.

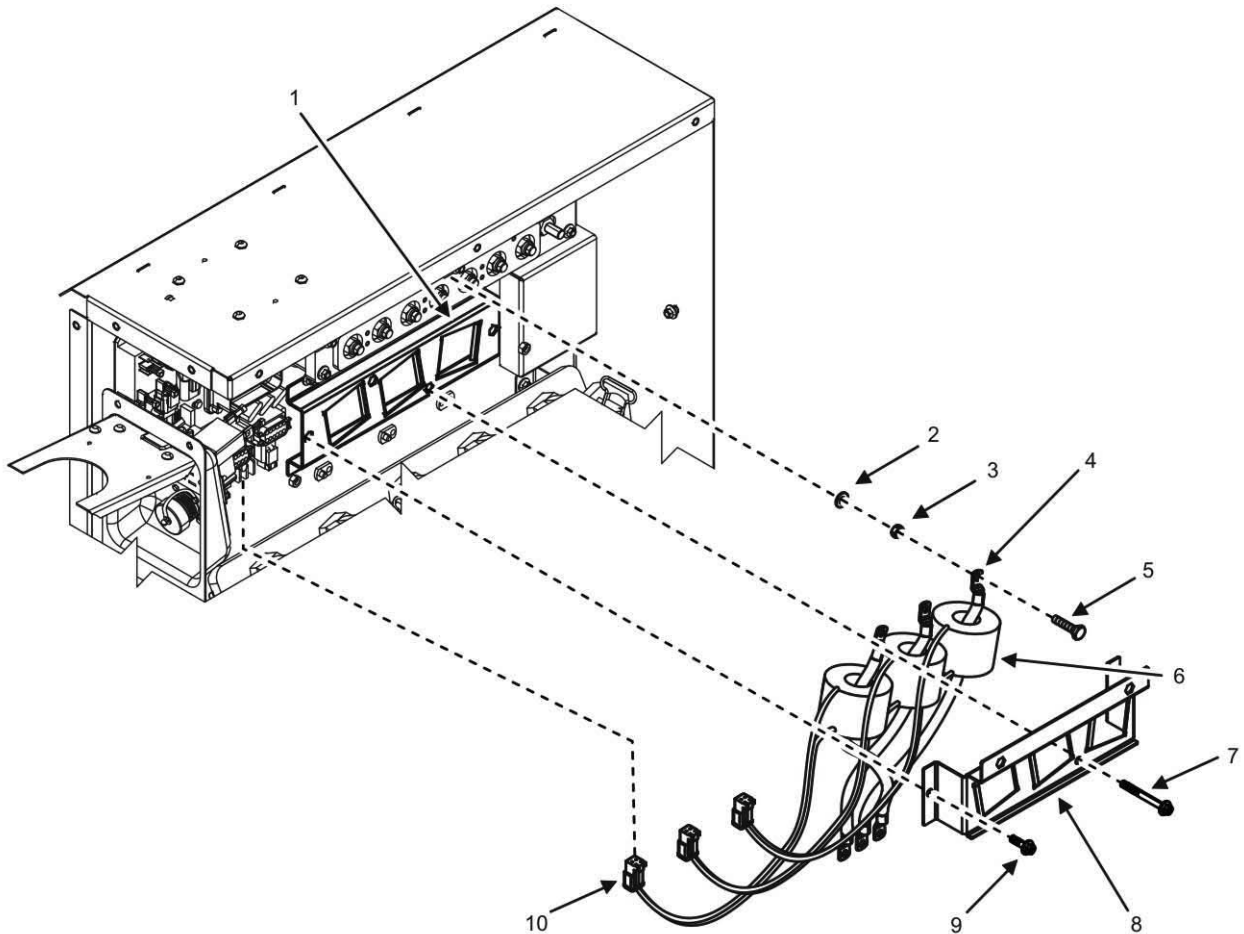


Figure 2. Transformer — Detail.

CAUTION

Printed circuit board module (not shown) contains components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit board. Failure to comply may cause damage to equipment.

NOTE

Prior to disassembly, tag all electrical wires, cables, and connectors for identification. Tags will be used as a guide during reassembly.

Transformer electrical wires (Figure 2, Item 10) are permanently attached to transformers (Figure 2, Item 6). If transformer electrical wires (Figure 2, Item 10) are damaged beyond repair, replace transformer (Figure 2, Item 6).

9. Tag and disconnect transformer electrical wires (Figure 2, Item 10) at printed circuit board module (not shown).

NOTE

Transformer electrical wires (Figure 2, Item 10) are permanently attached to transformers (Figure 2, Item 6). If transformer electrical wires (Figure 2, Item 10) are damaged beyond repair, replace transformer (Figure 2, Item 6).

10. Inspect transformer electrical wires (Figure 2, Item 10) and replace transformer (Figure 2, Item 6) if damaged.
11. Tag three electrical leads (Figure 2, Item 4) to voltage selection board (not shown)
12. Remove three bolts (Figure 2, Item 5), washers (Figure 2, Item 3), and lock nuts (Figure 2, Item 2) securing electrical leads (Figure 2, Item 4) to voltage selection board (not shown).
13. Discard lock nuts (Figure 2, Item 2).
14. Remove three electrical leads (Figure 2, Item 4) to voltage selection board (not shown).
15. Inspect three electrical leads (Figure 2, Item 4) for damage and replace as required.

CAUTION

Orientation of transformers (Figure 2, Item 6) must be tagged prior to removal. X1 marking faces the top of the output box. Transformers are to be installed to the orientation they were removed. Failure to comply may cause damage to equipment.

NOTE

Prior to removal, tag orientation of current transformers (Figure 2, Item 6). Tags will be used as a guide during reassembly.

16. Tag and remove three transformers (Figure 2, Item 6) from transformer bottom bracket (Figure 2, Item 1) mounted in output box.

END OF TASK**Inspect Transformers**

1. Inspect transformer bottom bracket (Figure 2, Item 1) in output box for signs of obvious damage. Replace as required.
2. Inspect three transformers (Figure 2, Item 6) for signs of obvious damage. Replace as required.
3. Inspect three transformers (Figure 2, Item 6) by using a multimeter set to test Ohms to check resistance between two sleeves of two electrical wires (Figure 2, Item 10) of each transformer (Figure 2, Item 6).

NOTE

A measurement value greater than 2 Ω indicates a defective current transformer (Figure 2, Item 6).

4. Replace any transformer (Figure 2, Item 6) outside of specification.
5. Inspect transformer top bracket (Figure 2, Item 8) for signs of obvious damage. Replace as required.
6. Inspect all mounting hardware for signs of obvious damage. Replace as required.

END OF TASK

Install Transformers

CAUTION

Orientation of transformers (Figure 2, Item 6) must be installed to proper orientation. X1 marking faces the top of the output box. Failure to comply may cause damage to equipment.

1. Position three transformers (Figure 2, Item 6) to transformer bottom bracket (Figure 2, Item 1) with X1 marking facing the top of the output box.

CAUTION

Printed circuit board module (not shown) contains components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit board. Failure to comply may cause damage to equipment.

NOTE

Identification tags should remain in place until the output box is completely reassembled and has been tested for proper operation.

Apply a thin coat of electrically conductive grease to all electrical connections prior to assembly.

2. Insert electrical leads (Figure 2, Item 4) through transformers (Figure 2, Item 6) to mounting location on voltage selection board (not shown) using identifications tags installed during removal as a guide.
3. Apply a thin coat of electrically conductive grease to electrical connections.
4. Position electrical leads (Figure 2, Item 4) to voltage selection board (not shown) mounting location.
5. Insert bolt (Figure 2, Item 5) through electrical leads (Figure 2, Item 4) and voltage selection board (not shown).
6. Secure electrical leads (Figure 2, Item 4) to voltage selection board (not shown) with three new lock nuts (Figure 2, Item 2) and flat washers (Figure 2, Item 3).

NOTE

Lock nut (Figure 2, Item 2) must be held in place while tightening bolt (Figure 2, Item 5) to proper torque value.

7. Tighten bolt (Figure 2, Item 5) to 124 – 159 in/lb (14 – 18 Nm).
8. Connect transformer electrical wires (Figure 2, Item 10) to printed circuit board module (not shown) using identification tags installed during removal as a guide.

NOTE

Transformer top bracket (Figure 2, Item 8) is properly oriented over transformers (Figure 2, Item 6) when the lip is facing the top of the unit.

9. Position transformer top bracket (Figure 2, Item 8) over transformers (Figure 2, Item 6).
10. Secure transformer top bracket (Figure 2, Item 8) with two short screws (Figure 2, Item 9) and two long screws (Figure 2, Item 7).
11. Tighten two short screws (Figure 2, Item 9) and two long screws (Figure 2, Item 7) to 87 – 105 in/lb (10 – 12 Nm).
12. Position lower output box guard (not shown) and access door (not shown) over output box.

-
13. Install six screws (not shown) securing lower output box guard (not shown) and access door (not shown) over output box.
 14. Position upper output box guard (not shown) and access door (not shown) over output box.
 15. Install upper output box guard (not shown) over output box with four screws (not shown).
 16. Tighten screws (not shown) securing upper and lower output box guards (not shown) to 87 – 105 in/lb (10 – 12 Nm).
 17. Install right-side body panel (WP 0032, Remove/Install Right-Side Panel).
 18. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
 19. Close generator set doors.
 20. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
 21. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
 22. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL HOUR METER

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0163, Item 47)

Materials/Parts

Gasket (WP 0118, Figure 18, Item 4)

Meter, time (WP 0118, Repair Parts List, Figure 18, Item 3)

Grease, electrically conductive (WP 0164, Expendable and Durable Items List, Item 21)

Tag, marker (WP 0164, Item 36)

Personnel Required

91D (1)

References

WP 0062, Remove/Install Printed Circuit Board Module

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Rear body panel removed (WP 0030, Remove/Install Rear Body Panel)

Right-side body panel removed (WP 0032, Remove/Install Right-Side Body Panel)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL HOUR METER
WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

Remove Hour Meter

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove four screws (not shown) that secure upper output box guard (not shown) over output box.
3. Remove upper output box guard from output box.
4. Locate hour meter (Figure 1).

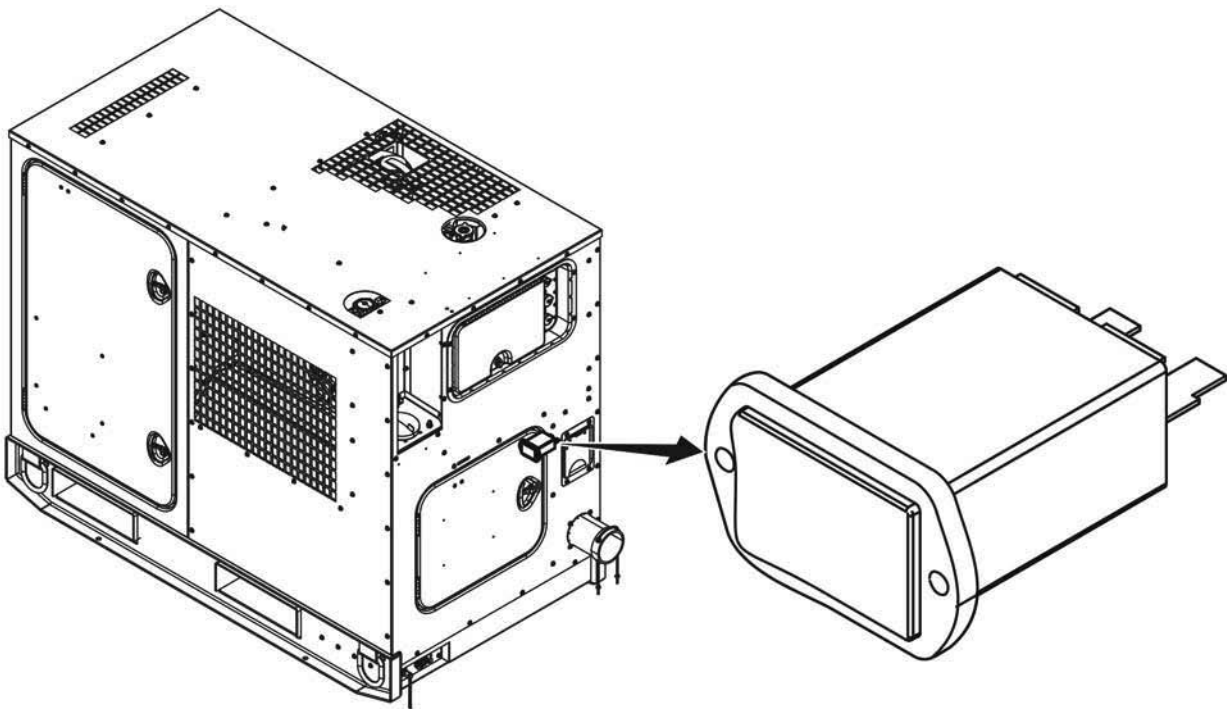


Figure 1. Hour Meter — Location.

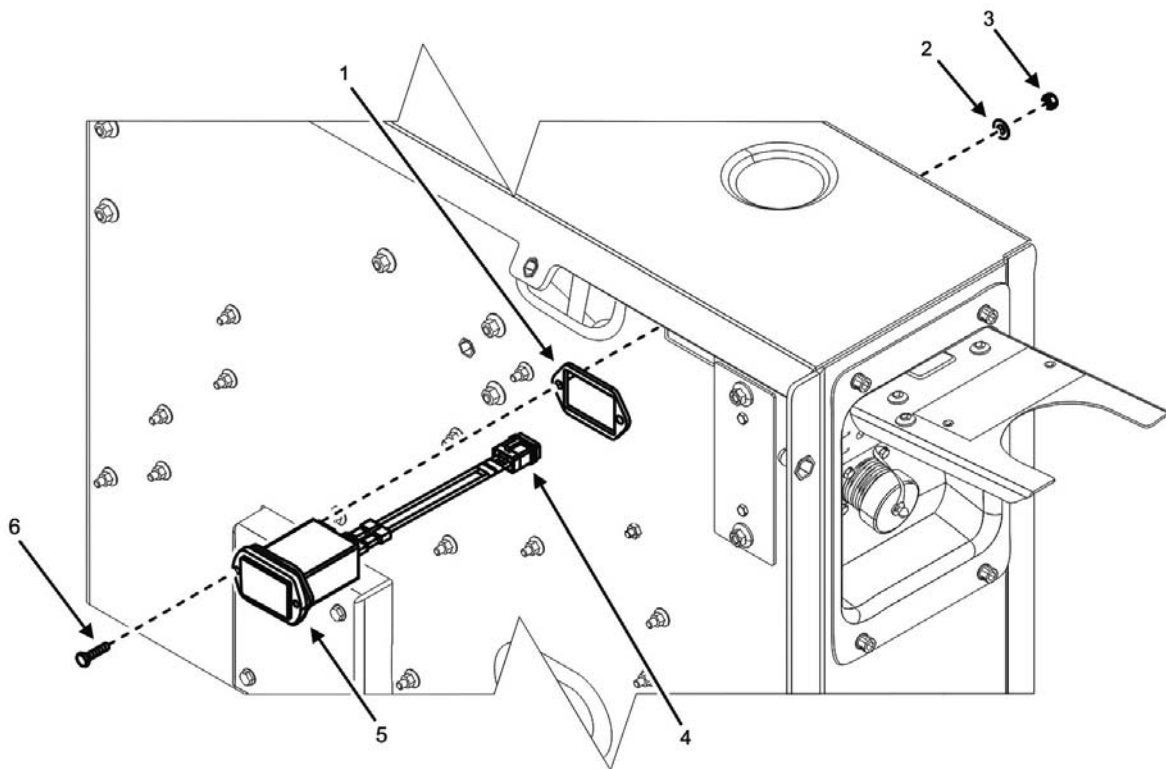


Figure 2. Hour Meter — Detail.

CAUTION

Printed circuit board contains components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit board. Failure to comply may cause damage to equipment.

NOTE

Prior to disassembly, tag all electrical wires, cables, and connectors for identification. Tags will be used as a guide during reassembly.

5. Tag and disconnect hour meter wiring harness (Figure 2, Item 4) from printed circuit module board of output box (WP 0062, Remove/Install Printed Circuit Board Module).

NOTE

Hour meter wiring harness (Figure 2, Item 4) and mounting gasket (Figure 2, Item 1) are supplied with replacement hour meter (Figure 2, Item 5).

6. Remove two nuts (Figure 2, Item 3) and two washers (Figure 2, Item 2) from inside the output box and two screws (Figure 2, Item 6) from the rear of the output box that secure hour meter (Figure 2, Item 5) to back wall of output box.
7. Remove hour meter (Figure 2, Item 5), gasket (Figure 2, Item 1), and hour meter wiring harness (Figure 2, Item 4) from output box. Discard gasket (Figure 2, Item 1).

END OF TASK

Inspect Hour Meter

1. Inspect hour meter (Figure 2, Item 5) and hour meter wiring harness (Figure 2, Item 4) for signs of obvious damage. Replace as required.
2. Inspect all mounting hardware for signs of obvious damage. Replace as required.

END OF TASK

Install Hour Meter

1. Position hour meter (Figure 2, Item 5), new gasket (Figure 2, Item 1), and hour meter wiring harness (Figure 2, Item 4) to mounting locations in output box and align the mounting holes.
2. Secure hour meter (Figure 2, Item 5) to output box by installing two screws (Figure 2, Item 6) to the back of output box and two washers (Figure 2, Item 2) and nuts (Figure 2, Item 3) to the inside of output box. Tighten to a value of 11 – 12 in/lb (1 Nm).

CAUTION

Printed circuit board contains components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit board. Failure to comply may cause damage to equipment.

NOTE

Identification tags should remain in place until the output box is completely re-assembled and has been tested for proper operation.

Apply a thin coat of electrically conductive grease to all electrical connections prior to assembly.

3. Apply a thin coat of electrically conductive grease to hour meter wiring harness (Figure 2, Item 4) of hour meter (Figure 2, Item 5) and printed circuit board module.
4. Install hour meter wiring harness (Figure 2, Item 4) to printed circuit board module using identifications tags installed during removal as a guide (WP 0062, Remove/Install Printed Circuit Board Module).
5. Install upper output box guard (not shown) over output box with four screws (not shown).
6. Tighten upper output box guard (not shown) screws (not shown) to 87 – 105 in/lb (10 – 12 Nm).
7. Install right-side body panel (WP 0032, Remove/Install Right-Side Body Panel).
8. Install rear body panel (WP 0030, Remove/Install Rear Body Panel).
9. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries)
10. Close generator set doors.
11. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
12. Start engine and check for proper operation (TM 9-6115-751-10).
13. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL PRINTED CIRCUIT BOARD MODULE

INITIAL SETUP:**Test Equipment**

Not Applicable

Personnel Required

91D (1)

Tools and Special Tools

Strap, Wrist, Electrostatic Discharge (WP 0163, Maintenance Allocation Chart, Item 29)

Tool Kit, General Mechanic's (GMTK) (WP 0163, Item 38)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0163, Item 47)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0163, Item 48)

References

WP 0061, Remove/Install Hour Meter

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Right-side body panel removed (WP 0032, Remove/Install Right-Side Body Panel)

Materials/Parts

Module, printed circuit board (WP 0121, Repair Parts List, Figure 21, Item 3)

Grease, electrically conductive (WP 0164, Expendable and Durable Items List, Item 21)

Tag, marker (WP 0164, Item 36)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL PRINTED CIRCUIT BOARD MODULE**Remove Printed Circuit Board Module**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove four screws (not shown) securing upper output box guard (not shown) over output box.
3. Remove upper output box guard (not shown) from output box.
4. Remove six screws (not shown) securing lower output box guard (not shown) and access door (not shown) over output box.
5. Remove lower output box guard (not shown) and access door (not shown) from output box.
6. Locate printed circuit board module (Figure 1).

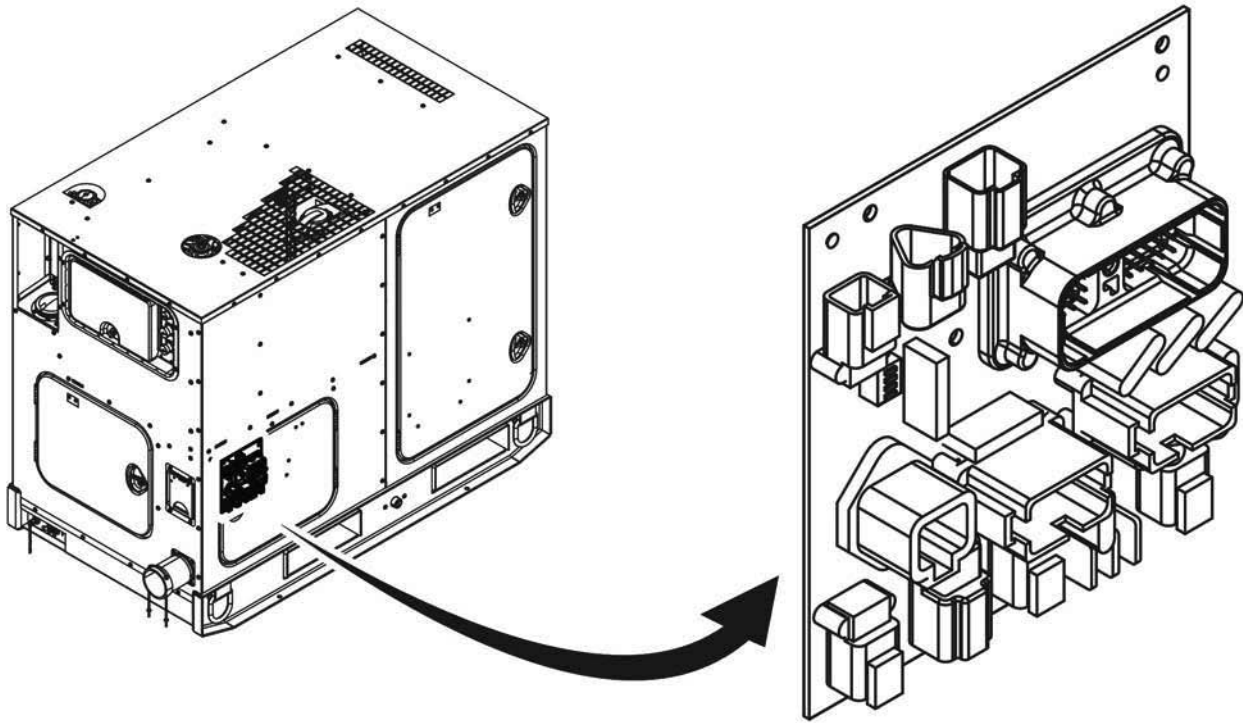


Figure 1. Printed Circuit Board Module — Location.

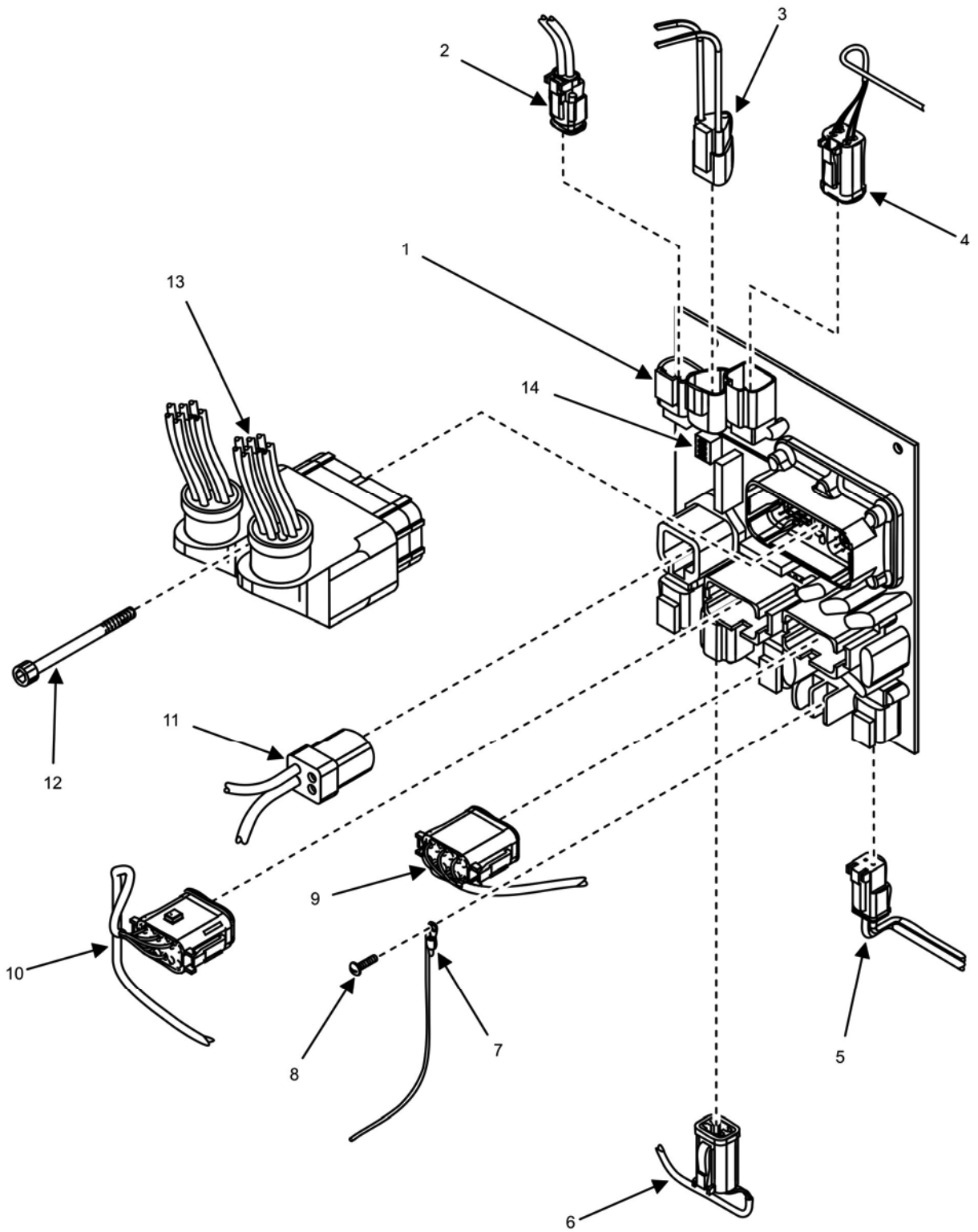


Figure 2. Printed Circuit Board Module Wiring — Removal.

CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

NOTE

Prior to disassembly, tag and identify all wiring harnesses and electrical leads according to markings on printed circuit board module (Figure 3). Tags will be used as a guide during reassembly.

7. Tag and remove wiring harness (Figure 2, Item 2) from printed circuit board module (Figure 2, Item 1) to top transformer (not shown).
8. Inspect wiring harness (Figure 2, Item 2) for frayed wires and other signs of obvious damage. Replace top transformer (not shown) as required.
9. Tag and remove hour meter wiring harness (Figure 2, Item 3) from printed circuit board module (Figure 2, Item 1) to hour meter (not shown).
10. Inspect hour meter wiring harness (Figure 2, Item 3) for frayed wires and other signs of obvious damage. Replace hour meter as required (WP 0061, Remove/Install Hour Meter).
11. Tag and remove voltage selection board wiring harness (Figure 2, Item 4) from printed circuit board module (Figure 2, Item 1) to voltage selection board (not shown).
12. Inspect voltage selection board wiring harness (Figure 2, Item 4) for frayed wires and other signs of obvious damage. Replace as required.
13. Tag DCS wiring harness (Figure 2, Item 13) from printed circuit board module (Figure 2, Item 1) to DCS (not shown).
14. Remove screw (Figure 2, Item 12) securing DCS wiring harness (Figure 2, Item 13) to printed circuit board module (Figure 2, Item 1).
15. Remove DCS wiring harness (Figure 2, Item 13) from printed circuit board module (Figure 2, Item 1).
16. Inspect DCS wiring harness (Figure 2, Item 13) for frayed wires and other signs of obvious damage. Replace as required.
17. Tag and remove wiring harness (Figure 2, Item 11) from printed circuit board module (Figure 2, Item 1) to relay (not shown).
18. Inspect wiring harness (Figure 2, Item 11) for frayed wires and other signs of obvious damage. Replace as required.
19. Tag and remove N terminal and contactor wiring harness (Figure 2, Item 10) from printed circuit board module (Figure 2, Item 1) to N terminal (not shown) and contactor (not shown).
20. Inspect N terminal and contactor wiring harness (Figure 2, Item 10) for frayed wires and other signs of obvious damage. Replace as required.
21. Tag and remove wiring harness (Figure 2, Item 9) from printed circuit board module (Figure 2, Item 1) to contactor (not shown) and line terminals (not shown).
22. Inspect wiring harness (Figure 2, Item 9) for frayed wires and other signs of obvious damage. Replace as required.
23. Tag and remove three transformer wiring harnesses (Figure 2, Item 5) from printed circuit board module (Figure 2, Item 1) to three transformers (not shown).
24. Inspect three transformer wiring harnesses (Figure 2, Item 5) for frayed wires and other signs of obvious damage. Replace as required.

25. Tag and remove switch box contactor receptacle wiring harness (Figure 2, Item 6) from printed circuit board module (Figure 2, Item 1) to switch box contactor receptacle (not shown).
26. Inspect switch box contactor receptacle wiring harness (Figure 2, Item 6) for frayed wires and other signs of obvious damage. Replace as required.

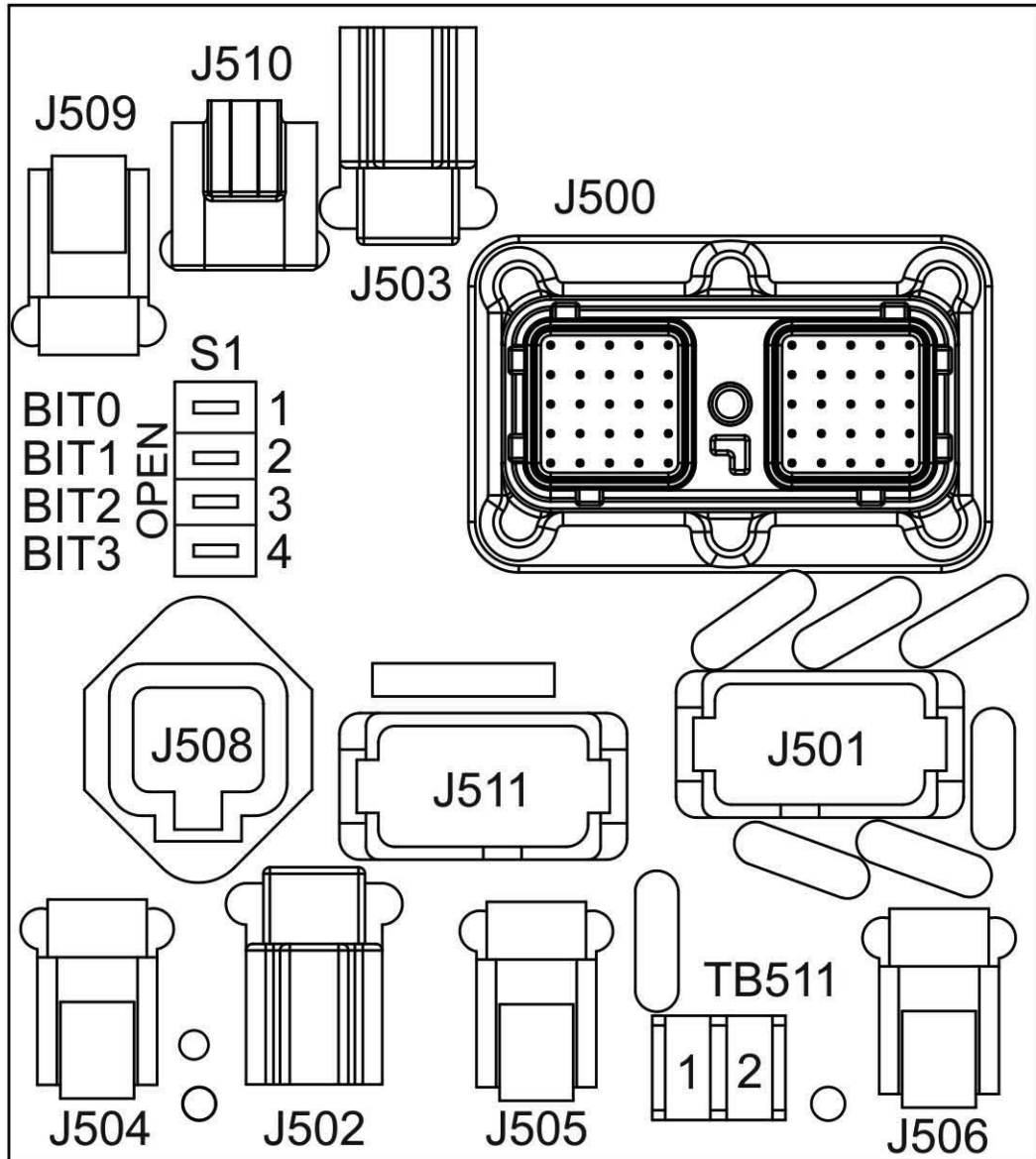


Figure 3. Printed Circuit Board Module Wiring Labels.

27. Tag electrical lead (Figure 2, Item 7) from printed circuit board module (Figure 2, Item 1) to ground strap bolt.
28. Remove screw (Figure 2, Item 8) with washer securing electrical lead (Figure 2, Item 7) to printed circuit board module (Figure 2, Item 1).
29. Remove electrical lead (Figure 2, Item 7) from printed circuit board module (Figure 2, Item 1).
30. Inspect electrical lead (Figure 2, Item 7) for frayed wire and other signs of obvious damage. Replace as required.

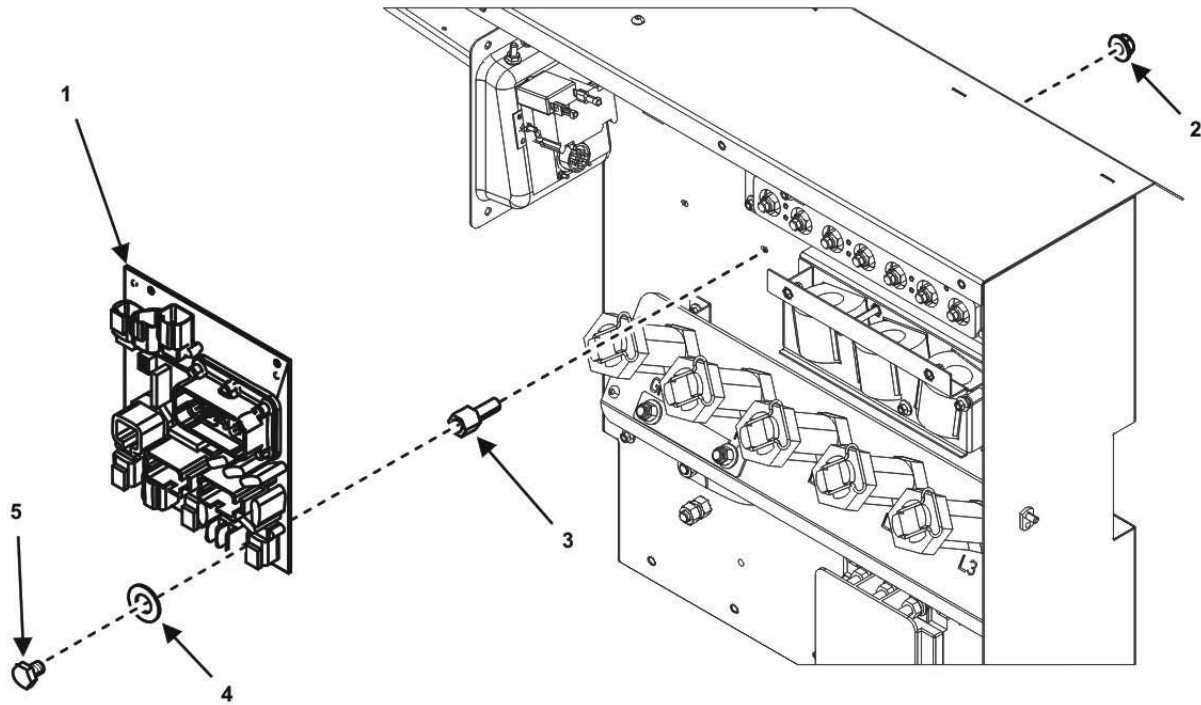


Figure 4. Printed Circuit Board Module — Removal.

31. Remove five nuts (Figure 4, Item 2) from back of output box that secure printed circuit board module (Figure 4, Item 1) to output box.
32. Remove printed circuit board module (Figure 4, Item 1) from output box and place on a suitable work surface.
33. Remove five screws (Figure 4, Item 5), five washers (Figure 4, Item 4), and five spacers (Figure 4, Item 3) from printed circuit board module (Figure 4, Item 1).
34. Note and record position of four dip switches (Figure 2, Item 14) on printed circuit board module (Figure 2, Item 1).

END OF TASK

Inspect Printed Circuit Board Module

CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

1. Inspect printed circuit board module (Figure 2, Item 1) for signs of obvious damage. Replace damaged module as required.
2. Inspect all mounting hardware for signs of obvious damage. Replace damaged hardware as required.

END OF TASK

Install Printed Circuit Board Module

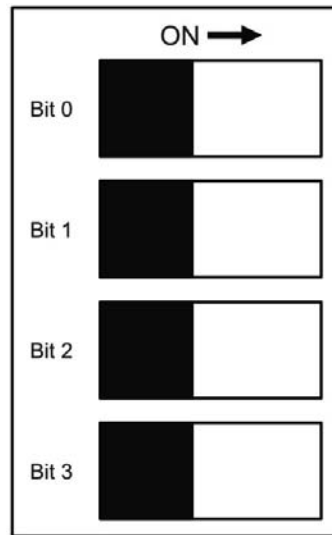


Figure 5. Dip Switch Settings.

CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

NOTE

Dip switch configurations should match Table 1. The dip switch is composed of four switches stacked vertically (Figure 5). The top switch is bit 0 and the bottom switch is bit 3 (Figure 5). In Table 1, 0 refers to the OFF position and 1 to the ON position. Figure 5 shows all switches in the OFF position.

Table 1. 15 kW Dip Switch Configuration.

GENSET HARDWARE CONFIGURATION	BIT 0	BIT 1	BIT 2	BIT 3
15 kW, 50/60 Hz	1	1	0	0
15 kW, 400 Hz	0	0	0	1

1. Configure four dip switches (Figure 2, Item 14) located on printed circuit board module (Figure 2, Item 1) using Table 1 and Figure 5 or notes taken during removal as a guide.
2. Install five flat washers (Figure 4, Item 4) and five screws (Figure 4, Item 5) to printed circuit board module (Figure 4, Item 1).
3. Install five spacers (Figure 4, Item 3) to threads of screws (Figure 4, Item 5).
4. Position printed circuit board module (Figure 4, Item 1) to mounting location on output box.
5. Install five nuts (Figure 4, Item 2) to threads of five screws (Figure 4, Item 5) on rear side of output box. Tighten nuts (Figure 4, Item 2) to 25 – 31 in/lb (3 – 4 Nm).

NOTE

Identification tags should remain in place until the output box is completely re-assembled and has been tested for proper operation.

A thin coat of electrically conductive grease should be applied to all electrical connections prior to assembly.

6. Apply a thin coat of electrically conductive grease to all printed circuit board module electrical leads and harnesses.
7. Install transformer wiring harness (Figure 2, Item 2) to printed circuit board module (Figure 2, Item 1) using identification tags installed during removal as a guide.
8. Install hour meter wiring harness (Figure 2, Item 3) to printed circuit board module (Figure 2, Item 1) using identification tags installed during removal as a guide.
9. Install voltage selection board wiring harness (Figure 2, Item 4) from voltage selection board to printed circuit board module (Figure 2, Item 1) using identification tags installed during removal as a guide.
10. Install DCS wiring harness (Figure 2, Item 13) from DCS to printed circuit board module (Figure 2, Item 1) using identification tags installed during removal as a guide.
11. Secure DCS wiring harness (Figure 2, Item 13) from DCS to printed circuit board module (Figure 2, Item 1) with screw (Figure 2, Item 12).

12. Install relay wiring harness (Figure 2, Item 11) to printed circuit board module (Figure 2, Item 1) using identification tags installed during removal as a guide.
13. Install N terminal and contactor wiring harness (Figure 2, Item 10) from N terminal and contactor to printed circuit board module (Figure 2, Item 1) using identification tags installed during removal as a guide.
14. Install wiring harnesses (Figure 2, Item 9) from terminals and contactor to printed circuit board module (Figure 2, Item 1) using identification tags installed during removal as a guide.
15. Install three transformers wiring harnesses (Figure 2, Item 5) from three transformers to printed circuit board module (Figure 2, Item 1) using identification tags installed during removal as a guide.
16. Install switch box contactor receptacle wiring harness (Figure 2, Item 6) from switch box contactor receptacle to printed circuit board module (Figure 2, Item 1) using identification tags installed during removal as a guide.
17. Position electrical lead (Figure 2, Item 7) from ground strap bolt to printed circuit board module (Figure 2, Item 1) using identification tags installed during removal as a guide.
18. Secure electrical lead (Figure 2, Item 7) from ground strap bolt to printed circuit board module (Figure 2, Item 1) with screw (Figure 2, Item 8) with washer.
19. Position lower output box guard (not shown) and access door (not shown) over output box.
20. Install six screws (not shown) securing lower output box guard (not shown) and access door (not shown) over output box.
21. Position upper output box guard (not shown) and access door (not shown) over output box.
22. Install upper output box guard (not shown) over output box with four screws (not shown).
23. Tighten screws (not shown) securing upper and lower output box guards (not shown) to 87 – 105 in/lb (10 – 12 Nm).
24. Install right-side body panel (WP 0032, Remove/Install Right-Side Body Panel).
25. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
26. Close generator set doors.
27. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
28. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
29. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL 50/60 HZ ENGINE ASSEMBLY

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)
 Torque Tube, 5-75 FT-LB (WP 0163, Item 41)
 Torque Wrench Head End, 1/4" X 3/8" Drive, 9/16" (WP 0162, Item 43)
 Wrench, Torque, Click, Ratcheting 3/8" Drive, 75 FT-LB (WP 0163, Item 46)
 Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0163, Item 48)

Materials/Parts

Assembly, engine (WP 0125, Repair Parts List, Figure 25, Item 1)
 Antifreeze, ethylene glycol (WP 0164, Expendable and Durable Items, Item 2)
 Cap set, protective (WP 0164, Item 9)
 Cloth, abrasive, crocus (WP 0164, Item 12)
 Compound, antiseize (WP 0164, Item 14)
 Distilled water (WP 0164, Item 18)
 Grease, electrically conductive (WP 0164, Item 21)
 Lubricating oil, engine (WP 0164, Item 24)
 Pan, drain (3) (WP 0164, Item 29)
 Penetrating oil (WP 0164, Item 30)
 Rag, wiping (6) (WP 0164, Item 32)
 Soap, ivory (WP 0164, Item 34)
 Tag, marker (WP 0164, Item 36)

Personnel Required

91D (1)
 Assistant (1)

References

WP 0079, Remove/Install Turbocharger
 WP 0095, General Maintenance

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)
 Engine cool
 Batteries disconnected (WP 0036, Remove/Install Batteries)
 Top body panel removed (WP 0028, Remove/Install Top Body Panel)
 Fuel system drained (WP 0043, Service Fuel System)
 Cooling system drained (WP 0021, Service Cooling System)
 Engine oil drained (WP 0065, Service Lubrication System)
 Fuel supply and return hoses from fuel filter/water separator removed (WP 0046, Remove/Install Fuel Filter/Water Separator)
 Front body panel removed (WP 0029, Remove/Install Front Body Panel)
 Left-side panels removed (WP 0031, Remove/Install Left-Side Body Panel)
 Right-side panels removed (WP 0032, Remove/Install Right-Side Body Panel)
 AC generator removed from flywheel and flywheel housing (WP 0053, Remove/Install 50/60 Hz AC Generator Assembly)
 Air intake hose assemblies disconnected from engine (WP 0019, Remove/Install Air Intake Hose Assemblies)
 Radiator hoses disconnected from engine (WP 0024, Remove/Install Radiator Hose and Tube Assemblies)
 Exhaust pipe removed from engine (WP 0077, Remove/Install Muffler)

INITIAL SETUP — CONTINUED:**Equipment Conditions**

Wiring removed from battery-charging alternator (WP 0074, Remove/Install Battery-Charging Alternator Assembly)

Wiring removed from starter (WP 0072, Remove/Install Starter)

Coolant heater, mounting bracket, and coolant heater hoses removed from engine and generator set (if installed) (WP 0025, Remove/Install Winterization Kit Components)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL 50/60 HZ ENGINE ASSEMBLY**WARNING**

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.
- Engine assembly weighs approximately 403.5 lb (183 kg). Use suitable lifting device with the capacity to lift the weight of the engine assembly. Failure to comply may cause injury or death to personnel.
- Comply with all lifting requirements. Observe the decals on equipment and parts that identify the weight and determine if assistance is needed. Maximum lift is 37 lb (16.8 kg) for one person, 74 lb (33.6 kg) for two persons, and 101 lb (45.8 kg) for three persons. Failure to comply may cause injury or death to personnel.

Remove 50/60 Hz Engine Assembly

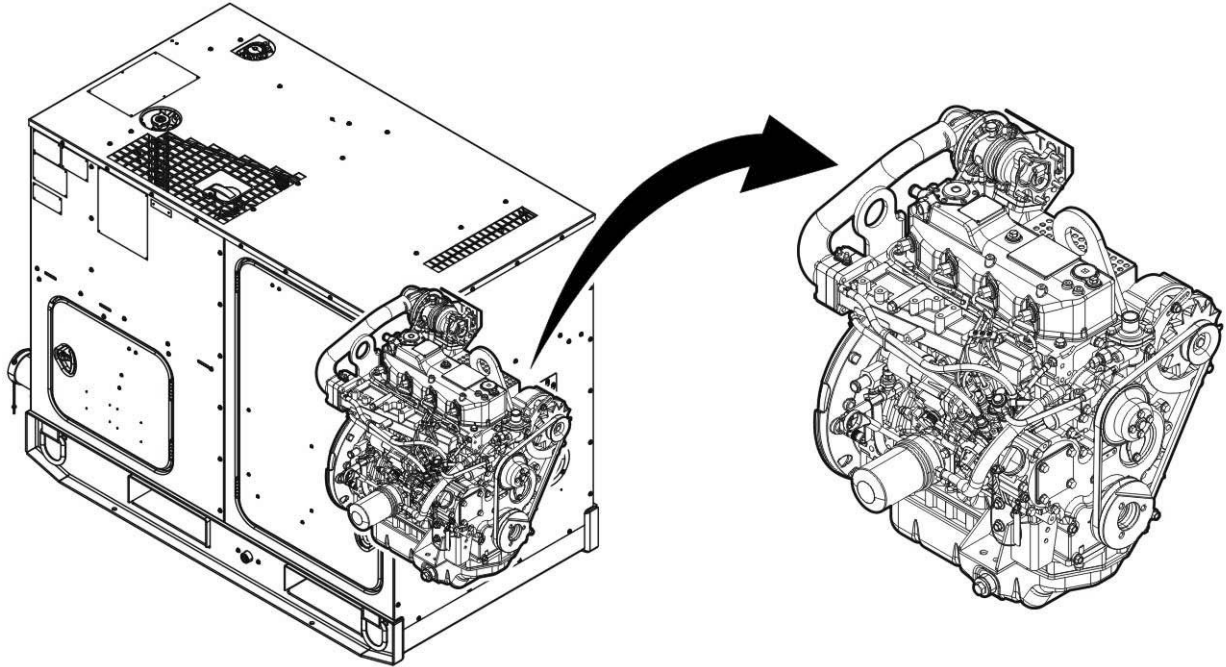


Figure 1. Engine Assembly — Location.

NOTE

Cap/plug all open fuel lines/fittings and cooling ports and hoses to prevent dirt and debris from entering the engine.

Tag all electrical wires and connectors prior to removal to aid installation. Remove tags from wires and connectors at installation.

All parts removed or disconnected from the engine assembly are intended for reuse at time of reassembly unless they are damaged and must be replaced.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate engine inside generator set (Figure 1).
3. Open hose clip (Figure 2, Item 2) on crankcase breather hose (Figure 2, Item 1) and slide away from valve cover nipple (Figure 2, Item 3). Remove crankcase breather hose (Figure 2, Item 1) from valve cover nipple (Figure 2, Item 3).
4. Allow hose clip (Figure 2, Item 2) to remain on crankcase breather hose (Figure 2, Item 1).

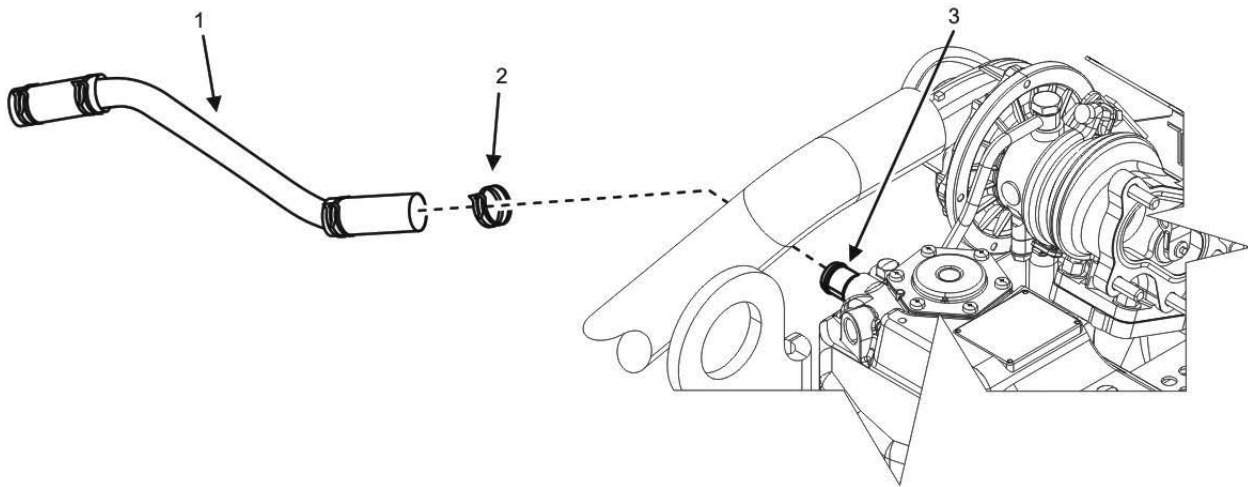


Figure 2. Breather Hose — Removal.

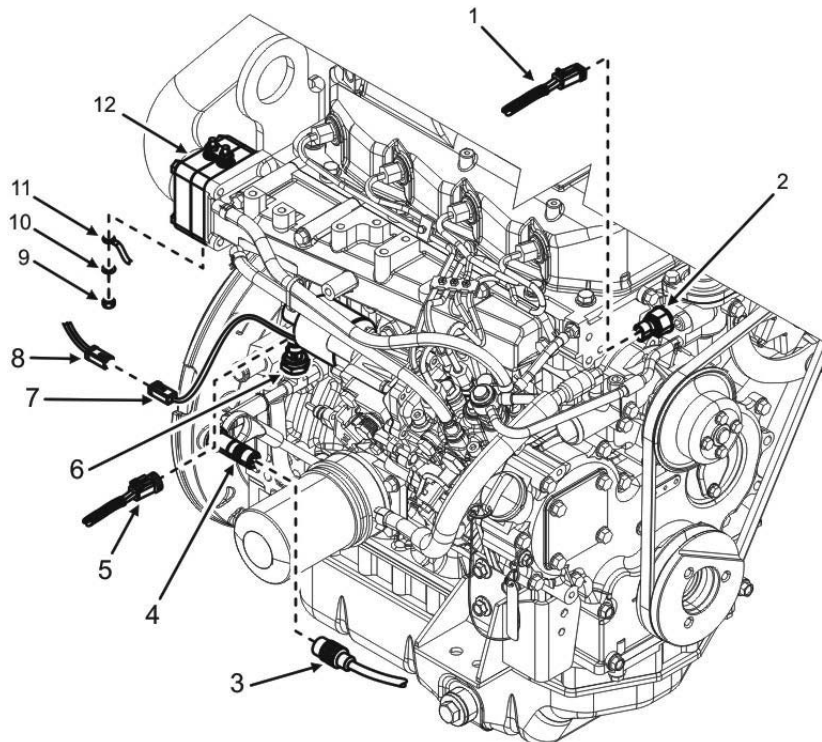


Figure 3. Electrical Connectors — Removal.

5. Disconnect electrical connectors at the following locations:
 - a. Electrical connector (Figure 3, Item 8) at governor actuator connector (Figure 3, Item 7).
 - b. Electrical connector (Figure 3, Item 1) at engine coolant temperature sensor (Figure 3, Item 2).
 - c. Electrical connector (Figure 3, Item 5) at engine oil pressure sender (Figure 3, Item 6).
 - d. Electrical connector (Figure 3, Item 3) at the engine speed sensor (Figure 3, Item 4).
6. Remove nut (Figure 3, Item 9), washer (Figure 3, Item 10), and electrical lead (Figure 3, Item 11) from intake air heater (Figure 3, Item 12).

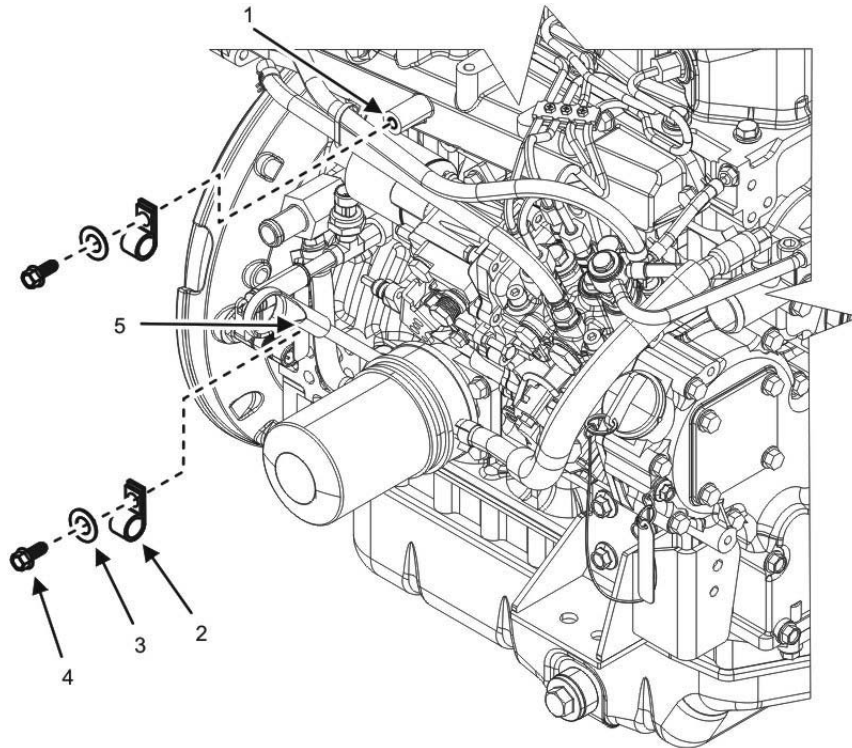


Figure 4. Intake-Side Loop Clamps — Removal.

NOTE

Loop clamps are used to position electrical wires out of harm's way. The procedure to remove all loop clamps is the same regardless of position within the generator set. Loop clamps are located in three positions that affect the engine removal process: on the intake manifold (Figure 4, Item 1), below the engine speed sensor (Figure 4, Item 5), and below the starter (Figure 5, Item 4)

7. Remove screw (Figure 4, Item 4), flat washer (Figure 4, Item 3), and loop clamp (Figure 4, Item 2) from intake manifold and speed sensor location (Figure 4, Items 1 and 5). Allow loop clamp (Figure 4, Item 2) to remain attached to wiring harness.
8. Remove screw (Figure 5, Item 3), flat washer (Figure 5, Item 2), and loop clamp (Figure 5, Item 1) from below starter (Figure 5, Item 4). Allow loop clamp to remain attached to wiring harness.

NOTE

Cap/plug all open lubrication lines/fittings to prevent dirt and debris from entering the lubrication system. Capture spilled engine oil and dispose of soiled rags IAW local SOP.

9. Remove two screws (Figure 6, Item 3) that secure bulkhead fitting (Figure 6, Item 1) to unit skid.
10. Place wiping rags under engine oil drain hose (Figure 6, Item 2) to capture any residual oil.
11. Remove oil drain hose (Figure 6, Item 2) from engine.
12. Dispose of soiled rags IAW local SOP.

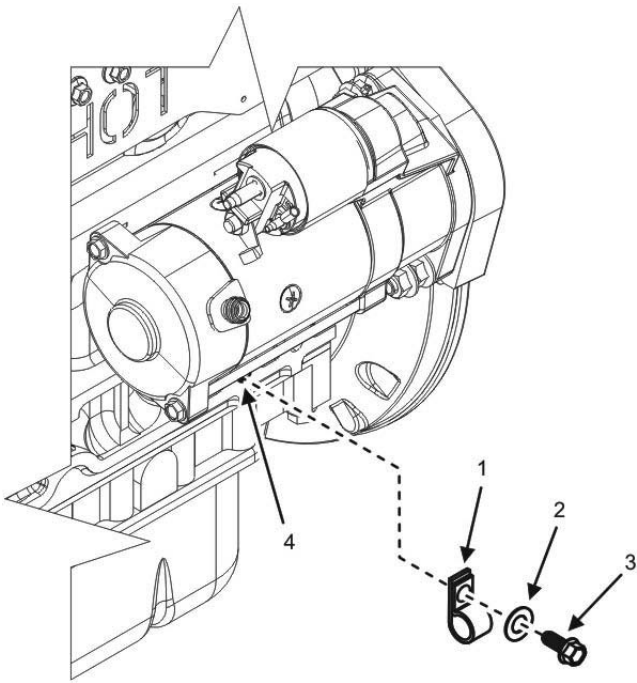


Figure 5. Exhaust Side Loop Clamp — Removal.

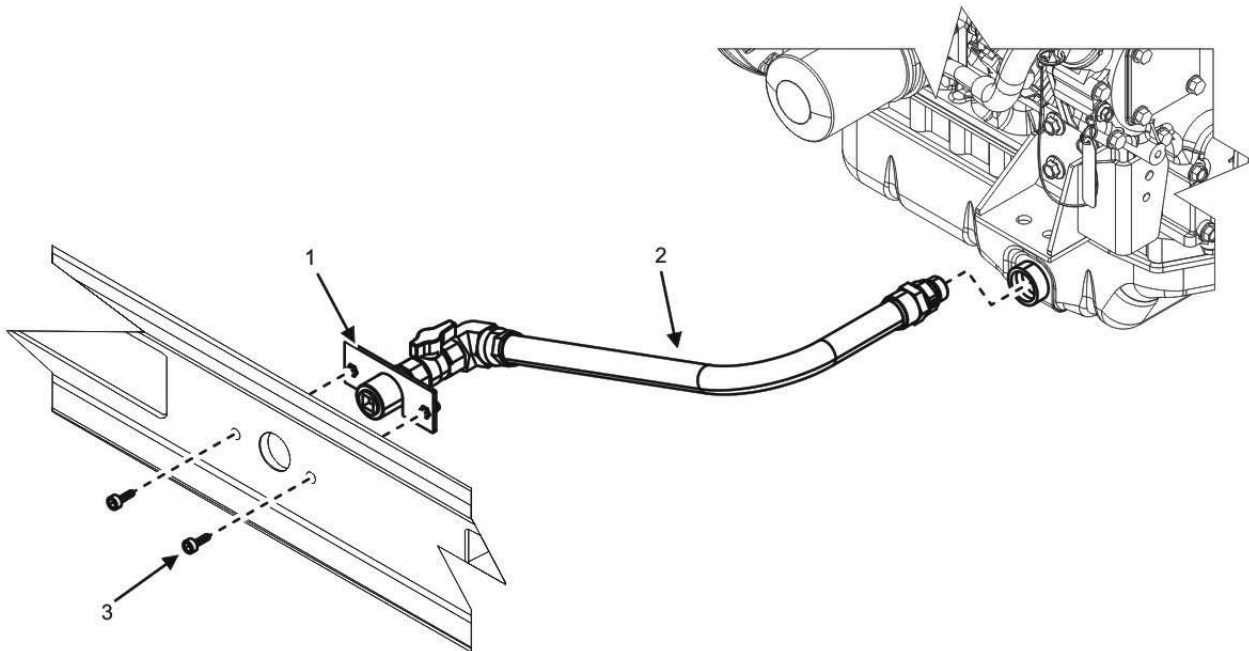


Figure 6. Engine Oil Drain Hose — Removal.

CAUTION

Disconnect turbocharger outlet hose prior to installation of lifting chains to prevent binding or kinking of hose. Failure to comply may cause damage to equipment.

13. Remove turbocharger outlet hose from turbine side of turbocharger and intake manifold prior to installing lifting chains (WP 0079, Remove/Install Turbocharger).

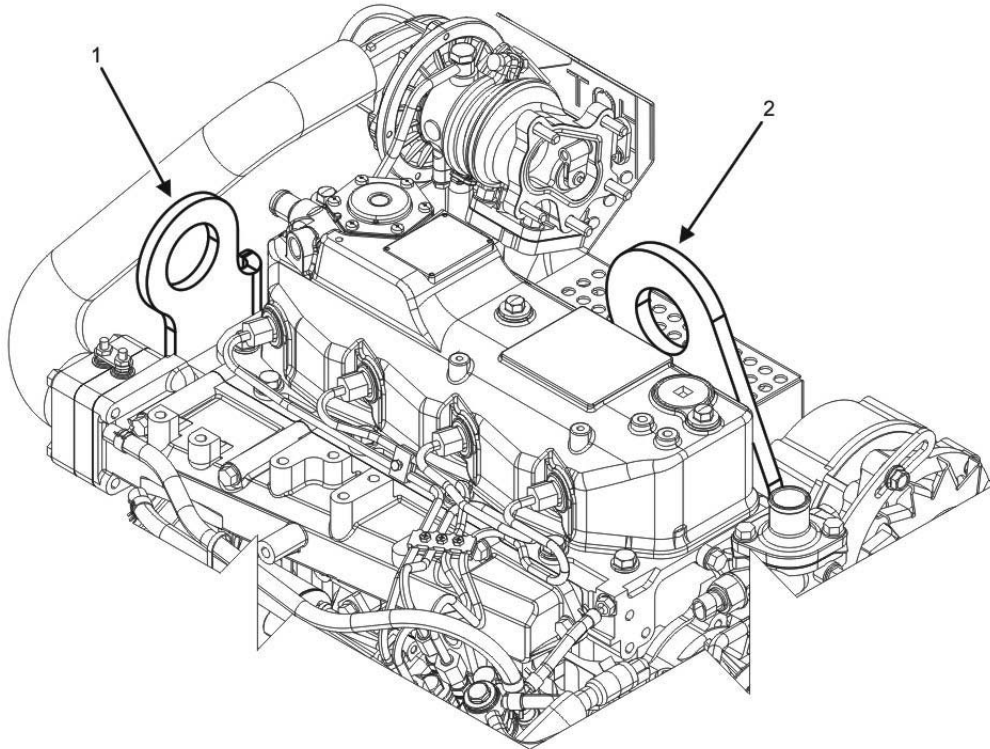


Figure 7. Lifting Eyes — Detail.

14. Inspect lifting eyes (Figure 7, Items 1 and 2) for damage and missing or loose attaching hardware (not shown).
15. Replace damaged lifting eyes (Figure 7, Items 1 and 2) and missing hardware (not shown) as required.
16. Torque loose lifting eye hardware (not shown) to 18 – 21 ft/lb (24 – 29 Nm) as required.
17. Attach suitable lifting device to lifting eyes (Figure 7, Items 1 and 2) of engine.
18. Raise lifting device to remove slack in chains.
19. Remove engine mount bolt (Figure 8, Item 4), snubbing washer (Figure 8, Item 3) and nut (Figure 8, Item 1) securing engine mount plate to left-side vibration isolator (Figure 8, Item 2).
20. Remove two bolts (Figure 8, Item 6) and two nuts (Figure 8, Item 5) that secure vibration isolators (Figure 8, Item 2) to unit skid. Discard vibration isolators (Figure 8, Item 2).
21. Repeat steps 19 and 20 for right-side vibration isolator (not shown).
22. Lift engine slightly until free of engine mounts using suitable lifting device (Figure 9).

WARNING

When lifting engine, use lifting equipment with minimum lifting capacity of 1000 lb (453.6 kg). Do not stand or put arms, legs, or any body part under hoisted load. Do not permit engine to swing. Failure to comply may cause injury or death to personnel.

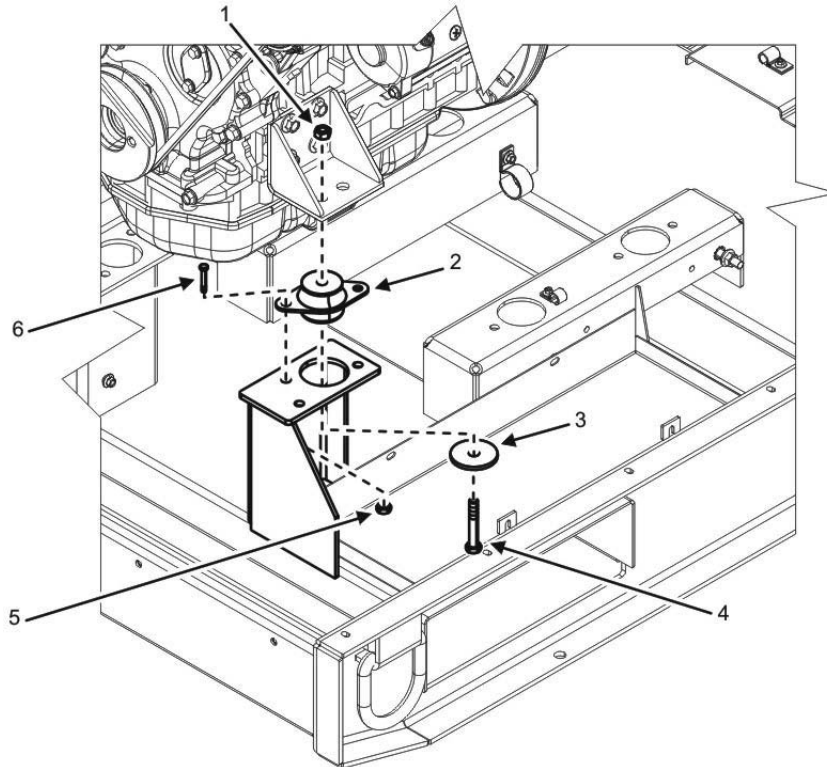


Figure 8. Engine Mounts — Removal.

23. Secure engine to engine stand or other suitable work surface.

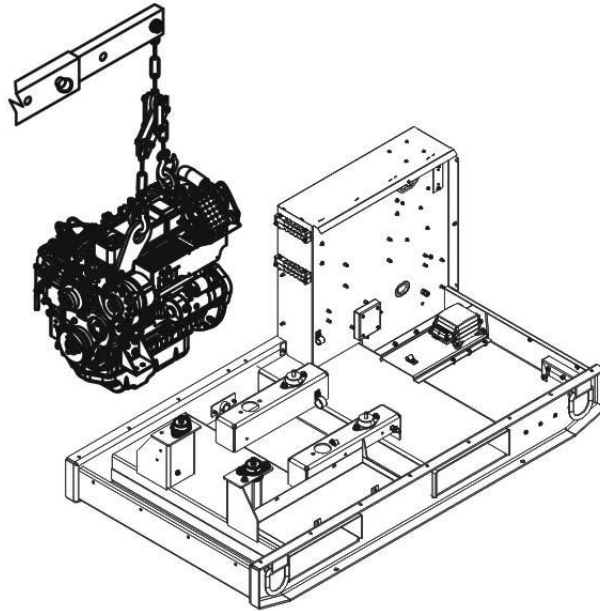


Figure 9. Engine — Removal.

24. Remove lifting device from engine.

END OF TASK

Inspect 50/60 Hz Engine Assembly

1. Inspect engine assembly for signs of obvious damage. Replace engine assembly as required.
2. Inspect lifting eyes (Figure 7, Items 1 and 2) for damage or loose hardware. Replace as required.
3. Inspect all bolts and washers for damage, deterioration, or wear and replace as required.
4. Inspect mounting location on skid for damage, corrosion, or cracks and replace as required.
5. Inspect electrical connectors for damage, corrosion, cracks, frayed wires, or excessive weathering. Repair wiring harness electrical connectors as required. See Repair Electrical Connectors (WP 0095, General Maintenance).

END OF TASK

Install 50/60 Hz Engine Assembly

NOTE

Wipe down hoses, parts, and connectors with wiping rag prior to installation.

1. Position new vibration isolators (Figure 8, Item 2) to mounting locations on unit skid and secure by installing two bolts (Figure 8, Item 6) and two nuts (Figure 8, Item 5) finger-tight on left and right side of skid.
2. Torque nuts (Figure 8, Item 5) and bolts (Figure 8, Item 6) to 35 – 42 ft/lb (48 – 57 Nm).
3. Inspect lifting eyes (Figure 7, Items 1 and 2) for damage and missing or loose attaching hardware (not shown).
4. Replace damaged lifting eyes (Figure 7, Items 1 and 2) and missing hardware (not shown) as required.

5. Tighten loose lifting eye hardware (not shown) to 18 – 21 ft/lb (24 – 29 Nm) as required.
6. Attach suitable lifting device to lifting eyes (Figure 7, Items 1 and 2) of engine.
7. Position engine (Figure 9) to its approximate mounting location in unit skid.
8. Clean mating surfaces of engine flywheel using a crocus cloth.
9. Apply anti-seize compound to mating surfaces of engine flywheel to minimize corrosion of dissimilar metals.
10. Lower engine slowly, using lifting device, until mounting holes on engine mounts align with vibration isolator (Figure 8, Item 2).
11. Insert engine mounting bolts (Figure 8, Item 4) upside-down in engine mount to temporarily secure engine to vibration isolator (Figure 8, Item 2) on unit skid.
12. Remove left-side engine mounting bolt (Figure 8, Item 4) installed upside-down in step 11.
13. Install snubbing washer (Figure 8, Item 3) to engine mounting bolt (Figure 8, Item 4).
14. Install engine mounting bolt (Figure 8, Item 4) with snubbing washer (Figure 8, Item 3) through unit skid and bottom of vibration isolator (Figure 8, Item 2) on left-side of skid.
15. Install nut (Figure 8, Item 1) to engine mounting bolt (Figure 8, Item 4) to secure engine to skid and vibration isolator (Figure 8, Item 2).
16. Tighten engine mounting nut (Figure 8, Item 1) to 64 – 68 ft/lb (87 – 93 Nm).
17. Repeat steps 12 through 16 to install engine mounting bolt to right-side of skid.
18. Remove lifting device from lifting eyes (Figure 7, Items 1 and 2) on engine.
19. Connect turbocharger outlet hose to turbine-side of turbocharger and engine intake manifold (WP 0079, Remove/Install Turbocharger).

NOTE

Prior to installation of oil drain hose, remove all caps/plugs from oil hoses/fittings. Capture spilled engine oil and dispose of IAW local SOP.

20. Install oil drain hose (Figure 6, Item 2) to engine.
21. Position engine oil hose bulkhead fitting (Figure 6, Item 1) to its mounting position on unit skid.
22. Secure bulkhead fitting (Figure 6, Item 1) to unit skid by installing two screws (Figure 6, Item 3).
23. Dispose of soiled rags IAW local SOP.

NOTE

Use tags placed on sensors/senders and wiring harness at removal to assist installation. Leave tags on electrical components until generator set is running properly.

24. Install electrical lead (Figure 3, Item 11) to bottom of intake air heater (Figure 3, Item 12) and secure by installing washer (Figure 3, Item 10) and nut (Figure 3, Item 9).
25. Secure electrical connectors at the following locations:
 - a. Electrical connector (Figure 3, Item 8) at governor actuator connector (Figure 3, Item 7).
 - b. Electrical connector (Figure 3, Item 1) at engine coolant temperature sensor (Figure 3, Item 2).
 - c. Electrical connector (Figure 3, Item 5) at engine oil pressure sender (Figure 3, Item 6).
 - d. Electrical connector (Figure 3, Item 3) at the engine speed sensor (Figure 3, Item 4).

NOTE

Loop clamps are used to position electrical wires out of harm's way. The procedure to install all loop clamps is the same regardless of position within the generator set. Loop clamps are located in three positions that affect the engine installation process: on the intake manifold (Figure 4, Item 1), below the engine speed sensor (Figure 4, Item 5), and below the starter (Figure 5, Item 4).

26. Slide and locate loop clamps (Figure 4, Item 2) (Figure 5, Item 1) to approximate mounting locations on wiring harness (not shown).
27. Install screw (Figure 5, Item 3), flat washer (Figure 5, Item 2), and loop clamp (Figure 5, Item 1) to below starter (Figure 5, Item 4).
28. Install screw (Figure 4, Item 4), flat washer (Figure 4, Item 3), and loop clamp (Figure 4, Item 2) to intake manifold and speed sensor location (Figure 4, Items 4 and 5).
29. Install AC generator (WP 0063, Remove/Install 50/60 Hz AC Generator Assembly).

NOTE

Prior to installation, remove all caps/plugs from crankcase breather hose (Figure 2, Item 1) and valve cover nipple (Figure 2, Item 3).

30. Install crankcase breather hose (Figure 2, Item 1) to valve cover nipple (Figure 2, Item 3) and secure by installing hose clip (Figure 2, Item 2).
31. Slide and position hose clip (Figure 2, Item 2) at valve cover nipple (Figure 2, Item 1).
32. Install coolant heater, bracket, and hoses (as required) (WP 0025, Remove/Install Winterization Kit Components).
33. Attach wiring to starter (WP 0072, Remove/Install Starter). Attach wiring to battery-charging alternator (WP 0074, Remove/Install Battery-Charging Alternator Assembly).
34. Install exhaust pipe (WP 0077, Remove/Install Muffler).
35. Install radiator hose and tube assemblies (WP 0024, Remove/Install Radiator Hose and Tube Assemblies).
36. Connect air intake hose assemblies (WP 0019, Remove/Install Air Intake Hose Assemblies).
37. Install front body panel (WP 0029, Remove/Install Front Body Panel).
38. Install right-side door panel (WP 0032, Remove/Install Right-Side Body Panels).
39. Install left-side door panel (WP 0031, Remove/Install Left-Side Body Panels).
40. Install front body panel (WP 0029, Remove/Install Front Body Panel).
41. Install fuel supply and return hoses from fuel filter/water separator to engine (WP 0046, Remove/Install Fuel Filter Water Separator).
42. Fill engine oil (WP 0065, Service Lubrication System).
43. Fill coolant (WP 0021, Service Cooling System).
44. Fill fuel tank (WP 0043, Service Fuel System).
45. Install top body panel (WP 0028, Remove/Install Top Body Panel).
46. Install battery cables (WP 0036, Remove/Install Batteries).
47. Close left-side door.

48. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
49. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
50. Repair as required.
51. Ensure oil and coolant levels are at proper operating level (TM 9-6115-751-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL 400 HZ ENGINE ASSEMBLY

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)
 Torque Tube, 5-75 FT-LB (WP 0163, Item 41)
 Torque Wrench Head End, 1/4" X 3/8" Drive, 9/16" (WP 0163, Item 43)
 Wrench, Torque, 1/2-in Drive, 250 FT-LB (WP 0163, Item 45)
 Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0163, Item 47)
 Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0163, Item 48)

Materials/Parts

Assembly, engine (WP 0125, Repair Parts List, Figure 25, Item 1)
 Antifreeze, ethylene glycol (WP 0164, Expendable and Durable Items, Item 2)
 Cap set, protective (WP 0164, Item 9)
 Cloth, abrasive, crocus (WP 0164, Item 12)
 Compound, antiseize (WP 0164, Item 14)
 Distilled water (WP 0164, Item 18)
 Grease, electrically conductive (WP 0164, Item 21)
 Lubricating oil, engine (WP 0164, Item 24)
 Pan, drain (3) (WP 0164, Item 29)
 Penetrating oil (2) (WP 0164, Item 30)
 Rag, wiping (6) (WP 0164, Item 32)
 Soap, ivory (WP 0164, Item 34)
 Tag, marker (WP 0164, Item 36)

Personnel Required

91D (1)
 Assistant (1)

References

WP 0079, Remove/Install Turbocharger
 WP 0095, General Maintenance

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)
 Engine cool
 Batteries disconnected (WP 0036, Remove/Install Batteries)
 Top body panel removed (WP 0028, Remove/Install Top Body Panel)
 Fuel system drained (WP 0043, Service Fuel System)
 Cooling system drained (WP 0021, Service Cooling System)
 Engine oil drained (WP 0065, Service Lubrication System)
 Fuel supply and return hoses from fuel filter/water separator removed (WP 0046, Remove/Install Fuel Filter/Water Separator)
 Front body panel removed with fuel filter water separator installed (WP 0029, Remove/Install Front Body Panel)
 Left-side door panel removed (WP 0031, Remove/Install Left-Side Body Panel)
 Right-side door panel removed (WP 0032, Remove/Install Right-Side Body Panel)
 Radiator hoses disconnected (WP 0024, Remove/Install Radiator Hose and Tube Assemblies)

INITIAL SETUP — CONTINUED:**Equipment Conditions**

Exhaust pipe removed from engine (WP 0077, Remove/Install Muffler)

Wiring removed from battery-charging alternator (WP 0074, Remove/Install Battery-Charging Alternator Assembly)

Wiring removed from starter (WP 0072, Remove/Install Starter)

Coolant heater, mounting bracket, and coolant heater hoses removed from engine and generator set (if installed) (WP 0025, Remove/Install Winterization Kit Components)

Equipment Conditions

Air intake hose assemblies disconnected from engine (WP 0019, Remove/Install Air Intake Hose Assemblies)

Air cleaner assembly removed (WP 0020, Service Air Cleaner)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL 400 HZ ENGINE ASSEMBLY**WARNING**

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.
- Engine assembly weighs approximately 403.5 lb (183 kg). Use suitable lifting device with the capacity to lift the weight of the engine assembly. Failure to comply may cause injury or death to personnel.
- Do not attempt to lift, carry, or move the equipment yourself. Observe the decals on equipment which identify the weight and determine if an assistant is needed. Maximum weight for one person is no more than 37 lb. Failure to comply may cause injury or death to personnel.

Remove 400 Hz Engine Assembly

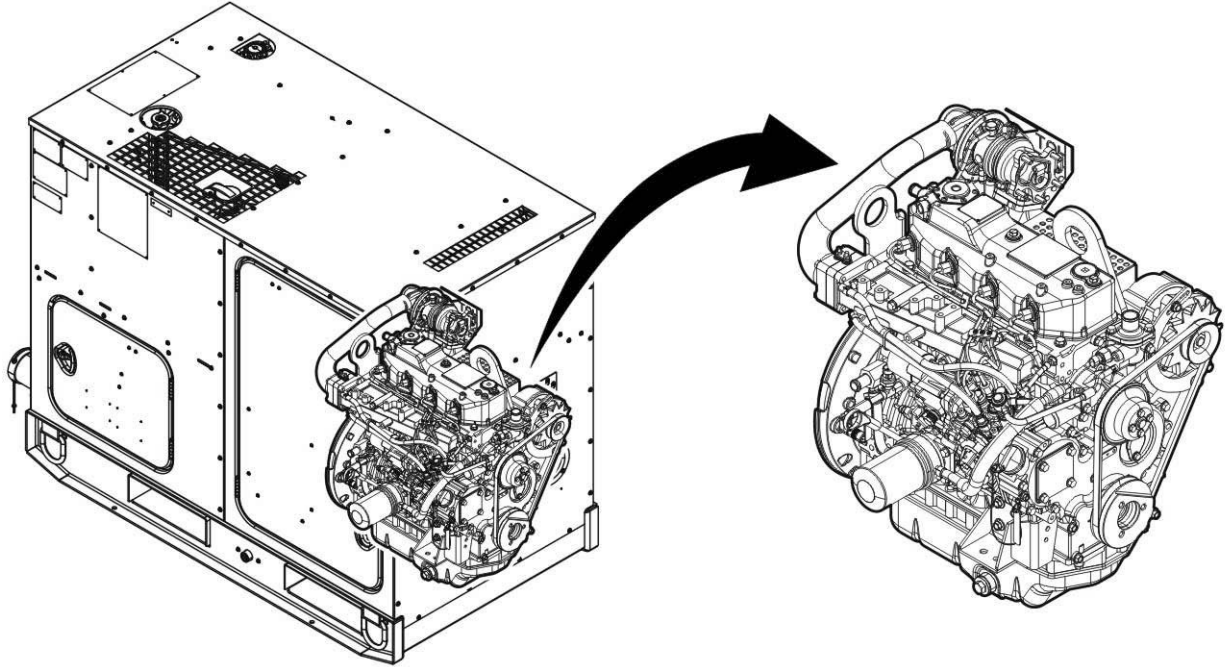


Figure 1. Engine Assembly — Location.

NOTE

Cap/plug all open fuel lines/fittings and cooling ports and hoses to prevent dirt and debris from entering the engine.

Tag all electrical wires and connectors prior to removal to aid installation. Remove tags from wires and connectors at installation.

All parts removed or disconnected from the engine assembly are intended for reuse at time of reassembly unless they are damaged and must be replaced.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate engine inside generator set (Figure 1).
3. Open hose clip (Figure 2, Item 2) on crankcase breather hose (Figure 2, Item 1) and slide away from valve cover nipple (Figure 2, Item 3). Remove crankcase breather hose (Figure 2, Item 1) from valve cover nipple (Figure 2, Item 3).
4. Allow hose clip (Figure 2, Item 2) to remain on crankcase breather hose (Figure 2, Item 1).

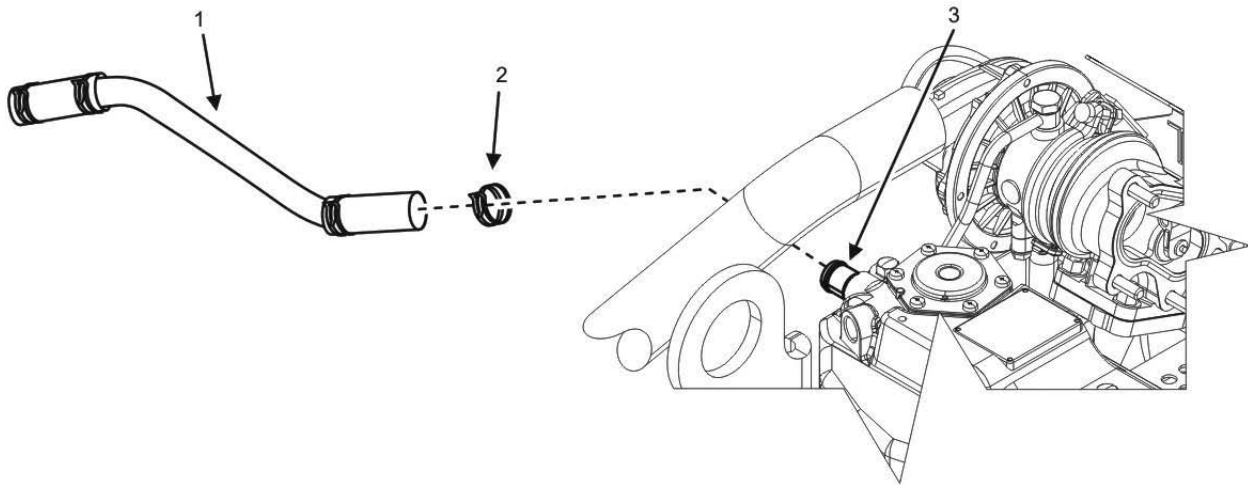


Figure 2. Breather Hose — Removal.

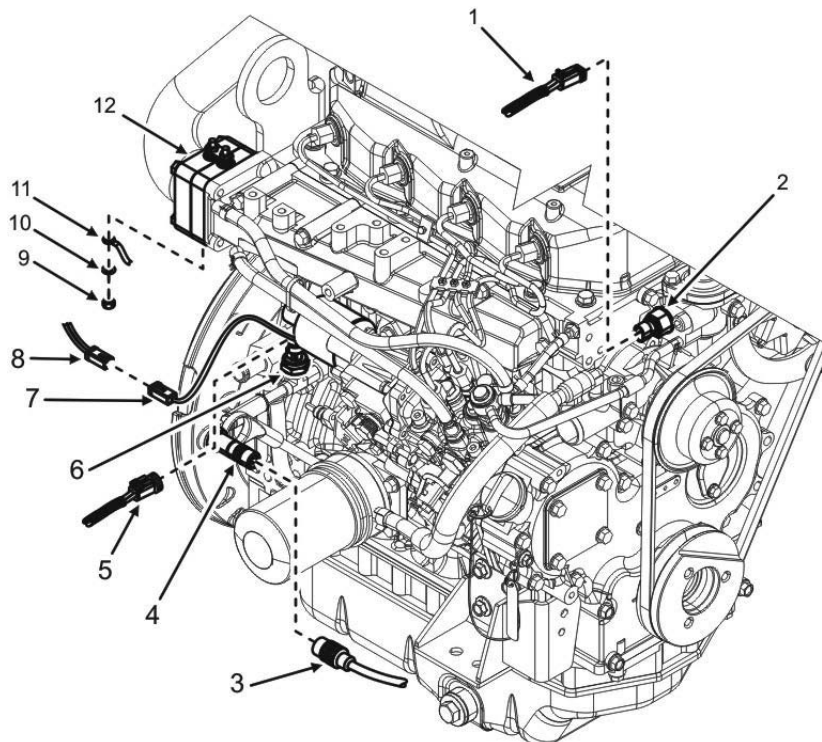


Figure 3. Electrical Connectors — Removal.

5. Disconnect electrical connectors at the following locations:
 - a. Electrical connector (Figure 3, Item 8) at governor actuator connector (Figure 3, Item 7).
 - b. Electrical connector (Figure 3, Item 1) at engine coolant temperature sensor (Figure 3, Item 2).
 - c. Electrical connector (Figure 3, Item 5) at engine oil pressure sender (Figure 3, Item 6).
 - d. Electrical connector (Figure 3, Item 3) at the engine speed sensor (Figure 3, Item 4).
6. Remove nut (Figure 3, Item 9), washer (Figure 3, Item 10), and electrical lead (Figure 3, Item 11) from intake air heater (Figure 3, Item 12).

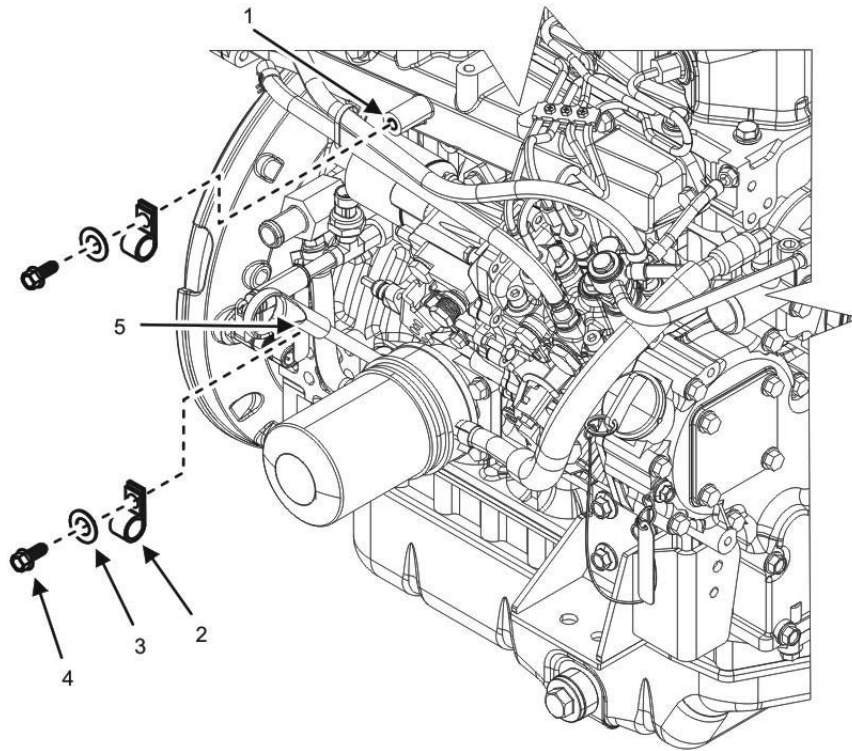


Figure 4. Intake-Side Loop Clamps — Removal.

NOTE

Loop clamps are used to position electrical wires out of harm's way. The procedure to remove all loop clamps is the same regardless of position within the generator set. Loop clamps are located in three positions that affect the engine removal process: on the intake manifold (Figure 4, Item 1), below the engine speed sensor (Figure 4, Item 5), and below the starter (Figure 5, Item 4)

7. Remove screw (Figure 4, Item 4), flat washer (Figure 4, Item 3), and loop clamp (Figure 4, Item 2) from intake manifold and speed sensor location (Figure 4, Items 1 and 5). Allow loop clamp (Figure 4, Item 2) to remain attached to wiring harness.
8. Remove screw (Figure 5, Item 3), flat washer (Figure 5, Item 2), and loop clamp (Figure 5, Item 1) from below starter (Figure 5, Item 4). Allow loop clamp to remain attached to wiring harness.

NOTE

Cap/plug all open lubrication lines/fittings to prevent dirt and debris from entering the lubrication system. Capture spilled engine oil and dispose of soiled rags IAW local SOP.

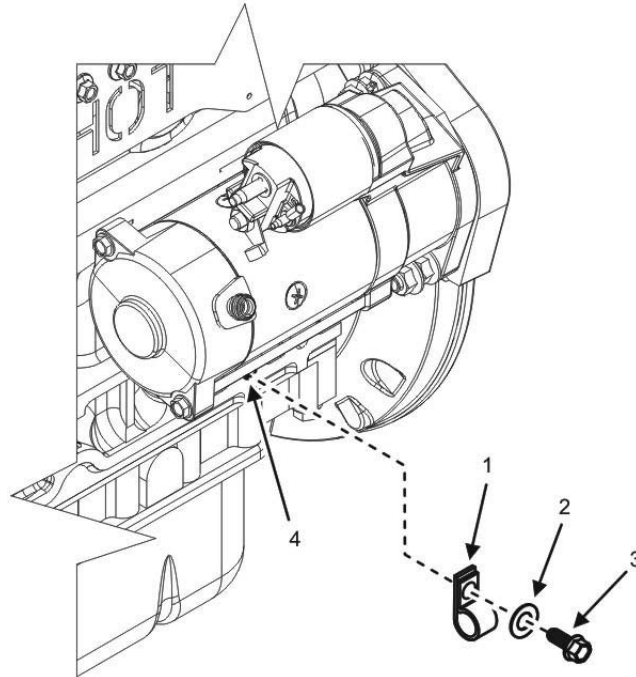


Figure 5. Exhaust Side Loop Clamp — Removal.

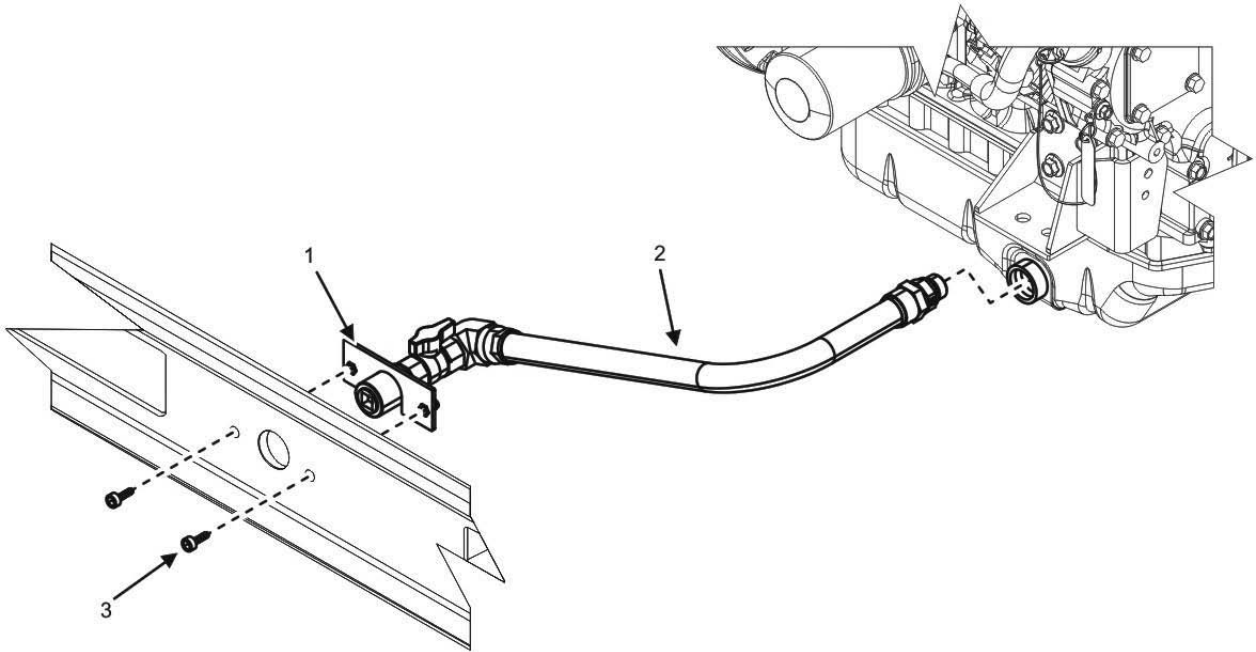


Figure 6. Engine Oil Drain Hose — Removal.

9. Remove two screws (Figure 6, Item 3) that secure bulkhead fitting (Figure 6, Item 1) to unit skid.
10. Place wiping rags under engine oil drain line hose (Figure 6, Item 2) to capture any residual oil.
11. Remove oil drain line hose (Figure 6, Item 2) from engine.
12. Dispose of soiled rags IAW local SOP.

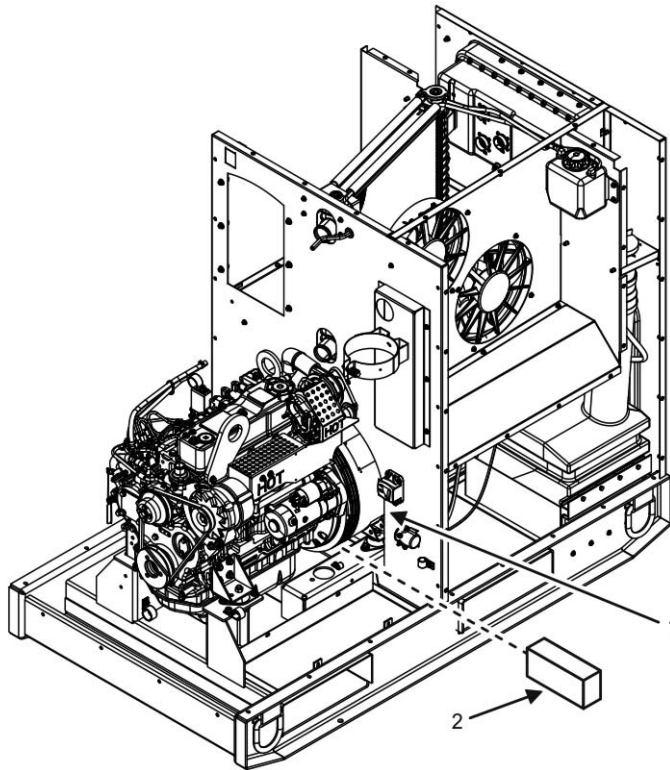


Figure 7. Block AC Generator — Detail.

13. Place blocking (Figure 7, Items 2) under AC generator (Figure 7, Item 1) to keep generator level.

CAUTION

Disconnect turbocharger outlet hose prior to installation of lifting chains to prevent binding or kinking of hose. Failure to comply may cause damage to equipment.

14. Remove turbocharger outlet hose from turbine side of turbocharger and intake manifold prior to installing lifting chains (WP 0079, Remove/Install Turbocharger).
15. Inspect lifting eyes (Figure 8, Items 1 and 2) for damage and missing or loose attaching hardware (not shown).
16. Replace damaged lifting eyes (Figure 8, Items 1 and 2) and missing hardware (not shown) as required.
17. Tighten loose lifting eye hardware (not shown) to 18 – 21 ft/lb (24 – 29 Nm) as required.
18. Attach suitable lifting device to lifting eyes (Figure 8, Items 1 and 2) of engine.
19. Raise lifting device to remove slack in chains.
20. Remove screw (Figure 9, Item 4), lock washer (Figure 9, Item 3), and flat washer (Figure 9, Item 2) that secure screen (Figure 9, Item 1) to AC generator. Discard lock washer (Figure 9, Item 3).
21. Remove screen (Figure 9, Item 1) from AC generator.

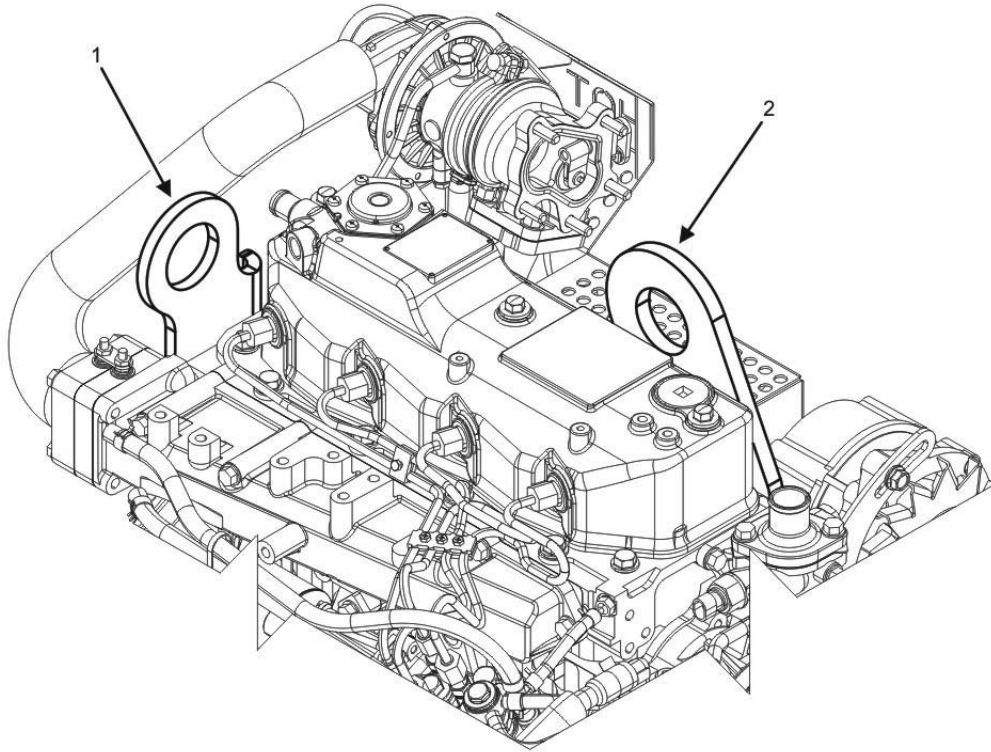


Figure 8. Lifting Eyes — Detail.

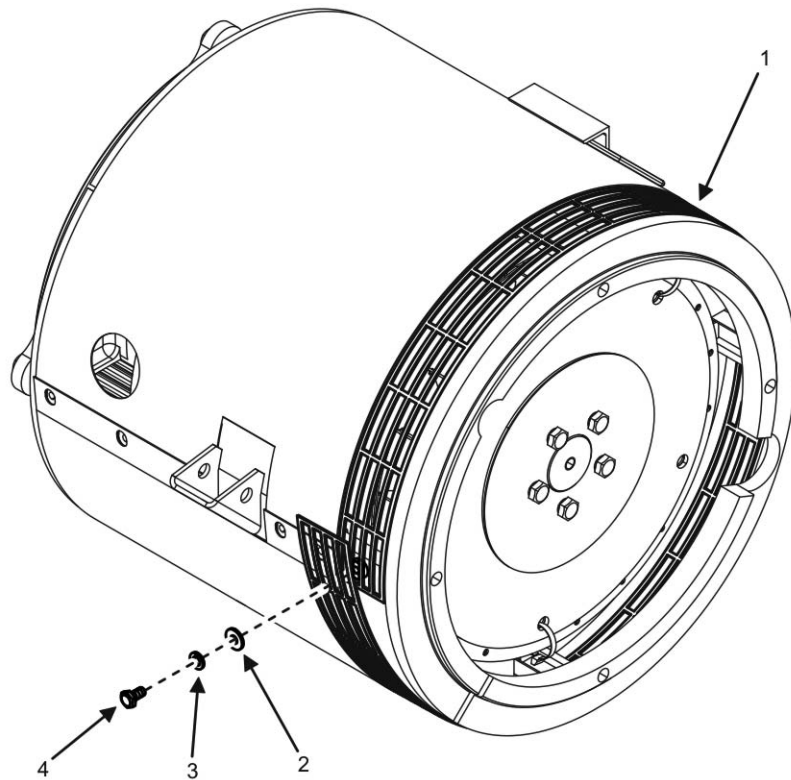


Figure 9. 400 Hz AC Generator Screen — Removal.

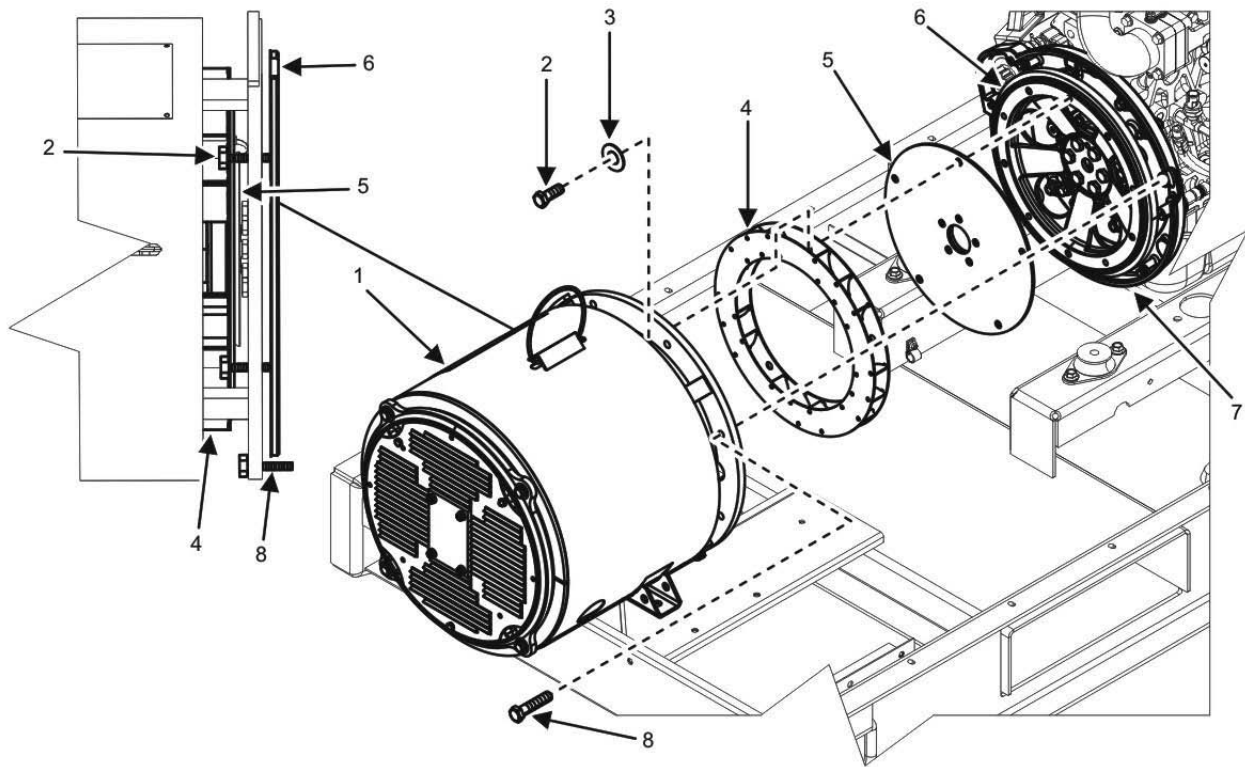


Figure 10. AC Generator Separation, 400 Hz — UOC 98K.

22. Rotate engine harmonic balancer hex cap screw (not shown) clockwise (viewed from water pump end of engine) using socket and breaker bar to gain access to five screws (Figure 10, Item 2) securing engine flywheel (Figure 10, Item 6) to AC generator drive plate (Figure 10, Item 5) and fan (Figure 10, Item 4).
23. Remove five screws (Figure 10, Item 2) and five washers (Figure 10, Item 3) securing fan (Figure 10, Item 4) and AC generator drive plate (Figure 10, Item 5) to engine flywheel (Figure 10, Item 6).
24. Remove four screws (Figure 10, Item 8) that secure AC generator (Figure 10, Item 1) to engine flywheel housing (Figure 10, Item 7).
25. Remove engine mounting bolt (Figure 11, Item 4), snubbing washer (Figure 11, Item 3), and nut (Figure 11, Item 1) securing engine mount plate to left-side vibration isolator (Figure 11, Item 2).
26. Remove two bolts (Figure 11, Item 6) and two nuts (Figure 11, Item 5) that secure vibration isolators (Figure 11, Item 2) to unit skid. Discard vibration isolators (Figure 11, Item 2).
27. Repeat steps 25 and 26 for right-side vibration isolator (not shown).

WARNING

When lifting engine, use lifting equipment with minimum lifting capacity of 1000 lb (453.6 kg). Do not stand or put arms, legs, or any body part under hoisted load. Do not permit engine to swing. Failure to comply may cause injury or death to personnel.

28. Lift engine slightly until free of engine mounts using suitable lifting device (Figure 12).

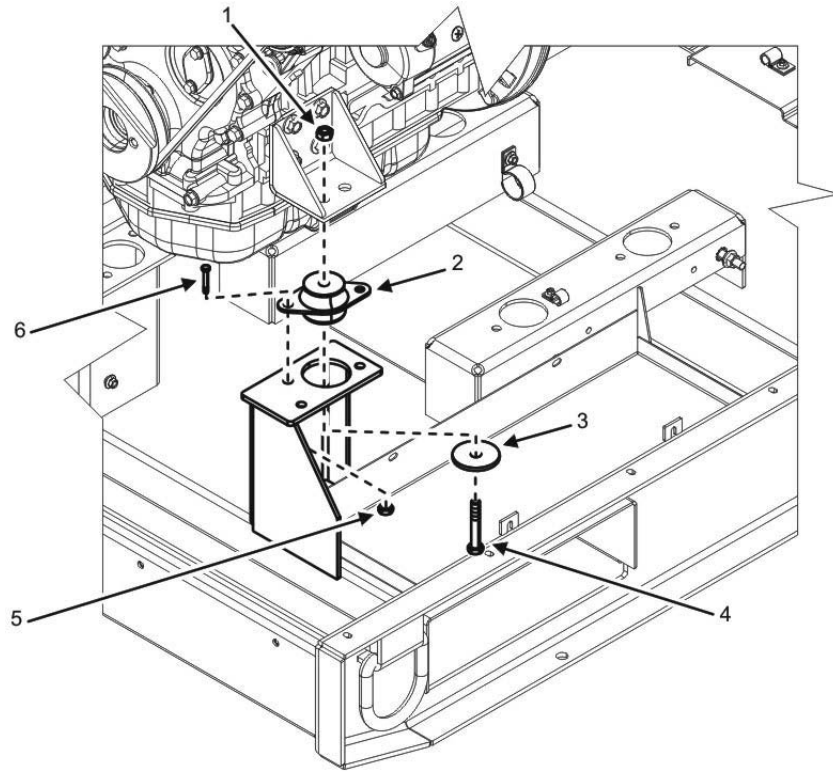


Figure 11. Engine Mounts — Removal.

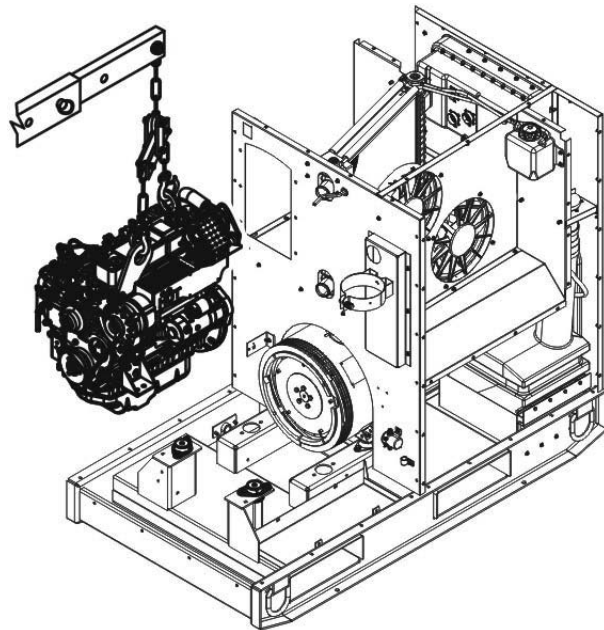


Figure 12. Engine — Removal.

CAUTION

The main rotor (not shown) of the AC generator (Figure 10, Item 1) may remain attached to engine flywheel (Figure 10, Item 6) as engine (Figure 12) is lifted. This is a result of galvanic corrosion between dissimilar metals of the engine flywheel (Figure 10, Item 6) and AC generator drive plate (Figure 10, Item 5). Do not allow main rotor (not shown) to be withdrawn from AC generator (Figure 10, Item 1) when engine (Figure 12) is removed. Failure to comply may cause damage to equipment.

NOTE

If main rotor (not shown) of generator begins to withdraw from AC generator (Figure 10, Item 1) as engine (Figure 12) is pulled away from AC generator (Figure 10, Item 1), perform steps 29 through 31 to separate engine and main rotor (not shown).

29. Saturate area with penetrating oil where engine flywheel (Figure 10, Item 6) and AC generator drive plate (Figure 10, Item 5) of AC generator (Figure 10, Item 1) are connected.
30. Allow penetrating oil to soak for 15 min.
31. Strike point of contact between engine flywheel (Figure 10, Item 6) and AC generator drive plate (Figure 10, Item 5) using a hammer and brass drift around circumference of engine flywheel (Figure 10, Item 6) until two components break free.
32. Pull engine free of AC generator using lifting device (Figure 12).
33. Install wire tie to temporarily secure and align mounting holes in AC generator drive plate (Figure 10, Item 5) and fan (Figure 10, Item 4).
34. Secure engine to engine stand or other suitable work surface.
35. Remove lifting device from engine.

END OF TASK

Inspect 400 Hz Engine Assembly

1. Inspect engine assembly for signs of obvious damage. Replace engine assembly as required.
2. Inspect lifting eyes (Figure 8, Items 1 and 2) for damage or loose hardware. Replace as required.
3. Inspect all bolts and washers for damage, deterioration, or wear and replace as required.
4. Inspect mounting location on skid for damage, corrosion, or cracks and replace as required.
5. Inspect electrical connectors for damage, corrosion, cracks, frayed wires, or excessive weathering. Repair wiring harness electrical connectors as required. See Repair Electrical Connectors task (WP 0095, General Maintenance).

END OF TASK

Install 400 Hz Engine Assembly**NOTE**

Wipe down hoses, parts, and connectors with wiping rag prior to installation.

1. Position new vibration isolators (Figure 11, Item 2) to mounting locations on unit skid and secure by installing two bolts (Figure 11, Item 6) and two nuts (Figure 11, Item 5) finger-tight on left- and right-side of skid.
2. Tighten nuts (Figure 11, Item 5) and bolts (Figure 11, Item 6) to 35 – 42 ft/lb (48 – 57 Nm).
3. Inspect lifting eyes (Figure 8, Items 1 and 2) for damage and missing or loose attaching hardware (not shown).
4. Replace damaged lifting eyes (Figure 8, Items 1 and 2) and missing hardware (not shown) as required.
5. Tighten loose lifting eye hardware (not shown) to 18 – 21 ft/lb (24 – 29 Nm) as required.
6. Attach suitable lifting device to lifting eyes (Figure 8, Items 1 and 2) of engine.
7. Position engine (Figure 12) to its approximate mounting location in unit skid.
8. Clean mating surfaces of engine flywheel (Figure 10, Item 6) and AC generator drive plate (Figure 10, Item 5) using a crocus cloth.
9. Apply antiseize compound to mating surfaces of engine flywheel (Figure 10, Item 6) and AC generator drive plate (Figure 10, Item 5) to minimize corrosion of dissimilar metals.
10. Lower engine slowly, using lifting device, until mounting holes on engine mounts align with vibration isolator (Figure 11, Item 2).
11. Insert engine mounting bolts (Figure 11, Item 4) upside-down in engine mount to temporarily secure engine to vibration isolator (Figure 11, Item 2) on unit skid.
12. Align engine assembly with AC generator.
13. Align mounting holes between AC generator (Figure 10, Item 1) and engine flywheel housing (Figure 10, Item 7).
14. Install four screws (Figure 10, Item 8) to secure engine flywheel housing (Figure 10, Item 7) to AC generator (Figure 10, Item 1).
15. Remove wire tie temporarily holding AC generator drive plate (Figure 10, Item 5) to fan (Figure 10, Item 4).

NOTE

For ease of installation, temporarily install two or three screws (Figure 10, Item 2) to secure AC generator drive plate (Figure 10, Item 5) and fan (Figure 10, Item 4) to engine flywheel (Figure 10, Item 6) without washers (Figure 10, Item 3). Installation without washers (Figure 10, Item 3) allows easier alignment of the three mounting holes until the assembly is partially complete. Screws (Figure 10, Item 2) installed without washers (Figure 10, Item 3) will be removed and reinstalled with the washers (Figure 10, Item 3) to properly join the three components.

16. Rotate engine harmonic balancer hex cap screw clockwise (as viewed from front of engine, not shown) using socket and breaker bar to position a mounting hole in AC generator drive plate (Figure 10, Item 5), fan (Figure 10, Item 4), and engine flywheel (Figure 10, Item 6) near the top of AC generator (Figure 10, Item 1).
17. Align a mounting hole in each of the three components and temporarily secure by installing one screw (Figure 10, Item 2) without a washer (Figure 10, Item 3).
18. Rotate engine harmonic balancer hex cap screw (not shown) clockwise (as viewed from front of engine) using socket and breaker bar to again position another mounting hole in AC generator drive plate (Figure 10, Item 5), fan (Figure 10, Item 4), and engine flywheel (Figure 10, Item 6) near the top of AC generator (Figure 10, Item 1).

19. Install a second screw (Figure 10, Item 2) to secure the AC generator drive plate (Figure 10, Item 5) and fan (Figure 10, Item 4) to engine flywheel (Figure 10, Item 6) without a washer (Figure 10, Item 3).
20. Continue to rotate the crankshaft to position the remaining three mounting holes near the top of AC generator (Figure 10, Item 1) and install remaining three screws (Figure 10, Item 2) with washers (Figure 10, Item 3).
21. Rotate the engine harmonic balancer hex cap screw (not shown) to return to a screw (Figure 10, Item 2) without a washer (Figure 10, Item 3) at top of AC generator (Figure 10, Item 1).
22. Remove the screw (Figure 10, Item 2) and reinstall the screw (Figure 10, Item 2) with washer (Figure 10, Item 3).
23. Repeat steps 21 and 22 for the remaining screws (Figure 10, Item 2) without washers (Figure 10, Item 3).
24. Tighten five screws (Figure 10, Item 2) to 40 – 45 ft/lb (55 – 61 Nm).
25. Tighten four screws (Figure 10, Item 8) securing engine flywheel housing (Figure 10, Item 7) to AC generator (Figure 10, Item 1) 40 – 45 ft/lb (55 – 61 Nm).
26. Position screen (Figure 9, Item 1) to its mounting location on AC generator.
27. Secure screen (Figure 9, Item 1) to AC generator by installing flat washer (Figure 9, Item 2), new lock washer (Figure 9, Item 3), and screw (Figure 9, Item 4).
28. Remove left-side engine mounting bolt (Figure 11, Item 4) installed upside-down in step 11.
29. Install snubbing washer (Figure 11, Item 3) to engine mounting bolt (Figure 11, Item 4).
30. Install engine mounting bolt (Figure 11, Item 4) with snubbing washer (Figure 11, Item 3) through unit skid and bottom of vibration isolator (Figure 11, Item 2) on left-side of skid.
31. Install nut (Figure 11, Item 1) to engine mounting bolt (Figure 11, Item 4) to secure engine to skid and vibration isolator (Figure 11, Item 2).
32. Tighten engine mounting nut (Figure 11, Item 1) to 64 – 68 ft/lb (87 – 93 Nm).
33. Repeat steps 28 through 32 to install engine mounting bolt to right-side of skid.
34. Remove lifting device from lifting eyes (Figure 8, Items 1 and 2) on engine.
35. Remove blocking (Figure 7, Item 2) from beneath AC generator (Figure 7, Item 1).
36. Connect turbocharger outlet hose to turbine-side of turbocharger and engine intake manifold (WP 0079, Remove/Install Turbocharger).

NOTE

Prior to installation of oil drain hose, remove all caps/plugs from oil hoses/fittings. Capture spilled engine oil and dispose of IAW local SOP.

37. Install oil drain hose (Figure 6, Item 2) to engine.
38. Position engine oil hose bulkhead fitting (Figure 6, Item 1) to its mounting position on unit skid.
39. Secure bulkhead fitting (Figure 6, Item 1) to unit skid by installing two screws (Figure 6, Item 3).
40. Dispose of soiled rags IAW local SOP.

NOTE

Use tags placed on sensors/senders and wiring harness at removal to assist installation. Leave tags on electrical components until generator set is running properly.

41. Install electrical lead (Figure 3, Item 11) to bottom of intake air heater (Figure 3, Item 12) and secure by installing washer (Figure 3, Item 10) and nut (Figure 3, Item 9).
42. Secure electrical connectors at the following locations:

- a. Electrical connector (Figure 3, Item 8) at governor actuator connector (Figure 3, Item 7).
- b. Electrical connector (Figure 3, Item 1) at engine coolant temperature sensor (Figure 3, Item 2).
- c. Electrical connector (Figure 3, Item 5) at engine oil pressure sender (Figure 3, Item 6).
- d. Electrical connector (Figure 3, Item 3) at the engine speed sensor (Figure 3, Item 4).

NOTE

Loop clamps are used to position electrical wires out of harm's way. The procedure to install all loop clamps is the same regardless of position within the generator set. Loop clamps are located in three positions that affect the engine installation process: on the intake manifold (Figure 4, Item 1), below the engine speed sensor (Figure 4, Item 5), and below the starter (Figure 5, Item 4).

43. Slide and locate loop clamps (Figure 4, Item 2) (Figure 5, Item 1) to approximate mounting locations on wiring harness (not shown).
44. Install screw (Figure 5, Item 3), flat washer (Figure 5, Item 2), and loop clamp (Figure 5, Item 1) to below starter (Figure 5, Item 4).
45. Install screw (Figure 4, Item 4), flat washer (Figure 4, Item 3), and loop clamp (Figure 4, Item 2) to intake manifold and speed sensor locations (Figure 4, Items 4 and 5).

NOTE

Prior to installation, remove all caps/plugs from crankcase breather hose (Figure 2, Item 1) and valve cover nipple (Figure 2, Item 3).

46. Install crankcase breather hose (Figure 2, Item 1) to valve cover nipple (Figure 2, Item 3) and secure by installing hose clip (Figure 2, Item 2) to its final location.
47. Slide and position hose clip (Figure 2, Item 2) at valve cover nipple (Figure 2, Item 3).
48. Install coolant heater, bracket, and hoses (as required) (WP 0025, Remove/Install Winterization Kit Components).
49. Attach wiring to starter (WP 0072, Remove/Install Starter).
50. Attach wiring to battery-charging alternator (WP 0074, Remove/Install Battery-Charging Alternator Assembly).
51. Install exhaust pipe to engine (WP 0077, Remove/Install Muffler).
52. Install radiator hose and tube assemblies to engine (WP 0024, Remove/Install Radiator Hose and Tube Assemblies).
53. Install air cleaner assembly (WP 0020, Service Air Cleaner).
54. Connect air intake hose assemblies to engine (WP 0019, Remove/Install Air Intake Hose Assemblies).
55. Install right-side door panel (WP 0032, Remove/Install Right-Side Body Panels).
56. Install left-side door panel (WP 0031, Remove/Install Left-Side Body Panels).
57. Install front body panel (WP 0029, Remove/Install Front Body Panel).
58. Install fuel supply and return hoses from fuel filter/water separator to engine (WP 0046, Remove/Install Fuel Filter Water Separator).
59. Fill engine oil (WP 0065, Service Lubrication System).
60. Fill coolant (WP 0021, Service Cooling System).
61. Fill fuel tank (WP 0043, Service Fuel System).
62. Install top body panel (WP 0028, Remove/Install Top Body Panel).
63. Connect battery cables (WP 0036, Remove/Install Batteries).

64. Close left-side door.
65. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
66. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
67. Repair as required.
68. Ensure oil and coolant levels are at proper operating level (TM 9-6115-751-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
SERVICE LUBRICATION SYSTEM

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Wrench, Oil Filter, Strap (WP 0163, Item 44)

Materials/Parts

Strainer (80 X 100 L.O.) (WP 0126, Repair Parts List, Figure 25, Item 17)

Grease, electrically conductive (WP 0164, Expendable and Durable Items List, Item 21)

Lubricating oil, engine (WP 0164, Item 24)

Lubricating oil, engine (WP 0164, Item 25)

Lubricating oil, engine (WP 0164, Item 26)

Pan, drain (WP 0164, Item 29)

Rag, wiping (WP 0164, Item 32)

Sealant (WP 0164, Item 33)

Personnel Required

91D (1)

References

MIL-PRF-2104H

MIL-PRF-46167D

TB-43-0211 (AOAP)

WP 0036, Remove/Install Batteries

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

SERVICE LUBRICATION SYSTEM**WARNING**

- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are running. Failure to comply may cause injury or death to personnel.

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

Drain Engine Oil and Remove Oil Filter

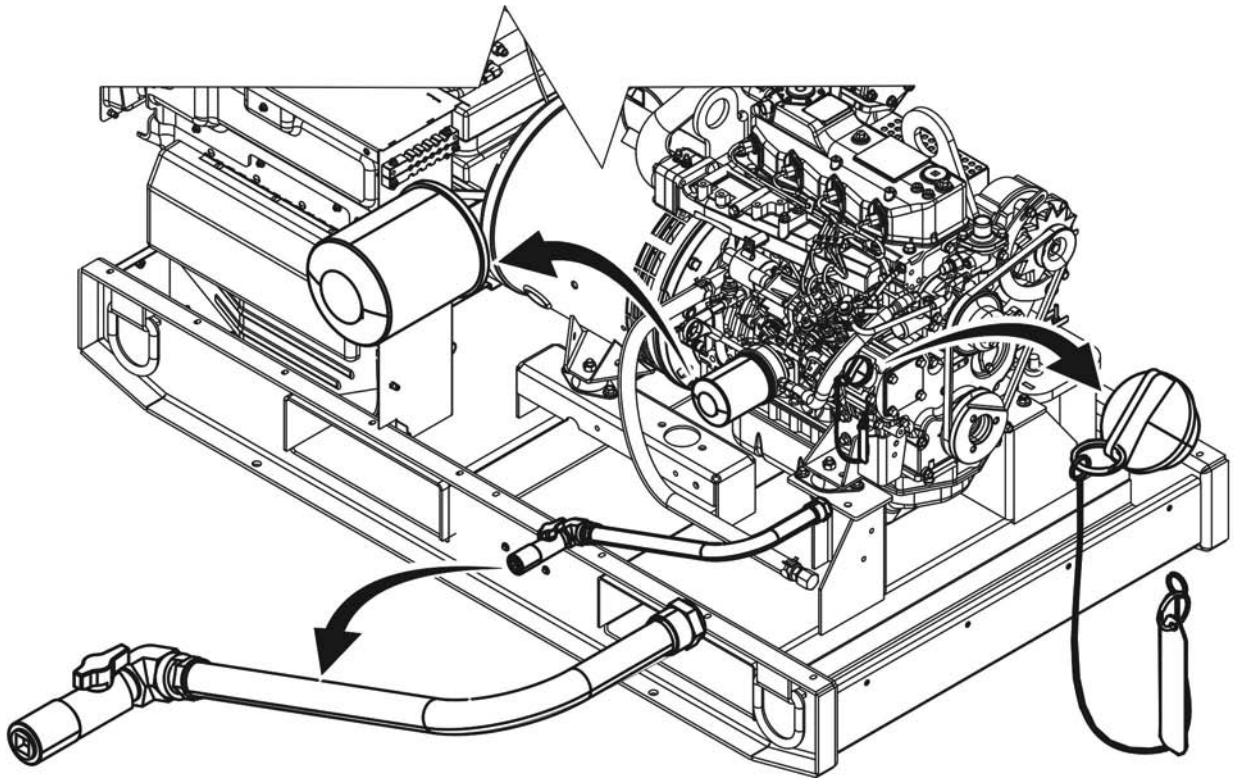


Figure 1. Oil Filler Cap and Oil Filter — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Set engine control switch to PRIME & RUN (TM 9-6115-751-10).
3. Start engine and run for 15 min or until unit has reached normal operating temperature (195°F (90.5°C)) (TM 9-6115-751-10).
4. Turn engine control switch to OFF (TM 9-6115-751-10).
5. Allow engine to cool for 2 min.
6. Open left- and right-side doors and locate the oil fill, oil fill cap, and oil filter (Figure 1).
7. Remove battery ground cable (WP 0036, Remove/Install Batteries).
8. Remove lower engine oil filler cap (Figure 2, Item 3) from engine.
9. Place a suitable drain pan of at least 9-qt capacity or more under the engine oil drain port (Figure 2, Item 7) to capture drained oil.
10. Locate ball valve (Figure 2, Item 6) on floor of unit skid.
11. Check that ball valve (Figure 2, Item 6) on oil drain hose (Figure 2, Item 5) is in the closed (handle at 90 degrees to valve body) position.
12. Loosen and remove drain plug (Figure 2, Item 8) from oil drain port (Figure 2, Item 7) on right side of skid.
13. Install a 6", 3/4" NPT galvanized nipple in oil drain port (Figure 2, Item 7) on right-side of skid.
14. Open ball valve (Figure 2, Item 6) to allow oil to completely drain into container.
15. Close ball valve (Figure 2, Item 6) when oil flow has stopped.
16. Remove 6", 3/4" NPT galvanized nipple from oil drain port (Figure 2, Item 7) on right-side of skid.

17. Apply pipe joint compound to threads of drain plug (Figure 2, Item 8).
18. Install drain plug (Figure 2, Item 8) into oil drain port (Figure 2, Item 7).
19. Place a wiping rag under oil filter (Figure 2, Item 9) to capture spilled oil.
20. Remove oil filter (Figure 2, Item 9) by turning counterclockwise with a filter wrench.
21. Place oil filter (Figure 2, Item 9) in oil drain pan to drain.

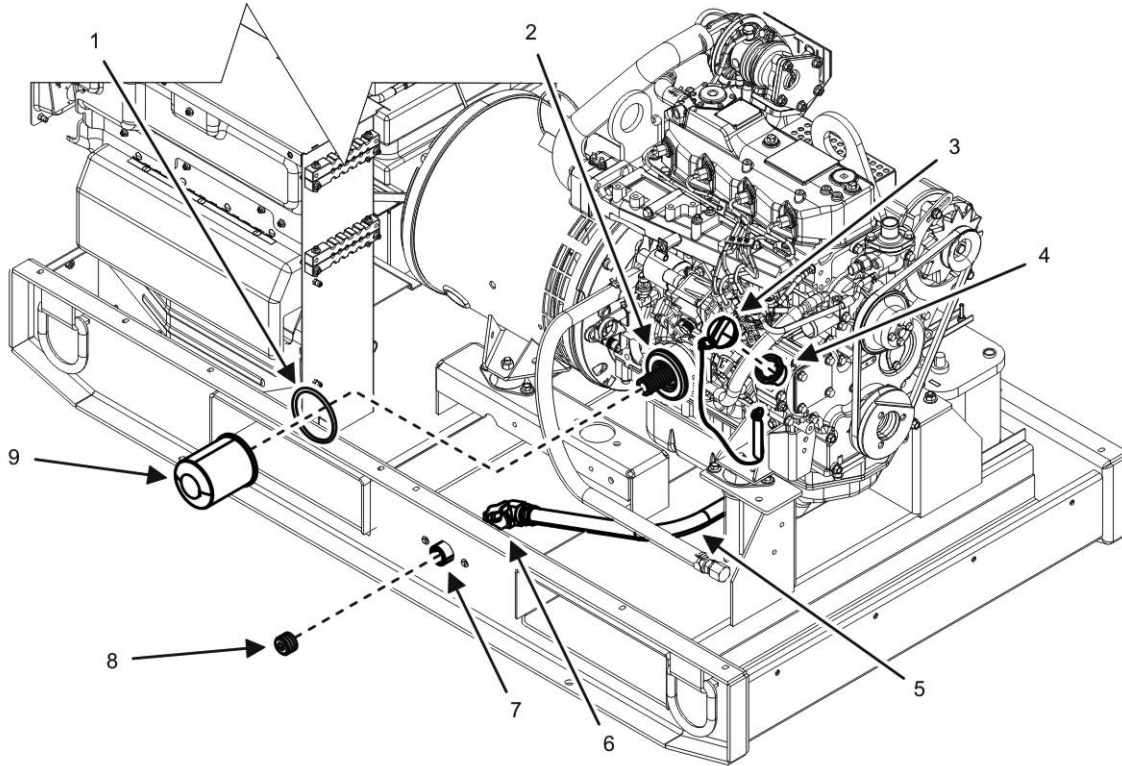


Figure 2. Service Lubrication System.

22. Check oil filter mounting location (Figure 2, Item 2) to ensure oil filter gasket (Figure 2, Item 1) was removed with oil filter (Figure 2, Item 9). If oil filter gasket (Figure 2, Item 1) is present at mounting location (Figure 2, Item 2), remove and discard gasket (Figure 2, Item 1).
23. Dispose of waste oil and oil filter (Figure 2, Item 9) IAW local SOP.

END OF TASK

Replace Oil Filter and Fill Engine Oil

1. Clean oil filter mounting surface with a clean wiping rag to prevent dirt and debris from entering the engine.
2. Apply a thin coat of clean engine oil to new oil filter gasket (Figure 2, Item 1).
3. Fill new oil filter (Figure 2, Item 9) half-full with approved engine oil (Table 1).

Table 1. Lubricating Oil.

SPECIFICATION	RATED TEMPERATURE
MIL-PRF-2104H ^a OE/HDO 15W40	+5°F to +135°F (-15°C to 57°C)
MIL-PRF-2104H OE/HDO-10	-15°F to +5°F (-26°C to -15°C)
MIL-PRF-46167D ^b	-50°F to +40°F (-45°C to 4°C)

^a Performance Specification, Lubrication Oil, Internal Combustion Engine, Combat/Tactical Service.

^b Performance Specification, Lubrication Oil, Internal Combustion Engine, Arctic.

NOTE

Choose specification oil based on ambient temperature requirements.

4. Install oil filter (Figure 2, Item 9) on engine by turning clockwise until oil filter gasket (Figure 2, Item 1) contacts engine.
5. Continue turning oil filter (Figure 2, Item 9) three-fourths of a turn after gasket has contacted engine.

CAUTION

Improper engine oil level may cause internal engine failure. If the oil level is too high, engine oil pressure will rise and may result in failure of internal engine oil seals. If the oil level is too low, insufficient oil pressure may cause failure of internal engine components. Failure to comply may cause damage to equipment.

6. Close ball valve (Figure 2, Item 6) if not already closed.

NOTE

The engine oil capacity of the engine is 8.4 qt (7.95 L). The oil filter already contains part of this amount, per step 3.

7. Pour required amount of approved oil (Table 1) into lower engine oil filler cap opening (Figure 2, Item 4).
8. Install lower engine oil filler cap (Figure 2, Item 3) and wait 5 min for engine oil to settle into oil pan.
9. Install battery ground cable (WP 0036, Remove/Install Batteries).
10. Close left- and right-side doors.
11. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
12. Start engine and check for oil leaks and proper operation.
13. Repair as required.
14. Allow engine to run for 5 min.
15. Ensure oil level is at proper operating level (Figure 3) and add engine oil to lower engine oil filler cap opening (Figure 2, Item 4) as required.

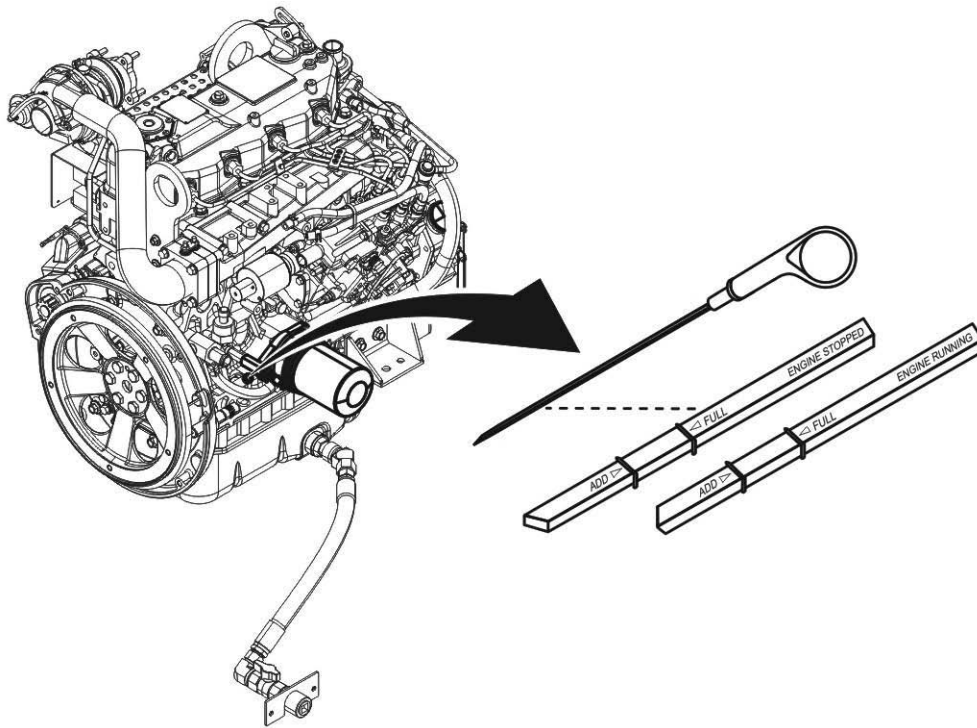


Figure 3. Dipstick — Proper Level.

16. Dispose of soiled rags IAW local SOP.

END OF TASK

Collect Engine Oil Sample

NOTE

The value of an oil sample is wholly dependent on whether the lubricant has circulated in the component long enough to accumulate and mix wear metal concentrations uniformly.

1. Perform Check Oil Level of Engine Not In Service task or Check Oil Level of Operating Engine task to determine if oil level is adequate to withdraw a sample.
2. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
3. Start and run engine for approximately 5 min to warm and circulate engine oil.

WARNING

Wear heat-resistant gloves and avoid contacting hot metal surfaces with hands and exposed skin after components have been heated. Wear additional protective clothing as required. Failure to comply may cause injury or death to personnel.

4. Open right-side door and locate oil sample collection valve (Figure 4, Item 1).
5. Place a wiping rag under the oil sample collection valve (Figure 4, Item 1) outlet to absorb purge oil.

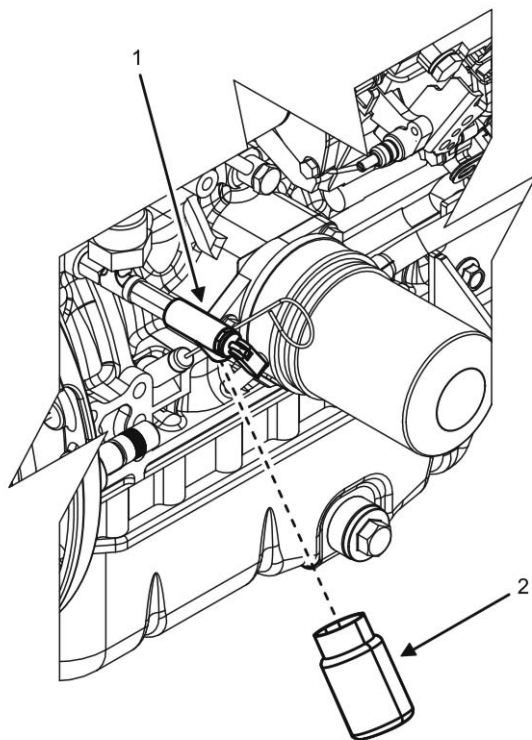


Figure 4. Oil Sample Collection.

CAUTION

Oil that has been trapped within the oil sample collection valve (Figure 4, Item 1) must be purged to prevent a false sample. Engine oil of an operating generator set can reach temperatures in excess of 150°F (65°C) at pressures greater than 80 psi. The time required to open the oil sample collection valve (Figure 4, Item 1) to clear the oil sample collection valve (Figure 4, Item 1) of possible contaminated oil should be momentary. Keeping the oil sample collection valve (Figure 4, Item 1) open for an extended period of time will reduce oil level. Failure to comply may cause damage to equipment.

5. Push toggle of collection valve (Figure 4, Item 1) toward engine to release purge oil, then release.
6. Wipe outlet of collection valve (Figure 4, Item 1) with a clean rag.
7. Place uncapped oil sample bottle (Figure 4, Item 2) under outlet of collection valve (Figure 4, Item 2).
8. Push toggle of collection valve (Figure 4, Item 1) toward engine and hold until oil is within one-half in from sample bottle (Figure 4, Item 2) opening.
9. Cap sample bottle (Figure 4, Item 2).
10. Wipe up any spilled oil and dispose of oil-soaked materials IAW local SOP.
11. Turn engine control switch to OFF position (TM 9-6115-751-10) if generator set was started only to retrieve an oil sample.

12. Perform Check Oil Level of Engine not in Service task or Check Oil Level of Operating Engine task (TM 9-6115-751-10).
13. Record information on oil sample bottle as outlined in TB-43-0211 (AOAP).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL ENGINE OIL DRAIN HOSE

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Hose, oil (WP 0126, Repair Parts List, Figure 26, Item 27)

Cap set, protective (WP 0164, Expendable and Durable Items List, Item 9)

Lubricating oil, engine (WP 0164, Item 24)

Pan, drain (WP 0164, Item 29)

Rag, wiping (WP 0164, Item 32)

Sealant (WP 0164, Item 33)

Personnel Required

91D (1)

References

Not Applicable

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Engine oil drained (WP 0065, Service Lubrication System)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL ENGINE OIL DRAIN HOSE

Remove Engine Oil Drain Hose

1. Ensure equipment conditions are met in the order presented in initial setup.
2. Open right-side door and locate engine oil drain hose (Figure 1).
3. Place wiping rags in bottom of unit skid under engine oil drain hose (Figure 1) to capture residual oil.

NOTE

Two wrenches will be required to separate the end fittings of the engine oil drain hose assembly. To aid in reassembly, tag fittings as disassembled. Capture spilled engine oil and wiping rags in a suitable container for disposal IAW local SOP.

4. Disconnect oil drain hose (Figure 2, Item 3) fitting at hose adaptor (Figure 2, Item 2). Cap/plug open ends of both fittings to prevent contamination from entering the lubrication system.

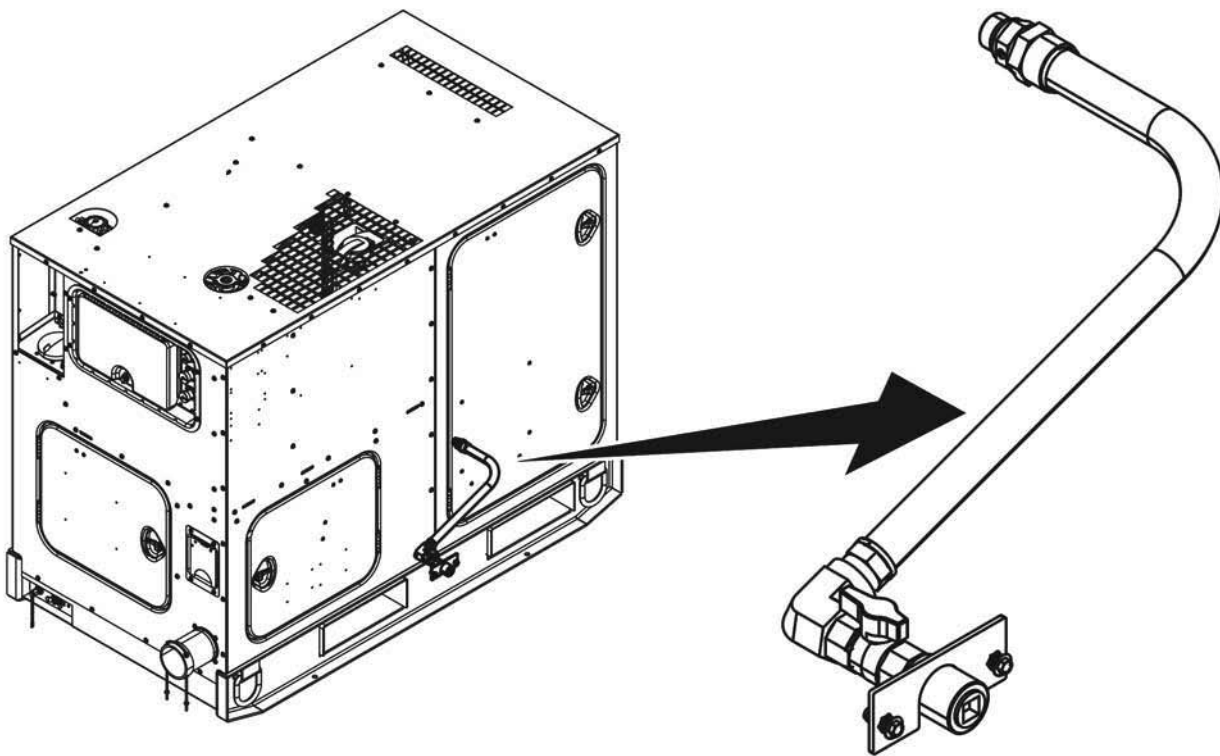


Figure 1. Engine Oil Drain Hose — Location.

5. Remove two screws (Figure 2, Item 7) that secure bulkhead fitting (Figure 2, Item 4) to unit skid (Figure 2, Item 6).

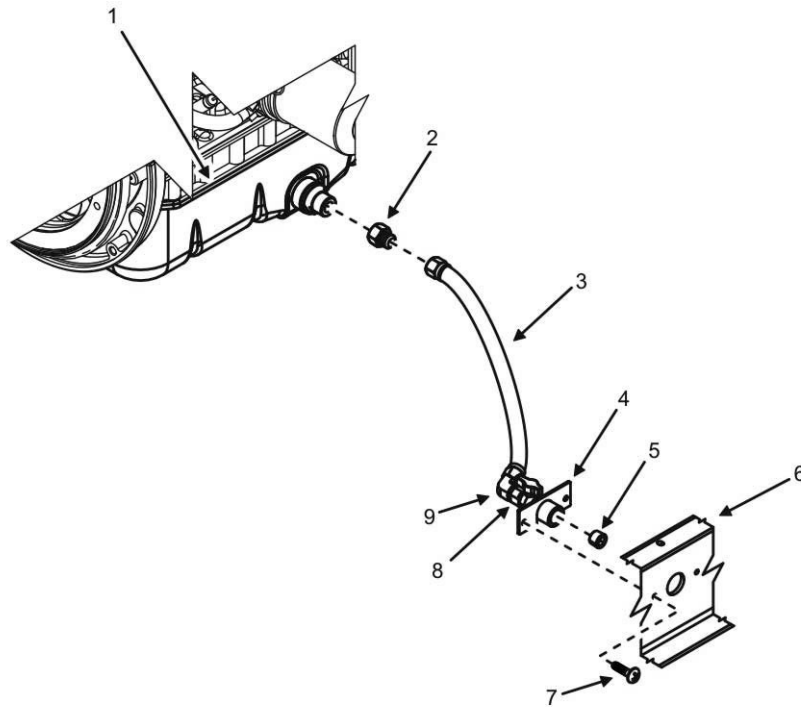


Figure 2. Oil Drain Hose — Removal.

6. Remove oil drain hose (Figure 2, Item 3) and attached fittings from generator set as an assembly and place on a suitable work surface.

END OF TASK

Inspect Oil Drain Hose

1. Inspect engine oil drain hose (Figure 2, Item 3) and attached fittings for signs of obvious damage and corrosion.
2. Replace oil drain hose (Figure 2, Item 3) and attached fittings individually as required.
3. Inspect ball valve (Figure 2, Item 8) for proper operation.
4. Replace ball valve (Figure 2, Item 8) if valve will not fully open or close or if operation is excessively stiff.
5. Inspect elbow fitting (Figure 2, Item 9) for damage or corrosion.
6. Replace elbow fitting (Figure 2, Item 9) if damaged or corroded.
7. Inspect hose adaptor (Figure 2, Item 2) installed in engine oil pan (Figure 2, Item 1) for damage or corrosion.
8. Replace hose adaptor (Figure 2, Item 2) if damaged or corroded.
9. Apply pipe joint compound to threads of elbow fitting (Figure 2, Item 9) and ball valve (Figure 2, Item 8) if separated during the inspection process prior to assembly.
10. Apply pipe joint compound to threads of hose adaptor (Figure 2, Item 2) if removed from oil pan for replacement.

END OF TASK

Install Engine Oil Drain Hose

1. Position oil drain hose (Figure 2, Item 3) assembly to its mounting location inside the generator set.
2. Position bulkhead fitting (Figure 2, Item 4) to its mounting location on unit skid (Figure 2, Item 6) and align the mounting holes.
3. Secure bulkhead fitting (Figure 2, Item 4) to unit skid (Figure 2, Item 6) by installing and tightening two screws (Figure 2, Item 7).
4. Remove cap/plugs from oil drain hose (Figure 2, Item 3) fitting and hose adaptor (Figure 2, Item 2) at engine oil pan (Figure 2, Item 1).
5. Apply pipe joint compound to threads of hose adaptor (Figure 2, Item 2).

NOTE

Two wrenches will be required to tighten the end fittings of the engine oil drain hose assembly. Capture spilled engine oil and wiping rags in a suitable container for disposal IAW local SOP.

6. Connect oil drain hose (Figure 2, Item 3) fitting to hose adaptor (Figure 2, Item 2).
7. Be sure pipe plug (Figure 2, Item 5) is tight at bulkhead fitting (Figure 2, Item 4).
8. Ensure ball valve (Figure 2, Item 7) handle can move freely from fully-open to fully-closed positions.
9. Close ball valve (Figure 2, Item 8) (handle positioned 90 degrees to valve body).
10. Fill engine with oil (WP 0065, Service Lubrication System).
11. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
12. Close right-side door.
13. Set engine control switch to PRIME & RUN (TM 9-6115-751-10).
14. Start generator set and check for proper operation (TM 9-6115-751-10).
15. Repair as required.
16. Dispose of captured engine oil and soiled rags IAW local SOP.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL OIL COOLER

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Socket, Socket Wrench, 1/2" Dr, 6Pt, Regular, 32mm
 (WP 0163, Maintenance Allocation Chart, Item 24)

Tool Kit, General Mechanic's (GMTK) (WP 0163,
 Item 38)

Materials/Parts

Cooler assembly, lube oil (WP 0126, Repair Parts
 List, Figure 26, Item 14)

O-ring (WP 0126, Figure 26, Item 15)

Strainer (80 X 100 L.O.) (WP 0126, Figure 26, Item
 17)

Antifreeze, ethylene glycol (WP 0164, Expendable
 and Durable Items List, Item 2)

Cap set, protective (WP 0164, Item 9)

Cleaning compound, engine cooling system (WP
 0164, Item 10)

Cleaning compound, solvent (WP 0164, Item 11)

Grease, electrically conductive (WP 0164, Item 21)

Lubricating oil, engine (WP 0164, Item 24)

Pan, drain (WP 0164, Item 29)

Rag, wiping (5) (WP 0164, Item 32)

Sealant (WP 0164, Item 33)

Personnel Required

91D (1)

Assistant (1)

References

WP 0070, Remove/Install Water Pump

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP
 0005)

Engine cool

Battery ground cable removed (WP 0036,
 Remove/Install Batteries)

Oil drained from engine and oil filter removed (WP
 0065, Service Lubrication System)

Radiator drained of engine coolant (WP 0021,
 Service Cooling System)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL OIL COOLER
Remove Oil Cooler

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door and locate oil cooler (Figure 1).

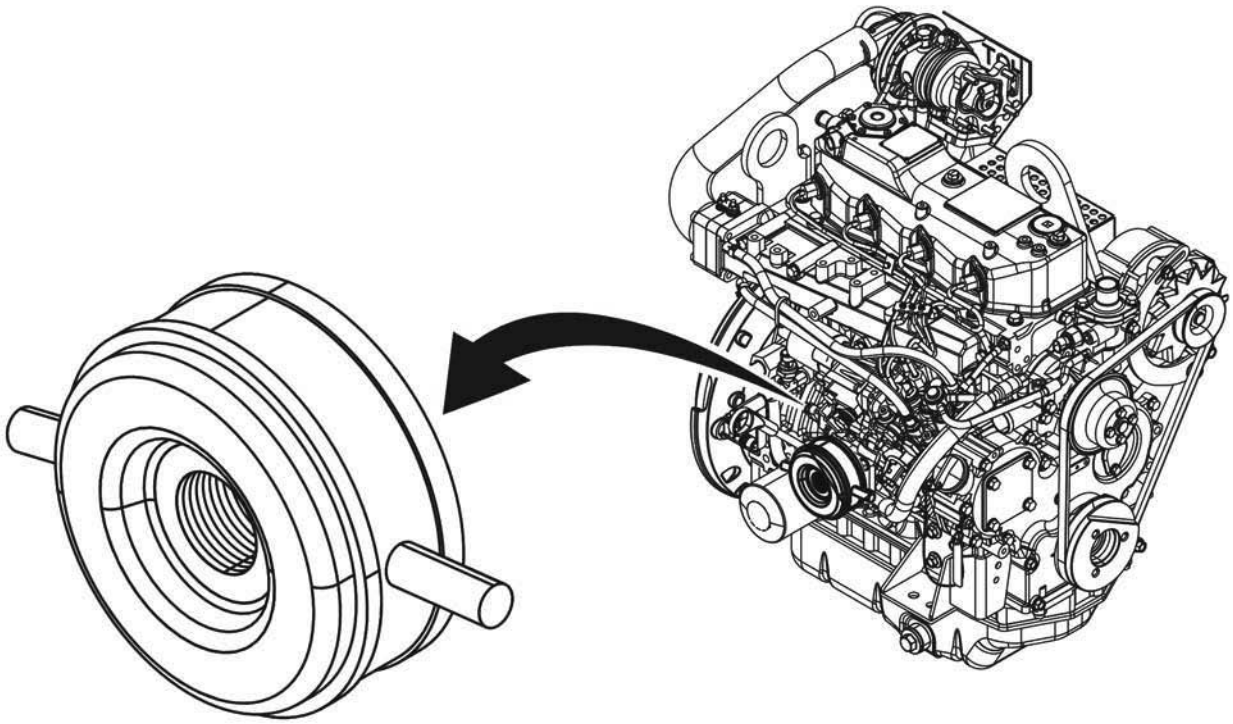


Figure 1. Oil Cooler — Location.

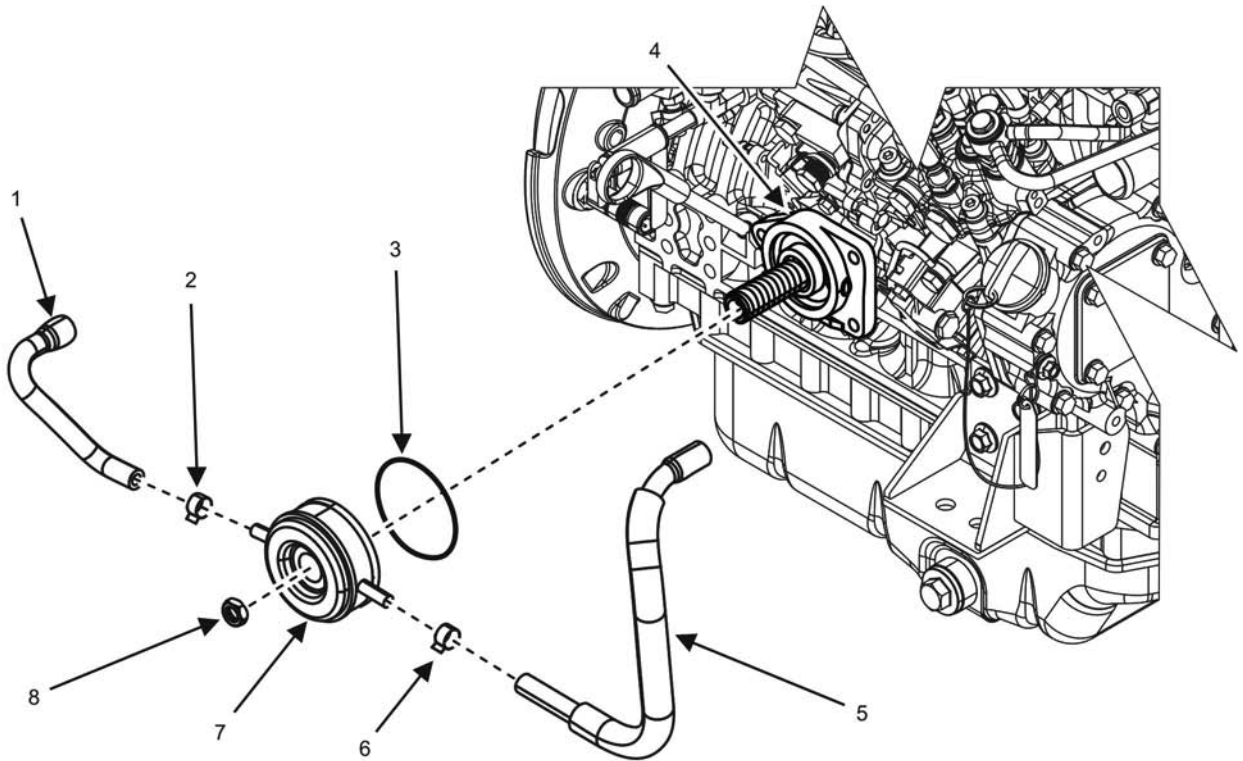


Figure 2. Oil Cooler — Removal.

3. Place a suitable drain pan under oil cooler assembly (Figure 2, Item 7).

NOTE

When removing coolant hoses from oil cooler, squeeze hose closed as it is being removed to minimize loss of coolant until a cap/plug can be inserted into open end of hose.

4. Loosen and slide back hose clip (Figure 2, Item 6) securing coolant hose (Figure 2, Item 5) from water pump to oil cooler assembly (Figure 2, Item 7).
5. Remove coolant hose (Figure 2, Item 5) from oil cooler assembly (Figure 2, Item 7) and insert cap/plug to minimize coolant loss.
6. Loosen and slide back hose clip (Figure 2, Item 2) securing coolant hose (Figure 2, Item 1) from oil cooler assembly (Figure 2, Item 7) to engine block.
7. Remove coolant hose (Figure 2, Item 1) from oil cooler assembly (Figure 2, Item 7) and insert cap/plug to minimize coolant loss.
8. Remove flange nut (Figure 2, Item 8) from oil cooler assembly (Figure 2, Item 7).
9. Remove oil cooler assembly (Figure 2, Item 7) from oil filter bracket assembly (Figure 2, Item 4). Note position of oil cooler (Figure 2, Item 7) alignment bracket (not shown) and oil filter bracket assembly (Figure 2, Item 4) guide for use during reinstallation.

NOTE

If reusing existing oil cooler assembly (Figure 2, Item 7), existing O-ring (Figure 2, Item 3) must be discarded and new O-ring (Figure 2, Item 3) must be used.

10. Remove and discard O-ring (Figure 2, Item 3) from oil cooler assembly (Figure 2, Item 7).

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

11. Clean mounting surface of oil cooler assembly (Figure 2, Item 7) and bracket with dry cleaning solvent and wiping rags.

END OF TASK

Inspect Oil Cooler and Oil Filter Bracket

1. Inspect oil cooler assembly (Figure 2, Item 7) for damage. Replace if damaged.
2. Inspect oil filter bracket (Figure 2, Item 4) and flange nut (Figure 2, Item 8) for damage. Replace components if damaged.
3. Inspect coolant hoses (Figure 2, Items 1 and 5) and hose clips (Figure 2, Items 2 and 6) for damage, cracks, or corrosion. Replace components if damaged, cracked, or corroded.
4. Inspect elbow fitting and joint fitting in engine block and on water pump for damage and leaks. Replace if damaged (WP 0070, Remove/Install Water Pump).

END OF TASK

Install Oil Cooler and Oil Filter Bracket**NOTE**

If reusing existing oil cooler assembly, existing O-ring must be discarded and new O-ring must be used.

1. Coat new O-ring (Figure 2, Item 3) with clean engine oil.

NOTE

Ensure oil cooler assembly (Figure 2, Item 7) alignment bracket (not shown) is properly positioned with the oil filter bracket assembly guide (not shown).

2. Install oil cooler assembly (Figure 2, Item 7) with new O-ring (Figure 2, Item 3) to oil filter bracket assembly (Figure 2, Item 4) using alignment bracket key.
3. Install flange nut (Figure 2, Item 8) with sleeve towards engine to secure oil cooler assembly (Figure 2, Item 7). Tighten 3/4 turns past finger tight.

NOTE

When installing coolant hoses to oil cooler, squeeze hose closed before cap/plug is removed to minimize loss of coolant.

4. Remove cap/plug from coolant hose (Figure 2, Item 5).
5. Install coolant hose (Figure 2, Item 5) from water pump to oil cooler assembly (Figure 2, Item 7).
6. Position hose clip (Figure 2, Item 6) on coolant hose (Figure 2, Item 5) to secure coolant hose (Figure 2, Item 5) to oil cooler (Figure 2, Item 7).
7. Remove cap/plug from coolant hose (Figure 2, Item 1).
8. Install coolant hose (Figure 2, Item 1) from engine block to oil cooler assembly (Figure 2, Item 7).
9. Slide hose clip (Figure 2, Item 2) into position on coolant hose (Figure 2, Item 1) to secure coolant hose (Figure 2, Item 1) to oil cooler (Figure 2, Item 7).
10. Replace oil filter and fill engine with oil (WP 0065, Service Lubrication System).
11. Close right-side door.
12. Fill radiator (WP 0021, Service Cooling System).
13. Install negative ground cable to right-hand battery (WP 036, Remove/Install Batteries).
14. Release air through coolant overflow vent line for 5 min before start up (TM 9-6115-751-10).
15. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
16. Start engine and check for coolant and oil leaks and proper operation (TM 9-6115-751-10).
17. Repair as required.
18. Dispose of soiled rags IAW local SOP.
19. Ensure coolant and oil level is at proper operating level (TM 9-6115-751-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL FUEL INJECTORS

INITIAL SETUP:**Test Equipment**

Beaker, Laboratory (WP 0163, Maintenance Allocation Chart, Item 6)
 Kit, Nozzle (WP 0163, Item 18)
 Tester, Diesel Fuel Injector Nozzle (WP 0163, Item 35)

Tools and Special Tools

Socket, Socket Wrench, 1/4" Dr, 6Pt, Regular, 12mm, (WP 0163, Item 25)
 Socket, Socket Wrench, 3/8" Dr, 6Pt, Regular, 12 mm (WP 0163, Item 26)
 Tool Kit, General Mechanic's (GMTK) (WP 0163, Item 38)
 Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0163, Item 46)
 Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0163, Item 48)

Materials/Parts

Packing (5) (WP 0128, Repair Parts List, Figure 28, Item 5)
 Packing, (P 12.0) (4) (WP 0128, Figure 28, Item 8)
 Protector, nozzle (4) (WP 0128, Figure 28, Item 6)
 Seat, nozzle (4) (WP 0128, Figure 28, Item 7)
 Valve assembly, injection (4) (WP 0128, Figure 28, Item 9)
 Brush, wire, scratch (WP 0164, Expendable and Durable Items List, Item 8)

Materials/Parts

Cap set, protective (WP 0164, Item 9)
 Cleaning compound, solvent (WP 0164, Item 11)
 Fuel, diesel (WP 0164, Item)
 Grease, electrically conductive (WP 0164, Item 21)
 Grease, general purpose (WP 0164, Item 22)
 Rag, wiping (2) (WP 0164, Item 32)

Personnel Required

91D (1)
 Assistant (1)

References

WP 0043, Service Fuel System

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)
 Engine cool
 Battery ground cable removed (WP 0036, Remove/Install Batteries)
 Valve cover removed (WP 0082, Remove/Install Valve Cover)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL FUEL INJECTORS**WARNING**

Never inject fuel near a fire source. Atomized fuel is highly combustible. Fuel pressure is high enough to penetrate skin. Ensure that spray from the injector nozzle is directed away from all personnel. Direct contact with spray can cause skin cell destruction and blood poisoning. Skin and eye protection are required when working in contact with fuel. Failure to comply may cause injury or death to personnel and damage to equipment.

Remove Fuel Injectors**WARNING**

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

NOTE

Capture spilled fluids and dispose of IAW local SOP.

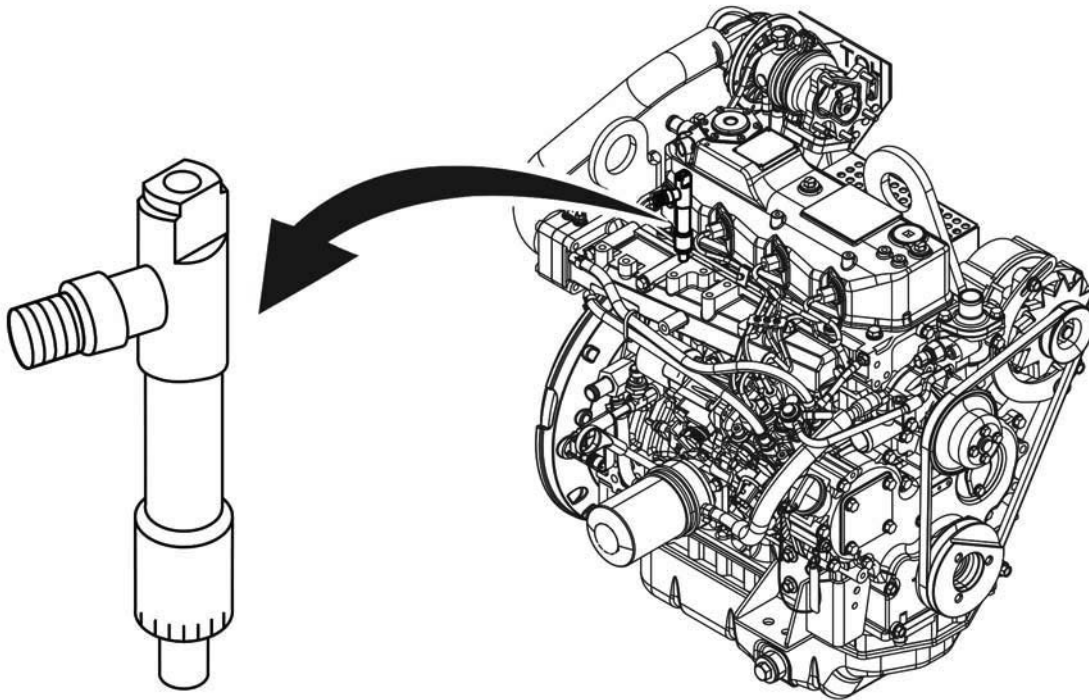


Figure 1. Fuel Injector — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door and locate fuel injector (Figure 1).

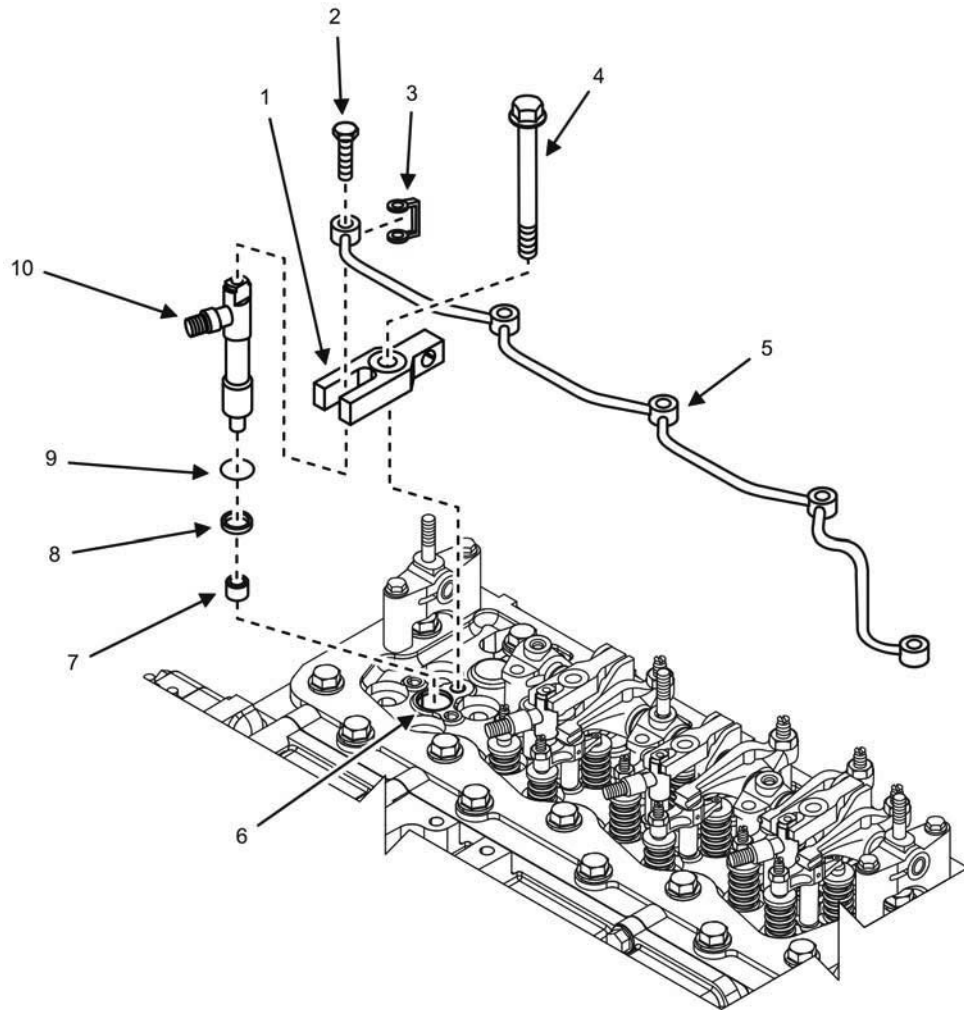


Figure 2. Fuel Injector Detail — Removal.

3. Place wiping rag under fuel injector return pipe assembly (Figure 2, Item 5) to capture spilled fuel.
4. Remove five joint bolts (Figure 2, Item 2) from fuel return pipe assembly (Figure 2, Item 5).
5. Remove fuel return pipe assembly (Figure 2, Item 5) from fuel injectors (Figure 2, Item 10).
6. Remove and discard packing (Figure 2, Item 3) from fuel return pipe assembly (Figure 2, Item 5).
7. Remove four fuel injector retainer bolts (Figure 2, Item 4) securing fuel injector retainers (Figure 2, Item 1).
8. Remove four fuel injector retainers (Figure 2, Item 1).
9. Remove four fuel injectors (Figure 2, Item 10) from cylinder head (Figure 2, Item 6) by hand.

CAUTION

Fuel injector nozzle protectors and seats may be in cylinder head opening or attached to fuel injectors. Be sure to check both places and ensure removal of both nozzle protectors and seats. Failure to comply may cause damage to equipment.

10. Remove and discard fuel injector nozzle protector (Figure 2, Item 7), seat (Figure 2, Item 8), and seal (Figure 2, Item 9) from fuel injector (Figure 2, Item 10).
11. Cap/plug all openings on cylinder head (Figure 2, Item 6).

END OF TASK**Inspect Fuel Injectors**

1. Inspect fuel injector (Figure 2, Item 10) for obvious signs of damage or excessive corrosion and replace as required.
2. Inspect fuel injector retainer and bolts (Figure 2, Items 1 and 4) for damage or excessive corrosion and replace as required.
3. Inspect fuel return pipe assembly (Figure 2, Item 5) for damage, leaks, or corrosion.
4. Replace fuel return pipe assembly (Figure 2, Item 5) if damaged, leaking, or corroded.
5. Inspect all bolts for wear or damage.
6. Replace any bolts if worn or damaged.

END OF TASK**Test Fuel Injector****CAUTION**

Damage will result to the nozzles and other components if a steel wire brush is used to clean fuel injectors. Use a brass wire brush instead. Failure to comply may cause damage to equipment.

NOTE

Fluids used for fuel injection nozzle testing should be captured and disposed of IAW local SOP. Aim the fuel injector into a suitable container to catch the fuel spray.

1. Clean fuel injector nozzle using clean diesel fuel and brass wire brush.

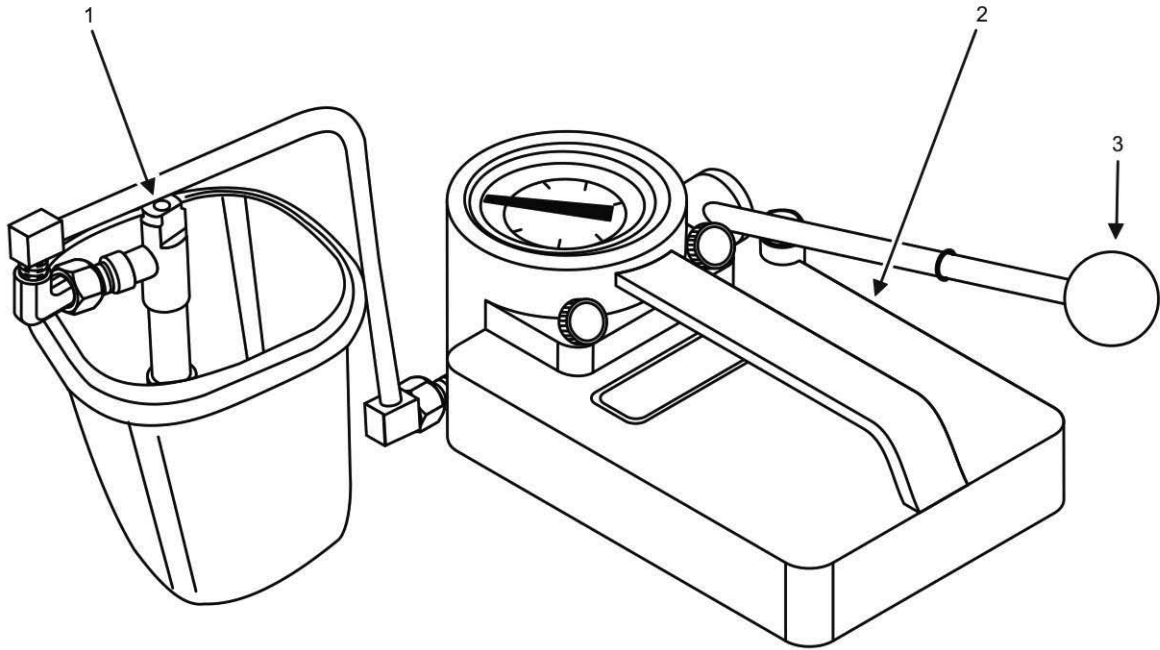


Figure 3. Fuel Injector Tester.

2. Connect fuel injector (Figure 3, Item 1) to fuel injector tester (Figure 3, Item 2).

WARNING

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

NOTE

Fluids used for injection nozzle testing should be captured and disposed of IAW local SOP. Aim the fuel injector into a suitable container to catch the fuel spray.

3. Increase pressure slowly by pumping operating lever (Figure 3, Item 3) until nozzle sprays fuel.
4. Pump operating lever (Figure 3, Item 3) more rapidly to repeatedly spray fuel from the fuel injector (Figure 3, Item 1).

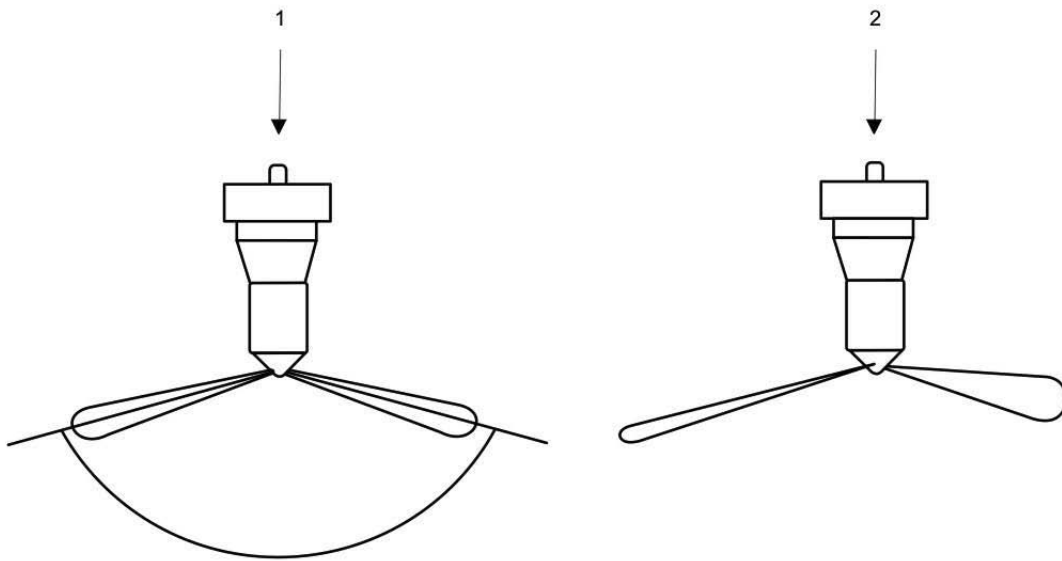


Figure 4. Test Fuel Injector Spray Pattern.

5. Observe the spray pattern (Figure 4).

NOTE

Spray pattern should be a very fine uniform spray. If a dripping or an uneven pattern is seen, service or replace injector.

6. Ensure spray is evenly distributed in a fan-shaped pattern across entire spray area (Figure 4, Item 1).
7. Replace injector nozzle if spray pattern is not evenly distributed, uneven, or abnormal (Figure 4, Item 2).
8. Dispose of excess fluids IAW local SOP.

END OF TASK

Check Fuel Injector Pressure

NOTE

Fluids used during injection nozzle testing should be captured and disposed of IAW local SOP.

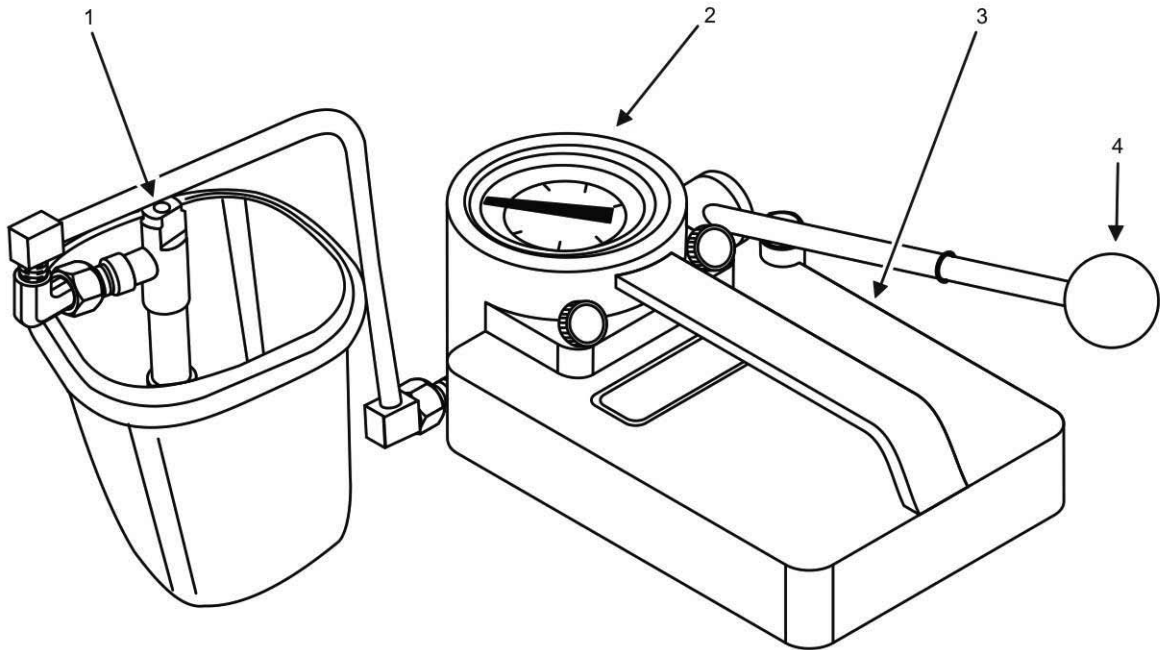


Figure 5. Fuel Injector Pressure.

1. Place fuel injector nozzle (Figure 5, Item 1) on a nozzle tester (Figure 5, Item 3).
2. Pump operating lever (Figure 5, Item 4) of nozzle tester (Figure 5, Item 3) slowly, observing the pressure reading at the point where fuel injector (Figure 5, Item 1) begins spraying fuel.

NOTE

Fuel injection pressure of a new fuel injector is approximately 72.5 psi (0.5 MPa) higher during the first 5 hr of initial operation. Table 1 value is for used fuel injectors.

3. Record reading on pressure gage (Figure 5, Item 2).
4. Replace if pressure is not within specifications shown in Table 1.

Table 1. Fuel Injection Pressure.

Fuel injector pressure	3058 – 3200 psi (21.1 – 22.1 MPa)
------------------------	--------------------------------------

5. Pump the operating lever (Figure 5, Item 4) slowly to hold the pressure steady at a point just below the opening pressure. Hold pressure for 5 sec.
6. Check fuel injector (Figure 5, Item 1) for proper sealing.

NOTE

If fuel leaks from the fitting on the pump connected to the fuel injector (Figure 5, Item 1), check that the nut on the fuel injector is tight. Replace the fuel injector if fuel continues to leak from either the nut or the nozzle.

7. Check nut of nozzle tester (Figure 5, Item 3) for proper tightness before replacing fuel injector (Figure 5, Item 1).
8. Replace fuel injector (Figure 5, Item 1) if it does not seal properly.

END OF TASK**Install Fuel Injectors**

1. Uncap/unplug all openings on the cylinder head (Figure 2, Item 6).
2. Install four new fuel injector seats (Figure 2, Item 8), nozzle protectors (Figure 2, Item 7), and seals (Figure 2, Item 9) to fuel injectors (Figure 2, Item 10).
3. Install four fuel injectors (Figure 2, Item 10) to the cylinder head (Figure 2, Item 6).
4. Install four fuel injector retainers (Figure 2, Item 1) to four fuel injectors (Figure 2, Item 10).
5. Install four fuel injector retainer bolts (Figure 2, Item 4) to four fuel injector retainers (Figure 2, Item 1).
6. Tighten fuel injector retainer bolts (Figure 2, Item 4) to 17 to 21 ft/lb (23 to 28 Nm).
7. Uncap/unplug all fuel return pipe (Figure 2, Items 5) openings.
8. Install fuel return pipe assembly (Figure 2, Item 5) to fuel injectors (Figure 2, Item 10) and cylinder head (Figure 2, Item 6) with new packing (Figure 2, Item 3) using five joint bolts (Figure 2, Item 2).
9. Tighten joint bolts (Figure 2, Item 2) to 69 – 80 in/lb (8 – 9 Nm).
10. Install valve cover (WP 0082, Remove/Install Valve Cover).
11. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
12. Bleed fuel system (WP 0043, Service Fuel System).
13. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
14. Start engine and check for fuel and oil leaks and proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
15. Repair as required.
16. Dispose of soiled rags IAW local SOP.
17. Ensure fuel and oil level is at proper operating level (TM 9-6115-751-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL FUEL INJECTION PUMP

INITIAL SETUP:**Test Equipment**

Adapter, Fuel Injection Pump Plunger (WP 0163, Maintenance Allocation Chart, Item 2)
 Band, Retaining (WP 0163, Item 5)
 Extension, Dial Indicator (WP 0163, Item 14)
 Indicator, Dial (WP 0163, Item 17)

Tools and Special Tools

Hammer, Hand, Soft Face, Dead Blow (WP 0163, Item 16)
 Metal Marking Pencil (WP 0163, Item 19)
 Puller Set, Mechanical (WP 0163, Item 21)
 Tool Kit, General Mechanic's (GMTK) (WP 0163, Item 38)
 Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 FT-LB (WP 0163, Item 45)
 Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0163, Item 48)

Materials/Parts

Fuel injection pump assembly (WP 0129, Repair Parts List, Figure 29, Item 1)
 Gasket, valve cover (WP 0143, Repair Parts List, Figure 43, Item 7)
 Governor actuator (WP 0134, Repair Parts List, Figure 34, Item 1)
 Packing, barrel plug (WP 0129, Figure 29, Item 5)
 Packing, P12.0 (3) (WP 0143, Figure 43, Item 19)
 O-ring (1A S-36.0) (WP 0129, Figure 29, Item 58)
 O-ring (WP 0129, Figure 29, Item 9)
 O-ring, F.I. pump (WP 0149, Repair Parts List, Figure 49, Item 19)
 Seal washer (8S) (WP 0141, Repair Parts List, Figure 41, Item 12)
 Washer (M10) (WP 0141, Figure 41, Item 17)
 Washer, split (WP 0129, Figure 29, Item 51)

Materials/Parts

Cap set, protective (WP 0164, Expendable and Durable Items List, Item 9)
 Cleaning compound, solvent (WP 0164, Item 11)
 Compound, sealing (WP 0164, Item 16)
 Fuel, diesel (WP 0164, Item 19)
 Grease, electrically conductive (WP 0164, Item 21)
 Grease, general purpose (WP 0164, Item 22)
 Lubricating oil, engine (WP 0164, Item 24)
 Pan, drain (WP 0164, Item 29)
 Rag, wiping (WP 0164, Item 32)

Personnel Required

91D (1)
 Assistant (1)

References

WP 0043, Service Fuel System
 WP 0063, Remove/Install 50/60 Hz Engine Assembly
 WP 0064, Remove/Install 400 Hz Engine Assembly
 WP 0073, Remove/Install Battery-Charging Alternator Belt
 WP 0083, Service Engine Valves

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)
 Engine cool
 Battery ground cable removed (WP 0036, Remove/Install Batteries)
 Front body panel removed (WP 0029, Remove/Install Front Body Panel)
 Valve cover removed (WP 0082, Remove/Install Valve Cover)

INITIAL SETUP — CONTINUED:**Equipment Conditions**

Intake manifold removed (WP 0076, Remove/Install Intake Manifold)

Coolant drained from engine (WP 0021, Service Cooling System)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL FUEL INJECTION PUMP**WARNING**

- Fuels used in generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel.
- Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.
- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are running. Failure to comply may cause injury or death to personnel.

NOTE

Capture spilled fuel and dispose of IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering fuel system.

When replacing fuel injection pump, part numbers must match. Each fuel injection pump is manufactured to match engine specifications. If using a fuel injection pump from another engine, ensure part numbers match before use. The part number for the 15 kW generator set fuel injection pump is 729584-51310.

Remove Fuel Injection Pump

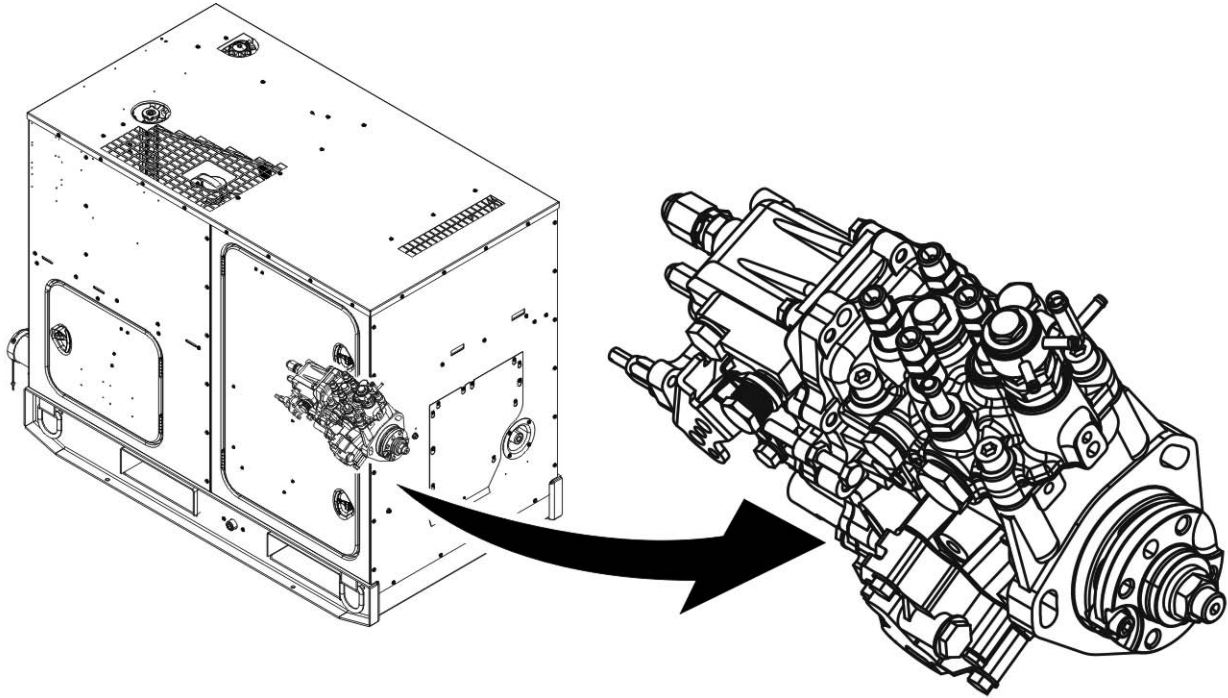


Figure 1. Fuel Injection Pump — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door and locate fuel injection pump (Figure 1).
3. Place a drain pan under fuel injection pump (Figure 1) to catch any spillage.

CAUTION

If there is no rocker arm/valve clearance when the cylinder is at TDC of the compression stroke, extreme wear and damage to the cylinder head and valves is possible. Ensure valve adjustment is carried out properly and valve bridge lock nuts and rocker arm adjustment lock nuts are secure. Failure to comply will cause damage to equipment.

NOTE

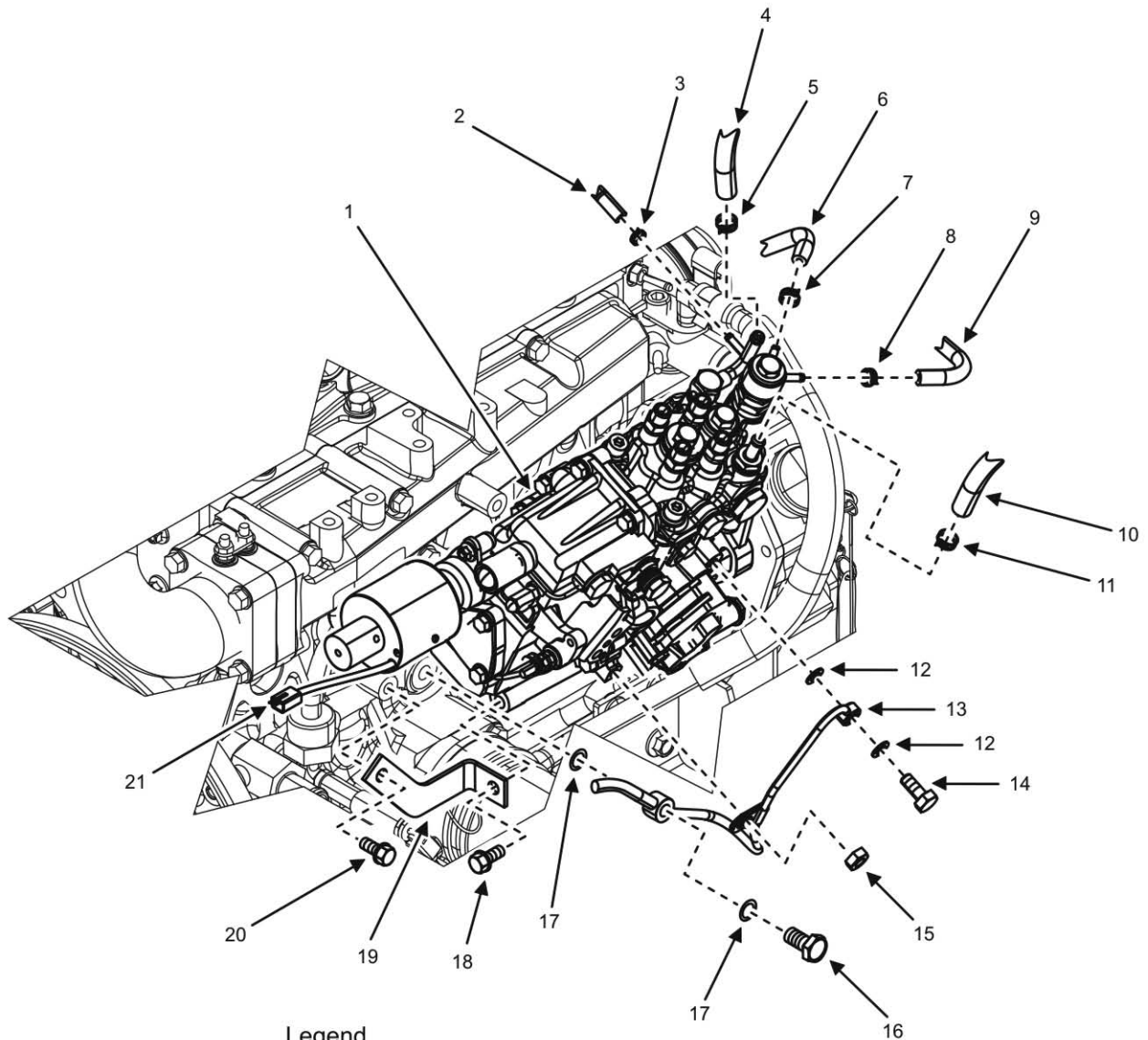
Cylinder number one is located at the flywheel end of the engine. The exhaust valve is operated by the short rocker arm, the intake valve is operated by the long rocker arm. This engine uses four valves per cylinder. The cylinder head operates two valves with a single rocker arm by employing a valve bridge between the two valves. Rotate crankshaft clockwise (from water pump end) to bring cylinder number one to TDC for compression stroke.

TDC is found when both rocker arms of cylinder one are loose and the cylinder "TC" mark on the flywheel is visible through the timing port of the flywheel housing. The firing order of the engine is 1-3-4-2.

Table 1. Valve Closure.

CYLINDER NO.	1		2		3		4	
	Exhaust	Intake	Exhaust	Intake	Exhaust	Intake	Exhaust	Intake
Valve								
Cylinder One at TDC	X	X		X	X			
Cylinder Four at TDC			X			X	X	X

4. Turn harmonic balancer hex cap screw (not shown) clockwise from water pump end of engine to bring cylinder number one to TDC (Table 1 and WP 0083, Service Engine Valves).



Legend

- | | |
|------------------------|----------------------|
| 1. Fuel Injection Pump | 12. Sealing Washer |
| 2. Fuel Return Pipe | 13. Lube Oil Line |
| 3. Hose Clip | 14. Pipe Joint Bolt |
| 4. Fuel Return Pipe | 15. Nut |
| 5. Hose Clip | 16. Pipe Joint Bolt |
| 6. Coolant Line | 17. Sealing Washer |
| 7. Hose Clip | 18. Bolt |
| 8. Hose Clip | 19. Bracket |
| 9. Coolant Line | 20. Bolt |
| 10. Fuel Supply Line | 21. Wiring Connector |
| 11. Hose Clip | |

Figure 2. Fuel Injection Pump — Removal.

- Loosen two bolts (Figure 2, Items 18 and 20) securing rear fuel injection pump bracket (Figure 2, Item 19) to fuel injection pump (Figure 2, Item 1) and engine block.

6. Remove rear fuel injection pump bracket (Figure 2, Item 19) from fuel injection pump (Figure 2, Item 1) and engine block.

CAUTION

Take care not to damage or bend the lube oil line. Failure to comply may cause damage to equipment.

NOTE

Cap the open port after removing bolts (Figure 2, Items 14 and 16) from fuel injection pump (Figure 2, Item 1) and engine block.

7. Remove one pipe joint bolt (Figure 2, Item 14) with two sealing washers (Figure 2, Item 12) securing lube oil line assembly (Figure 2, Item 13) to fuel injection pump (Figure 2, Item 1) and one bolt (Figure 2, Item 16) with two sealing washers (Figure 2, Item 17) securing lube oil line (Figure 2, Item 13) to engine block. Discard washers (Figure 2, Items 12 and 17).
8. Remove one nut (Figure 2, Item 15) securing clamp holding lube oil line assembly (Figure 2, Item 13) to fuel injection pump (Figure 2, Item 1).
9. Loosen and slide back hose clip (Figure 2, Item 7) on coolant line (Figure 2, Item 6) on fuel injection pump (Figure 2, Item 1).
10. Remove coolant line (Figure 2, Item 6) from fuel injection pump (Figure 2, Item 1).
11. Loosen and slide hose clip (Figure 2, Item 8) on coolant line (Figure 2, Item 9) back and leave on coolant line (Figure 2, Item 9).
12. Remove coolant line (Figure 2, Item 9) from fuel injection pump (Figure 2, Item 1).
13. Cap/plug open ends of coolant lines (Figure 2, Items 6 and 9) and openings on fuel injection pump.
14. Loosen and slide hose clip (Figure 2, Item 3) back on fuel return pipe (Figure 2, Item 2) of fuel injection pump (Figure 2, Item 1).
15. Remove fuel return pipe (Figure 2, Item 2) from fuel injection pump (Figure 2, Item 1).
16. Loosen and slide hose clip (Figure 2, Item 5) back on fuel return pipe (Figure 2, Item 4) on fuel injection pump (Figure 2, Item 1).
17. Remove fuel return pipe (Figure 2, Item 4) from fuel injection pump (Figure 2, Item 1).
18. Cap/plug open ends of fuel return pipes (Figure 2, Items 2 and 4) and openings on fuel injection pump.
19. Loosen and slide hose clip (Figure 2, Item 11) back on fuel supply line (Figure 2, Item 10).
20. Remove fuel supply line (Figure 2, Item 10) from fuel injection pump (Figure 2, Item 1).
21. Cap/plug open end of fuel supply line and openings on fuel injection pump.
22. Separate governor actuator wiring connector (Figure 2, Item 21) on fuel injection pump (Figure 2, Item 1).
23. Remove four bolts (Figure 3, Item 3) and four sealing washers (Figure 3, Item 4) securing fuel injection pump gear cover (Figure 3, Item 2) to gear case cover (Figure 3, Item 1).

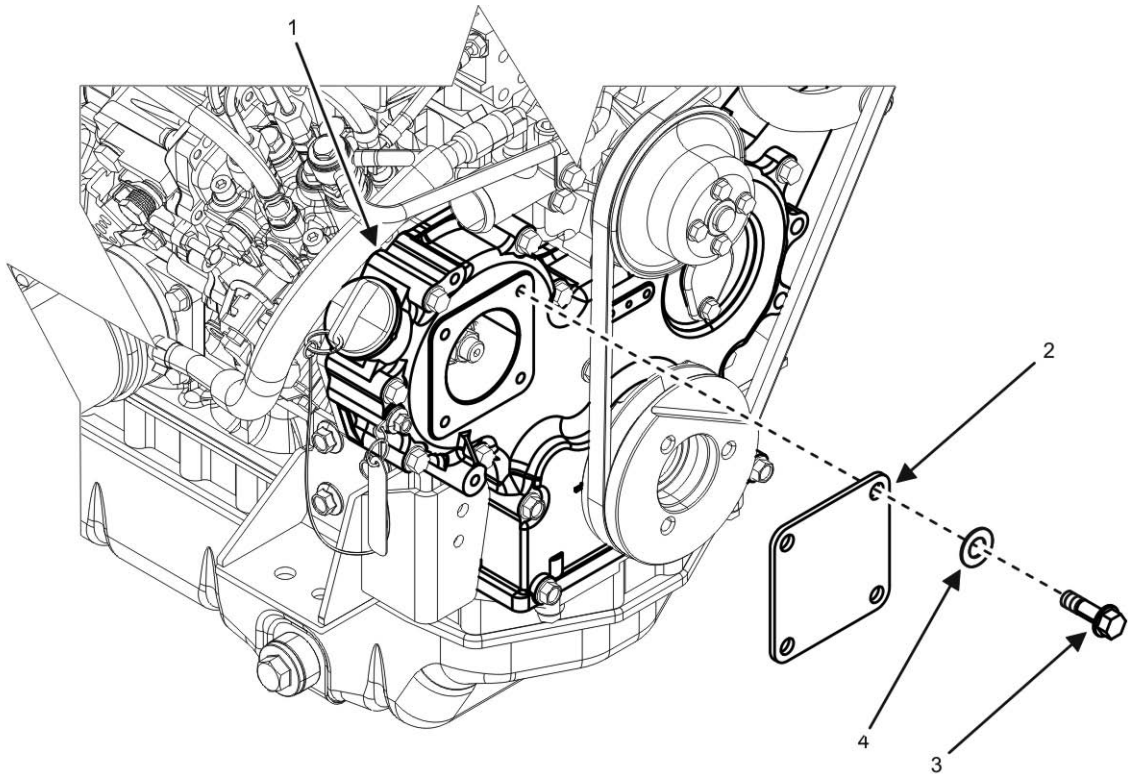


Figure 3. Injection Pump Gear Cover.

NOTE

The injection pump gear cover is secured with gasket sealer. Use a flat tip screwdriver in recess on bottom corner to loosen injection pump gear cover and separate from gear case cover.

24. Remove fuel injection pump gear cover (Figure 3, Item 2) and remove excess gasket sealer from fuel injection pump gear cover (Figure 3, Item 2) with a putty knife.
25. Record fuel injection timing to use when positioning fuel injection pump (Figure 4, Item 2) during installation:
 - a. Locate and record fuel injection pump timing index number (Figure 4, Item 1) stamped into flat boss area on engine side of fuel injection pump housing.
 - b. Treat number as if decimal point is between two digits (for example, 58 = 5.8).
 - c. Record number and label as fuel injection pump timing index number.

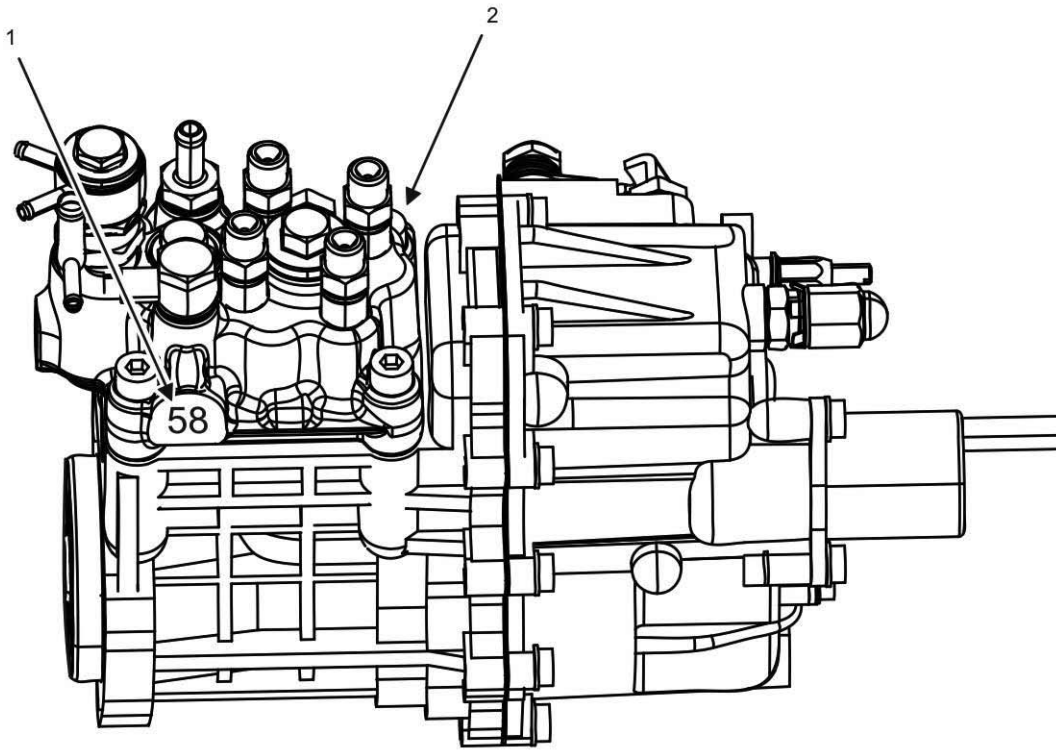


Figure 4. Fuel Injection Timing Number.

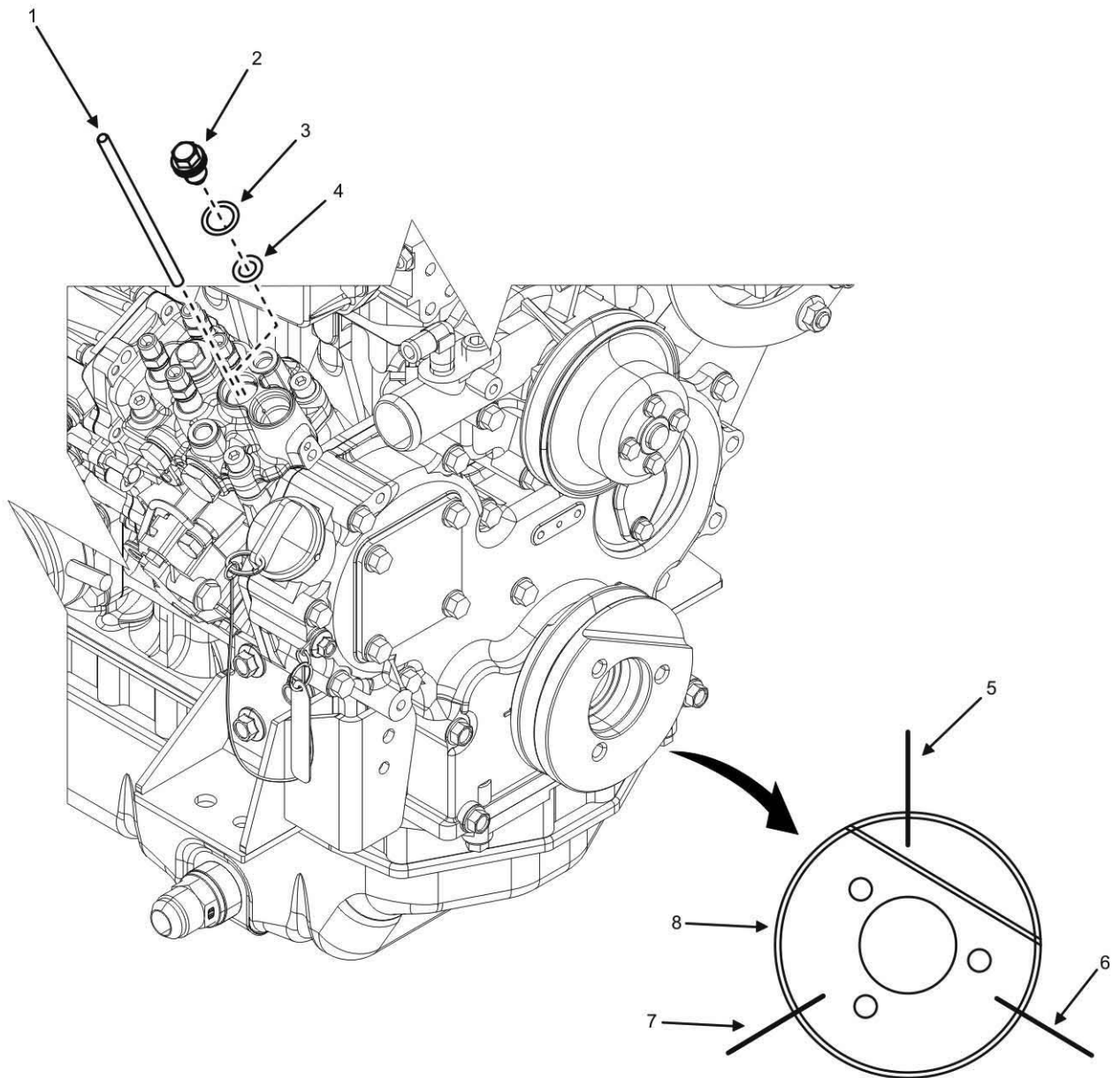


Figure 5. Install Brass Drift Punch.

NOTE

To position fuel injection pump for easier removal and installation, use a 1/4-in brass drift punch (any clean, straight shaft that will fit in the opening) in the plunger opening to position pump at the bottom of its stroke. Positioning fuel injection pump at the bottom of its stroke removes spring tension from the shaft.

26. Use a 1/4-in brass drift punch (Figure 5, Item 1) to position fuel injection pump:
 - a. Remove fuel injection pump barrel plug (Figure 5, Item 2).
 - b. Remove O-ring (Figure 5, Item 3) and barrel plug packing (Figure 5, Item 4). Discard O-ring (Figure 5, Item 3).

- c. Install 1/4-in brass drift punch (Figure 5, Item 1) into fuel injection pump barrel plug opening.
 - d. Mark harmonic balancer (Figure 5, Item 8) in 1/3 increments (Figure 5, Items 5, 6, and 7) with reference to gear case cover.
 - e. Rotate crankshaft counterclockwise until 1/4-in brass drift punch (Figure 5, Item 1) is at lowest point indicating fuel injection pump has reached the bottom of its stroke. Ensure this position as the barrel starts to come up (approximately 1/3 of a counterclockwise turn).
 - f. Remove 1/4-in brass drift punch (Figure 5, Item 1) from pump barrel plug opening. Cap/plug hole of pump barrel plug.
27. Make a reference point mark with metal marking pencil on fuel injection pump drive gear (Figure 6, Item 6) and bore of gear case opening (Figure 6, Item 5).
 28. Prevent fuel injection pump drive gear (Figure 6, Item 2) from moving by securing harmonic balancer nut (not shown) with socket and breaker bar.

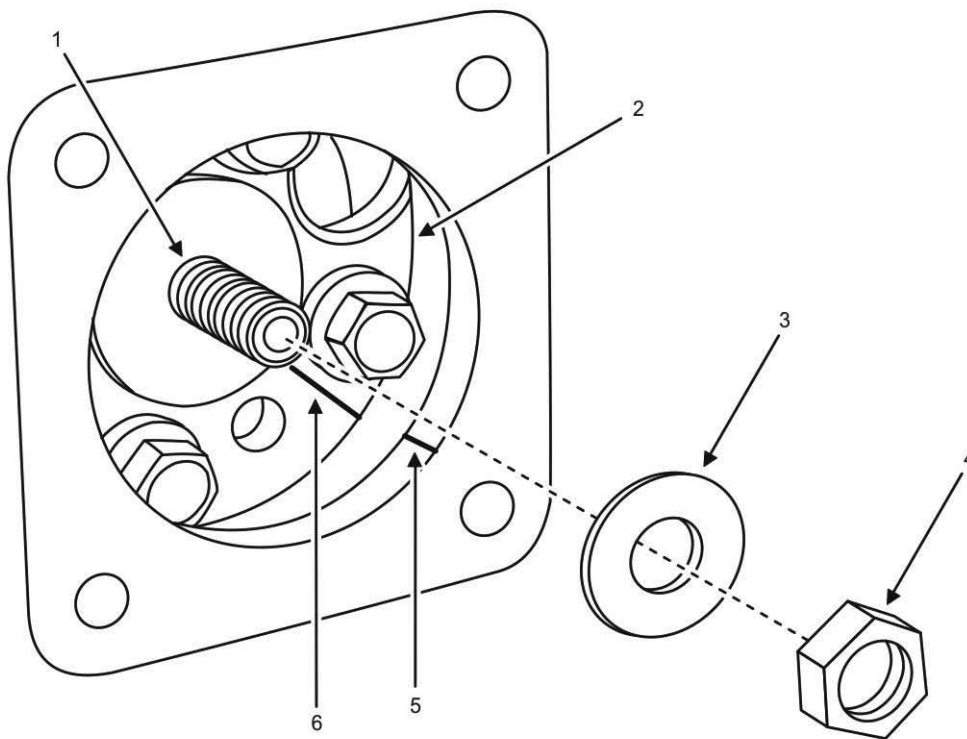


Figure 6. Fuel Injection Pump Drive Gear.

CAUTION

To aid in reassembly, mark reference points on fuel injection pump drive gear and bore of gear case opening (Figure 6). Failure to comply may cause damage to equipment.

After marking the position of the pump drive gear, do not rotate the engine crankshaft. Rotating the crankshaft will cause the fuel injection pump to become misaligned. Failure to comply may cause damage to equipment.

Do not loosen or remove the four bolts retaining the fuel injection pump drive gear to the fuel injection pump hub. Do not disassemble the fuel injection pump drive gear from the fuel injection pump hub. Correct fuel injection timing will be very difficult or impossible to achieve. Failure to comply may cause damage to equipment.

29. Loosen single drive gear nut (Figure 6, Item 4) on fuel injection pump drive gear (Figure 6, Item 2) and turn to end of fuel injection pump drive shaft (Figure 6, Item 1).
30. Leave fuel injection pump hub attached to fuel injection pump drive gear (Figure 6, Item 2).
31. Loosen fuel injection pump drive gear (Figure 6, Item 2) as an assembly from fuel injection pump drive shaft (Figure 6, Item 1) using a two-bolt gear puller.
32. Allow fuel injection drive gear (Figure 6, Item 2) to remain in gear case cover once loose from fuel injection pump.
33. Remove fuel injection pump drive gear nut (Figure 6, Item 4) and lock washer (Figure 6, Item 3) from fuel injection pump drive shaft (Figure 6, Item 1). Discard lock washer.

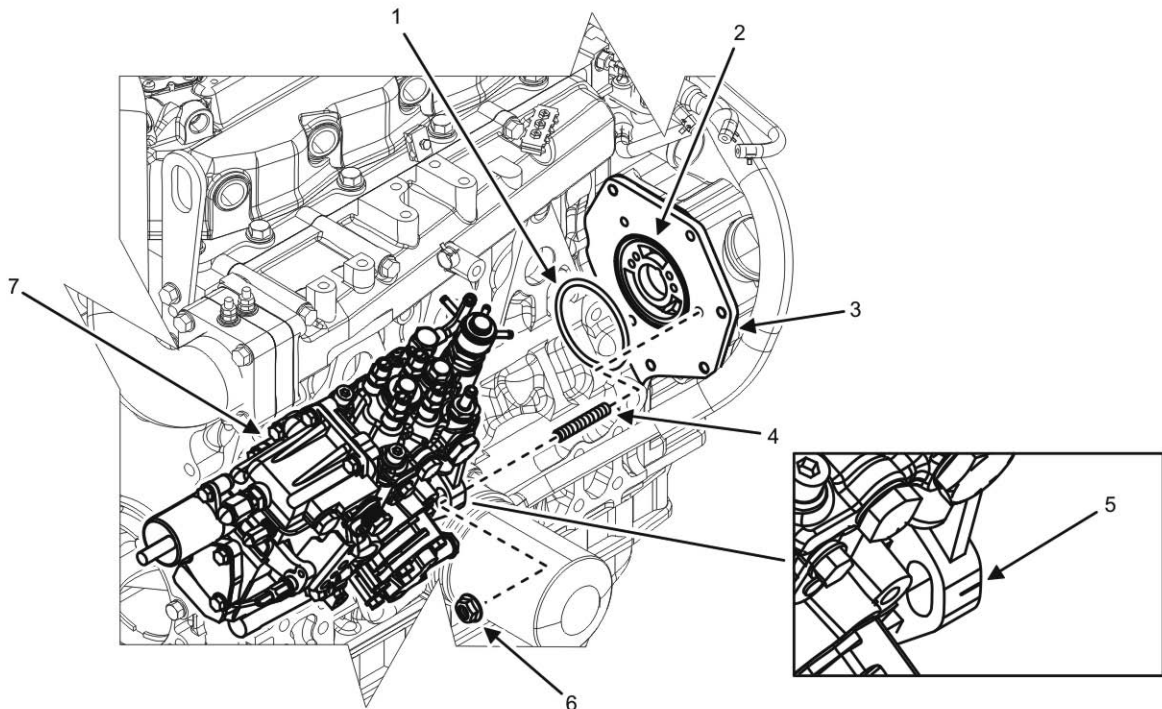


Figure 7. Fuel Injection Pump and Mounting Flange.

34. Locate mark stamped into flat outside mounting boss (Figure 7, Item 5) of fuel injection pump (Figure 7, Item 7) and gear case mounting flange (Figure 7, Item 3).

-
35. Enhance corresponding marks with metal marking pencil to assist during reinstallation if reusing existing fuel injection pump (Figure 7, Item 7).
 36. Loosen without removing three nuts (Figure 7, Item 6) securing fuel injection pump (Figure 7, Item 7) to gear case mounting flange (Figure 7, Item 3).

WARNING

Support components when removing attaching hardware or component may fall. Failure to comply may cause injury or death to personnel and damage to equipment.

37. Support fuel injection pump (Figure 7, Item 7) to ease weight for removal.

CAUTION

Do not rotate the crankshaft with the fuel injection pump (Figure 7, Item 7) removed. Failure to comply may cause damage to equipment.

Take care not to damage or bend the lube oil line. Failure to comply may cause damage to equipment.

38. Remove three nuts (Figure 7, Item 6) securing fuel injection pump (Figure 7, Item 7) to gear case mounting flange (Figure 7, Item 3).

NOTE

Fuel injection pump (Figure 7, Item 7) is under slight spring tension. A light tap with a rubber mallet may be necessary to loosen the pump from engine.

39. Remove fuel injection pump (Figure 7, Item 7) assembly from three studs (Figure 7, Item 4).
40. Inspect studs (Figure 7, Item 4) for damage. Replace as required.
41. Remove and discard O-ring (Figure 7, Item 1) from mounting location (Figure 7, Item 2) or pump.
42. Cover fuel injection pump openings in engine block with a wiping rag to prevent dirt and debris from entering engine.

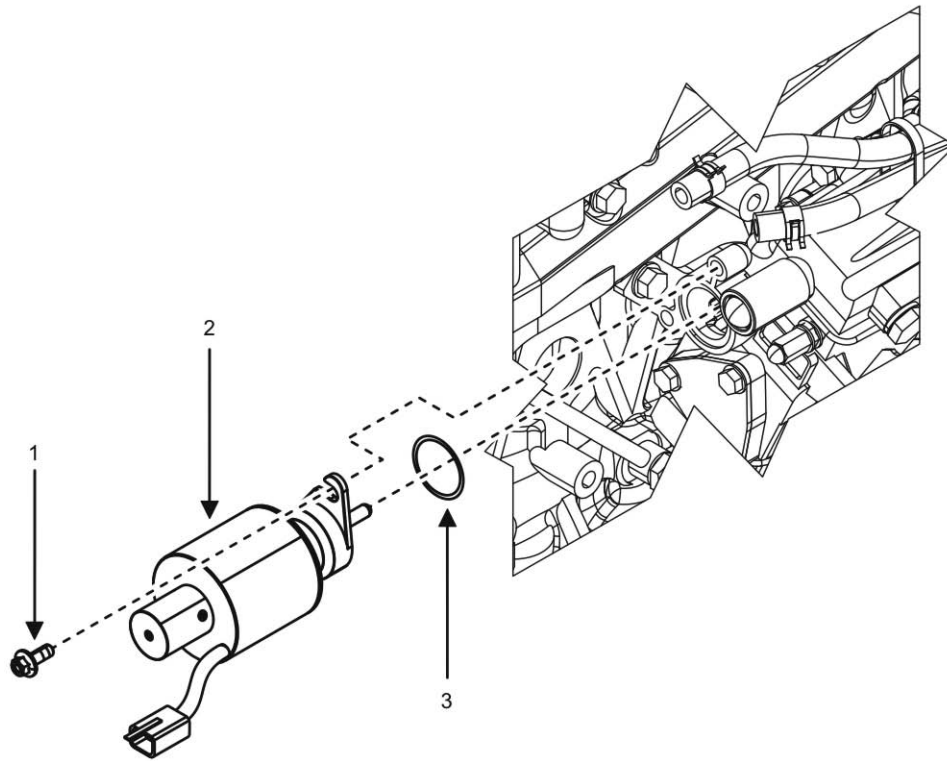


Figure 8. Fuel Injection Pump — Actuator Removal.

NOTE

Governor actuator may need to be removed and set aside for reinstallation on new fuel injection pump. Governor actuator will not need to be removed if reinstalling the same fuel injection pump as removed. Perform steps 43 – 45 to remove the governor actuator when necessary.

43. Remove two bolts (Figure 8, Item 1) securing governor actuator (Figure 8, Item 2) to fuel injection pump (Figure 7, Item 7).
44. Remove governor actuator (Figure 8, Item 2).
45. Remove O-ring (Figure 8, Item 3) and discard.

CAUTION

Do not allow gasket residue to enter engine. Do not damage mounting surface when scraping gasket material. Failure to comply will cause damage to equipment.

46. Scrape excess gasket sealer from mounting surfaces using a putty knife.

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

NOTE

Spilled solvent should be cleaned IAW local SOP. Dispose of solvent and soiled cloths IAW local SOP.

47. Clean mounting surfaces using wiping rags and dry cleaning solvent.
48. Dispose of captured fuel IAW local SOP.

END OF TASK**Inspect Fuel Injection Pump**

1. Inspect fuel injection pump (Figure 2, Item 1) for damage, corrosion, or built-up deposits. Replace as required.
2. Inspect all hoses and lines for any signs of damage or leaks. Replace as required.
3. Inspect fuel injection pump drive gear (Figure 6, Item 2) for damage. Replace engine (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly) if fuel injection pump drive gear (Figure 6, Item 2) is damaged.
4. Inspect all bolts, nuts, and studs for stripped or damaged threads. Replace as required.
5. Inspect fuel injection pump barrel plug (Figure 5, Item 2) for damage to threads. Replace as required.
6. Inspect brass packing (Figure 5, Item 4) for damage. Replace as required.
7. Inspect governor actuator (Figure 8, Item 2) for damage. Replace as required.

END OF TASK**Install Fuel Injection Pump****NOTE**

If installing the same fuel injection pump as removed, timing index number calculations will not be necessary. Use marks previously made to align pump (Remove Fuel Injection Pump task) and proceed to step 2. Use calculation in step 1 when installing a new fuel injection pump.

1. Record timing index number (Figure 4, Item 1) found on replacement fuel injection pump, inserting decimal point between the two digits (e.g., 58 = 5.8).

CAUTION

Take care when installing barrel plug packing (Figure 5, Item 4) to avoid damage. Damage or incorrect installation of the barrel plug packing (Figure 5, Item 4) may result in inoperability of the generator set. Failure to comply will cause damage to equipment.

2. Install fuel injection pump barrel plug (Figure 5, Item 2), barrel plug packing (Figure 5, Item 4), and new O-ring (Figure 5, Item 3) to fuel injection pump if reusing existing fuel injection pump.
3. Install governor actuator (Figure 8, Item 2) with two bolts (Figure 8, Item 1) and new O-ring (Figure 8, Item 3), if removed.

4. Tighten two bolts (Figure 8, Item 1) securing governor actuator (Figure 8, Item 2) to fuel injection pump to 8 ft/lb (10 – 12 Nm).

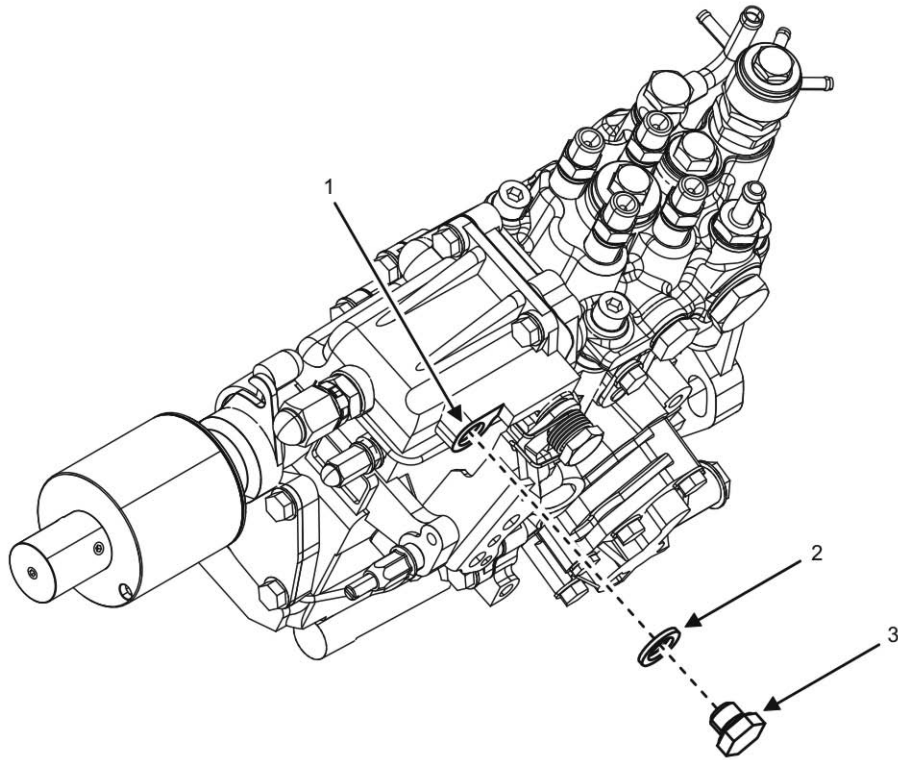


Figure 9. Fuel Injection Pump Oil Fill.

CAUTION

When reinstalling a new or repaired fuel injection pump, it is important to add 5 – 7 oz (150 – 200 cm³) of engine oil to fuel injection pump fill plug to provide lubrication for initial start-up. Failure to comply may cause damage to equipment.

5. Remove fuel injection pump oil fill plug (Figure 9, Item 3) and sealing washer (Figure 9, Item 2). Discard sealing washer (Figure 9, Item 2).
6. Add 5 – 7 oz (150 – 200 cm³) of engine oil to fuel injection pump fill plug opening (Figure 9, Item 1).
7. Install fuel injection pump fill plug (Figure 9, Item 3) with new sealing washer (Figure 9, Item 2).
8. Uncover fuel injection pump openings in engine block.

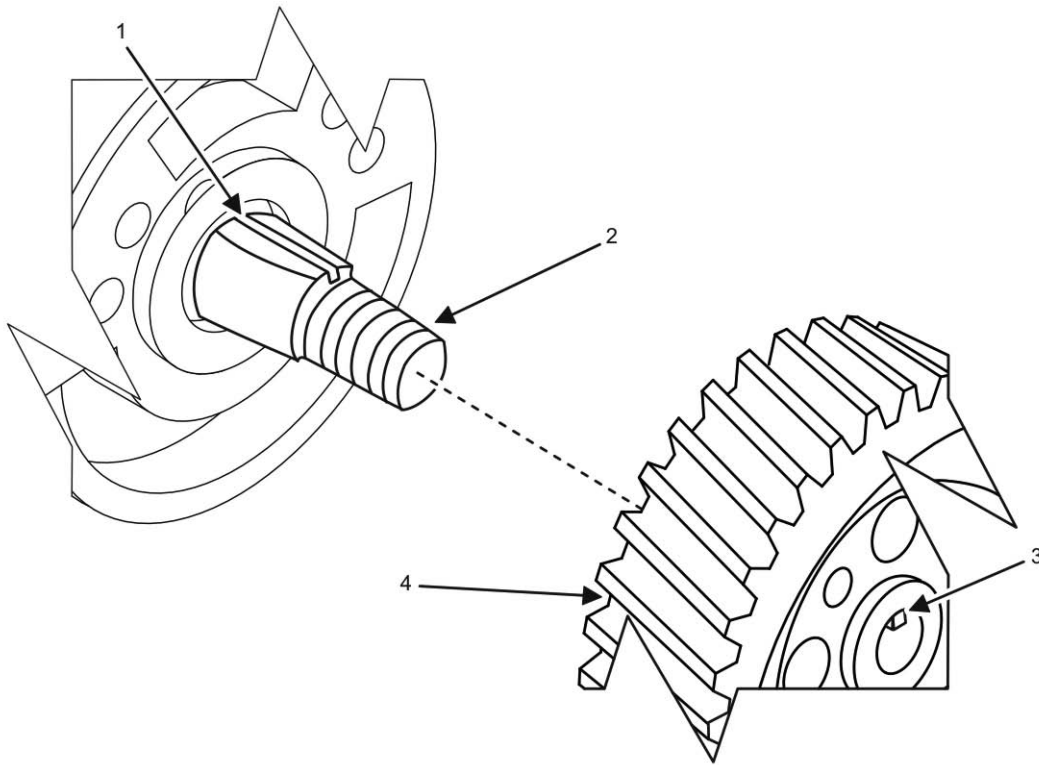


Figure 10. Fuel Injection Pump Install.

9. Ensure fuel injection pump drive gear (Figure 10, Item 4) is aligned using reference marks (Figure 6, Items 5 and 6) made during removal.
10. Apply grease to new O-ring (Figure 7, Item 1).
11. Ensure surface of fuel injection pump shaft (Figure 10, Item 2) is clean and dry.
12. Hold O-ring (Figure 7, Item 1) in place in mounting location (Figure 7, Item 2) while installing fuel injection pump (Figure 7, Item 7).
13. Align keyway (Figure 10, Item 1) on fuel injection pump shaft (Figure 10, Item 2) with key (Figure 10, Item 3) in fuel injection pump drive gear (Figure 10, Item 4).
14. Install fuel injection pump into fuel injection pump drive gear (Figure 10, Item 4).
15. Install and finger-tighten three nuts (Figure 7, Item 6) onto mounting studs (Figure 7, Item 4).

NOTE

Do not lubricate threads of fuel injection pump drive gear shaft and nut.

16. Install new lock washer (Figure 6, Item 3) and nut (Figure 6, Item 4) on fuel injection pump shaft (Figure 10, Item 2) finger tight to fuel injection pump drive gear (Figure 10, Item 4).
17. Secure harmonic balancer bolt (not shown) while tightening fuel injection pump drive gear nut (Figure 6, Item 4).
18. Tighten fuel injection pump drive gear nut (Figure 6, Item 4) to 58 – 65 ft/lb (78 – 88 Nm).

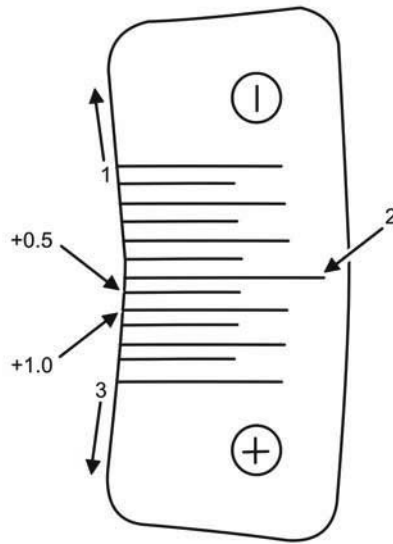


Figure 11. Timing Grid Sticker.

NOTE

A timing grid sticker comes with each new fuel injection pump. Use following steps 19 through 25 as needed for installation of new fuel injection pump. Each 0.5 degree mark on timing grid sticker is 0.5 mm apart.

19. Locate standard mark (Figure 11, Item 2) on timing grid sticker (Figure 11) that comes with new fuel injection pump (Figure 12, Item 5).

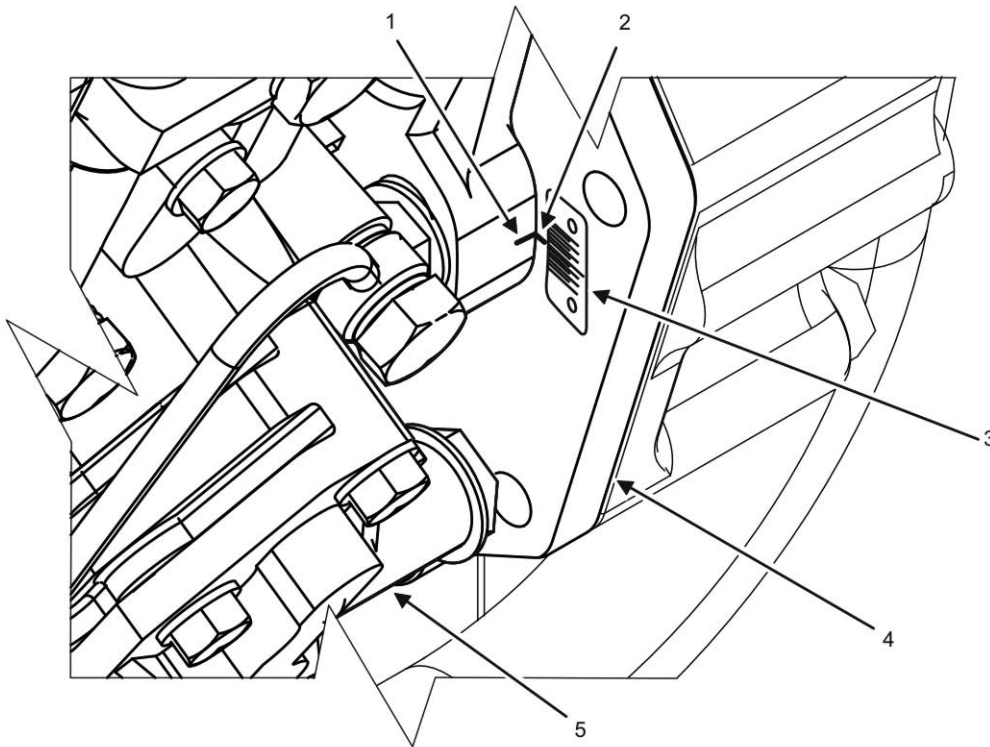


Figure 12. Timing Grid Sticker—Mounting Flange.

20. Align standard mark (Figure 11, Item 2) of timing grid sticker with reference mark (Figure 12, Item 2) on back of gear case mounting flange (Figure 12, Item 4) while installing timing grid sticker (Figure 12, Item 3).
21. Find difference between numbers recorded in step 1 and in Remove Fuel Injection Pump task, step 27.
22. Record the difference of these two numbers.

NOTE

Standard mark of timing grid sticker applied in step 20 is needed for the below procedure. For purpose of adjustment, standard mark equals 0 degrees. Use reference mark (Figure 12, Item 2) on outside upper mounting boss of fuel injection pump (Figure 12, Item 5) to correspond values with standard mark. Rotation of fuel injection pump clockwise or counterclockwise is 0.5 degrees difference for each mark away from standard mark of 0 degrees. The difference of +0.5 degrees would require rotating the fuel injection pump clockwise one mark past the standard mark.

The fuel injector pump may be adjusted on the mounting studs by rotating and tightening it anywhere within the elongated mounting hole.

23. Use standard mark from step 20 as starting point to rotate fuel injection pump (Figure 12, Item 5) clockwise by positive amount shown on sticker (Figure 11, Item 3) if difference in timing index number from step 22 is positive.
24. Use standard mark from step 20 as starting point to rotate fuel injection pump (Figure 12, Item 5) counterclockwise by negative amount shown on sticker (Figure 11, Item 1) if difference in timing index number from step 22 is negative.
25. Keep standard mark (Figure 11, Item 2) of timing grid sticker aligned with mark on fuel injection pump (Figure 12, Item 1) if there is no difference (number of zero).

26. Finger-tighten fuel injection pump mounting nuts (Figure 7, Item 6) to studs (Figure 7, Item 4) once properly aligned.
27. Tighten fuel injection pump mounting nuts (Figure 7, Item 6) to 17 – 21 ft/lb (23 – 28 Nm).
28. Apply gasket sealer to sealing surface of fuel injection pump gear cover (Figure 13, Item 2).
29. Position fuel injection pump gear cover (Figure 13, Item 2) and align holes in injection pump gear cover with gear case cover (Figure 13, Item 1).
30. Install four bolts (Figure 13, Item 3) and four new washers (Figure 13, Item 4) securing fuel injection pump gear cover (Figure 13, Item 2) to gear case cover (Figure 13, Item 1).
31. Tighten four bolts to 14 – 17 ft/lb (18 – 23 Nm).
32. Install governor actuator wiring connector (Figure 14, Item 21) to fuel injection pump (Figure 14, item 1).
33. Uncap/unplug open end of fuel supply line (Figure 14, Item 10).
34. Attach fuel supply line (Figure 14, Item 10) to fuel injection pump (Figure 14, Item 1).
35. Position tension hose clip (Figure 14, Item 11) on fuel supply line (Figure 14, Item 10).

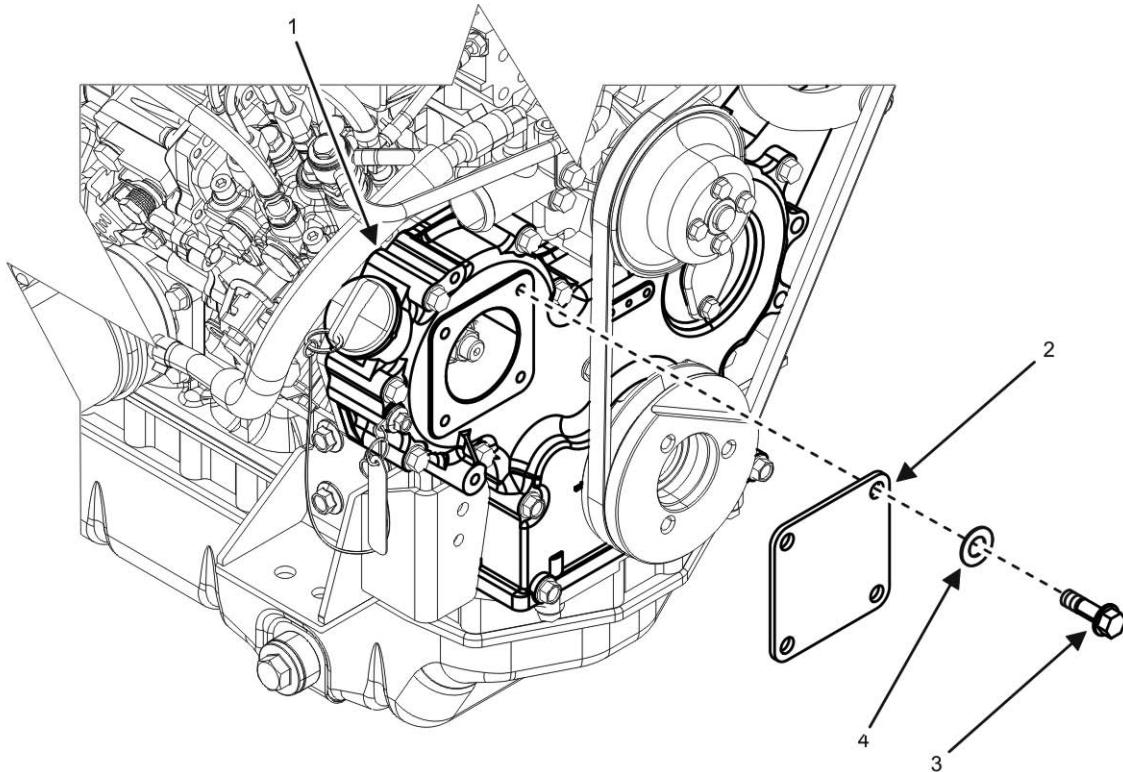
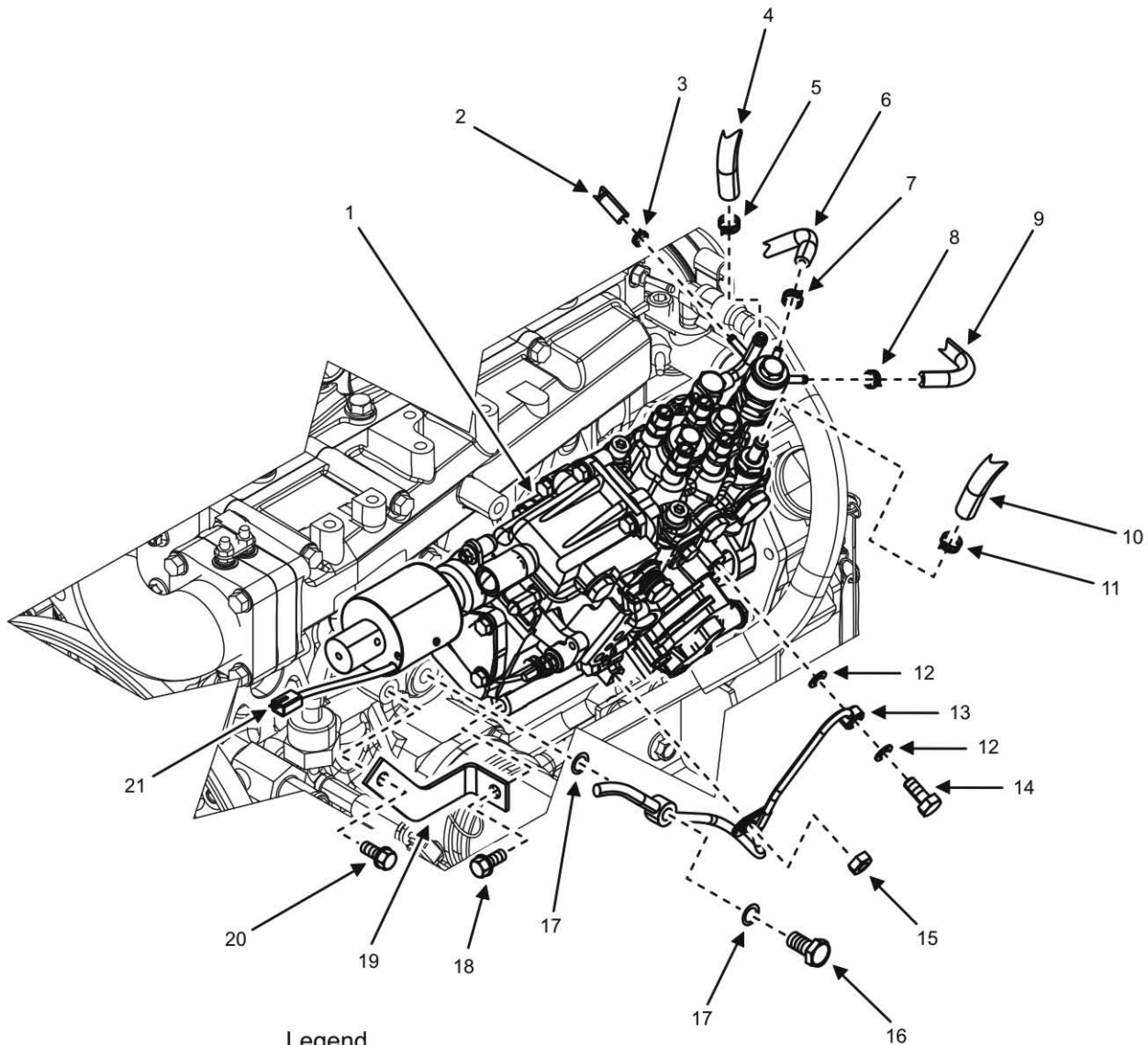


Figure 13. Injection Pump Gear Cover — Installation.



Legend

- | | |
|------------------------|----------------------|
| 1. Fuel Injection Pump | 12. Sealing Washer |
| 2. Fuel Return Pipe | 13. Lube Oil Line |
| 3. Hose Clip | 14. Pipe Joint Bolt |
| 4. Fuel Return Pipe | 15. Nut |
| 5. Hose Clip | 16. Pipe Joint Bolt |
| 6. Coolant Line | 17. Sealing Washer |
| 7. Hose Clip | 18. Bolt |
| 8. Hose Clip | 19. Bracket |
| 9. Coolant Line | 20. Bolt |
| 10. Fuel Supply Line | 21. Wiring Connector |
| 11. Hose Clip | |

Figure 14. Fuel Injection Pump and Components — Install.

36. Uncap/unplug open ends of fuel return pipes (Figure 14, Items 2 and 4).
37. Install fuel return pipe (Figure 14, Item 4) to fuel injection pump (Figure 14, Item 1).

38. Install fuel return pipe (Figure 14, Item 2) to fuel injection pump (Figure 14, Item 1).
39. Position tension hose clips (Figure 14, Items 3 and 5) on fuel return pipes (Figure 14, Items 2 and 4).
40. Uncap/unplug open ends of coolant lines.
41. Attach coolant line (Figure 14, Item 9) to fuel injection pump (Figure 14, Item 1).
42. Attach coolant line (Figure 14, Item 6) to fuel injection pump (Figure 14, Item 1).
43. Position tension hose clamps (Figure 14, Items 7 and 8) on coolant lines (Figure 14, Items 6 and 9).
44. Install one pipe joint bolt (Figure 14, Item 15) with two new sealing washers (Figure 14, Item 12) securing lube oil line assembly (Figure 14, Item 13) to fuel injection pump (Figure 14, Item 1) and one pipe joint bolt (Figure 14, Item 16) with two new sealing washers (Figure 14, Item 17) to engine block.
45. Install one nut (Figure 14, Item 15) securing clamp holding lube oil line assembly (Figure 14, Item 13) to fuel injection pump (Figure 14, Item 1).
46. Position rear bracket (Figure 14, Item 19) on fuel injection pump (Figure 14, Item 1) and engine block.
47. Install two bolts (Figure 14, Items 18 and 20) to rear bracket (Figure 14, Item 19) securing fuel injection pump (Figure 14, Item 1) to engine block.
48. Install intake manifold (WP 0076, Remove/Install Intake Manifold).
49. Install valve cover (WP 0082, Remove/Install Valve Cover).
50. Install front body panel (WP 0029, Remove/Install Front Body Panel).
51. Purge fuel lines (WP 0043, Service Fuel System).
52. Install battery ground cable (WP 0036, Remove/Install Batteries).
53. Fill generator set with coolant (WP 0021, Service Cooling System).
54. Release air through coolant overflow vent line for 5 min before start up (TM 9-6115-751-10).
55. Close right-side door.
56. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
57. Start engine and check for fuel or oil leaks and proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
58. Repair as required.
59. Dispose of soiled rags IAW local SOP.
60. Ensure fuel and oil level is at proper operating level (TM 9-6115-751-10).

END OF TASK

Check/Adjust Fuel injector Pump

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door.
3. Determine fuel injection timing:
 - a. Locate and record fuel injection pump timing index number (Figure 4, Item 1) stamped into boss on engine side of fuel injection pump (Figure 4, Item 2) housing.
 - b. Use number by placing a decimal point between two digits (e.g., 58 = 5.8).
 - c. Record number and label as fuel injection pump timing index number.

- d. Use number from above to calculate fuel injection timing with formula:
- (1) Fuel injection timing index number multiplied by two.
 - (2) Result of above plus 3.5.
 - (3) Sum equals fuel injection timing number in degrees.
 - (4) Record fuel injection timing number in degrees.

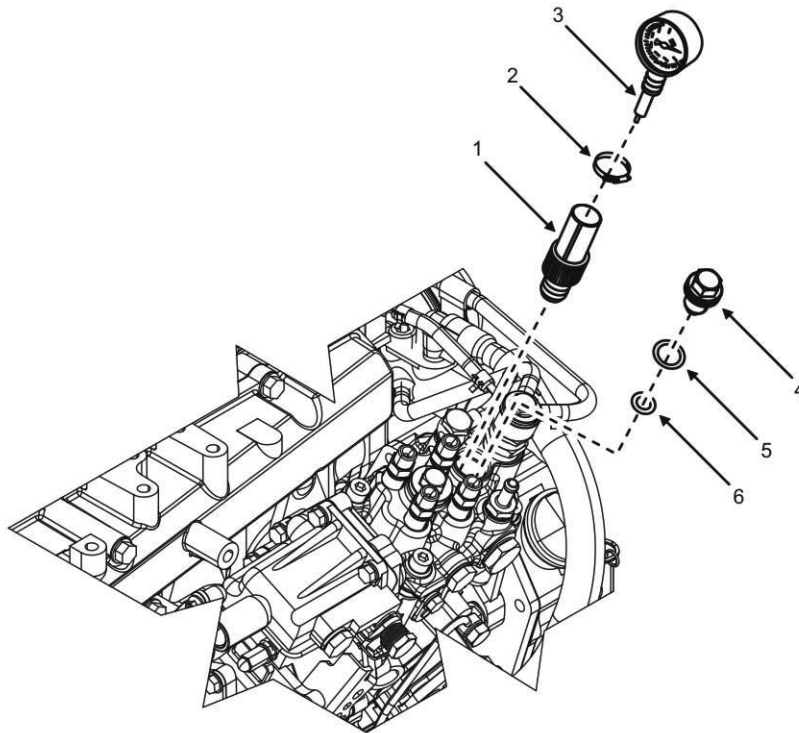


Figure 15. Install Dial.

4. Use dial indicator to position fuel injection pump:
 - a. Remove forward fuel injection pump barrel plug (Figure 15, Item 4), barrel plug packing (Figure 15, Item 6), and O-ring (Figure 15, Item 5).
 - b. Install dial indicator (Figure 15, Item 3) with extension attached and adapter (Figure 15, Item 1) into fuel injection barrel plug pump opening.
 - c. Secure with retaining band (Figure 15, Item 2) at approximately midpoint of travel.

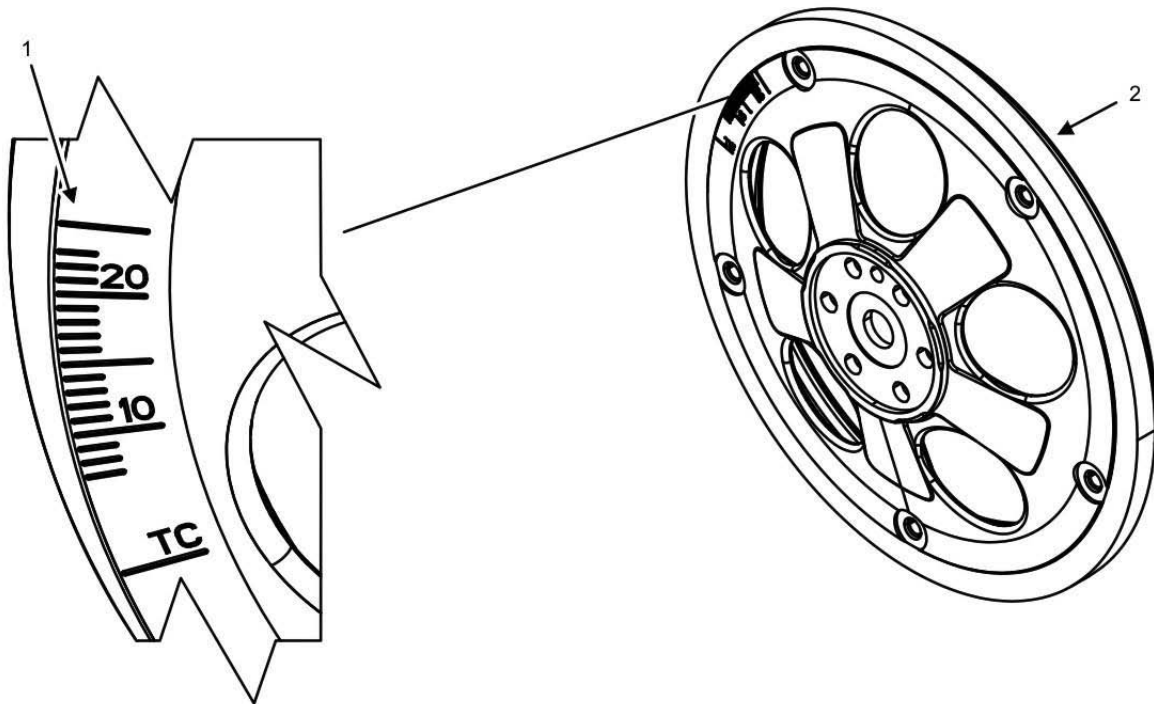


Figure 16. Flywheel Marks.

- d. Use a wrench on harmonic balancer bolt to rotate the crankshaft in a clockwise direction. Look through flywheel inspection port to find timing marks (Figure 16, Item 1).

NOTE

The flywheel will have multiple timing grids based on the number of cylinders (four). Any of the grids can be used to check fuel injection timing.

- e. Continue to rotate harmonic balancer to rotate crankshaft until fuel injection timing marks (Figure 16, Item 1) on flywheel (Figure 16, Item 2) are visible.

NOTE

The TDC mark can be identified by the "TC" mark stamped beneath the timing marks (Figure 16, Item 1) on the flywheel (Figure 16, Item 2).

- f. Note location of TDC mark on flywheel.
- g. Find target fuel injection timing mark (based on sum from step 3) on flywheel (Figure 16, Item 2).
- h. Mark/note location of fuel injection timing mark.

NOTE

When movement of dial indicator ceases, fuel injection pump plunger is at the bottom of its stroke. Rock crankshaft back and forth slightly to determine that dial indicator is showing no movement.

- i. Rotate harmonic balancer nut counterclockwise until dial indicator (Figure 15, Item 3) shows no movement.
- j. Zero dial indicator (Figure 15, Item 3). Fuel injection pump is at bottom of stroke.

-
- k. Slowly rotate harmonic balancer nut clockwise until dial indicator (Figure 15, Item 3) shows pump plunger lift of 0.098 in (2.5 mm).
 - l. Check position of target fuel injection timing mark (Figure 16, Item 1) on flywheel (Figure 16, Item 2).
 - m. Compare with timing reference mark by flywheel inspection port.
 - n. Adjust fuel injection timing if two marks are not aligned. Proceed to step 5.
 - o. Proceed to step p if two marks are aligned. Fuel injection timing is correct.
 - p. Remove dial indicator (Figure 15, Item 3) from adapter (Figure 15, Item 1).
 - q. Remove retaining band (Figure 15, Item 2) securing adapter (Figure 15, Item 1).
 - r. Remove adapter (Figure 15, Item 1) from pump plunger opening.

CAUTION

Take care when installing brass packing (Figure 15, Item 6) to avoid damage. Damage or incorrect installation of the brass packing (Figure 15, Item 6) may result in inoperability of the generator set. Failure to comply will cause damage to equipment.

- s. Install pump barrel plug (Figure 15, Item 4), brass packing (Figure 15, Item 6), and new O-ring (Figure 15, Item 5).
 - t. Tighten pump barrel plug to 22 – 26 ft/lb (30 – 35 Nm).
 - u. Proceed to step 15.
5. Rotate crankshaft until target fuel injection timing mark (Figure 16, Item 1) and timing reference mark by flywheel inspection port are aligned.

CAUTION

Do not rotate the crankshaft during the remainder of this procedure. Failure to comply may cause damage to equipment.

6. Note reading of dial indicator:
 - a. Fuel injection timing is retarded if reading is less than 0.098 in (2.5 mm).
 - b. Fuel injection timing is advanced if reading is greater than 0.098 in (2.5 mm).

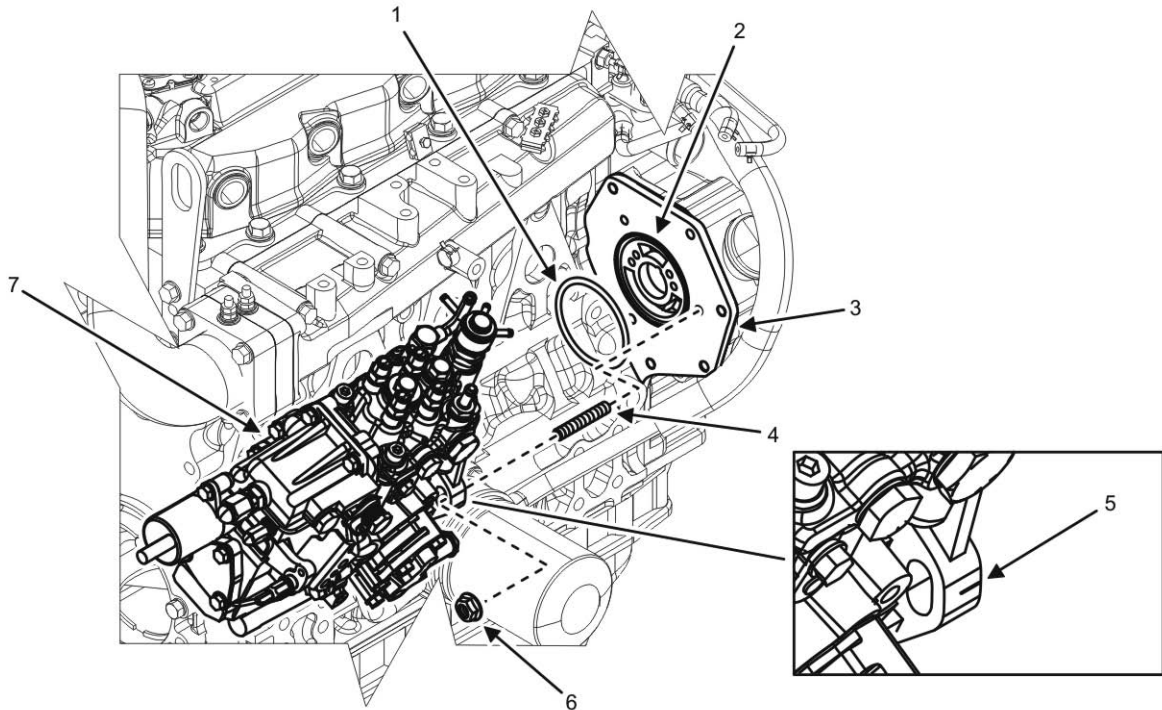


Figure 17. Fuel Injection Pump and Mounting Flange Adjustment.

NOTE

Ensure O-ring (Figure 17, Item 1) stays properly seated in mounting location (Figure 17, Item 2) when rotating fuel injection pump.

7. Loosen three nuts (Figure 17, Item 6) securing fuel injection pump (Figure 17, Item 7) to gear case mounting flange (Figure 17, Item 3) and studs (Figure 17, Item 4).
8. Rotate fuel injection pump (Figure 17, Item 7) slots (Figure 17, Item 5) on studs (Figure 17, Item 4) until dial indicator (Figure 15, Item 3) reads 0.098 in (2.5 mm):

NOTE

When dial indicator reads 0.098 in (2.5 mm) and target fuel injection timing mark and timing reference mark on flywheel remain aligned, fuel injection timing is correct.

- a. Advance injection timing if reading from step 6 is retarded by rotating top of fuel injection pump (Figure 17, Item 7) away from engine block.
- b. Retard injection timing if reading from step 6 is advanced by rotating top of fuel injection pump (Figure 17, Item 7) toward engine block.
9. Tighten fuel injection pump mounting nuts (Figure 17, Item 6) on gear case mounting flange (Figure 17, Item 3) to 17 – 21 ft/lb (23 – 28 Nm).
10. Remove dial indicator (Figure 15, Item 3) from adapter (Figure 15, Item 1).
11. Remove retaining band (Figure 15, Item 2) securing adapter (Figure 15, Item 1).
12. Remove adapter (Figure 15, Item 1) from pump plunger opening.
13. Install pump barrel plug (Figure 15, Item 4) with new O-ring (Figure 15, Item 5).
14. Tighten pump barrel plug to 22 – 26 ft/lb (30 – 35 Nm).

15. Install intake manifold (WP 0076, Remove/Install Intake Manifold).
16. Install valve cover (WP 0082, Remove/Install Valve Cover).
17. Install front body panel (WP 0029, Remove/Install Front Body Panel).
18. Install battery ground cable (WP 0036, Remove/Install Batteries).
19. Fill generator set with coolant, if required (WP 0021, Service Cooling System).
20. Close right-side door.
21. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
22. Start engine and check for fuel leaks and proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
23. Repair as required.
24. Dispose of soiled rags IAW local SOP.
25. Ensure fuel is at proper operating level (TM 9-6115-751-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL WATER PUMP

INITIAL SETUP:**Test Equipment**

Thermometer, Self-Indicating (WP 0163, Maintenance Allocation Chart, Item 36)

Tools and Special Tools

Hammer, Hand, Soft Face, Dead Blow (WP 0163, Item 16)

Tool Kit, General Mechanic's (GMTK) (WP 0163, Item 38)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0163, Item 48)

Materials/Parts

Gasket, 16 (WP 0131, Repair Parts List, Figure 31, Item 6)

Gasket 8, round (WP 0131, Figure 31, Item 8)

Gasket, water pump (WP 0131, Figure 31, Item 28)

Gasket, case (WP 0131, Figure 31, Item 14)

Gasket, water pump (WP 0131, Figure 31, Item 12)

Plug, (R03) (2) (WP 0131, Figure 31, Item 5)

Pump assembly, water (WP 0131, Figure 31, Item 1)

O-ring (G30) (WP 0131, Figure 31, Item 17)

Antifreeze, ethylene glycol (WP 0164, Expendable and Durable Items, Item 2)

Cap set, protective (WP 0164, Item 9)

Cleaning compound, solvent (WP 0164, Item 11)

Distilled water, (WP 0164, Item 18)

Grease, electrically conductive (WP 0164, Item 21)

Pan, drain (WP 0164, Item 29)

Rag, wiping (WP 0164, Item 32)

Sealant (WP 0164, Item 33)

Soap, ivory (WP 0164, Item 34)

Personnel Required

91D (1)

Assistant (1)

References

Not Applicable

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Front body panel removed (WP 0029, Remove/Install Front Body Panel)

Radiator drained (WP 0021, Service Cooling System)

Radiator hoses removed (WP 0024, Remove/Install Radiator Hose and Tube Assemblies)

Battery-charging alternator belt removed (WP 0073, Remove/Install Battery-Charging Alternator Belt)

Battery-charging alternator removed (WP 0074, Remove/Install Battery-Charging Alternator Assembly)

Thermostat removed (WP 0071, Remove/Install Thermostat)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL WATER PUMP**NOTE**

The water pump can be removed and installed with or without the thermostat installed. If replacing the water pump with a new water pump, the thermostat will need to be removed and set aside for reuse.

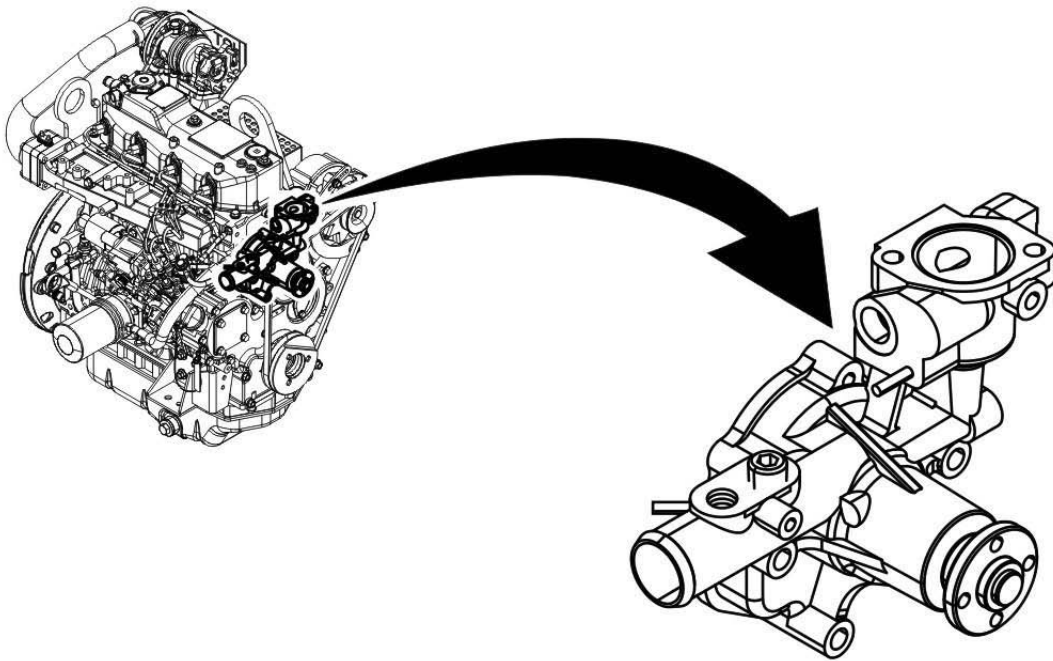
Remove Water Pump and Joint

Figure 1. Water Pump — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate water pump (Figure 1).

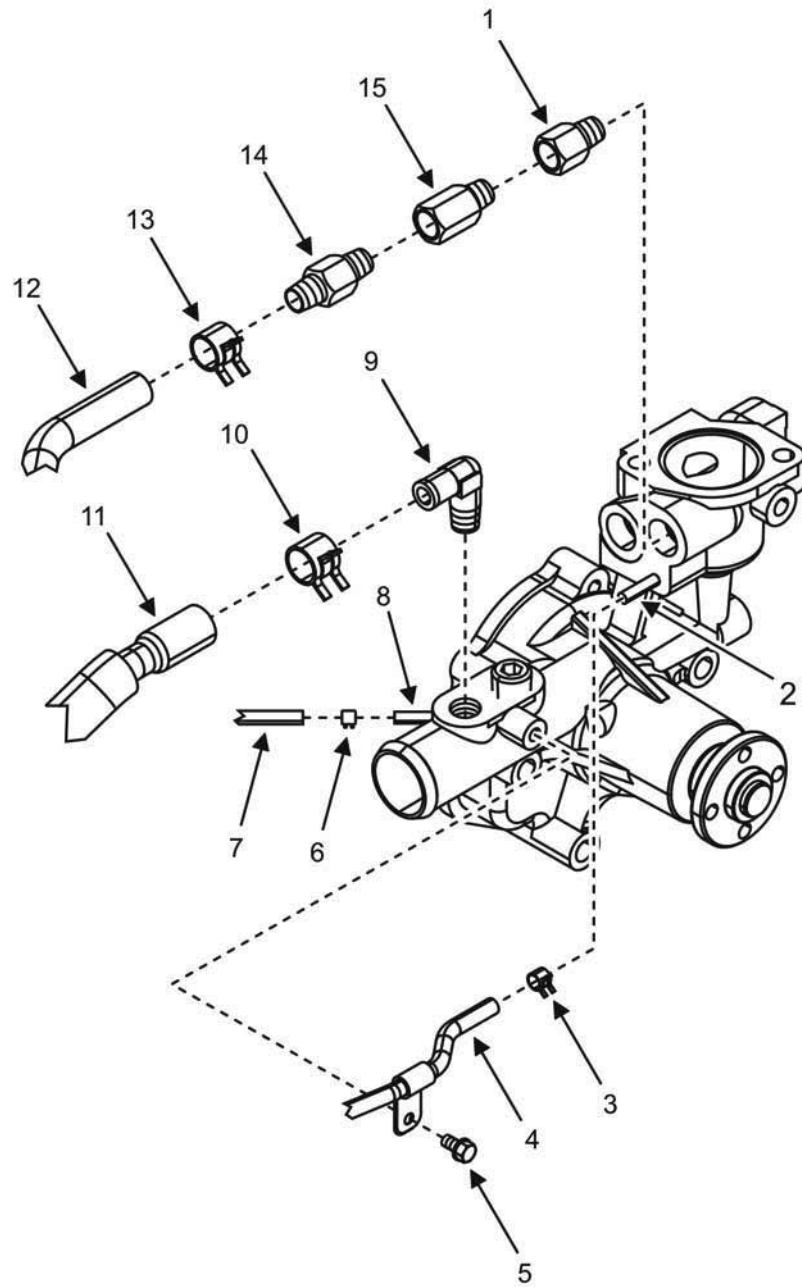


Figure 2. Water Pump — Hose Removal.

3. Cap/plug openings on water pump.
4. Remove pipe bracket bolt (Figure 2, Item 5) securing upper cold start device pipe (Figure 2, Item 4) to water pump nipple (Figure 2, Item 2).

NOTE

Place a suitable catch container below each hose, the water pump, and pump joint as it is detached to catch any residual coolant that leaks out. Clean spilled coolant IAW local SOP. Dispose of coolant and soiled cloths IAW local SOP.

5. Loosen and slide back hose clip (Figure 2, Item 3) on upper cold start device pipe (Figure 2, Item 4) at water pump nipple (Figure 2, Item 2).
6. Remove upper cold start device pipe (Figure 2, Item 4) from water pump nipple (Figure 2, Item 2). Cap/plug to prevent dirt or debris from entering.
7. Loosen and slide back hose clip (Figure 2, Item 10) on oil cooler return line (Figure 2, Item 11).
8. Remove oil cooler return line (Figure 2, Item 11) from elbow fitting (Figure 2, Item 9). Cap/plug to prevent dirt or debris from entering.
9. Loosen hose clip (Figure 2, Item 6) and slide back on lower cold start device pipe (Figure 2, Item 7) at water pump nipple (Figure 2, Item 8).
10. Remove lower cold start device pipe (Figure 2, Item 7) from water pump nipple (Figure 2, Item 8). Cap/plug to prevent dirt or debris from entering.

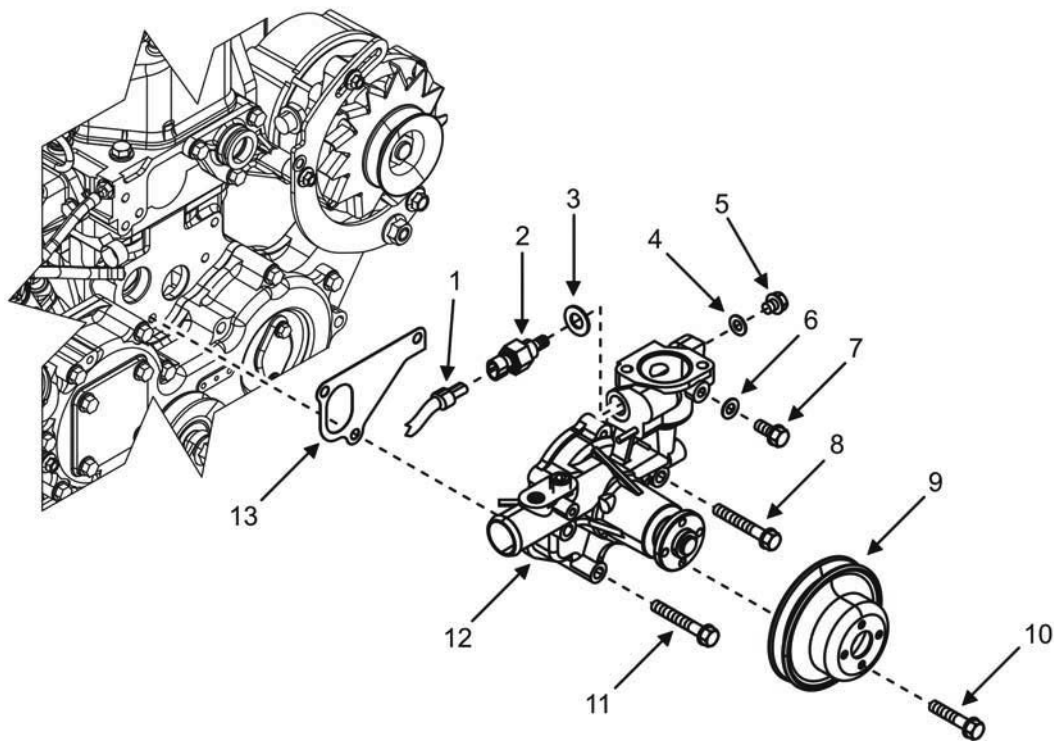


Figure 3. Water Pump — Removal.

11. Remove four bolts (Figure 3, Item 10) from water pump pulley (Figure 3, Item 9).
12. Remove water pump pulley (Figure 3, Item 9).
13. Remove electrical wire (Figure 3, Item 1) from connection at temperature switch (Figure 3, Item 2).

NOTE

Perform step 14 – 15 if removing and installing a water pump on a generator set with a winterization kit.

14. Remove hose clip (Figure 2, Item 13) securing winterization kit hose (Figure 2, Item 12) to hose adapter (Figure 2, Item 14).
15. Remove winterization kit hose (Figure 2, Item 12) from two pipe adapters (Figure 2, Items 1 and 15) and one hose adapter (Figure 2, Item 14). Cap/plug to prevent dirt and debris from entering.

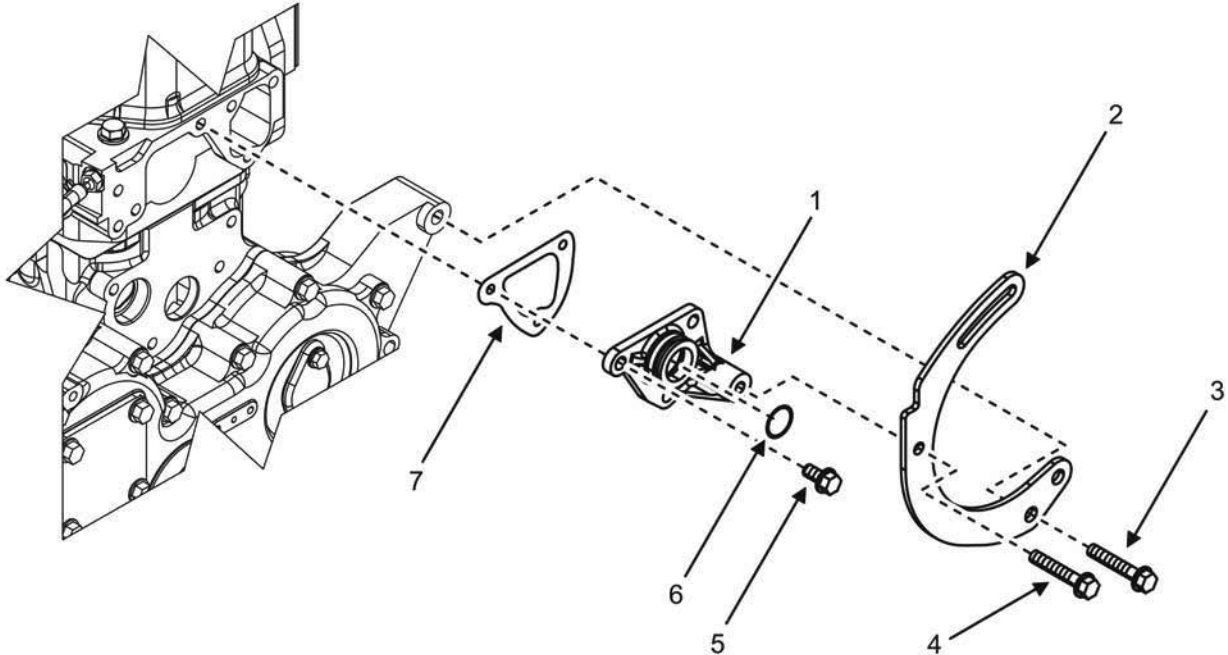


Figure 4. Joint — Removal Detail.

16. Remove two bolts (Figure 4, Items 3 and 4) securing battery-charging alternator bracket (Figure 4, Item 2) and remove battery-charging alternator bracket (Figure 4, Item 2).
17. Remove three bolts (Figure 3, Items 8 and 11) from water pump (Figure 3, Item 12).

NOTE

The water pump fits snugly over O-ring (Figure 4, Item 6) on pump joint (Figure 4, Item 1). Light percussion from a rubber mallet will assist with the removal of the water pump (Figure 3, Item 12).

18. Remove water pump (Figure 3, Item 12) and place on a suitable work surface.
19. Remove water pump gasket (Figure 3, Item 13) and discard.
20. Cap/plug openings in engine block and water pump (Figure 3, Item 12).

NOTE

If replacing the water pump with a new water pump, the elbow fitting (Figure 2, Item 9), bolt (Figure 3, Item 7), and plug (Figure 3, Item 5) will need to be removed and set aside for reuse. Perform steps 21 – 26 to remove these items.

21. Remove elbow fitting (Figure 2, Item 9). Set aside for reuse.
22. Cap/plug opening on water pump (Figure 3, Item 12).
23. Remove bolt (Figure 3, Item 7) and gasket (Figure 3, Item 6) from water pump (Figure 3, Item 12). Set aside for reuse.
24. Discard gasket and cap/plug opening on water pump (Figure 3, Item 12).
25. Remove plug (Figure 3, Item 5) and gasket (Figure 3, Item 4) from water pump (Figure 3, Item 12). Set aside for reuse.
26. Discard gasket (Figure 3, Item 4) and cap/plug opening on water pump (Figure 3, Item 12).

NOTE

If replacing the water pump with a new water pump, the temperature switch (Figure 3, Item 2) will need to be removed and set aside for reuse. Perform steps 27 – 29 to remove this item.

27. Remove temperature switch (Figure 3, Item 2) from water pump (Figure 3, Item 12).
28. Remove temperature switch gasket (Figure 3, Item 3) from water pump (Figure 3, Item 12).
29. Cap/plug opening on water pump (Figure 3, Item 12).

NOTE

Perform step 30 if removing and installing a new water pump on a generator set with a winterization kit.

30. Remove two pipe adapters (Figure 2, Items 1 and 15) and one hose adapter (Figure 2, Item 14) and set aside for reuse.
31. Cap/plug openings on water pump (Figure 3, Item 12).
32. Remove and discard O-ring (Figure 4, Item 6) from pump joint (Figure 4, Item 1).
33. Remove three mounting bolts (Figure 4, Item 5) from pump joint (Figure 4, Item 1).
34. Remove pump joint (Figure 4, Item 1) and place on suitable work surface.
35. Remove and discard pump joint gasket (Figure 4, Item 7).
36. Cap/plug any openings in the engine block and pump joint (Figure 4, Item 1).

CAUTION

Do not allow gasket residue to enter cooling system or engine block. Do not damage mounting surface when scraping gasket material. Failure to comply will cause damage to equipment.

37. Scrape any remaining gasket material on water pump and engine block using a putty knife.

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

NOTE

Clean spilled solvent IAW local SOP. Dispose of solvent and soiled cloths IAW local SOP.

38. Clean water pump (Figure 3, Item 12), pump joint (Figure 4, Item 1), and engine block of any remaining gasket residue using dry cleaning solvent and wiping rags.

END OF TASK**Inspect Water Pump and Joint**

1. Inspect pump joint (Figure 4, Item 1) for cracks and damage.
2. Replace pump joint (Figure 4, Item 1) if cracked or damaged.
3. Inspect water pump (Figure 3, Item 12) for cracks and damage.
4. Replace water pump (Figure 3, Item 12) if cracked or damaged.

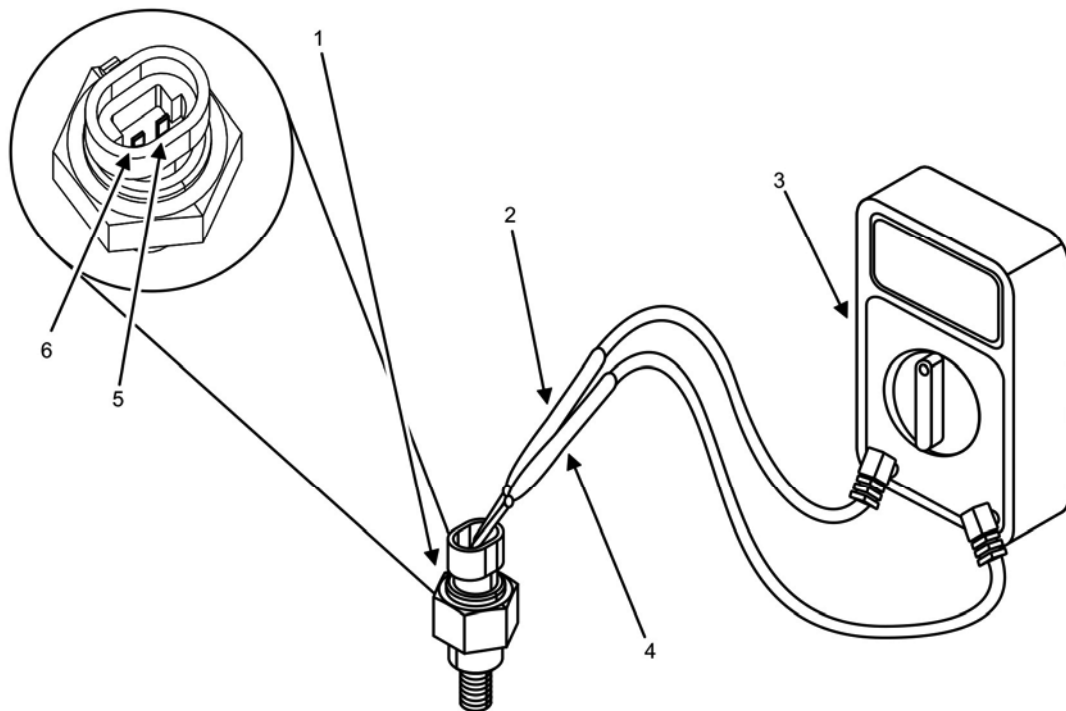
END OF TASK**Test Temperature Sensor**

Figure 5. Test Temperature Sensor.

Table 1. Temperature Sensor Resistance.

DEGREES (°F) (°C)	RESISTANCE (OHMS)
0 (-17.78)	700
10 (-12.22)	735
20 (-6.67)	770
30 (-1.11)	810
40 (4.44)	848
50 (10)	887
60 (15.56)	928
70 (21.11)	970
80 (26.67)	1012
90 (32.22)	1056
100 (37.78)	1100
110 (43.33)	1148
120 (48.89)	1195
130 (54.44)	1245
140 (60)	1295
150 (65.56)	1347
160 (71.11)	1400
170 (76.67)	1455
180 (82.22)	1512
190 (87.78)	1570
200 (93.33)	1625
210 (98.89)	1685
220 (104.44)	1745
230 (110)	1804

WARNING

Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.

NOTE

Ambient air temperature will need to be determined when temperature sensor is removed from water pump. Use appropriate temperature range in Table 1 when comparing Ohm measurement obtained from test.

1. Position temperature sensor (Figure 5, Item 1) on a suitable work surface.
2. Allow 5 min for temperature sensor (Figure 5, Item 1) to reach ambient air temperature.
3. Determine ambient air temperature using a thermometer.
4. Attach one multimeter lead (Figure 5, Item 2) to one connector lead (Figure 5, Item 5) of temperature sensor (Figure 5, Item 1).
5. Attach second multimeter lead (Figure 5, Item 4) to second connector lead (Figure 5, Item 6) of temperature sensor (Figure 5, Item 1).
6. Record multimeter (Figure 5, Item 3) measurement set to Ohms.
7. Compare multimeter (Figure 5, Item 3) measurement with corresponding ambient air temperature in Table 1.

8. Replace temperature sensor (Figure 5, Item 1) if multimeter (Figure 5, Item 3) measurement does not correspond to Table 1 Ohm values.

END OF TASK

Install Water Pump and Joint

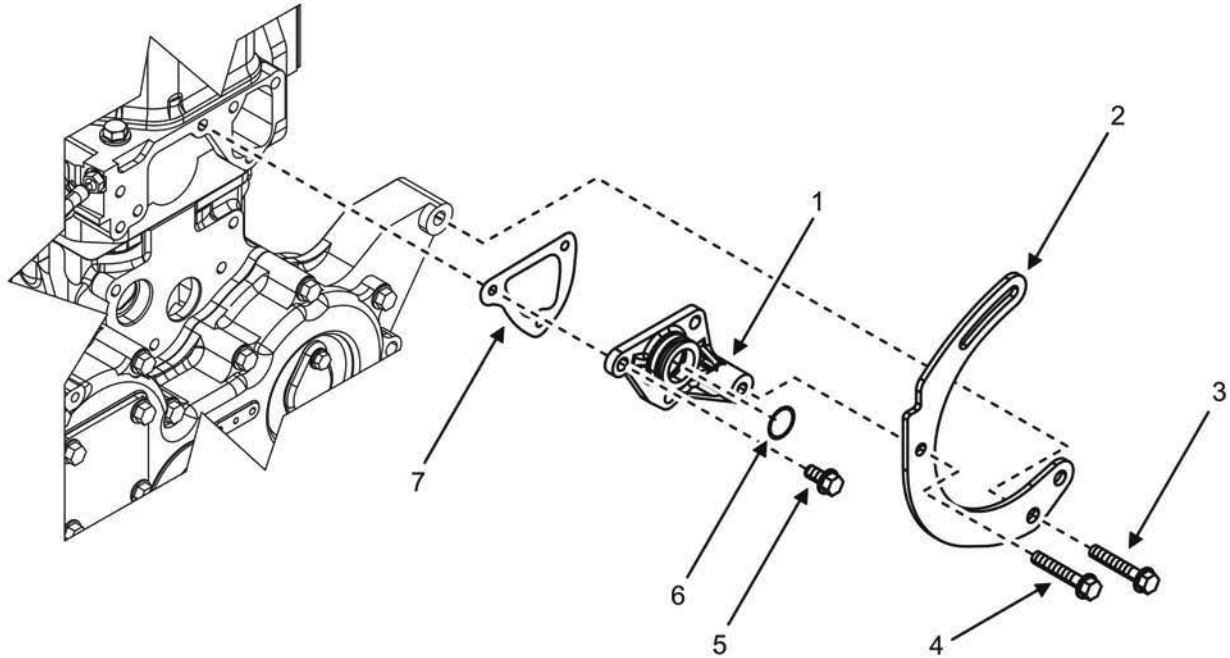


Figure 6. Joint — Install.

NOTE

Wipe down hoses, parts, and connectors with wiping rag prior to installation.

1. Remove caps/plugs from pump joint (Figure 6, Item 1) and engine block opening.
2. Install new pump joint gasket (Figure 6, Item 7) on pump joint (Figure 6, Item 1).
3. Install pump joint (Figure 6, Item 1) on engine block with three bolts (Figure 6, Item 5).

CAUTION

Pump joint is aluminum alloy material. When tightening bolts to aluminum alloy, 80% of torque values must be used. Failure to comply may cause damage to equipment.

4. Tighten three bolts (Figure 6, Item 5) to 13.6 – 16.8 ft/lb (18.08 – 22.72 Nm).

CAUTION

Pump joint O-ring should not be substituted with generic O-ring because factory-specified material is different than used on generic O-rings. Failure to comply may cause damage to equipment.

5. Apply light coating of lubricant to new O-ring (Figure 6, Item 6).
6. Install new O-ring (Figure 6, Item 6) on pump joint (Figure 6, Item 1).

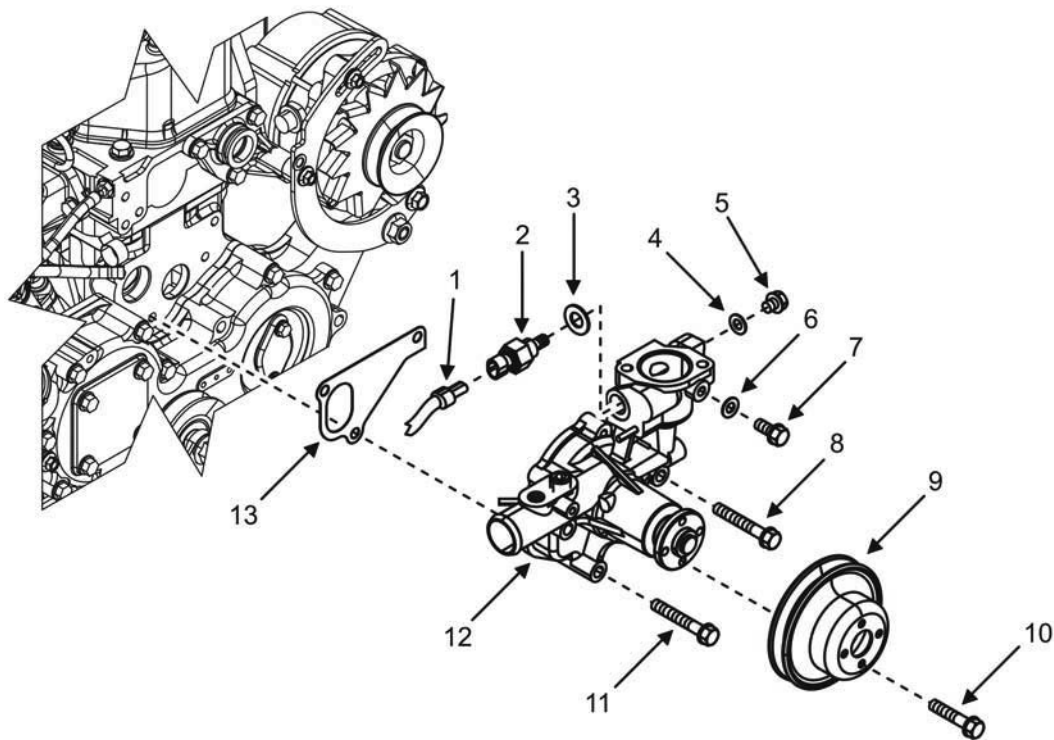


Figure 7. Water Pump — Install Detail.

7. Remove caps/plugs from engine block and water pump (Figure 7, Item 12).
8. Position a new water pump gasket (Figure 7, Item 13) on water pump (Figure 7, Item 12).
9. Position water pump (Figure 7, Item 12) on pump joint (Figure 6, Item 1) and engine block.
10. Press water pump (Figure 7, Item 12) onto pump joint (Figure 6, Item 1).
11. Secure water pump (Figure 7, Item 12) with three bolts (Figure 7, Items 8 and 11).

CAUTION

Water pump is aluminum alloy material. When tightening bolts to aluminum alloy, 80% of torque values must be used. Failure to comply may cause damage to equipment.

12. Tighten bolts (Figure 7, Items 8 and 11) to 13.6 – 16.8 ft/lb (18.08 – 22.72 Nm).

NOTE

If replacing the water pump with a new water pump, bolt (Figure 7, Item 7), plug (Figure 7, Item 5), and elbow fitting from replaced water pump will need to be reused. Perform steps 13 – 16 to install these items.

13. Install bolt (Figure 7, Item 7) and new gasket (Figure 7, Item 6) to water pump (Figure 7, Item 12).
14. Install plug (Figure 7, Item 5) and new gasket (Figure 7, Item 4) to water pump (Figure 7, Item 12).
15. Apply pipe joint compound to elbow fitting (Figure 8, Item 9).

-
16. Install elbow fitting (Figure 8, Item 9) and turn 1 1/2 turns past finger tight. Align elbow fitting (Figure 8, Item 9) so it is parallel to temperature switch opening (90 degrees from crankshaft line facing toward fuel injection pump side of engine).
 17. Remove cap/plug from oil cooler return line (Figure 8, Item 11).
 18. Install oil cooler return line (Figure 8, Item 11) to elbow fitting (Figure 8, Item 9).
 19. Position hose clip (Figure 8, Item 10) over oil cooler return line (Figure 8, Item 11) and elbow fitting (Figure 8, Item 9).

NOTE

Perform steps 20 through 23 if installing a water pump on a generator set with a winterization kit.

20. Apply pipe joint compound to two pipe adapters (Figure 8, Items 1 and 15) and one hose adapter (Figure 8, Item 14).
21. Install two pipe adapters (Figure 8, Items 1 and 15) and one hose adapter (Figure 8, Item 14) to water pump 1 1/2 turns past finger tight.
22. Remove cap/plug and install winterization kit hose (Figure 8, Item 12) to hose adapter (Figure 8, Item 14).
23. Slide hose clip (Figure 8, Item 13) into position on hose adapter (Figure 8, Item 14) and winterization kit hose (Figure 8, Item 12).
24. Install battery-charging alternator bracket (Figure 6, Item 2) to pump joint (Figure 6, Item 1) with two bolts (Figure 6, Items 3 and 4).

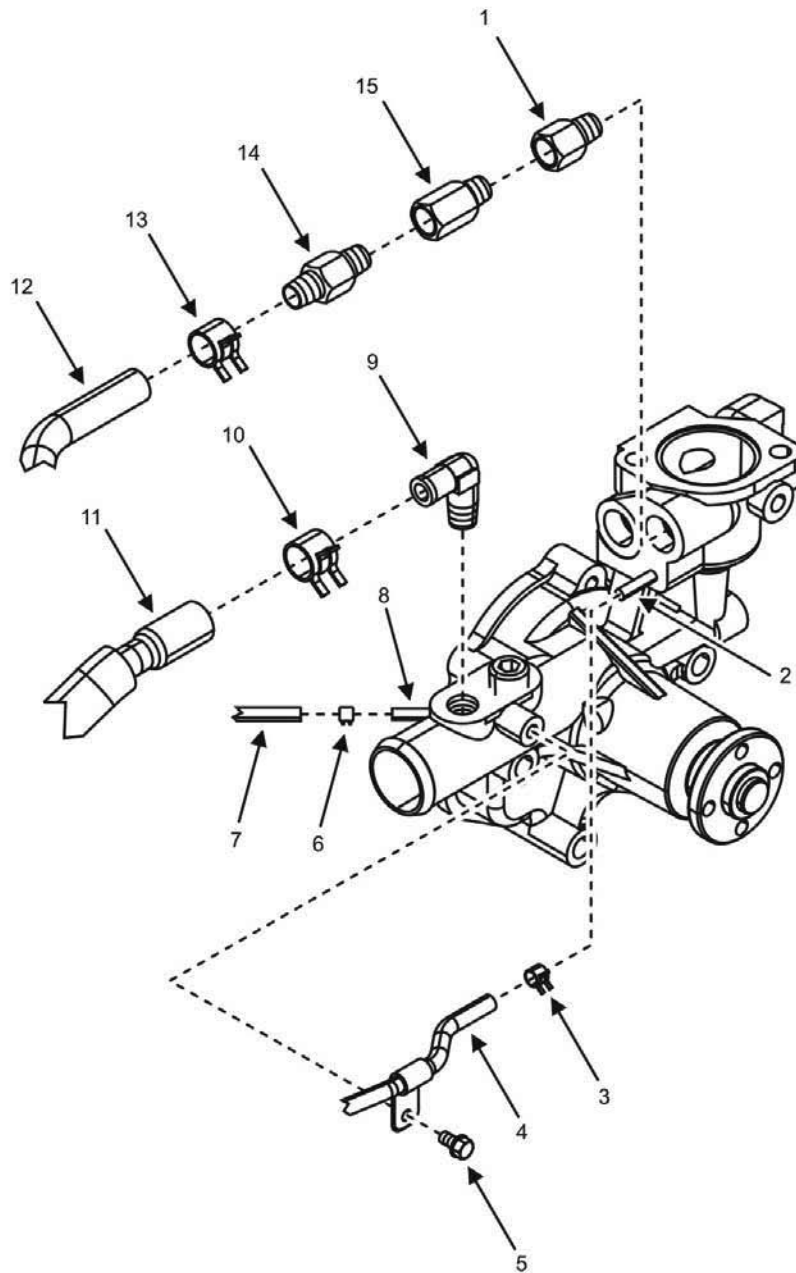


Figure 8. Water Pump — Hose Install.

NOTE

If replacing the water pump with a new water pump, the temperature switch (Figure 7, Item 2) from the replaced water pump (Figure 7, Item 12) will need to be reused. Perform steps 22 –23 to install this item.

25. Install temperature switch gasket (Figure 7, Item 3) to water pump (Figure 7, Item 12).
26. Install temperature switch (Figure 7, Item 2) to water pump (Figure 7, Item 12).
27. Attach electrical wire (Figure 7, Item 1) to temperature switch (Figure 7, Item 2).

NOTE

To hold the water pump pulley (Figure 7, Item 9) secure, install the alternator belt before wrench tightening or applying torque to the water pump pulley bolts (Figure 7, Item 10).

28. Install water pump pulley (Figure 7, Item 9) with four bolts (Figure 7, Item 10). Finger-tighten.
29. Remove cap/plug from lower cold start device pipe (Figure 8, Item 7).
30. Attach lower cold start device pipe (Figure 8, Item 7) to water pump nipple (Figure 8, Item 8).
31. Position hose clip (Figure 8, Item 6) over water pump nipple (Figure 8, Item 8) and lower cold start device pipe (Figure 8, Item 7).
32. Remove cap/plug from upper cold start device pipe (Figure 8, Item 4).
33. Attach upper cold start device pipe (Figure 8, Item 4) to water pump nipple (Figure 8, Item 2).
34. Position hose clip (Figure 8, Item 3) over water pump nipple (Figure 8, Item 2) and upper cold start device pipe (Figure 8, Item 4).
35. Install pipe bracket bolt (Figure 8, Item 5) to upper cold start device pipe (Figure 8, Item 4).

NOTE

The water pump can be removed and installed with or without the thermostat installed. If replacing the water pump with a new water pump, the thermostat will need to be removed from old water pump and installed on new water pump.

36. Install thermostat, if necessary (WP 0071, Remove/Install Thermostat).
37. Install battery-charging alternator (WP 0074, Remove/Install Battery-Charging Alternator Assembly).
38. Install battery-charging alternator belt (WP 0073, Remove/Install Battery-Charging Alternator Belt).

CAUTION

Water pump pulley is attached to aluminum alloy material. When tightening bolts to aluminum alloy, 80% of torque values must be used. Failure to comply may cause damage to equipment.

NOTE

In order to assist in holding the water pump pulley secure, install the battery-charging alternator belt before wrench tightening or applying torque to the water pump pulley bolts.

39. Tighten four water pump pulley bolts (Figure 7, Item 10) to 13.6 – 16.8 ft/lb (18.08 – 22.72 Nm).
40. Install radiator hoses (WP 0024, Remove/Install Radiator Hose and Tube Assemblies).
41. Fill radiator (WP 0021, Service Cooling System).
42. Install front body panel (WP 0029, Remove/Install Front Body Panel).
43. Install top panel (WP 0028, Remove/Install Top Body Panel).
44. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).

45. Release air through coolant overflow vent line for 5 min before start up (TM 9-6115-751-10).
46. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
47. Start engine and check for coolant leaks and proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
48. Repair as required.
49. Dispose of soiled rags IAW local SOP.
50. Ensure coolant level is at proper operating level (TM 9-6115-751-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL THERMOSTAT

INITIAL SETUP:**Test Equipment**

Thermometer, Self-Indicating (WP 0163,
Maintenance Allocation Chart, Item 36)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163,
Item 38)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP
0163, Item 48)

Materials/Parts

Gasket, cover (WP 0130, Repair Parts List, Figure
30, Item 3)

Gasket, thermostat (WP 0130, Figure 30, Item 5)

Thermostat (WP 0130, Figure 30, Item 4)

Antifreeze, ethylene glycol (WP 0164, Expendable
and Durable Items, Item 2)

Cap set, protective (WP 0164, Item 9)

Cleaning compound, solvent (WP 0164, Item 11)

Distilled water, (WP 0164, Item 18)

Grease, electrically conductive (WP 0164, Item 21)

Pan, drain (WP 0164, Item 29)

Rag, wiping (WP 0164, Item 32)

Soap, ivory (WP 0164, Item 34)

Personnel Required

91D (1)

Assistant (1)

References

Not Applicable

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP
0005)

Engine cool

Battery ground cable removed (WP 0036,
Remove/Install Batteries)

Radiator drained (WP 0021, Service Cooling
System)

Upper radiator hose removed from thermostat
housing (WP 0024, Remove/Install Radiator Hose
and Tube Assemblies)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL THERMOSTAT**Remove Thermostat**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door.
3. Locate thermostat (Figure 1).

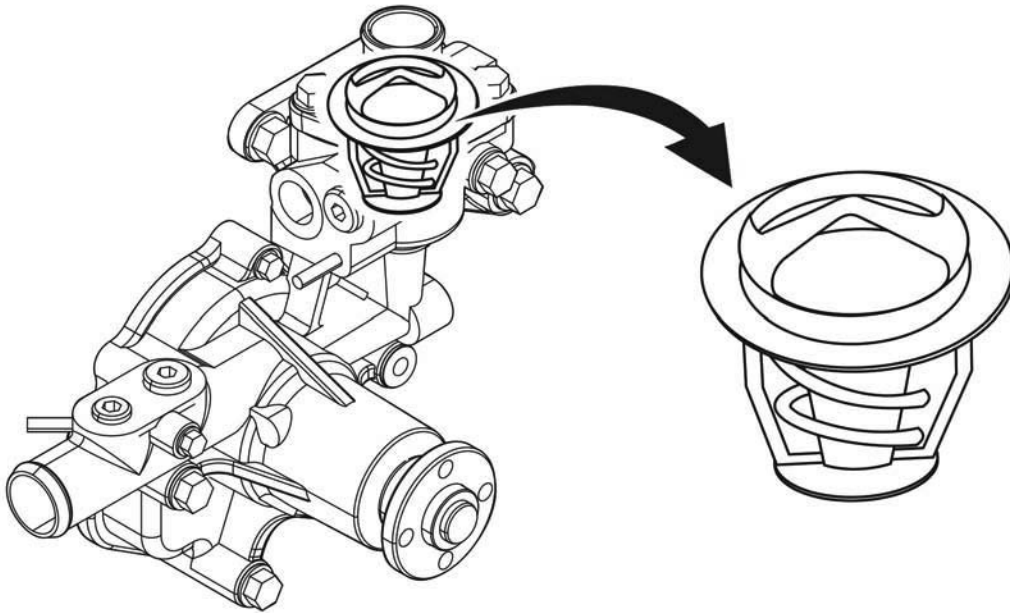


Figure 1. Thermostat — Location.

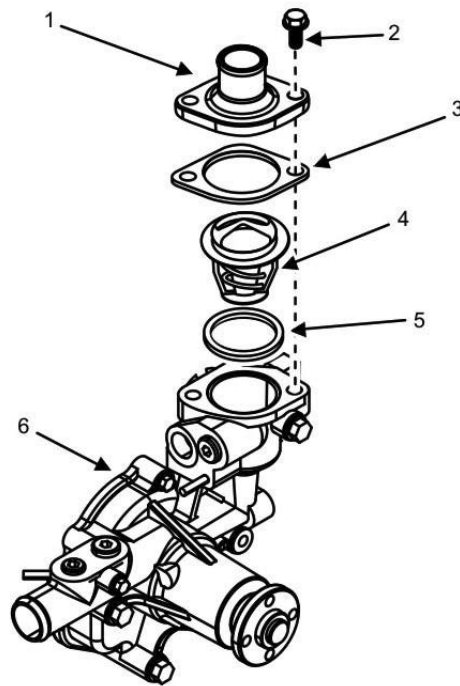


Figure 2. Remove Thermostat — Detail.

4. Remove two bolts (Figure 2, Item 2) from thermostat housing (Figure 2, Item 1).
5. Remove thermostat housing (Figure 2, Item 1).

6. Remove and discard thermostat housing gasket (Figure 2, Item 3).
7. Remove thermostat (Figure 2, Item 4) and place on a suitable work surface.
8. Remove and discard thermostat gasket (Figure 2, Item 5).
9. Cap/plug opening in water pump (Figure 2, Item 6).

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

CAUTION

Do not allow any gasket residue to enter the cooling system. Do not damage sealing surface when scraping excess gasket material. Failure to comply may cause damage to equipment.

10. Clean gasket residue from thermostat housing and mounting location on engine using dry cleaning solvent, brush, wiping rags, and putty knife.

END OF TASK

Test Thermostat

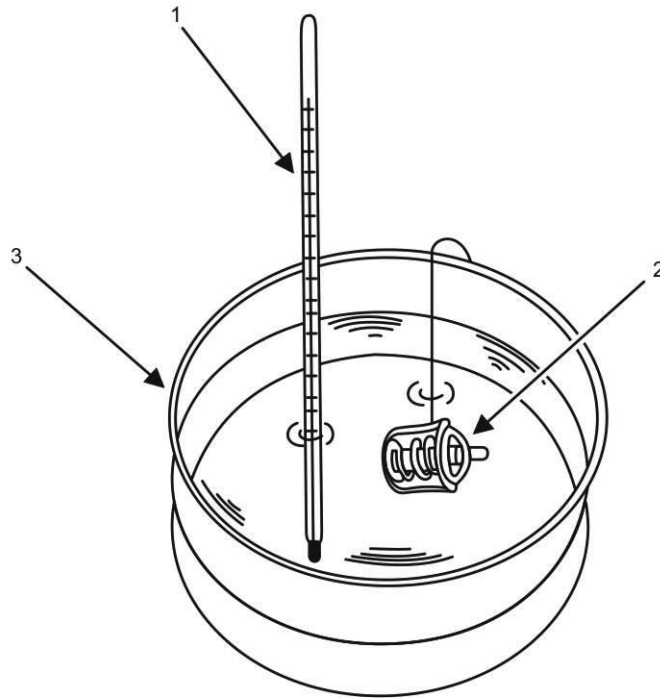


Figure 3. Test Thermostat.

WARNING

Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.

NOTE

Thermostat should begin to open at 179.6°F to 182°F (82°C to 83.3°C). Thermostat should be open by time water temperature reaches 195°F (90.5°C).

Ensure thermometer is not touching bottom of container but is submerged at least 2 in.

1. Suspend thermostat (Figure 3, Item 2) and an accurate thermometer (Figure 3, Item 1) in container of water (Figure 3, Item 3).
2. Apply heat to container gradually using an outside heat source.
3. Note temperature when thermostat (Figure 3, Item 2) begins to open. Thermostat (Figure 3, Item 2) should begin to open at 179.6°F to 182°F (82°C to 83.3°C).
4. Continue to apply heat to container.
5. Note temperature when thermostat (Figure 3, Item 2) opens. Thermostat (Figure 3, Item 2) should be open by time water temperature reaches 195°F (90.5°C).
6. Replace thermostat (Figure 3, Item 2) if thermostat (Figure 3, Item 2) does not react IAW either specification.

END OF TASK

Install Thermostat

NOTE

Wipe down hoses, parts, and connectors with wiping rag prior to installation.

1. Remove cap/plug from water pump (Figure 2, Item 6).
2. Position new gasket (Figure 2, Item 5) on thermostat (Figure 2, Item 4) opening.
3. Position thermostat (Figure 2, Item 4) into opening with spring end of thermostat facing toward bottom of water pump (Figure 2, Item 6).
4. Position new thermostat housing gasket (Figure 2, Item 3) on water pump (Figure 2, Item 6).
5. Install thermostat housing (Figure 2, Item 1) with two bolts (Figure 2, Item 2) on water pump (Figure 2, Item 6).

CAUTION

Thermostat housing is aluminum alloy material. When tightening bolts to aluminum alloy, 80% of torque values must be used. Failure to comply may cause damage to equipment.

6. Tighten two bolts (Figure 2, Item 2).
7. Install upper radiator hose and clamp to thermostat housing (WP 0024, Remove/Install Radiator Hose and Tube Assemblies).
8. Fill radiator (WP 0021, Service Cooling System).

-
9. Install battery ground cable (WP 0036, Remove/Install Batteries).
 10. Release air through coolant overflow vent line for 5 min before start up (TM 9-6115-751-10).
 11. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
 12. Start engine and check for coolant leaks and proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
 13. Repair as required.
 14. Dispose of soiled rags IAW local SOP.
 15. Ensure coolant level is at proper operating level (TM 9-6115-751-10).

END OF TASK

END OF WORK PACKAGE

**FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL STARTER**

INITIAL SETUP:

Test Equipment

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Motor, starter, 24 volt (WP 0133, Repair Parts List, Figure 33, Item 1)

Grease, electrically conductive (WP 0164, Expendable and Durable Items List, Item 21)

Personnel Required

91D (1)

Assistant (1)

References

WP 0036, Remove/Install Batteries

WP 0039, Remove/Install Engine Wiring Harness

WP 0042, Remove/Install Power Wiring Harness

WP 0090, Torque Limits

WP 0095, General Maintenance

Foldout Pages

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL STARTER

WARNING

- NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.
- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

Remove Starter

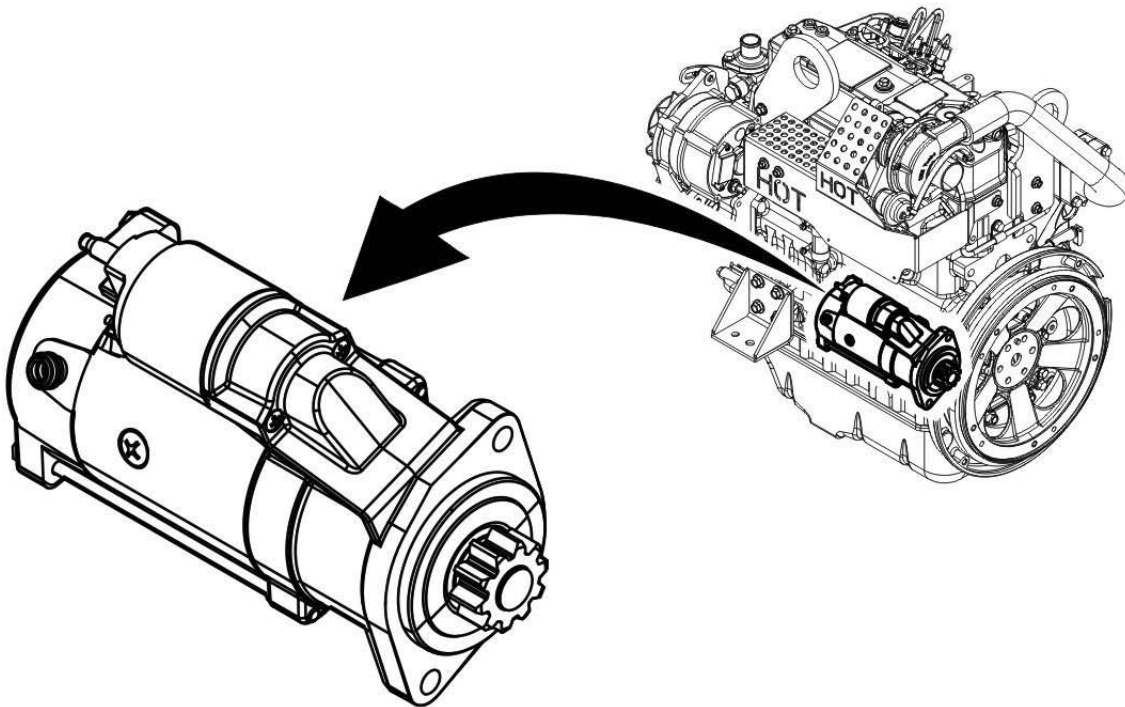


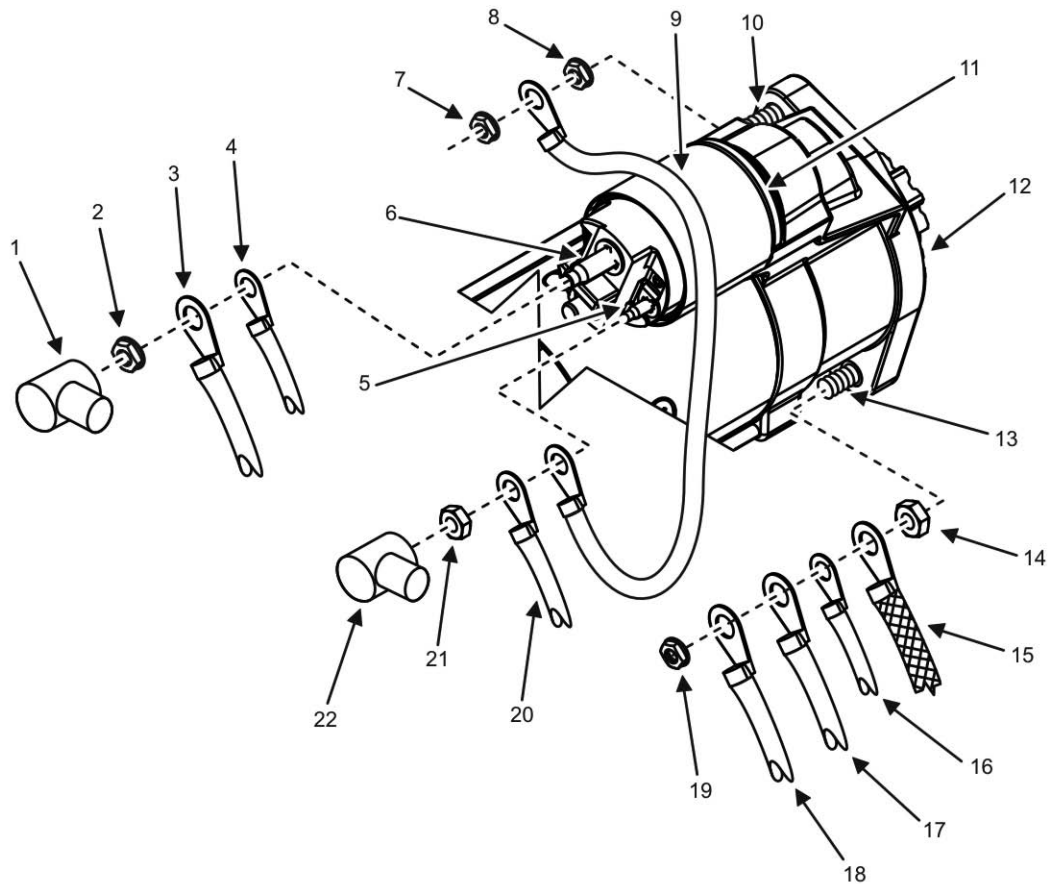
Figure 1. Starter Assembly — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door.
3. Remove battery ground cable (WP 0036, Remove/Install Batteries).
4. Remove nut (Figure 2, Item 19) from lower starter mounting stud (Figure 2, Item 13).

NOTE

Tag or mark all electrical wires and connectors prior to removal to aid at installation.

5. Remove M1-T120 (Figure 2, Item 18), negative battery cable (Figure 2, Item 17), M1-T120 (Figure 2, Item 16), and braided ground strap (Figure 2, Item 15) from lower starter mounting stud (Figure 2, Item 13).
6. Remove nut (Figure 2, Item 21) from lower starter mounting stud (Figure 2, Item 13).
7. Re-position boot (Figure 2, Item 1) to expose nut (Figure 2, Item 2) on solenoid upper stud (Figure 2, Item 6) on starter solenoid (Figure 2, Item 11).
8. Remove nut (Figure 2, Item 2) from solenoid upper stud (Figure 2, Item 6).
9. Remove M1-T106 wire (Figure 2, Item 3) from solenoid upper stud (Figure 2, Item 6).
10. Remove positive battery (Figure 2, Item 4) cable from solenoid upper stud (Figure 2, Item 6).
11. Re-position boot (Figure 2, Item 22) to expose nut (Figure 2, Item 21) on solenoid lower stud (Figure 2, Item 5).
12. Remove nut (Figure 2, Item 21) from solenoid lower stud (Figure 2, Item 5).



Legend

- | | |
|---------------------------------|---------------------------------|
| 1. Boot | 12. Starter |
| 2. Nut | 13. Lower Starter Mounting Stud |
| 3. M1 - T106 | 14. Nut |
| 4. Positive Battery | 15. Ground Strap |
| 5. Solenoid Lower Stud | 16. M1 - T120 |
| 6. Solenoid Upper Stud | 17. Negative Battery |
| 7. Nut | 18. M1 - T120 |
| 8. Nut | 19. Nut |
| 9. Diode Wire | 20. T107 |
| 10. Upper Starter Mounting Stud | 21. Nut |
| 11. Starter Solenoid | 22. Boot |

Figure 2. Starter Assembly — Removal.

13. Remove diode wire and T107 wire (Figure 2, Items 9 and 20) from solenoid lower stud (Figure 2, Item 5).
14. Support starter (Figure 2, Item 12) from underneath.
15. Remove nut (Figure 2, Item 7) from upper starter mounting stud (Figure 2, Item 10).
16. Remove diode wire (Figure 2, Item 9) from upper starter mounting stud (Figure 2, Item 10).
17. Remove second mounting nut (Figure 2, Item 8) from upper starter mounting stud (Figure 2, Item 10).
18. Remove starter (Figure 2, Item 12) from engine and generator set.
19. Place starter (Figure 2, Item 12) on a suitable work surface.

END OF TASK

Inspect Starter

1. Inspect all wires and connectors for damage, fraying, or corrosion.
2. Replace any damaged wires or connectors (WP 0095, General Maintenance).
3. Inspect starter (Figure 2, Item 12) for signs of obvious damage.
4. Replace damaged starter (Figure 2, Item 12).
5. Inspect two mounting studs (Figure 2, Items 10 and 13) for damaged threads, excessive wear, or corrosion.
6. Replace two mounting studs (Figure 2, Items 10 and 13) if damaged, excessively worn, or corroded.

END OF TASK**Install Starter**

1. Position starter (Figure 2, Item 12) to two mounting studs (Figure 2, Items 10 and 13) on exhaust-side of engine.
2. Install upper starter mounting nut (Figure 2, Item 8) to upper starter mounting stud (Figure 2, Item 10). Finger-tighten.
3. Install diode wire (Figure 2, Item 9) to upper starter mounting stud (Figure 2, Item 10).
4. Install second nut (Figure 2, Item 7) to upper starter mounting stud (Figure 2, Item 10). Finger-tighten.

NOTE

Use tags and markings applied during removal as guides at installation. Leave tags and markings in place until installation is complete and generator set is operating properly.

5. Install diode wire and T107 wire (Figure 2, Items 9 and 20) to solenoid lower stud (Figure 2, Item 5) using tags and markings applied at removal as a guide.
6. Install nut (Figure 2, Item 21) and tighten to 2.2 ft/lb (3 Nm).
7. Install boot (Figure 2, Item 22) to solenoid lower stud (Figure 2, Item 5).
8. Install positive battery (Figure 2, Item 4) cable to solenoid upper stud (Figure 2, Item 6) using tags and markings applied at removal as a guide.
9. Install M1-T106 wire (Figure 2, Item 3) to solenoid upper stud (Figure 2, Item 6) using tags and markings applied at removal as a guide.
10. Install nut (Figure 2, Item 2) and tighten to 11.1 ft/lb (15 Nm).
11. Install boot (Figure 2, Item 1) to solenoid upper stud (Figure 2, Item 6).
12. Install mounting nut (Figure 2, Item 14) from lower starter mounting stud (Figure 2, Item 13).
13. Install braided ground strap (Figure 2, Item 15), M1-T120 (Figure 2, Item 16), negative battery cable (Figure 2, Item 17), and M1-T120 (Figure 2, Item 18) wires to lower starter mounting stud (Figure 2, Item 13) using tags and markings applied at removal as a guide.
14. Install nut (Figure 2, Item 19) to lower starter mounting stud (Figure 2, Item 13).
15. Tighten upper and lower starter mounting nuts (Figure 2, Items 7 and 19) to 38 – 42 ft/lb (47 – 57 Nm).
16. Install battery ground cable (WP 0036, Remove/Install Batteries).
17. Close left-side door.
18. Turn engine control switch to PRIME & RUN (TM 9 6115-751-10)

19. Start engine and check for proper operation (TM 9 6115-751-10).
20. Repair as required.

END OF TASK

Test Starter

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door.
3. Locate starter on exhaust-side of engine (Figure 1).

NOTE

When DCS indicates batteries are charged but unit will not crank, check for battery current at starter solenoid (Figure 2, Item 11).

4. Check control wire (Figure 2, Item 20) at solenoid lower stud (Figure 2, Item 5) for approximately 24 VDC (not less than 20.0 VDC) by attaching the positive lead of the multimeter to control wire (Figure 2, Item 20) and the negative lead to mounting stud (Figure 2, Item 13) while assistant operates the DEAD CRANK SWITCH (TM 9-6115-751-10).
5. Turn DEAD CRANK SWITCH to CRANK with help from assistant. Watch for rotation of the harmonic balancer at the front of the engine indicating the starter is operational.
6. Listen for clicking and spinning sounds at starter solenoid (Figure 2, Item 11) when DEAD CRANK SWITCH is in the CRANK position and engine does not crank.

NOTE

When diode wire (Figure 2, Item 9) is tested, the multimeter should indicate a high resistance in one direction and a low resistance with the leads reversed. If the diode wire (Figure 2, Item 9) is shorted, the multimeter will indicate approximately zero resistance with the multimeter leads in either direction. If the diode wire (Figure 2, Item 9) is open, the multimeter will indicate infinite resistance or greater than 100,000 Ω with the multimeter leads in either direction. If diode wire (Figure 2, Item 9) is found to be defective by way of a short during the test in step 7, relays K11 and K10 must be checked in relay panel for proper function (WP 0061, Remove/Install Relay Panel).

7. Using a multimeter set to test Ω (WP 0093, General Maintenance), check diode wire (Figure 2, Item 9) (Foldout Pages) for proper resistance if clicking and spinning sounds are not heard at starter solenoid (Figure 2, Item 6) in step 6. Replace diode wire (Figure 2, Item 9) as required.
8. Replace starter (Figure 2, Item 12) if clicking and spinning sounds are not heard at starter solenoid (Figure 2, Item 11) and starter diode wire (Figure 2, Item 9) is not defective.
9. Close left-side door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL BATTERY-CHARGING ALTERNATOR BELT

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Belt, V-drive 1/2 in X 40 1/8 in (WP 0132, Repair Parts List, Figure 32, Item 7)

Grease, electrically conductive (WP 0164, Expendable and Durable Items List, Item 21)

Rag, wiping (WP 0164, Item 32)

Personnel Required

91D (1)

References

WP 0074, Remove/Install Battery-Charging Alternator Assembly

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Front access panel removed (WP 0029, Remove/Install Front Body Panel)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL BATTERY-CHARGING ALTERNATOR BELT**Remove Battery-Charging Alternator Belt**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate battery-charging alternator belt (Figure 1).

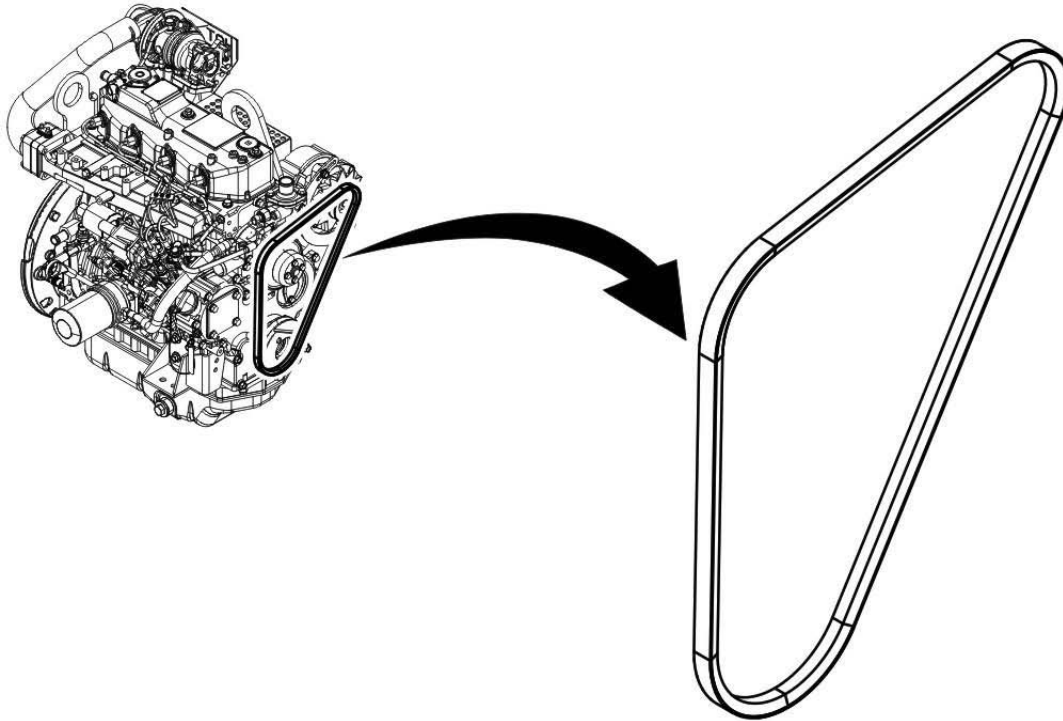


Figure 1. Battery-Charging Alternator Belt — Location.

3. Loosen screw (Figure 2, Item 3) that secures battery-charging alternator (Figure 2, Item 1) to upper mounting bracket (Figure 2, Item 2).
4. Loosen screw (Figure 2, Item 5) that secures battery-charging alternator (Figure 2, Item 1) to engine.

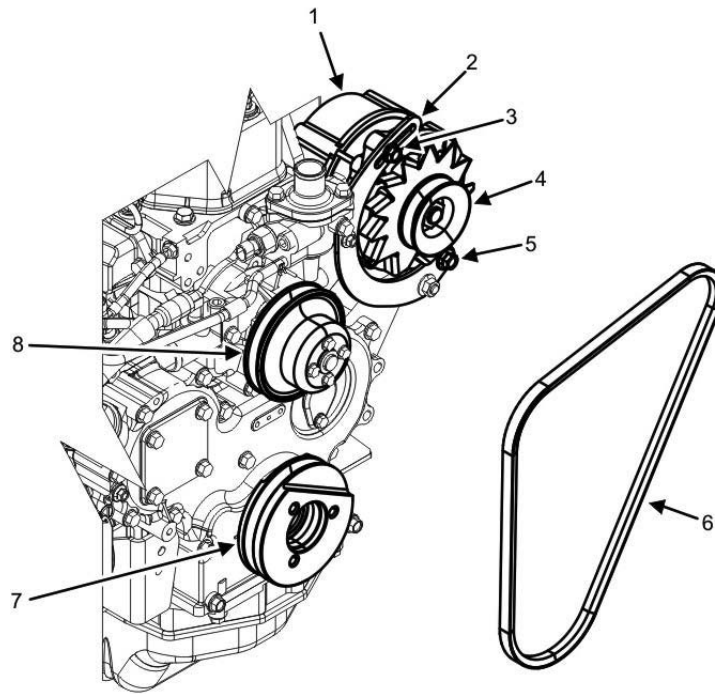


Figure 2. Battery-Charging Alternator Belt — Removal.

5. Pull battery-charging alternator (Figure 2, Item 1) toward engine to create slack in battery-charging alternator belt (Figure 2, Item 6).
6. Remove battery-charging alternator belt (Figure 2, Item 6) from battery-charging alternator pulley (Figure 2, Item 4), crankshaft pulley (Figure 2, Item 7), and water pump pulley (Figure 2, Item 8). Remove battery-charging alternator belt (Figure 2, Item 6) from unit.

END OF TASK

Inspect Battery-Charging Alternator Belt and Components

1. Inspect water pump pulley (Figure 2, Item 8) and crankshaft pulley (Figure 2, Item 7) for damage. Replace components as required.
2. Inspect battery-charging alternator (Figure 2, Item 1) for damage. Replace as required (WP 0074, Remove/Install Battery-Charging Alternator Assembly).
3. Inspect battery-charging alternator belt (Figure 2, Item 6) for wear, cracks, or damage. Replace as required.

END OF TASK

Install Battery-Charging Alternator Belt

1. Pull battery-charging alternator (Figure 2, Item 1) toward engine to allow installation of battery-charging alternator belt (Figure 2, Item 6).
2. Position battery-charging alternator belt (Figure 2, Item 6) around crankshaft pulley (Figure 2, Item 7), water pump pulley (Figure 2, Item 8), and battery-charging alternator pulley (Figure 2, Item 4).

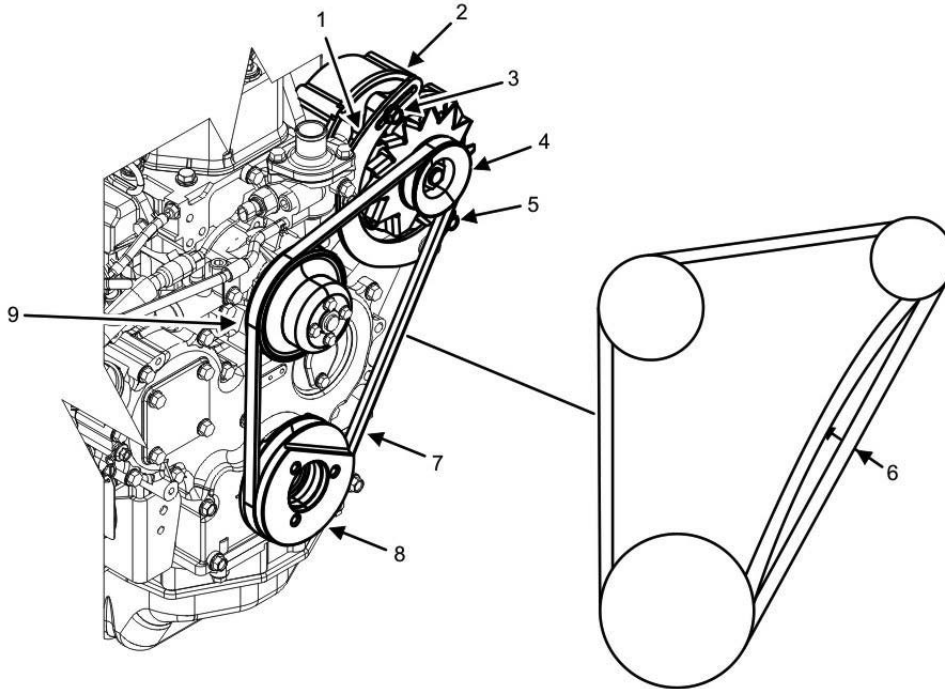


Figure 3. Adjust Battery-Charging Alternator Belt.

3. Push battery-charging alternator (Figure 3, Item 2) away from engine until battery-charging alternator belt (Figure 3, Item 7) appears to be tight.
4. Tighten upper battery-charging alternator mounting screw (Figure 3, Item 3) to lock battery-charging alternator (Figure 3, Item 2) in position.
5. Tighten lower battery-charging alternator mounting screw (Figure 3, Item 5) to lock battery-charging alternator (Figure 3, Item 2) in position.

NOTE

Instructions are given for checking belt deflection (Figure 3, Item 6) between the battery-charging alternator pulley (Figure 3, Item 4) and the crankshaft pulley (Figure 3, Item 8). Belt deflection (Figure 3, Item 6) can also be checked between the water pump pulley (Figure 3, Item 9) and battery-charging alternator pulley (Figure 3, Item 4) or between crankshaft pulley (Figure 3, Item 8) and battery-charging alternator pulley (Figure 3, Item 4) using the same method.

6. Apply moderate pressure to center of battery-charging alternator belt (Figure 3, Item 7) between battery-charging alternator pulley (Figure 3, Item 4) and crankshaft pulley (Figure 3, Item 8) to deflect battery-charging alternator belt (Figure 3, Item 7) inward.

7. Check belt deflection (Figure 3, Item 6) with machinist's rule and compare belt deflection (Figure 3, Item 6) with values in Table 1.

Table 1. Belt Deflection.

DEFLECTION CHECK POSITION	NEW BELT DEFLECTION	USED BELT DEFLECTION
Between battery-charging alternator and crankshaft	0.31 – 0.44 in (8 – 12 mm)	0.37 – 0.50 in (10 – 14 mm)
Between water pump and battery-charging alternator	0.19 – 0.31 in (5 – 8 mm)	0.25 – 0.37 in (7 – 10 mm)
Between water pump and crankshaft	0.25 – 0.44 in (7 – 11 mm)	0.31 – 0.50 in (9 – 13 mm)

NOTE

Belt adjustment is not necessary if belt deflection (Figure 3, Item 6) is within specification. A used belt is defined as one that has been on a running engine for 5 minutes or more.

8. Proceed to step 10 and adjust battery-charging alternator belt deflection (Figure 3, Item 6) if belt deflection (Figure 3, Item 6) is outside of specification.
9. Proceed to step 15 if belt deflection (Figure 3, Item 6) is within specification.
10. Loosen upper battery-charging alternator mounting screw (Figure 3, Item 3) from mounting bracket (Figure 3, Item 1).
11. Loosen lower mounting screw (Figure 3, Item 5).

CAUTION

When adjusting battery-charging alternator belt tension, apply pressure to battery-charging alternator housing when pushing. Do not push on battery-charging alternator pulley. Pushing on battery-charging alternator pulley may cause damage to the battery-charging alternator (Figure 3, Item 2). Failure to comply may cause damage to equipment.

12. Adjust belt deflection (Figure 3, Item 6) by pushing battery-charging alternator (Figure 3, Item 2) away from engine until belt deflection (Figure 3, Item 6) is within specification.
13. Tighten upper battery-charging alternator mounting screw (Figure 3, Item 3) to lock battery-charging alternator (Figure 3, Item 2) in position.
14. Repeat steps 10 through 13 to check belt deflection (Figure 3, Item 6) until proper tension is achieved.
15. Torque lower mounting screw (Figure 3, Item 5) to 35 – 42 ft/lbs (47 – 57 Nm).
16. Torque upper mounting screw (Figure 3, Item 3) to 18 – 21 ft/lbs (24 – 29 Nm).
17. Install front access panel (WP 0029, Remove/Install Front Body Panel).
18. Install top body panel (WP 0028, Remove/Install Top Body Panel).
19. Install battery ground cable (WP 0036, Remove/Install Batteries).
20. Turn engine control switch to PRIME & RUN (TM 9 6115-751-10).

21. Start engine and check for proper operation (TM 9 6115-751-10).
22. Repair as required.
23. Dispose of soiled rags IAW local SOP.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL BATTERY-CHARGING ALTERNATOR ASSEMBLY

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0163, Item 46)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0163, Item 48)

Materials/Parts

Alternator, battery-charging (WP 0132, Repair Parts List, Figure 32, Item 2)

Grease, electrically conductive (WP 0164, Expendable and Durable Items List, Item 21)

Rag, wiping (WP 0164, Item 32)

Personnel Required

91D (1)

Assistant (1)

References

WP 0018, Repair DCS

WP 0036, Remove/Install Batteries

WP 0029, Remove/Install Front Body Panel

WP 0073, Remove/Install Battery-Charging Alternator Belt

WP 0095, General Maintenance

Foldout Pages

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL BATTERY-CHARGING ALTERNATOR ASSEMBLY
Test Battery-Charging Alternator Assembly**WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.
- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

WARNING

- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

NOTE

This test is not necessary if you are removing the battery-charging alternator for access to other components.

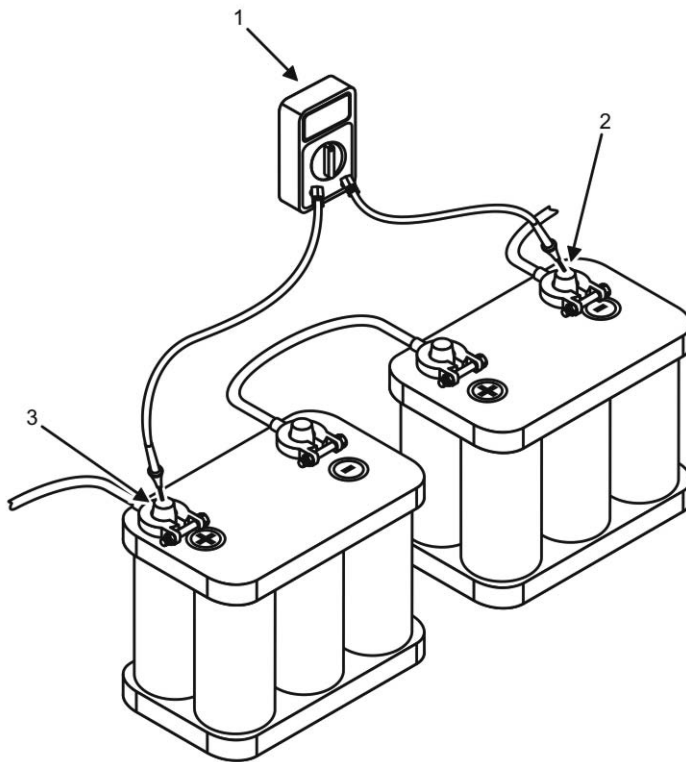


Figure 1. Test Battery-Charging Alternator.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door.
3. Set the multimeter (Figure 1, Item 1) to measure VDC.
4. Attach multimeter (Figure 1, Item 1) to right-side battery negative terminal (Figure 1, Item 2) and left-side battery positive terminal (Figure 1, Item 3).
5. Record voltage reading displayed on the multimeter (Figure 1, Item 1).

6. Install battery ground cable (WP 0036, Remove/Install Batteries).
7. Set engine control switch to PRIME & RUN (TM 9-6115-751-10).
8. Start generator set (TM 9-6115-751-10).
9. Attach multimeter leads to B+ stud (Figure 3, Item 16) and B- stud (Figure 3, Item 2) on battery-charging alternator (Figure 3, Item 1).

NOTE

If voltage at battery-charging alternator (Figure 3, Item 1) with engine operating is not between 26 and 31 VDC range, the battery-charging alternator (Figure 3, Item 1) or field flash wire (Figure 3, Item 5) may be defective. If voltage at battery-charging alternator (Figure 3, Item 1) is within 26 and 31 VDC range, wiring to starter (not shown) can be tested to confirm proper operation (see step 17).

10. Record voltage reading. Proceed to step 11 if voltage is not within 26 to 31 VDC range or proceed to step 17 if voltage is within 26 to 31 VDC range.
11. Shut down generator set (TM 9-6115-751-10).
12. Remove field flash wire (P2-P) (Figure 3, Item 11) and connect multimeter leads from field flash wire (Figure 3, Item 11) to B- stud (Figure 3, Item 2).
13. Use an assistant to start generator set (TM 9-6115-751-10).

CAUTION

Be sure to observe multimeter display throughout entire starting and running of generator set to obtain an accurate reading. Full field flash voltage reading should be observed within 30 seconds of starting. Failure to comply may cause damage to equipment.

NOTE

If voltage reading obtained in step 14 is the same $\pm 5\%$ as battery voltage reading obtained in step 5, battery-charging alternator (Figure 3, Item 1) is receiving proper field flash signal from DCS. If voltage reading obtained in step 14 is not the same $\pm 5\%$ as battery voltage reading obtained in step 5, field flash wire (Figure 3, Item 11) or DCS may be malfunctioning. See WP 0095, General Maintenance and Foldout Pages to check field flash wire (Figure 3, Item 5) and see WP 0018, Repair DCS to check DCS.

14. Record voltage reading and compare to reading obtained in step 5.
15. Shut down generator set (TM 9-6115-751-10).
16. Replace battery-charging alternator (Figure 3, Item 1) if voltage recorded in step 10 is outside 26 to 31 VDC range but field flash wire (Figure 3, Item 2) voltage in step 14 is the same as battery voltage (step 5).
17. Attach multimeter (Figure 1, Item 1) to right-side battery negative terminal (Figure 1, Item 2) and left-side battery positive terminal (Figure 1, Item 3).
18. Start generator set (TM 9-6115-751-10).
19. Record voltage reading displayed on the multimeter (Figure 1, Item 1).
20. Shut down generator set (TM 9-6115-751-10).
21. Test and replace wiring as required (WP 0095, General Maintenance and Foldout Pages) if voltage reading in step 19 does not match voltage reading $\pm 5\%$ obtained in step 10.
22. Remove multimeter (Figure 1, Item 1) from battery terminals.
23. Remove battery ground cable (WP 0036, Remove/Install Batteries).

24. Close left-side door.

END OF TASK

Remove Battery-Charging Alternator Assembly

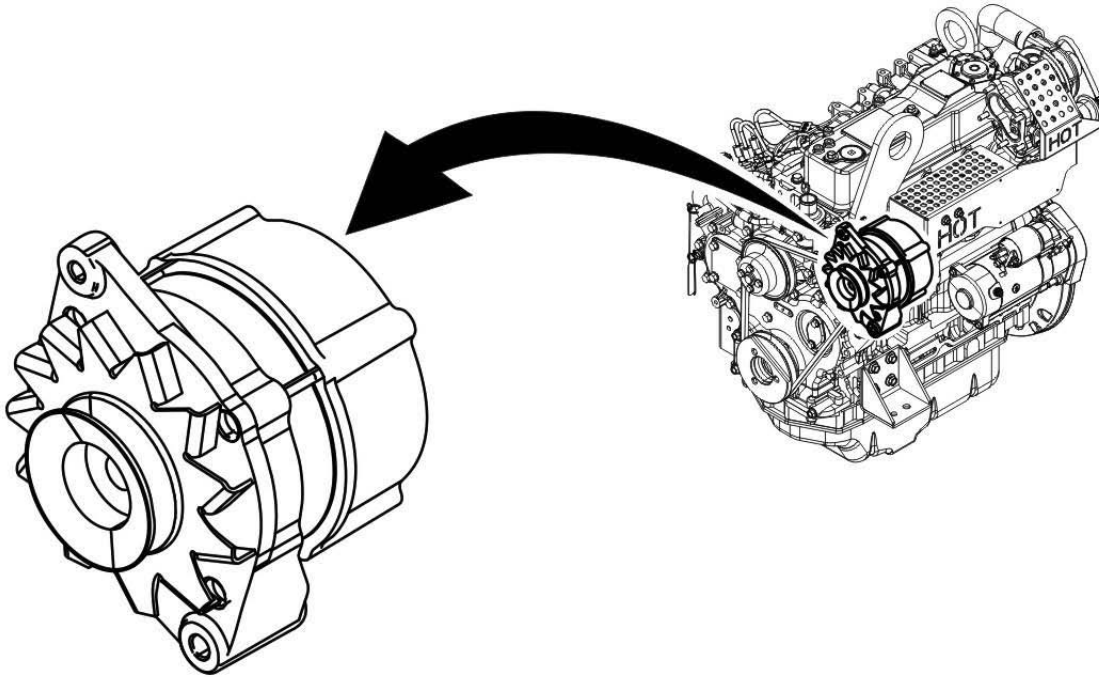


Figure 2. Battery-Charging Alternator — Location.

NOTE

To aid installation, tag and identify all electrical wires and connectors prior to removal.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove battery ground cable (WP 0036, Remove/Install Batteries).
3. Open left-side door and locate battery-charging alternator (Figure 2).
4. Remove access panel (WP 0029, Remove/Install Front Body Panel).
5. Remove battery-charging alternator belt (WP 0073, Remove/Install Battery-Charging Alternator Belt).

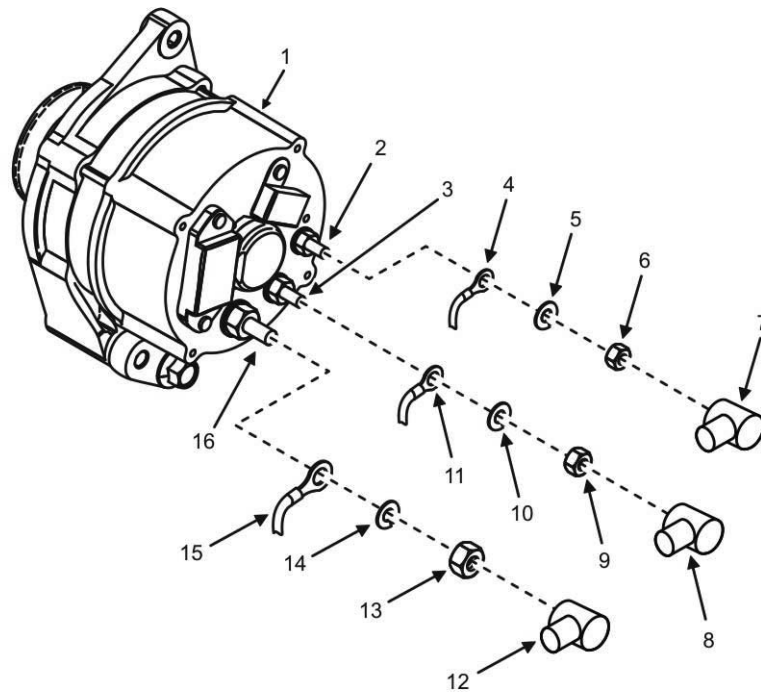


Figure 3. Battery-Charging Alternator Assembly — Wiring.

6. Tag all electrical wires for reinstallation.
7. Remove boot (Figure 3, Item 12) to expose stud B+ (Figure 3, Item 16) on rear of battery-charging alternator (Figure 3, Item 1).
8. Remove nut (Figure 3, Item 13), washer (Figure 3, Item 14), and electrical wire (Figure 3, Item 15) from stud B+ (Figure 3, Item 16).
9. Remove boot (Figure 3, Item 8) to expose stud D+ (Figure 3, Item 3) on rear of battery-charging alternator (Figure 3, Item 1).
10. Remove nut (Figure 3, Item 9), washer (Figure 3, Item 10), and electrical wire (Figure 3, Item 11) from stud D+ (Figure 3, Item 3).
11. Remove boot (Figure 3, Item 7) to expose stud B- (Figure 3, Item 2) on rear of battery-charging alternator (Figure 3, Item 1).
12. Remove nut (Figure 3, Item 6), washer (Figure 3, Item 5), and electrical wire (Figure 3, Item 4) from stud B- (Figure 3, Item 2).

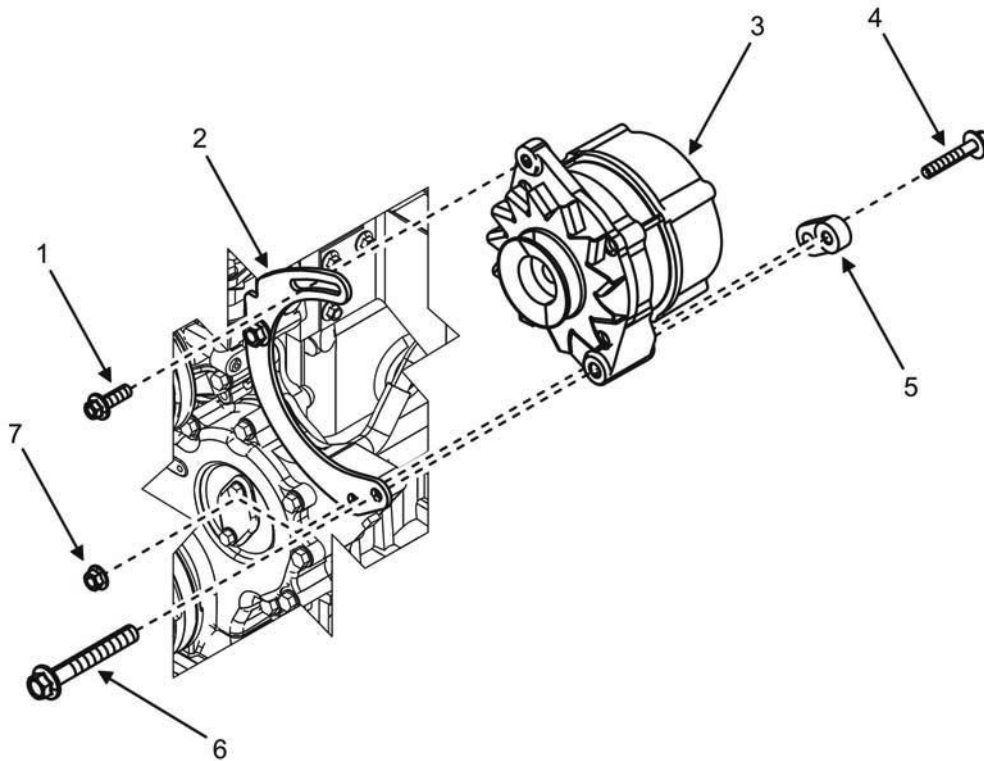


Figure 4. Battery-Charging Alternator Assembly — Removal.

13. Remove bolt (Figure 4, Item 1) on mounting bracket (Figure 4, Item 2).
14. Remove nut (Figure 4, Item 7) and bolt (Figure 4, Item 4) that secures spacer (Figure 4, Item 5) to mounting bracket (Figure 4, Item 2).
15. Loosen bolt (Figure 4, Item 6) without removing to allow battery-charging alternator (Figure 4, Item 3) to be removed.
16. Support battery-charging alternator (Figure 4, Item 3) from below.
17. Remove bolt (Figure 4, Item 6) that secures battery-charging alternator (Figure 4, Item 3) to mounting bracket (Figure 4, Item 2).
18. Remove battery-charging alternator (Figure 4, Item 3) from mounting bracket (Figure 4, Item 2) and place on a suitable work surface.

END OF TASK

Inspect Battery-Charging Alternator Assembly

1. Inspect battery-charging alternator (Figure 4, Item 3) for signs of obvious damage.
2. Replace damaged battery-charging alternator (Figure 4, Item 3).
3. Inspect mounting bracket (Figure 4, Items 2) for signs of obvious damage.
4. Replace damaged mounting bracket (Figure 4, Item 2) as required.

END OF TASK

Install Battery-Charging Alternator Assembly**NOTE**

At installation, remove tags from wires and connectors.

1. Position battery-charging alternator (Figure 4, Item 3) to mounting location on exhaust side of engine.
2. Support battery-charging alternator (Figure 4, Item 3) from below.
3. Secure battery-charging alternator (Figure 4, Item 3) to mounting bracket (Figure 4, Item 2) by installing bolt (Figure 4, Item 1). Finger-tighten.
4. Align mounting holes in mounting bracket (Figure 4, Item 2), spacer (Figure 4, Item 5), and battery-charging alternator (Figure 4, Item 3).
5. Secure spacer (Figure 4, Item 5) with bolt (Figure 4, Item 4) and nut (Figure 4, Item 7) to mounting bracket (Figure 4, Item 2).
6. Secure battery-charging alternator (Figure 4, Item 3) to mounting bracket (Figure 4, Item 2) and spacer (Figure 4, Item 5) by installing bolt (Figure 4, Item 4). Finger-tighten.
7. Tighten nut (Figure 4, Item 7) and bolts (Figure 4, Items 4 and 6) to 35 – 42 ft/lb (47 – 57 Nm).
8. Tighten bolt (Figure 4, Item 1) to 18 – 21 ft/lb (24 – 29 Nm).
9. Install electrical wire (Figure 3, Item 4) to stud B- (Figure 3, Item 2) at rear of battery-charging alternator (Figure 3, Item 1), and secure by installing nut (Figure 3, Item 6) and washer (Figure 3, Item 5). Tighten to 2.0 – 2.8 ft/lb (2.7 – 3.8 Nm).
10. Position boot (Figure 3, Item 7) over stud B- (Figure 3, Item 2).
11. Install electrical wire (Figure 3, Item 11) to stud D+ (Figure 3, Item 3) at rear of battery-charging alternator (Figure 3, Item 1), and secure by installing nut (Figure 3, Item 9) and washer (Figure 3, Item 10). Tighten to 2 – 2.8 ft/lb (2.7 – 3.8 Nm).
12. Position boot (Figure 3, Item 8) over stud D+ (Figure 3, Item 3).
13. Install electrical wire (Figure 3, Item 15) to stud B+ (Figure 3, Item 16) at rear of battery-charging alternator (Figure 3, Item 1), and secure by installing nut (Figure 3, Item 13) and washer (Figure 3, Item 14). Tighten to 5.5 – 15.5 ft/lb (7.5 – 8 Nm).
14. Position boot (Figure 3, Item 12) over stud B+ (Figure 3, Item 16).
15. Install battery-charging alternator belt (WP 0073, Remove/Install Battery-Charging Alternator Belt).
16. Install access panel (WP 0029, Remove/Install Front Body Panel).
17. Install battery ground cable (WP 0036, Remove/Install Batteries).
18. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
19. Start engine and check for proper operation (TM 9-6115-751-10).
20. Repair as required.
21. Dispose of soiled rags IAW local SOP.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL INTAKE AIR HEATERS

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Gasket, air heater (WP 0140, Repair Parts List, Figure 40, Item 6)

Gasket, air heater (WP 0140, Figure 40, Item 8)

Heater, air (WP 140, Figure 40, Item 5)

Heating element (WP 0140, Figure 40, Item 7)

Cap set, protective (WP 0164, Expendable Durable Items List, Item 9)

Cleaning compound, solvent (WP 0164, Item 11)

Grease, electrically conductive (WP 0164, Item 21)

Rag, wiping (WP 0164, Item 32)

Personnel Required

91D (1)

References

Not Applicable

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL INTAKE AIR HEATERS**WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

Remove Intake Air Heaters

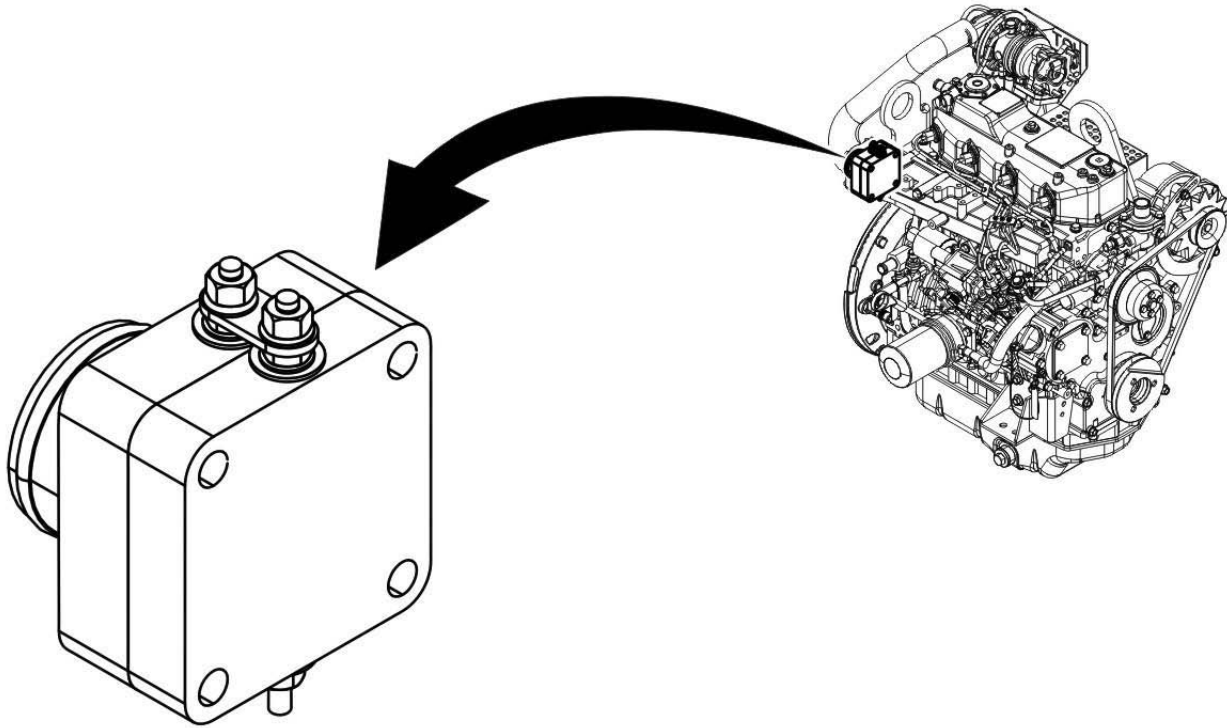


Figure 1. Air Heater — Location.

1. Ensure equipment conditions are met in the order presented in initial setup.
2. Open right-side door and locate air heaters (Figure 1).
3. Loosen and slide back hose clamp (Figure 2, Item 2) on air intake hose (Figure 2, Item 1).
4. Remove air intake hose (Figure 2, Item 1) from air heater (Figure 2, Item 14). Cap/plug opening in air intake hose (Figure 2, Item 1).
5. Inspect air intake hose (Figure 2, Item 1) and hose clamp (Figure 2, Item 2) for any signs of damage and replace as required.
6. Slide back boot (Figure 2, Item 11) on electrical wire (Figure 2, Item 12).
7. Remove nut (Figure 2, Item 10) and lock washer (Figure 2, Item 9) from electrical wire (Figure 2, Item 12) on air heater (Figure 2, Item 6).
8. Remove electrical wire (Figure 2, Item 12) from air heater (Figure 2, Item 6) terminal.
9. Remove two nuts (Figure 2, Item 4) and two lock washers (Figure 2, Item 3) from series busbar (Figure 2, Item 5) on air heater (Figure 2, Items 6 and 14) terminals.
10. Remove series busbar (Figure 2, Item 5).

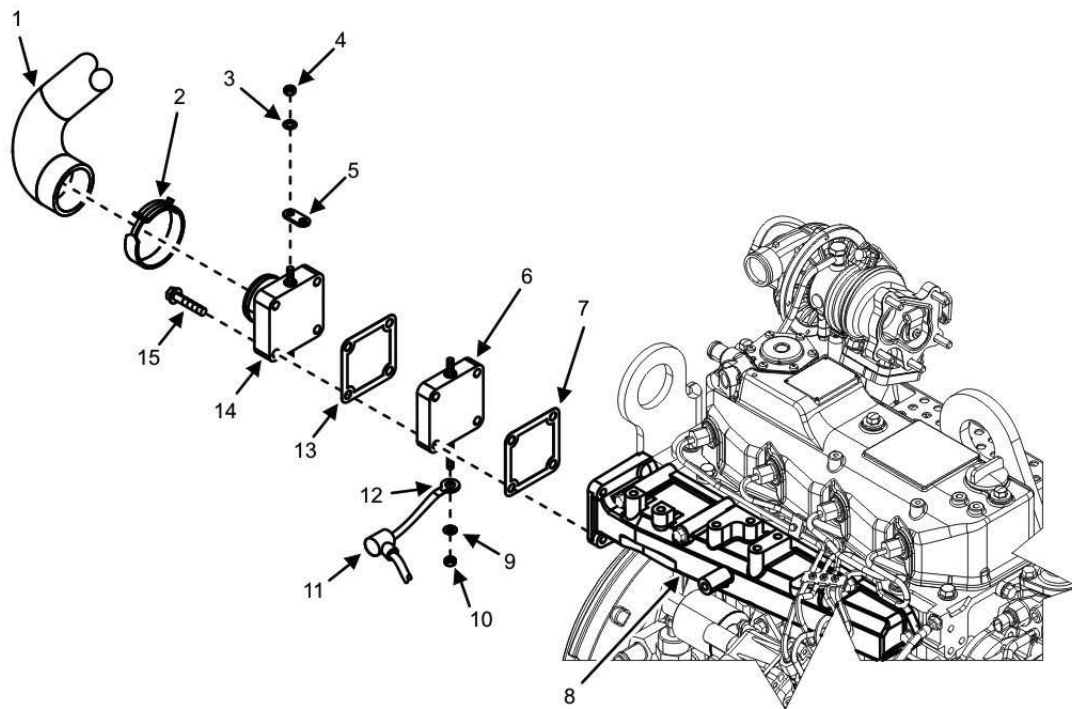


Figure 2. Air Heater Assembly — Removal.

11. Loosen four bolts (Figure 2, Item 15) securing air heaters (Figure 2, Items 6 and 14) to intake manifold (Figure 2, Item 8).
12. Remove four bolts (Figure 2, Item 15), air heaters (Figure 2, Items 6 and 14), and gaskets (Figure 2, Item 7 and 13) from intake manifold (Figure 2, Item 8). Discard gaskets (Figure 2, Items 7 and 13).
13. Place air heaters (Figure 2, Items 6 and 14) on suitable work surface.

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

CAUTION

Do not allow gasket residue to enter cooling system or intake manifold (Figure 2, Item 8). Do not damage mounting surface when removing gasket material. Failure to comply will cause damage to equipment.

14. Remove residual gasket material from mounting surfaces of air heaters (Figure 2, Items 6 and 14) and intake manifold (Figure 2, Item 8) using dry cleaning solvent and wiping rags.
15. Cap/plug openings in intake manifold (Figure 2, Item 8).

END OF TASK

Inspect Air Heaters

1. Inspect air heaters (Figure 2, Items 6 and 14) for dirt, debris, or any blockage.
2. Remove dirt, debris, or any blockage from air heaters (Figure 2, Items 6 and 14).
3. Inspect air heaters (Figure 2, Items 6 and 14) for any damage or missing parts.
4. Replace air heaters (Figure 2, Items 6 and 14) if any damage is found.
5. Inspect air heater terminals (Figure 3, Items 2 and 5) for any damage.
6. Replace air heaters (Figure 2, Items 6 and 14) if terminal damage is found.
7. Inspect air heater terminal (Figure 3, Items 2 and 5) hardware for signs of damage or loose hardware.
8. Replace or tighten hardware as required.

END OF TASK

Test Air Heaters

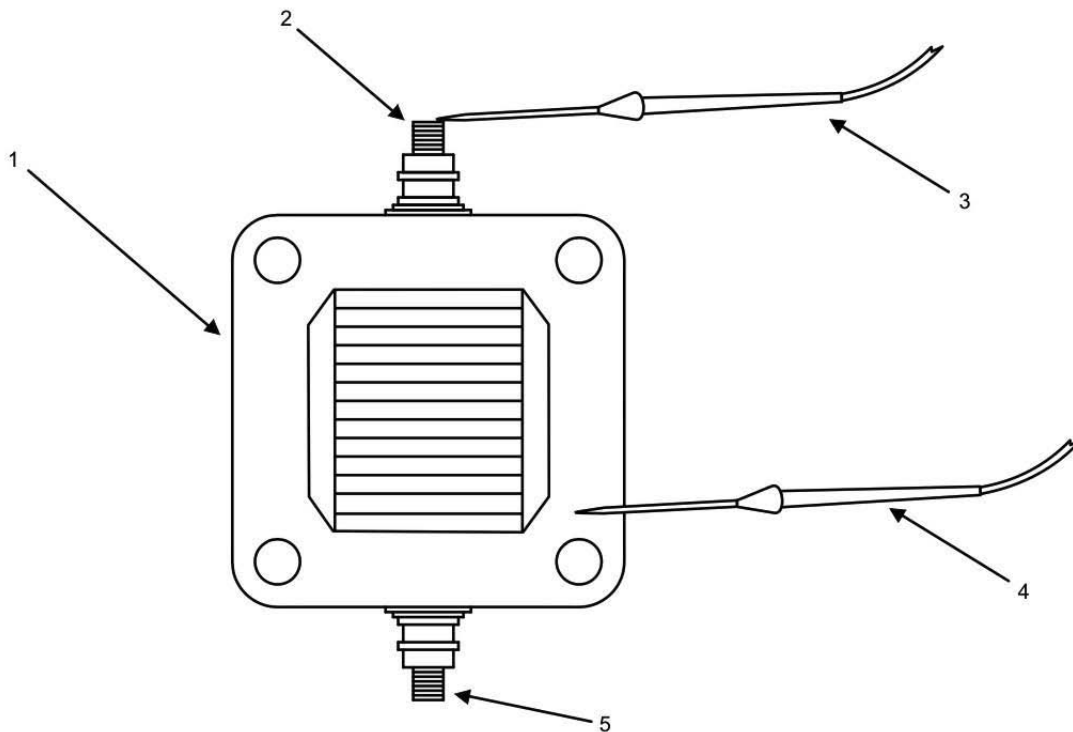


Figure 3. Air Heater — Test.

NOTE

Air heaters (Figure 3, Item 1) are designed to activate when engine temperature is 21°F – -25°F (-6°F – -32°C). When heaters are activated, the absence of voltage at the heaters indicates a fault within the 24-VDC electrical system.

An open circuit between the air heater terminals (Figure 3, Items 2 and 5) will be indicated by a resistance value of infinity. A value of 0 Ohms between the metal frame of the heater and air heater terminal (Figure 3, Items 2 and 5) will indicate a short to ground. A continuity test with a multimeter selected for Ohms scale may be performed with air heater(s) (Figure 3, Items 1) installed or removed. Electrical wire (Figure 2, Item 12) and series busbar (Figure 2, Item 5) must be removed to do test.

1. Remove negative ground cable from right-hand battery (WP 0036, Remove/Install Batteries) if not already removed.
2. Open right-side door if air heaters (Figure 3, Item 1) will be tested while installed.

NOTE

Ensure multimeter has been properly calibrated. When testing, allow reading on multimeter to stabilize before recording value. A closed or complete circuit of an operable heater will display a resistance value of 0.1 – 1.0 Ohms.

3. Use a multimeter selected for Ohms scale to measure resistance between two air heater terminals (Figure 3, Items 2 and 5) on air heater (Figure 3, Item 1) by placing meter leads (Figure 3, Item 3 and 4) on each air heater terminal (Figure 3, Items 2 and 5).
4. Replace air heater (Figure 3, Item 1) if resistance value obtained in step 3 is more than 1.0 Ohm.
5. Measure insulation resistance by placing meter lead (Figure 3, Item 3) on one terminal (Figure 3, Items 2 or 5) and meter lead (Figure 3, Item 4) on metal frame of air heater (Figure 3, Item 1).
6. Replace air heater (Figure 3, Item 1) if resistance value obtained in step 5 is less than 1 Ohm.
7. Repeat steps 3 through 6 for second air heater (Figure 3, Item 1).

END OF TASK**Install Air Heaters**

1. Remove caps/plugs from intake manifold (Figure 2, Item 8).
2. Position new air heater gasket (thin) (Figure 2, Item 13) between air heaters (Figure 2, Items 6 and 14) and new air heater gasket (thick) (Figure 2, Item 7) between air heater (Figure 2, Item 6) and intake manifold (Figure 2, Item 8).
3. Install four bolts (Figure 2, Item 15) through air heaters (Figure 2, Items 6 and 14) and gaskets (Figure 2, Item 7 and 13) and into intake manifold (Figure 2, Item 8).
4. Tighten four bolts (Figure 2, Item 15) and secure air heaters (Figure 2, Items 6 and 14) to intake manifold (Figure 2, Item 8).
5. Connect electrical wire (Figure 2, Item 12) to air heater (Figure 2, Item 6) lower terminal.
6. Install nut (Figure 2, Item 10) and new lock washer (Figure 2, Item 9) to air heater (Figure 2, Item 6).
7. Slide boot (Figure 2, Item 11) into place over air heater (Figure 2, Item 6).
8. Place series busbar (Figure 2, Item 5) onto air heaters (Figure 2, Items 6 and 14).
9. Install two lock washers (Figure 2, Item 3) and nuts (Figure 2, Item 4) and secure series busbar (Figure 2, Item 5) to air heaters (Figure 2, Items 6 and 14).

10. Remove caps/plugs from air intake hose (Figure 2, Item 1).

NOTE

Wipe down hoses, parts, and connectors with wiping rag prior to installation to aid during leak checks.

11. Install air intake hose (Figure 2, Item 1) to air heater (Figure 2, Item 14).
12. Position and tighten hose clamp (Figure 2, Item 2) securing air intake hose (Figure 2, Item 1) to air heater (Figure 2, Item 14).
13. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
14. Close right-side door.
15. Turn engine control switch to PRIME & RUN (TM 9 6115-751-10).
16. Start engine and check for proper operation (TM 9 6115-751-10).
17. Check for evidence of heat at intake manifold (Figure 2, Item 8) and air heaters (Figure 2, Items 6 and 14).
18. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL INTAKE MANIFOLD

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Adapter, Socket Wrench Drive, 1/4" Male-3/8"
 Female (WP 0163, Maintenance Allocation Chart,
 Item 3)

Hammer, Hand, Soft Face, Dead Blow (WP 0163,
 Item 16)

Socket, Socket Wrench 1/4" Dr, 6Pt, Regular, 12 mm
 (WP 0163, Item 25)

Socket, Socket Wrench, 3/8" Dr, 6Pt, Regular, 12
 mm (WP 0163, Item 26)

Tool Kit, General Mechanic's (GMTK) (WP 0163,
 Item 38)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP
 0163, Item 48)

Materials/Parts

Manifold, air intake (WP 0135, Repair Parts List,
 Figure 35, Item 1)

Gasket, manifold (WP 0135, Figure 35, Item 2)

Cap set, protective (WP 0164, Expendable Durable
 Items List, Item 9)

Cleaning compound, solvent (WP 0164, Item 11)

Fuel, diesel (WP 0164, Item 19)

Grease, electrically conductive (WP 0164, Item 21)

Rag, wiping (WP 0164, Item 32)

References

Not Applicable

Personnel Required

91D (1)
 Assistant (1)

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP
 0005)

Engine cool

Battery ground cable removed (WP 0036,
 Remove/Install Batteries)

Intake air heaters removed (WP 0075,
 Remove/Install Intake Air Heater)

Fuel injection lines removed (WP 0082,
 Remove/Install Valve Cover)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/ INSTALL INTAKE MANIFOLD

Remove Intake Manifold

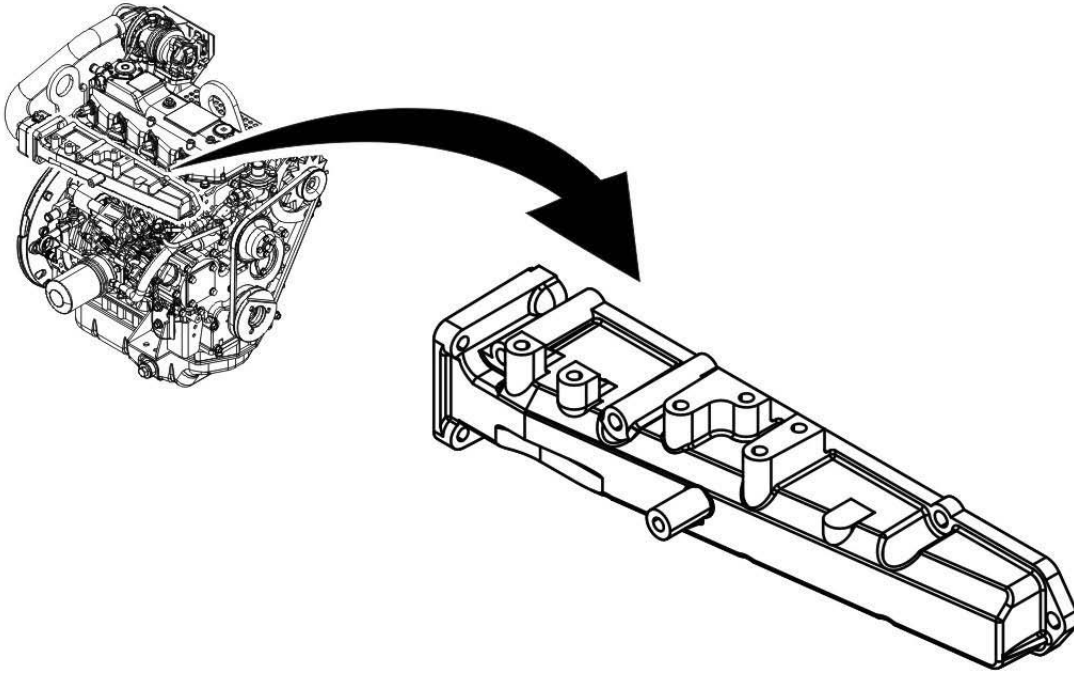


Figure 1. Intake Manifold — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door and locate intake manifold (Figure 1).
3. Disconnect coolant temperature sensor wire from connector (not shown), if necessary.
4. Ensure two screws that secure lower radiator tube support bracket to engine are removed (WP 0082, Remove/Install Valve Cover, Figure 2, Items 2, 3, and 4).

NOTE

Use of a 1/4-in ratchet, extension, and universal joint will be necessary to reach bolt along the bottom of the intake manifold.

There are five M8 – 20 mm size bolts (Figure 2, Item 4) and two M8 – 80 mm size bolts (Figure 2, Item 5). Be sure to note location of the two M8 – 80 mm size bolts (Figure 2, Item 5) for the top mounting holes near the air heater.

5. Loosen seven bolts (Figure 2, Items 4 and 5) securing intake manifold (Figure 2, Item 3) to cylinder head (Figure 2, Item 1).
6. Remove seven bolts (Figure 2, Items 4 and 5) securing intake manifold (Figure 2, Item 3) to cylinder head (Figure 2, Item 1).

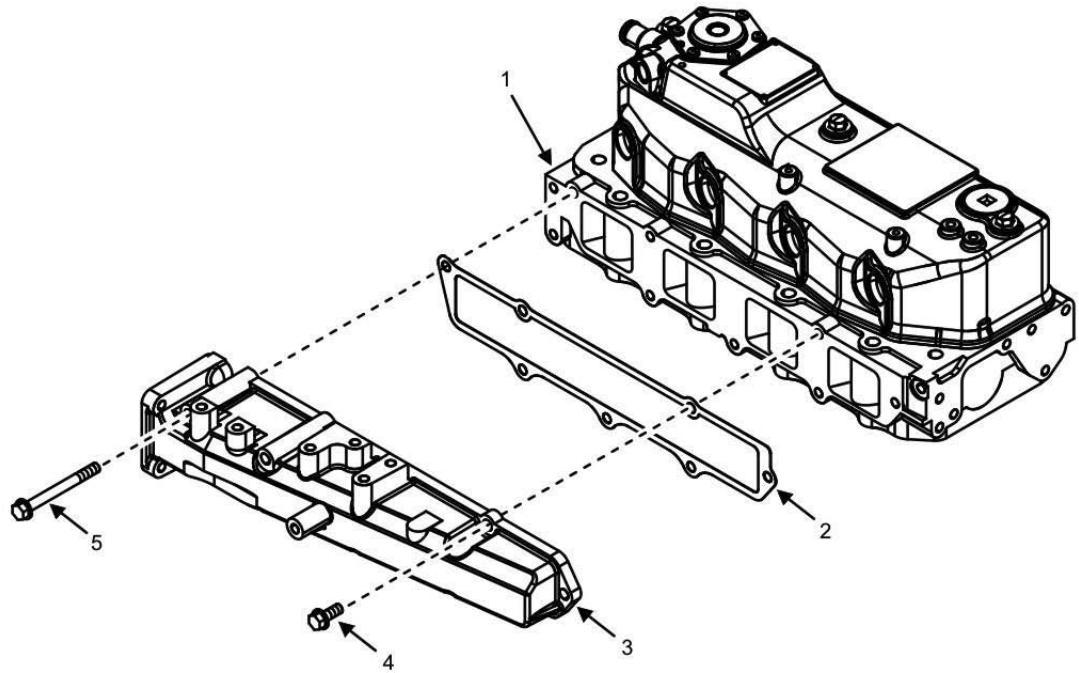


Figure 2. Intake Manifold— Removal.

NOTE

It may be necessary to lightly tap the intake manifold (Figure 2, Item 3) with a rubber mallet to loosen the manifold from the cylinder head.

7. Remove intake manifold (Figure 2, Item 3) and metal gasket (Figure 2, Item 2) from cylinder head (Figure 2, Item 1). Discard metal gasket.

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

8. Clean intake manifold (Figure 2, Item 3) and cylinder head (Figure 2, Item 1) mounting surfaces with wiping rags and dry cleaning solvent.
9. Cap/plug any openings in cylinder head (Figure 2, Item 1).

END OF TASK

Inspect Intake Manifold

1. Inspect intake manifold (Figure 2, Item 3) for damage and/or cracks.
2. Replace intake manifold (Figure 2, Item 3) if damaged or cracked.

END OF TASK

Install Intake Manifold

1. Uncap/unplug openings in cylinder head (Figure 2, Item 1).
2. Install new metal gasket (Figure 2, Item 2) on mounting surface of intake manifold (Figure 2, Item 3).
3. Position intake manifold (Figure 2, Item 3) and metal gasket (Figure 2, Item 2) on mounting location of cylinder head (Figure 2, Item 1).
4. Align holes of intake manifold (Figure 2, Item 3), gasket (Figure 2, Item 2), and cylinder head (Figure 2, Item 1) using a mounting bolt.

NOTE

Use of a 1/4-in ratchet, extension, and universal joint will be necessary to reach bolt along the bottom of the intake manifold.

There are five M8 – 20 mm size bolts (Figure 2, Item 4) and two M8 – 80 mm size bolts (Figure 2, Item 5). Be sure to install the two M8 – 80 mm size bolts (Figure 2, Item 5) into top mounting holes near the air heater.

5. Secure intake manifold (Figure 2, Item 4) to cylinder head (Figure 2, Item 1) by installing and tightening seven bolts (Figure 2, Items 4 and 5).
6. Install fuel injection lines (WP 0082, Remove/Install Valve Cover).
7. Install air heaters (WP 0075, Remove/Install Intake Air Heater).
8. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
9. Close right-side door.
10. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
11. Start engine and check for fuel and air leaks and proper operation (TM 9-6115-751-10).
12. Repair as required.
13. Dispose of soiled rags IAW local SOP.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL MUFFLER

INITIAL SETUP**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Clamp, loop (WP 0109, Repair Parts List, Figure 9, Item 5)

Clamp, loop (WP 0109, Figure 9, Item 7)

Gasket, turbine outlet (WP 0141, Repair Parts List, Figure 41, Item 4)

Muffler (WP 0109, Figure 9, Item 4)

Nut, hex flange M8 (WP 0109, Figure 9, Item 2)

Brush, wire, scratch (WP 0164, Expendable and Durable items List, Item 8)

Cap set, protective (WP 0164, Item 9)

Cleaning compound, solvent (WP 0164, Item 11)

Penetrating oil (WP 0164, Item 30)

Personnel Required

91D (1)

References

Not Applicable

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Top body panel removed (WP 0028, Remove/Install Top Body Panel)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL MUFFLER**Remove Muffler****WARNING**

Exhaust system can get very hot. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.

CAUTION

Do not allow gasket pieces to enter turbocharger. Cap the turbocharger to prevent debris from entering the system. Failure to comply will cause damage to equipment.

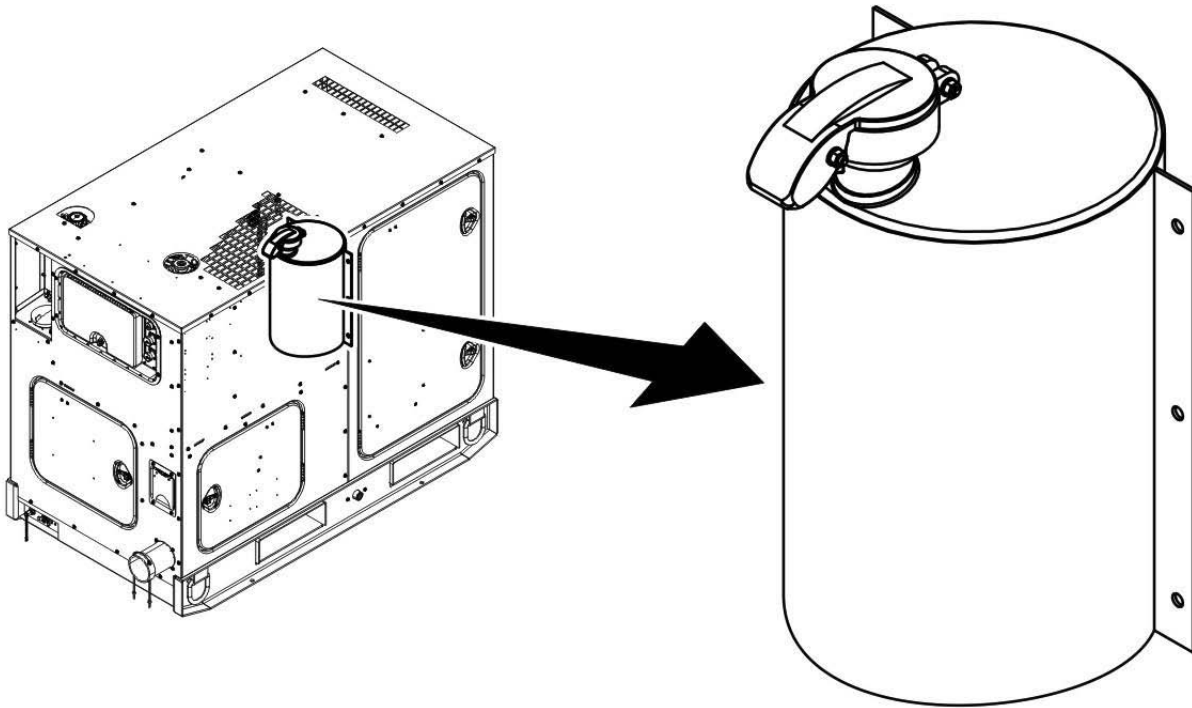


Figure 1. Muffler — Location.

NOTE

Prior to loosening exhaust elbow (Figure 2, Item 7) from turbocharger (Figure 2, Item 4), apply penetrating oil to five nuts (Figure 2, Item 8). Allow penetrating oil to soak for 5 min.

Due to extreme heat absorbed by the exhaust system, replace nuts (Figure 2, Item 8).

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door and locate muffler (Figure 1) attached to unit bulkhead.
3. Remove and discard five nuts (Figure 2, Item 8) that secure exhaust elbow (Figure 2, Item 7) to turbocharger (Figure 2, Item 4).
4. Remove six screws (Figure 2, Item 11) and nuts (Figure 2, Item 13) that secure muffler (Figure 2, Item 12) to unit bulkhead.
5. Lift muffler (Figure 2, Item 12), flex pipe (Figure 2, Item 10), and exhaust elbow (Figure 2, Item 7) from generator set as a unit and place on a suitable work surface.
6. Remove and discard gasket (Figure 2, Item 5) from turbocharger (Figure 2, Item 4).
7. Loosen screw (Figure 2, Item 3) and nut (Figure 2, Item 1) that secure rain cap (Figure 2, Item 2) to muffler (Figure 2, Item 12).

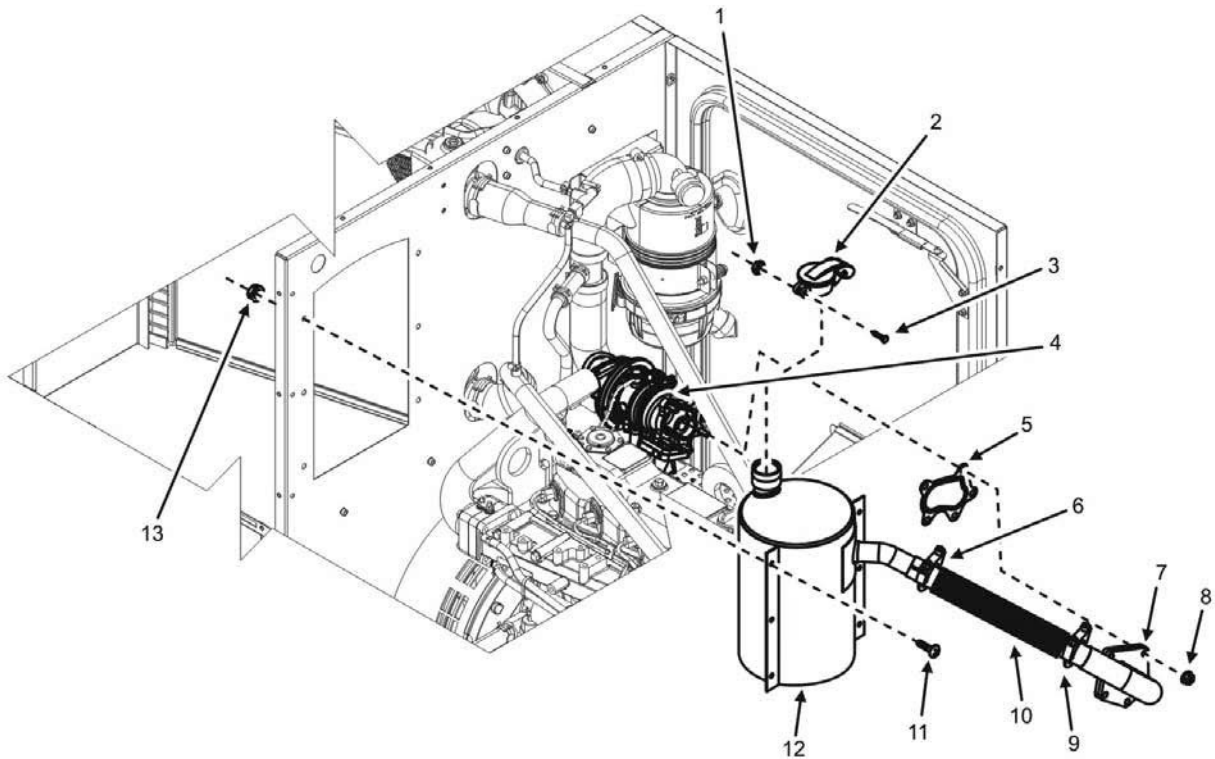


Figure 2. Muffler — Removal.

8. Remove rain cap (Figure 2, Item 2) from muffler (Figure 2, Item 12).
9. Inspect rain cap (Figure 2, Item 2) for signs of obvious damage.
10. Replace damaged rain cap (Figure 2, Item 2) if needed. Otherwise, set rain cap (Figure 2, Item 2) aside for reuse.

END OF TASK

Clean and Inspect Muffler

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

1. Clean muffler (Figure 2, Item 12), flex pipe (Figure 2, Item 10), and exhaust elbow (Figure 2, Item 7) with stiff bristle brush and dry cleaning solvent.
2. Inspect muffler (Figure 2, Item 12), flex pipe (Figure 2, Item 10), and exhaust elbow (Figure 2, Item 7) for dents, cracks, excessive corrosion, clogging, and other damage.

NOTE

If exhaust system components need to be separated for replacement, apply indexing marks to components prior to separation to assist in alignment at installation.

3. Replace muffler (Figure 2, Item 12), flex pipe (Figure 2, Item 10), and exhaust elbow (Figure 2, Item 7) individually as required if severely dented, cracked, excessively corroded, clogged, or damaged.

4. Discard and replace clamps (Figure 2, Items 6 and 9) if muffler (Figure 2, Item 12), flex pipe (Figure 2, Item 10), and exhaust elbow (Figure 2, Item 7) are separated.
5. Clean mating surfaces of turbocharger (Figure 2, Item 4) and exhaust elbow (Figure 2, Item 7) with dry cleaning solvent and a stiff bristle brush to remove any residual gasket material.

END OF TASK

Install Muffler

1. Install rain cap (Figure 2, Item 2) to muffler (Figure 2, Item 12) with nut (Figure 2, Item 1) and screw (Figure 2, Item 3).
2. Assemble muffler (Figure 2, Item 12), flex pipe (Figure 2, Item 10), and exhaust elbow (Figure 2, Item 7) aligning components using indexing marks applied at inspection if components were separated during the inspection process.
3. Install clamps (Figure 2, Items 6 and 9). Finger-tighten.
4. Remove protective plug from turbocharger (Figure 2, Item 4).
5. Position muffler (Figure 2, Item 12), flex pipe (Figure 2, Item 10), and exhaust elbow (Figure 2, Item 7) as a unit to mounting location on generator set bulkhead.
6. Install muffler (Figure 2, Item 12) to unit bulkhead with six screws (Figure 2, Item 11) and nuts (Figure 2, Item 13). Finger-tighten.
7. Position new gasket (Figure 2, Item 5) to mounting location on turbocharger (Figure 2, Item 4).
8. Align mounting holes in exhaust elbow (Figure 2, Item 7), new gasket (Figure 2, Item 5), and turbocharger (Figure 2, Item 4).
9. Secure exhaust elbow (Figure 2, Item 7) to turbocharger (Figure 2, Item 4) by installing five nuts (Figure 2, Item 8). Finger-tighten. Tighten five nuts (Figure 2, Item 8) at turbocharger (Figure 2, Item 4) to 17 – 21 ft/lb (23 – 29 Nm).
10. Tighten four nuts (Figure 2, Items 13) at bulkhead to 17 – 21 ft/lb (23 – 29 Nm).
11. Tighten clamps (Figure 2, Items 6 and 9).
12. Install top body panel (WP 0028, Remove/Install Top Body Panel).
13. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
14. Open right-side door.
15. Set engine control switch to PRIME & RUN (TM 9-6115-751-10).
16. Start generator set and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
17. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
SERVICE TURBOCHARGER

INITIAL SETUP:**Test Equipment**

Stethoscope (WP 0163, Maintenance Allocation Chart, Item 28)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Item 38)

Materials/Parts

Bottle, spray (WP 0164, Expendable and Durable Items List, Item 5)

Cleaning compound, solvent (WP 0164, Item 11)

Compound, antiseize (WP 0164, Item 14)

Distilled water, (WP 0164, Item 18)

Lubricating oil, engine (WP 0164, Item 24)

Penetrating oil, (WP 0164, Item 30)

Rag, wiping (4) (WP 0164, Item 32)

Wash, turbocharger (WP 0164, Item 38)

Personnel Required

91D (1)

References

WP 0019, Remove/Install Air Intake Hose Assemblies

WP 0036, Remove/Install Batteries

WP 0077, Remove/Install Muffler

WP 0079, Remove/Install Turbocharger

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

SERVICE TURBOCHARGER**WARNING**

- A turbocharger runs at very high speeds, becomes very hot, and requires more time to cool down than other parts of the engine assembly. Allow generator set to cool for at least 30 min before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.
- Wear heat resistant gloves and avoid contacting hot metal surfaces with hands and exposed skin after components have been heated. Wear additional protective clothing as required. Failure to comply may cause injury or death to personnel.

Inspect Turbocharger

1. Ensure equipment conditions are met in the order presented in initial setup.
2. Open left-side door.
3. Inspect turbocharger (Figure 1) for damage or cracks.
4. Replace turbocharger (Figure 1) if damaged or cracked (WP 0079, Remove/Install Turbocharger).
5. Ensure equipment conditions are met in the order presented in initial setup.
6. Open left-side door.

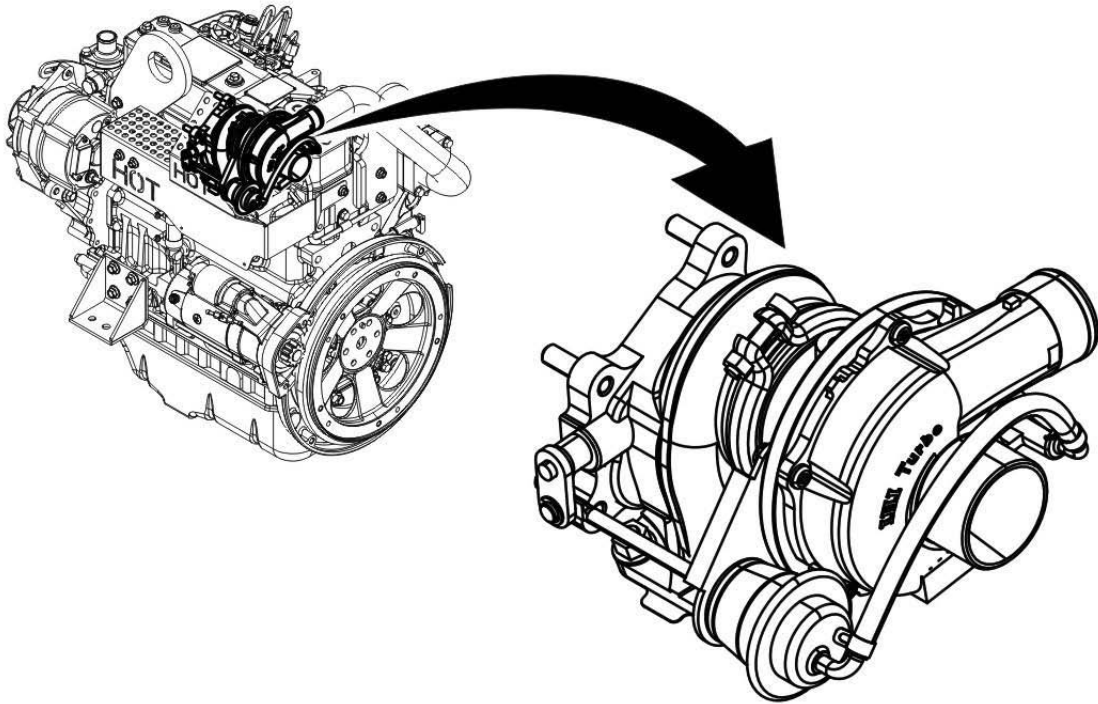


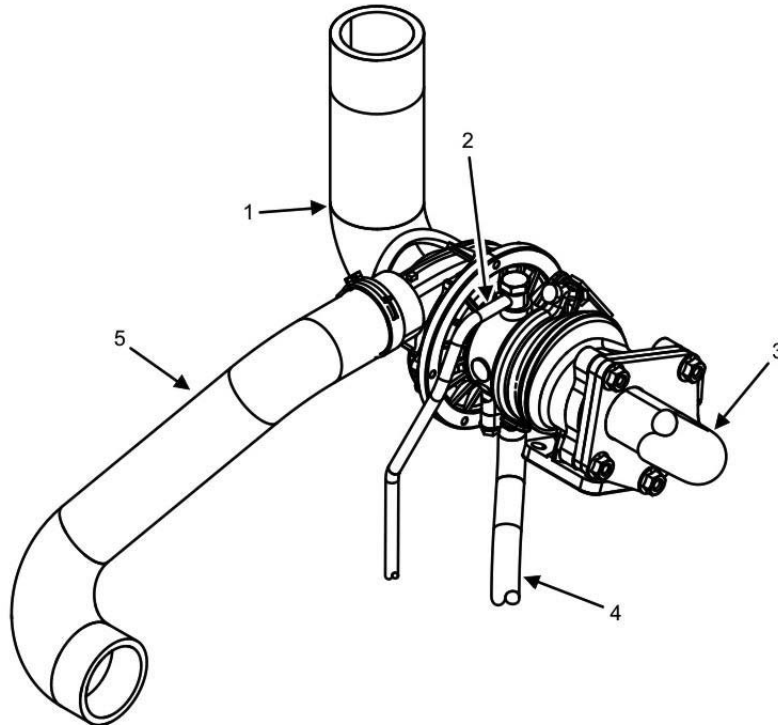
Figure 1. Inspect Turbocharger — Location.

7. Inspect turbocharger (Figure 1) for damage or cracks.
8. Replace turbocharger (Figure 1) if damaged or cracked (WP 0079, Remove/Install Turbocharger).

END OF TASK

Inspect Turbocharger for Leaks

1. Inspect turbocharger for oil leaks at the oil inlet line (Figure 2, Item 2) and oil outlet line (Figure 2, Item 4).
2. Replace oil line (Figure 2, Items 2 or 4) if leaking.
3. Inspect air inlet hose (Figure 2, Item 1) and intake air heater hose (Figure 2, Item 5).
4. Replace if hardware is cracked or broken (WP 0019, Remove/Install Air Intake Hose Assemblies).
5. Inspect exhaust outlet connection (Figure 2, Item 3) on turbocharger compressor side for cracked or broken hardware.

**Figure 2. Inspect Turbocharger — Leaks.**

6. Replace cracked or broken hardware (WP 0077, Remove/Install Muffler).

END OF TASK

Inspect Turbocharger Rotor Rotation

WARNING

Ensure engine control switch is OFF and generator set is completely shut down before performing rotor rotation inspection. Failure to comply will cause injury or death to personnel.

CAUTION

Do not insert any sharp objects into air inlet side of turbocharger. Use fingers to rotate nut on rotor shaft. Do not use pliers on fins of exhaust gas outlet side of turbocharger. Failure to comply may cause damage to equipment.

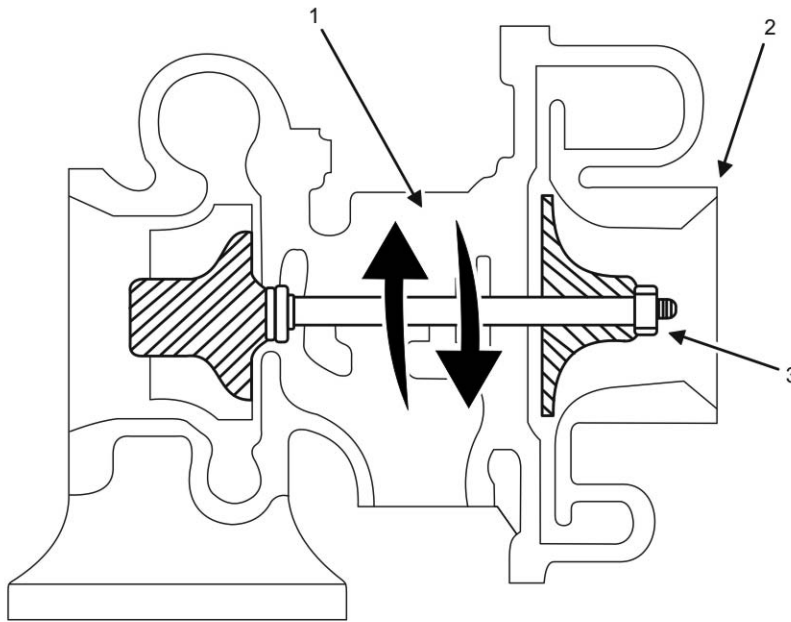


Figure 3. Inspect Turbocharger — Rotation.

1. Inspect the rotor rotation (Figure 3, Item 1) with engine control switch OFF (TM 9-6115-751-10) and battery ground cable removed (WP 0036, Remove/Install Batteries).
 - a. Remove air inlet hose clip and air inlet hose from turbocharger (Figure 3, Item 2). See Clean Turbocharger task.
 - b. Manually rotate the rotor by turning the nut (Figure 3, Item 3) in air inlet side of turbocharger (Figure 3, Item 2).
 - (1) Smooth rotor rotation (Figure 3, Item 1) indicates proper operation.
 - (2) Any catching or resistance to rotor rotation (Figure 3, Item 1) indicates improper operation.
 - c. Replace turbocharger (Figure 1) if catching or resistance to rotor rotation (Figure 3, Item 1) is found (WP 0079, Remove/Install Turbocharger).
 - d. Install air inlet hose clip and air inlet hose to turbocharger (Figure 3, Item 2). See Clean Turbocharger task.
2. Inspect the rotor rotation with engine in operation (TM 9-6115-751-10).

-
- a. Ensure battery ground cable is connected and engine control switch is set to PRIME & RUN (WP 0036, Remove/Install Batteries and TM 9-6115-751-10).
 - b. Start generator set (TM 9-6115-751-10).
 - c. Allow engine to reach normal operating temperature.

WARNING

A turbocharger runs at very high speeds, becomes very hot, and requires more time to cool down than other parts of the engine assembly. Allow generator set to cool for at least 30 min before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

- d. Place stethoscope firmly against turbocharger case.
- e. Place generator set under load.
- f. Check for high-pitched sound or sounds that indicate improper operation.
- g. Replace turbocharger if high-pitched sound is emitted (WP 0079, Remove/Install Turbocharger).

END OF TASK

Clean Turbocharger

WARNING

- Operating generator set with unit doors open or panels removed exposes personnel to a high noise level. Close unit doors and replace panels or wear hearing protection while operating or working near a running generator set. Failure to comply may cause injury or death to personnel.
- Starting engine when unit is partially disassembled is dangerous. Operate engine in this condition only as long as required to test operation. Keep away from unprotected moving engine parts during operation. Failure to comply may cause injury or death to personnel.

CAUTION

Do not spray turbocharger wash or water too quickly. Use short strokes from a spray bottle to inject turbocharger wash and water into the turbocharger. Spraying too much turbocharger wash or water or spraying too quickly will damage the turbocharger. Avoid dirty or dusty environments when running engine without air intake hose attached to turbocharger. Failure to comply will cause damage to the unit.

NOTE

The washing procedure is intended to clean the impeller on the compressor only if the engine loses rpm or seems to run slowly. The process does not require disassembling the turbocharger.

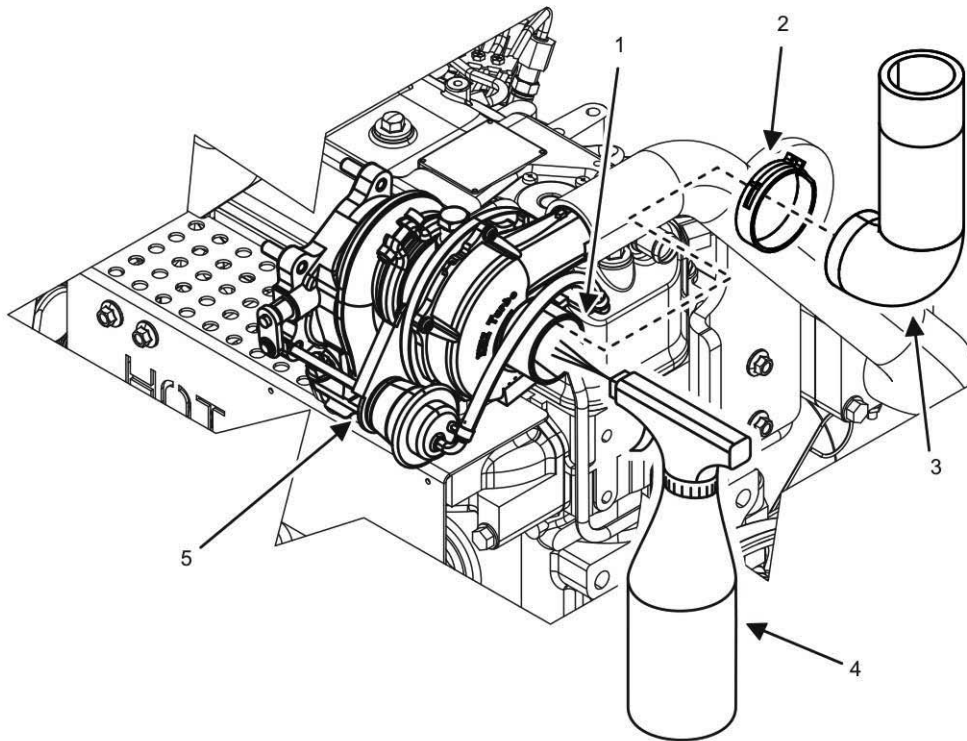


Figure 4. Clean Turbocharger.

1. Turn engine control switch to PRIME & RUN (TM 9-6115-750-10).

2. Start engine (TM 9-6115-751-10).
3. Allow engine to reach normal operating temperature.
4. Turn engine control switch to OFF (TM 9-6115-751-10).
5. Remove air inlet hose clip (Figure 4, Item 2) and air inlet hose (Figure 4, Item 3) from turbocharger (Figure 4, Item 5).
6. Restart engine (TM 9-6115-751-10).
7. Operate engine at normal load.
8. Add at least 9 oz (266 cm³) turbocharger wash to clean spray bottle (Figure 4, Item 4).
9. Spray 2 to 3 oz (60 to 90 cm³) of turbocharger wash slowly over a period of 10 to 15 sec into turbocharger air inlet (Figure 4, Item 1).
10. Continue to operate engine under same load for 3 to 4 min.
11. Fill a second clean spray bottle (Figure 4, Item 4) with clean water.
12. Spray 2 to 3 oz (60 to 90 cm³) of clean water slowly over a period of 10 to 15 sec into turbocharger air inlet (Figure 4, Item 1).
13. Continue to operate engine under normal load for at least 10 min to completely dry air inlet (Figure 4, Item 1) system and turbocharger (Figure 4, Item 5).
14. Verify engine is no longer running slowly and holds revolutions per minute.
15. Repeat steps 7 through 14 if performance has not improved.
16. Replace turbocharger (WP 0079, Remove/Install Turbocharger) if performance does not improve after executing the washing process three times.
17. Turn engine control switch to OFF (TM 9-6115-751-10) and allow engine to cool.
18. Wipe off turbocharger with wiping rags.
19. Wipe any excess turbocharger wash or water from engine and generator set with wiping rags.
20. Install air inlet hose clip (Figure 4, Item 2) and air inlet hose (Figure 4, Item 3) to turbocharger (WP 0079, Remove/Install Turbocharger).
21. Close left-side door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL TURBOCHARGER

INITIAL SETUP:**Test Equipment**

Air-Hydraulic Pump (WP 0163, Maintenance Allocation Chart, Item 4)
 Extension, Dial Indicator (WP 0163, Item 14)
 Indicator, Dial (WP 0163, Item 17)

Tools and Special Tools

Crowfoot Attachment Set, Socket Wrench Flare Nut, Metric (WP 0163, Item 12)
 Tool Kit, General Mechanic's (WP 0163, Item 38)
 Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0163, Item 48)

Materials/Parts

Gasket, turbine outlet (WP 0141, Repair Parts List, Figure 41, Item 4)
 Gasket, turbine inlet (WP 0141, Figure 41, Item 5)
 Gasket, round (M10) (2) (WP 0141, Figure 42, Item 22)
 Nut, hex flange M8 (WP 0109, Repair Parts List, Figure 9, Item 2)
 O-ring (4D P-16.0) (WP 0141, Figure 41, Item 6)
 Stud, locked in (5) (WP 0141, Figure 41, Item 3)
 Turbine (WP 0141, Figure 41, Item 2)
 Cap set, protective (WP 0164, Expendable Durable Items List, Item 9)
 Cleaning compound, solvent (WP 0164, Item 11)

Materials/Parts

Compound, antiseize (WP 0164, Item 14)
 Lubricating oil, engine (WP 0164, Item 24)
 Rag, wiping (WP 0164, Item 32)

Personnel Required

91D (1)
 Assistant (1)

Reference

WP 0019, Remove/Install Air Intake Hose Assemblies
 WP 0077, Remove/Install Muffler
 WP 0080, Remove/Install Exhaust Manifold

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)
 Engine cool
 Battery ground cable removed (WP 0036, Remove/Install Batteries)
 Remove air cleaner base cover (WP 0020, Service Air Cleaner)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL TURBOCHARGER

Remove Turbocharger

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door and locate turbocharger (Figure 1).

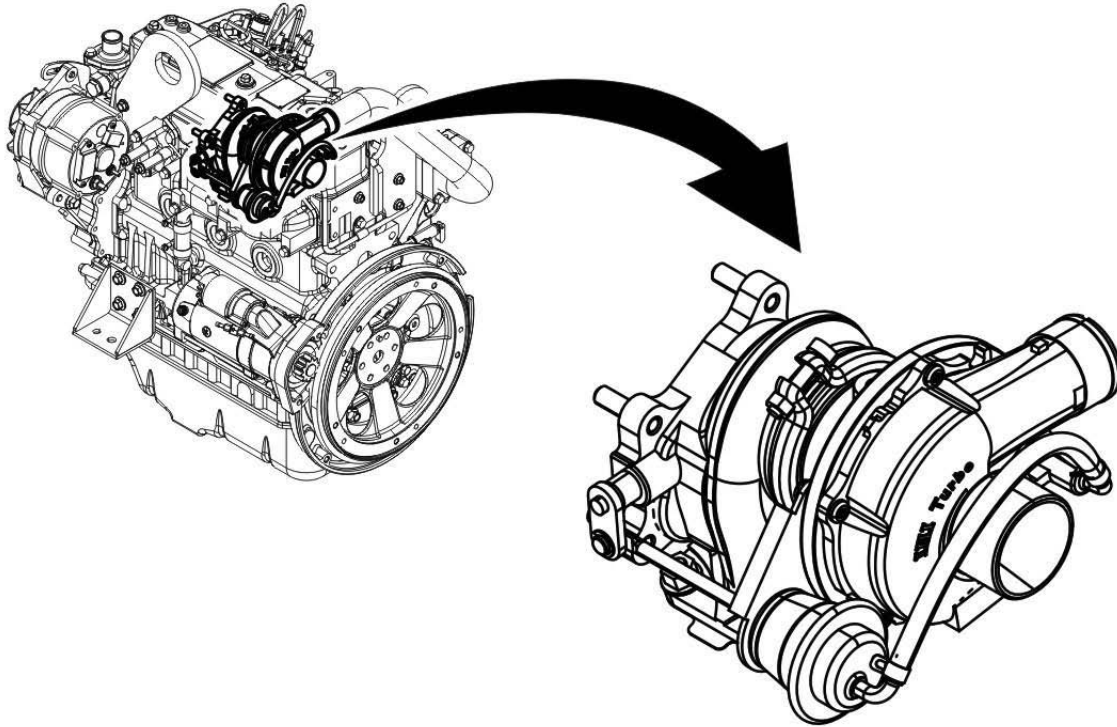


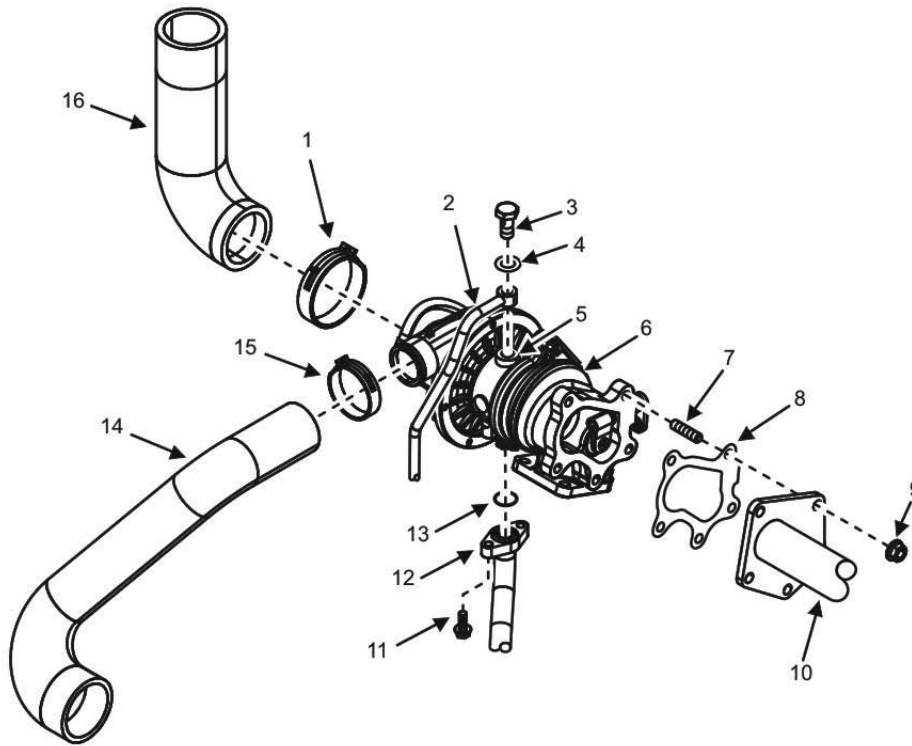
Figure 1. Turbocharger — Location.

3. Remove banjo bolt (Figure 2, Item 3) and two sealing washers (Figure 2, Item 4) securing oil inlet line (Figure 2, Item 2) to oil inlet port (Figure 2, Item 5) on turbocharger (Figure 2, Item 6). Discard sealing washers (Figure 2, Item 4).
4. Remove two bolts (Figure 2, Item 11) attaching oil outlet line (Figure 2, Item 12) to bottom of turbocharger (Figure 2, Item 6).

NOTE

Oil return line O-ring (Figure 2, Item 13) is difficult to access while turbocharger is mounted to exhaust manifold. The O-ring (Figure 2, Item 13) may need to be removed after turbocharger (Figure 2, Item 6) is removed. See step 18.

5. Remove and discard O-ring (Figure 2, Item 13) from oil outlet line (Figure 2, Item 12) if accessible.



Legend

- | | |
|--------------------------|---------------------|
| 1. Hose Clip | 10. Exhaust Outlet |
| 2. Oil Inlet Line | 11. Bolt |
| 3. Banjo Bolt | 12. Oil Outlet Line |
| 4. Sealing Washer | 13. O-Ring |
| 5. Oil Inlet Port | 14. Heater Hose |
| 6. Turbocharger | 15. Hose Clip |
| 7. Stud | 16. Air Inlet Hose |
| 8. Exhaust Outlet Gasket | |
| 9. Nut | |

Figure 2. Turbocharger and Lines — Removal.

6. Remove five nuts (Figure 2, Item 9) from five studs (Figure 2, Item 7) on exhaust outlet (Figure 2, Item 10) of turbocharger (Figure 2, Item 6).
7. Disconnect exhaust outlet (Figure 2, Item 10) from turbocharger (Figure 2, Item 6).
8. Remove and discard exhaust outlet gasket (Figure 2, Item 8).
9. Loosen hose clip (Figure 2, Item 15) on heater hose (Figure 2, Item 14).
10. Remove heater hose (Figure 2, Item 14) from turbocharger (Figure 2, Item 6).
11. Loosen hose clip (Figure 2, Item 1) on air inlet hose (Figure 2, Item 16).
12. Remove air inlet hose (Figure 2, Item 16) from turbocharger (Figure 2, Item 6).

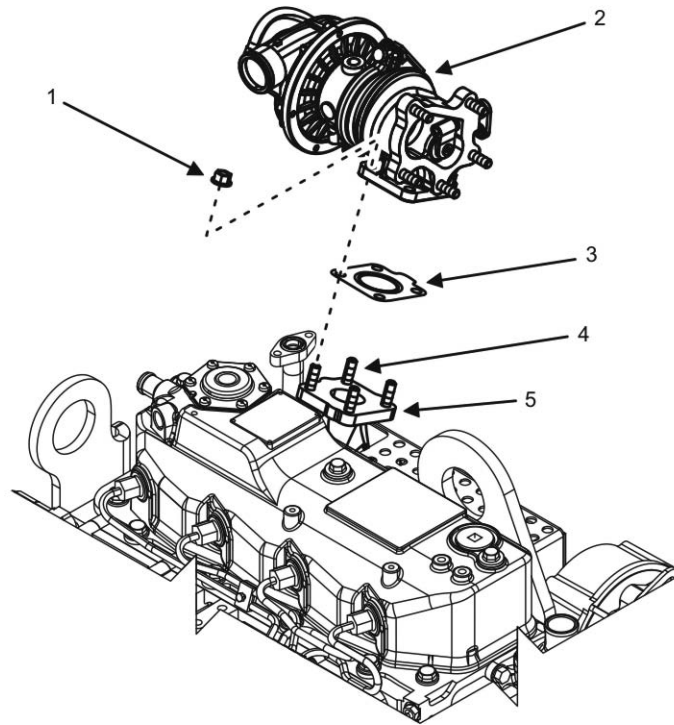


Figure 3. Turbocharger — Removal.

13. Remove four mounting nuts (Figure 3, Item 1) from four mounting studs (Figure 3, Item 4) on turbocharger (Figure 3, Item 2).
14. Remove turbocharger (Figure 3, Item 2) from exhaust manifold (Figure 3, Item 5).
15. Remove turbocharger exhaust manifold gasket (Figure 3, Item 3).
16. Discard turbocharger exhaust manifold gasket (Figure 3, Item 3).
17. Remove and discard O-ring (Figure 2, Item 13) if not removed in step 5.

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

CAUTION

Cover and protect exhaust opening in exhaust manifold to prevent dirt and debris from entering engine. Failure to comply may cause damage to equipment.

18. Clean turbocharger and exhaust manifold mounting surfaces of dirt and debris using dry cleaning solvent and wiping rags.
19. Dispose of soiled rags IAW standard SOP.

END OF TASK

Inspect Turbocharger

1. Check for oil leaks at the oil inlet and outlet lines (Figure 2, Items 2 and 12) and connections. Repair if required.

NOTE

Studs (Figure 2, Item 7) only need to be removed if damaged.

2. Inspect studs (Figure 2, Item 7) for damage. Replace as required
3. Check turbocharger (Figure 2, Item 6) for cracks or broken hardware. Replace if required.
4. Check heater hose and air inlet hoses (Figure 2, Items 14 and 16) for cracks and leaks. Replace if required (WP 0019, Remove/Install Air Intake Hose Assemblies).
5. Inspect exhaust outlet (Figure 2, Item 10) for cracks or broken hardware. Replace exhaust outlet (Figure 2, Item 10) if required (WP 0077, Remove/Install Muffler).
6. Inspect four studs (Figure 3, Item 4) on exhaust manifold for signs of damage. Replace if required (WP 0080, Remove/Install Exhaust Manifold).

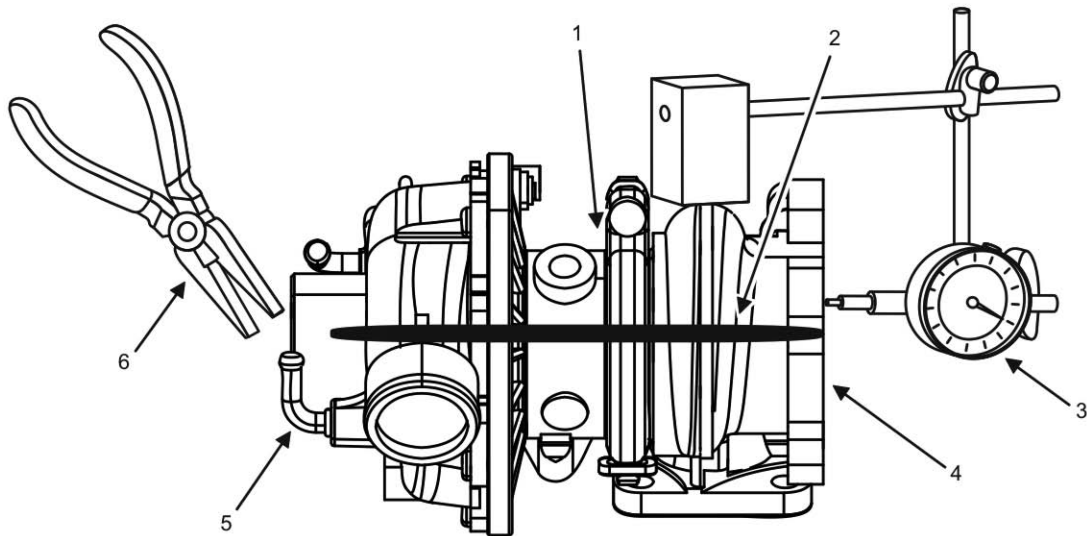


Figure 4. Rotor End Play.

NOTE

Attach dial indicator bracket on solid work surface.

7. Check rotor end play of turbocharger (Figure 4, Item 1) using a dial indicator (Figure 4, Item 3).
 - a. Insert dial indicator (Figure 4, Item 3) at end of rotor shaft (Figure 4, Item 2) on exhaust outlet end (Figure 4, Item 4) of turbocharger (Figure 4, Item 1).

CAUTION

Insert needle nose pliers into air inlet end of turbocharger and use nut on rotor shaft to move turbocharger rotor end to end. Do not use pliers on fins of turbocharger. Metal-to-metal contact will damage fins. Failure to comply may cause damage to equipment.

NOTE

The turbocharger must be stabilized before performing the test or it may result in inaccurate results.

- b. Move the rotor shaft (Figure 4, Item 2) manually on air inlet end (Figure 4, Item 5) in and out with needle nose pliers (Figure 4, Item 6) on nut while observing readings.
- c. Reference Table 1 to compare readings.

Table 1. Checking Rotor Play.

ROTOR PLAY	STANDARD DIMENSION	WEAR LIMIT
End play	0.001 – 0.0033 in (0.026 – 0.084 mm)	0.0044 in (0.09 mm)
Run-out	0.0031 – 0.0051 in (0.08 – 0.13 mm)	0.006 in (0.16 mm)

- d. Replace turbocharger (Figure 4, Item 1) if end play measurements are outside specified limits.

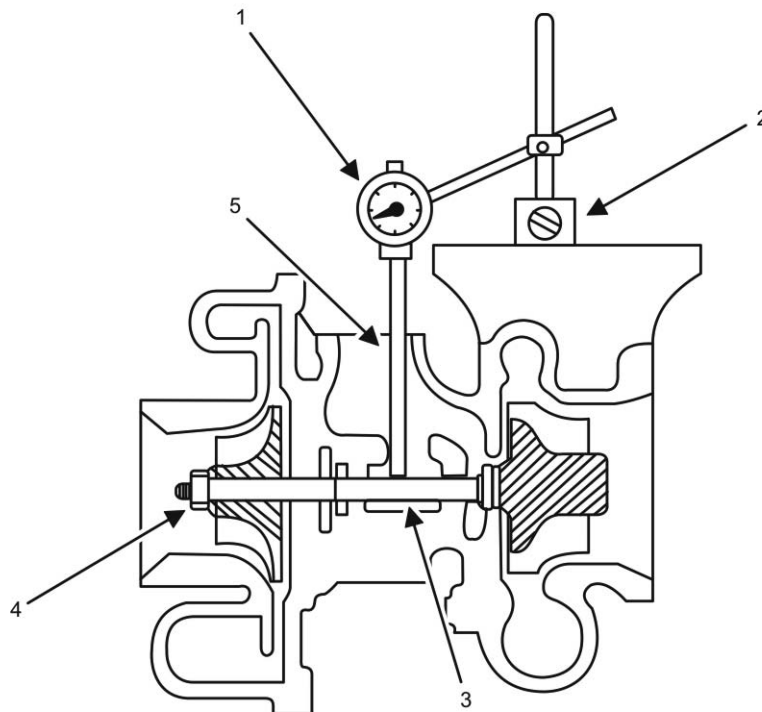


Figure 5. Rotor Run Out.

8. Check rotor shaft (Figure 5, Item 3) run out using a dial indicator (Figure 5, Item 1) and extension.
 - a. Insert dial indicator (Figure 5, Item 1) into oil outlet port (Figure 5, Item 5) against rotor shaft (Figure 5, Item 3).

CAUTION

Use a nut driver to manually turn rotor shaft nut in air inlet side of turbocharger. Do not contact the metal fins with nut driver. Do not turn rotor shaft by metal fins. Failure to comply may cause damage to equipment.

NOTE

The turbocharger must be stabilized before performing the test or it may result in inaccurate results. Attach dial indicator bracket (Figure 5, Item 2) on solid work surface.

- b. Rotate the rotor shaft manually by turning nut (Figure 5, Item 4) while observing readings.
- c. Reference Table 1 to compare readings.
- d. Replace turbocharger if run out measurements are outside specified limits.

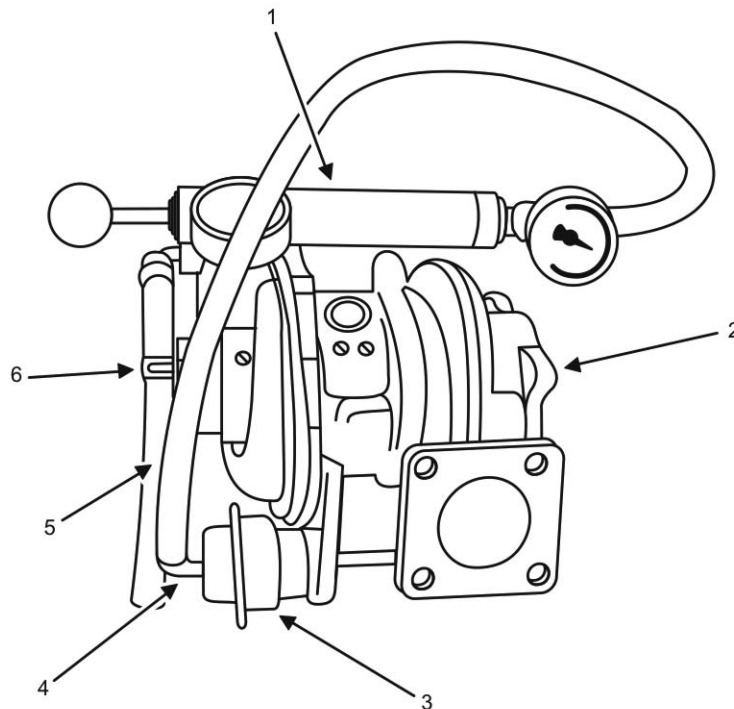


Figure 6. Waste Gate Valve.

9. Check waste gate valve on turbocharger (Figure 6, Item 3) using a hand-operated air pump (Figure 6, Item 1).
 - a. Loosen hose clip (Figure 6, Item 6) and slide back on hose (Figure 6, Item 5) of waste gate actuator pipe (Figure 6, Item 4).
 - b. Remove hose (Figure 6, Item 5) from waste gate actuator pipe (Figure 6, Item 4) on turbocharger (Figure 6, Item 3).
 - c. Connect hand-operated air pump (Figure 6, Item 1) to waste gate actuator pipe (Figure 6, Item 4).

CAUTION

Do not apply over 40 psi (2.8 kgf/cm²) to waste gate actuator. Failure to comply may cause damage to equipment.

- d. Apply 17 psi (0.12 MPa; 1.2 kgf/cm²) to waste gate actuator pipe (Figure 6, Item 4).
 - e. Ensure that waste gate valve opens fully by looking into exhaust outlet end (Figure 6, Item 2) of turbocharger (Figure 6, Item 3).
 - f. Replace turbocharger (Figure 6, Item 3) if waste gate valve does not open fully.
 - g. Release pressure from hand-operated air pump (Figure 6, Item 1).
10. Perform a waste gate actuator leak test.
 - a. Apply 17 psi (0.12 MPa; 1.2 kgf/cm²) to waste gate actuator pipe (Figure 6, Item 4).
 - b. Allow pressure to remain in circuit for 1 min.
 - c. Observe pressure reading.
 - d. Replace turbocharger (Figure 6, Item 3) if pressure reading is less than 15.9 psi (0.11 MPa; 1.1 kgf/cm²) after 1 min.
 11. Remove hand-operated air pump (Figure 6, Item 1) from waste gate actuator pipe (Figure 6, Item 4).
 12. Install hose (Figure 6, Item 5) to waste gate actuator pipe (Figure 6, Item 4) and secure with hose clip (Figure 6, Item 6).

END OF TASK

Install Turbocharger

CAUTION

Lube oil return pipe O-ring (Figure 2, Item 13) is difficult to access while turbocharger is mounted to exhaust manifold. O-ring should be installed before installing turbocharger to exhaust manifold. Take precaution to prevent loss or damage to O-ring when installing. Failure to comply may cause damage to equipment.

1. Coat new O-ring (Figure 2, Item 13) with a light coat of clean engine oil prior to installation.
2. Position new O-ring (Figure 2, Item 13) on oil outlet line (Figure 2, Item 12).
3. Position new turbocharger exhaust manifold gasket (Figure 3, Item 3) on the exhaust manifold (Figure 3, Item 5).
4. Position turbocharger (Figure 3, Item 2) on exhaust manifold (Figure 3, Item 5).

CAUTION

Use of a crowfoot in combination with a torque wrench will be required to access turbocharger mounting nuts in order to torque to specification. When using a crowfoot with a torque wrench, reduce torque value by 10%. Failure to comply may cause damage to equipment.

5. Install four nuts (Figure 3, Item 1) to four turbocharger mounting studs (Figure 3, Item 4).
6. Install two bolts (Figure 2, Item 11) to oil outlet line (Figure 2, Item 12) to secure oil outlet line (Figure 2, Item 12) to turbocharger (Figure 2, Item 6).
7. Install heater hose (Figure 2, Item 14) to turbocharger (Figure 2, Item 6) and secure by installing hose clip (Figure 2, Item 15).

8. Install air inlet hose (Figure 2, Item 16) to turbocharger (Figure 2, Item 6) securely by installing hose clip (Figure 2, Item 1).
9. Apply antiseize compound and install new studs (Figure 2, Item 7), if necessary.
10. Install new exhaust outlet gasket (Figure 2, Item 8) on exhaust outlet.
11. Install turbocharger (Figure 2, Item 6) to five studs (Figure 2, Item 7).
12. Install and tighten five nuts (Figure 2, Item 9) on studs (Figure 2, Item 7) securing exhaust outlet (Figure 2, Item 10) to turbocharger (Figure 2, Item 6).
13. Remove cap/plug from oil inlet port (Figure 2, Item 5) on turbocharger (Figure 2, Item 6).
14. Pour 2 oz (60 cm³) of clean engine oil in the oil inlet port (Figure 2, Item 5). Rotate turbocharger's compressor wheel by hand to ensure shaft bearings are lubricated.
15. Position oil inlet line (Figure 2, Item 2) to oil inlet port (Figure 2, Item 5).
16. Secure oil inlet line (Figure 2, Item 2) to oil inlet port (Figure 2, Item 5) by installing two new sealing washers (Figure 2, Item 4) and banjo bolt (Figure 2, Item 3).
17. Torque banjo bolt (Figure 2, Item 3) to 19.6 – 25.76 Nm (14-19 ft/lb).
18. Install air cleaner base cover (WP 0020, Service Air Cleaner).
19. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
20. Close left-side door.
21. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
22. Start engine and check for oil and exhaust leaks and proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
23. Repair as required.
24. Dispose of soiled rags IAW local SOP.
25. Ensure oil level is at proper operating level (TM 9-6115-751-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL EXHAUST MANIFOLD

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special ToolsSocket, Socket Wrench, 3/8" Dr, 6Pt, Regular, 12mm
(WP 0163, Maintenance Allocation Chart, Item 26)Tool Kit, General Mechanic's (GMTK) (WP 0163,
Item 38)Wrench, Torque, Click Ratcheting, 1/2" Drive, 250
FT-LB (WP 0163, Item 45)**Materials/Parts**Gasket, exhaust manifold (WP 0136, Repair Parts
List, Figure 36, Item 1)Gasket, round (M10) (WP 0141, Repair Parts List,
Figure 41, Item 22)

Manifold, exhaust (WP 0136, Figure 36, Item 3)

O-ring (4D P-16.0) (WP 0141, Figure 41, Item 6)

Cap set, protective (WP 0164, Expendable and
Durable Items List, Item 9)

Cleaning compound, solvent (WP 0164, Item 11)

Compound, antiseize (WP 0164, Item 14)

Materials/Parts

Lubricating oil, engine (WP 0164, Item 24)

Rag, wiping (WP 0164, Item 32)

Personnel Required

91D (1)

Assistant (1)

References

Not Applicable

Equipment ConditionsEngine control switch OFF (TM 9-6115-751-10, WP
0005)

Engine cool

Battery ground cable removed (WP 0036,
Remove/Install Batteries)Turbocharger removed (WP 0079, Remove/Install
Turbocharger)**Special Environmental Conditions**

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL EXHAUST MANIFOLD**WARNING**

Exhaust system can get very hot. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.

Remove Exhaust Manifold

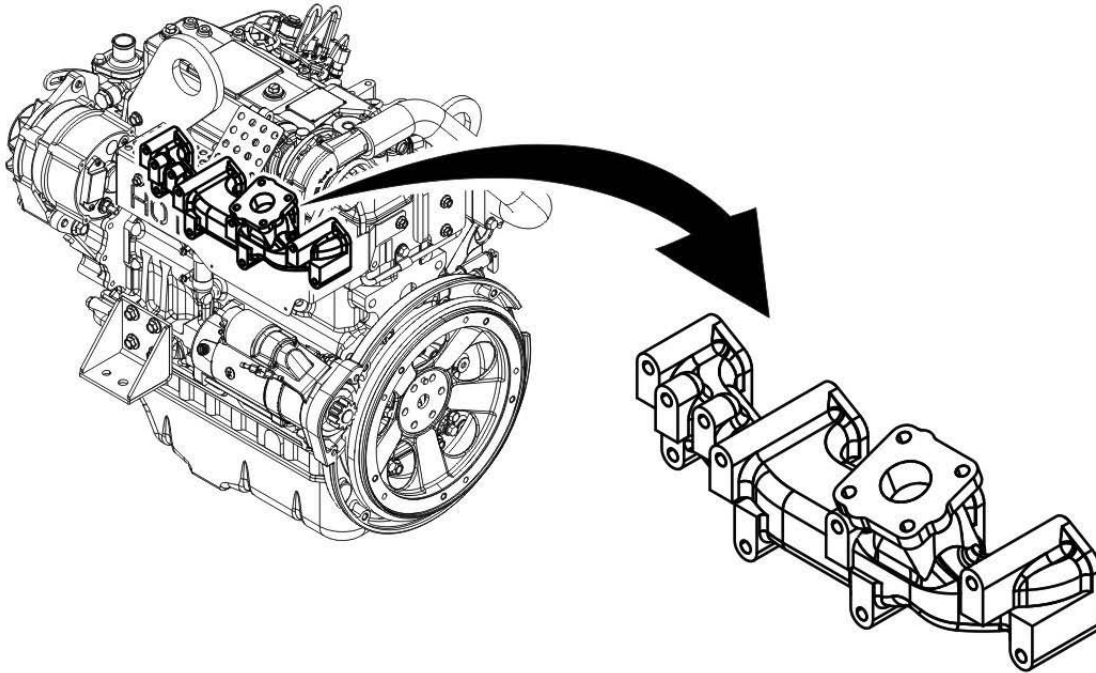


Figure 1. Exhaust Manifold — Location.

1. Ensure equipment conditions are met in order presented in initial setup
2. Open left-side door and locate exhaust manifold (Figure 1).
3. Remove screw (Figure 2, Item 5) and two screws (Figure 2, Item 7) that secure exhaust heat shield (Figure 2, Item 6) to exhaust manifold (Figure 2, Item 3).
4. Remove exhaust heat shield (Figure 2, Item 6) from engine.
5. Inspect exhaust heat shield (Figure 2, Item 6) for signs of obvious damage. Replace damaged exhaust heat shield (Figure 2, Item 6). Otherwise, set exhaust heat shield (Figure 2, Item 6) aside for reuse.

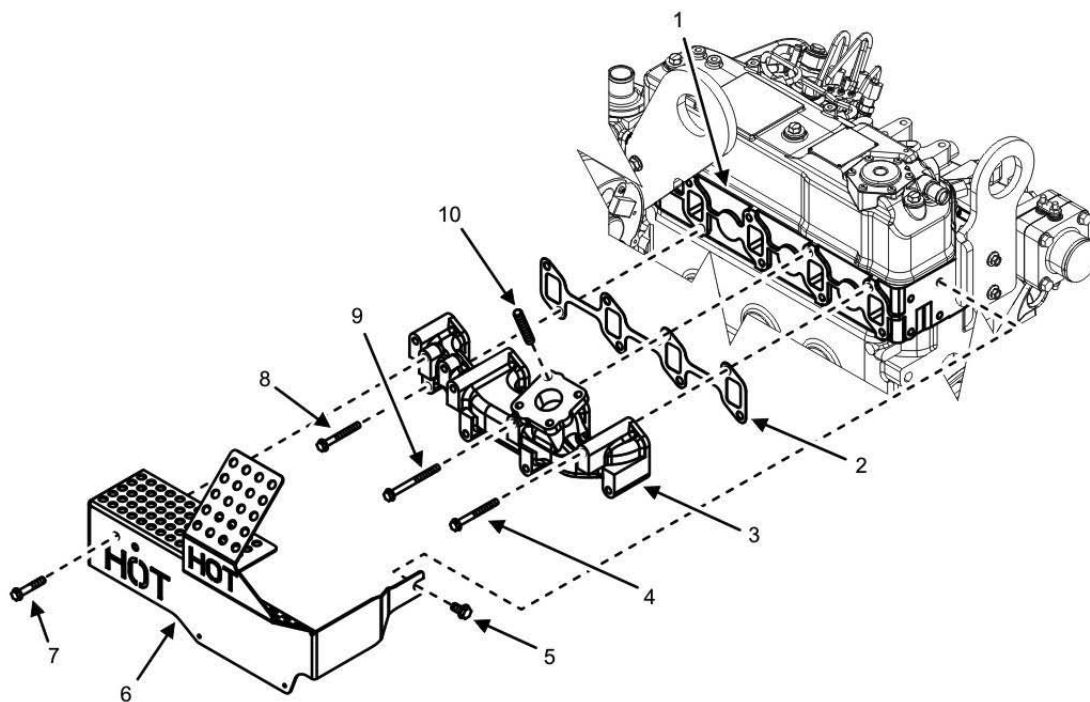


Figure 2. Exhaust Manifold Details — Removal.

NOTE

Exhaust manifold mounting screws (Figure 2, Items 4, 8, and 9) are of varying lengths. Note the position of the screws during removal to aid installation.

6. Remove eight screws (Figure 2, Items 4, 8, and 9) that secure exhaust manifold (Figure 2, Item 3) to cylinder head (Figure 2, Item 1).
7. Remove exhaust manifold (Figure 2, Item 3) from cylinder head (Figure 2, Item 1).
8. Remove and discard gasket (Figure 2, Item 2) from cylinder head (Figure 2, Item 1).
9. Cap/plug openings in cylinder head (Figure 2, Item 1) to prevent dirt and debris from entering engine.
10. Remove dirt, debris, and residual gasket material from exhaust manifold (Figure 2, Item 3) and mounting surface of cylinder head (Figure 2, Item 1).

NOTE

If replacing exhaust manifold with a new exhaust manifold, the four studs that secure the turbocharger to the exhaust manifold must be removed and set aside for reuse on new exhaust manifold.

11. Remove four studs (Figure 2, Item 10) from exhaust manifold (Figure 2, Item 3) and set aside for reuse.

END OF TASK

Inspect Exhaust Manifold

1. Inspect exhaust manifold (Figure 2, Item 3) visually for cracks and damage.
2. Replace exhaust manifold (Figure 2, Item 3) if cracked or damaged.
3. Inspect studs (Figure 2, Item 10) on exhaust manifold (Figure 2, Item 3) for damaged threads.
4. Replace studs (Figure 2, Item 10) on exhaust manifold (Figure 2, Item 3) if threads are damaged.

END OF TASK**Install Exhaust Manifold**

1. Remove caps/plugs from cylinder head (Figure 2, Item 1).
2. Clean dirt and debris from mounting surfaces of exhaust manifold (Figure 2, Item 3) and cylinder head (Figure 2, Item 1) with wiping rag prior to installation.
3. Install studs (Figure 2, Item 10) to exhaust manifold (Figure 2, Item 3).
4. Position new gasket (Figure 2, Item 2) to mounting location on exhaust manifold (Figure 2, Item 3).

NOTE

Have an assistant help to support exhaust manifold (Figure 2, Item 3) and gasket (Figure 2, Item 2) while mounting screws (Figure 2, Items 4, 8, and 9) are being installed.

5. Position exhaust manifold (Figure 2, Item 3) to mounting location on cylinder head (Figure 2, Item 1) and align the mounting holes.

NOTE

Exhaust manifold mounting screws (Figure 2, Items 4, 8, and 9) are of varying lengths. Use note made at removal to install screws (Figure 2, Items 4, 8, and 9) to the correct locations.

6. Secure exhaust manifold (Figure 2, Item 3) to cylinder head (Figure 2, Item 1) by installing screws (Figure 2, Items 4, 8, and 9) finger-tight.
7. Tighten screws (Figure 2, Items 4, 8, and 9).
8. Position exhaust heat shield (Figure 2, Item 6) to exhaust manifold (Figure 2, Item 3) and secure by installing screw (Figure 2, Item 5) and two screws (Figure 2, Item 7).
9. Install turbocharger (WP 0079, Remove/Install Turbocharger).
10. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
11. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
12. Start engine and check for exhaust leaks and proper operation (TM 9-6115-751-10).
13. Repair as required.
14. Dispose of soiled rags IAW local SOP.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL ENGINE SPEED SENSOR

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Sensor, magnetic speed (WP 0127, Repair Parts List, Figure 27, Item 1)

Grease, electrically conductive (WP 0164, Expendable and Durable Items List, Item 21)

Personnel Required

91D (1)

References

Not Applicable

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL ENGINE SPEED SENSOR**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

Adjust Engine Speed Sensor

1. Ensure equipment conditions are met in the order presented in initial setup.
2. Open right-side door.
3. Locate engine speed sensor (Figure 1) on engine flywheel housing (Figure 2, Item 5).

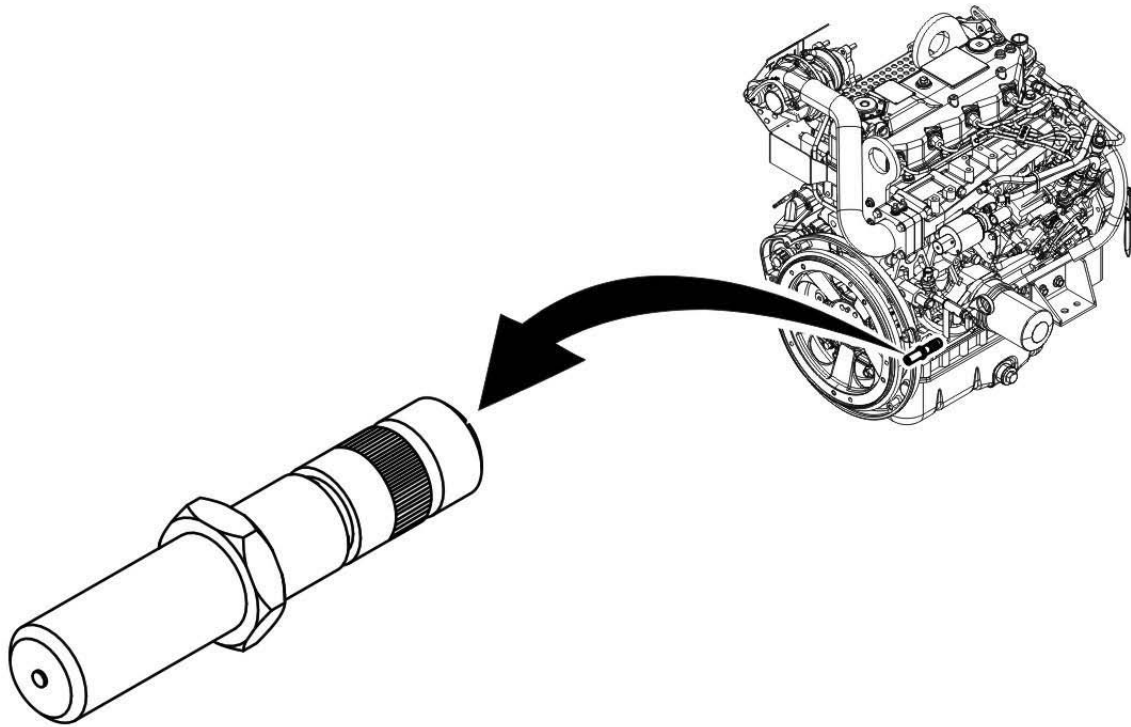


Figure 1. Engine Speed Sensor — Location.

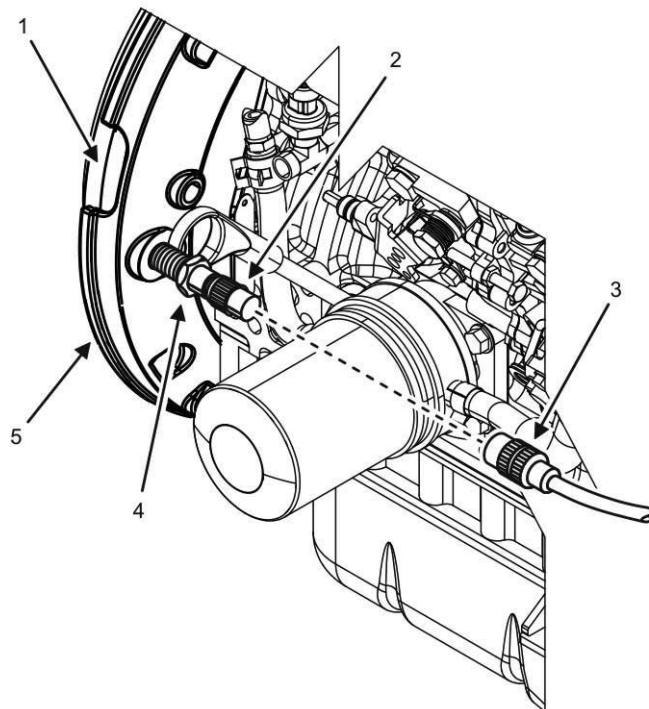


Figure 2. Engine Speed Sensor — Adjust.

CAUTION

Engine speed sensor (Figure 2, Item 2) is a magnetic pickup device. There must be a specific gap between engine speed sensor (Figure 2, Item 2) and flywheel (Figure 2, Item 1). Engine speed reading will not be transmitted to unit DCS if gap is not within specification or if engine speed sensor (Figure 2, Item 2) contacts flywheel (Figure 2, Item 1). Failure to comply may cause damage to equipment.

NOTE

Gap between tip of engine speed sensor (Figure 2, Item 2) and flywheel (Figure 2, Item 1) should be 0.025 in (0.635 mm).

1. Adjust gap of engine speed sensor (Figure 2, Item 2) as follows:
 - a. Disconnect electrical connector (Figure 2, Item 3) from engine speed sensor (Figure 2, Item 2).
 - b. Loosen jam nut (Figure 2, Item 4) that secures engine speed sensor (Figure 2, Item 2) to flywheel housing (Figure 2, Item 5).

CAUTION

Engine speed sensor (Figure 2, Item 2) is very fragile. When adjusting engine speed sensor (Figure 2, Item 2), turn sensor inward very slowly until engine speed sensor (Figure 2, Item 2) just touches flywheel (Figure 2, Item 1). Hard contact with the flywheel (Figure 2, Item 1) may cause engine speed sensor (Figure 2, Item 2) to fail. Failure to comply may cause damage to equipment.

- c. Turn engine speed sensor (Figure 2, Item 2) slowly inward (clockwise) until engine speed sensor (Figure 2, Item 2) just contacts flywheel.
 - d. Tighten jam nut (Figure 2, Item 4) until it lightly touches flywheel housing (Figure 2, Item 5).
 - e. Turn engine speed sensor (Figure 2, Item 2) (with jam nut (Figure 2, Item 4) attached) outward (counterclockwise) until gap between flywheel housing (Figure 2, Item 5) and jam nut (Figure 2, Item 4) is 0.032 – 0.035 in.
 - f. Tighten jam nut (Figure 2, Item 4) firmly against flywheel housing (Figure 2, Item 5) while holding the engine speed sensor (Figure 2, Item 2) stationary to maintain the correct gap.
 - g. Connect electrical connector (Figure 2, Item 3) to engine speed sensor (Figure 2, Item 2).
2. Install negative ground cable to right-hand battery. (WP 0036, Remove/Install Batteries).
 3. Close generator set doors door.
 4. Turn engine control switch to PRIME and RUN (TM 9-6115-751-10).
 5. Start engine and check for proper operation (TM 9-6115-751-10).
 6. Repair as required.

END OF TASK

Remove Engine Speed Sensor

1. Ensure equipment conditions are met in the order presented in initial setup.
2. Open right-side door.
3. Locate engine speed sensor (Figure 1).

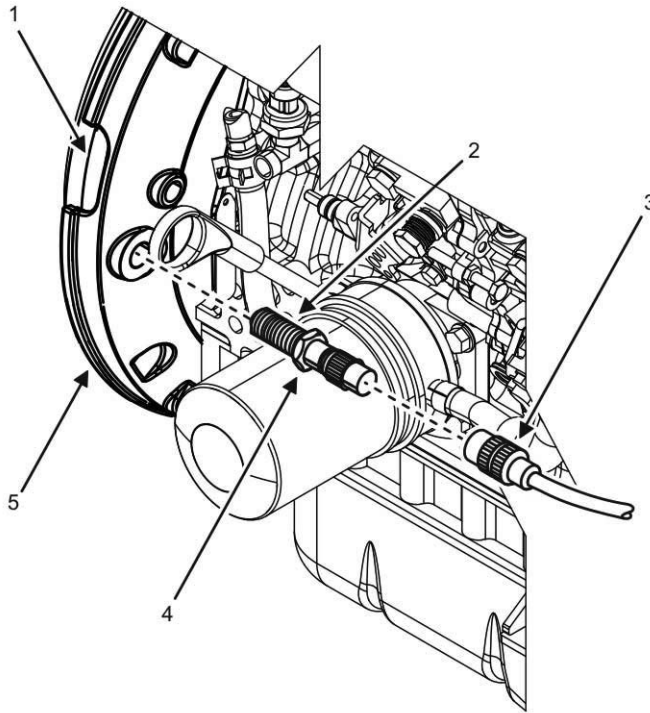


Figure 3. Engine Speed Sensor — Removal.

4. Disconnect electrical connector (Figure 3, Item 3) at engine speed sensor (Figure 3, Item 2).
5. Loosen jam nut (Figure 3, Item 4) that secures engine speed sensor (Figure 3, Item 2) to flywheel housing (Figure 3, Item 5).
6. Remove engine speed sensor (Figure 3, Item 2) from flywheel housing (Figure 3, Item 5) by turning engine speed sensor (Figure 3, Item 2) counterclockwise.
7. Inspect engine speed sensor (Figure 3, Item 2) for signs of obvious damage. Replace damaged engine speed sensor (Figure 3, Item 2) as required.

END OF TASK

Install Engine Speed Sensor

1. Position engine speed sensor (Figure 3, Item 2) to its mounting location on intake side of engine at flywheel housing (Figure 3, Item 5).

CAUTION

Engine speed sensor (Figure 3, Item 2) is a magnetic pickup device. There must be a specific gap between engine speed sensor (Figure 3, Item 2) and flywheel (Figure 3, Item 1). Engine speed reading will not be transmitted to unit DCS if gap is not within specification or if engine speed sensor (Figure 3, Item 2) contacts flywheel (Figure 3, Item 1). Failure to do so may cause damage to equipment.

2. Install engine speed sensor (Figure 3, Item 2) into flywheel housing (Figure 3, Item 5) by turning clockwise. Stop installation before engine speed sensor (Figure 3, Item 2) contacts flywheel (Figure 3, Item 1).
3. Adjust gap between engine speed sensor (Figure 3, Item 2) and flywheel (Figure 3, Item 1). See Adjust Engine Speed Sensor task.
4. Connect electrical connector (Figure 3, Item 3) to engine speed sensor (Figure 3, Item 2).
5. Close generator set doors.
6. Install negative ground cable to right-hand battery (WP 0036, Remove/Install Batteries).
7. Turn engine control switch to PRIME and RUN (TM 9-6115-751-10).
8. Start engine and check for proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
9. Repair as required.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL VALVE COVER

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Crowfoot Attachment Set, Socket Wrench, Flare Nut, Metric (WP 0163, Maintenance Allocation Chart, Item 12)

Socket, Socket Wrench, 3/8" Dr, 6Pt, Regular, 12mm (WP 0163, 26)

Socket, Socket Wrench, 3/8" Dr, 6Pt, Regular, 17mm (WP 0163, Item 27)

Tool Kit, General Mechanic's (GMTK) (WP 0163, Item 38)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0163, Item 46)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0163, Item 48)

Materials/Parts

Gasket, valve cover (WP 0143, Repair Parts List, Figure 43, Item 7)

O-ring 1A P-32.0 (WP 0143, Figure 43, Item 17)

Packing, P12.0 (3) (WP 0143, Figure 43, Item 19)

Brush, wire, scratch (WP 0164, Expendable and Durable Items List, Item 8)

Cap set, protective (WP 0164, Item 9)

Materials/Parts

Cleaning compound, solvent (WP 0164, Item 11)

Fuel, diesel (WP 0164, Item 19)

Grease, general purpose (WP 0164, Item 22)

Pan, drain (WP 0164, Item 29)

Rag, wiping (WP 0164, Item 32)

Personnel Required

91D (1)

Assistant (1)

References

WP 0043, Service Fuel System

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL VALVE COVER**WARNING**

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

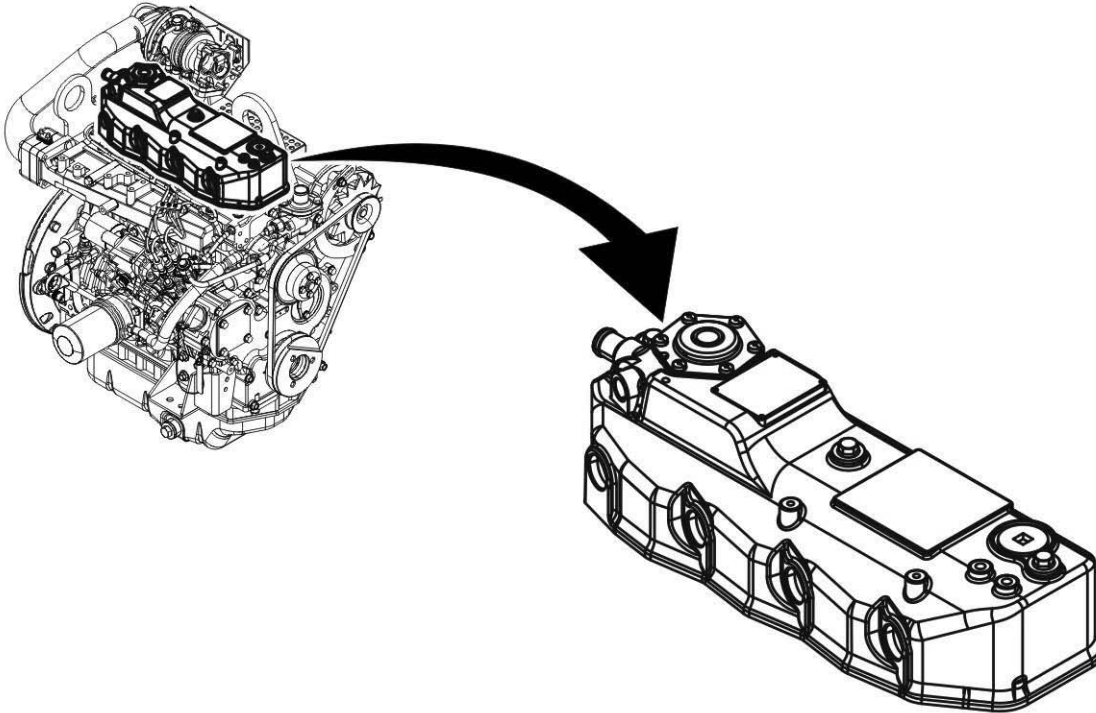
Remove Valve Cover

Figure 1. Valve Cover and Crankcase Breather — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side doors and locate valve cover (Figure 1).
3. Remove two screws (Figure 2, Item 2) that secure lower radiator tube (Figure 2, Item 3) support bracket (Figure 2, Item 4) to engine.
4. Clean area around fuel injection lines (Figure 2, Item 9) and valve cover (Figure 2, Item 6) with dry cleaning solvent and wiping rags to prevent contamination from entering fuel system.
5. Place wiping rags under fuel injection lines (Figure 2, Item 9) to capture spilled fuel.

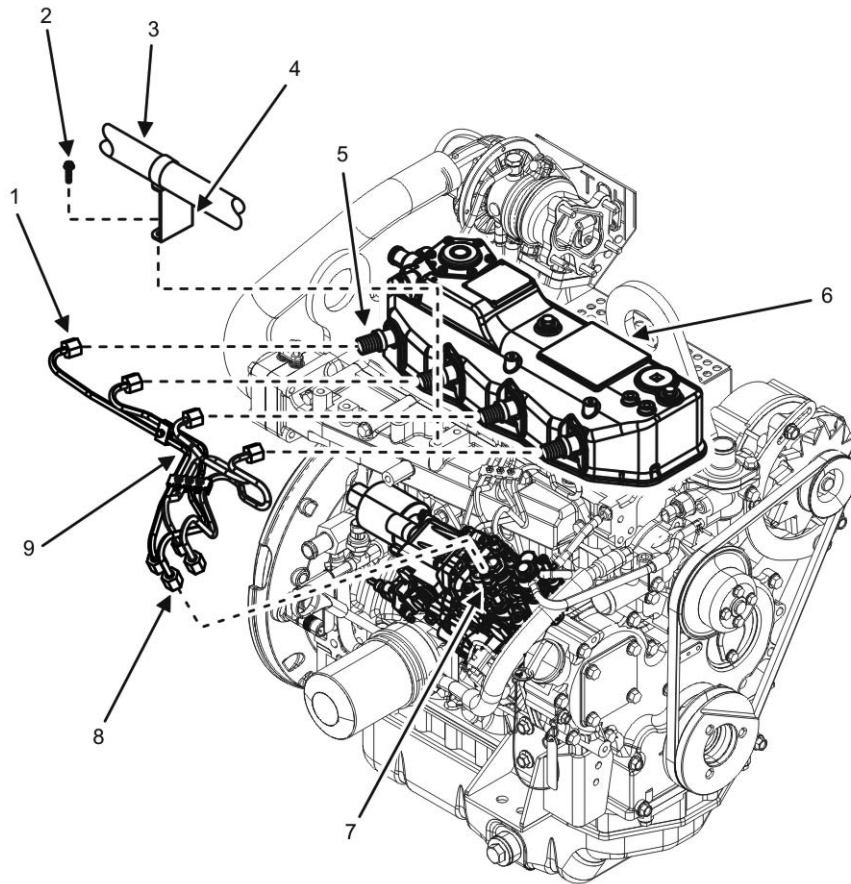


Figure 2. High-Pressure Fuel Injection Lines Detail — Removal.

CAUTION

Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system. Failure to comply may cause damage to equipment.

To prevent rounding the fuel injection line nuts, always use a flare nut wrench. When loosening the fuel injection line nuts, always hold the fuel injection pump delivery valves with a second wrench to prevent loosening of the delivery valves. Failure to comply may cause damage to equipment.

6. Use flare nut wrench to loosen four nuts (Figure 2, Item 1) on high-pressure fuel injection lines (Figure 2, Item 9) from fuel injectors (Figure 2, Item 5).
7. Use flare nut wrench to loosen four nuts (Figure 2, Item 8) of high-pressure fuel injection lines (Figure 2, Item 9) from fuel injection pump delivery valves (Figure 2, Item 7) while using a second wrench to secure fuel injection pump delivery valves (Figure 2, Item 7).

CAUTION

Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system. Failure to comply may cause damage to equipment.

To aid in reinstallation, remove high-pressure fuel injection lines as an assembly. Disassembling the high-pressure fuel injection lines from the retainers or bending any of the high-pressure fuel injection lines will make it difficult to reinstall the fuel lines. Failure to comply may cause damage to equipment.

8. Lift lower radiator tube support bracket (Figure 2, Item 4) slightly to allow removal of high-pressure fuel injection lines (Figure 2, Item 9).
9. Remove high-pressure fuel injection lines (Figure 2, Item 9) as an assembly from the engine using wiping rag to capture excess fuel.
10. Set high-pressure fuel injection lines (Figure 2, Item 9) on a level surface.
11. Cap/plug all open fittings on fuel injectors and fuel lines.

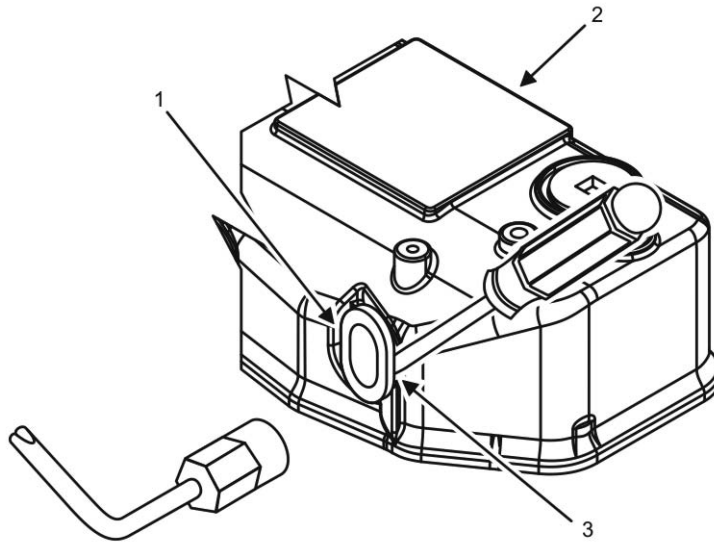


Figure 3. Remove Fuel Injector Grommet.

12. Remove grommets (Figure 3, Item 1) from valve cover (Figure 3, Item 2) with flat tip screwdriver at the notch (Figure 3, Item 3) located on the valve cover (Figure 3, Item 2).

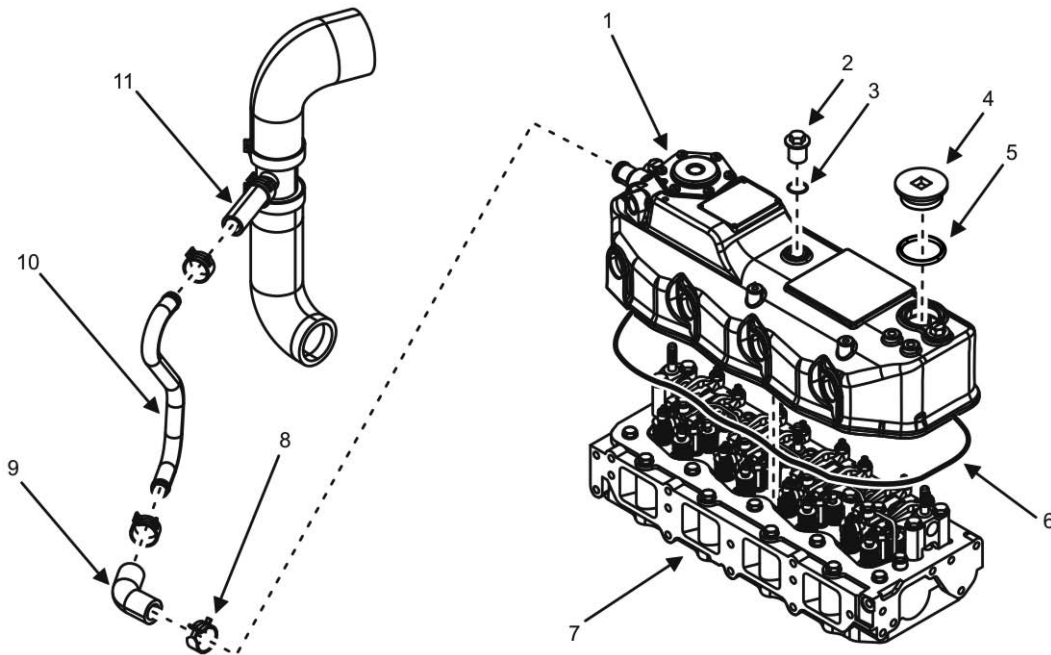


Figure 4. Remove Valve Cover — Detail.

13. Remove crankcase breather line coupling (Figure 4, Item 9) from valve cover (Figure 4, Item 1) by opening clamp (Figure 4, Item 8) and sliding away from valve cover (Figure 4, Item 1).
14. Allow clamp (Figure 4, Item 8) to remain on crankcase breather line coupling (Figure 4, Item 9).
15. Remove crankcase breather line (Figure 4, Item 10) from crankcase breather line coupling (Figure 4, Item 11) by opening clamp (Figure 4, Item 8) and sliding away from crankcase breather line coupling (Figure 4, Item 11).
16. Allow clamp (Figure 4, Item 8) to remain on crankcase breather line (Figure 4, Item 10).
17. Place crankcase breather line (Figure 4, Item 10) on a suitable work surface.
18. Remove three valve cover nuts (Figure 4, Item 2).
19. Remove and discard valve cover nut O-rings (Figure 4, Item 3).

NOTE

It may be necessary to lightly tap valve cover (Figure 4, Item 1) using a rubber mallet to loosen the valve cover from the cylinder head (Figure 4, Item 7).

20. Remove valve cover (Figure 4, Item 1) from cylinder head (Figure 4, Item 7).

NOTE

If replacing existing valve cover (Figure 4, Item 1) with a new valve cover (Figure 4, Item 1), cap (Figure 4, Item 4) will need to be removed and saved for reuse on replacement valve cover (Figure 4, Item 1).

21. Remove cap (Figure 4, Item 4) and O-ring (Figure 4, Item 5) from valve cover (Figure 4, Item 1) and set aside for reuse. Discard O-ring (Figure 4, Item 5).

CAUTION

If scraping of gasket material from valve cover (Figure 4, Item 1) is required, be sure to prevent gasket debris from entering the cylinder head (Figure 4, Item 7) assembly. Dislodged gasket material can clog oil passages and lead to engine damage. Failure to comply will cause damage to equipment.

22. Remove and discard valve cover gasket (Figure 4, Item 6).
23. Place valve cover (Figure 4, Item 1) on a suitable work surface.

NOTE

Disassembly of the crankcase breather assembly is only necessary if performing cleaning of crankcase breather assembly.

24. Remove six screws (Figure 5, Item 2) securing diaphragm cover (Figure 5, Item 3) on valve cover (Figure 5, Item 4).
25. Remove diaphragm cover (Figure 5, Item 3), diaphragm (Figure 5, Item 1), spring (Figure 5, Item 6), and diaphragm plate (Figure 5, Item 5).

NOTE

Dispose of soiled rags IAW local SOP.

26. Clean valve cover (Figure 4, Item 1) and cylinder head (Figure 4, Item 7) of gasket residue and sludge with dry cleaning solvent and soft wiping rag.

END OF TASK

Inspect Valve Cover

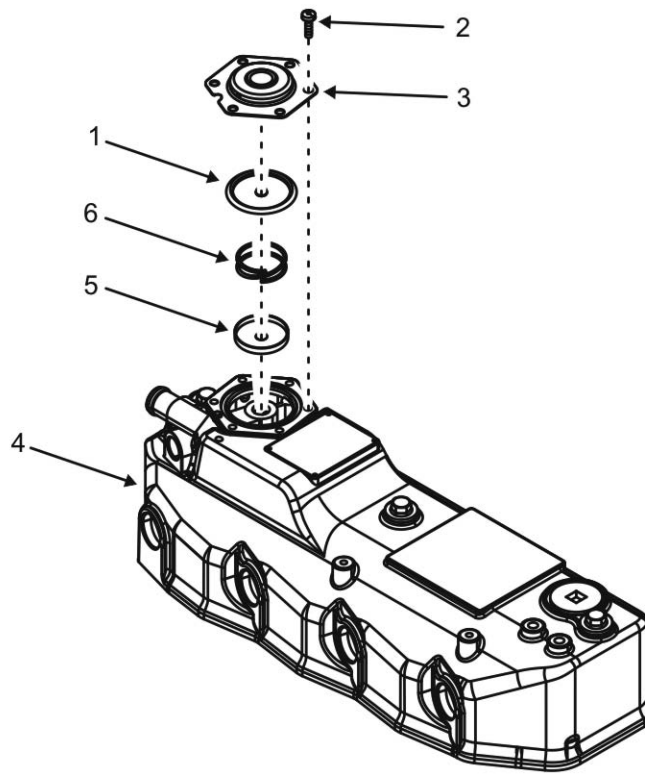


Figure 5. Remove Crankcase Breather Assembly — Detail.

1. Inspect valve cover (Figure 4, Item 1) for dents, cracks, and valve cover gasket residue.
2. Replace valve cover (Figure 4, Item 1) if cracked or severely dented, or if cracks or dents contact the valve train.
3. Inspect valve cover bonnet nuts for damage.
4. Replace damaged valve cover bonnet nuts.
5. Inspect crankcase breather line (Figure 4, Item 10) for cracks and/or deterioration.
6. Replace crankcase breather line (Figure 4, Item 10) if cracked or severely deteriorated.

WARNING

Eye protection is required when working with compressed air. Do not use compressed air to clean skin. Do not aim at personnel. Compressed air can propel particles at high velocity and injure eyes. Failure to comply may cause injury or death to personnel.

7. Clean interior of crankcase breather line (Figure 4, Item 10) with compressed air.
8. Inspect crankcase breather line coupling (Figure 4, Item 11).
9. Inspect diaphragm (Figure 5, Item 1) for tears.
10. Replace diaphragm (Figure 5, Item 1) if torn.
11. Inspect spring (Figure 5, Item 6) for distortion.
12. Replace spring (Figure 5, Item 6) if distorted.

13. Inspect diaphragm plate and cover (Figure 5, Items 5 and 3) for damage.
14. Replace diaphragm plate and cover (Figure 5, Items 5 and 3) as required.
15. Inspect screws (Figure 5, Item 2) for damage.
16. Replace screws (Figure 5, Item 2) as required.

NOTE

Dispose of soiled rags in IAW local SOP.

17. Clean crankcase breather assembly components (Figure 5, Items 1, 5, and 6) with dry cleaning solvent and a soft wiping rag.

END OF TASK

Install Valve Cover

NOTE

Steps 1 and 2 only need to be performed if crankcase breather assembly was disassembled for cleaning.

1. Install diaphragm plate (Figure 5, Item 5), diaphragm (Figure 5, Item 1), and spring (Figure 5, Item 6) into valve cover (Figure 5, Item 4).
2. Install diaphragm cover (Figure 5, Item 3) with six screws (Figure 5, Item 2).

NOTE

If replacing existing valve cover with a new valve cover, cap from old valve cover will need to be installed on new valve cover.

3. Lubricate O-ring (Figure 4, Item 5) with multipurpose grease.
4. Install cap (Figure 4, Item 4) with new O-ring (Figure 4, Item 5) to valve cover (Figure 4, Item 1).
5. Apply a light coat of multipurpose grease to new valve cover gasket (Figure 4, Item 6).
6. Position new valve cover gasket (Figure 4, Item 6) inside groove on valve cover (Figure 4, Item 1).
7. Position valve cover (Figure 4, Item 1) on cylinder head (Figure 4, Item 7).
8. Lubricate three new O-rings (Figure 4, Item 3) with multipurpose grease.
9. Attach valve cover (Figure 4, Item 1) with three valve cover nuts (Figure 4, Item 2) and three new O-rings (Figure 4, Item 3). Finger-tighten.
10. Tighten valve cover nuts (Figure 4, Item 2) to 7 – 9 ft/lb (9.8 – 11.8 Nm).
11. Attach crankcase breather line (Figure 4, Item 10) to crankcase breather line coupling (Figure 4, Item 11).
12. Secure crankcase breather line (Figure 4, Item 10) by sliding the clamp (Figure 4, Item 8) onto the crankcase cover breather line coupling (Figure 4, Item 11).
13. Attach the crankcase breather line coupling (Figure 4, Item 9) to the valve cover (Figure 4, Item 1).
14. Secure crankcase breather line coupling (Figure 4, Item 9) by sliding the clamp (Figure 4, Item 8) onto the valve cover (Figure 4, Item 1).
15. Insert grommets (Figure 3, Item 1) into valve cover (Figure 3, Item 2).

16. Lift lower radiator tube support bracket (Figure 2, Item 4) slightly to allow high pressure fuel injection lines to be positioned.

CAUTION

To prevent rounding the fuel line nuts, always use a flare nut wrench. When loosening the fuel line nuts, always hold the fuel injection pump delivery valves with a second wrench to prevent loosening of the delivery valves.

17. Position fuel injection lines (Figure 2, Item 9) on fuel injectors (Figure 2, Item 5) and fuel injection pump delivery valves (Figure 2, Item 7).
18. Use flare nut wrench to tighten four nuts (Figure 2, Item 1) of high-pressure fuel injection lines (Figure 2, Item 9) to fuel injectors (Figure 2, Item 5).
19. Use flare nut wrench to tighten four nuts (Figure 2, Item 1) of high-pressure fuel injection lines (Figure 2, Item 9) to fuel injection pump delivery valves (Figure 2, Item 7) while using a second wrench to secure fuel injection pump delivery valves (Figure 2, Item 7).

CAUTION

Use of a crowfoot in combination with a torque wrench will be required to torque fuel injection line nuts to specification. When using a crowfoot with a torque wrench, reduce torque value by 10%. Failure to comply may cause damage to equipment.

20. Tighten all high-pressure fuel injection lines to between 22 – 25 ft/lb (29 – 34 Nm).
21. Install two screws (Figure 2, Item 2) to secure lower radiator tube support bracket (Figure 2, Item 4) to engine.
22. Purge air from fuel system (WP 0043, Service Fuel System).
23. Install battery ground cable (WP 0036, Remove/Install Batteries).
24. Close right-side door.
25. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
26. Start engine and check for oil, fuel or air leaks and proper operation (TM 9-6115-751-10).
27. Repair as required.
28. Dispose of soiled rags IAW local SOP.
29. Ensure oil level is at proper operating level (TM 9-6115-751-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
SERVICE ENGINE VALVES

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Gasket, valve cover (WP 0143, Repair Parts List, Figure 43, Item 7)

Packing, P12.0 (3) (WP 0143, Figure 43, Item 19)

Cap set, protective (WP 0164, Expendable and Durable Items List, Item 9)

Cleaning compound, solvent (WP 0164, Item 11)

Grease, electrically conductive, (WP 0164, Item 21)

Grease, general purpose (WP 0164, Item 22)

Rag, wiping (1) (WP 0164, Item 32)

Personnel Required

91D (1)

Assistant (1)

References

Not Applicable

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Access panel removed (WP 0029, Remove/Install Front Body Panel)

Valve cover removed (WP 0082, Remove/Install Valve Cover)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

SERVICE ENGINE VALVES**WARNING**

- Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.
- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

WARNING

- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator set is running. Failure to comply may cause injury or death to personnel.

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

If there is no rocker arm/valve clearance when the cylinder is at TDC of the compression stroke, extreme wear and damage to the cylinder head and valves is possible. Ensure valve adjustment is carried out properly and valve bridge lock nuts and rocker arm adjustment lock nuts are secure. Failure to comply will cause damage to equipment.

Check Valve Clearance

NOTE

Cylinder number one is located at the flywheel end of the engine. The exhaust valve is operated by the short rocker arm, the intake valve is operated by the long rocker arm (Figure 1).

This engine uses four valves per cylinder. The cylinder head operates two valves with a single rocker arm by employing a valve bridge between the two valves. Set clearance between the valve bridge and valves before adjusting the clearance between the rocker arm and the valve bridge.

TDC is found when both rocker arms on the cylinder being adjusted are loose and the cylinder TDC mark on the flywheel is visible through the timing port of the flywheel housing. The firing order of the engine is 1-3-4-2. Table 1 shows the valves that can be adjusted when either cylinder number one or cylinder number four is at TDC.

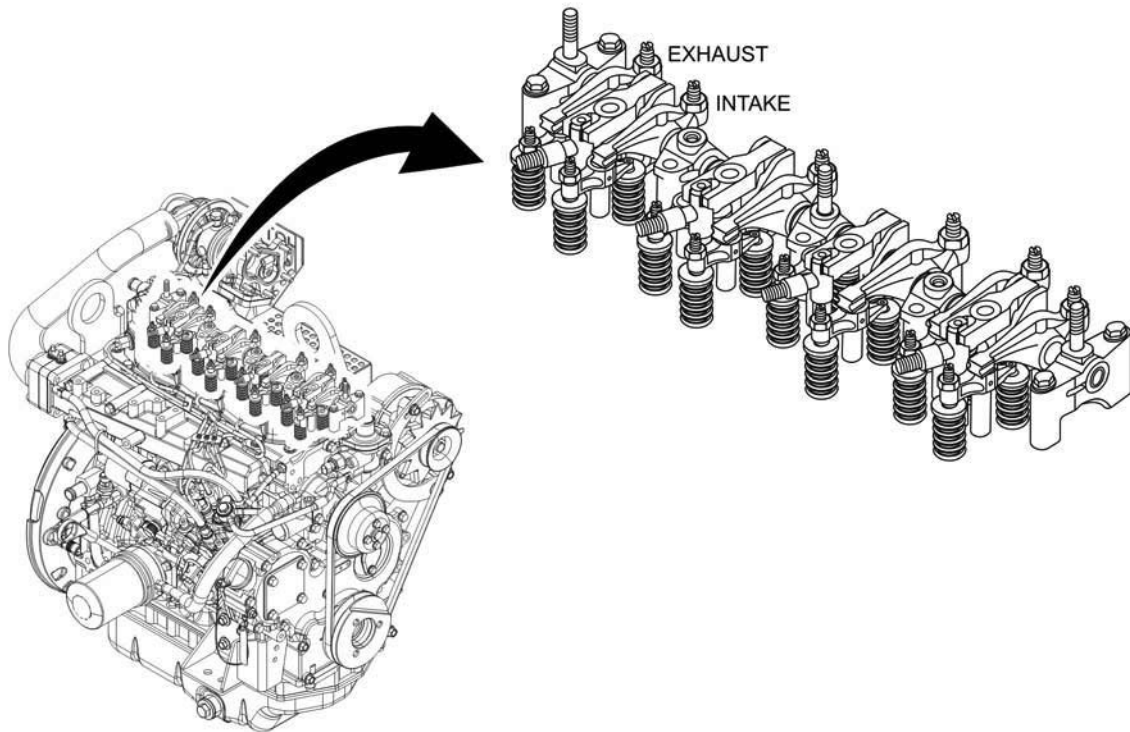


Figure 1. Valve Locations.

Table 1. Valve Closure.

CYLINDER NO.	1		2		3		4	
	Exhaust	Intake	Exhaust	Intake	Exhaust	Intake	Exhaust	Intake
Cylinder One at TDC	X	X		X	X			
Cylinder Four at TDC			X			X	X	X

NOTE

Rotate crankshaft clockwise (from coolant pump end) to bring piston number one to TDC for compression stroke. Fuel injectors may be removed if necessary to remove compression when rotating engine by hand.

If adjusting cylinders individually, the cylinder to be adjusted first does not have to be the number one cylinder. Select and adjust the cylinder where the piston is nearest to TDC after turning the crankshaft. Make adjustment to the other cylinders in firing order by turning the crankshaft 180 degrees in a clockwise direction after each adjustment.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right- and left-side doors.
3. Locate engine valves and rocker arms (Figure 1).
4. Turn harmonic balancer hex cap screw (not shown) clockwise from water pump end to bring cylinder number one (closest to flywheel end) to TDC.
5. Ensure that exhaust valves on cylinder number one open and close followed by the intake valves opening and closing (Table 1).

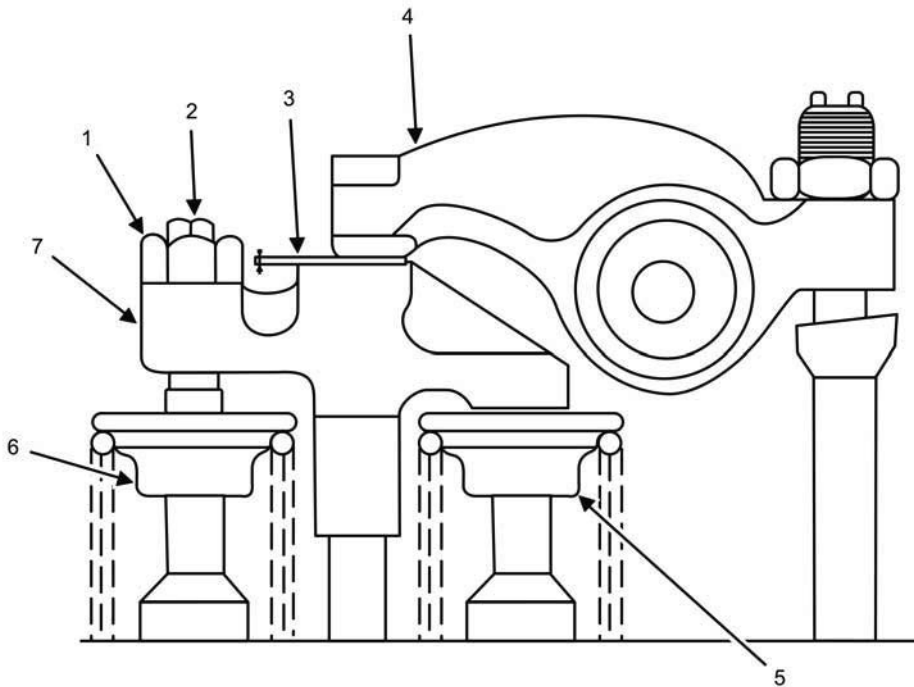


Figure 2. Valve Bridge and Rocker Arm Details.

6. Mark a TDC reference mark on harmonic balancer (not shown) in relation to front gear case cover (not shown).
7. Confirm TDC on compression stroke has been established in cylinder number one (Table 1) by moving valve bridge (Figure 2, Item 7) of intake and/or exhaust valves (Figure 2, Items 5 and 6) up and down, checking for looseness.
8. Ensure that valve bridge (Figure 2, Item 7) is contacting both valves (Figure 2, Items 5 and 6).

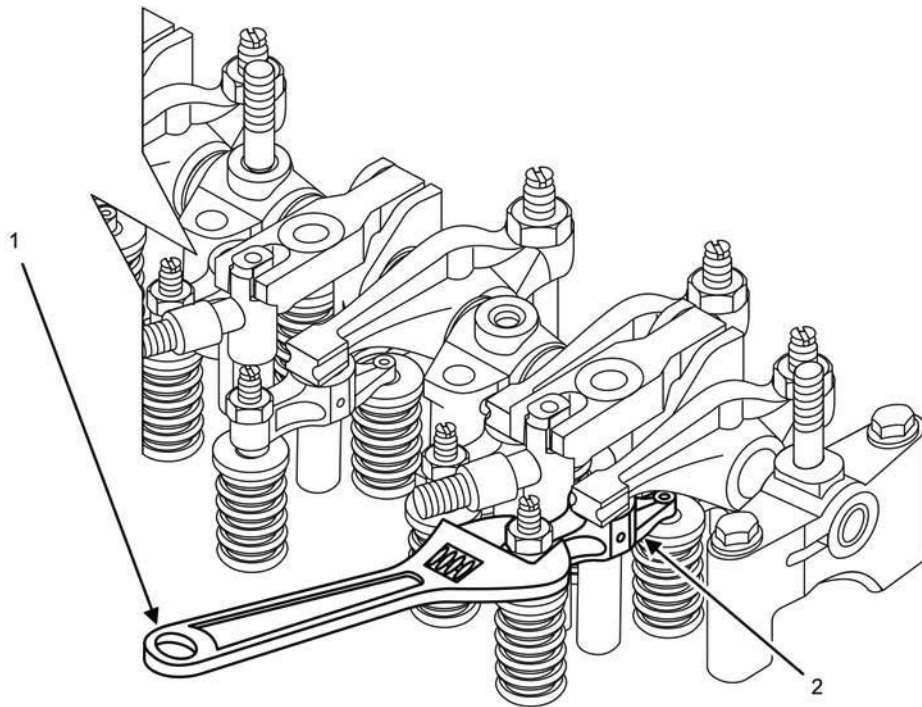


Figure 3. Secure Valve Bridge.

CAUTION

Loosen adjusting screw lock nut only while holding the valve bridge securely using an adjustable wrench. Adjusting the valves without securing the valve bridge may result in bending the valve stems. Failure to comply will cause damage to equipment.

9. Secure valve bridge (Figure 3, Item 2) with adjustable wrench (Figure 3, Item 1).
10. Loosen valve bridge (Figure 2, Item 7) adjusting screw lock nut (Figure 2, Item 1) while holding the valve bridge (Figure 3, Item 2) in position with an adjustable wrench (Figure 3, Item 1).
11. Ensure valve bridge (Figure 2, Item 7) contacts the rear valve (Figure 2, Item 5).
 - a. Press downward on the valve bridge (Figure 2, Item 7) with light finger pressure.
 - b. Loosen valve bridge adjusting screw (Figure 2, Item 2) until there is visible clearance between the valve bridge adjusting screw (Figure 2, Item 2) and front valve (Figure 2, Item 6).
 - c. Adjust the valve bridge adjusting screw (Figure 2, Item 2) until there is zero clearance between the valve bridge adjusting screw (Figure 2, Item 2) and the front valve (Figure 2, Item 6).
12. Ensure valve bridge (Figure 2, Item 7) has equal contact with front valve (Figure 2, Item 6) and rear valve (Figure 2, Item 5).

NOTE

There is a tendency for the clearance to decrease slightly when the adjusting screw lock nut is tightened. Ensure the initial clearance adjustment is slightly loose before tightening the adjusting screw lock nut.

13. Tighten adjusting screw lock nut (Figure 2, Item 1) while continuing to hold valve bridge (Figure 3, Item 2) with adjustable wrench (Figure 3, Item 1).

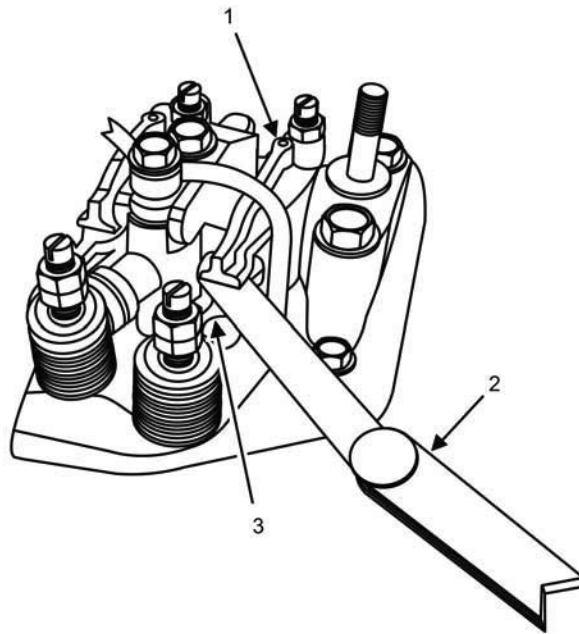


Figure 4. Check Valve Clearance at Rocker Arm.

14. Check valve clearance between valve bridge (Figure 4, Item 3 and Figure 2, Item 7) and rocker arm (Figure 4, Item 1 and Figure 2, Item 4).
 - a. Insert feeler gage (Figure 4, Item 2 and Figure 2, Item 3) that drags lightly in gap between valve bridge (Figure 4, Item 3 and Figure 2, Item 7) and rocker arm (Figure 4, Item 1 and Figure 2, Item 4) to check for clearance.
 - b. Record clearance results of feeler gage (Figure 4, Item 2 and Figure 2, Item 3) measurement to use as a wear indicator.
 - c. Compare clearance to factory specifications:
 - (1.) Minimum factory specification of 0.006 in (0.152 mm).
 - (2.) Maximum factory specification of 0.010 in (0.25 mm).

NOTE

It is advisable to adjust each valve (if required) as it is checked.

- d. Adjust valve clearance if measurement is not within specifications. See Adjust Engine Valves task.
15. Repeat steps 8 through 14 for remaining valves (Table 1).
16. Repeat steps 4 through 15 for cylinder four and complete remaining adjustments (Table 1).
17. Install valve cover (WP 0082, Remove/Install Valve Cover).
18. Install access panel (WP 0029, Remove/Install Top Body Panel).
19. Install battery ground cable (WP 0036, Remove/Install Batteries).
20. Close right- and left-side doors.
21. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
22. Start engine and check for leaks and proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).

23. Repair as required.

END OF TASK

Adjust Valve Clearance

1. Check clearance gap for dirt and wear.
2. Remove dirt with wiping rag if present.

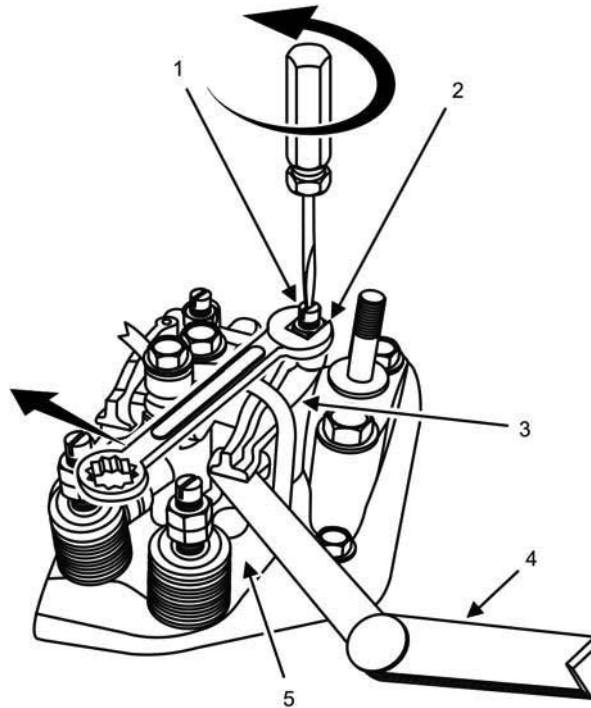


Figure 5. Adjust Valve Clearance at Rocker Arm.

3. Loosen valve adjusting screw lock nut (Figure 5, Item 2).
4. Loosen valve adjusting screw (Figure 5, Item 1) sufficiently to allow easy insertion of thickness gage (Figure 5, Item 4).
5. Insert thickness gage (Figure 5, Item 4) of 0.008 in (0.20 mm) size between valve bridge (Figure 5, Item 5) and rocker arm (Figure 5, Item 3).
6. Tighten valve adjusting screw (Figure 5, Item 1) until a slight drag is felt on the thickness gage (Figure 5, Item 4) as it is being slid back and forth.

NOTE

Clearance tends to slightly decrease when valve adjusting screw lock nut (Figure 5, Item 2) is tightened. It is recommended to make the initial clearance adjustment slightly loose before tightening valve adjusting screw lock nut (Figure 5, Item 2).

7. Tighten valve adjusting screw lock nut (Figure 5, Item 2) while holding valve adjusting screw (Figure 5, Item 1) in place.
8. Verify clearance and adjust as necessary.

-
9. Apply light coat of lubricating oil to contact surfaces of push rod (not shown) and valve adjusting screw (Figure 5, Item 1).
 10. Repeat steps 1 through 9 for remaining valves in need of adjustment.
 11. Install valve cover (WP 0082, Remove/Install Valve Cover).
 12. Install access panel (WP 0029, Remove/Install Front Body Panel).
 13. Install battery ground cable (WP 0036, Remove/Install Batteries).
 14. Close right- and left-side doors.
 15. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
 16. Start engine and check for leaks and proper operation. Apply 100% rated load for 30 min or until coolant reaches normal operating temperature (TM 9-6115-751-10).
 17. Repair as required.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL FLYWHEEL

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0163, Item 46)

Materials/Parts

Flywheel (WP 0138, Repair Parts List, Figure 38, Item 3)

Flywheel (WP 0138, Figure 38, Item 4)

Screw, hex flange head (M10 X 1.5 X 25) (6) (WP 0138, Figure 38, Item 6)

Alcohol, denatured (WP 0164, Expendable and Durable Items, Item 1)

Antifreeze, ethylene glycol (WP 0164, Item 2)

Cap set, protective (WP 0164, Item 9)

Cloth, abrasive, crocus (WP 0164, Item 12)

Compound, antiseize (WP 0164, Item 14)

Distilled water, (WP 0164, Item 18)

Grease, electrically conductive (WP 0164, Item 21)

Lubricating oil, engine (WP 0164, Item 24)

Pan, drain (3) (WP 0164, Item 29)

Materials/Parts

Penetrating oil ,(2) (WP 0164, Item 30)

Rag, wiping (6) (WP 0164, Item 32)

Sealant (WP 0164, Item 33)

Soap, ivory (WP 0164, Item 34)

Tag, marker (WP 0164, Item 36)

Personnel Required

91D (1)

Assistant (1)

References

Not Applicable

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Engine assembly removed (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly)

Special Environmental Conditions

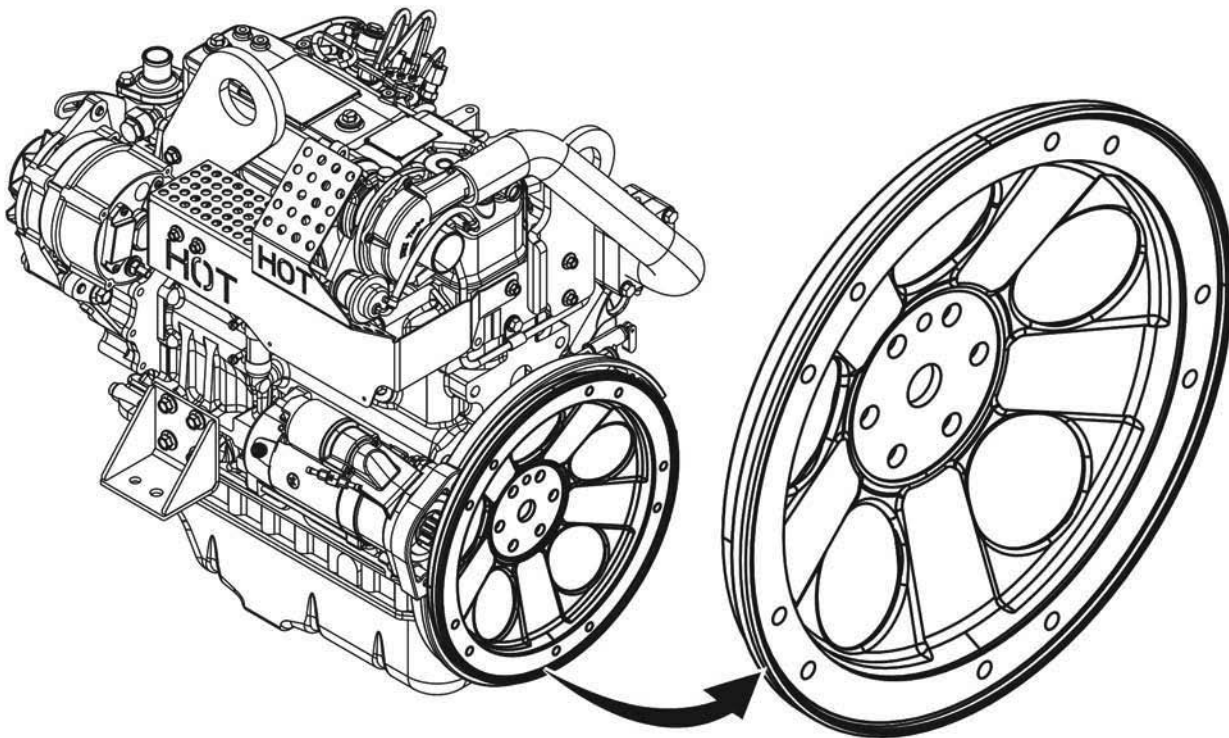
Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL FLYWHEEL**WARNING**

- Support components when removing/installing the attaching hardware or component may fall. Failure to comply may cause injury or death to personnel and damage to equipment.
- When lifting the engine, use lifting equipment with minimum lifting capacity of 500 lb (227 kg). Do not stand or put arms, legs, or any body part under hoisted load. Do not permit engine to swing while hoisted. Failure to comply may cause injury or death to personnel.

Remove Flywheel**Figure 1. Flywheel — Location.****NOTE**

The engine must be removed from the generator set to gain access to the flywheel. Remove the flywheel from the engine while the engine is still suspended on the lifting device.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate flywheel (Figure 1) on engine assembly.

NOTE

Proper orientation of the flywheel (Figure 2, Item 3) to the engine crankshaft is ensured by the indexing dowel pin (Figure 2, Item 2) installed in the crankshaft. There is no need to mark flywheel (Figure 2, Item 3) and crankshaft prior to removal.

- Secure crankshaft flange (Figure 2, Item 5) in position by having assistant hold harmonic balancer bolt (not shown) steady.

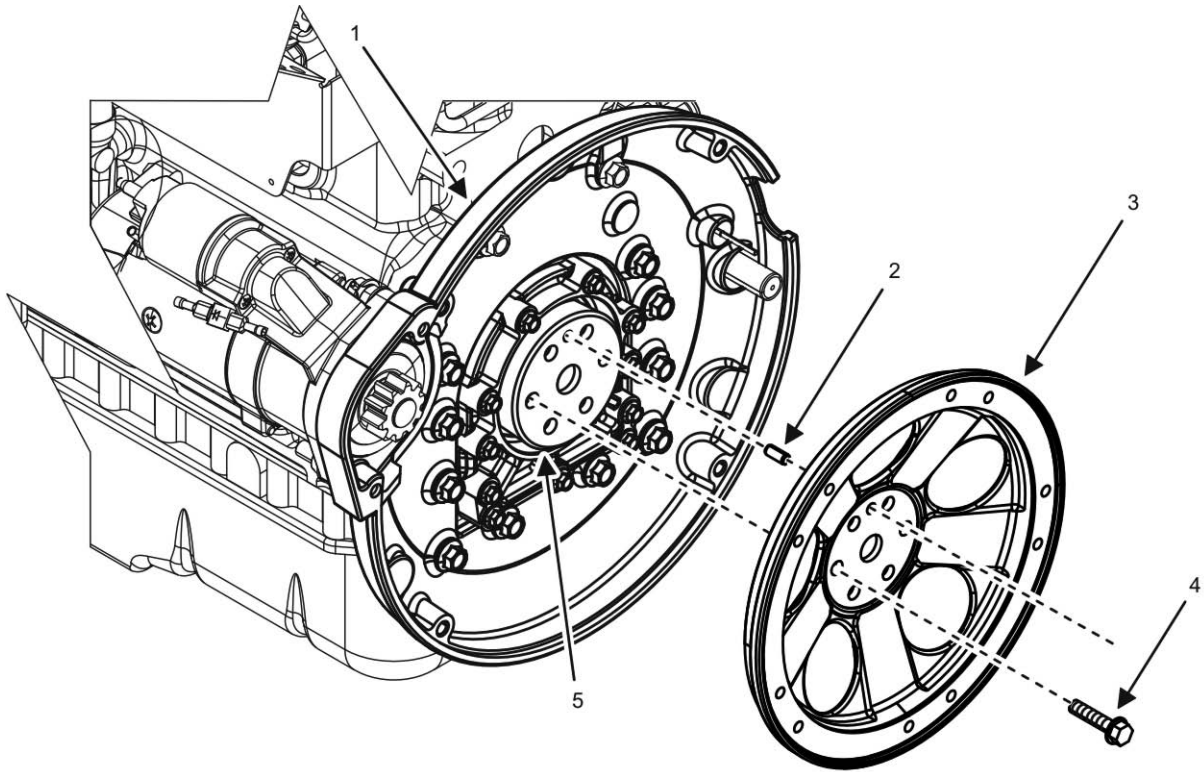


Figure 2. Flywheel — Removal.

- Remove six screws (Figure 2, Item 4) securing flywheel (Figure 2, Item 3) to crankshaft flange (Figure 2, Item 5).
- Remove flywheel (Figure 2, Item 3) from crankshaft flange (Figure 2, Item 5) and flywheel housing (Figure 2, Item 1) and place on a suitable work surface.

END OF TASK**Inspect Flywheel**

- Inspect flywheel (Figure 2, Item 3) for obvious signs of damage or corrosion. Replace as required.
- Clean flywheel (Figure 2, Item 3) using denatured alcohol and a wiping rag prior to installation.
- Check crankshaft flange (Figure 2, Item 5) to be sure dowel pin (Figure 2, Item 2) is intact.

END OF TASK

Install Flywheel

1. Clean mating surfaces of flywheel (Figure 2, Item 3) and crankshaft flange (Figure 2, Item 5) with denatured alcohol prior to installing flywheel.
2. Position flywheel (Figure 2, Item 3) to its mounting location on crankshaft flange (Figure 2, Item 5). Be sure to engage dowel pin (Figure 2, Item 2) on crankshaft flange (Figure 2, Item 5) into corresponding alignment hole in flywheel (Figure 2, Item 3) to assure proper engine timing.
3. Support flywheel (Figure 2, Item 3) on crankshaft flange (Figure 2, Item 5).
4. Apply clean engine oil to threads and undercut of screws (Figure 2, Item 4) prior to installation.
5. Secure flywheel (Figure 2, Item 3) to crankshaft flange (Figure 2, Item 5) by installing six new screws (Figure 2, Item 4). Finger-tighten.
6. Secure crankshaft flange (Figure 2, Item 5) in position by having assistant hold harmonic balancer bolt (not shown) steady.
7. Tighten six screws (Figure 2, Item 4) in a cross pattern to a value of 36.9 – 45 ft/lb (50 – 61 Nm).
8. Install engine assembly (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).
9. Release air through coolant overflow vent line for 5 min before start up (TM 9-6115-751-10).
10. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
11. Start engine and check for leaks and proper operation (TM 9-6115-751-10).
12. Repair as required.
13. Dispose of soiled rags IAW local SOP.
14. Ensure fluid levels are at proper operating level (TM 9-6115-751-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL CRANKCASE REAR BEARING CASE COVER

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Case assembly, oil seal (WP 0139, Repair Parts List, Figure 39, Item 2)

Seal, oil (WP 0139, Figure 39, Item 3)

Antifreeze, ethylene glycol (WP 0164, Expendable and Durable Items, Item 2)

Cap set, protective (WP 0164, Item 9)

Cleaning compound, solvent (WP 0164, Item 11)

Cloth, abrasive, crocus (WP 0164, Item 12)

Compound, antiseize (WP 0164, Item 14)

Compound, sealing (WP 0164, Item 16)

Distilled water, (WP 0164, Item 18)

Grease, electrically conductive (WP 0164, Item 21)

Grease, general purpose (WP 0164, Item 22)

Lubricating oil, engine (WP 0164, Item 24)

Pan, drain (3) (WP 0164, Item 29)

Penetrating oil, (2) (WP 0164, Item 30)

Rag, wiping (6) (WP 0164, Item 32)

Materials/Parts

Sealant (WP 0164, Item 33)

Soap, ivory (WP 0164, Item 34)

Tag, marker (WP 0164, Item 36)

Personnel Required

91D (1)

References

Not Applicable

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Engine assembly removed (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly)

Flywheel removed (WP 0084, Remove/Install Flywheel)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL CRANKCASE REAR BEARING CASE COVER

Remove Crankcase Rear Bearing Case Cover

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate crankcase rear bearing case cover (Figure 1).

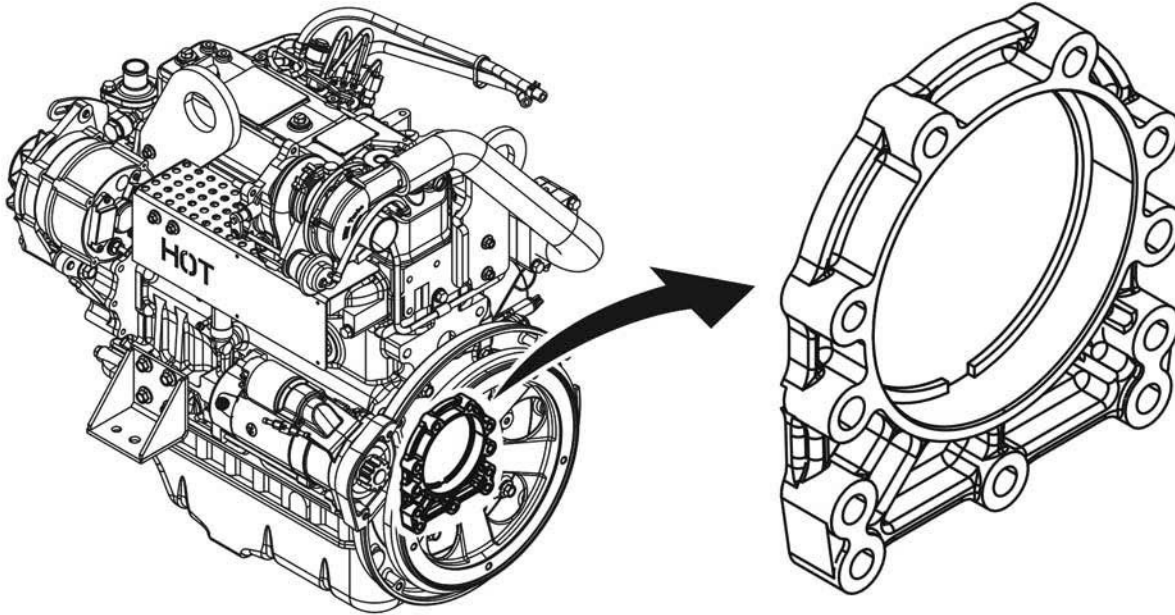


Figure 1. Crankcase Rear Bearing Case Cover — Location.

NOTE

Three M8 – 35 mm bolts secure crankcase rear bearing case cover (Figure 2, Item 6) to oil pan spacer (Figure 2, Item 8). Six M8 – 30 mm bolts secure crankcase rear bearing case cover (Figure 2, Item 6) to engine block (Figure 2, Item 1).

3. Remove nine bolts (Figure 2, Item 7) securing rear bearing case cover (Figure 2, Item 6) to oil pan spacer (Figure 2, Item 8) and engine block (Figure 2, Item 1).

CAUTION

If use of pry bar is necessary to remove crankcase rear bearing case cover (Figure 2, Item 6), do not damage crankcase rear bearing case cover (Figure 2, Item 6), oil pan spacer (Figure 2, Item 8), or engine block (Figure 2, Item 1). Failure to comply may cause damage to equipment.

4. Remove crankcase rear bearing case cover (Figure 2, Item 6), using pry bar if necessary, to separate from gasket material and dowel pins (Figure 2, Items 2 and 9).
5. Remove and discard crankcase rear bearing case oil seal (Figure 2, Item 5).

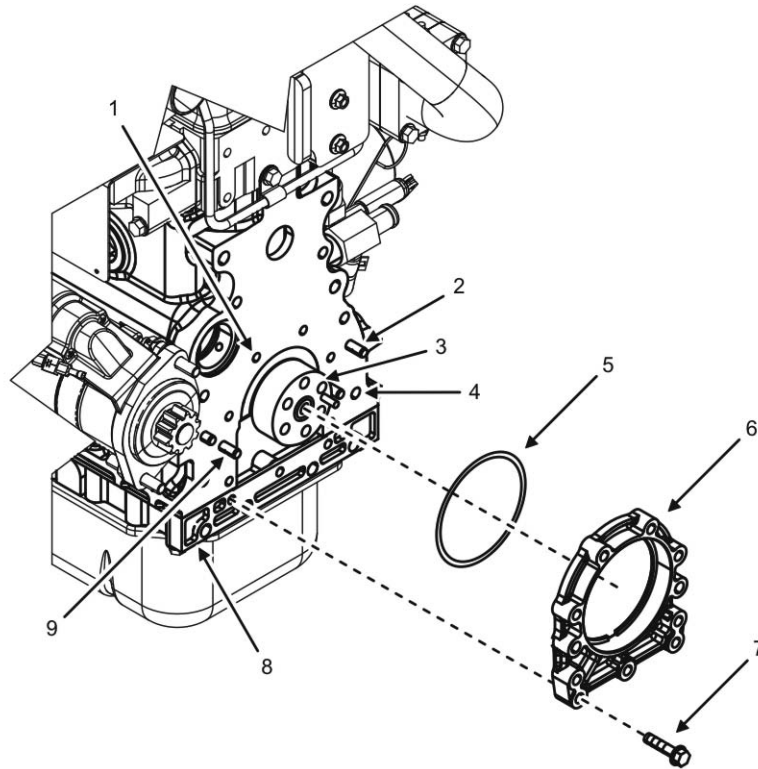


Figure 2. Crankcase Rear Bearing Case Cover — Removal.

CAUTION

If scraping of gasket material from mounting surfaces is necessary, ensure that mounting surfaces are not scratched or damaged. Failure to comply may cause damage to equipment.

6. Scrape excess gasket-forming compound from engine block mating surface (Figure 2, Item 4) and oil pan spacer (Figure 2, Item 8).

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

7. Clean mating surfaces of crankshaft (Figure 2, Item 3), engine block mating surface (Figure 2, Item 4), oil pan spacer (Figure 2, Item 8), and crankcase rear bearing case cover (Figure 2, Item 6) with dry cleaning solvent and wiping rags to remove dirt, debris, grease, and oil.
8. Dispose of soiled rags IAW local SOP.

END OF TASK

Inspect Crankcase Rear Bearing Case Cover

1. Inspect crankcase rear bearing case cover (Figure 2, Item 6) for cracks or damage. Replace as required.
2. Inspect dowel pins (Figure 2, Items 2 and 9) for signs of damage. Replace as required.
3. Inspect bolts (Figure 2, Item 7) for damaged or worn threads. Replace as required.

END OF TASK**Install Crankcase Rear Bearing Case Cover**

1. Coat new crankcase rear bearing case oil seal (Figure 2, Item 5) with automotive grease.
2. Install new crankcase rear bearing case oil seal (Figure 2, Item 5) into crankcase rear bearing case cover (Figure 2, Item 6).

CAUTION

Take care during installation to avoid damage to outer surface of seal. Failure to comply may cause damage to equipment.

3. Apply gasket-forming compound to mounting surface of crankcase rear bearing case cover (Figure 2, Item 6).
4. Position crankcase rear bearing case cover (Figure 2, Item 6) to engine block (Figure 2, Item 1) and oil pan spacer (Figure 2, Item 8), aligning crankcase rear bearing case cover (Figure 2, Item 6) with dowel pins (Figure 2, Items 2 and 9).

CAUTION

Crankcase rear bearing case cover (Figure 2, Item 6) is aluminum alloy material. When tightening bolts (Figure 2, Item 7) to aluminum alloy, 80% of torque values must be used. Failure to comply may cause damage to equipment.

5. Install nine bolts (Figure 2, Item 7) securing crankcase rear bearing case cover (Figure 2, Item 6) to engine block (Figure 2, Item 1) and oil pan spacer (Figure 2, Item 8). Finger-tighten.
6. Install flywheel (WP 0084, Remove/Install Flywheel).
7. Install engine assembly (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).
8. Install battery ground cable (WP 0036, Remove/Install Batteries).
9. Release air through coolant overflow vent line for 5 min before start up (TM 9-6115-751-10).
10. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
11. Start engine and check for fluid leaks and proper operation (TM 9-6115-751-10).
12. Repair as required.
13. Dispose of soiled rags IAW local SOP.
14. Ensure all fluid levels are at proper operating level (TM 9-6115-751-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL OIL PAN AND STRAINER

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Gasket, pipe (WP 0137, Repair Parts List, Figure 37, Item 8)

Pan, lubricating oil (WP 0137, Figure 37, Item 5)

Pipe strainer, oil inlet (WP 0137, Figure 37, Item 7)

Antifreeze, ethylene glycol (WP 0164, Expendable and Durable Items, Item 2)

Cap set, protective (WP 0164, Item 9)

Cleaning compound, solvent (WP 0164, Item 11)

Cloth, abrasive, crocus (WP 0164, Item 12)

Compound, antiseize (WP 0164, Item 14)

Compound, sealing (WP 0164, Item 16)

Detergent, general purpose (WP 0164, Item 17)

Distilled water, (WP 0164, Item 18)

Grease, electrically conductive (WP 0164, Item 21)

Lubricating oil, engine (WP 0164, Item 24)

Pan, drain (3) (WP 0164, Item 29)

Materials/Parts

Penetrating oil, (2) (WP 0164, Item 30)

Rag, wiping (6) (WP 0164, Item 32)

Sealant (WP 0164, Item 33)

Soap, ivory (WP 0164, Item 34)

Tag, marker, (WP 0164, Item 36)

Personnel Required

91D (1)

Assistant (1)

References

Not Applicable

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Engine assembly removed (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL OIL PAN AND OIL STRAINER

Remove Oil Pan and Oil Strainer

1. Ensure equipment conditions are met in the order presented in initial setup.
2. Locate oil pan (Figure 1).

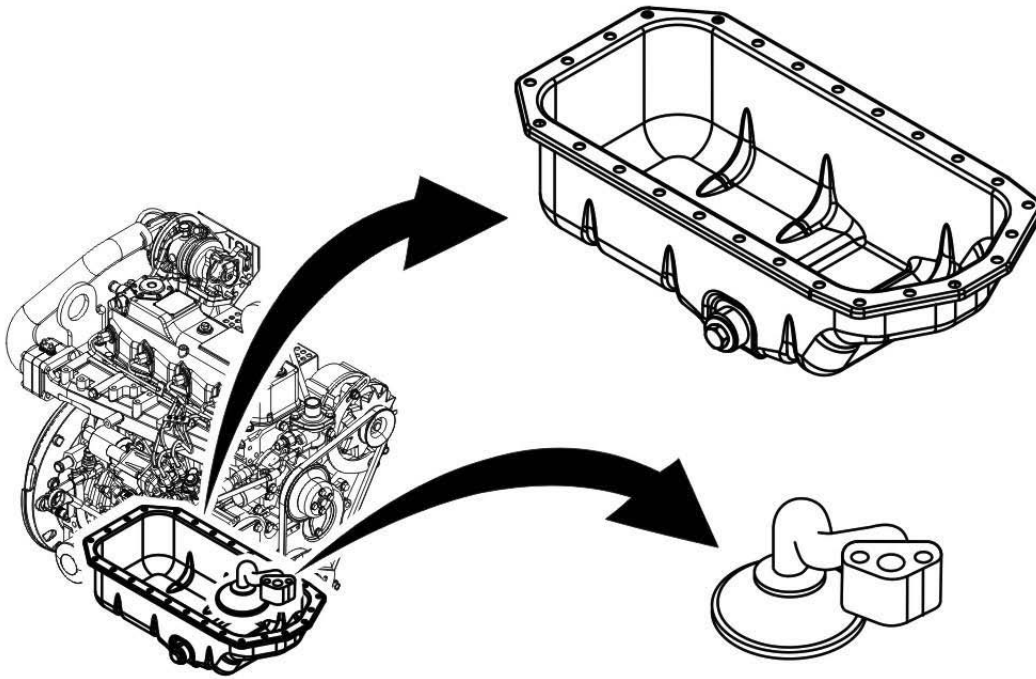


Figure 1. Oil Pan and Strainer — Location.

NOTE

Oil pan is best removed with engine inverted on engine stand. Figure 2 shown in proper orientation for clarity.

The oil pan (Figure 2, Item 5) is secured by 22 M8-45 mm bolts (Figure 2, Item 3) and four M8-16 mm bolts (Figure 2, Item 4). Bolts must be tagged/marked during removal to assist at installation.

3. Remove and tag location of 26 bolts (Figure 2, Items 3 and 4) securing oil pan (Figure 2, Item 5) to oil pan spacer (Figure 2, Item 2).

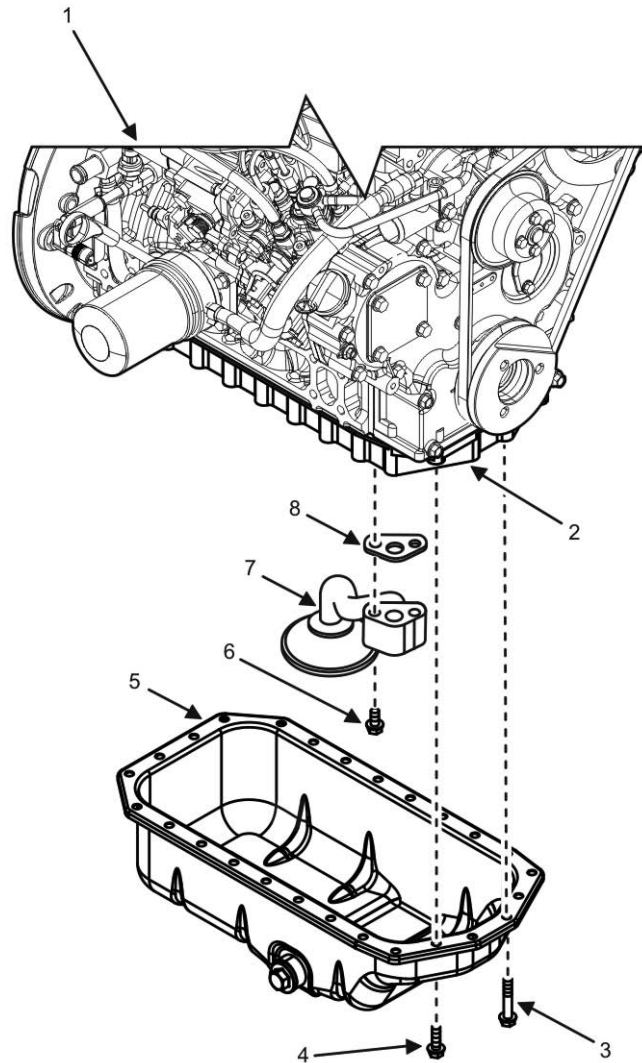


Figure 2. Oil Pan — Removal.

WARNING

Support components when removing/installing the attaching hardware or component may fall. Failure to comply may cause injury or death to personnel and damage to equipment.

4. Remove oil pan (Figure 2, Item 5) by lightly tapping with rubber mallet, if necessary.
5. Remove two bolts (Figure 2, Item 6) and oil strainer (Figure 2, Item 7) from engine (Figure 2, Item 1).
6. Remove and discard gasket (Figure 2, Item 8) from oil strainer (Figure 2, Item 7) and/or mounting surface of engine (Figure 2, Item 1).

CAUTION

If scraping gasket material from mounting surfaces is necessary, ensure that mounting surfaces are not scratched or damaged. Damaged mounting surfaces may seal improperly. Failure to comply may cause damage to equipment.

When scraping gasket material from engine block, keep gasket scrapings and other foreign material from entering engine block. Failure to comply may cause damage to equipment.

7. Remove gasket material from mounting surfaces of oil pan (Figure 2, Item 5), oil pan spacer (Figure 2, Item 2), and oil strainer (Figure 2, Item 7) by scraping, if necessary.

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

8. Clean surfaces of gasket residue using dry cleaning solvent and wiping rags.

END OF TASK

Inspect Oil Pan and Strainer

1. Remove excess oil from oil pan (Figure 2, Item 5) with wiping rag.
2. Inspect oil pan (Figure 2, Item 5) for dents, cracks, and other damage.
3. Repair small dents in oil pan (Figure 2, Item 5) by tapping back into place with rubber mallet.
4. Replace oil pan (Figure 2, Item 5) if damage may affect capacity or oil flow.
5. Inspect oil strainer (Figure 2, Item 7) for cracked or bent tube, or broken screen.
6. Replace oil strainer (Figure 2, Item 7) if tube is cracked or bent, or if screen is broken.
7. Clean oil strainer (Figure 2, Item 7) thoroughly with degreaser prior to installation.
8. Inspect oil pan spacer (Figure 2, Item 2) for cracks, dents, or other damage.
9. Replace oil pan spacer (Figure 2, Item 2) if cracked, dented, or damaged.
10. Inspect all bolts for excessive wear or damaged threads.
11. Replace any bolt that is excessively worn or has damaged threads.

END OF TASK

Install Oil Pan and Oil Strainer

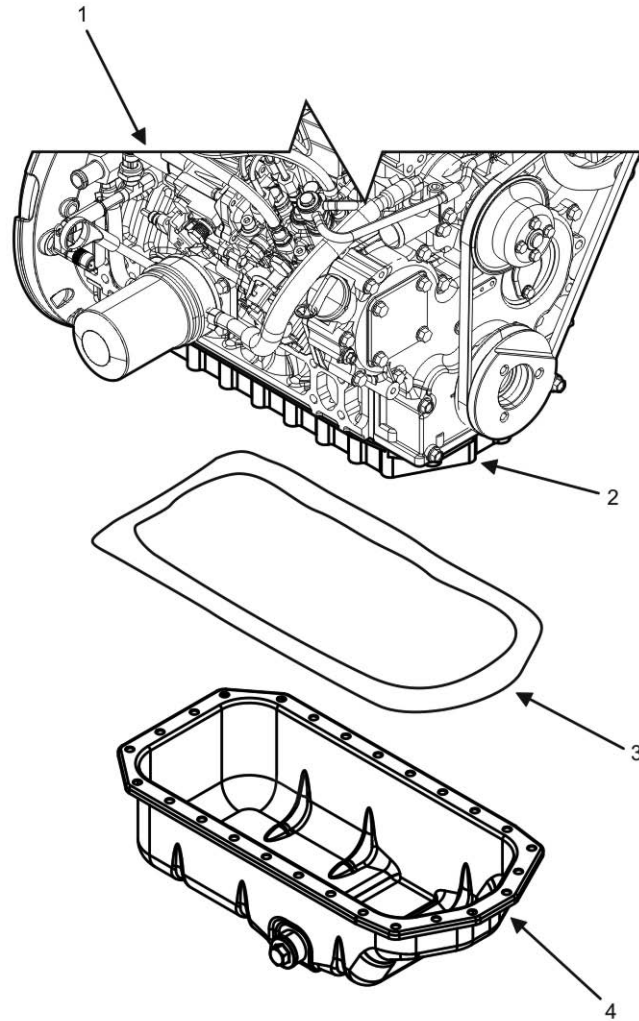


Figure 3. Gasket Compound Application.

1. Install new gasket (Figure 2, Item 8) to oil strainer (Figure 2, Item 7) mounting surface.
2. Position oil strainer (Figure 2, Item 7) to its mounting location on engine (Figure 2, Item 1).
3. Install two bolts (Figure 2, Item 6) to secure oil strainer (Figure 2, Item 7) to engine (Figure 2, Item 1).

CAUTION

Oil strainer is aluminum alloy material. Tighten bolts to aluminum alloy to maximum of 80% of nominal torque value (WP 0090 Torque Limits). Failure to comply may cause damage to equipment.

4. Tighten two bolts (Figure 2, Item 6) to oil strainer (Figure 2, Item 7).
5. Apply gasket compound (Figure 3, Item 3) to mounting surface of oil pan (Figure 3, Item 4).
6. Position oil pan (Figure 3, Item 4) to its mounting location on oil pan spacer (Figure 3, Item 2) and engine (Figure 3, Item 1).

7. Secure oil pan (Figure 2, Item 5) by installing 26 bolts (Figure 2, Items 3 and 4) finger-tight IAW tags/markings applied at removal.

CAUTION

Oil pan spacer (Figure 2, Item 2) is aluminum alloy material. Tighten oil pan bolts (Figure 2, Item 3 and 4) to oil pan spacer (Figure 2, Item 2) to maximum of 80% of nominal torque value (WP 0090 Torque Limits). Failure to comply may cause damage to equipment.

NOTE

Tighten oil pan bolts (Figure 2, Items 3 and 4) in a diagonal pattern to avoid uneven tightening of oil pan (Figure 2, Item 5).

8. Tighten all oil pan bolts (Figure 2, Items 3 and 4).
9. Install engine assembly (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).
10. Release air through coolant overflow vent line for 5 min before start up (TM 9-6115-751-10).
11. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
12. Start engine and check for oil leaks and proper operation (TM 9-6115-751-10).
13. Repair as required.
14. Dispose of soiled rags IAW local SOP.
15. Ensure fluid levels are at proper operating levels (TM 9-6115-751-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
TEST ENGINE COMPRESSION

INITIAL SETUP:**Test Equipment**

Adapter, Compression Test (WP 0163, Maintenance Allocation Chart, Item 1)
 Tester, Cylinder Compression (WP 0163, Item 34)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Item 38)

Materials/Parts

Gasket, valve cover (WP 0143, Repair Parts List, Figure 43, Item 7)
 Packing, P12.0 (3) (WP 0143, Figure 43, Item 19)
 Packing, (P12.0) (4) (WP 0128, Repair Parts List, Figure 28, Item 8)
 Packing (5) (WP 0128, Figure 28, Item 5)
 Protector, nozzle (4) (WP 0128, Figure 28, Item 6)
 Seal washer (8S) (1) (WP 0128, Figure 28, Item 15)
 Seat, nozzle (4) (WP 0128, Figure 28, Item 7)
 Cap set, protective (1) (WP 0164, Expendable and Durable Items List, Item 9)
 Grease, electrically conductive (WP 0164, Item 21)
 Grease, general purpose (WP 0164, Item 22)
 Lubricating oil, engine (WP 0164, Item 24)
 Pan, drain (WP 0164, Item 29)

Materials/Parts

Rag, wiping (WP 0164, Item 32)
 Sealant (WP 0164, Item 33)

Personnel Required

91D (1)

References

WP 0036, Remove/Install Batteries
 WP 0063, Remove/Install 50/60 Hz Engine Assembly
 WP 0064, Remove/Install 400 Hz Engine Assembly
 WP 0068, Remove/Install Fuel Injectors
 WP 0082, Remove/Install Valve Cover

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)
 Engine cool
 Intake and exhaust valves adjusted (WP 0083, Service Engine Valves)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

TEST ENGINE COMPRESSION**NOTE**

Intake and exhaust valves must be adjusted to specification prior to testing engine compression (WP 0083, Service Engine Valves). Batteries must be fully charged prior to testing engine compression.

Test Engine Compression**WARNING**

- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are running. Failure to comply may cause injury or death to personnel.

CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

1. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
2. Start engine and run until normal operating temperature is reached (TM 9-6115-751-10).
3. Turn engine control switch to OFF (TM 9-6115-751-10).

WARNING

Top and some housing panels can get very hot. Allow panels to cool down before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

4. Open right- and left-side doors.
5. Remove battery ground cable (WP 0036, Remove/Install Batteries).
6. Remove valve cover (WP 0082, Remove/Install Valve Cover).
7. Remove fuel injectors (WP 0068, Remove/Install Fuel Injectors).
8. Locate fuel injector opening (Figure 1).

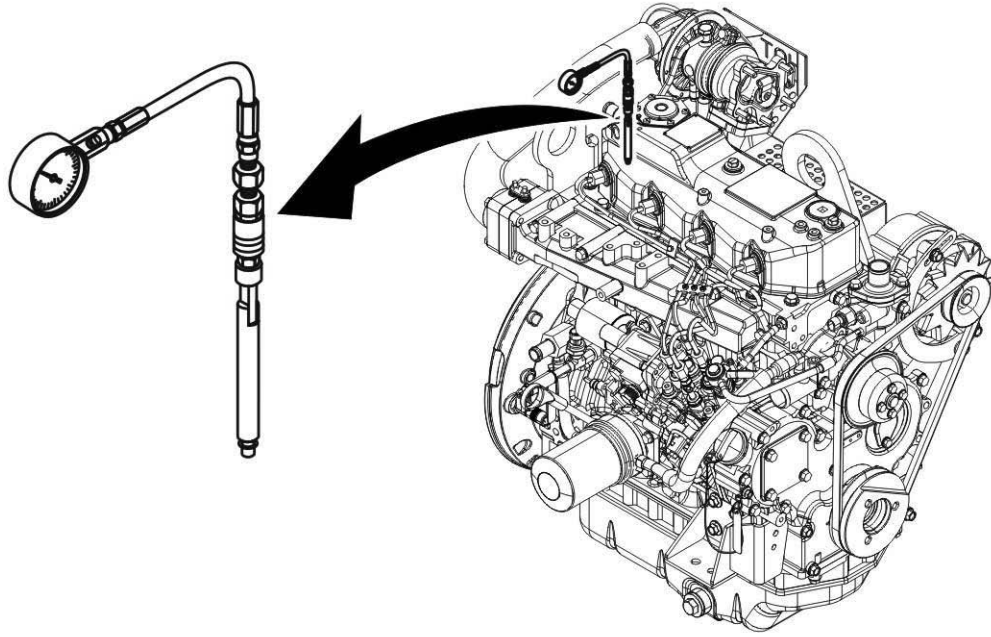


Figure 1. Compression Gage in Fuel Injector Opening — Location.

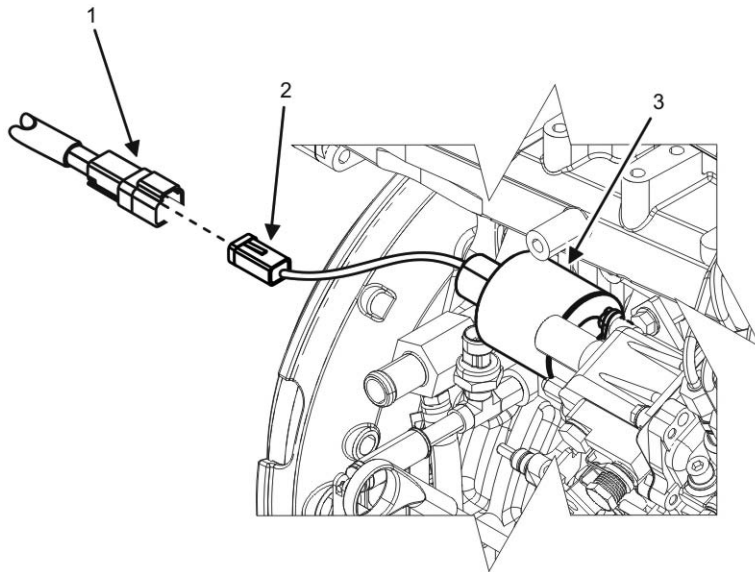


Figure 2. Governor Actuator — Removal.

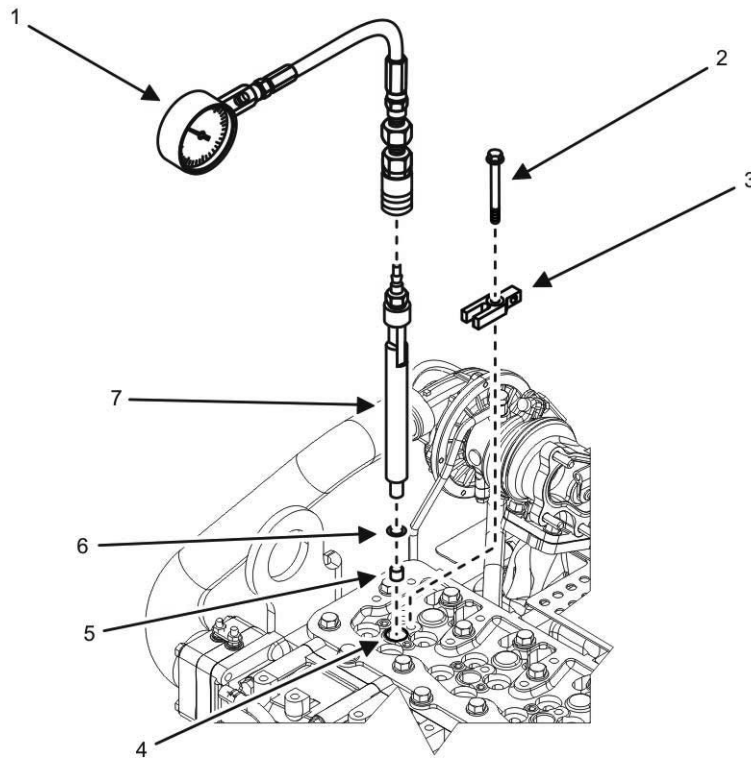


Figure 3. Compression Gage in Fuel Injector Opening.

NOTE

Disconnecting the fuel injection pump governor actuator (Figure 2, Item 3) prevents the fuel injection pump from injecting fuel during compression testing.

The rocker arms, push rods, and valve stems are shown removed in Figure 3 for better visibility of fuel injector opening (Figure 3, Item 4).

9. Disconnect fuel injection pump governor actuator (Figure 2, Item 3) connector (Figure 2, Item 2) at wiring harness (Figure 2, Item 1).

NOTE

Compression is tested in each of the four cylinders.

10. Install battery ground cable (WP 0036, Remove/Install Batteries).
11. Crank engine for a few seconds using DEAD CRANK SWITCH (TM 9 611-751-10) to clear cylinders of any residual fuel.
12. Install nozzle seat (Figure 3, Item 6) and nozzle protector (Figure 3, Item 5) at tip end of compression gage adapter (Figure 3, Item 7).

CAUTION

Release pressure in compression gage (Figure 3, Item 1) using release button after each use before removing compression gage (Figure 3, Item 1). Failure to comply will cause damage to equipment.

NOTE

Cylinder one is located at the flywheel end of the engine.

13. Install compression gage (Figure 3, Item 1) and compression gage adapter (Figure 3, Item 7) into fuel injector opening (Figure 3, Item 4) at cylinder one. Secure with fuel injector retainer (Figure 3, Item 3) and bolt (Figure 3, Item 2) to torque value of 17 to 21 ft/lb (23 to 28 Nm).
14. Crank engine through four compression cycles using DEAD CRANK SWITCH (TM 9-6115-751-10) until compression gage (Figure 3, Item 1) reading is stabilized.
15. Record compression reading on compression gage (Figure 3, Item 1).
16. Remove bolt (Figure 3, Item 2), fuel injector retainer (Figure 3, Item 3), compression gage (Figure 3, Item 1), and compression gage adapter (Figure 3, Item 7) from cylinder.
17. Ensure nozzle seat (Figure 3, Item 6) and nozzle protector (Figure 3, Item 5) are removed from tip of compression gage adapter (Figure 3, Item 7) or from fuel injector opening (Figure 3, Item 4).
18. Repeat steps 13 through 17 for cylinders two, three, and four.

NOTE

Factory specification for compression pressure is between 411 to 441 psi (2.84 to 3.04 MPa). Allowable limit is 340 to 370 psi (2.35 to 2.55 MPa). Compression pressures should not vary more than 29 to 43 psi (0.2 to 0.3 MPa).

19. Compare compression pressure readings between cylinders.
20. Replace engine if compression pressures vary between cylinders by more than 29 to 43 psi (0.2 to 0.3 MPa) (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).
21. Replace engine if compression pressure is outside specification of 340 to 370 psi (2.35 to 2.55 MPa) (WP 0063, Remove/Install 50/60 Hz Engine Assembly or WP 0064, Remove/Install 400 Hz Engine Assembly).
22. Remove battery ground cable (WP 0036, Remove/Install Batteries).
23. Install fuel injectors (WP 0068, Remove/Install Fuel Injectors).
24. Install valve cover (WP 0082, Remove/Install Valve Cover).
25. Connect fuel injection pump governor actuator (Figure 2, Item 3) connector (Figure 2, Item 2) to wiring harness (Figure 2, Item 1).
26. Install battery ground cable (WP 0036, Remove/Install Batteries).
27. Close right- and left-side doors.
28. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).

24. Start engine and check for leaks and proper operation. Apply 100% rated load for 30 minutes or until coolant reaches normal operating temperature (TM 9-6115-751-10).
25. Repair as required.
26. Dispose of soiled rags IAW local SOP.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
TEST ENGINE OIL PRESSURE

INITIAL SETUP:**Test Equipment**

Test Set, Oil Systems Pressure (WP 0163, Maintenance Allocation Chart, Item 32)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Item 38)

Materials/Parts

Sender, oil pressure (WP 0126, Repair Parts List, Figure 26, Item 33)

Grease, electrically conductive (WP 0164, Expendable and Durable Items List, Item 21)

Rag, wiping (4) (WP 0164, Item 32)

Sealant (WP 0164, Item 33)

Personnel Required

91D (1)

References

WP 0010, Engine System Troubleshooting with a DCS Code

WP 0011, Engine System Troubleshooting without a DCS Code

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0036, Remove/Install Batteries)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

CHECK ENGINE OIL PRESSURE**Check Engine Oil Pressure**

1. Ensure battery ground cable is installed (WP 0036, Remove/Install Batteries).
2. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
3. Start engine and allow generator set to reach rated speed (TM 9-6115-751-10).
4. Record oil pressure value on DCS screen once generator set has reached rated speed (TM 9-6115-751-10).
5. Turn engine control switch to OFF (TM 9-6115-751-10).
6. Ensure equipment conditions are met in order presented in initial setup.
7. Open right-side door on generator set.
8. Locate oil pressure sender (Figure 1).

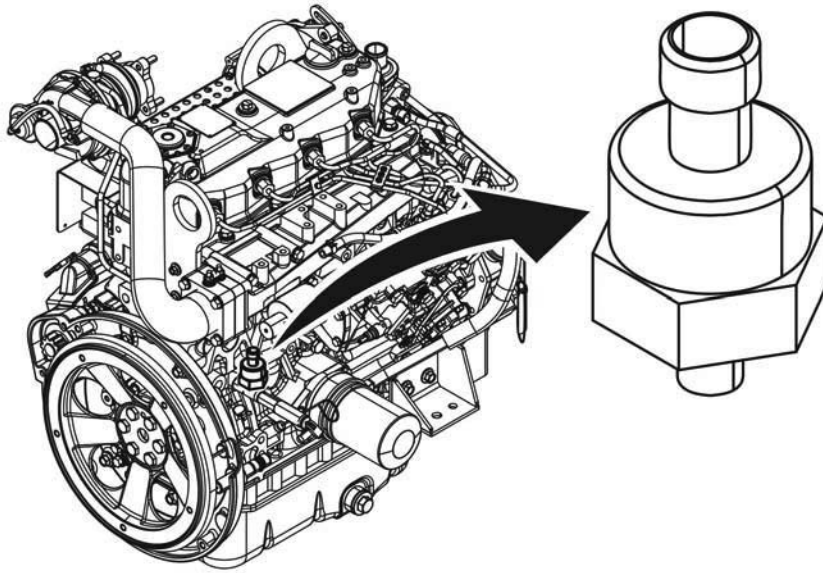


Figure 1. Engine Oil Pressure Sender — Location.

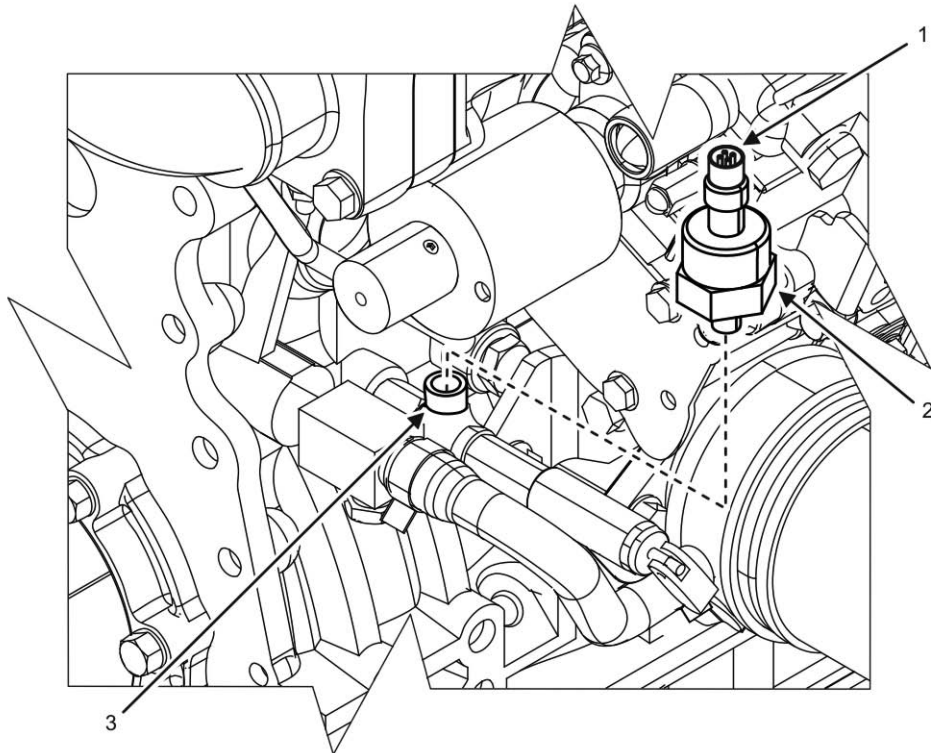


Figure 2. Engine Oil Pressure Sender — Removal.

9. Disconnect electrical lead (Figure 2, Item 1) from oil pressure sender (Figure 2, Item 2).

NOTE

Place a rag under oil pressure sender (Figure 2, Item 2) to capture oil spilled upon removal.
Dispose of soiled rag IAW local SOP.

10. Remove engine oil pressure sender (Figure 2, Item 2) from tee fitting (Figure 2, Item 3) and save for reuse.

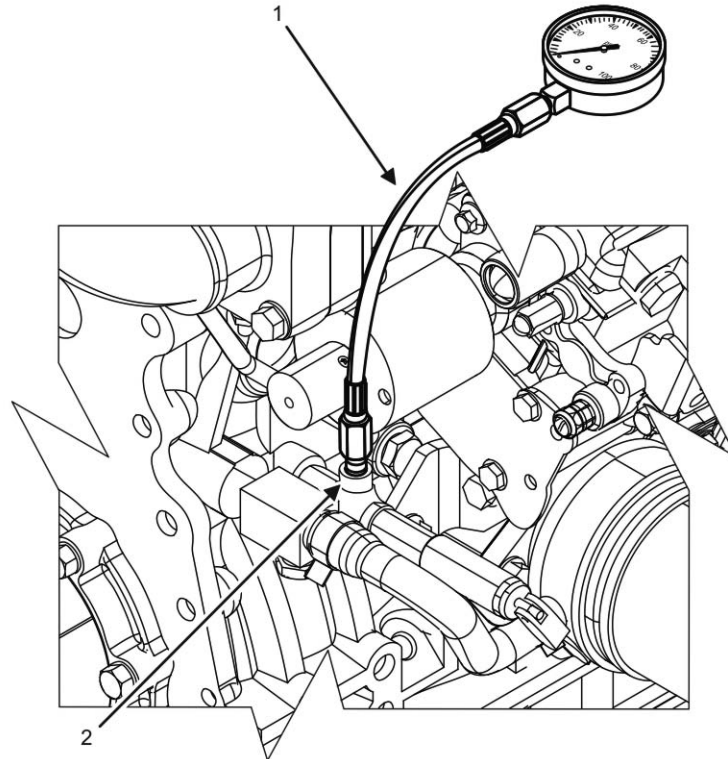


Figure 3. Check Engine Oil Pressure.

11. Install oil pressure gage (Figure 3, Item 1) into tee fitting (Figure 3, Item 2).
12. Install battery ground cable (WP 0036, Remove/Install Batteries).

NOTE

[Warning 141: Oil Pressure Sensor Low] will display on DCS screen when oil pressure sender is disconnected from wiring. Proceed with test and reconnect wiring when finished.

13. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
14. Start engine and check for oil leaks. Repair/reinstall connection as required.

NOTE

Idle speed reading should be less than rated speed reading.

15. Observe engine oil pressure at engine idle speed. Compare reading with Table 1 value.

Table 1. Engine Oil Pressure.

RPM	OIL PRESSURE
Low idle	8.8 psi (0.06 MPa)
2000 – 2600 rpm	49 – 71 psi (0.34 – 0.49 MPa)
1500 – 1800 rpm	42 – 64 psi (0.29 – 0.44 MPa)

NOTE

Rated speed for engine depends on the AC alternator: 1500 rpm at 50 Hz, 1800 rpm at 60 Hz, and 2000 rpm at 400 Hz.

16. Observe engine oil pressure at rated speed. Compare reading with Table 1 range. Oil pressure reading should fall within range listed in Table 1.

NOTE

If oil pressure reading obtained from test is within specification but oil pressure sender provides a different reading to DCS as recorded, replace oil pressure sender.

17. Troubleshoot oil pressure sender (Figure 2, Item 2) IAW [Warning 135: Oil Pressure Sensor High] if oil pressure measurements are within specification (Table 1). (WP 0010, Engine System Troubleshooting with a DCS Code).
18. Install existing oil pressure sender (Figure 2, Item 2) if oil pressure measurements are within specification and DCS readings are the same. Proceed to step 20.
19. Troubleshoot and remedy cause of low engine oil pressure if measurements are outside of specification (WP 0010, Engine System Troubleshooting with a DCS Code and WP 0011, Engine System Troubleshooting without a DCS Code).
20. Remove battery ground cable (WP 0036, Remove/Install Batteries).
21. Turn engine control switch to OFF (TM 9-6115-751-10).

WARNING

Top and some housing panels can get very hot. Allow panels to cool down before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

22. Allow engine to cool.
23. Remove oil pressure gage (Figure 3, Item 1) from tee fitting (Figure 3, Item 2).
24. Apply pipe joint compound to threads of oil pressure sender (Figure 2, Item 2).
25. Install engine oil pressure sender (Figure 2, Item 2) to tee fitting (Figure 2, Item 3) and tighten one and half turns past finger-tight.
26. Connect electrical lead (Figure 2, Item 1) removed in step 4 to oil pressure sender (Figure 2, Item 2).
27. Install battery ground cable (WP 0036, Remove/Install Batteries).
28. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).

29. Start engine and check for oil leaks at oil pressure sender (Figure 2, Item 2).
30. Repair as required.
31. Wipe up any excess oil or spills using wiping rags.
32. Ensure oil level is at proper operating level (TM 9-6115-751-10).
33. Close right-side door.
34. Dispose of soiled rag(s) IAW local SOP.

END OF TASK

END OF WORK PACKAGE

**FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
LUBRICATION INSTRUCTIONS**

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Antifreeze, ethylene glycol (WP 0164, Expendable and Durable Items List, Item 2)

Lubricating oil, engine (WP 0164, Item 24)

Lubricating oil, engine (WP 0164, Item 25)

Lubricating oil, engine (WP 0164, Item 26)

Rag, wiping (WP 0164, Item 32)

Personnel Required

91D (1)

References

A-A-52624A

MIL-PRF-2104H

MIL-PRF-46167D

MIL-A-53009A

TB 750-651

WP 0021, Service Cooling System

WP 0065, Service Lubrication System

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

LUBRICATION INSTRUCTIONS

The AMMPS 15 kW generator set uses a variety of lubricating and cooling fluids. Refer to Table 1 for the fluids and their applications.

WARNING

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

CAUTION

Ensure the lubrication and cooling systems have been filled to capacity before operating the unit. Failure to comply may cause damage to equipment.

Table 1. Lubrication Orders.

USAGE	FLUID/LUBRICANT	CAPACITIES	TEMPERATURES
Engine oil	MIL-PRF-2104H ^a OE/HDO-15/40	Crankcase and engine 8.4 qt (8.0 L) with filter	+5°F to +135°F (-15°C to +57°C)
	MIL-PRF-2104H OE/HDO-10		-15°F to +5°F (-26°C to -15°C)
	MIL-PRF-46167D ^b		-50°F to +40°F (-45°C to +4°C)
Engine antifreeze	A-A-52624A ^c	Radiator and engine 6.9 qt (6.5 L)	-50°F to +135°F (-45°C to 57°C)
Hinge/latch lubrication	MIL-PRF-2104H OE/HDO-15/40	Not applicable	Not applicable

^a Performance Specification, Lubrication Oil, Internal Combustion Engine, Combat/Tactical Service.

^b Performance Specification, Lubrication Oil, Internal Combustion Engine, Arctic.

^c Commercial Item Description: Antifreeze, Multi-engine Type.

Change Engine Oil and Engine Oil Filter

See Table 2 and WP 0065, Service Lubrication System.

Table 2. Table of Lubricants — Engine.

SPECIFICATION	TYPE OF LUBRICANT	FREQUENCY	TEMPERATURE
MIL-PRF-2104H OE/HDO-15/40	Engine oil	500 hr or 6 months	+5°F to +135°F (-15°C to +57°C)
MIL-PRF-2104H OE/HDO-10			-15°F to +5°F (-26°C to -15°C)
MIL-PRF-46167D			-50°F to +40°F (-45°C to +4°C)

END OF TASK

Change Engine Coolant

See Table 3 and WP 0021, Service Cooling System.

Table 3. Table of Coolants — Engine.

SPECIFICATION	TYPE OF LUBRICANT	FREQUENCY	TEMPERATURE
A-A-52624A	Antifreeze	1500 hr or 1 year	-50°F to +135°F (-45°C to 57°C)
MIL-A-53009A ^a	Liquid Cooling System Corrosion Inhibitor	See TB 750-651 ^b	+40°F to +135°F (+4°C to +57°C)

^a Military Specification, Additive, Antifreeze Extender, Liquid Cooling Systems.

^b Use of Antifreeze Solutions, Antifreeze Extender, Cleaning Compounds, and Test Kit in Engine Cooling Systems.

END OF TASK

Lubricate Hinges

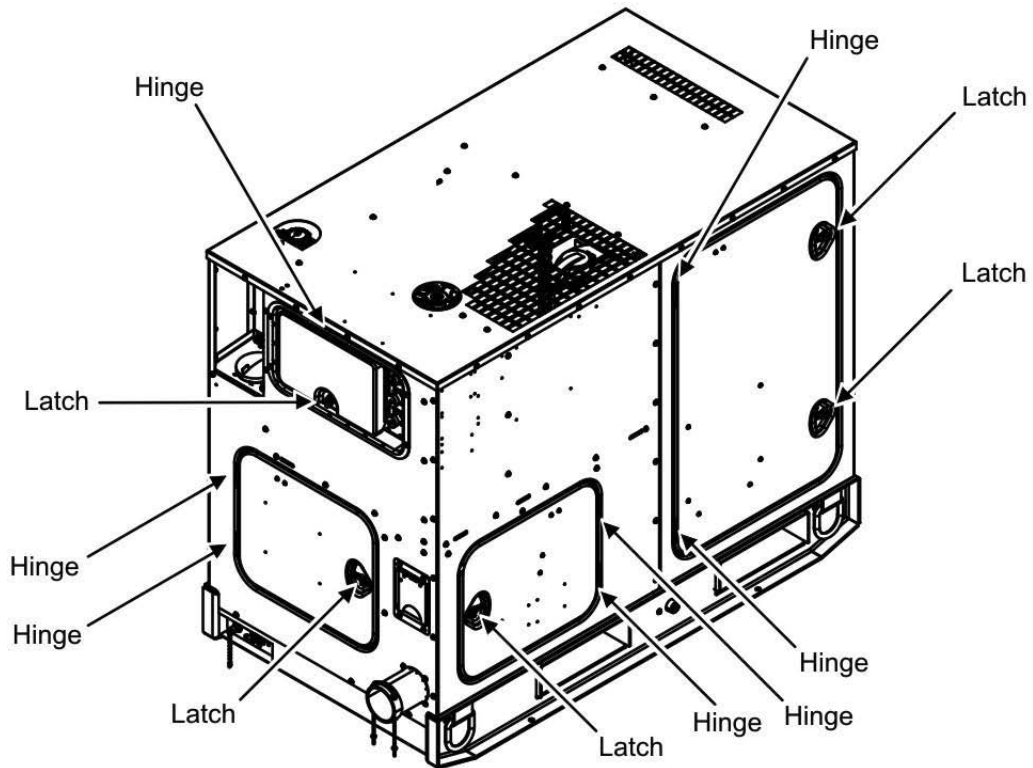


Figure 1. Hinge Locations — Rear and Right Side.

1. Open door (Figure 1 and Figure 2).
2. Apply one drop of lubrication oil (Table 4) to each hinge/latch.
3. Cycle door through three open-close sequences.

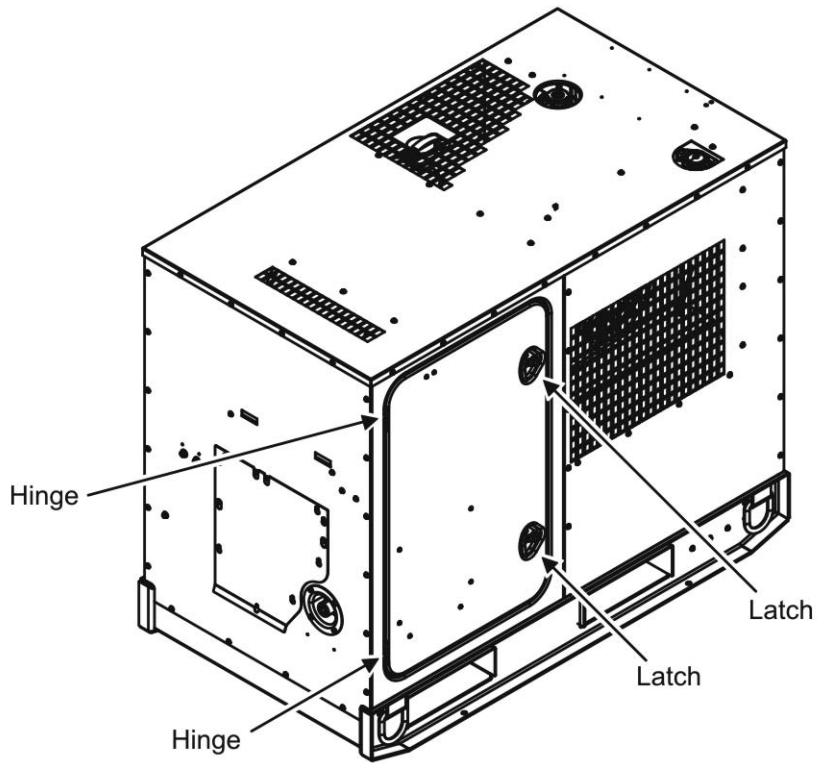


Figure 2. Hinge Locations — Front and Left Side.

NOTE

Dispose of soiled rags IAW local SOP.

4. Wipe excess oil from hinge/latch.
5. Repeat steps 1 – 4 for each door.

Table 4. Table of Lubricant — Hinges.

SPECIFICATION	TYPE OF LUBRICANT	FREQUENCY	METHOD OF APPLICATION
MIL-PRF-2104H	MIL-PRF-2104H OE/HDO-15/40	500 hr	Oil can, mechanic's flexible

END OF TASK

END OF WORK PACKAGE

**FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
TORQUE LIMITS**

SCOPE

This WP provides general torque limits for fasteners used on the 15 kW generator set. Special torque limits are indicated in Table 1. The Table 2 given in this WP shall be used when specific torque limits are not indicated in Table 1.

The following formula should be used to determine the setting used on the torque wrench when using a crowfoot extension: (SOCKET, CROWFOOT WRENCH HEAD 17105) $M1 = M2 \times L1 / L2$. The values from the formula are defined in the list below.

<u>Term</u>	<u>Definition</u>
M1	The torque setting of the wrench (this is what is being calculated).
M2	The desired torque to be applied to the nut.
L1	The normal length of the torque wrench (from center of grip to center of drive).
L2	The length of the torque wrench plus the length of crowfoot adapter (measured from the center of crowfoot drive to center of wrench drive).

The example shows the calculation of the torque to be set on an 18-in wrench with a 4-in crowfoot adapter to obtain 80 ft/lb of torque.

$$M1 (65.45) = 80 \times 18/22.$$

When any extension is 90 degrees from the torque wrench, no adjustment is necessary.

These general and special torque limits shall not be applied to fasteners that retain rubber components. The rubber components may be damaged before the correct torque limit is reached. If a special torque limit is not given in the maintenance instructions for rubber components, tighten the fastener until it touches the metal, and then tighten it one more turn.

Table 1. Special Torque Limits.

COMPONENT	THREAD DIAMETER AND PITCH	TORQUE	LUBRICATING OIL APPLICATION
Cylinder head bolt	M10 – 1.25 mm	85.3 – 91.1 Nm 46 – 49 ft/lb	Applied
Connecting rod bolt	M9 – 1.0 mm	44.1 – 49.0 Nm 33 – 36 ft/lb	Applied
Flywheel bolt	M10 – 1.25 mm	83.3 – 88.2 Nm 61 – 65 ft/lb	Applied
Positive Crankcase Ventilation (PCV) flange bolt	M8 – 1.5 mm	113 – 123 Nm 83 – 91 ft/lb	Not applied
Main bearing cap bolt	M12 – 1.5 mm	93.2 – 98.1 Nm 69 – 72 ft/lb	Applied
Harmonic balancer bolt	M14 – 1.5 mm	112.7 – 122.7 Nm 83 – 91 ft/lb	Applied
Fuel injector retainer bolt	M8 – 1.25 mm	24.2 – 28.4 Nm 18 – 21 ft/lb	Not applied
Fuel pump drive gear nut	M14 – 1.5 mm	78 – 88 Nm 58 – 65 ft/lb	Not applied
High-pressure fuel lines bolt	M12 – 1.5 mm	29.4 – 34.3 Nm 22 – 25 ft/lb	Not applied
High-pressure fuel injector line nut	Any	29 – 34 Nm 22 – 25 ft/lb	Not applied
Fuel return line bolt	Any	7.8 – 9.8 Nm 69 – 87 in/lb	Not applied
Fuel injection pump mounting bolt	Any	23 – 28 Nm 17 – 21 ft/lb	Not applied
Fuel injector nozzle case nut	Any	39.2 – 44.1 Nm 30 – 33 ft/lb	Not applied
Fuel injection pump plunger plug	Any	30 – 35 Nm 22 – 26 ft/lb	Not applied

How to Use Torque Table

1. Measure the diameter of the fastener (Figure 1, Item 2).
2. Look down the left-hand column under "Diameter" heading to find the diameter of the fastener.
3. Measure the distance between the thread ridges in millimeter to determine pitch (Figure 1, Item 1).
4. To locate torque value, look across to column matching description and size of fastener.

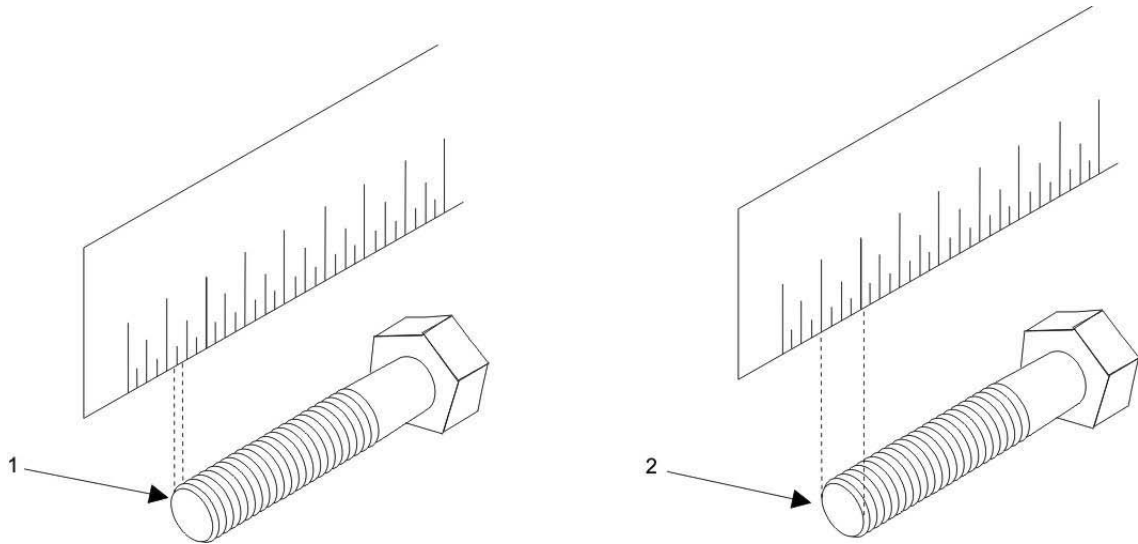


Figure 1. Screw/Bolt Measurement.

CAUTION

The torque values in Table 2 should be applied only to bolts marked "7" (7T strength). Failure to comply will cause damage to equipment.

NOTE

Apply 80% of listed torque value to fasteners tightened to aluminum alloys. Apply 60% of listed torque value to fasteners of 4T strength and all lock nuts.

Table 2. Standard Torque Limits.

ITEM	THREAD DIAMETER AND PITCH	TORQUE
Cap screw (7T) and nut	M6 – 1.0 mm	9.8 – 11.8 Nm 7 – 9 ft/lb
Cap screw (7T) and nut	M8 – 1.25 mm	22.6 – 28.4 Nm 17 – 21 ft/lb
Cap screw (7T) and nut	M10 – 1.5 mm	44.1 – 53.9 Nm 33 – 40 ft/lb
Cap screw (7T) and nut	M12 – 1.75 mm	78.4 – 98.0 Nm 58 – 72 ft/lb
Cap screw (7T) and nut	M14 – 1.5 mm	127.5 – 147.1 Nm 94 – 108 ft/lb
Cap screw (7T) and nut	M16 – 1.5 mm	215.7 – 235.4 Nm 159 – 174 ft/lb
PT Plug	0.125 mm – NA	9.8 Nm 7 ft/lb
PT plug	0.25 mm – NA	19.6 Nm 14 ft/lb
PT plug	0.375 mm – NA	29.4 Nm 22 ft/lb
PT plug	0.500 mm – NA	58.8 Nm 43 ft/lb
Pipe joint plug	M8 – NA	12.7 – 16.7 Nm 9 – 12 ft/lb
Pipe joint plug	M10 – NA	19.6 – 18.7 Nm 14 – 19 ft/lb
Pipe joint plug	M12 – NA	24.5 – 34.3 Nm 18 – 25 ft/lb
Pipe joint plug	M14 – NA	39.2 – 49.0 Nm 29 – 36 ft/lb
Pipe joint plug	M16 – NA	49.0 – 58.8 Nm 36 – 43 ft/lb

END OF TASK**END OF WORK PACKAGE**

CHAPTER 4

SUSTAINMENT MAINTENANCE TROUBLESHOOTING PROCEDURES

FOR

AMMPS 15KW GENERATOR SET

CHAPTER 4

SUSTAINMENT MAINTENANCE TROUBLESHOOTING PROCEDURES

WORK PACKAGE INDEX

<u>Title</u>	<u>WP Sequence No.</u>
SUSTAINMENT MAINTENANCE TROUBLESHOOTING INDEX.....	0091
SUSTAINMENT MAINTENANCE TROUBLESHOOTING PROCEDURES	0092

**SUSTAINMENT MAINTENANCE
 AMMPS 15KW GENERATOR SET
 SUSTAINMENT MAINTENANCE TROUBLESHOOTING INDEX**

GENERAL TROUBLESHOOTING INFORMATION

NOTE

Always perform sustainment maintenance PMCS prior to beginning any troubleshooting procedure (WP 0094, Sustainment PMCS).

Sustainment maintenance is responsible for repair and/or replacement of failed LRUs as identified by field maintenance. There are no specific troubleshooting procedures for sustainment maintenance. The malfunction/symptom index found below lists malfunction(s) identified at the field level and their related sustainment maintenance corrective action (by WP). If engine or AC generator overhaul is required, notify your supervisor.

MALFUNCTION/SYMPTOM INDEX

Malfunction/Symptom

Troubleshooting Procedure WP and Page

Generator set inoperable

Failed LRU as determined by field maintenance..... WP 0092, Page 1

END OF WORK PACKAGE

**SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
SUSTAINMENT MAINTENANCE TROUBLESHOOTING PROCEDURES**

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special ToolsTool Kit, General Mechanic's (GMTK) (WP 0163,
Maintenance Allocation Chart, Item 43)**Materials/Parts**

Not Applicable

Personnel Required

91D (1)

ReferencesChapter 3, Field Maintenance Instructions (Chapter 3
Index)

WP 0094, Sustainment PMCS

Equipment Conditions

Not Applicable

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

GENERATOR SET**NOTE**

Always perform sustainment maintenance PMCS prior to beginning any troubleshooting procedure (WP 0094, Sustainment PMCS).

SYMPTOM

Generator set inoperable.

MALFUNCTION

Failed LRU as determined by field maintenance.

CORRECTIVE ACTION

Repair/replace failed component(s) IAW maintenance procedures contained in Chapter 3, Field Maintenance Instructions (Chapter 3 Index). If symptom continues, notify your supervisor.

END OF WORK PACKAGE

CHAPTER 5
SUSTAINMENT MAINTENANCE INSTRUCTIONS
FOR
AMMPS 15KW GENERATOR SET

CHAPTER 5

SUSTAINMENT MAINTENANCE INSTRUCTIONS

WORK PACKAGE INDEX

<u>Title</u>	<u>WP Sequence No.</u>
SUSTAINMENT PMCS INTRODUCTION	0093
SUSTAINMENT PMCS	0094
GENERAL MAINTENANCE	0095
REMOVE/INSTALL HARMONIC BALANCER	0096
REMOVE/INSTALL GEAR CASE COVER	0097
REPLACE CLYINDER HEAD GASKET	0098
WIRING DIAGRAMS	0099

**SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
SUSTAINMENT PMCS INTRODUCTION**

INTRODUCTION

This section contains information required to perform sustainment maintenance PMCS. All PMCS for the AMMPS 15 kW generator set are completed by the operator (TM 9-6115-751-10) or by field maintenance personnel (WP 0016, Field PMCS). There are no PMCS tasks to be performed by sustainment maintenance personnel.

END OF WORK PACKAGE

**SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
SUSTAINMENT PMCS**

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Not Applicable

Materials/Parts

Not Applicable

Personnel Required

Not Applicable

References

TM 9-6115-751-10

WP 0016, Field PMCS

Equipment Conditions

Not Applicable

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

There are no PMCS tasks to be performed by sustainment maintenance personnel. All PMCS for the AMMPS 15 kW generator set are completed by the operator (TM 9-6115-751-10) or by field maintenance personnel (WP 0016, Field PMCS).

END OF WORK PACKAGE

**SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
GENERAL MAINTENANCE**

INITIAL SETUP:**Test Equipment**

- Cable, Local Control (WP 0163, Maintenance Allocation Chart, Item 8)
- Cable, Remote Control (WP 0163, Item 9)
- Test Set, Electronic Systems (WP 0163, Item 31)

Tools and Special Tools

- Cable, Auxiliary With NATO Plug (WP 0163, Item 7)
- Crimping, Tool, Terminal, (WP 0163, Item 10)
- Crimping, Tool, Terminal, Hand (WP 0163, Item 11)
- Oiler, Hand (WP 0163, Item 20)
- Remover, Electrical Contact (WP 0163, Item 22)
- Tool Kit, General Mechanic's (GMTK) (WP 0163, Item 38)
- Tool, Rivet Nut (WP 0162, Item 40)

Materials/Parts

- Boot, dust and moisture (28) (WP 0154, Repair Parts List, Figure 54, Item 15)
- Boot, vehicular comp (2) (WP 0155, Repair Parts List, Figure 55, Item 12)
- Contact, electrical, 16 – 20 AWG (4) (WP 0154, Figure 54, Item 37)
- Contact, electrical (8) 18 – 20 AWG (WP 0154, Figure 54, Item 14)
- Contact, electrical, 22 – 16 AWG (15) (WP 0154, Figure 54, Item 21)
- Contact, electrical, 22 – 16 AWG (34) (WP 0154, Figure 54, Item 40)
- Connector, electrical magnetic sensor (WP 0154, Figure 54, Item 64)
- Contact, pin, 16 – 18 AWG (3) (WP 0154, Figure 54, Item 48)
- Connector, plug, electrical (WP 0154, Figure 54, Item 3)

Materials/Parts

- Connector, plug, electrical (WP 0154, Figure 54, Item 6)
- Connector, plug, electrical (WP 0154, Figure 54, Item 10)
- Contact, socket, 20 – 18 AWG (2) (WP 0154, Figure 54, Item 60)
- Nut, plain, clinch (WP 0104, Repair Parts List, Figure 4, Item 4)
- Plug, 12 (WP 0146, Repair Parts List, Figure 46, Item 6)
- Plug, 30 (WP 0146, Figure 46, Item 3)
- Plug, 50 (WP 0146, Figure 46, Item 2)
- Seal (3) (WP 0154, Figure 54, Item 46)
- Seal, plain (2) (WP 0154, Figure 54, Item 70)
- Terminal, lug (3) (WP 0154, Figure 54, Item 8)
- Terminal, lug, 16 – 14 AWG (4) (WP 0154, Figure 54, Item 44)
- Terminal, lug, 16 – 20 AWG (2) (WP 0154, Figure 54, Item 69)
- Terminal, lug, ring (1) (WP 0155, Figure 55, Item 2)
- Terminal, lug, ring (1) (WP 0155, Figure 55, Item 8)
- Terminal, lug, ring, M8, 12 – 10 AWG (8) (WP 0155, Figure 55, Item 7)
- Terminal, lug, ring, 3/8 in, 12 – 10 AWG (2) (WP 0155, Figure 55, Item 9)
- Terminal, quick disconnect (3) (WP 0154, Figure 54, Item 29)
- Terminal, quick disconnect (3) (WP 0154, Figure 54, Item 62)
- Terminal, quick disconnect, 14 – 16 AWG (17) (WP 0154, Figure 54, Item 28)
- Terminal, taper, receptacle (2) (WP 0155, Figure 55, Item 11)

INITIAL SETUP — CONTINUED:**Materials/Parts**

Baking soda (WP 0164, Expendable and Durable Items List, Item 4)
 Brush, wire, scratch (WP 0164, Item 8)
 Cap set, protective (WP 0164, Item 9)
 Fuel, diesel (WP 0164, Item 19)
 Fuel, diesel (WP 0164, Item 20)
 Lubricating oil, engine (WP 0164, Item 27)
 Rag, wiping (WP 0164, Item 32)
 Tape, pressure sensitive (WP 0164, Item 37)

Personnel Required

91D (1)

References

A-A-52557A
 MIL-DLT-83133G
 WP 0009, Electrical System Troubleshooting without a DCS Code
 WP 0016, Field Maintenance PMCS
 WP 0017, Remove/Install DCS
 WP 0018, Repair DCS

References

WP 0019, Remove/Install Air Intake Hose Assemblies
 WP 0021, Service Cooling System
 WP 0036, Remove/Install Batteries
 WP 0043, Service Fuel System
 WP 0044, Remove/Install Fuel Pump, Main/Auxiliary
 WP 0045, Remove/Install Fuel Manifold
 WP 0047, Replace Fuel Filter/Water Separator Element
 WP 0065, Service Lubrication System
 WP 0089, Lubrication Instructions

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)
 Engine cool
 Battery ground cable removed (WP 0036, Remove/Install Batteries)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

GENERAL MAINTENANCE

This section provides general maintenance procedures for using a fire extinguisher, understanding general fuel requirements, using a multimeter, jump starting the generator set, cleaning battery terminals, repairing electrical connectors, accessing log files on DCS, using InPower AMMPS for troubleshooting and updating, and preparation for storage.

Using a Fire Extinguisher

Do not use a fire extinguisher without reading the instructions and receiving proper training. When using a fire extinguisher, choose the proper type of fire extinguisher for the class of fire. Be sure to use a type "A" on ordinary materials (paper, cardboard, and most plastics), type "B" on combustible or combustibles (diesel, gas, grease, and oil), type "C" on electrical fires, type "D" on combustible metal/chemical fires, or a multipurpose extinguisher designated with the proper letter for the class fire. For example, an "ABC" extinguisher will handle class "A," "B," and "C" fires. Using the improper fire extinguisher can result in spreading of the fire and failure to extinguish. Failure to comply may cause injury or death to personnel. Do not attempt to extinguish a fire that is large in size. Do not attempt to extinguish a fire when there is no clear exit visible. Be sure building is evacuated. Call for help IAW local SOP. Stay low to avoid smoke. Failure to comply may cause injury or death to personnel.

1. Determine the class of fire ("A," "B," "C," or "D").

2. Choose the correct type of extinguisher.
3. Pull the pin of the extinguisher.
4. Aim the extinguisher at the base of the fire.
5. Sweep back and forth toward the fire.
6. Continue until fire is extinguished.
7. Recharge or dispose of extinguisher IAW local SOP.

END OF TASK

General Fuel Requirements

WARNING

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (static grounding). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate ESD. Fire and possible explosion can result. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open flames when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.
- Hot engine surfaces from the engine and generator circuitry are possible sources of ignition. When hot refueling with DF-1, DF-2, JP5, or JP8, avoid fuel splash and fuel spill. Do not smoke or use open flame when performing refueling. Remember PMCS is still required. Flames and possible explosion may result. Failure to comply may cause injury or death to personnel.

NOTE

DF-2 and JP8 are the types of fuel for the generator set. See Table 1.

Table 1. Fuel.

AMBIENT TEMPERATURE	FUEL
-50°F to +135°F (-45.6°C to 57.2°C)	MIL-DTL-83133G ^a JP8
+20°F to +135°F (-6.7°C to 57.2°C)	A-A-52557A ^b GR 2-D
-50°F to +135°F (-45.6°C to 57.2°C)	A-A-52557A GR 1-D

^aTurbine Fuel, Aviation, Kerosene Type, JP-8 (NATO F-34), NATO F-35, and JP-8+100 (NATO F-37).

^bFuel Oil, Diesel; for Posts, Camps and Stations.

END OF TASK

Using a Multimeter

1. Select turn dial for option to be used:
 - a. Ohms for resistance, continuity, and short circuit.
 - b. Volts for voltage.
 - c. Amperes for current.

WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

CAUTION

Only use instruments known to be in good working order. When an instrument is used to measure resistance, proper function should be confirmed by touching metal tips of leads together and observing for minimum resistance indication. Failure to comply may cause damage to equipment.

2. Measure resistance value.
 - a. Connect multimeter leads to leads of item being checked.
 - b. Use red lead for positive terminal.
 - c. Use black lead for negative terminal.
 - d. Observe display for reading.
 - e. Compare reading to specifications.
3. Check for opens or continuity.
 - a. Connect multimeter leads to wiring circuit being checked.
 - b. Observe display for reading.
 - c. Consult specifications for maximum permissible reading.
4. Check for short circuit, wire to wire.
 - a. Connect multimeter leads to wires being checked.
 - b. Observe display for reading.
 - c. Reading must be greater than 100 kilohms ($k\Omega$) wire to wire or short exists.
5. Check for short circuit to ground.
 - a. Connect one multimeter lead to wire being checked.
 - b. Touch multimeter probe to bare metal, such as engine block.
 - c. Observe display for reading.
 - d. Repeat steps 5a through c for remaining wires in circuit.
 - e. Reading must be greater than 100 $k\Omega$ or short to ground exists.

6. Place proper lead on proper terminal to check voltage:
 - a. Use red lead for positive terminal.
 - b. Use black lead for negative terminal.
 - c. Observe display for reading.
 - d. Compare reading to specifications.
7. Place proper lead on proper terminal to check current:
 - a. Use red lead for positive terminal.
 - b. Use black lead for negative terminal.
 - c. Observe display for reading.
 - d. Compare reading to specifications.

END OF TASK

Jump Starting the Generator Set

Jump starting requires the use of the NATO slave receptacle. NATO slave cables are required to jump start a 24-V system. The generator set cannot be jump started with a 12-V system. Ensure the vehicle/equipment being used to jump start the generator set is a 24-V system.

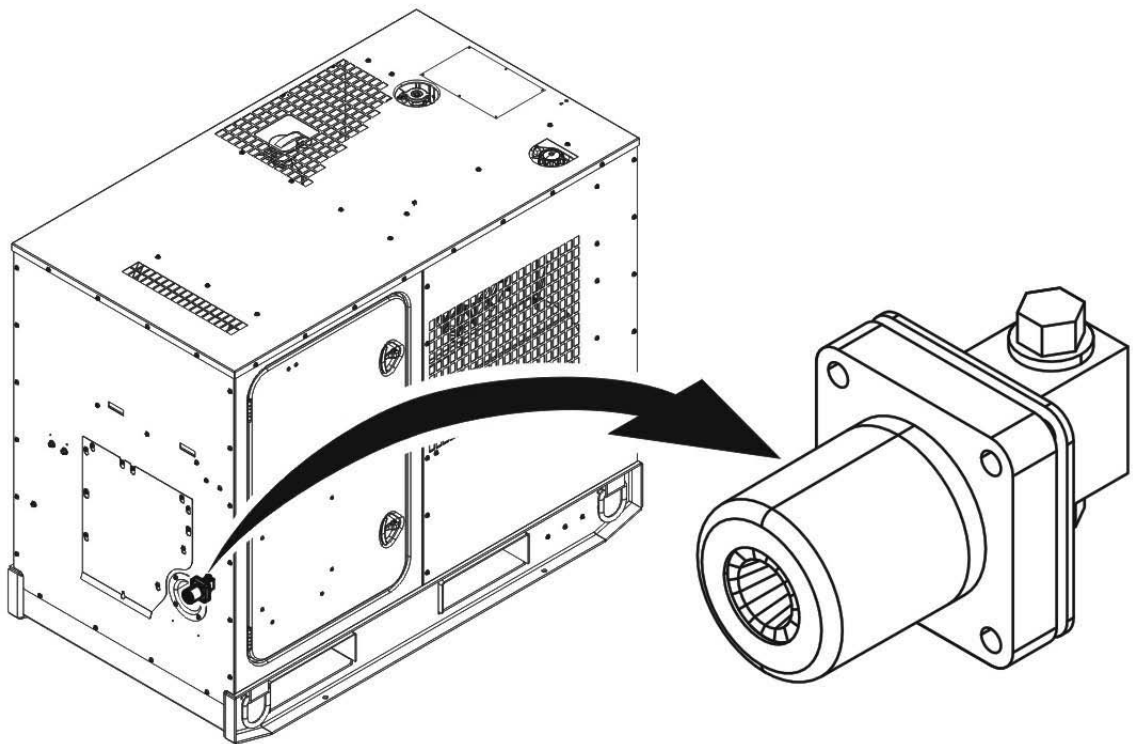


Figure 1. NATO Slave Receptacle — Location.

WARNING

- NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.
 - Ensure equipment/vehicles being used to jump-start the generator set are not touching. Touching of metal surfaces can cause improper grounding. Do not allow the cable ends to touch each other or any part of the generator set/vehicle/equipment other than the NATO slave receptacle. May result in damage to the electrical system of the generator set/vehicle/equipment. Failure to comply may cause injury or death to personnel.
 - High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator set is running. Failure to comply may cause injury or death to personnel.
1. Move the vehicle/equipment being used to jump start close enough to the generator set that the cables reach.
 2. Ensure the engine control switch on the generator set is OFF (TM 9-6115-751-10).
 3. Ensure the vehicle/equipment being used to jump start is OFF.
 4. Locate the NATO slave receptacle inside the left side door (Figure 1).
 5. Remove the NATO slave receptacle cover.
 6. Ensure NATO slave cable ends are free of dirt and debris.
 7. Ensure NATO slave receptacles are free of dirt and debris.
 8. Connect the NATO slave cable to the generator set.
 9. Turn on the vehicle/equipment being used to jump start the generator set.
 10. Connect the other end of the NATO slave cable to the vehicle/equipment being used to jump start.
 11. Allow the generator set to charge for 10 min.

CAUTION

Do not crank engine in excess of 15 sec. Allow starter to cool for at least 15 sec between attempted starts. Failure to comply may cause damage to equipment.

12. Set engine control switch to PRIME & RUN (TM 9-6115-751-10).
13. Start engine and check for proper operation (TM 9-6115-751-10).
14. Ensure proper operation of the generator set.
15. Remove the NATO slave cable from the vehicle/equipment being used to jump start.
16. Remove the NATO slave cable from the generator set.
17. Replace the cap on the NATO slave receptacle.

END OF TASK

Clean Battery Posts**WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
 - The right-hand battery negative lead that connects directly to the grounding stud must be disconnected prior to disconnecting or removing batteries. Follow procedural steps in exact order given for removal and installation. Failure to comply may cause injury or death to personnel.
 - Shut down generator sets before performing inspection of load cables. Failure to comply may cause injury or death to personnel by electrocution.
 - Batteries give off combustible gas. Do not smoke or use open flame when performing maintenance. Failure to comply may cause injury or death to personnel and damage to equipment.
 - Battery acid can cause burns to skin and cause eye injury. Wear safety goggles and chemical gloves and avoid acid splash while working on the batteries. Failure to comply may cause injury or death to personnel.
 - Lifting batteries may cause back strain. Ensure proper lifting techniques are used when lifting batteries. Failure to comply may cause injury or death to personnel.
1. Remove battery cables from battery terminals (WP 0036, Remove/Install Batteries).
 2. Apply a one-part sodium bicarbonate to two-parts water solution to terminals.
 3. Let terminals stand in solution for 2 – 3 min.
 4. Clean terminals with a wire brush.
 5. Dry battery terminals with a wiping rag.
 6. Install battery cables to battery terminals (WP 0036, Remove/Install Batteries).

END OF TASK

Repair Electrical Connectors

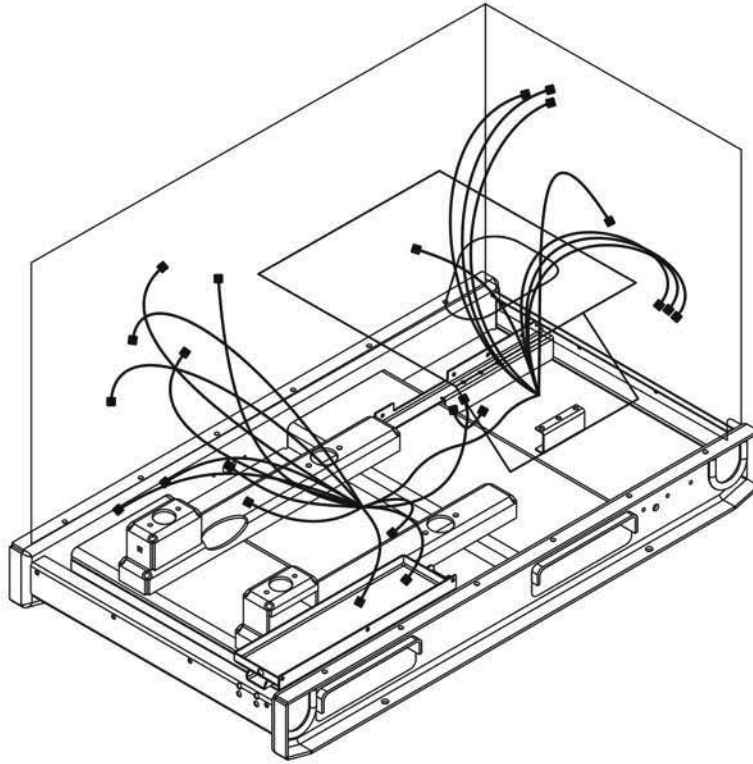


Figure 2. Wiring Harness — Location.

NOTE

Several types of connector are used on the AMMPS generator set wiring harness. Each type of electrical connector can be replaced without removing the entire wiring harness from the unit. Replacement steps for each type of electrical connector are given below. A table at the end of each repair step identifies the relevant electrical connector, contact type, and number of contacts required for each component connector type.

See the fold-out electrical wiring diagrams in the rear of this manual for locations of the various types of electrical connectors. Electrical connector numbers in the tables are keyed to the Engine Harness fold out diagram at the back of this manual.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate electrical connector or wiring harness (Figure 2) that requires repair.
3. Replace simple crimp-on ring connector (Table 2).

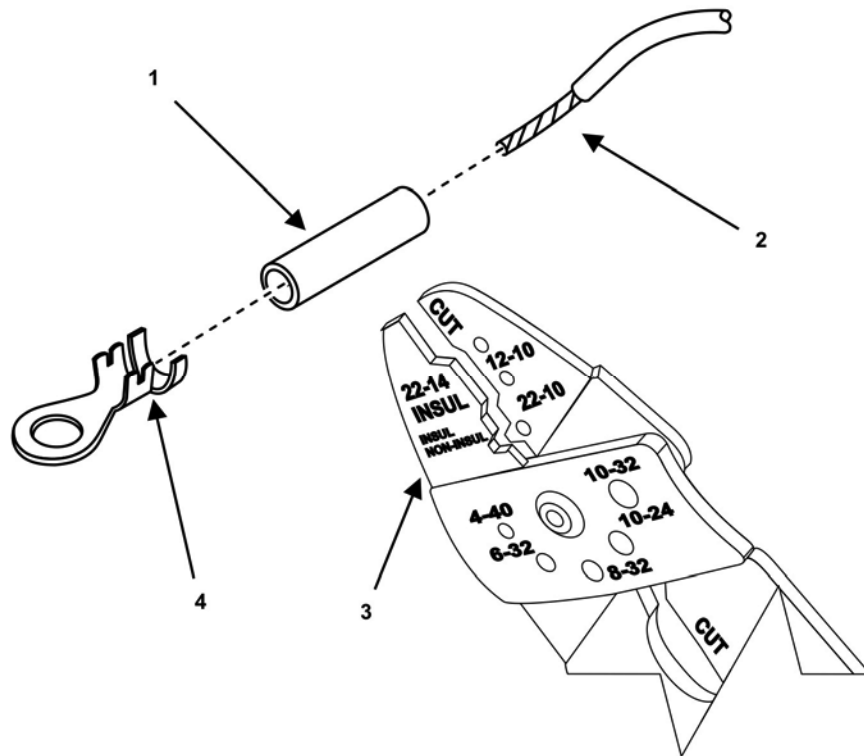


Figure 3. Simple Crimp-on Ring Connector.

- a. Identify failed electrical component connector (Figure 3, Item 4).
- b. Cut and discard old connector (Figure 3, Item 4) from wire lead (Figure 3, Item 2) at base of old connector.
- c. Install a length of new shrink wrap (Figure 3, Item 1) long enough to cover the crimp area of new connector (Figure 3, Item 4) onto wire lead (Figure 3, Item 2).
- d. Strip insulation from wire lead (Figure 3, Item 2) equal to depth of new connector well.
- e. Place bare wire of wire lead (Figure 3, Item 2) into new connector (Figure 4, Item 4) well and crimp to secure connector (Figure 3, Item 4) to wire lead (Figure 3, Item 2) using a crimping tool (Figure 3, Item 3).
- f. Test new connector (Figure 3, Item 4) using a multimeter to verify continuity is present using wire diagram as a guide to identify the correct circuit.
- g. Slide shrink wrap (Figure 3, Item 1) over newly crimped connection and heat to form a tight seal.
- h. Install new connector (Figure 3, Item 4) to electrical component.
- i. Check operation of electrical component for proper operation. Repair as required.

Table 2. Crimp-on Ring Connector Repair.

WIRING HARNESS	ELECTRICAL COMPONENT	CONNECTOR TYPE	NO. CONTACTS
Engine Wiring Harness	DEAD CRANK SWITCH	Ring	3
Engine Wiring Harness	Battery-charging Alternator	Ring	1
Engine Wiring Harness	Starter Relay	Ring	1
Engine Wiring Harness	Grid Heater Relay	Ring	4
Engine Wiring Harness	Grid Heater	Ring	1
Power Wiring Harness	Battery-Charging Alternator (B+)	Ring	2
Power Wiring Harness	Battery-Charging Alternator (Ground)	Ring	1
Power Wiring Harness	Starter (B+)	Ring	1
Power Wiring Harness	Starter (B-)	Ring	2
Power Wiring Harness	Main DC Circuit Breaker (B+)	Ring	4

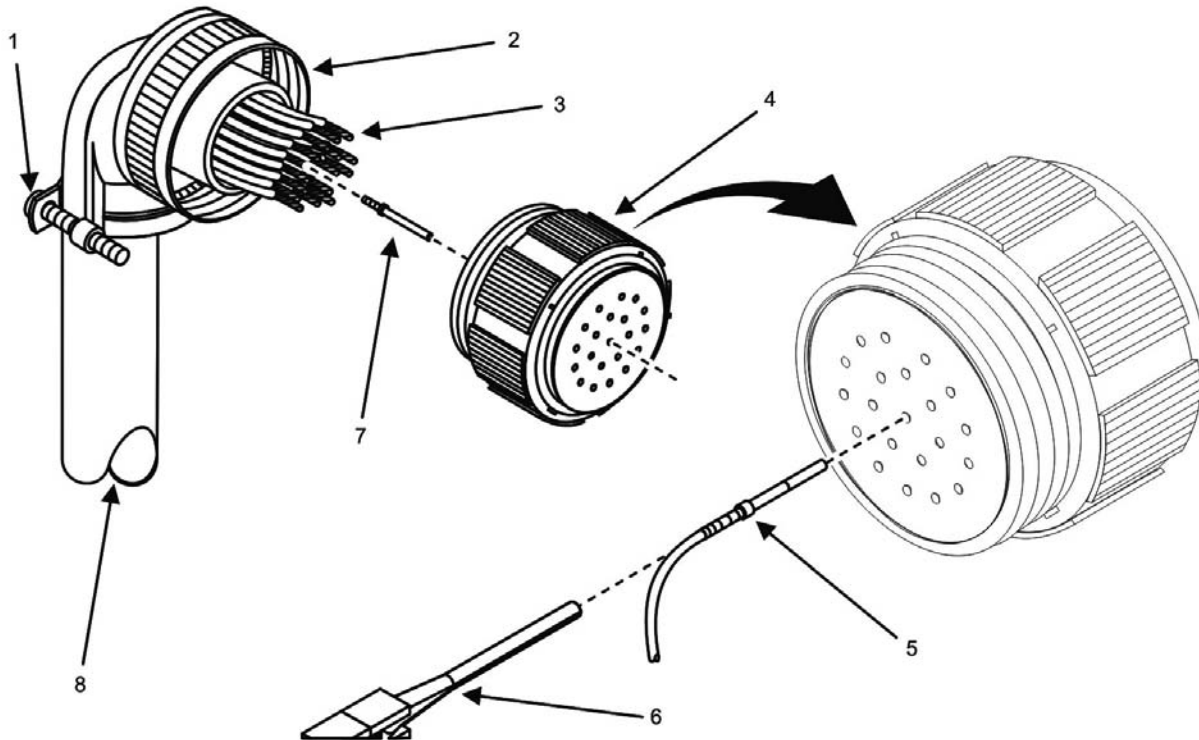


Figure 4. Multipin Connector Repair.

4. Repair multipin bulkhead-mounted connector (Table 3).

NOTE

This task contains typical repair instructions for the multipin connectors used on the 15 kW AMMPS DCS and engine speed sensor. There are four different connectors used on the generator set. Each one varies in the number of pins/sockets used in the connector. Repair of each connector uses the same procedure provided below. See Table 3 for the correct connector for your application.

- a. Disconnect cable connector from generator set component.
- b. Test wire/socket connections (Figure 4, Item 5) of electrical connector using a multimeter to determine failed socket(s) (Figure 4, Item 7) within the connector.

- c. Loosen two screws (Figure 4, Item 1) that secure strap of shell (Figure 4, Item 2) to cable (Figure 4, Item 8).
- d. Unscrew shell (Figure 4, Item 2) from connector housing (Figure 4, Item 4).
- e. Slide shell (Figure 4, Item 2) down cable (Figure 4, Item 8) to access back of connector housing (Figure 4, Item 4).
- f. Remove every wire/socket connection (Figure 4, Item 5) from rear of connector housing (Figure 4, Item 4) using extractor tool (Figure 4, Item 6).
- g. Inspect all individual wire/socket connections for signs of obvious damage. Replace all damaged sockets (Figure 4, Item 7) while accessible
- h. Inspect cable (Figure 4, Item 8), shell (Figure 4, Item 2), and connector housing (Figure 4, Item 4) for signs of obvious damage. Replace all damaged components as required.

CAUTION

De-solder (see TB SIG 222) broken/damaged socket(s) (Figure 4, Item 7) and remove socket (Figure 4, Item 7) from cable wire (Figure 4, Item 3).

- i. Solder (see TB SIG 222) new socket(s) (Figure 4, Item 7) to cable wire (Figure 4, Item 3).
- j. Test new socket/wire connection(s) (Figure 4, Item 5) to ensure proper electrical flow.
- k. Insert all individual socket/wire connections (Figure 4, Item 5) into rear of connector housing (Figure 4, Item 4) using tags/markings applied during removal as a guide. Push socket/wire connections (Figure 4, Item 5) into connector housing (Figure 4, Item 4) locations by hand until each socket (Figure 4, Item 7) is fully seated and will not pull out.
- l. Slide shell (Figure 4, Item 2) over cable (Figure 4, Item 8) to its mounting location on connector housing (Figure 4, Item 4) and secure by screwing shell (Figure 4, Item 2) onto connector housing (Figure 4, Item 4).
- m. Tighten two screws (Figure 4, Item 1) to secure strap of shell (Figure 4, Item 2) to cable (Figure 4, Item 8) and relieve strain on cable (Figure 4, Item 8).

Table 3. Multipin Bulkhead-Mounted Connector Repair.

ELECTRICAL COMPONENT (CONNECTOR NUMBER)	CONTACT TYPE	NO. CONTACTS
DCS (P1)	Socket	21
DCS (P2)	Socket	29
DCS (P3)	Socket	61
Engine Speed Sensor (P14)	Pin	2

- 5. Repair square type connector (Table 4).

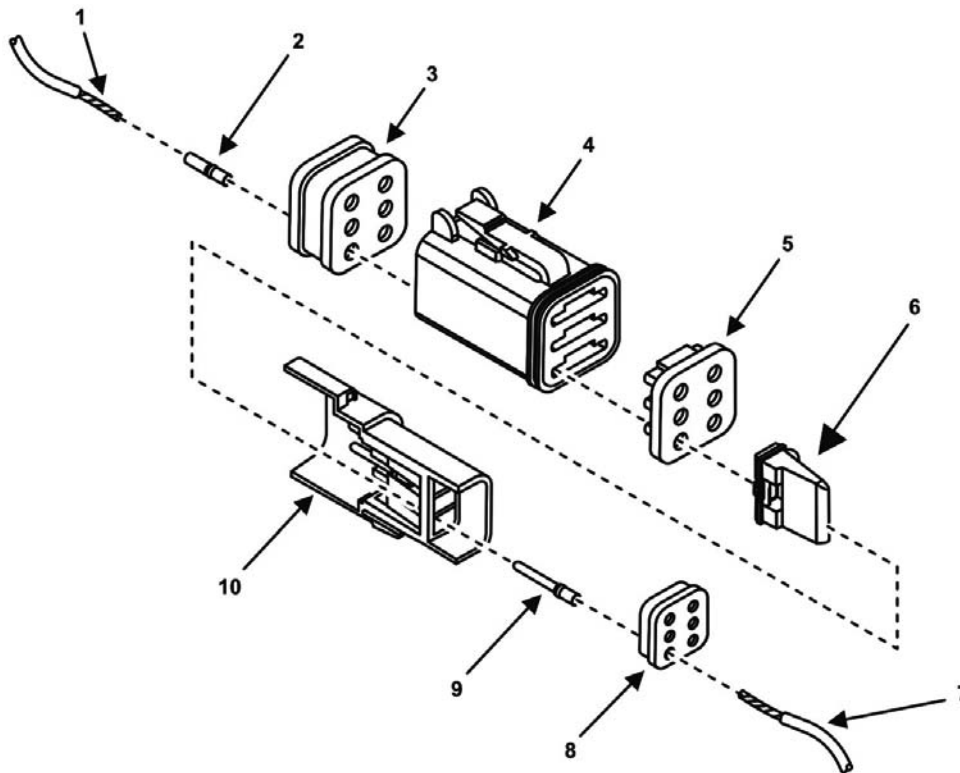


Figure 5. Square-Type Connector.

NOTE

Electrical connectors covered by this method may vary in design/shape, but the procedure to repair them is the same.

- a. Identify electrical connector (Figure 5, Items 4 and 10) containing failed contact (Figure 5, Items 2 and 9).
- b. Disconnect connector (Figure 5, Items 4 and 10) from electrical component (Table 4).
- c. Test contact (Figure 5, Items 2 and 9) of electrical connector (Figure 5, Items 4 and 10) using a multimeter to determine failed contact (Figure 5, Items 2 and 9) within the connector (Figure 5, Items 4 and 10).
- d. Remove wedge lock (Figure 5, Item 6) or retainer lock (Figure 5, Item 5) from connector (Figure 5, Items 4 and 10) by pulling straight out using needle nose pliers.
- e. Remove failed contact (Figure 5, Item 2 and 9) by gently pulling wire (Figure 5, Items 1 and 7) attached to failed contact (Figure 5, Item 2 and 9) from connector (Figure 5, Items 4 and 10) while, at the same time, releasing the locking finger of failed contact (Figure 5, Items 2 and 9) using the proper contact removal tool.
- f. Hold seal (Figure 5, Items 3 and 8) in place using the removal tool as it may be displaced when pulling failed contact (Figure 5, Items 2 and 9) from rear of connector (Figure 5, Items 4 and 10) once failed contact (Figure 5, Items 2 and 9) is free from its locking finger.
- g. Cut failed contact (Figure 5, Items 2 and 9) from wire lead (Figure 5, Items 1 and 7) at base of failed contact (Figure 5, Items 2 and 9). Discard failed contact (Figure 5, Items 2 and 9).

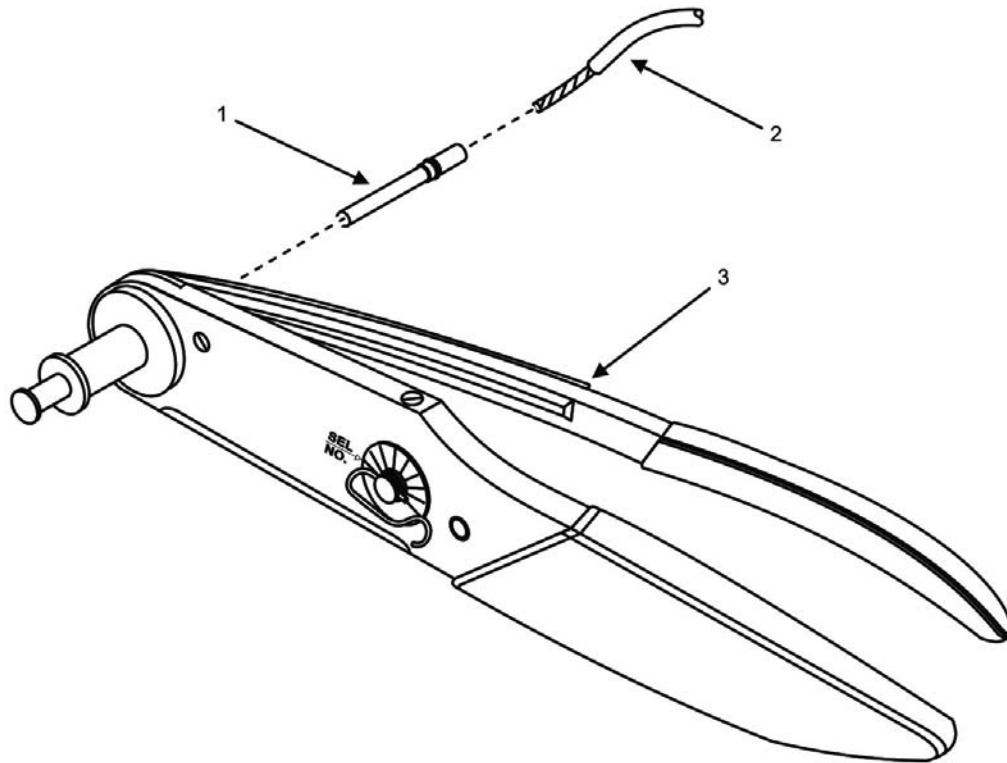


Figure 6. Square-Type Crimping Tool.

- h. Strip insulation from wire lead (Figure 5, Items 1 and 7) to the length of new contact (Figure 5, Items 2 and 9) wire well.

NOTE

Crimping tool must be readjusted for each type/size of contact.

- i. Adjust crimping tool (Figure 6, Item 3) to the correct size of new contact (Figure 6, Item 1).
- j. Insert new contact (Figure 6, Item 1) into crimping tool (Figure 6, Item 3).
- k. Insert wire (Figure 6, Item 2) into contact (Figure 6, Item 1). Ensure all strands of wire are inside contact barrel. Contact (Figure 6, Item 1) must be centered between indicators of crimping tool (Figure 6, Item 3).
- l. Close handles of crimping tool (Figure 6, Item 3) until crimp cycle is completed.
- m. Release crimping tool handles and remove crimped contact (Figure 6, Item 1) from tool crimping tool (Figure 6, Item 3).
- n. Inspect crimped contact (Figure 6, Item 1) to ensure all strands of wire lead are inside contact barrel.
- o. Repeat substeps 5i through n if all wire strands were not captured inside contact (Figure 6, Item 1).
- p. Grasp wire lead (Figure 5, Items 1 and 7) approximately 1.0 in (25 mm) behind new contact (Figure 5, Items 2 and 9).
- q. Insert new contact (Figure 5, Items 2 and 9) straight into rear of seal (Figure 5, Items 3 and 8) until a click is felt.
- r. Pull gently on wire lead (Figure 5, Items 1 and 7) to verify contact (Figure 5, Items 2 and 9) is locked into connector (Figure 5, Items 4 and 10).

- s. Install wedge lock (Figure 5, Item 6) or retainer lock (Figure 5, Item 5) into connector (Figure 5, Items 4 and 10).
- t. Install repaired connector (Figure 5, Items 4 and 10) to electrical component.
- u. Check electrical component for proper operation. Repair as required.

Table 4. Square-Type Connector Repair.

ELECTRICAL COMPONENT (CONNECTOR NUMBER)	CONTACT TYPE	NO. CONTACTS
Winterization kit (J20C)	Socket	3
Main fuel pump (P65)	Socket	2
Auxiliary fuel pump (P60)	Socket	2
Governor actuator (P37)	Socket	2
G1 field (P90)	Socket	2
Fuel level sensor (P70)	Socket	3
Spares (P75)	Socket	6
G1 quad (P85)	Socket	2
Output box — P500	Socket	34

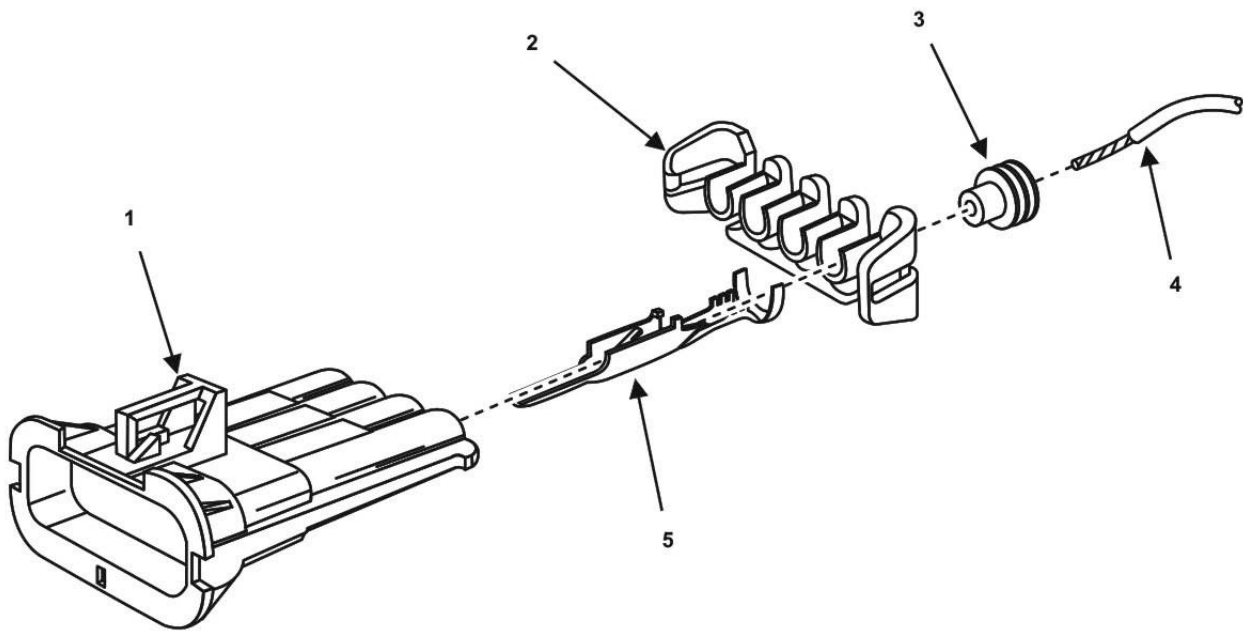


Figure 7. Flat-Type Pin Connector.

NOTE

The flat-type electrical connectors used on the AMMPS 15 kW generator set wiring harness are all of the pin type. The mating connectors are integral parts of the electrical components to which they are attached. The female type connectors attached to various electrical components are not repairable and therefore not depicted.

- 6. Repair flat-type connector (Table 5).

- a. Identify electrical connector containing failed contact.
- b. Disconnect wiring harness from electrical component.
- c. Test contacts (Figure 7, Item 5) of electrical connector using a multimeter to determine failed contact within the connector.
- d. Pull connector lock (Figure 7, Item 2) from rear of electrical connector shell (Figure 7, Item 1).
- e. Remove failed contact (Figure 7, Item 5) by gently pulling wire lead (Figure 7, Item 4) attached to failed contact (Figure 7, Item 5) from rear of connector shell (Figure 7, Item 1) while, at the same time, releasing contact (Figure 7, Item 5) from front of connector shell (Figure 7, Item 1) using the proper contact removal tool.
- f. Remove and discard failed contact (Figure 7, Item 5) from wire lead (Figure 7, Item 4).
- g. Remove and discard seal (Figure 7, Item 3) from wire lead (Figure 7, Item 4).
- h. Strip insulation from wire lead (Figure 7, Item 4) to the length of new contact wire well.
- i. Install new seal (Figure 7, Item 3) onto wire lead (Figure 7, Item 4).
- j. Crimp new contact (Figure 7, Item 5) to wire lead (Figure 7, Item 4) using proper crimping tool.
- k. Test new contact (Figure 7, Item 5) using a multimeter to verify continuity is present using wire diagram as a guide to identify the correct circuit.
- l. Grasp wire lead (Figure 7, Item 4) approximately 1.0 in (25 mm) behind new contact (Figure 7, Item 5).
- m. Insert new contact (Figure 7, Item 5) straight into rear of connector shell (Figure 7, Item 1) until a click is felt.
- n. Pull gently on wire lead (Figure 7, Item 4) to verify contact (Figure 7, Item 5) is locked into connector shell (Figure 7, Item 1).
- o. Install connector lock (Figure 7, Item 2) into rear of connector shell (Figure 7, Item 1).
- p. Install seal (Figure 7, Item 3) into connector lock (Figure 7, Item 2) until outer surface of seal (Figure 7, Item 3) is flush with outer surface of connector lock (Figure 7, Item 2).
- q. Install repaired connector (Figure 7, Item 1) to electrical component.
- r. Check electrical component for proper operation. Repair as required.

Table 5. Flat-Type Connector Repair.

WIRING HARNESS	ELECTRICAL COMPONENT (#)	CONTACT TYPE	NO. CONTACTS
Engine wiring harness	Battery sensor (P5)	Pin	3
Engine wiring harness	Coolant temperature sensor (P35)	Pin	2
Engine wiring harness	Oil pressure sensor (P40)	Pin	3
Engine wiring harness	Cooling fans (P96 and P97)	Pin	8
Engine wiring harness	Relay panel (P5A) (black)	Pin	4
Engine wiring harness	Relay panel (P5B) (grey)	Pin	4
Engine wiring harness	Relay panel (P5C) (blue)	Pin	5
Engine wiring harness	Relay panel (P5D) (green)	Pin	7
Power wiring harness	Relay panel (P11) (black)	Pin	1
Power wiring harness	Relay panel (P10) (grey)	Pin	1

7. Repair winterization kit connector (Table 6).

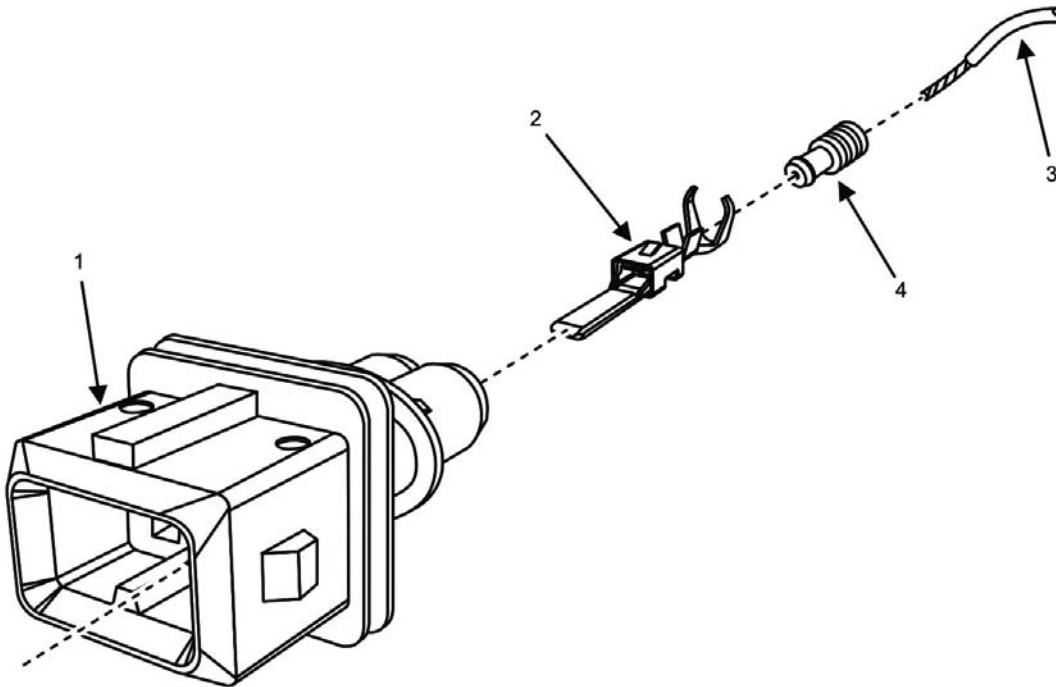


Figure 8. Winterization Kit Pin Connector.

- a. Identify electrical connector containing failed contact.
- b. Disconnect wiring harness from electrical component.
- c. Test contacts of electrical connector using a multimeter to determine failed contact within the connector.
- d. Remove failed contact (Figure 8, Item 2) by inserting the extraction tool fully into the connector (Figure 8, Item 1) at the failed contact (Figure 8, Item 2). When the extraction tool reaches its full travel, the locking tabs on the failed contact (Figure 8, Item 2) are released.
- e. Pull wire lead (Figure 8, Item 3) connected to failed contact (Figure 8, Item 2) gently from the rear of connector (Figure 8, Item 1) to remove failed contact (Figure 8, Item 2).
- f. Remove failed contact (Figure 8, Item 2) from wire lead (Figure 8, Item 3). Discard failed contact (Figure 8, Item 2).
- g. Slide seal (Figure 8, Item 4) further on wire lead (Figure 8, Item 3).
- h. Strip insulation from wire lead (Figure 8, Item 3) to the length of new contact wire well.
- i. Crimp new contact (Figure 8, Item 2) to wire lead (Figure 8, Item 3) using proper crimping tool.
- j. Test new contact (Figure 8, Item 2) using a multimeter to verify continuity is present using wire diagram as a guide to identify the correct circuit.
- k. Grasp wire lead (Figure 8, Item 3) approximately 1.0 in (25 mm) behind new contact (Figure 8, Item 2).
- l. Insert new contact (Figure 8, Item 2) and wire lead (Figure 8, Item 3) straight into rear of connector (Figure 8, Item 1) until a click is felt.
- m. Pull gently on wire lead (Figure 8, Item 3) to verify contact (Figure 8, Item 2) is locked into connector (Figure 8, Item 1).
- n. Install seal (Figure 8, Item 4) into connector (Figure 8, Item 1) until outer surface of seal (Figure 8, Item 4) is flush with outer surface of connector (Figure 8, Item 1).

- o. Install repaired connector (Figure 8, Item 1) to electrical component.
- p. Check electrical component for proper operation. Repair as required.

Table 6. Winterization Kit Connector Repair.

ELECTRICAL COMPONENT (#)	CONTACT TYPE	NO. CONTACTS
Winterization kit — fuel metering pump (P21)	Pin	2

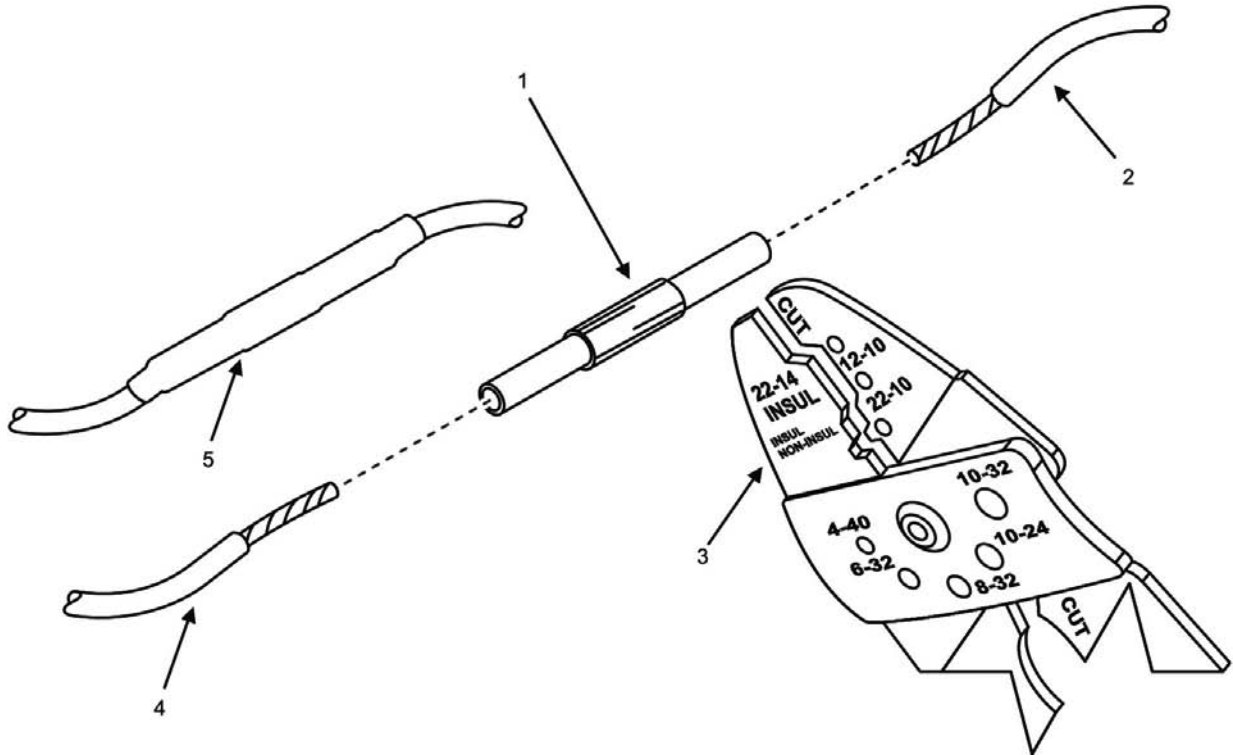


Figure 9. Butt Connector.

NOTE

Butt connectors are installed to repair (splice) in-line damage to an electrical wire. If damage to wire is longer than a replacement butt connector, use two butt connectors and a length of appropriate replacement wire to make a splice repair.

- 8. Install butt connector.
 - a. Locate in-line damage to electrical wire and determine size of wire and butt connector required.
 - b. Remove and discard damaged section of wire from wiring harness.
 - c. Remove the insulation from each end of the original wiring harness ends (Figure 9, Items 2 and 4).
 - d. Cut a piece of shrink wrap (Figure 9, Item 5) 1.0 in (25 mm) longer than the butt connector (Figure 9, Item 1) being used for the repair.
 - e. Slide shrink wrap (Figure 9, Item 5) over one end of the original wiring harness ends (Figure 9, Items 2 or 4).
 - f. Crimp both ends of original wiring harness (Figure 9, Items 2 and 4) into butt connector (Figure 9, Item 1) using a wire crimping tool (Figure 9, Item 3).

- g. Slide shrink wrap (Figure 9, Item 5) over the installed butt connector (Figure 9, Item 1). Be sure entire butt connector (Figure 9, Item 1) is covered and shrink wrap (Figure 9, Item 5) is overlapping original wiring harness ends (Figure 9, Items 2 and 4).
- h. Heat shrink wrap (Figure 9, Item 5) until it has tightly covered butt connector (Figure 9, Item 1).
- i. Check electrical component for proper operation. Repair as required.

END OF TASK

Downloading Log Files from DCS

1. Connect USB cable (Figure 10, Item 4) from compatible PC (Figure 10, Item 1) to USB port (Figure 10, Item 2) on DCS (Figure 10, Item 3).
2. Activate PC.
3. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).

NOTE

Most PCs will detect the DCS as a removable drive and will automatically maximize the window on the PC screen. If DCS drive does not automatically maximize, find the removable drive on the PC (for example, [Logfiles E:\]) and maximize the window to access log files.

4. Select one of the following logs (files) from generator set DCS data base.
 - a. Fault log.
 - b. Maintenance log.
 - c. Operational log.

NOTE

Log files are Comma-Separated Values (CSV) files. A compatible program is required for viewing. Files can be copied and renamed onto a desktop without opening and viewing.

5. Open selected log by either method below:
 - a. Double-click on selected log.
 - b. Right-click on selected log, and then click on [Open] from drop-down menu.
6. Review data in file.
7. Select any or all of the data.
8. Create folder for the generator set logs on PC.
9. Copy file to PC by using a "drag and drop" to desktop or by using [Save As] feature to generator set folder.
10. Remove USB cable (Figure 10, Item 4) from compatible PC (Figure 10, Item 1) and USB port (Figure 10, Item 2) on DCS (Figure 10, Item 3).

END OF TASK

Installing InPower AMMPS to a Compatible PC

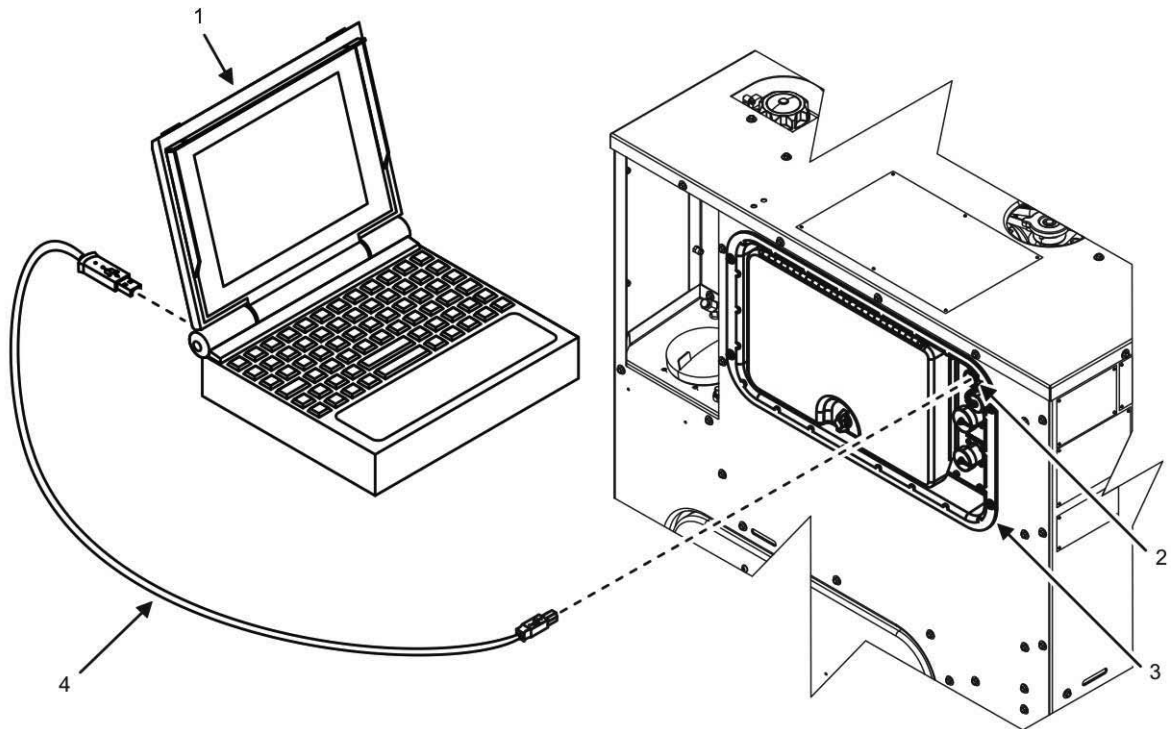


Figure 10. PC and DCS USB Connection.

1. Install battery ground cable (WP 0036, Remove/Install Batteries) and ensure battery power is supplied to the DCS (TM 9-6115-751-10).
2. Connect USB cable (Figure 10, Item 4) from a compatible PC (Figure 10, Item 1) to USB port (Figure 10, Item 2) on DCS (Figure 10, Item 3).

NOTE

Most PCs will detect the DCS as two removable drives and will automatically maximize the log files window on the PC screen. Find the removable drive on the PC that contains the [SERVTOOL] folder (for example, [Flash Drive F:\]) and maximize the window to access install files.

3. Select and open [Flash Drive] on PC.
4. Select and open [SERVTOOL] folder from [Flash Drive].
5. Select and open [V 1.0 InPower AMMPS] (version number may vary) folder.
6. Select and open [Setup] execution file.

NOTE

Installer may run for several minutes depending on PC performance.

7. Select [Next] on the next four screens to install InPower AMMPS at default settings onto PC.
8. Select [Next] to finish installation and view [ReadMe] file.
9. Select [Next] once finished viewing [ReadMe] file.

10. Select [Finish] once setup has completed successfully.
11. Select and open InPower AMMPS software from desktop or start menu to confirm proper operation.
12. Remove USB cable (Figure 10, Item 4) from DCS (Figure 10, Item 3) and compatible PC (Figure 10, Item 1) once InPower AMMPS software is installed successfully.

END OF TASK

Using InPower AMMPS on a Compatible PC

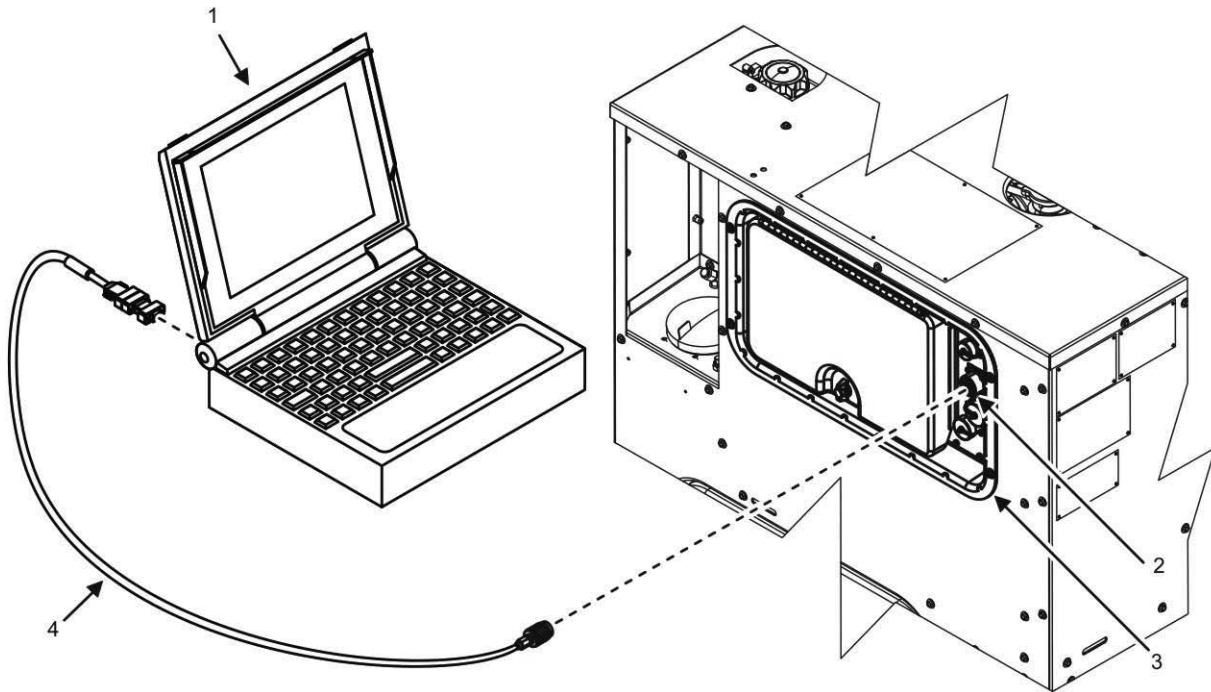


Figure 11. PC and DCS Remote Connection.

1. Install battery ground cable (WP 0036, Remove/Install Batteries) and ensure battery power is supplied to the DCS (TM 9-6115-751-10).
2. Connect a remote control cable or local control cable (Figure 11, Item 4) (with MAIN adapter) to the DCS (Figure 11, Item 3) at REMOTE port (Figure 11, Item 2) and a compatible PC (Figure 11, Item 1).

NOTE

DCS screen will activate upon connection of remote operating cable.

3. Select and open InPower AMMPS software from desktop or start menu. Install if necessary. See Installing InPower AMMPS to a Compatible PC task.

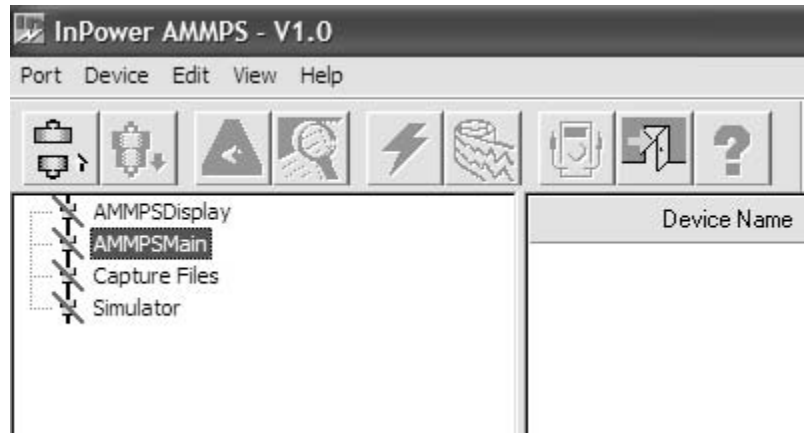


Figure 12. AMMPS Main.

4. Select [AMMPSMain] from left-side explorer pane (Figure 12).

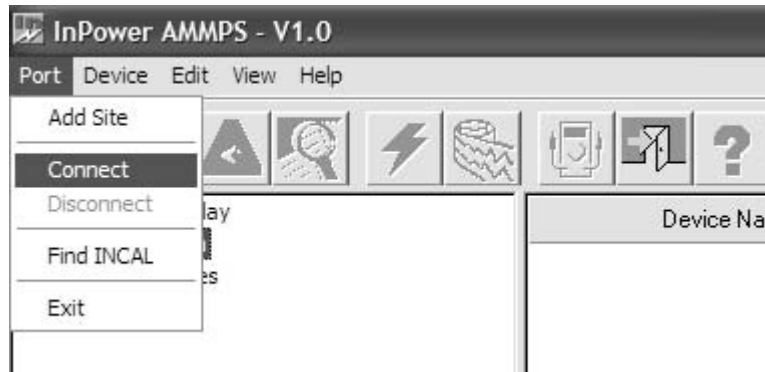


Figure 13. Port Connect.

5. Right-click on [AMMPSMain] or select [Port] from menu bar (Figure 13).
6. Select [Connect] from drop-down menu (Figure 13).

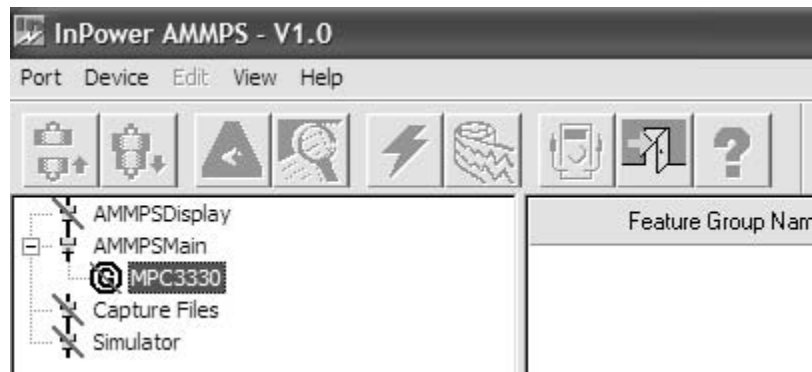


Figure 14. Device MPC3330.

7. Select device [MPC3330] once connected to [AMMPSMain] (Figure 14).

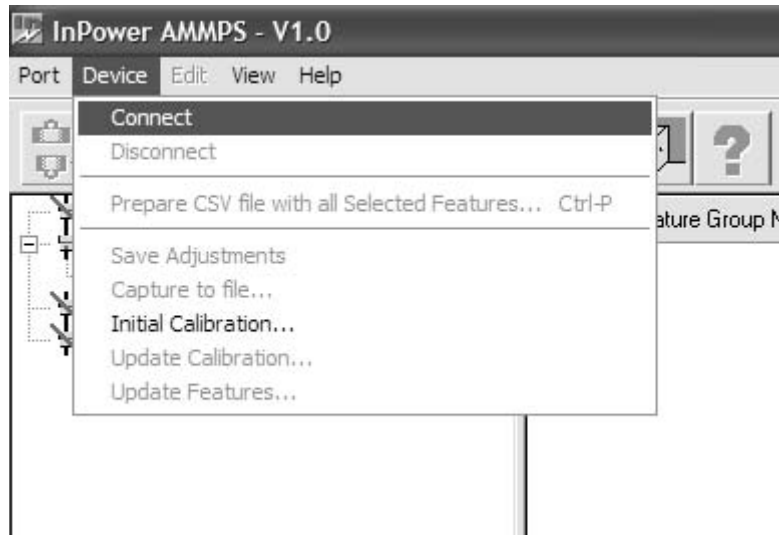


Figure 15. Device Connect.

8. Right-click on [MPC3330] or select [Device] from menu bar (Figure 15).
9. Select [Connect] from drop-down menu (Figure 15).

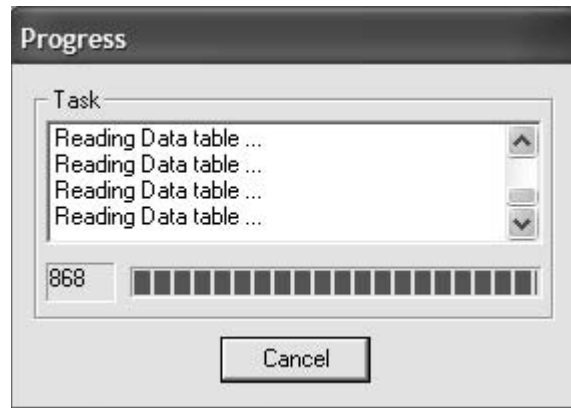


Figure 16. Data Table.

NOTE

Depending on performance of computer, DCS data may take several minutes to load.

10. View [Progress] dialog box as InPower AMMPS imports data from DCS (Figure 16).

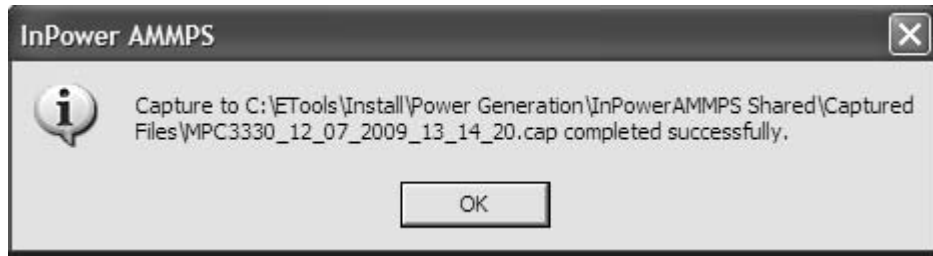


Figure 17. Capture File.

11. Select [OK] once InPower AMMPS captures file successfully (Figure 17).

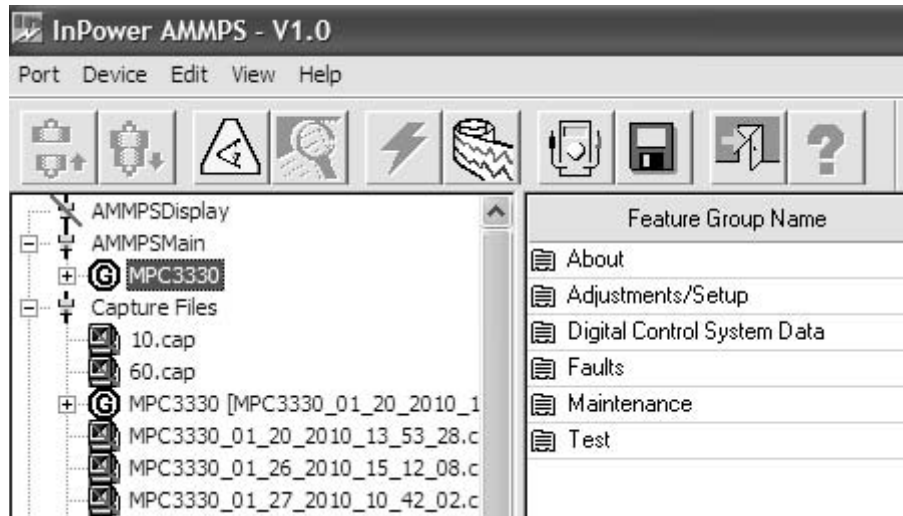


Figure 18. InPower AMMPS Maintenance.

12. Use InPower AMMPS for maintenance or troubleshooting as required (Figure 18).

END OF TASK

Using Initial Calibration to Install Control Firmware Updates

1. Install battery ground cable (WP 0036, Remove/Install Batteries) and ensure battery power is supplied to the DCS (TM 9-6115-751-10).
2. Connect a local control cable (Figure 11, Item 4) (with MAIN adapter) to the DCS (Figure 11, Item 3) and a compatible PC (Figure 11, Item 1).

NOTE

DCS screen will activate upon connection of remote operating cable.

3. Select and open InPower AMMPS software from desktop or start menu. Install if necessary. See Installing InPower AMMPS to a Compatible PC task.

NOTE

[Initial Calibration] feature is used to download a new firmware version calibration file into a replacement or current DCS.

4. Connect to [AMMPSMain]. See Using InPower AMMPS on a Compatible PC task.
5. Mark or save a capture file as required. See Using a Capture File to Overlay Data task.

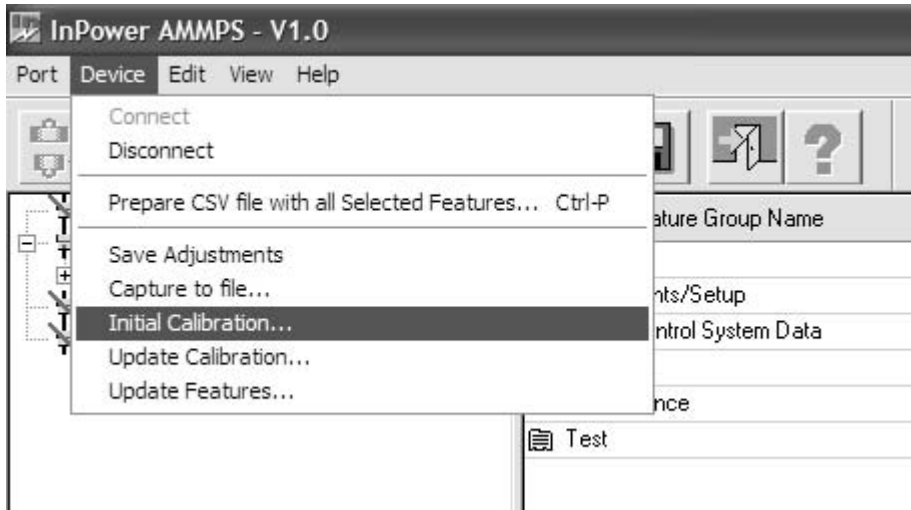


Figure 19. Initial Calibration.

CAUTION

Calibration steps must be followed in order presented. Failure to comply may cause damage to equipment.

NOTE

If a dialog box indicates that there is an error loading during InPower AMMPS installation, specify the correct drive designation as required.

6. Click on the [Device] drop-down menu and select [Initial Calibration] (Figure 19).

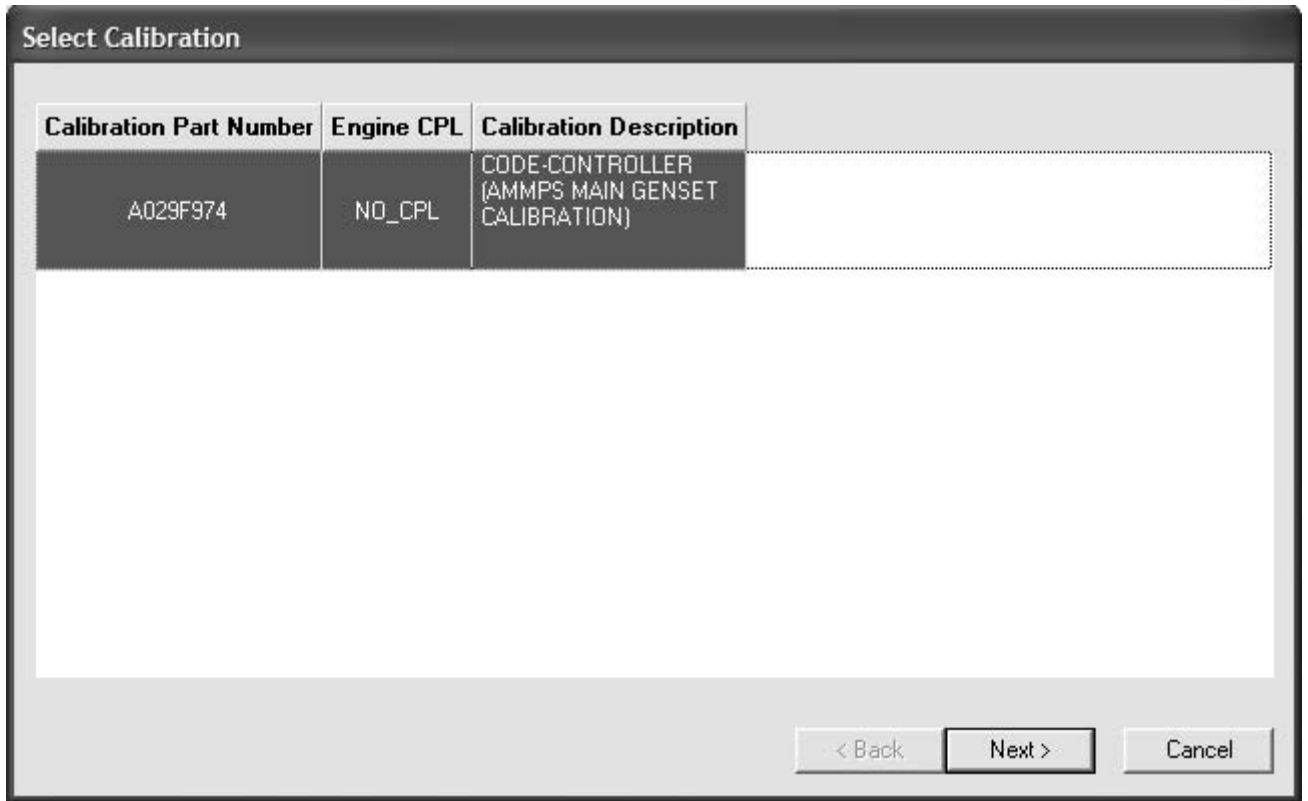


Figure 20. Select Calibration.

NOTE

Figure 20 is an example of a [Calibration Part Number]. [Calibration Part Number] may vary.

7. Select the appropriate [Calibration Part Number] and select [Next] (Figure 20).

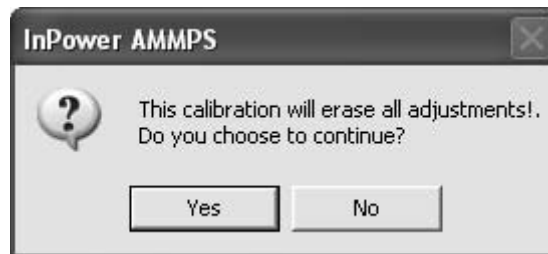


Figure 21. Calibration Erase.

8. Select [YES] if dialog box displays (Figure 21).

History

Calibration Part Number: A029F974 Current Calibration Revision:

Description: CODE-CONTROLLER (AMMPS MAIN GENSET CALIBRATION) CD Calibration Revision:

Revision History	Calibration File	Revision Description
14DEC2009	A029F974	History to be updated

< Back Next > Cancel

Figure 22. History.

9. Choose [Next] if [History] displays the [Calibration File] selected in step 7 (Figure 22).
10. Choose [Back] to select the correct calibration file if [History] displays a calibration file that does not match the [Calibration File] selected in step 7 (Figure 22).

Save & Restore Parameters

Parameters Loaded From: Connected Device

Parameter Description	Value	Units
Fault History Table	<DataTable>	
Faults Occurrence Table	<DataTable>	

Set Data Plate From Capture File...

Overlay Capture File After Calibration

< Back Next > Cancel

Figure 23. Save and Restore Parameters.

11. Select [Next] after confirming that the correct information is displayed in [Save & Restore Parameters] (Figure 23).

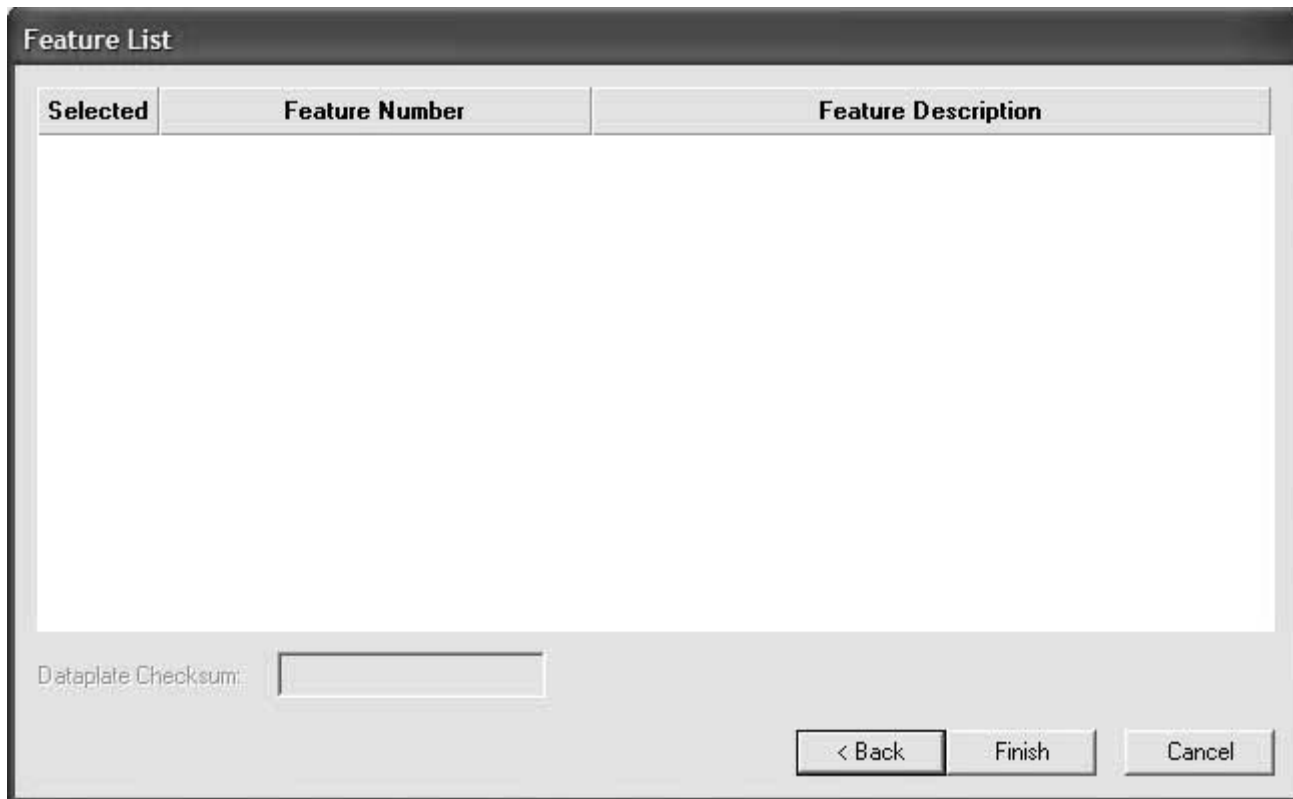


Figure 24. Feature List Finish.

12. Select [Finish] when [Feature List] dialog box displays (Figure 24).

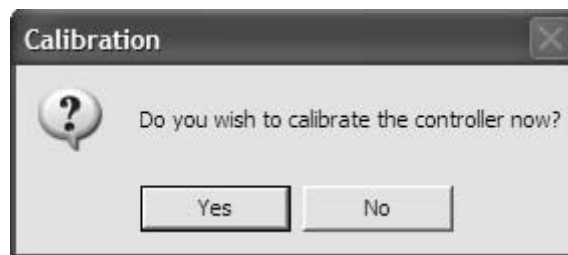


Figure 25. Confirm Calibration.

13. Select [Yes] after confirming that DCS is ready for calibration (Figure 25).

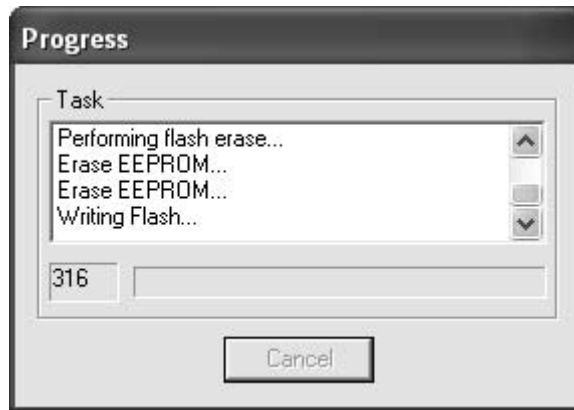


Figure 26. Calibration Progress.

NOTE

During the download, it is normal operation for the generator set control to display failure messages (e.g. [System Failure]) and DCS codes. Do not clear DCS codes or perform any other actions during the calibration file download or the download may be interrupted. When the download is complete, a final dialog box (Figure 27) informs the user the download completed successfully.

14. Monitor PC and DCS as calibration is downloaded (Figure 26) to ensure connections are not disturbed and power is not interrupted.

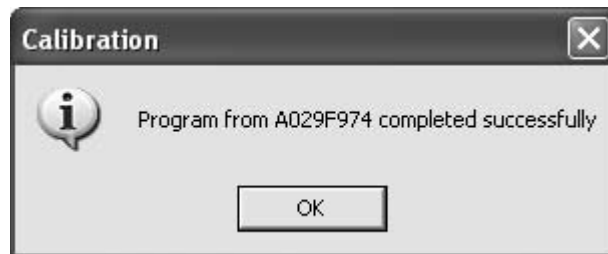


Figure 27. Calibration Completed Successfully.

NOTE

The calibration file download may take approximately 20 min, depending on PC performance and connection between DCS and PC. Calibration to the DCS may fail if battery is disconnected during the download process or if the cable drops off accidentally during the download. If DCS LED does not power on and will not power on after turning engine control switch to PRIME & RUN (TM 9-6115-751-10), proceed to Recovering AMMPS DCS if Initial or Update Calibration Fails task. PANEL LIGHTS will still work if calibration is interrupted. If PANEL LIGHTS do not work, proceed to electrical troubleshooting of DCS before attempting recovery of DCS (WP 0009, Electrical System Troubleshooting without a DCS Code).

15. Select [OK] when dialog box indicates [Calibration] has successfully completed (Figure 27).

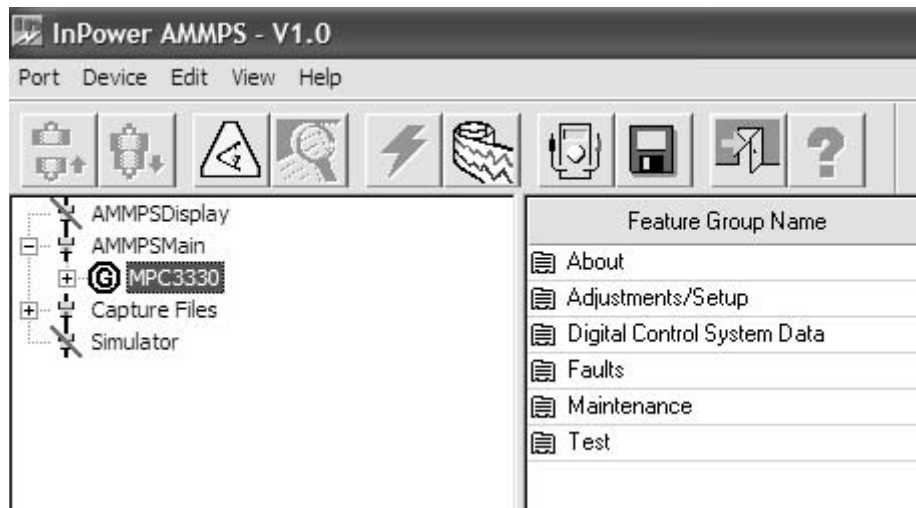


Figure 28. DCS Reconnect.

16. Observe PC screen to confirm InPower AMMPS automatically reconnected to [AMMPSMain] (Figure 28).
17. Overlay capture file and reset engine hours as required. See Using a Capture File to Overlay Data task.
18. Reset parameters as required if capture file is unavailable. See Using a Capture File to Overlay Data task, steps 20 through 27 and step 29.
19. Disconnect from [AMMPSMain] and remove local control cable (Figure 11, Item 4) (with MAIN adapter).
20. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
21. Start engine and check for proper operation (TM 9-6115-751-10).
22. Repair as required.

END OF TASK

Using Update Calibration to Install Display Firmware Updates

1. Install battery ground cable (WP 0036, Remove/Install Batteries) and ensure battery power is supplied to the DCS (TM 9-6115-751-10).
2. Connect a local control cable (Figure 11, Item 4) (with DISPLAY adapter) to the DCS (Figure 11, Item 3) and a compatible PC (Figure 11, Item 1).

NOTE

DCS screen will activate upon connection of remote operating cable.

3. Select and open InPower AMMPS software from desktop or start menu. Install if necessary. See Installing InPower AMMPS to a Compatible PC task.

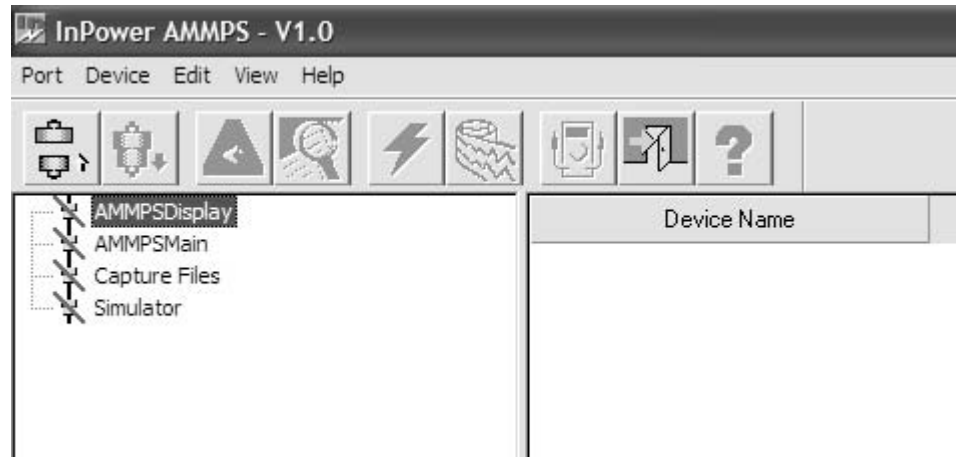


Figure 29. AMMPS Display.

NOTE

[Update Calibration] feature is used to download a new display firmware version calibration file into a replacement or current DCS.

4. Select [AMMPSDisplay] from left-side explorer pane (Figure 29).

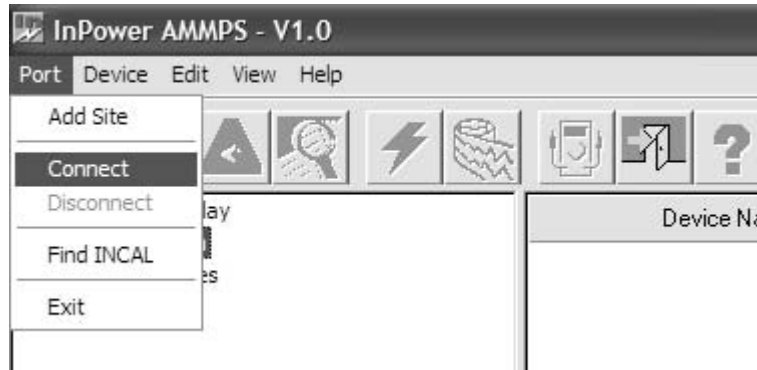


Figure 30. Port Connect for AMMPS Display.

5. Double-click on [AMMPSDisplay] (Figure 29) or select [Connect] from [Port] drop-down menu (Figure 30).

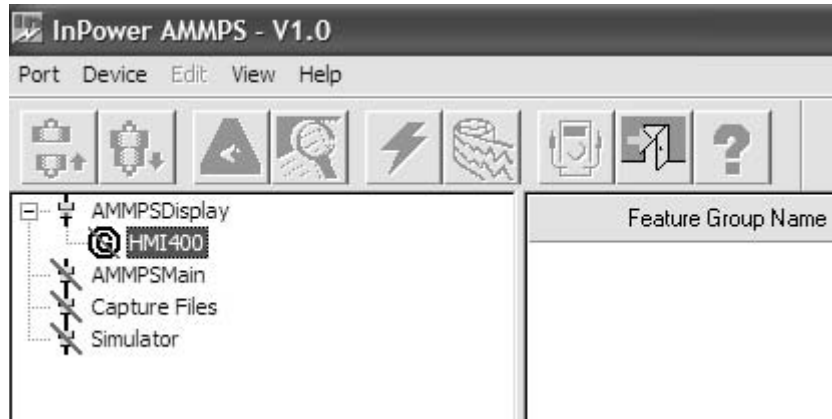


Figure 31. Device HMI400.

6. Select [HMI400] from left-side explorer pane (Figure 31).
7. Select [Connect] from [Device] drop-down menu bar (Figure 32).

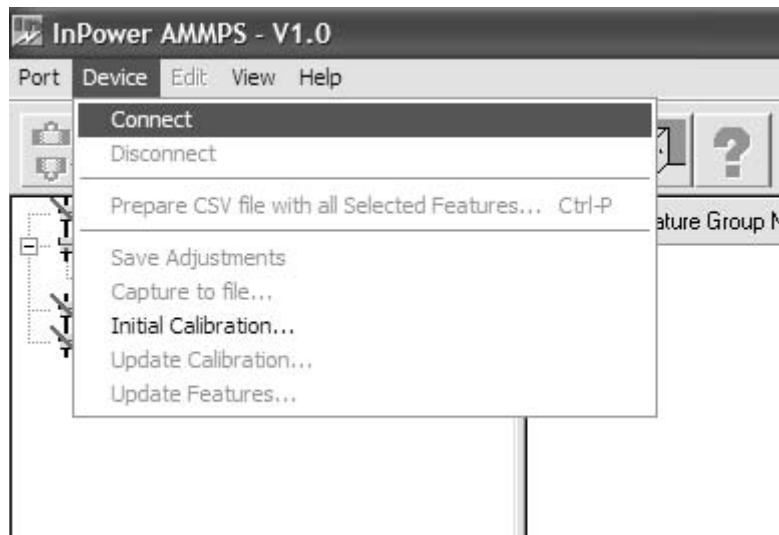


Figure 32. Device Connect for AMMPS Display.



Figure 33. Highlight Display Device.

8. Select [HMI400] from left-side explorer pane once connected (Figure 33).

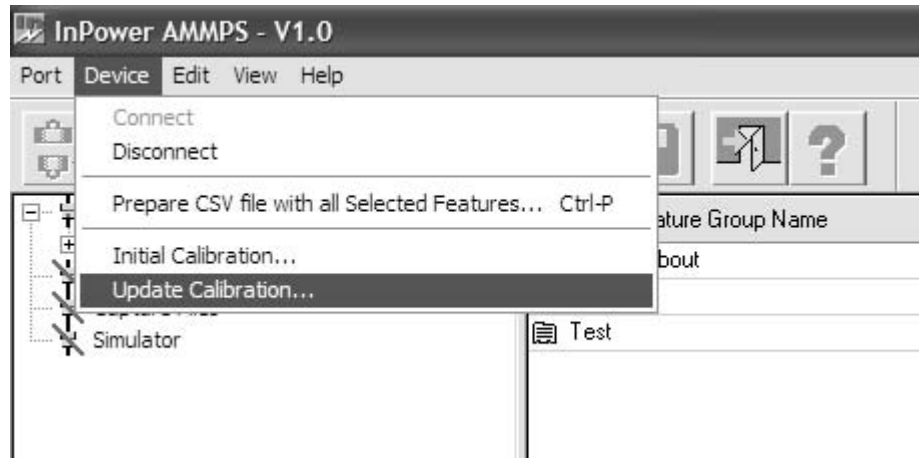


Figure 34. AMMPS Display Update Calibration.

9. Select [Update Calibration] from [Device] drop-down menu (Figure 34).

10. Select [Finish] on [History] dialog box (Figure 35).

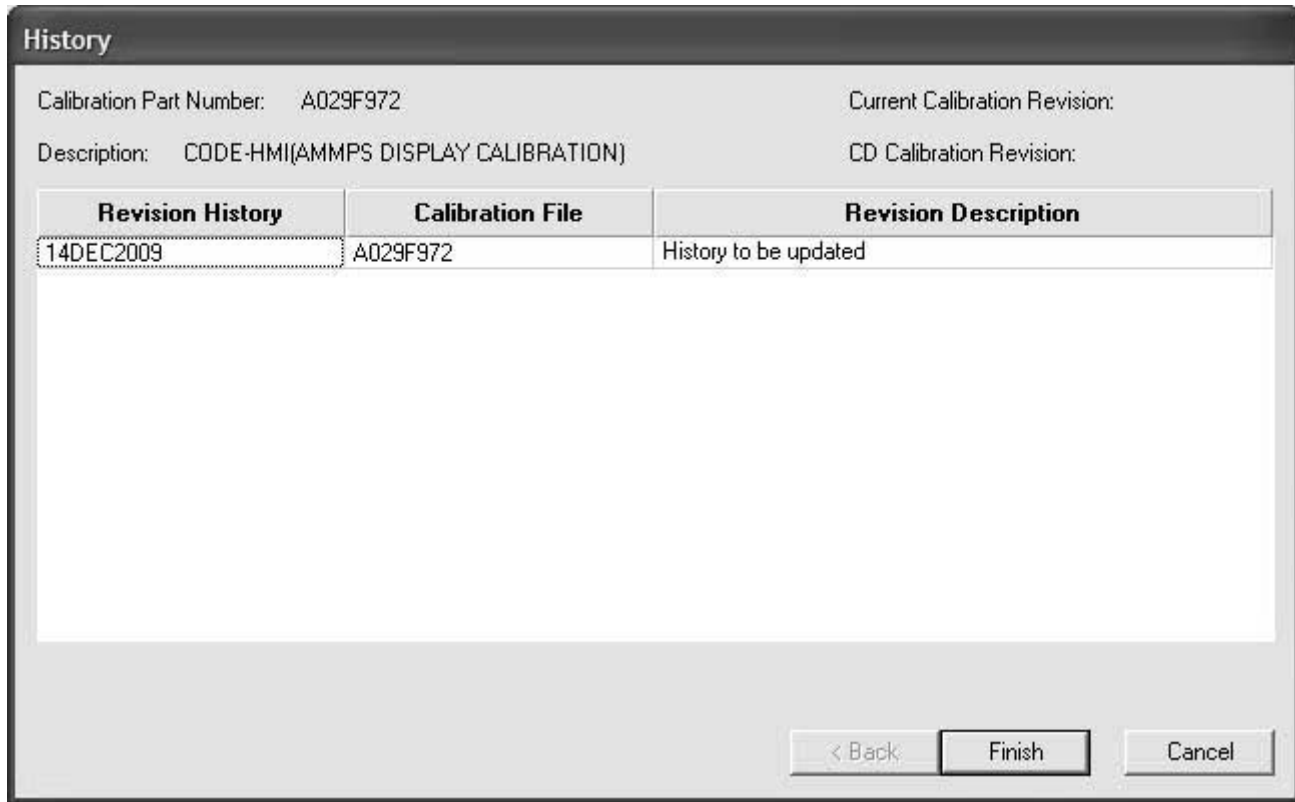


Figure 35. AMMPS Display History.

11. Select [Yes] on [Calibration] dialog box (Figure 36).

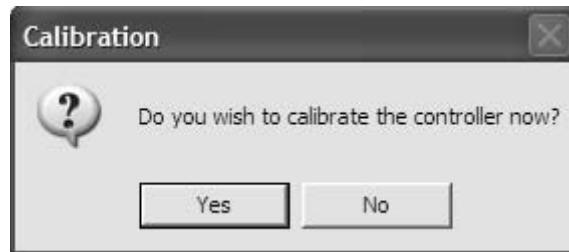


Figure 36. AMMPS Display Dialog Box.

12. Monitor PC and DCS as calibration is downloaded to ensure connections are not disturbed and power is not interrupted.

NOTE

PC will automatically disconnect from DCS when display firmware has been updated. InPower AMMPS will not need to be disconnected from DCS and can be closed.

13. Observe PC screen to confirm InPower AMMPS automatically disconnected from DCS.

14. Access DCS [About] screen to confirm display firmware has been updated (TM 9-6115-751-10).

15. Remove local control cable (Figure 11, Item 4) (with DISPLAY adapter).
16. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
17. Start engine and check for proper operation (TM 9-6115-751-10).
18. Repair as required.

END OF TASK

Recovering AMMPS DCS if Initial Calibration Fails

1. Attempt to connect to [AMMPSMain]. See Using InPower AMMPS on a Compatible PC task.

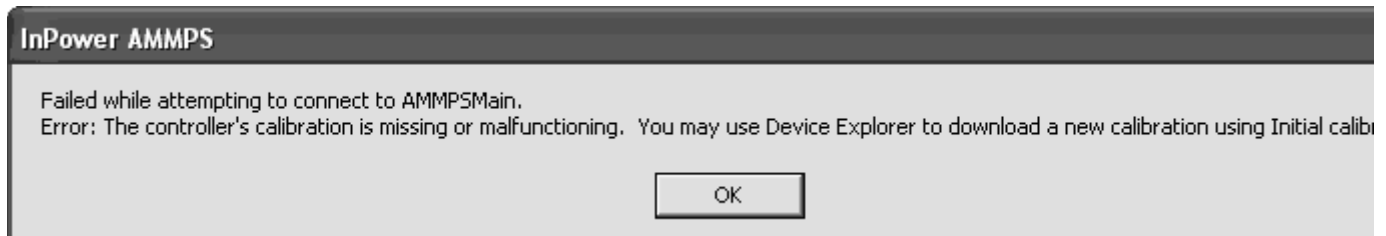


Figure 37. Failed Connection.

2. Check PC screen for dialog box indicating failed attempt (Figure 37).
3. Select [OK] and proceed to highlight [AMMPSMain] connection port (Figure 38).

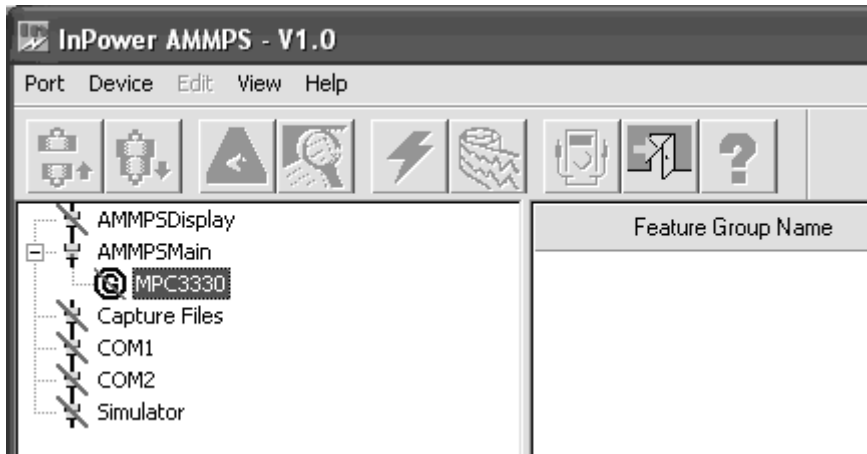


Figure 38. Highlight.

4. Proceed to Using Initial Calibration to Install Firmware Updates task and complete steps 5 through 22.
5. Test and replace DCS as required if symptom continues (WP 0017, Remove/Install DCS and WP 0018, Repair DCS).

END OF TASK

Using a Capture File to Overlay Data

CAUTION

It is important to save the latest capture file from DCS being replaced. Data can only be accessed using InPower AMMPS and a MSD hard drive (or compatible computer). If data is accessible, capture file can be used to overlay parameters and maintenance timers from the replaced DCS. If unable to access capture file data, maintenance timers will be reset and some parameters from replaced DCS will be lost. Use latest hard copy records to determine when maintenance actions are due. Failure to comply will cause damage to equipment.

It is important to save log data from DCS being replaced. The maintenance, operational, and fault logs should be downloaded from the DCS with a USB cable and saved to the hard drive of a MSD (or compatible computer). Maintenance, operational, and fault logs cannot be uploaded to the new DCS, but can be saved for reference. All logs will start over with a new DCS. If unable to access logs, use latest hard copy records to access operational, maintenance, and fault events. Failure to comply may cause damage to equipment.

NOTE

DCS that contains desired data will be referred to as DCS 1. DCS 2 is the destination DCS. DCS 2 can either be the same DCS after a calibration has been completed or a new DCS that is replacing a failed DCS.

1. Connect to [AMMPSMain] of DCS 1. See Using InPower AMMPS on a Compatible PC task.

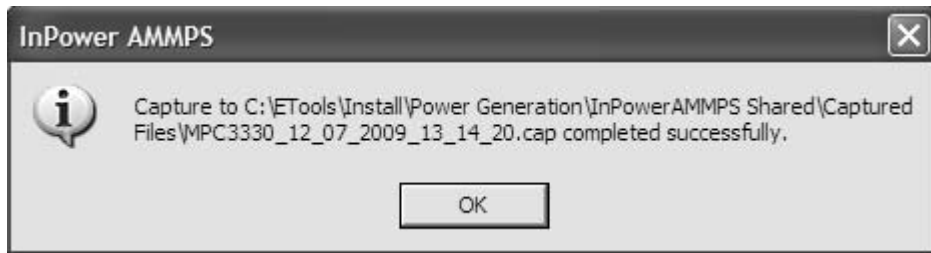


Figure 39. Confirm Capture File.

2. Confirm that a capture file completed successfully (Figure 39).
3. Use explorer pane of PC to access [C:\ETools\Install\Power Generation\InPowerAMMPS Shared\Captured Files] on the computer hard drive.

NOTE

Capture files can be renamed and stored in the [Captured Files] folder on the hard drive of a PC. They can also be removed and placed in an easy access location such as a desktop, CD, or memory drive. If a different PC will be used to upload capture file to DCS 2, capture file must be copied and pasted to PC that will be used.

4. Copy and paste desired (most recent) capture file to selected location and rename as DCS 1 or rename capture file as DCS 1 and leave in current location.
5. Disconnect InPower AMMPS from DCS.
6. Record engine hours of DCS 1 and save for use with DCS 2.
7. Disconnect from [AMMPSMain] and remove local control cable (Figure 11, Item 4) (with MAIN adapter).

8. Paste capture file from DCS 1 into [C:\ETools\Install\Power Generation\InPowerAMMPS Shared\Captured Files] on the PC hard drive.
9. Connect to [AMMPSMain] of DCS 2. See Using InPower AMMPS on a Compatible PC task.

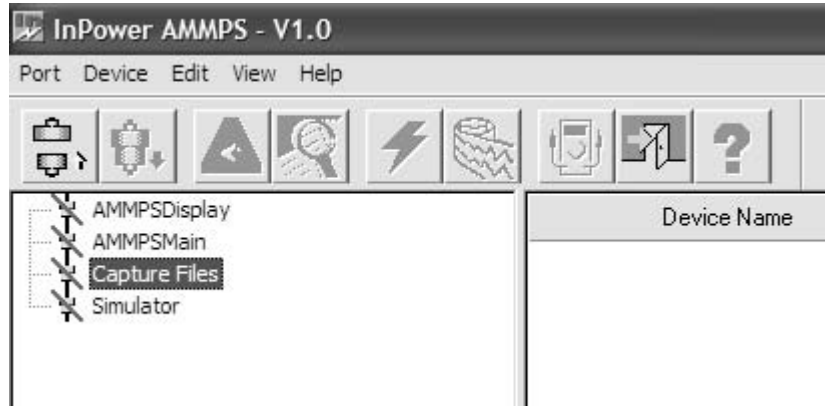


Figure 40. Capture File Explorer.

10. Select [Capture Files] from explorer pane (Figure 40).

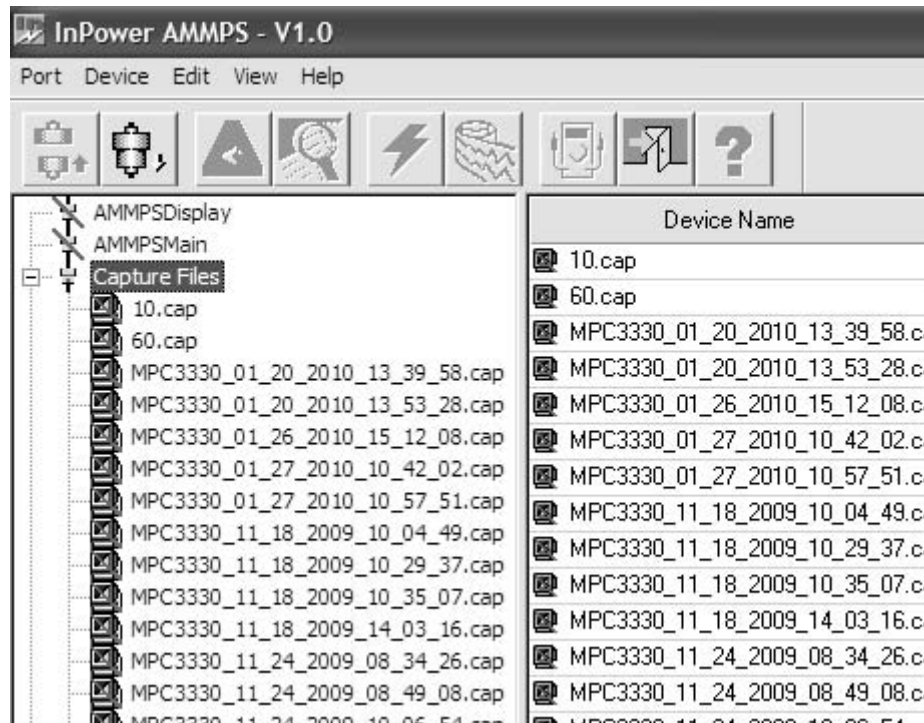


Figure 41. Open Capture Files Explorer.

11. Double-click on [Capture Files] to display available [Capture Files] (Figure 41).

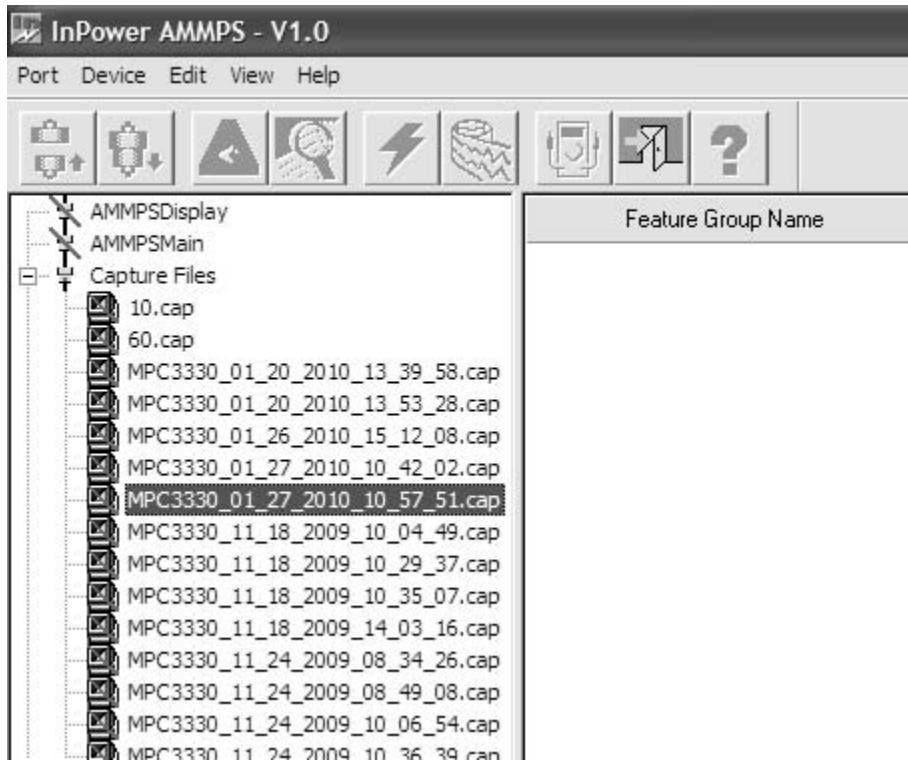


Figure 42. Select Capture File.

NOTE

Selected capture file shown in Figure 42 is an example. Any desired capture file can be selected and used as long as data required has been captured in file.

12. Select desired capture file from DCS 1 based on latest data captured or pasted to file (Figure 42).
13. Double-click selected capture file to connect and display capture file (Figure 42).

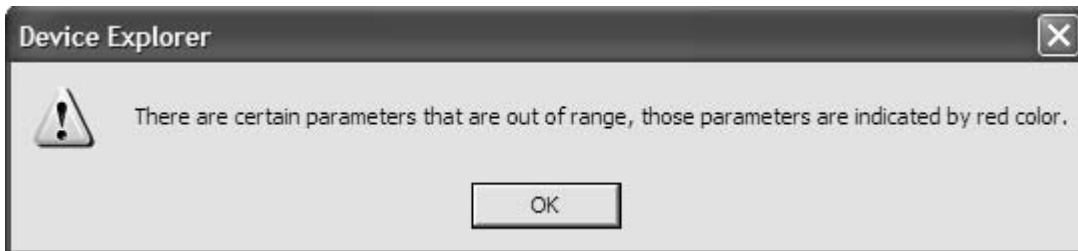


Figure 43. Parameters Dialog Box.

14. Choose [OK] when dialog box displays (Figure 43).

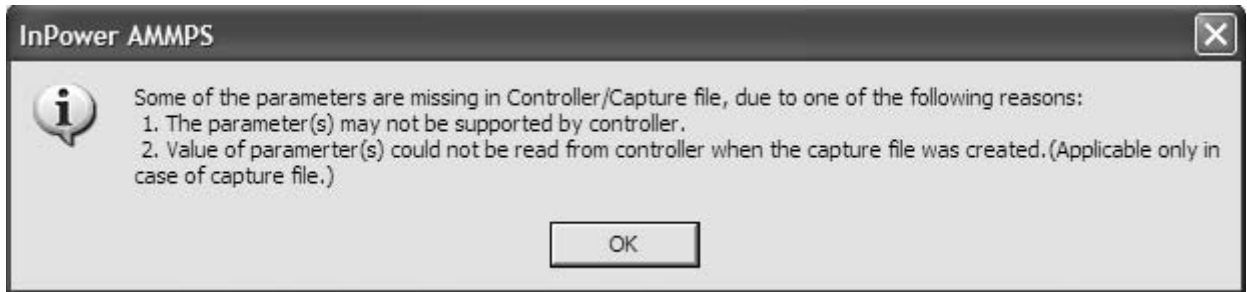


Figure 44. Parameters Missing.

NOTE

A dialog box indicating missing parameters (Figure 44) may display due to missing information (such as a model number) or a problem with the capture file. Depending on the condition of DCS 1, some data may not have been copied to capture file. Continue to overlay available data. Remaining data can be entered as required. See step 20.

15. Choose [OK] if second dialog box displays (Figure 44).
16. Connect InPower AMMPS to [AMMPSMain] and [MPC3330] of DCS 2. See Using InPower AMMPS on a Compatible PC task.

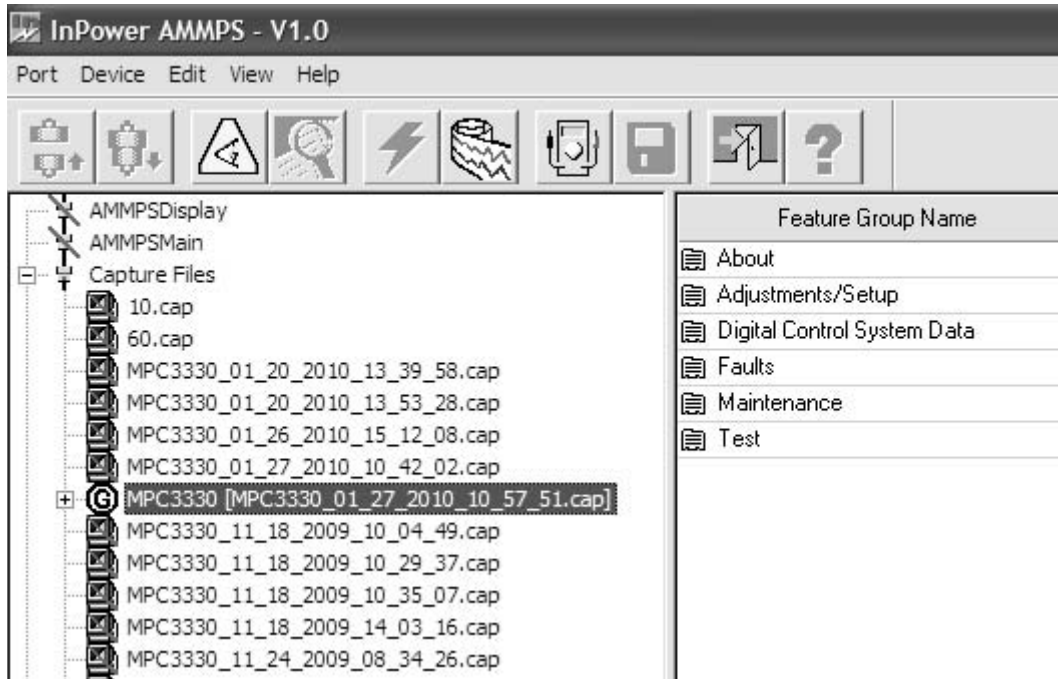


Figure 45. Drag Capture File.

NOTE

Before “drag and drop”, ensure InPower AMMPS is connected to [AMMPS Main] and [MPC3330] of DCS 2. Once selected, “drag” capture file from current location and “drop” to [AMMPSMain] to overlay file.

17. Select capture file (Figure 45) with mouse pointer and hold down left mouse button to “drag and drop” capture file to [AMMPSMain] device (Figure 46).

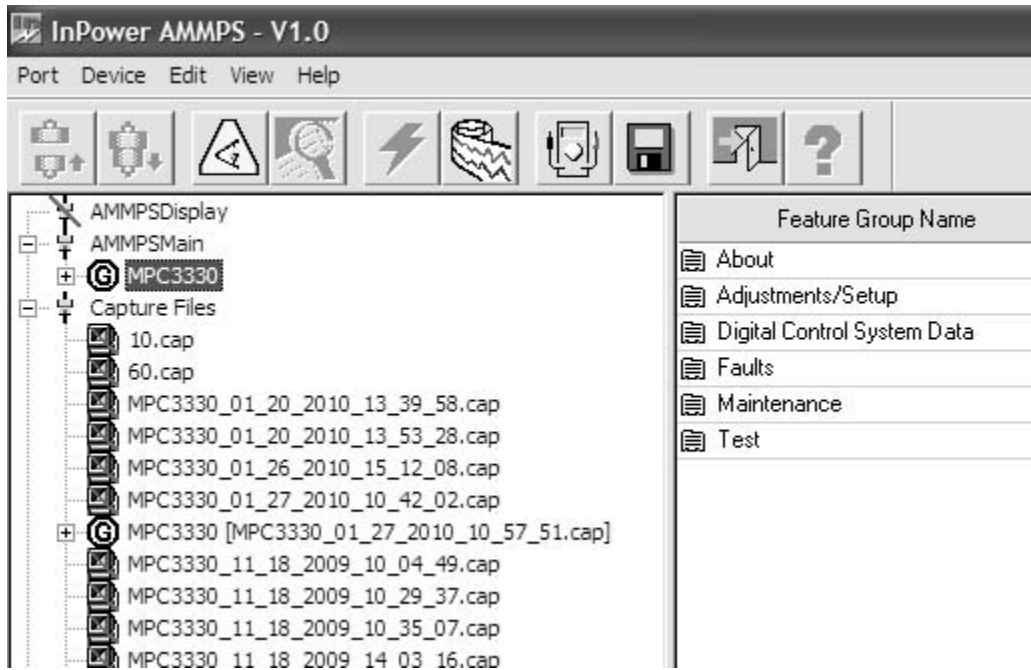


Figure 46. Drop Capture File.

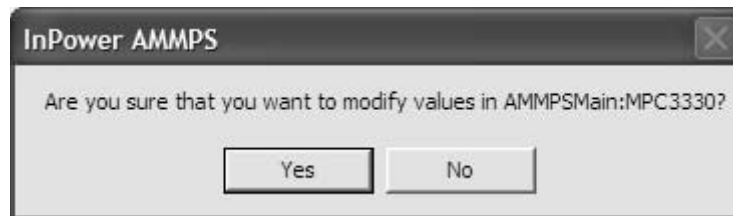


Figure 47. Modify Values.

18. Choose [Yes] when dialog box displays (Figure 47).

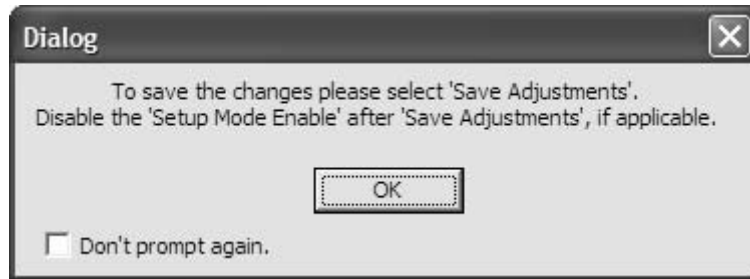


Figure 48. Save Adjustments.

19. Choose [OK] when dialog box displays (Figure 48).

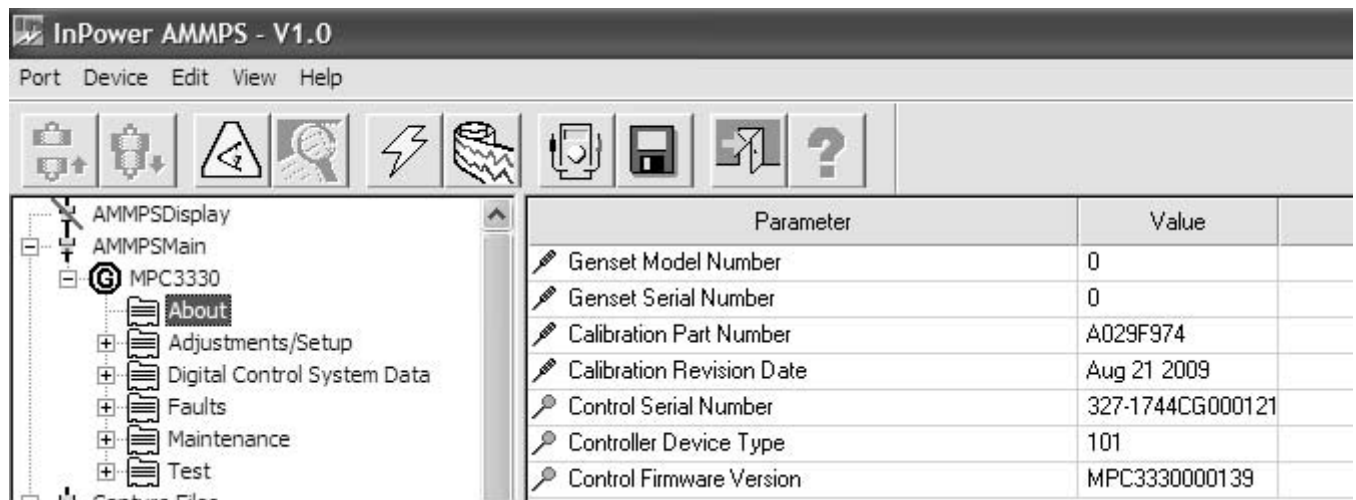


Figure 49. About Parameters.

NOTE

[About] is shown in Figure 49 as an example of an option available from the explorer pane. [Adjustments/Setup], [Digital Control System Data], [Faults], [Maintenance], and [Test] are also all available for viewing. Adjustments to the parameters are only required when a value is missing or a value is desired that currently is not saved to a parameter.

20. Select an option (e.g. [About]) from explorer pane under [MPC3330] device and modify parameters as required by double-clicking within [Value] and typing desired text (e.g. add model number to [Value] column of [Genset Model Number] Parameter) (Figure 49).

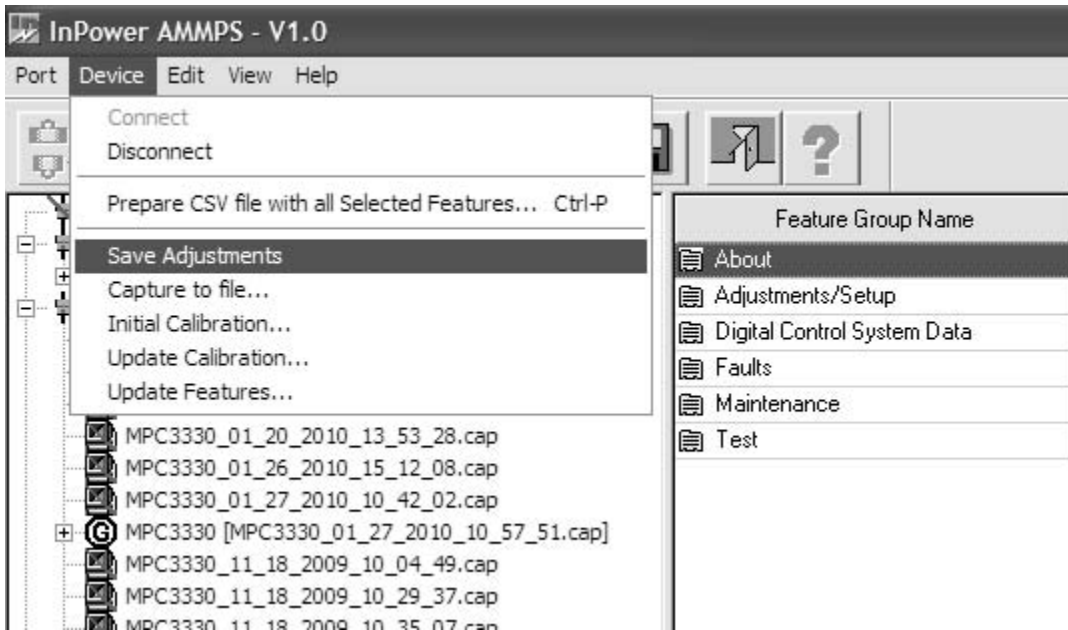


Figure 50. Save Adjustments from Drop-Down Menu.

21. Select [Save Adjustments] from [Device] drop-down menu or select save icon shortcut (not shown) (Figure 50).

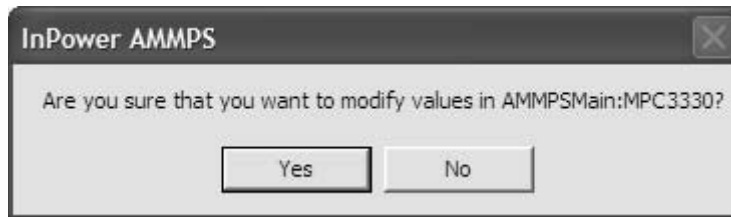


Figure 51. Confirm Modify Values.

22. Select [Yes] when dialog box displays (Figure 51).

Save Adjustments

Site ID: AMMPMain Device Name: MPC3330

Following parameter values have been changed. Do you want to permanently save the changes you have made?

Parameter Description	Old Value	New Value	Unit
Maintenance Item 5004 Countdown	700.20	750.06	Hou
Maintenance Item 5001 Countdown	0.15	250.02	Hou
Maintenance Item 5007 Countdown	1950.30	2000.16	Hou
Genset 3 Phase 400Hz Voltage Calibration	0.999	0.992	%
Calibration Revision Date	Nov 4 2009	Aug 21 2009	
Maintenance Item 5017 Countdown	200.16	250.02	Hou
Maintenance Item 5014 Countdown	5.18	24.00	Hou
Maintenance Item 5011 Countdown	5.18	24.00	Hou
Maintenance Item 5006 Countdown	700.20	750.06	Hou
Maintenance Item 5003 Countdown	700.20	750.06	Hou
Genset 3 Phase 50/60Hz Voltage Calibration	0.996	0.988	%
Maintenance Item 5009 Countdown	450.18	500.04	Hou
Genset 240V Single Phase 50/60Hz Voltage Calibration	1.000	0.985	%
Genset 120V Single Phase 400Hz Voltage Calibration	1.001	0.978	%
Maintenance Item 5010 Countdown	1450.26	1500.12	Hou
Maintenance Item 5016 Countdown	200.16	250.02	Hou
Maintenance Item 5013 Countdown	2450.34	2500.20	Hou
Maintenance Item 5002 Countdown	700.20	750.06	Hou
Maintenance Item 5008 Countdown	1450.26	1500.12	Hou
Maintenance Item 5005 Countdown	1950.30	2000.16	Hou
Genset 120V Single Phase 50/60Hz Voltage Calibration	0.996	0.972	%
Genset 240V Single Phase 400Hz Voltage Calibration	1.005	0.991	%
Maintenance Item 5012 Countdown	4950.54	5000.40	Hou

Save Discard Cancel

Figure 52. Confirm Save Adjustments.

23. Review [Save Adjustments] dialog box for changes between [Old Value] column and [New Value] column (Figure 52).
24. Confirm parameters are the correct or desired changes for DCS 2 (Figure 52).
25. Compare hard copy records as required.
26. Double-click [New Value] column as required adjust parameter values and set as required (Figure 52).

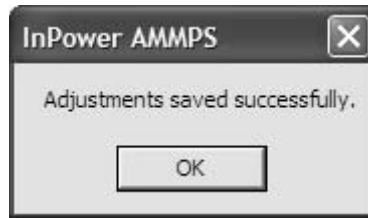


Figure 53. Saved.

27. Select [OK] when [Adjustments saved successfully] displays in dialog box (Figure 53).
28. Retry capture file procedure if adjustments are not saved successfully. See steps 1 through 27.
29. Update engine hours using adjustments screen 2 based on recorded value from DCS 1 (TM 9-6115-751-10).
30. Turn main DC circuit breaker OFF (TM 9-6115-751-10).
31. Turn main DC circuit breaker ON (TM 9-6115-751-10).
32. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
33. Start engine and check for proper operation (TM 9-6115-751-10).
34. Repair as required.

END OF TASK

Preparation for Storage (Less Than Nine Months)

NOTE

Steps 1 through 6 must be completed monthly.

1. Perform operator Before PMCS (TM 9-6115-751-10).
2. Start generator set (TM 9-6115-751-10).
3. Allow generator set to operate until coolant temperature reaches 185°F (85°C).
4. Turn engine control switch OFF (TM 9-6115-751-10).
5. Perform operator After PMCS (TM 9-6115-751-10).
6. Ensure scheduled field maintenance PMCS (WP 0016, Field Maintenance PMCS) has been performed as required.

END OF TASK

Preparation for Storage (9 Months to 36 Months)**NOTE**

Read all storage and preservation steps that follow prior to performing them to avoid duplication of steps. Perform steps in order given.

1. Ensure AMMPS 15 kW generator set is fully functional.
 - a. Perform operator Before PMCS (TM 9-6115-751-10).
 - b. Operate generator set at 80% load for 1/2 hour (TM 9-6115-751-10).
 - c. Perform operator After PMCS (TM 9-6115-751-10).
 - d. Verify generator set is fully mission-capable.
 - (1) Repair or replace all defects found while performing PMCS (TM 9-6115-751-10).
 - (2) Repeat substeps 1 a through c.
2. Prepare cooling system for storage.
 - a. Start engine (TM 9-6115-751-10).
 - b. Operate generator set until [Coolant] reaches 180°F (85°C) if necessary.
 - c. Drain coolant (WP 0021, Service Cooling System).
 - d. Clean radiator interior (WP 0021, Service Cooling System).
 - e. Refill cooling system (WP 0021, Service Cooling System) with a mixture of 50% antifreeze and 50% distilled water (WP 0089, Lubrication Instructions).
3. Prepare fuel injection system for storage.
 - a. Fill a suitable 1 gal (4.55 L) or larger container with approved diesel fuel (WP 0089, Lubrication Instructions).
 - b. Fill a suitable 1 gal (4.55 L) or larger container with MIL-PRF-21260E, Grade PEI 0 preservative oil.
 - c. Obtain a suitable 1 gal (4.55 L) or larger empty container.
 - d. Place containers outside of rear door.
 - e. Disconnect the main fuel pump from the fuel manifold (WP 0044, Remove/Install Fuel Pump Main/Auxiliary).
 - f. Connect a suitable flexible fuel line to the main fuel pump.
 - g. Disconnect fuel return line and place into empty container (WP 0045, Remove/Install Fuel Manifold).
 - h. Insert flexible fuel line from substep 3f into container containing approved diesel fuel.
 - i. Start engine (TM 9-6115-751-10) and operate for 2 min.
 - j. Transfer flexible fuel line from substep 3f to container of MIL-PRF-21260E, Grade PEI 0 preservative oil.
 - k. Continue to operate engine until preservative oil flows from return line.
 - l. Turn engine control switch to OFF (TM 9-6115-751-10).
 - m. Replace fuel filter/water separator element (WP 0047, Replace Fuel Filter/Water Separator Element).
 - n. Install main fuel pump (WP 0044, Remove/Install Fuel Pump Main/Auxiliary).
4. Prepare valves, intake system, and cylinders for storage.
 - a. Remove air intake hose at intake manifold (WP 0019, Remove/Install Air Intake Hose Assemblies).
 - b. Fill an oil gun with MIL-PRF-21260E, Grade PEI 0 preservative lubricating oil.

- c. Spray oil into opening of intake manifold for 15 sec while cranking the engine using the DEAD CRANK SWITCH (TM 9-6115-751-10).

CAUTION

Do not crank engine in excess of 15 sec. Allow starter to cool for at least 15 sec between cranks. Failure to comply may cause damage to equipment.

- d. Repeat substep 4c for three additional periods of 15 sec each.
 - e. Install air intake hose removed in substep 4a.
5. Prepare lubrication system for storage.
- a. Drain engine oil (WP 0065, Service Lubrication System).
 - b. Replace oil filter (WP 0065, Service Lubrication System).
 - c. Fill engine crankcase (WP 0065, Service Lubrication System) with preservative lubricating oil conforming to grade 10, 30, or 15-40 of MIL-PRF-21260E.
 - d. Crank the engine for 15 sec using the DEAD CRANK SWITCH (TM 9-6115-751-10).

CAUTION

Do not crank engine in excess of 15 sec. Allow starter to cool for at least 15 sec between cranks. Failure to comply may cause damage to equipment.

- e. Repeat substep 5d for three additional periods of 15 sec each.
6. Prepare 24-V electrical system for storage.
- a. Clean dirt, acid, and other residues from top of batteries.
 - b. Remove batteries from generator set (WP 0036, Remove/Install Batteries).
 - c. Check voltage of the removed batteries (WP 0036, Remove/Install Batteries).

CAUTION

Charge AGM batteries only with a device with an AGM setting or that can regulate the voltage between 14.25 V and 14.75 V. Failure to comply will cause damage to equipment.

- d. Charge Absorbed Glass Mat (AGM) batteries as required.
 - (1) When charge level is less than 12.7 V.
 - (2) Charge every six months.
 - e. Charge flooded wet cell batteries as required.
 - (1) When charge level is less than 12.5 V.
 - (2) Charge every three months.
7. Prepare fuel system for storage.
- a. Drain fuel/preservative oil mixture from the fuel supply lines between the fuel filter/water separator and the fuel tank (WP 0043, Service Fuel System).
 - b. Drain fuel tank (WP 0043, Service Fuel System).
 - c. Clean fuel strainers (WP 0043, Service Fuel System).
8. Prepare AC generator for storage.
- a. Seal end bell vents with tape meeting SAE-AMS-T-22085 standard.

-
- b. Seal generator fan screen with tape meeting SAE-AMS-T-22085 standard.
 - c. Seal wire ports in generator housing with tape meeting SAE-AMS-T-22085 standard.
9. Prepare diesel engine for storage.
 - a. Clean dip stick and dip stick tube of dirt and oil and then seal dip stick/dip stick tube junction with tape meeting SAE-AMS-T-22085 standard.
 - b. Clean oil fill of dirt and oil and then seal with tape meeting SAE-AMS-T-22085 standard.
 10. Lubricate all doors IAW WP 0089, Lubrication Instructions and close securely.
 11. Prepare three warning tags stating "THIS GENERATOR SET HAS BEEN PRESERVED. CHANGE FUEL FILTERS AND ENGINE OIL AND PERFORM PMCS" and attach to:
 - a. Dip stick
 - b. Oil filler cap.
 - c. Engine control switch.

CAUTION

Adequate air flow must be provided around generator set when stored under a tent or tarp. Failure to comply will cause damage to equipment.

NOTE

Store generator set inside an enclosed structure (preferred) or under roof when possible.

When storing generator set outside, cover with a tent or tarp. Allow at least 36 in (0.91 m) space between cover and generator set on all sides to ensure adequate air flow.

12. Move generator set into storage.

END OF TASK

Replace Freeze Plug

NOTE

Several freeze plugs of varying sizes are installed on the engine block. The procedure to replace each freeze plug is the same regardless of size or location.

It is not necessary to remove the engine assembly from the generator set to replace a freeze plug.

9. Drain cooling system (WP 0021, Service Cooling System).
10. Relocate or remove any engine components that restrict access the freeze plug to be replaced. Refer to the relevant WP for the proper procedure to relocate or remove the component.

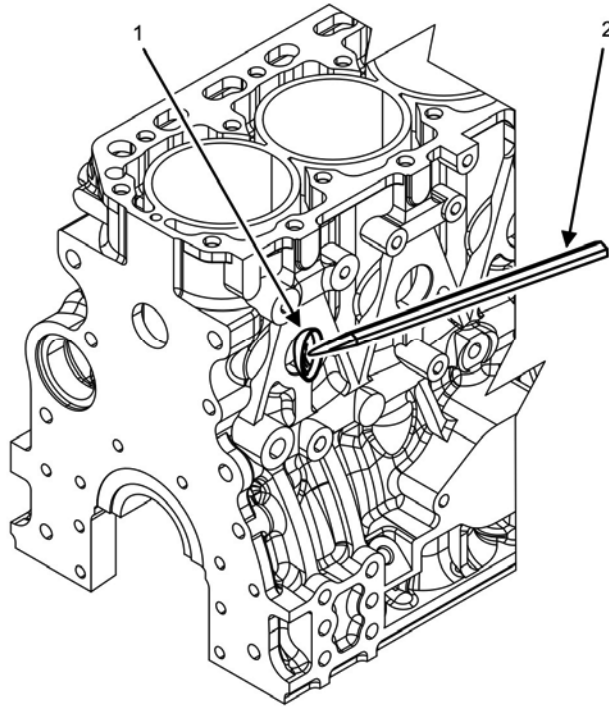


Figure 54. Remove Freeze Plug.

11. Place wiping rags under freeze plug (Figure 54, Item 1) to absorb any residual coolant that may spill when freeze plug has been removed.

CAUTION

Use of excessive force with the hammer when removing freeze plug may cause freeze plug to be pushed inside engine block. Use care not to push freeze plug into engine block when removing it. Failure to comply may cause damage to equipment.

12. Remove freeze plug (Figure 54, Item 1) by tapping with a hammer and punch (Figure 54, Item 2) until freeze plug (Figure 54, Item 1) cocks in opening of engine block.
13. Remove and discard freeze plug (Figure 54, Item 1) from opening in engine block.
14. Remove dirt, debris, and oil from opening in engine block by wiping with a rag.
15. Remove any burrs from opening using crocus cloth.

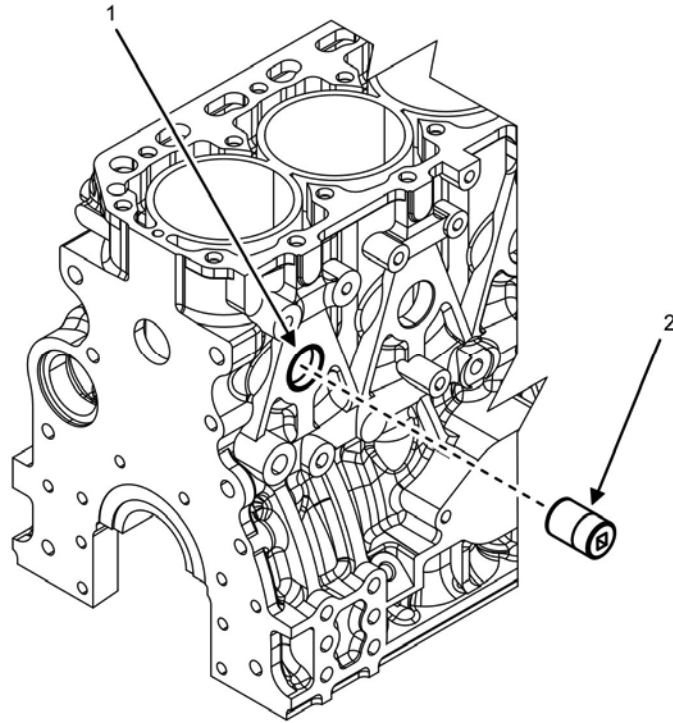


Figure 55. Install Freeze Plug.

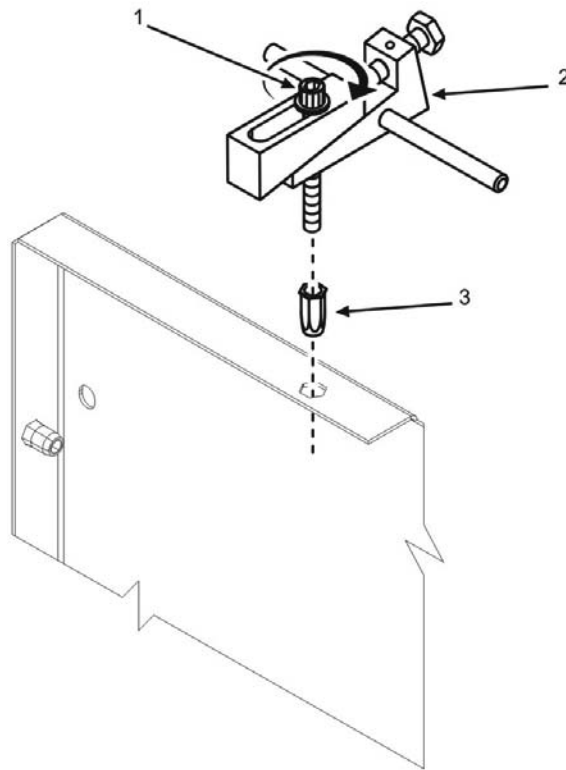
16. Position new freeze plug (Figure 55, Item 1) to opening in engine block.
17. Tap freeze plug (Figure 55, Item 1) into opening using a hammer and the proper size socket (Figure 55, Item 2) until freeze plug (Figure 55, Item 1) is fully seated into opening of engine block.
18. Replace any engine components previously removed or relocated.
19. Fill the cooling system (WP 0021, Service Cooling System).

WARNING

Starting engine when unit is partially disassembled is dangerous. Operate engine in this condition only as long as required to test operation. Keep away from unprotected moving engine parts during operation. Failure to comply may cause injury or death to personnel.

20. Set engine control switch to PRIME & RUN (TM 9-6115-751-10).
21. Start engine and run for 5 min (TM 9-6115-751-10).
22. Inspect cooling system (WP 0021, Service Cooling System) for leaks. Repair as required.
23. Stop engine and let cool.
24. Check coolant level in recovery bottle (WP 0021, Service Cooling System) and add coolant as required to bring level of coolant in bottle to LOW marking line.
25. Dispose of spilled coolant and soiled rags IAW local SOP.

END OF TASK

Install Clinch Nut**Figure 56. Clinch Nut to Rivet Tool**

26. Install new clinch nut (Figure 56, Item 3) to rivet nut tool (Figure 56, Item 2) by turning socket head screw (Figure 56, Item 1) clockwise until clinch nut (Figure 56, Item 3) is fully installed on tool.

CAUTION

Prior to tightening hex head screw (Figure 56, Item 1), position rivet nut tool (Figure 56, Item 2) flush with panel (Figure 56, Item 3) surface. Failure to comply may result in damage to equipment.

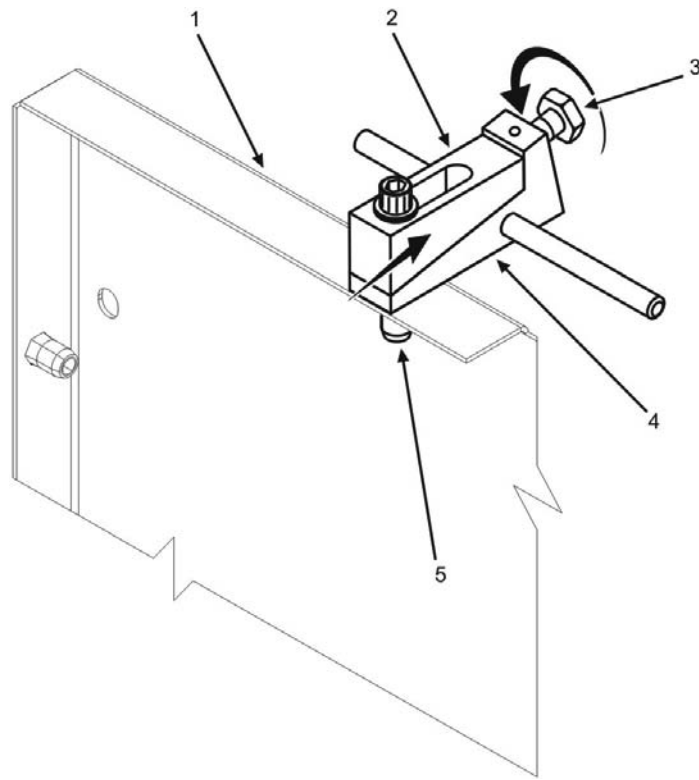


Figure 57. Install Clinch Nut to Panel

27. Install clinch nut (Figure 57, Item 5) into opening in panel (Figure 57, Item 1) with bottom surface of tool (Figure 57, Item 4) flush with panel (Figure 57, Item 1).
28. Turn hex head screw (Figure 57, Item 3) clockwise to draw top wedge (Figure 57, Item 2) of tool toward hex head screw (Figure 57, Item 3).
29. Continue to tighten hex head screw (Figure 57, Item 3) until top wedge (Figure 57, Item 2) is fully seated on bottom wedge (Figure 57, Item 4) of tool.

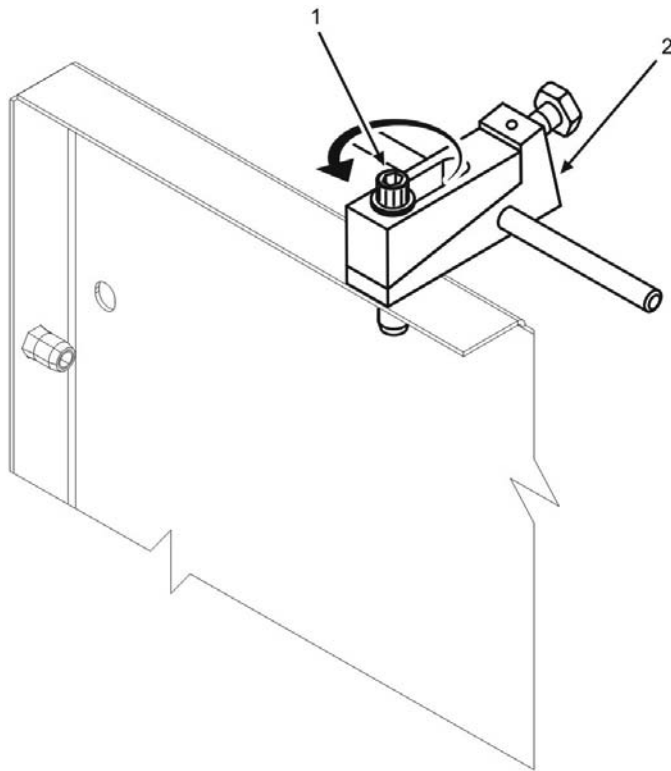


Figure 58. Remove Rivet Nut Tool

30. Turn socket head screw (Figure 58, Item 1) counter-clockwise to remove tool (Figure 58, Item 2) from panel.

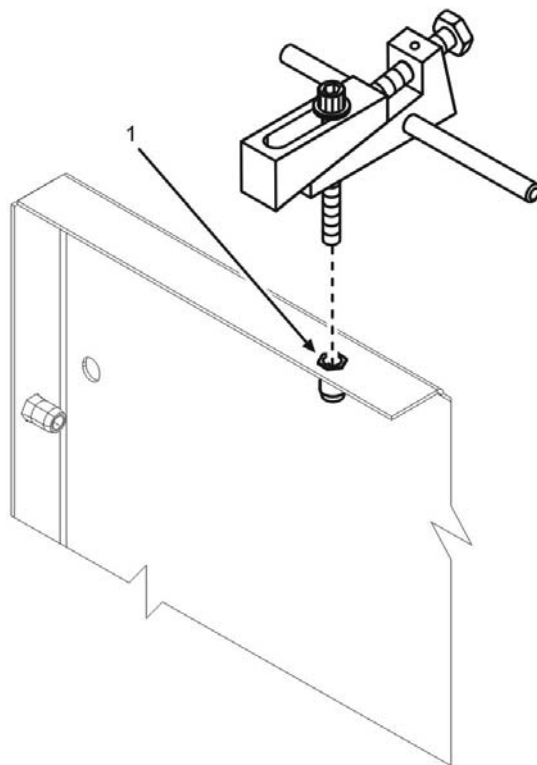


Figure 59. Installed Clinch Nut

31. Use installed clinch nut (Figure 59, Item 1) to secure panel as required.

END OF TASK

END OF WORK PACKAGE

**SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL HARMONIC BALANCER**

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Puller Set, Mechanical (WP 0163, Maintenance Allocation Chart, Item 21)

Tool Kit, General Mechanic's (GMTK) (WP 0163, Item 38)

Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 FT-LB (WP 0163, Item 45)

Materials/Parts

Balancer, harmonic (1) (WP 0150, Repair Parts List, Figure 50, Item 1)

Bolt, harmonic balancer (1) (WP 0150, Figure 50, Item 3)

Washer (1) (WP 0150, Figure 50, Item 2)

Cleaning compound, solvent (WP 0164, Expendable and Durable Items List, Item 11)

Lubricating oil, engine (WP 0164, Item 24)

Rag, wiping (2) (WP 0164, Item 32)

Personnel Required

91D (1)

References

Remove/Install Gear Case Cover (WP 0097, Remove/Install Gear Case Cover)

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Front body panel removed (WP 0029, Remove/Install Front Body Panel)

Battery-charging alternator belt removed (WP 0073, Remove/Install Battery-Charging Alternator Belt)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL HARMONIC BALANCER**Remove Harmonic Balancer**

1. Ensure equipment conditions are met in order presented in initial setup.

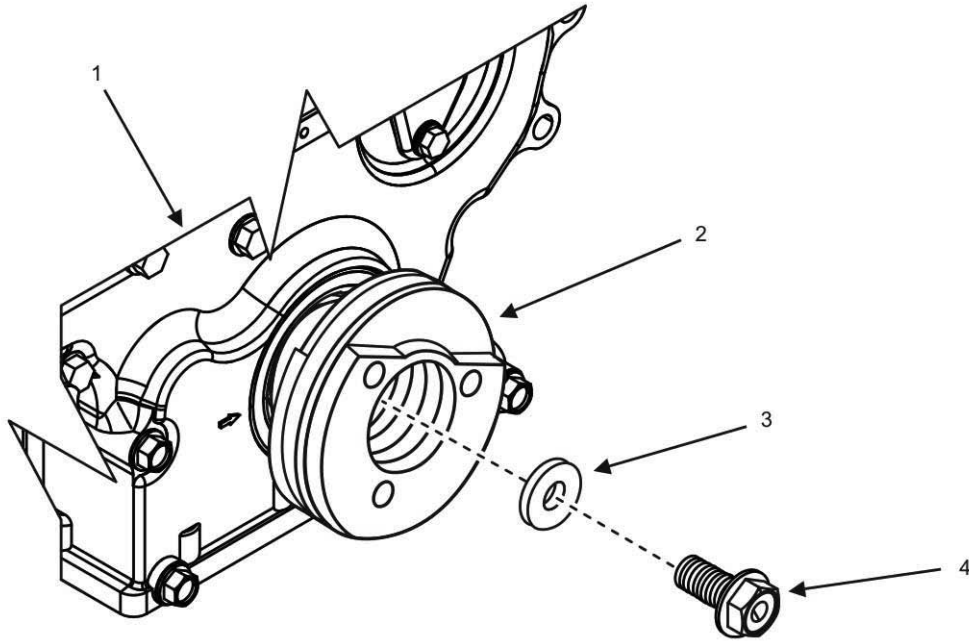


Figure 1. Harmonic Balancer — Removal.

2. Clamp or secure crankshaft at flywheel end to prevent movement when loosening hex cap screw (Figure 1, Item 4).
3. Remove hex cap screw (Figure 1, Item 4) and flat washer (Figure 1, Item 3) securing harmonic balancer (Figure 1, Item 2) to engine (Figure 1, Item 1). Discard flat washer (Figure 1, Item 3).
4. Re-install hex cap screw (Figure 1, Item 4) partially to engine (Figure 1, Item 1).

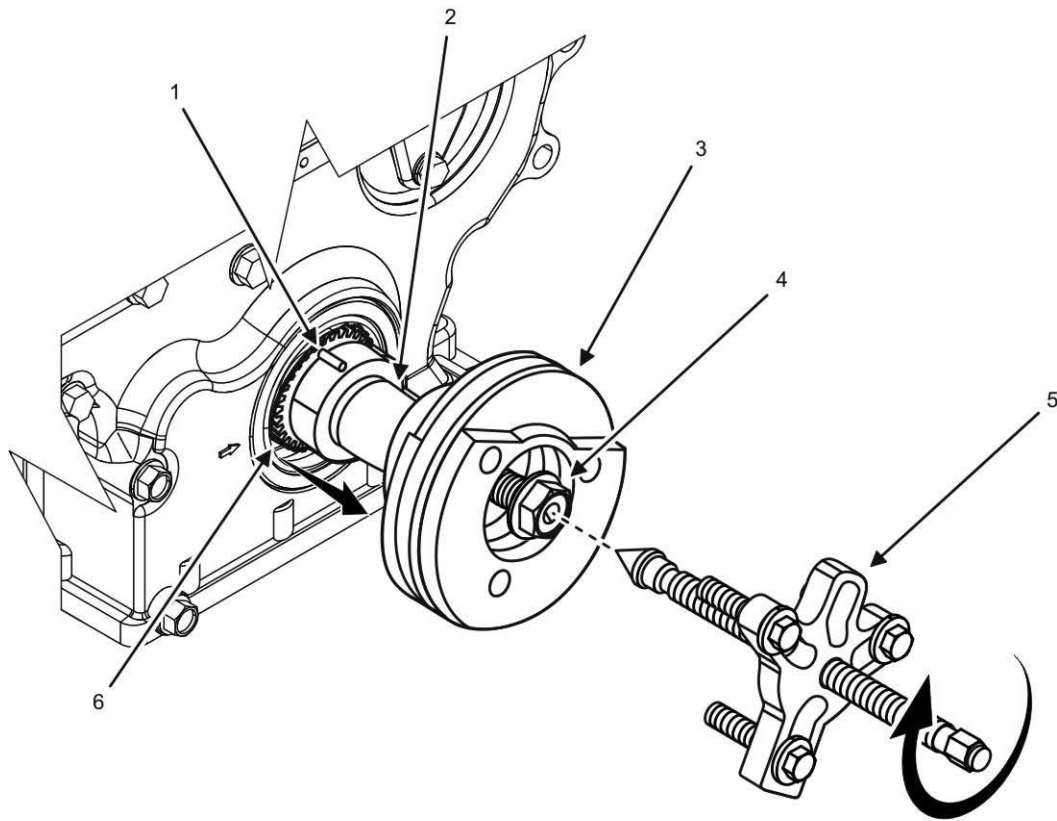


Figure 2. Harmonic Balancer — Removal.

CAUTION

Use care to avoid damaging the threads in the end of the crankshaft (Figure 2, Item 2) when removing the harmonic balancer (Figure 2, Item 3). When installing the three-bolt gear puller (Figure 2, Item 4), position tip of puller against hex cap screw (Figure 2, Item 4). Do not place tip of puller directly onto crankshaft threads. Failure to comply may cause damage to the equipment.

5. Install a three-bolt gear puller (Figure 2, Item 5) to harmonic balancer (Figure 2, Item 3).
6. Turn center screw of three-bolt gear puller (Figure 2, Item 5) clockwise to pull harmonic balancer (Figure 2, Item 3) from crankshaft (Figure 2, Item 2).
7. Remove three-bolt gear puller (Figure 2, Item 5) from harmonic balancer (Figure 2, Item 3) once harmonic balancer (Figure 2, Item 3) is loose on crankshaft (Figure 2, Item 1).
8. Remove and discard hex cap screw (Figure 2, Item 4) securing harmonic balancer (Figure 2, Item 3) to crankshaft (Figure 2, Item 2).
9. Remove harmonic balancer (Figure 2, Item 3) from crankshaft (Figure 2, Item 2). Be sure dowel pin (Figure 2, Item 1) remains in place on crankshaft (Figure 2, Item 2)
10. Place harmonic balancer (Figure 2, Item 3) on a suitable work surface.

END OF TASK

Inspect Harmonic Balancer

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

1. Clean harmonic balancer (Figure 2, Item 3) using dry cleaning solvent and wiping rags to remove dirt, grease, and oil.
2. Inspect harmonic balancer (Figure 2, Item 3) for damage. Replace if damaged.
3. Wipe dirt, grease and oil from oil seal (Figure 2, Item 6) clean using wiping rags.
4. Inspect oil seal (Figure 2, Item 6) for signs of visual damage. Replace oil seal (Figure 2, Item 6) (WP 0097, Remove/Install Gear Case Cover) if damaged.

END OF TASK

Install Harmonic Balancer

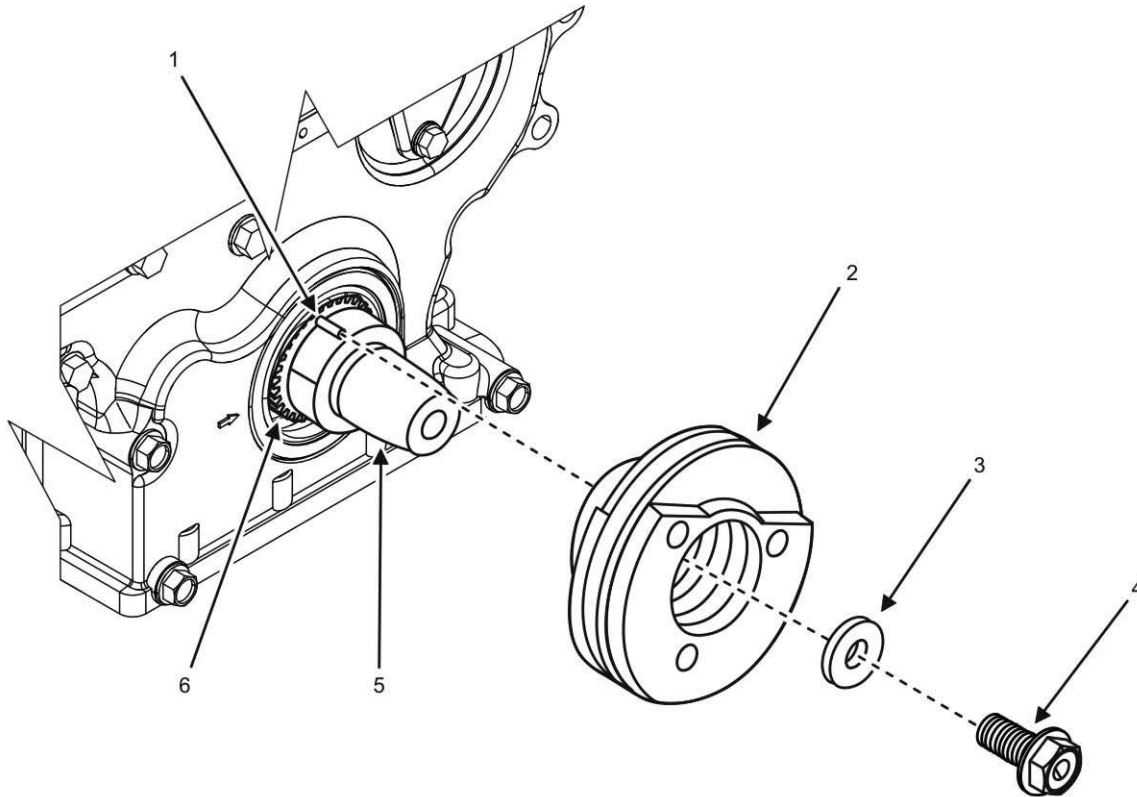


Figure 3. Harmonic Balancer Crankshaft — Alignment.

1. Clean mating surfaces of crankshaft (Figure 3, Item 5) and harmonic balancer (Figure 3, Item 2) to remove dirt, grease, and oil.
2. Apply a light coat of clean engine oil to oil seal (Figure 3, Item 6).

-
3. Apply a light coat of clean engine oil to crankshaft (Figure 3, Item 5) and harmonic balancer (Figure 3, Item 2) prior to installation.
 4. Clamp or secure crankshaft at flywheel end to prevent movement when tightening hex cap screw (Figure 3, Item 4).

CAUTION

Failure to align the dowel pin (Figure 3, Item 1) with the harmonic balancer (Figure 3, Item 2) and the crankshaft (Figure 3, Item 5) will result in excessive engine vibration. Failure to comply may cause damage to the equipment.

5. Install harmonic balancer (Figure 3, Item 2) to crankshaft (Figure 3, Item 5), aligning hole on harmonic balancer (Figure 3, Item 2) with dowel pin (Figure 3, Item 1) on crankshaft (Figure 3, Item 5).
6. Secure harmonic balancer (Figure 3, Item 2) to crankshaft (Figure 3, Item 5) by installing new flat washer (Figure 3, Item 3) and new hex cap screw (Figure 3, Item 4).
7. Tighten hex cap screw (Figure 3, Item 4) to 83 – 91 ft/lb (112 – 122 Nm).
8. Install battery-charging alternator belt (WP 0073, Remove/Install Battery-Charging Alternator Belt).
9. Install front body panel (WP 0029, Remove/Install Front Body Panel).
10. Set engine control switch to PRIME & RUN (TM 9-6115-751-10).
11. Start engine and check for proper operation (TM 9-6115-751-10).
12. Repair as required.

END OF TASK

END OF WORK PACKAGE

**SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
REMOVE/INSTALL GEAR CASE COVER**

INITIAL SETUP:**Test Equipment**

Not Applicable

Personnel Required

91D (1)

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0163, Item 46)

References

WP 0086, Remove/Install Oil Pan and Strainer

Materials/Parts

Cover assembly, gear case (WP 0149, Repair Parts List, Figure 49, Item 8)

O-ring 1A S-24.0 (WP 0149, Figure 49, Item 10)

O-ring, F.I. pump (WP 0149, Figure 49, Item 19)

Seal, oil (WP 0149, Figure 49, Item 9)

Seal, washer 8S (5) (WP 0149, Figure 49, Item 7)

Cleaning compound, solvent (WP 0164, Expendable and Durable Items List, Item 11)

Compound, sealing (WP 0164, Item 16)

Grease, general purpose (WP 0164, Item 22)

Rag, wiping (WP 0164, Item 32)

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery-charging alternator removed (WP 0074, Remove/Install Battery-Charging Alternator Assembly)

Harmonic balancer removed (WP 0096, Remove/Install Harmonic Balancer)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REMOVE/INSTALL GEAR CASE COVER**WARNING**

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

Remove Gear Case Cover

1. Remove four bolts that secure oil pan and spacer to front cover (WP 0086, Remove/Install Oil Pan and Strainer).

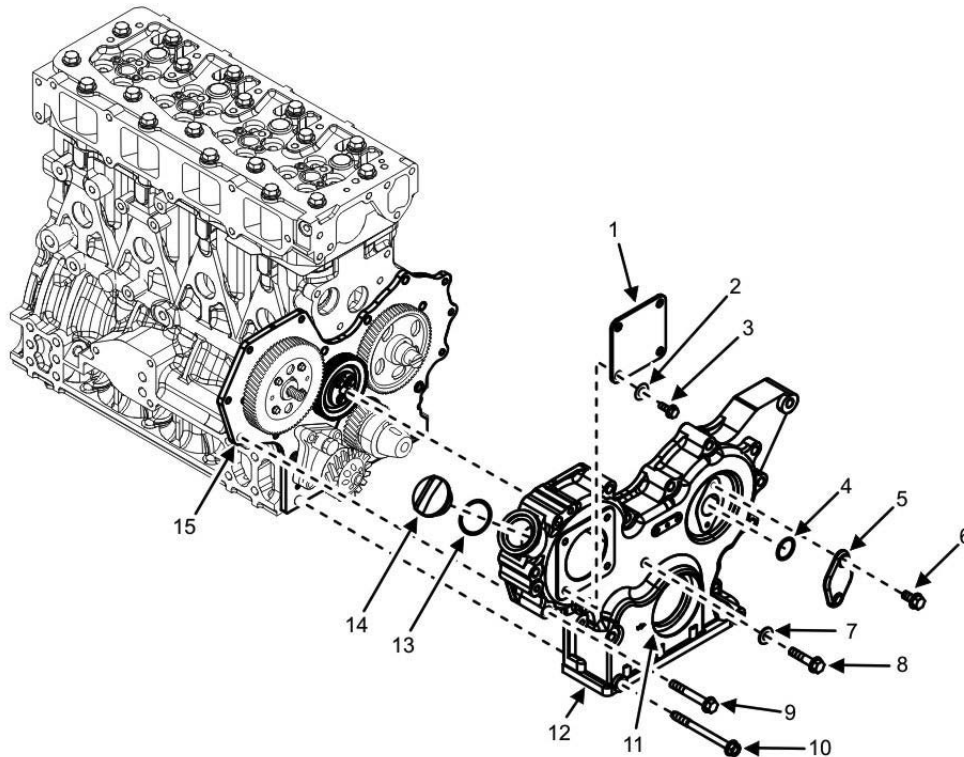


Figure 1. Gear Case Cover — Removal.

NOTE

The 16 screws (Figure 1, Items 8, 9, and 10) on the gear case cover (Figure 1, Item 12) vary in size. There is one M8-30 sized screw (Figure 1, Item 8), 12 M8-55 sized screws (Figure 1, Item 9), and three M8-85 sized screws (Figure 1, Item 10). Mark all screw (Figure 1, Items 8, 9, and 10) locations when removing to aid in reassembly.

2. Ensure equipment conditions are met in order presented in initial setup.
3. Remove 16 screws (Figure 1, Items 8, 9, and 10) securing gear case cover (Figure 1, Item 12) to gear case front plate (Figure 1, Item 15).
4. Remove sealing washer (Figure 1, Item 7) from screw (Figure 1, Item 8) or gear case cover (Figure 1, Item 12). Discard sealing washer (Figure 1, Item 7).

CAUTION

The gear case cover (Figure 1, Item 12) may need to be tapped lightly with a rubber mallet to loosen. A pry bar may need to be used to separate the gasket sealer holding the gear case cover (Figure 1, Item 12) to the gear case front plate (Figure 1, Item 15). Take care not to damage the gear case cover (Figure 1, Item 12) when using a pry bar or rubber mallet. Failure to comply may cause damage to the equipment.

5. Remove gear case cover (Figure 1, Item 12) and place on suitable work surface.

6. Remove and discard oil seal (Figure 1, Item 11).

CAUTION

If scraping of the gasket material from the mounting surfaces is necessary, ensure that the mounting surfaces are not scratched or damaged. An improper seal may result. Failure to comply may cause damage to the equipment.

7. Remove gasket residue from gear case cover (Figure 1, Item 12) and gear case front plate (Figure 1, Item 15) mounting surfaces with putty knife.
8. Remove two screws (Figure 1, Item 6) securing camshaft cover (Figure 1, Item 5) on gear case cover (Figure 1, Item 12).
9. Remove camshaft cover (Figure 1, Item 5) and O-ring (Figure 1, Item 4). Discard O-ring (Figure 1, Item 4).
10. Remove oil filler plug (Figure 1, Item 14) and O-ring (Figure 1, Item 13). Discard O-ring (Figure 1, Item 13).
11. Remove four screws (Figure 1, Item 3) and sealing washers (Figure 1, Item 2) securing fuel injection pump gear cover (Figure 1, Item 1) to gear case cover (Figure 1, Item 12). Discard four sealing washers (Figure 1, Item 2).
12. Remove fuel injection pump gear cover (Figure 1, Item 1).

CAUTION

If scraping of gasket material from the mounting surfaces is necessary, ensure that the mounting surfaces are not scratched or damaged. An improper seal may result. Failure to comply may cause damage to the equipment.

13. Remove excess gasket material with a putty knife from fuel injection pump gear cover (Figure 1, Item 1).
14. Clean fuel injection pump gear cover (Figure 1, Item 1) with dry cleaning solvent and wiping rags.

END OF TASK

Inspect Gear Case Cover

1. Inspect gear case cover (Figure 1, Item 12) for gasket residue and damage.
2. Replace gear case cover (Figure 1, Item 12) if damaged.
3. Clean gear case cover (Figure 1, Item 12) with dry cleaning solvent and wiping rags.

END OF TASK

Install Gear Case Cover

CAUTION

Timing gear backlash must be tested before installing gear case cover (Figure 1, Item 12). Failure to comply may cause damage to the equipment.

When applying gasket-forming compound, be sure to circle the screw holes to ensure a proper seal. Failure to comply may cause damage to the equipment.

1. Notify local supervisor to test timing gear backlash.
2. Apply gasket-forming compound to both fuel injection pump gear cover (Figure 1, Item 1) and mounting surface on front of gear case cover (Figure 1, Item 12) where fuel injection pump gear cover (Figure 1, Item 1) mounts.

3. Install fuel injection pump gear cover (Figure 1, Item 1) to gear case cover (Figure 1, Item 12) using four screws (Figure 1, Item 3) and four new sealing washers (Figure 1, Item 2).
4. Wipe excess gasket-forming compound from gear case cover (Figure 1, Item 12).
5. Install oil filler plug (Figure 1, Item 14) with new O-ring (Figure 1, Item 13) to gear case cover (Figure 1, Item 12).
6. Install camshaft cover (Figure 1, Item 5), two screws (Figure 1, Item 6), and new O-ring (Figure 1, Item 4).

NOTE

Depth of seal insertion should be approximately 1/16 inch from edge of case cover.

7. Coat new oil seal (Figure 1, Item 11) lip with grease and apply gasket forming compound to outer edge of new oil seal (Figure 1, Item 11). Install new oil seal (Figure 1, Item 11) into gear case cover (Figure 1, Item 12).
8. Apply gasket-forming compound to both gear case cover (Figure 1, Item 12) and gear case front plate (Figure 1, Item 15).
9. Position gear case cover (Figure 1, Item 12) onto gear case front plate (Figure 1, Item 15).

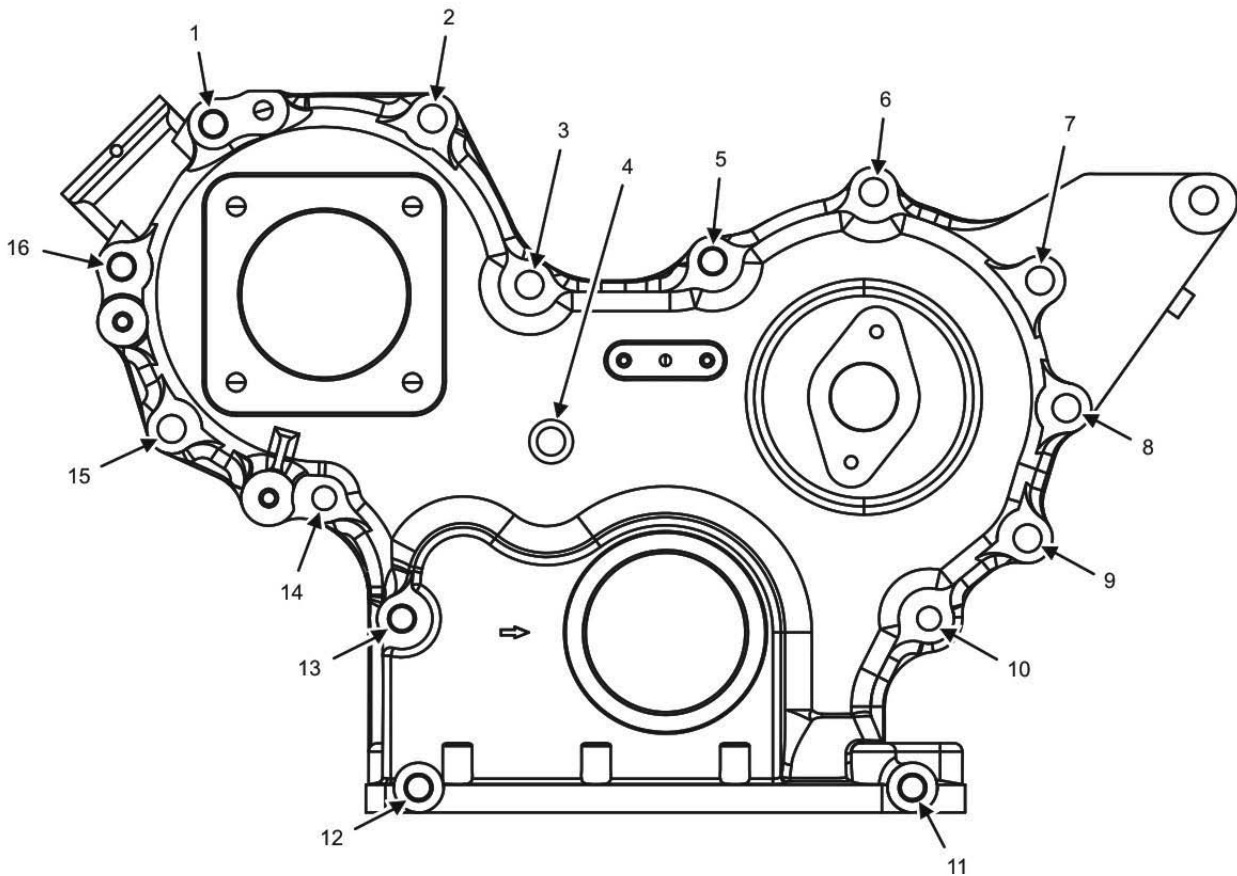


Figure 2. Mounting Screws Location — Length Detail.

CAUTION

Sixteen screws (Figure 2, Items 1 through 16), that secure the gear case cover (Figure 1, Item 12) to gear case front plate (Figure 1, Item 15) are of varying lengths. Screws (Figure 2, Items 1 through 16) must be installed in the correct locations to allow gear case cover (Figure 1, Item 12) to properly seal to gear case front plate (Figure 1, Item 15). Failure to comply may cause damage to the equipment.

- 10. Install new sealing washer (Figure 1, Item 7) to screw (Figure 1, Item 8).
- 11. Install 16 screws (Figure 2, Items 1 through 16) to gear case cover (Figure 1, Item 12) finger-tight, ensuring proper length screws are installed in the correct locations IAW Table 1.
- 12. Tighten 16 screws (Figure 2, Items 1 through 16) to 17 – 21 ft/lb (22.6 – 28.4 Nm) in crossing pattern.

Table 1. Gear Case Mounting Screws.

Callout	Metric Size	Length in Inches	Quantity
Figure 2, Items 1-3, 5-10, 14-16	M8 – 55	2.17 in	12
Figure 2, Items 11-13	M8 – 85	3.35 in	3
Figure 2, Item 4	M8 – 30	1.18 in	1

- 13. Install four bolts that secure oil pan and spacer to front cover (WP 0086, Remove/Install Oil Pan and Spacer).
- 14. Install harmonic balancer (WP 0096, Remove/Install Harmonic Balancer).
- 15. Install battery-charging alternator (WP 0074, Remove/Install Battery-Charging Alternator Assembly).
- 16. Set engine control switch to PRIME & RUN (TM 9-6115-751-10).
- 17. Start engine and check for proper operation (TM 9-6115-751-10).
- 18. Repair as required.

END OF TASK

END OF WORK PACKAGE

SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
REPLACE CYLINDER HEAD GASKET

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Tool Kit, General Mechanic's (GMTK) (WP 0163, Maintenance Allocation Chart, Item 38)

Materials/Parts

Bolt, cylinder head (18) (WP 0142, Repair Parts List, Figure 42, Item 1)

Cylinder head assembly (WP 0142, Figure 42, Item 2)

Gasket, head (WP 0142, Figure 42, Item 5)

Seal washer (8S) (WP 0128, Repair Parts List, Figure 28, Item 15)

Cleaning compound, solvent (WP 0164, Expendable and Durable Items List, Item 11)

Cloth, cleaning, electronics (WP 0164, Item 13)

Penetrating oil (WP 0164, Item 30)

Personnel Required

91D (1)

Assistant (1)

References

Not Applicable

Equipment Conditions

Engine control switch OFF (TM 9-6115-751-10, WP 0005)

Engine cool

Battery-charging alternator removed (WP 0074, Remove/Install Battery-Charging Alternator Assembly)

Water pump and joint removed (WP 0070, Remove/Install Water Pump)

Valve cover removed (WP 0082, Remove/Install Valve Cover)

Fuel injectors and fuel return line removed (WP 0068, Remove/Install Fuel Injector)

Intake manifold removed (WP 0076, Remove/Install Intake Manifold)

Exhaust manifold removed (WP 0080, Remove/Install Exhaust Manifold)

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

REPLACE CYLINDER HEAD GASKET

Replace Cylinder Head Gasket

1. Ensure equipment conditions are met in order presented in initial setup.

CAUTION

Ensure cylinder 1 is at Top Dead center (TDC) (WP 0083, Service Engine Valves) prior to removing the rocker arm assembly. Failure to comply will make the required valve adjustment more difficult and may result in damage to equipment.

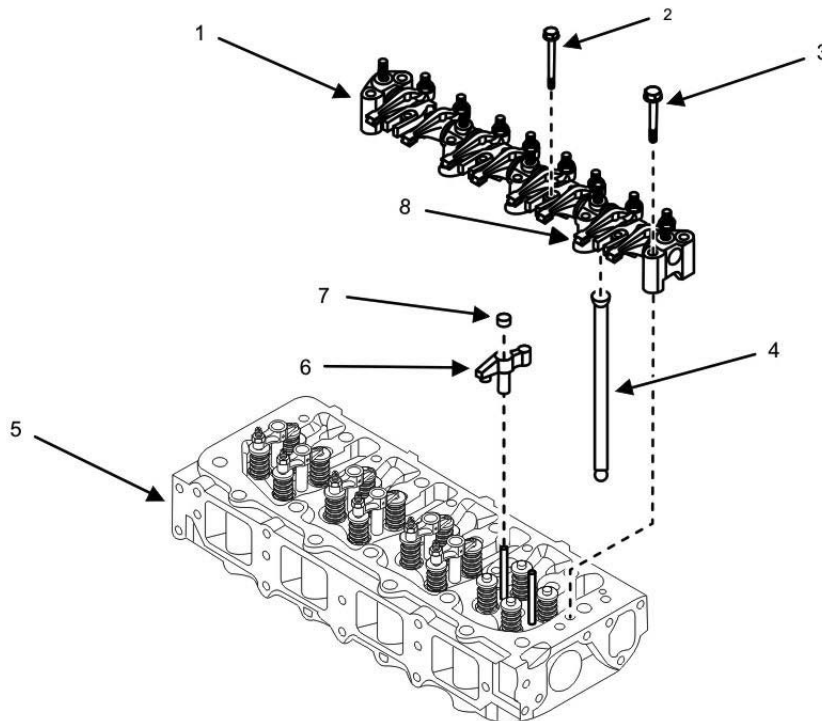


Figure 1. Rocker Arms and Push Rods — Removal Detail.

2. Remove seven M8-50 bolts (Figure 1, Item 3) and three M8-25 bolts (Figure 1, Items 2) securing the rocker arm assembly (Figure 1, Item 1) to the cylinder head (Figure 1, Item 5).
3. Remove rocker arm assembly (Figure 1, Item 1) and place on a suitable work surface.

CAUTION

The eight push rods (Figure 1, Item 4), valve bridge seats (Figure 1, Item 7), and valve bridges (Figure 1, Item 6) must be installed to the location from which they were removed. Failure to comply may cause damage to the equipment.

NOTE

Tag location of the eight push rods (Figure 1, Item 4), valve bridge seats (Figure 1, Item 7), and valve bridges (Figure 1, Item 6) at removal to ensure installation in proper location. The eight valve bridges (Figure 1, Item 6) and valve bridge seats (Figure 1, Item 7) only need to be removed if damaged.

4. Remove eight push rods (Figure 1, Item 4) from cylinder head (Figure 1, Item 5) and place on a suitable work surface.
5. Remove eight valve bridges (Figure 1, Item 6) and place on suitable work surface.
6. Remove eight valve bridge seats (Figure 1, Item 7) and place on suitable work surface.
7. Cap/plug openings in cylinder head (Figure 1, Item 5) to prevent dirt and debris from entering.

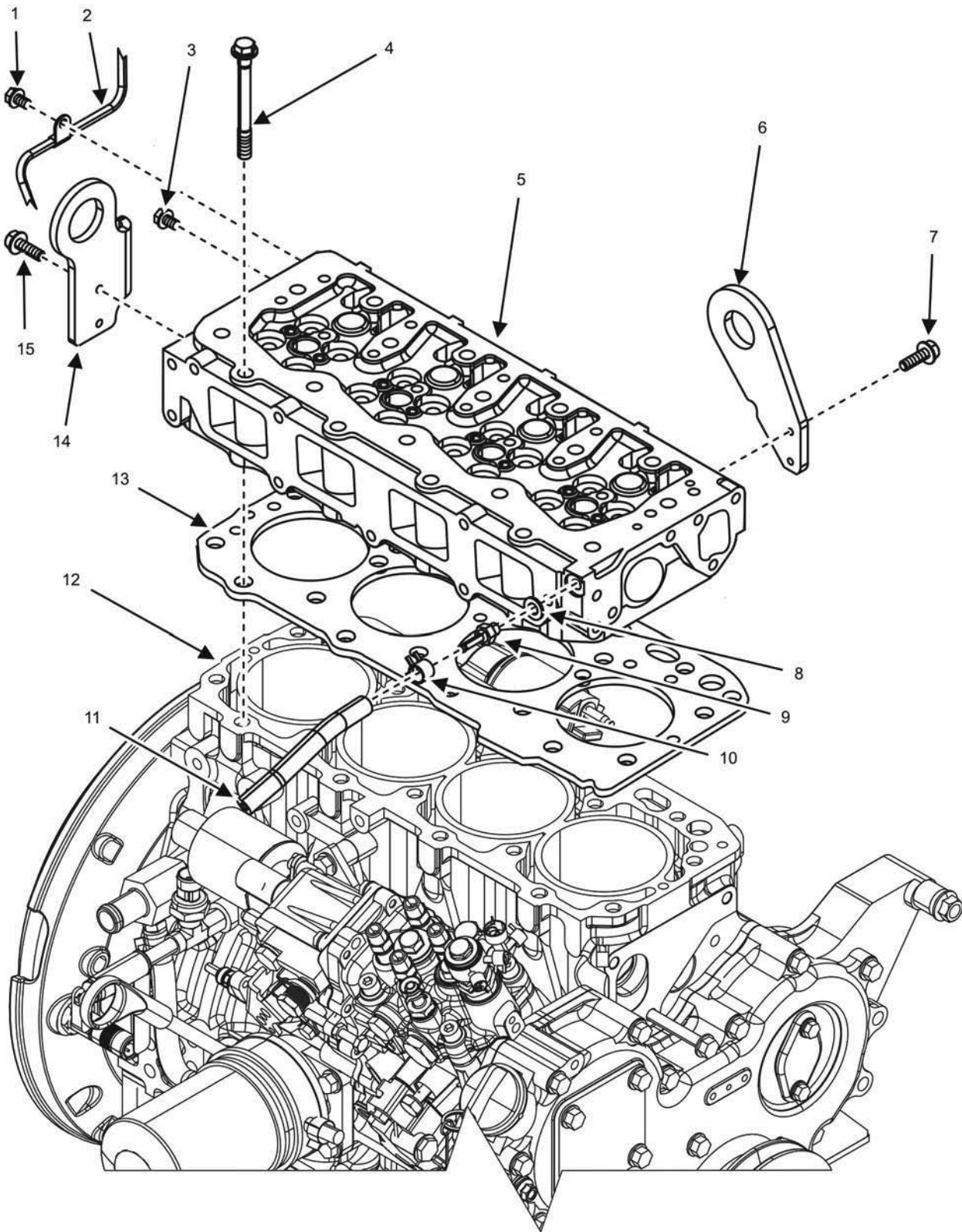


Figure 2. Cylinder Head — Removal.

8. Apply penetrating oil to all 18 cylinder head bolts (Figure 2, Item 4).
9. Remove bolt (Figure 2, Item 1) and lube oil inlet line (Figure 2, Item 2) from cylinder head (Figure 2, Item 5).
10. Remove bolt (Figure 2, Item 3) from cylinder head (Figure 2, Item 5).
11. Remove hose clip (Figure 2, Item 10) and hose (Figure 2, Item 11) from fuel return hose fitting (Figure 2, Item 9).
12. Remove fuel return hose fitting (Figure 2, Item 9) and sealing washer (Figure 2, Item 8) from cylinder head (Figure 2, Item 5).
13. Discard sealing washer (Figure 2, Item 8).

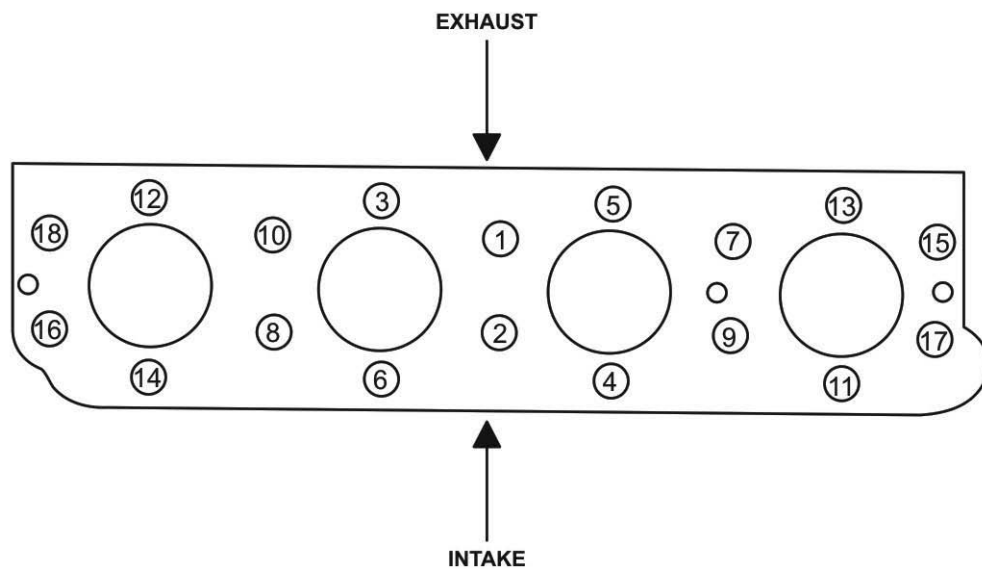


Figure 3. Cylinder Bolt Removal Sequence.

14. Loosen all 18 cylinder head bolts (Figure 2, Item 4) in the order shown in Figure 3.
15. Remove and discard all 18 cylinder head bolts (Figure 2, Item 4) in the order shown in Figure 3.
16. Remove cylinder head (Figure 2, Item 5) from engine with help from assistant. Place cylinder head (Figure 2, Item 5) on a suitable work surface.

CAUTION

Do not allow the cylinder head gasket (Figure 2, Item 13) residue to enter the engine block (Figure 2, Item 12) or cylinder head (Figure 2, Item 5). Failure to comply will cause damage to the equipment.

17. Remove and discard cylinder head gasket (Figure 2, Item 13).

WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

18. Clean cylinder head (Figure 2, Item 5) and engine block (Figure 2, Item 12) of cylinder head gasket (Figure 2, Item 13) residue with dry cleaning solvent and soft cloth.
19. Inspect cylinder head (Figure 2, Item 5) for cracks and/or damage.
20. Replace cylinder head (Figure 2, Item 5) if cracked and/or damaged.
21. Inspect lift eyes (Figure 2, Items 6 and 14) and bolts (Figure 2, Items 7 and 15) for loose or damaged parts.
22. Replace lift eyes (Figure 2, Items 6 and 14) and/or bolts (Figure 2, Items 7 and 15) and torque bolts (Figure 2, Items 7 and 15) to 18 – 21 ft/lb (24 – 29 Nm) as required.
23. Position new cylinder head gasket (Figure 2, Item 13) on engine block (Figure 2, Item 12).
24. Apply a light coat of lubricating oil to 18 new cylinder head bolts (Figure 2, Item 4).
25. Position cylinder head (Figure 2, Item 5) on engine block (Figure 2, Item 12).
26. Install 18 cylinder head bolts (Figure 2, Item 4). Finger-tighten.

CAUTION

The 18 cylinder head bolts (Figure 2, Item 4) are tightened in a two-step process in the order specified in Figure 3. Failure to tighten in the two-step process and in the proper order will warp the cylinder head (Figure 2, Item 5). Failure to comply may cause damage to the equipment.

27. Tighten 18 cylinder head bolts (Figure 2, Item 4) in sequence shown in Figure 3 to 31 – 33 ft/lb (42 – 46 Nm). Tighten 18 cylinder head bolts (Figure 2, Item 4) in same sequence to 63 – 67 ft/lb (85 – 91 Nm).
28. Install fuel return hose fitting (Figure 2, Item 9) and new sealing washer (Figure 2, Item 8) to cylinder head (Figure 2, Item 5).
29. Install hose (Figure 2, Item 11) to fuel return hose fitting (Figure 2, Item 9) and position hose clip (Figure 2, Item 10) on hose (Figure 1, Item 11).
30. Install bolt (Figure 2, Item 3) to cylinder head (Figure 2, Item 5).
31. Install bolt (Figure 2, Item 1) to cylinder head (Figure 2, Item 5) securing lube oil inlet line (Figure 2, Item 2) to cylinder head (Figure 2, Item 5).

NOTE

The eight valve bridges (Figure 1, Item 6) and eight valve bridge seats (Figure 1, Item 7) only need to be installed if removed.

32. Remove caps/plugs from openings in cylinder head (Figure 1, Item 5).
33. Install eight valve bridge seats (Figure 1, Item 7) to eight valve bridges (Figure 1, Item 6) from where originally removed.
34. Install eight valve bridges (Figure 1, Item 6) in location from where originally removed.
35. Install eight push rods (Figure 1, Item 4) into cylinder head (Figure 1, Item 5) shafts from where originally removed.
36. Position rocker arm assembly (Figure 1, Item 1) on cylinder head (Figure 1, Item 5).
37. Align eight push rods (Figure 1, Item 4) with their respective eight rocker arms (Figure 1, Item 8).

-
38. Install rocker arm assembly (Figure 1, Item 1) with seven M 8-50 bolts (Figure 1, Item 3) and three M8-25 bolts (Figure 1, Item 2) to the cylinder head (Figure 1, Item 5).
 39. Torque seven M 8-50 bolts (Figure 1, Item 3) and three M8-25 bolts (Figure 1, Item 2) to 14 to 17 ft/lb (19 to 23 Nm).
 40. Adjust valves (WP 0082, Service Engine Valves).
 41. Install exhaust manifold (WP 0080, Remove/Install Exhaust Manifold).
 42. Install intake manifold (WP 0076, Remove/Install Intake Manifold).
 43. Install fuel injectors and fuel return line (WP 0068, Remove/Install Fuel Injectors).
 44. Install valve cover (WP 0082, Remove/Install Valve Cover).
 45. Install water pump and joint (WP 0070, Remove/Install Water Pump).
 46. Install battery-charging alternator (WP 0074, Remove/Install Battery-Charging Alternator Assembly).
 47. Set engine control switch to PRIME & RUN (TM 9-6115-751-10).
 48. Start engine and check for proper operation (TM 9-6115-751-10). Apply 100% rated load for 30 minutes or until coolant reaches normal operating temperature (TM 9-6115-751-10).
 49. Repair as required.

END OF TASK

END OF WORK PACKAGE

**FIELD MAINTENANCE
AMMPS 15KW GENERATOR SET
WIRING DIAGRAMS**

INITIAL SETUP:**Test Equipment**

Not Applicable

Tools and Special Tools

Not Applicable

Materials/Parts

Not Applicable

Personnel Required

91D

References

NMWR 9-6115-751

Foldout Pages

Equipment Conditions

Not Applicable

Special Environmental Conditions

Not Applicable

Drawings Required

Not Applicable

INTRODUCTION

All diagrams and essential wiring information are provided for all electrical circuits with the exception of the DCS. Wiring diagram for the DCS is provided in NMWR 9-6115-751.

WIRE IDENTIFICATION

Identification of wires is done in the Foldout Pages in the Rear Matter of this manual.

ABBREVIATIONS

Abbreviations in the wiring information conform to ASME Y14.38 unless the wires are marked as shown in the respective diagrams.

WIRING DIAGRAMS

Wiring schematics and diagrams are provided in the Foldout Pages located in the Rear Matter of this manual.

END OF WORK PACKAGE

CHAPTER 6
PARTS INFORMATION
FOR
AMMPS 15KW GENERATOR SET

CHAPTER 6
PARTS INFORMATION

WORK PACKAGE INDEX

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RPSTL INTRODUCTION	0100
GENERATOR SET REPAIR PARTS LIST	0101
DC ELECTRIC INSTALLATION REPAIR PARTS LIST	0102
RELAY PANEL REPAIR PARTS LIST	0103
HOUSING INSTALLATION REPAIR PARTS LIST.....	0104
DCS INSTALLATION REPAIR PARTS LIST.....	0105
DCS CONTROL PANEL ASSEMBLY REPAIR PARTS LIST	0106
DCS ENCLOSURE ASSEMBLY REPAIR PARTS LIST	0107
INTAKE AIR INSTALLATION REPAIR PARTS LIST	0108
EXHAUST INSTALLATION REPAIR PARTS LIST	0109
COOLING SYSTEM INSTALLATION REPAIR PARTS LIST.....	0110
FUEL SYSTEM INSTALLATION REPAIR PARTS LIST	0111
FUEL MANIFOLD ASSEMBLY REPAIR PARTS LIST.....	0112
FUEL FILTER/WATER SEPARATOR REPAIR PARTS LIST	0113
OUTPUT BOX INSTALLATION REPAIR PARTS LIST	0114
CONTACTOR REPAIR PARTS LIST	0115
OUTPUT TERMINAL BOARD REPAIR PARTS LIST	0116
VOLTAGE SELECTION BOARD REPAIR PARTS LIST.....	0117
HOUR METER REPAIR PARTS LIST.....	0118
CONVENIENCE RECEPTACLE REPAIR PARTS LIST	0119
TRANSFORMERS REPAIR PARTS LIST.....	0120
PRINTED CIRCUIT BOARD MODULE REPAIR PARTS LIST	0121
POWER PLANT INSTALLATION REPAIR PARTS LIST	0122
AC GENERATOR ASSEMBLY, 50/60 HZ REPAIR PARTS LIST.....	0123
AC GENERATOR ASSEMBLY, 400 HZ REPAIR PARTS LIST.....	0124
ENGINE ASSEMBLY REPAIR PARTS LIST.....	0125
LUBRICATION SYSTEM REPAIR PARTS LIST	0126
ENGINE SPEED SENSOR REPAIR PARTS LIST.....	0127
FUEL INJECTORS AND LINES REPAIR PARTS LIST	0128
FUEL INJECTION PUMP REPAIR PARTS LIST	0129
THERMOSTAT REPAIR PARTS LIST	0130
WATER PUMP REPAIR PARTS LIST.....	0131
BATTERY-CHARGING ALTERNATOR AND BELT REPAIR PARTS LIST.....	0132

<u>Title</u>	<u>WP Sequence No.</u>
STARTER REPAIR PARTS LIST	0133
GOVERNOR ACTUATOR REPAIR PARTS LIST	0134
INTAKE MANIFOLD REPAIR PARTS LIST	0135
EXHAUST MANIFOLD REPAIR PARTS LIST	0136
OIL PAN AND STRAINER REPAIR PARTS LIST	0137
FLYWHEEL REPAIR PARTS LIST	0138
CRANKCASE REAR BEARING COVER REPAIR PARTS LIST	0139
INTAKE AIR HEATER REPAIR PARTS LIST	0140
TURBOCHARGER REPAIR PARTS LIST	0141
CYLINDER HEAD ASSEMBLY REPAIR PARTS LIST	0142
VALVE COVER REPAIR PARTS LIST	0143
ENGINE VALVES REPAIR PARTS LIST	0144
ROCKER ARMS AND PUSH RODS REPAIR PARTS LIST	0145
SHORT BLOCK ASSEMBLY REPAIR PARTS LIST	0146
CONNECTING PISTONS AND CONNECTING RODS REPAIR PARTS LIST	0147
CRANKSHAFT REPAIR PARTS LIST	0148
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BULK ITEM	0157
SPECIAL TOOLS LIST	0158
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PART NUMBER INDEX	0160

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
RPSTL INTRODUCTION

INTRODUCTION

SCOPE

This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of operator and field maintenance of the AMMPS 15 kW generator set. It authorizes the requisitioning, issue, and disposition of spares, repair parts, and special tools as indicated by the source, maintenance, and recoverability (SMR) codes.

GENERAL

In addition to the Introduction work package, this RPSTL is divided into the following work packages.

1. **Repair Parts List Work Packages.** Work packages containing lists of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. These work packages also include parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Sending units, brackets, filters, and bolts are listed with the component they mount on. Bulk materials are listed by item name in FIG. BULK at the end of the work packages. Repair parts kits are listed separately in their own functional group and work package. Repair parts for reparable special tools are also listed in a separate work package. Items listed are shown on the associated illustrations.
2. **Special Tools List Work Packages.** Work packages containing lists of special tools, special TMDE, and special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in the DESCRIPTION AND USABLE ON CODE (UOC) column). Tools that are components of common tool sets and/or Class VII are not listed.
3. **Cross-Reference Indexes Work Packages.** There are two cross reference indexes work packages in this RPSTL: the National Stock Number (NSN) Index work package and the Part Number (P/N) Index work package. The National Stock Number (NSN) Index work package refers you to the figure and item number. The Part Number (P/N) Index work package refers you to the figure and item number.

EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIALTOOLS LIST WPS

ITEM NO. (Column (1)). Indicates the number used to identify items called out in the illustration.

SMR CODE (Column (2)). The SMR code containing supply/requisitioning information, maintenance level authorization criteria, and disposition instruction, as shown in the following breakout. This entry may be subdivided into four subentries, one for each service.

Table 1. SMR Code Explanation.

<u>Source Code</u> <u>XX</u>	<u>Maintenance Code</u> <u>XX</u>	<u>Recoverability Code</u> <u>X</u>
1st two positions: How to get an item.	3rd position: Who can install, replace, or use the item.	4th position: Who can do complete repair* on the item.
		5th position: Who determines the disposition action on unserviceable items.

*Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

Source Code. The source code tells you how you get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follow:

<u>Source Code</u>	<u>Application/Explanation</u>
PA PB PC PD PE PF PG PH PR PZ	NOTE Items coded PC are subject to deterioration. Stock items; use the applicable NSN to requisition/request items with these source codes. They are authorized to the level indicated by the code entered in the third position of the SMR code.
KD KF KB	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance level indicated in the third position of the SMR code. The complete kit must be requisitioned and applied.
MF-Made at field level MH-Made at below depot/sustainment level ML-Made at SRA MD-Made at depot MG-Navy only	Items with these codes are not to be requisitioned/requested individually. They must be made from bulk material which is identified by P/N in the DESCRIPTION AND UOC column and listed in the bulk material group work package of the RPSTL. If the item is authorized to you by the third position code of the SMR code, but the source indicates it is made at a higher level, order the item from the higher level of maintenance.
AF-Assembled by field level AH-Assembled by below depot/sustainment level AL-Assembled by SRA AD-Assembled by depot AG-Navy only	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated in the source code. If the third position of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.
XA	Do not requisition an "XA" coded item. Order the next higher assembly. (Refer to NOTE below.)
XB	If an item is not available from salvage, order it using the CAGEC and part number.
XC	Installation drawings, diagrams, instruction sheets, field service drawings; identified by manufacturer's part number.

Source Code

Application/Explanation

XD Item is not stocked. Order an XD-coded item through local purchase or normal supply channels using the CAGEC and part number given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes except for those items source coded "XA" or those aircraft support items restricted by requirements of AR 750-1.

Maintenance Code. Maintenance codes tell you the level(s) of maintenance authorized to use and repair support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:

Third Position. The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to the following levels of maintenance:

Maintenance

Code

Application/Explanation

- F - Field maintenance can remove, replace, and use the item.
- H - Below Depot Sustainment maintenance can remove, replace, and use the item.
- L - Specialized repair activity can remove, replace, and use the item.
- G - Afloat and ashore intermediate maintenance can remove, replace, and use the item (Navy only).
- K - Contractor facility can remove, replace, and use the item.
- Z - Item is not authorized to be removed, replaced, or used at any maintenance level.
- D - Depot can remove, replace, and use the item.

*NOTE - Army may use C in the third position. However, for joint service publications, Army will use O.

Fourth Position. The maintenance code entered in the fourth position tells you whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (perform all authorized repair functions).

NOTE

Some limited repair may be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.

Maintenance

Code

Application/Explanation

- F - Field is the lowest level that can do complete repair of the item.
- H - Below Depot Sustainment is the lowest level that can do complete repair of the item.
- L - Specialized repair activity (*enter specialized repair activity or TASMG designator*) is the lowest level that can do complete repair of the item.
- D - Depot is the lowest level that can do complete repair of the item.
- G - Both afloat and ashore intermediate levels are capable of complete repair of item. (Navy only).
- K - Complete repair is done at contractor facility.

- Z - Nonreparable. No repair is authorized.
- B - No repair is authorized. No parts or special tools are authorized for maintenance of "B" coded item. However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is shown in the fifth position of the SMR code as follows:

<u>Recoverability Code</u>	<u>Application/Explanation</u>
Z -	Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in the third position of the SMR code.
F -	Reparable item. When uneconomically repairable, condemn and dispose of the item at the field level.
H -	Reparable item. When uneconomically repairable, condemn and dispose of the item at the below depot sustainment level.
D -	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item are not authorized below depot level.
L -	Reparable item. Condemnation and disposal not authorized below Specialized Repair Activity (SRA).
A -	Item requires special handling or condemnation procedures because of specific reasons (such as precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.
G -	Field level repairable item. Condemn and dispose at either afloat or ashore intermediate levels. (Navy only).
K -	Reparable item. Condemnation and disposal to be performed at contractor facility.

NSN (Column (3)). The NSN for the item is listed in this column.

CAGEC (Column (4)). The Commercial and Government Entity Code (CAGEC) is a five-digit code which is used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

PART NUMBER (Column (5)). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When you use an NSN to requisition an item, the item you receive may have a different part number from the number listed.

DESCRIPTION AND UOC (Column (6)). This column includes the following information:

1. The federal item name and, when required, a minimum description to identify the item.
2. Part numbers of bulk materials are referenced in this column in the line entry to be manufactured or fabricated.
3. Hardness Critical Item (HCI). A support item that provides the equipment with special protection from electromagnetic pulse (EMP) damage during a nuclear attack.
4. The statement END OF FIGURE appears just below the last item description in column (6) for a given figure in both the repair parts list and special tools list work packages.

QTY (Column (7)). The QTY (quantity per figure) column indicates the quantity of the item used in the breakout shown on the illustration/figure, which is prepared for a functional group, sub-functional group, or an assembly. A

"V" appearing in this column instead of a quantity indicates that the quantity is variable and quantity may change from application to application.

EXPLANATION OF CROSS-REFERENCE INDEXES WORK PACKAGES FORMAT AND COLUMNS

1. National Stock Number (NSN) Index Work Package. NSNs in this index are listed in National Item Identification Number (NIIN) sequence.

STOCK NUMBER Column. This column lists the NSN in NIIN sequence. The NIIN consists of the last nine digits of the NSN. When using this column to locate an item, ignore the first four digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

For example, if the NSN is 5385-01-574-1476, the NIIN is 01-574-1476.

FIG. Column. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in the repair parts list and special tools list work packages.

ITEM Column. The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

2. Part Number (P/N) Index work package. Part numbers in this index are listed in ascending alphanumeric sequence (vertical arrangement of letter and number combinations which places the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9 and each following letter or digit in like order).

PART NUMBER Column. Indicates the part number assigned to the item.

FIG. Column. This column lists the number of the figure where the item is identified/located in the repair parts list and special tools list work packages.

ITEM Column. The item number is the number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

SPECIAL INFORMATION

UOC. The UOC appears in the lower left corner of the Description Column heading. Usable on codes are shown as "UOC:..." in the Description Column (justified left) on the first line under the applicable item/nomenclature. Uncoded items are applicable to all models. Identification of the UOCs used in the RPSTL are:

<u>Code</u>	<u>Used On</u>
98J	Model MEP 1050
98K	Model MEP 1051

Fabrication Instructions. Bulk materials required to manufacture items are listed in the bulk material functional group of this RPSTL. Part numbers for bulk material are also referenced in the Description Column of the line item entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items source coded to be manufactured or fabricated are found in applicable TM.

Index Numbers. Items which have the word BULK in the figure column will have an index number shown in the item number column. This index number is a cross-reference between the NSN / Part Number (P/N) Index work packages and the bulk material list in the repair parts list work package.

HOW TO LOCATE REPAIR PARTS

1. When NSNs or Part Numbers Are Not Known.

First. Using the Table of Contents, determine the assembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and lists are divided into the same groups.

Second. Find the figure covering the functional group or the subfunctional group to which the item belongs.

Third. Identify the item on the figure and note the number(s).

Fourth. Look in the repair parts list work package for the figure and item numbers. The NSNs and part numbers are on the same line as the associated item numbers.

2. When NSN Is Known.

First. If you have the NSN, look in the STOCK NUMBER column of the NSN Index work package. The NSN is arranged in NIIN sequence. Note the figure and item number next to the NSN.

Second. Turn to the figure and locate the item number. Verify that the item is the one you are looking for.

3. When Part Number Is Known.

First. If you have the part number and not the NSN, look in the PART NUMBER column of the part number index WP. Identify the figure and item number.

Second. Look up the item on the figure in the applicable repair parts list work package.

ABBREVIATIONS

Not applicable.

END OF WORK PACKAGE

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
GENERATOR SET REPAIR PARTS LIST**

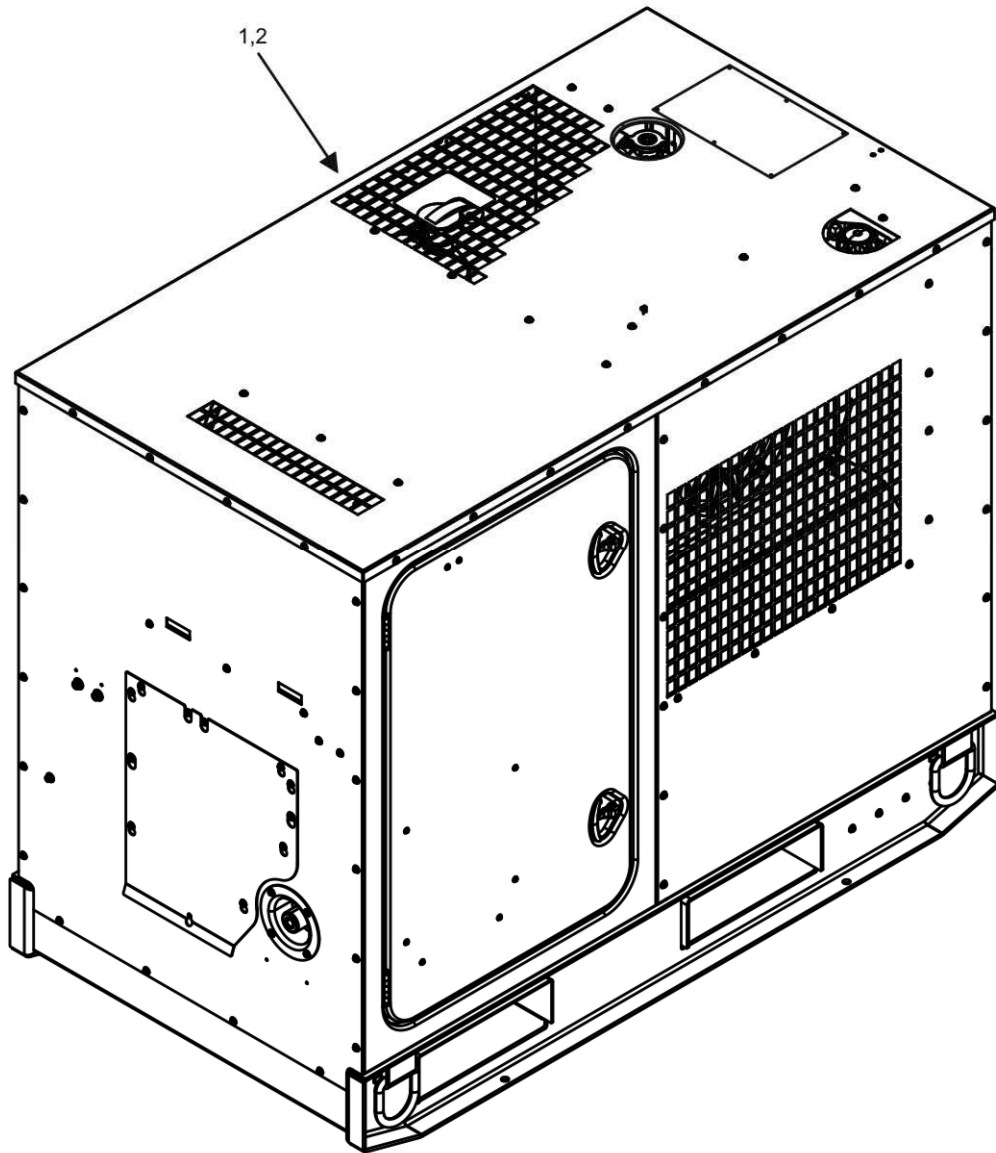


Figure 1. Generator Set (Sheet 1 of 8).

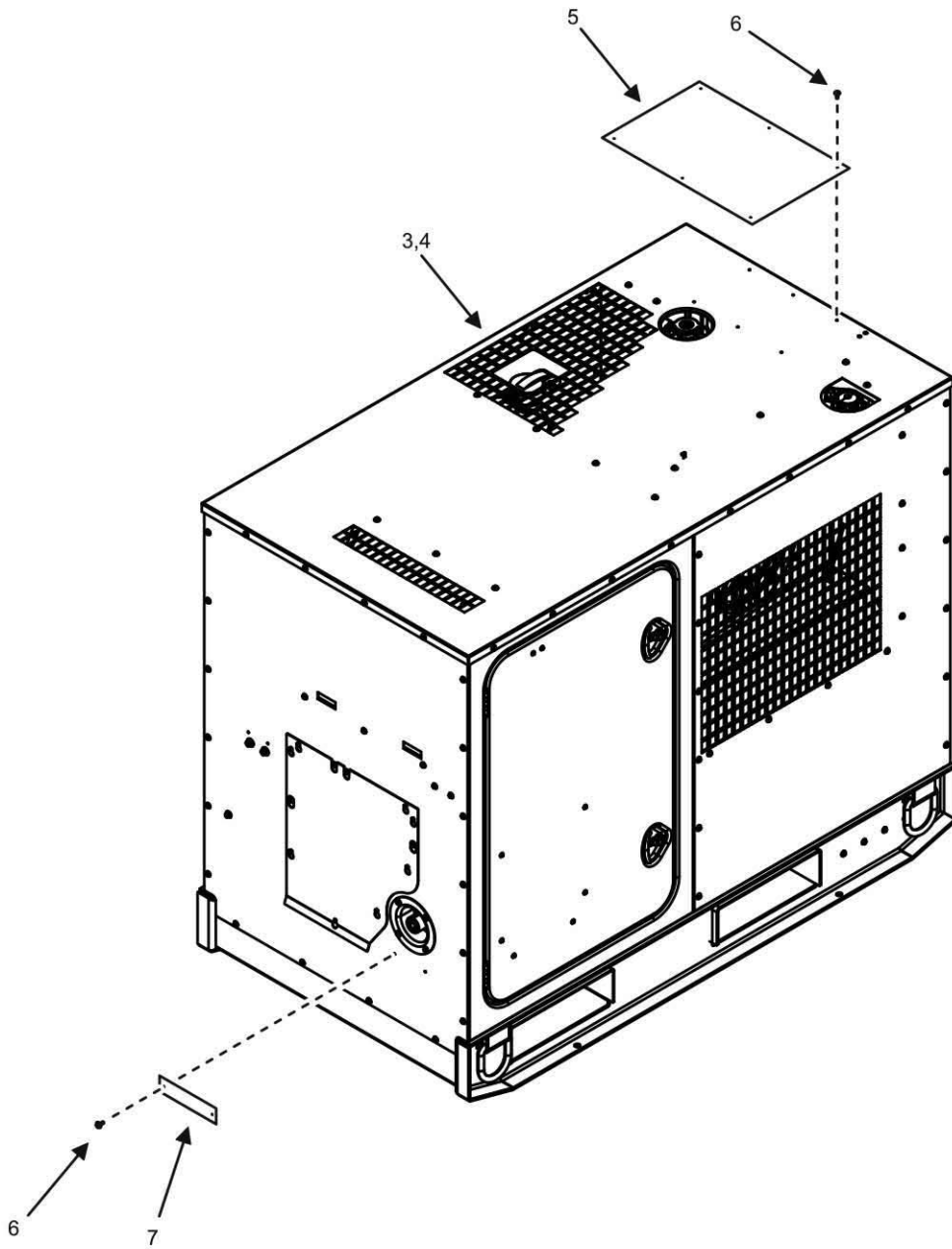


Figure 1. Generator Set (Sheet 2 of 8).

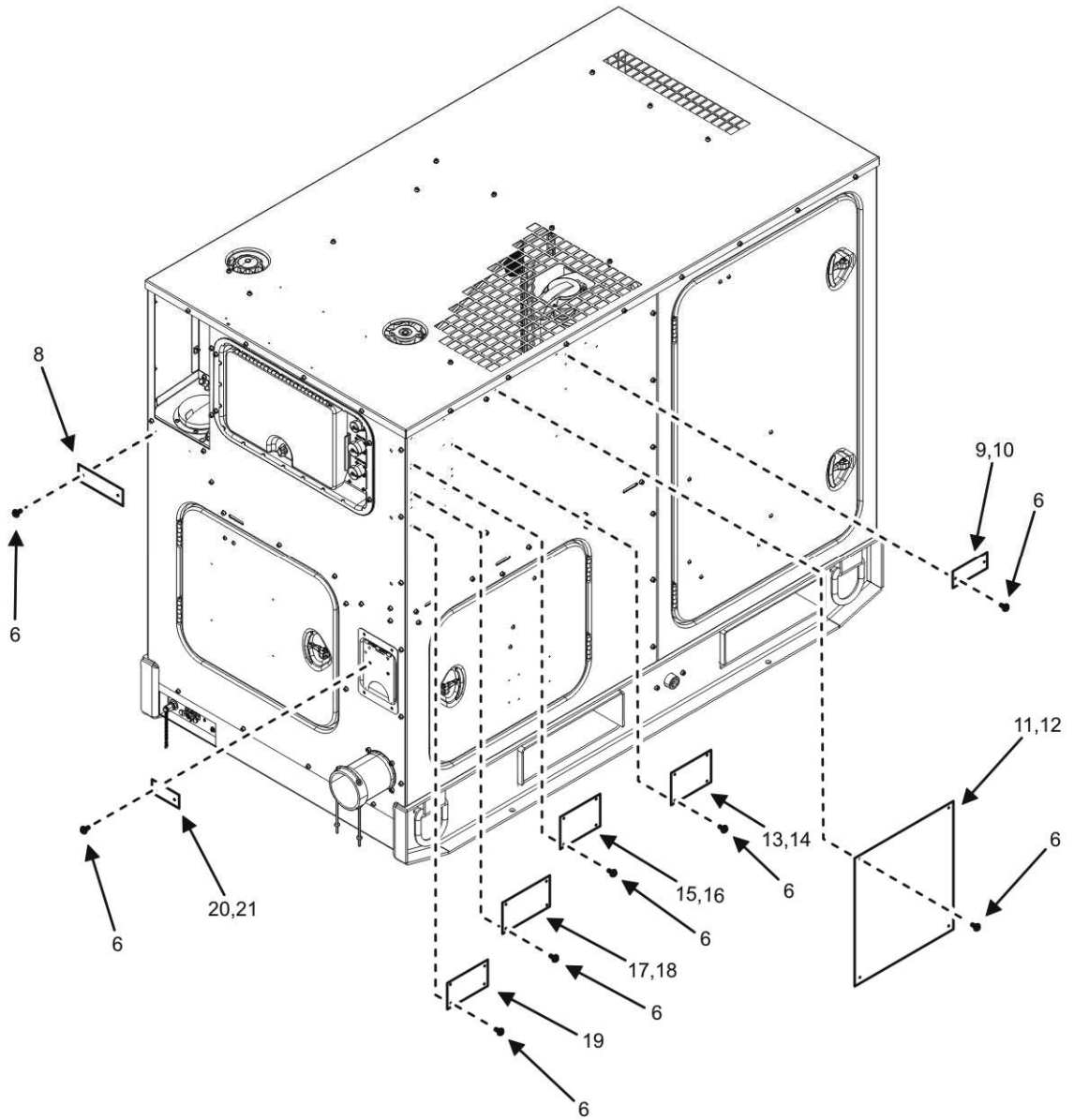


Figure 1. Generator Set (Sheet 3 of 8).

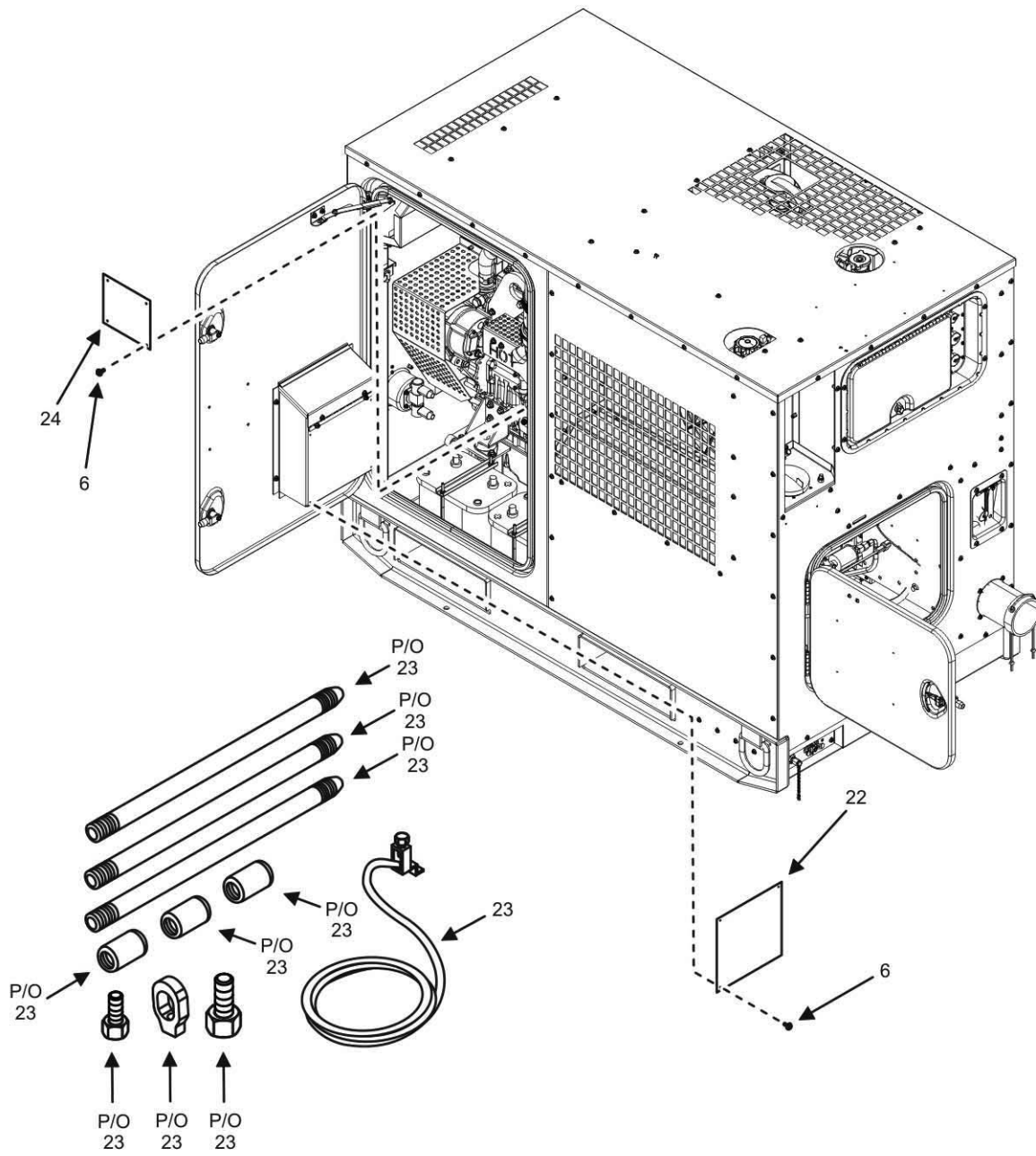


Figure 1. Generator Set (Sheet 4 of 8).

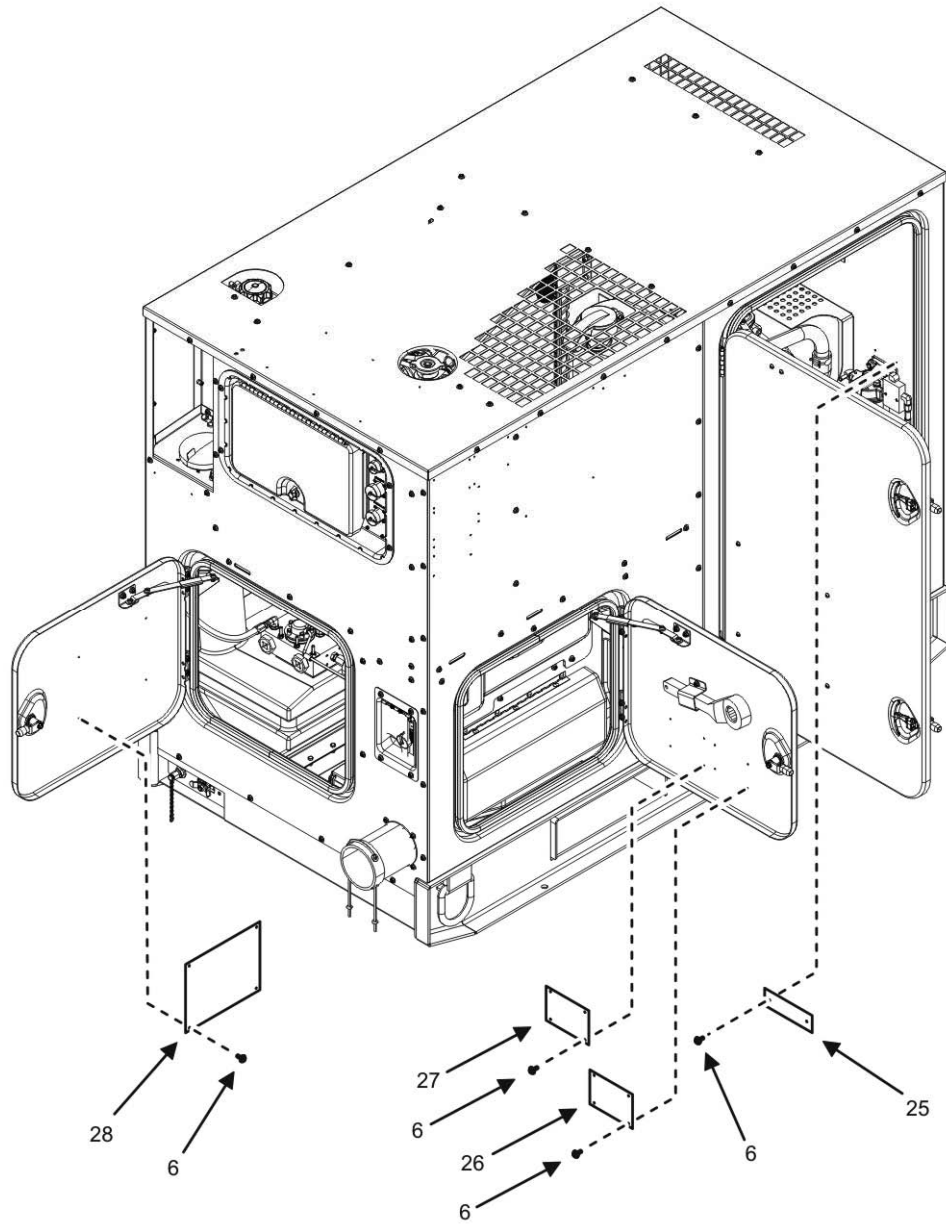


Figure 1. Generator Set (Sheet 5 of 8).

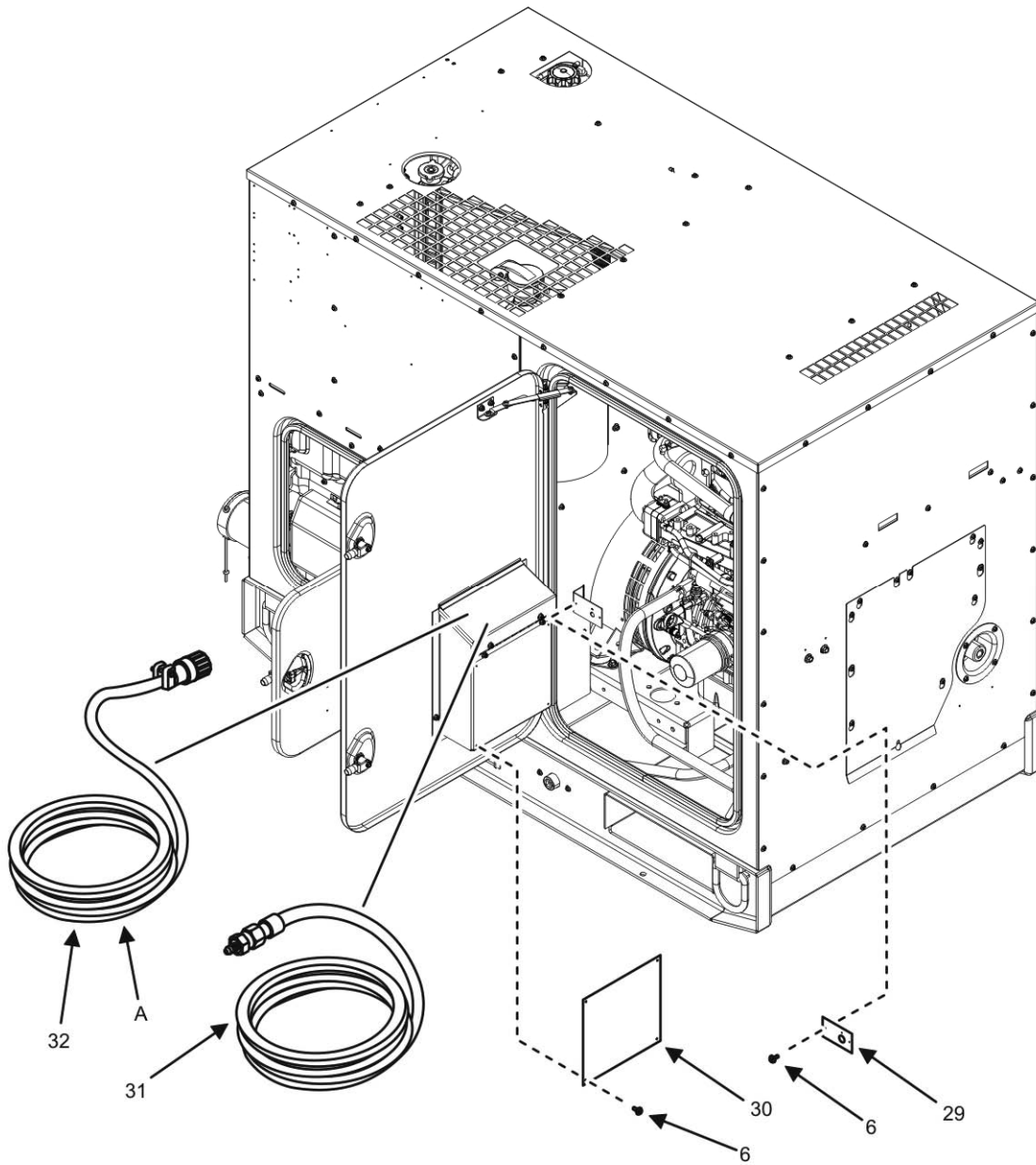


Figure 1. Generator Set (Sheet 6 of 8).

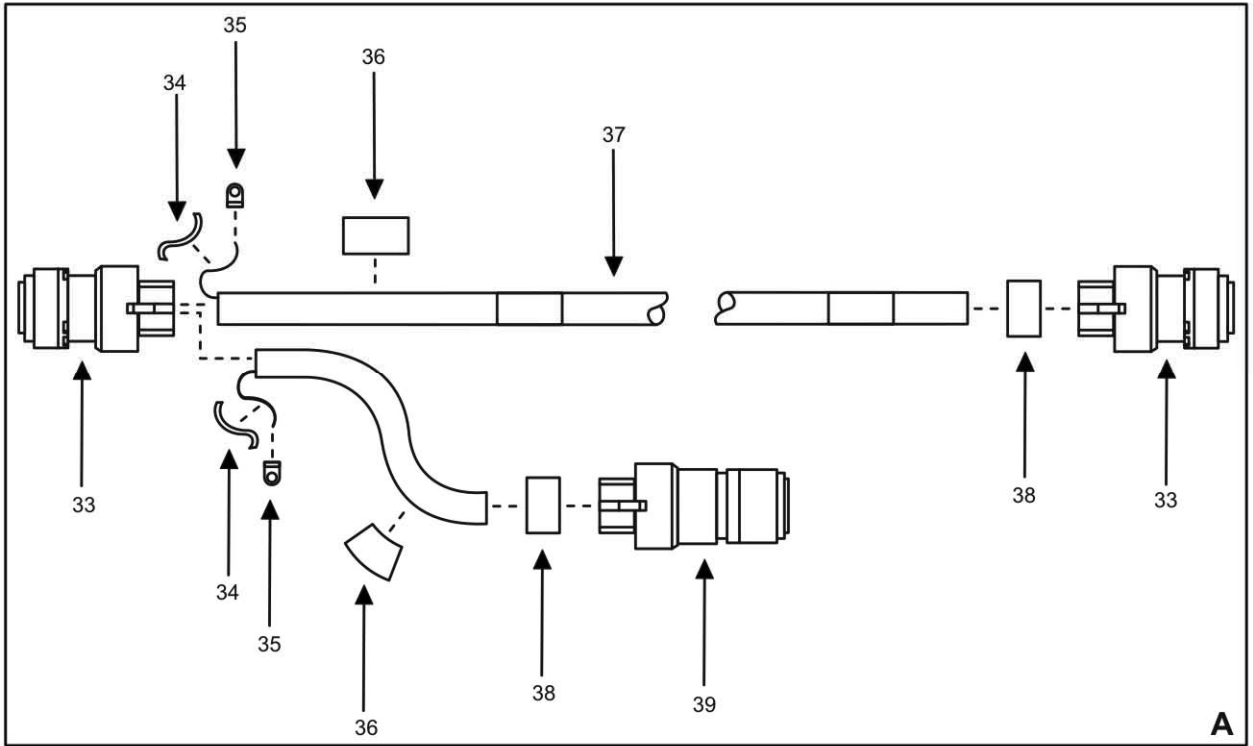


Figure 1. Generator Set (Sheet 7 of 8).

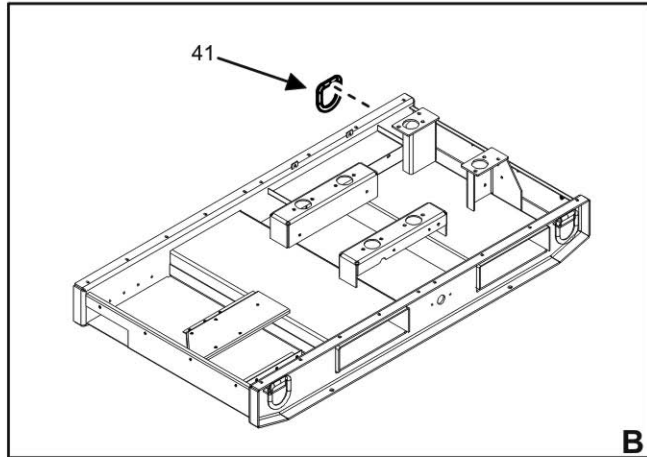
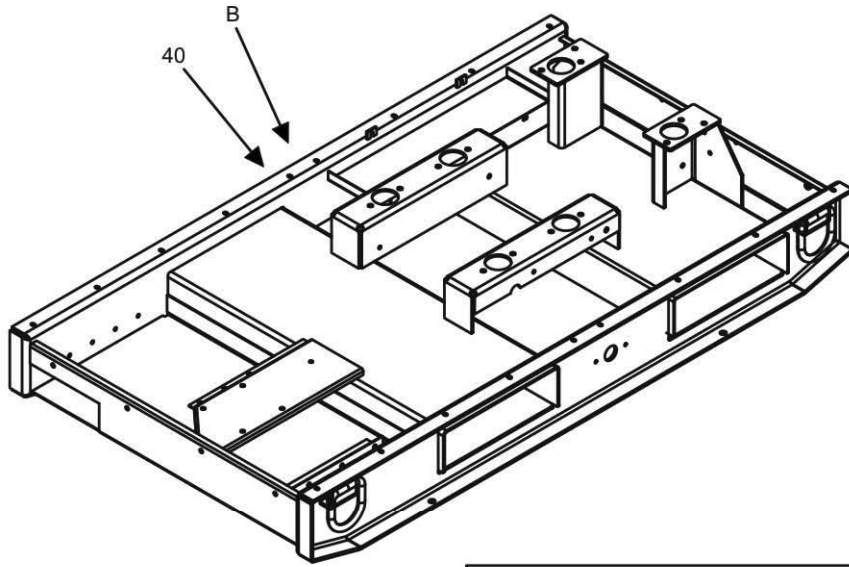


Figure 1. Generator Set (Sheet 8 of 8).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 00	
								FIG. 1 GENERATOR SET	
1	PAFHH	PAFHH	PAFFF	PAFFF	6115015617634	30554	MEP-1050	GENERATOR SET, DIESEL UOC: 98J	1
2	PAFHH	PAFHH	PAFFF	PAFFF	6115015617674	30554	MEP-1051	GENERATOR SET, DIESEL UOC: 98K	1
3	XAFHH	XAFHH	XBFFF	XBFFF		30554	04-21150	.GENERATOR ASSEMBLY UOC: 98J	1
4	XAFHH	XAFHH	XBFFF	XBFFF		30554	04-21151	.GENERATOR ASSEMBLY UOC: 98K	1
5	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21026	.PLATE, OPERATING INSTRUCTIONS	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5320009321972	81349	M24243/6-A402H	.RIVET, BLIND	62
7	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	88-20075	.PLATE, SLAVE, RECEPTACLE	1
8	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21236	.PLATE, FUEL	1
9	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21078-5	.PLATE, UID IDENTIFICATION UOC: 98J	1
10	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21078-6	.PLATE, UID IDENTIFICATION UOC: 98K	1
11	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21023-5	.PLATE, LIFTING AND TIE DOWN UOC: 98J	1
12	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21023-6	.PLATE, LIFTING AND TIE DOWN UOC: 98K	1
13	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21077-5	.PLATE, IDENTIFICATION, GENERATOR SET UOC: 98J	1
14	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21077-6	.PLATE, IDENTIFICATION, GENERATOR SET UOC: 98K	1
15	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21024-5	.PLATE, IDENTIFICATION, OTAN UOC: 98J	1
16	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21024-6	.PLATE, IDENTIFICATION, OTAN UOC: 98K	1
17	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21022-5	.PLATE, SET RATING UOC: 98J	1
18	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21022-6	.PLATE, SET RATING UOC: 98K	1
19	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21011-3	.PLATE, SYSTEM CAPACITY	1
20	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21237	.PLATE, PARALLELING, RECEPTACLE UOC: 98J	1

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
21	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21240	.PLATE, PARALLELING, RECEPTACLE UOC: 98K	1
22	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21380	.PLATE, WIRING DIAGRAM	1
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5975008783791	58536	AA55804-3B 9FT	..ROD, GROUND	1
24	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21025	.PLATE, BATTERY CONNECTION	1
25	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21016	.PLATE, FIRST FUEL FILTER	1
26	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	88-20110	.PLATE, CAUTION, VOLTAGE	1
27	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21475-1	.PLATE, GROUNDING STUD	1
28	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21017-1	.PLATE, INFORMATION, FUEL	1
29	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	88-21776	.PLATE, DEAD CRANK	1
30	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21381	.PLATE, WIRING DIAGRAM	1
31	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4720000213320	01276	FA1493FFF3000	..HOSE ASSEMBLY, FUEL	1
32	PAFFF	PAFFF	PAFFF	PAFFF	6150015860026	44940	04-21228	.HARNES, CONTROL (SEE SHEET 7 FOR PARTS BREAKDOWN)	1
33	XBFZZ	XBFZZ	XBFZZ	XBFZZ		8N187	MS 3106E	..CONNECTOR, PLUG, ELECTRICAL	2
34	XBFZZ	XBFZZ	XBFZZ	XBFZZ		85901	ATUM 24/6-0	..SLEEVE, HEAT SHRINK (MAKE FROM ATUM 24/6-0 ON BULK ITEMS LIST, CUT TO LENGTH AS NEEDED)	2
35	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940002048966	81343	MS25036-102	..TERMINAL, LUG	2
36	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG3T3-100B	..LAMINATE, LABEL	4
37	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	09130SWC8	..CABLE, SHEILD (MAKE FROM 09130SWC8 ON BULK ITEMS LIST, CUT TO LENGTH AS NEEDED)	1
38	MFFZZ	MFFZZ	MFFZZ	MFFZZ		30554	88-20541-1	..INSULATION SLEEVING (MAKE FROM 88-20541-1 ON BULK ITEMS LIST, CUT TO LENGTH AS NEEDED)	2
39	XBFZZ	XBFZZ	XBFZZ	XBFZZ		8N187	MS 3101E	..CONNECTOR, PLUG, ELECTRICAL	1
40	XAFFF	XAFFF	XAFFF	XAFFF		44940	04-20761	...SKID ASSEMBLY	1
41	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20499	....EYE, LIFTING	4
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
DC ELECTRIC INSTALLATION REPAIR PARTS LIST**

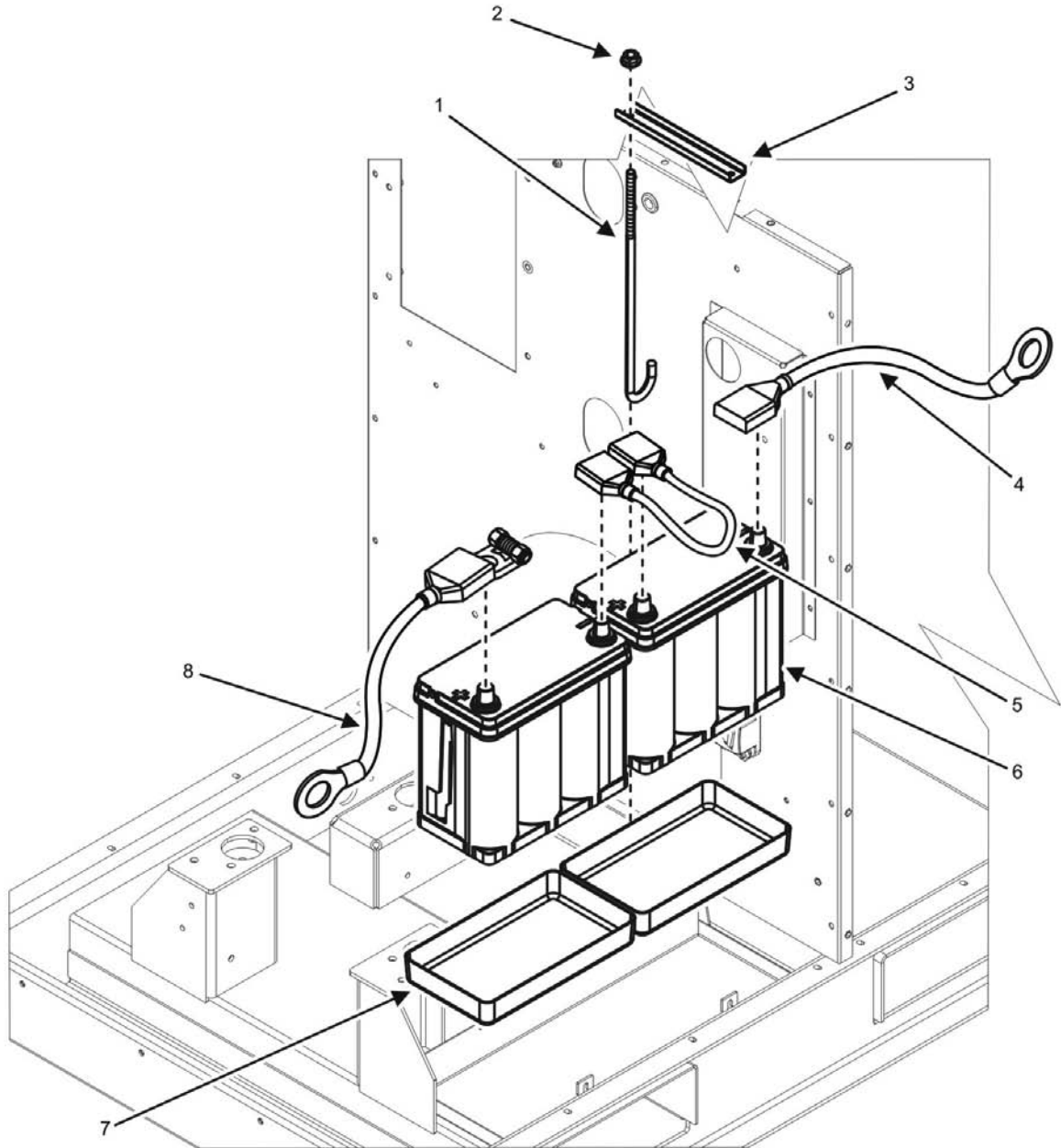


Figure 2. DC Electric Installation (Sheet 1 of 4).

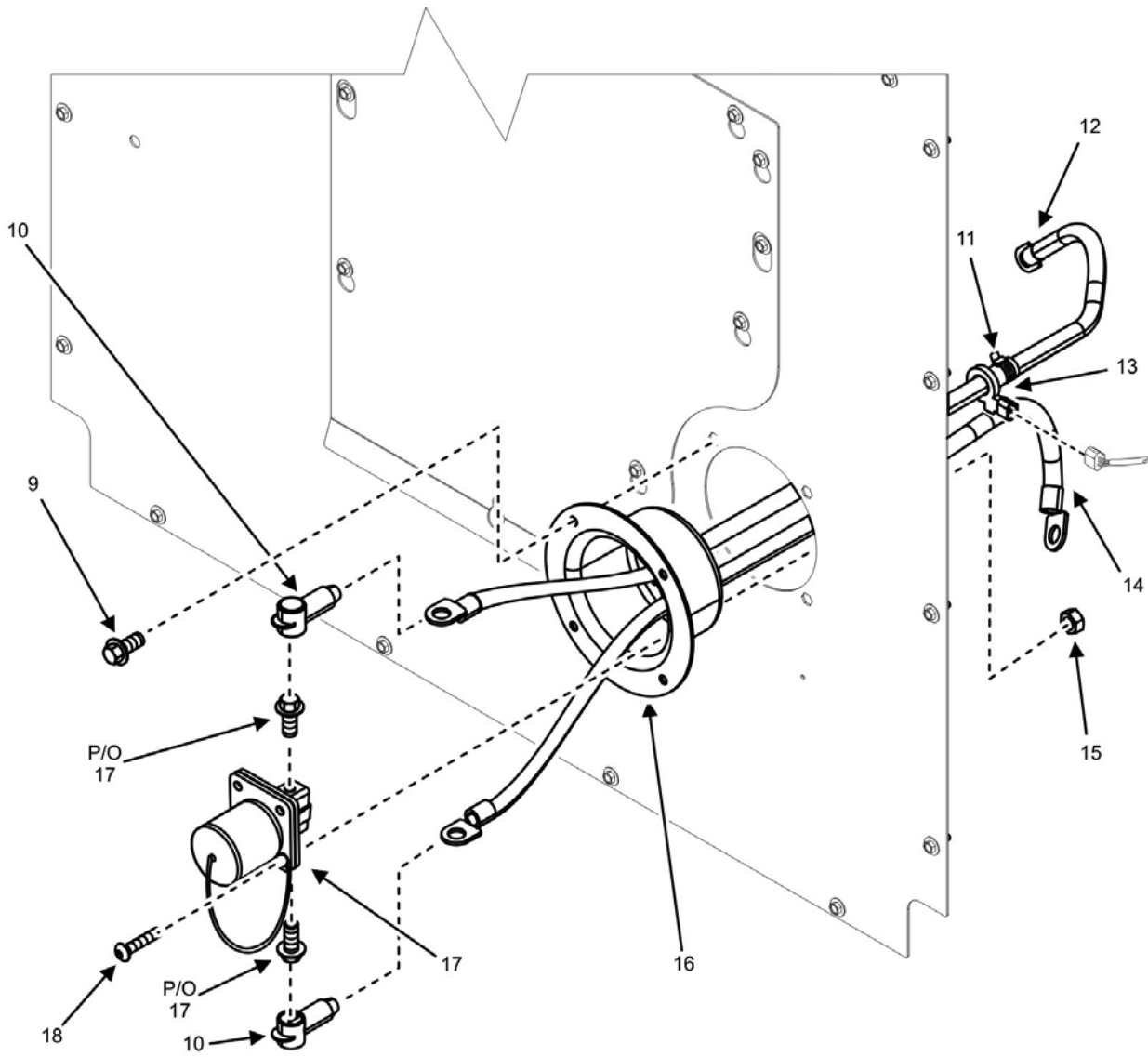


Figure 2. DC Electric Installation (Sheet 2 of 4).

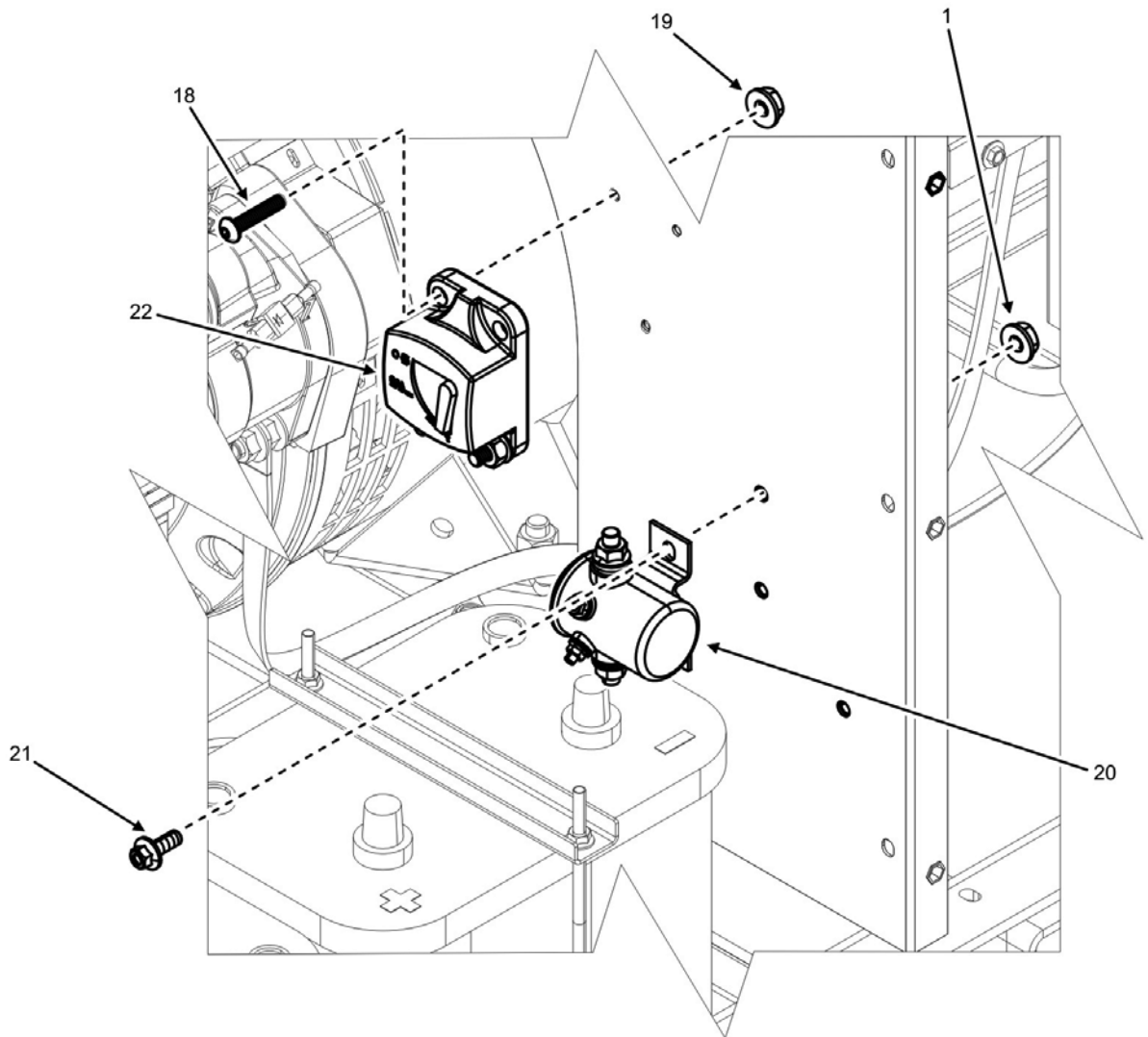


Figure 2. DC Electric Installation (Sheet 3 of 4).

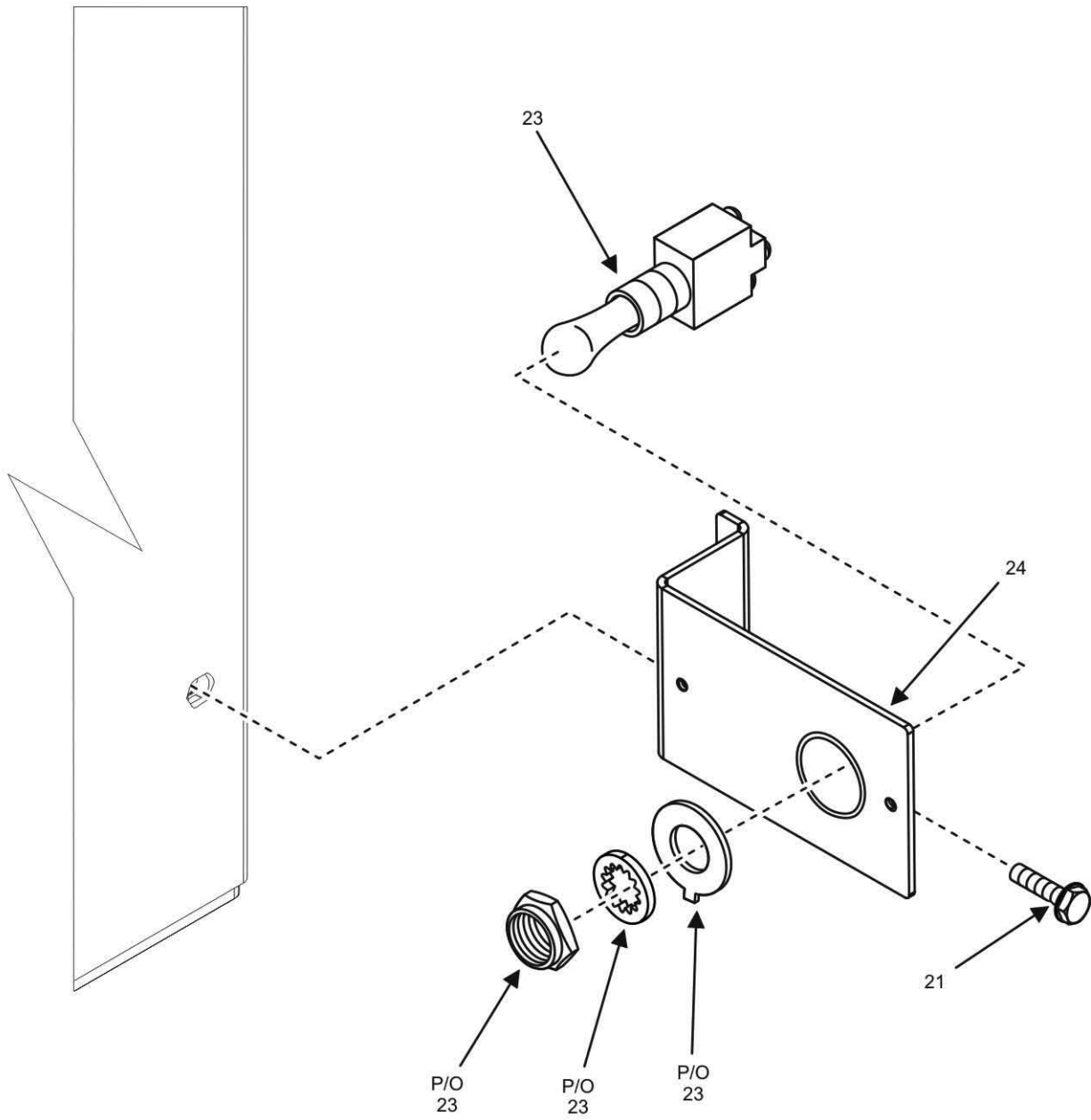


Figure 2. DC Electric Installation (Sheet 4 of 4).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 01	
								FIG. 2 DC ELECTRIC INSTALLATION	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	..NUT, PLAIN, EXTENDED	6
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21470	..ROD, BATTERY RETAINER	4
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21469	..HOLDER, BATTERY, PLATE	2
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20674-4	..LEAD, BATTERY, NEGATIVE	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20673-2	..LEAD, ELECTRICAL, JUMPER	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6140013788232	5CEF5	8002-002/MDL. NO. 34	..BATTERY, STORAGE	2
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20586	..TRAY, BATTERY	2
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20674-3	..LEAD, BATTERY, POSITIVE	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0KMA3	A026G000	..SCREW, FLANGE HEAD, M6	4
10	PCFZZ	PCFZZ	PCFZZ	PCFZZ		1HDR0	228N3V02	..BOOT, DUST AND MOISTURE	2
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5975015886525	06383	PLTS-M30	..STRAP, TIEDOWN, ELECTRICAL	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20675-3	..LEAD, ELECTRICAL, NATO SLAVE, POSITIVE	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0S2B6	HAB-80-S	..SENSOR, CURRENT	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20675-4	..LEAD, ELECTRICAL, NATO SLAVE, NEGATIVE	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M5	..NUT, PLAIN, HEXAGON, M5	4
16	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20645	..TERMINAL BOX	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935010979974	19207	11674728	..CONNECTER, RECEPTACLE	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN7380A2-M5X25	..SCREW, CAP, SOCKET HEAD	7
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310011688140	1FH08	DIN934M5	..NUT, HEX, M5	3
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5945008557478	30554	88-22202	..RELAY, ELECTROMAGNETIC	1
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A016WB4K 42	..SCREW, CAP, HEXAGON, M6	3
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5925015894819	1UW16	187080F-03-1	..CIRCUIT BREAKER	1
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5930006831625	96906	MS24523-31	....SWITCH, TOGGLE, DEAD CRANK	1
24	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21343	..BRACKET, DEAD CRANK SWITCH	1
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
RELAY PANEL ASSEMBLY REPAIR PARTS LIST**

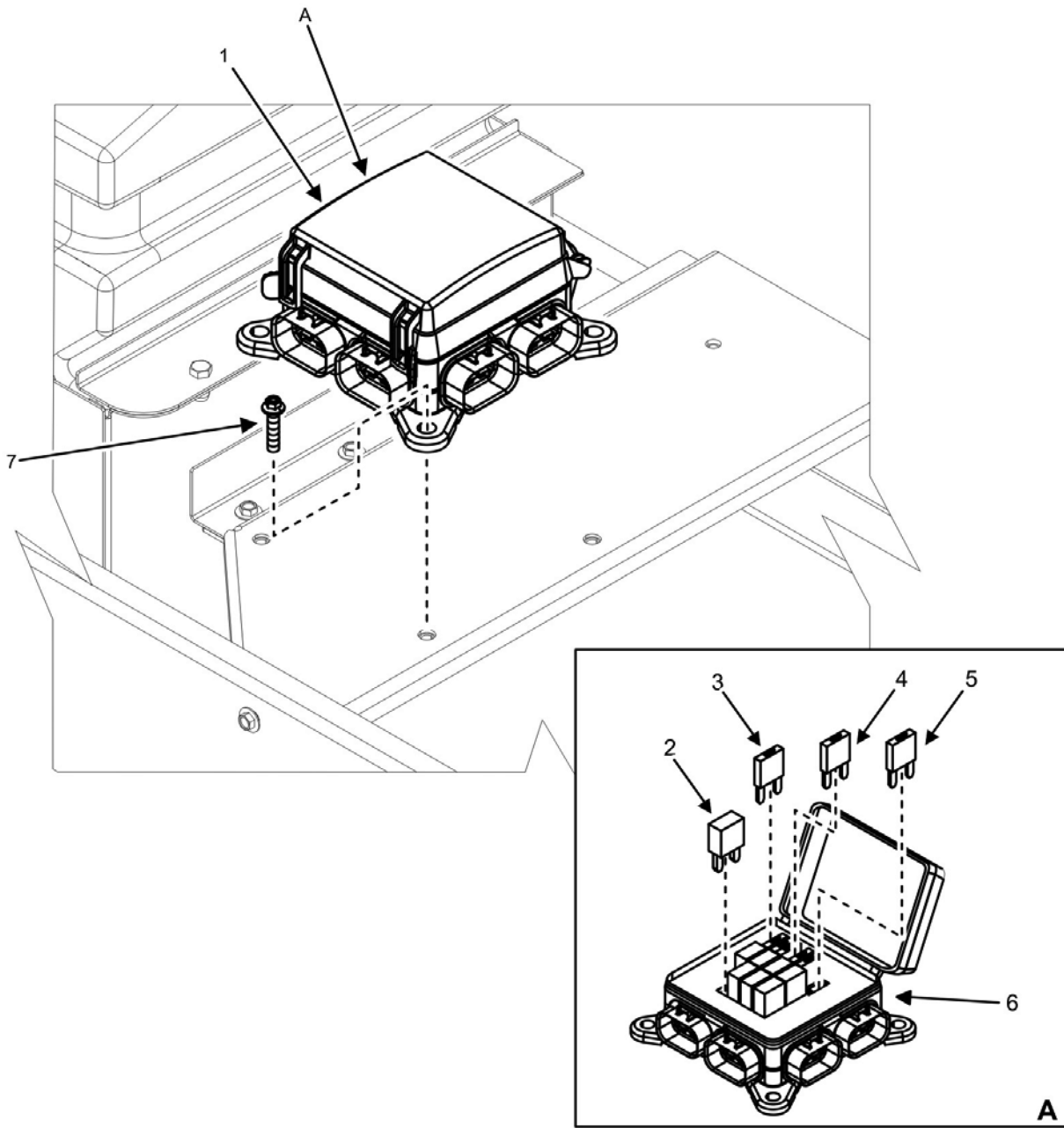


Figure 3. Relay Panel Assembly (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC NAVY			(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
							GROUP 0101		
							FIG. 3 RELAY PANEL ASSEMBLY		
1	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20209	...PANEL, RELAY	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		1UW16	301-1C-S-D2-B120-7031	....RELAY	8
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5925015694427	1UW16	22320-200	....CIRCUIT BREAKER	5
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5925015715799	1UW16	22330-200	....CIRCUIT BREAKER	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5925015696394	1UW16	22310-200	....CIRCUIT BREAKER	2
6	XBFZZ	XBFZZ	XBFZZ	XBFZZ		1UW16	31S-276-0U	....HOUSING, PANEL, RELAY	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A016WB4K42	...SCREW, CAP, HEXAGON HEAD	4
							END OF FIGURE		

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
HOUSING INSTALLATION REPAIR PARTS LIST**

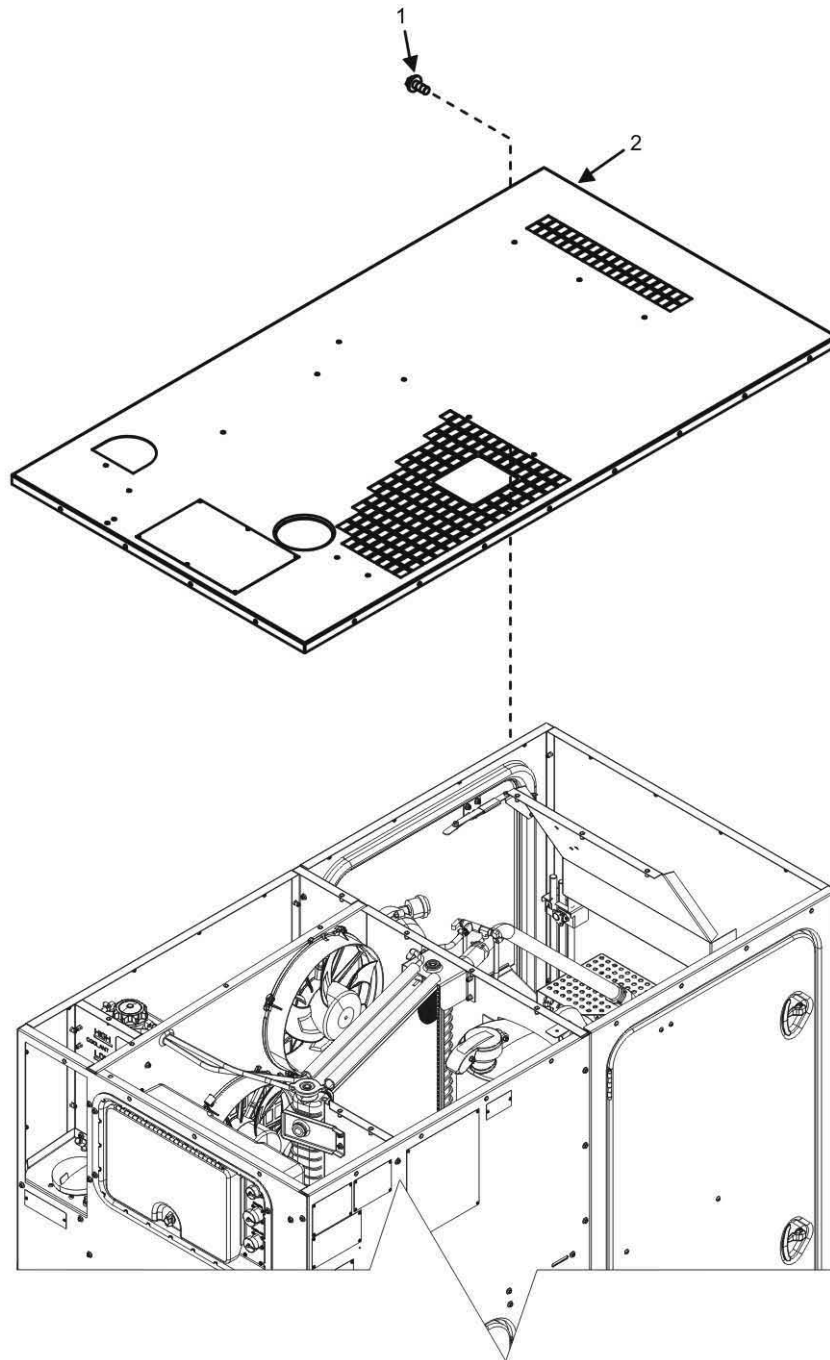


Figure 4. Housing Installation (Sheet 1 of 16).

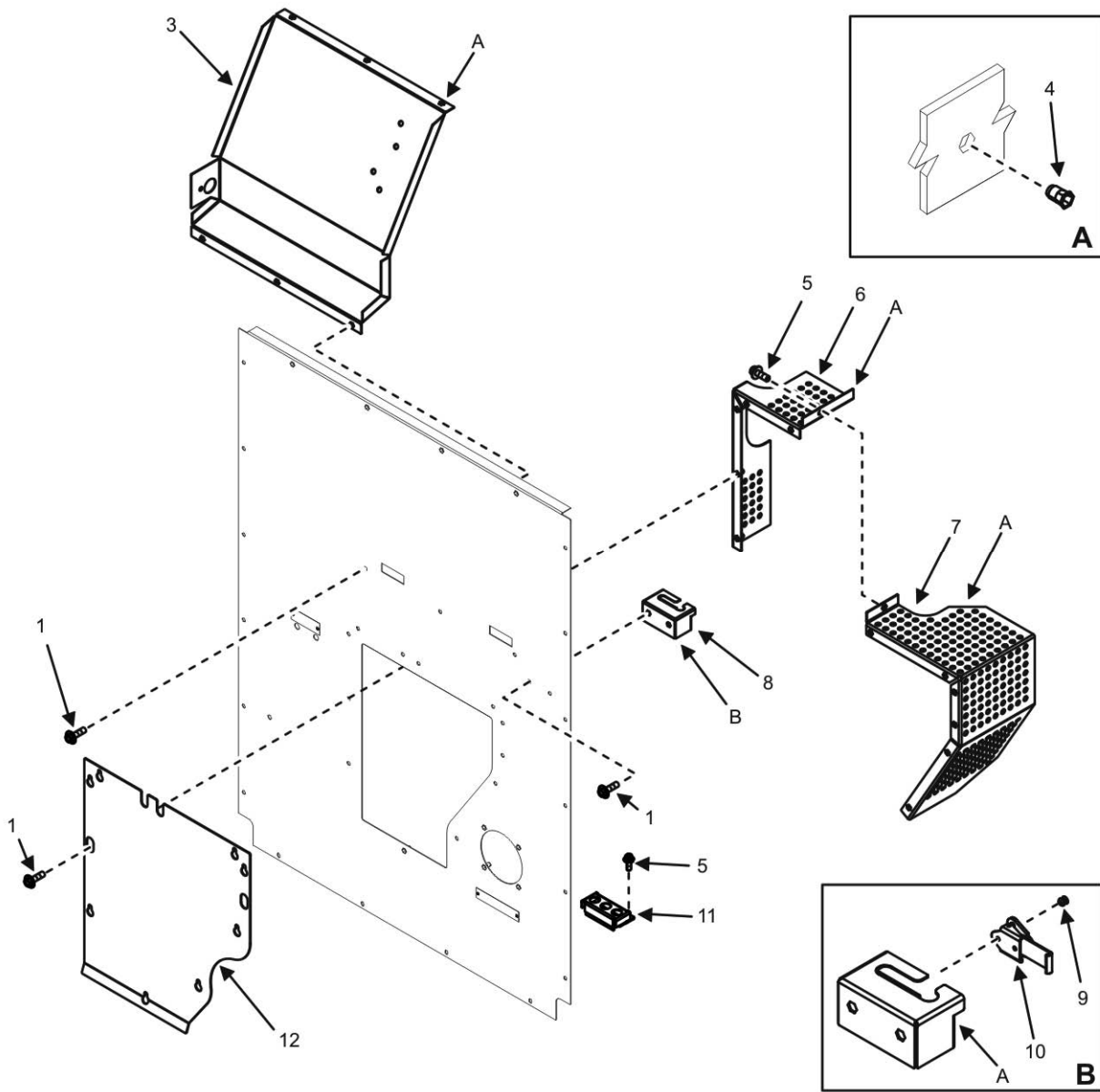


Figure 4. Housing Installation (Sheet 2 of 16).

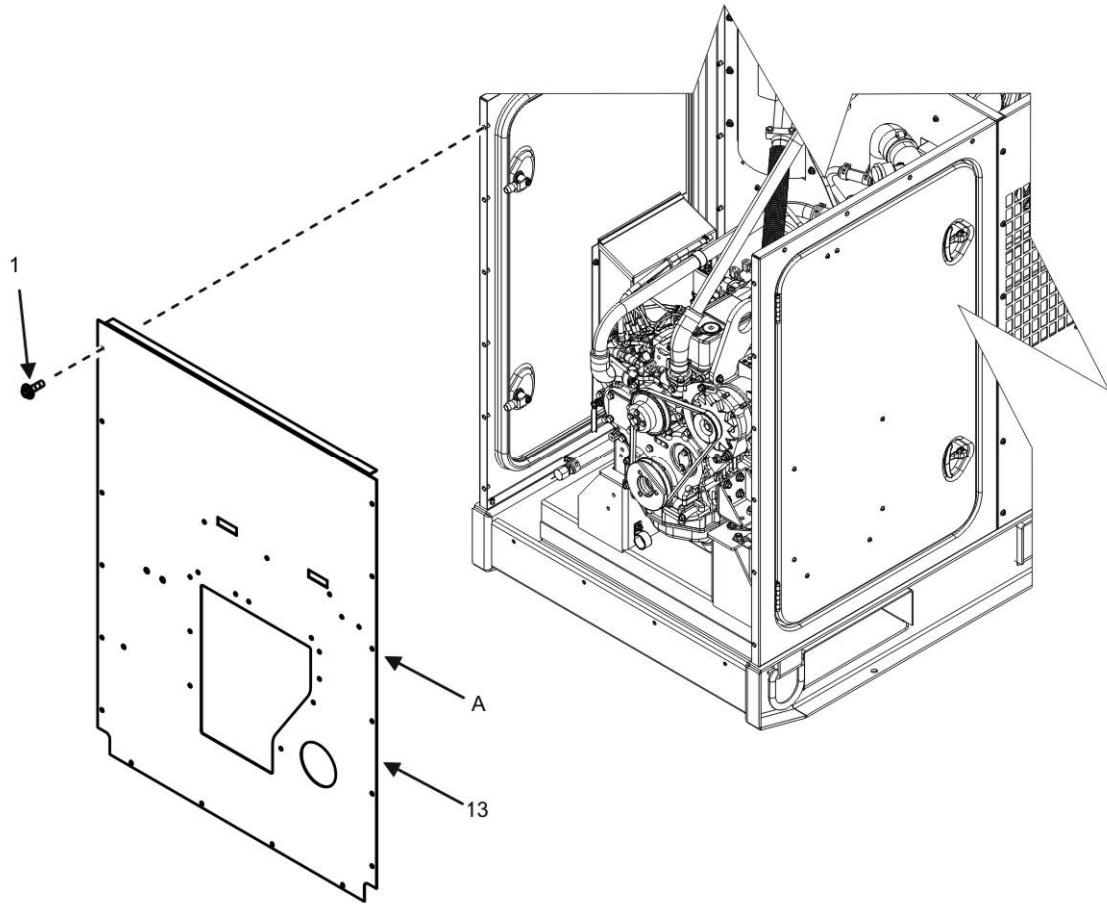


Figure 4. Housing Installation (Sheet 3 of 16).

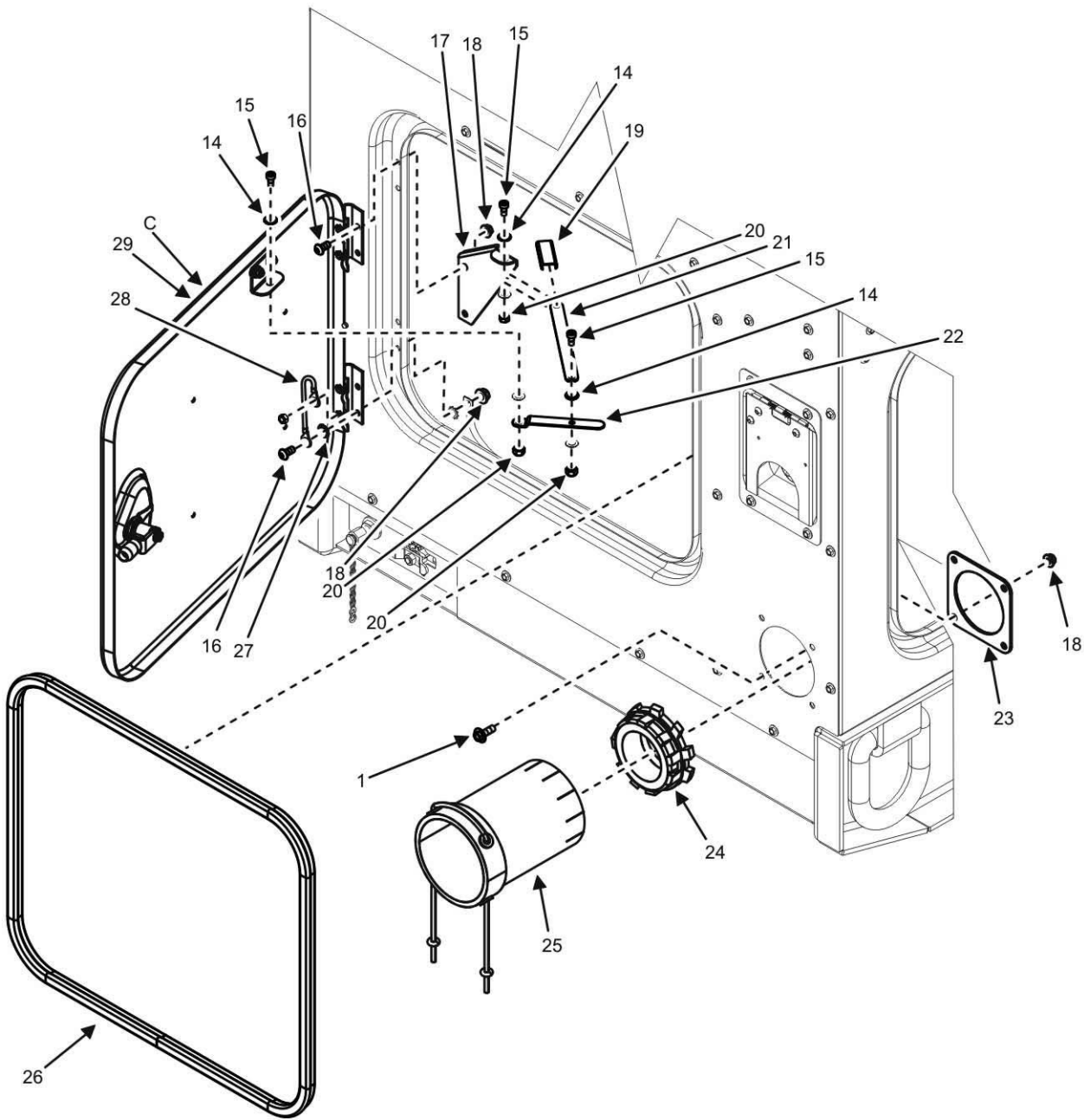


Figure 4. Housing Installation (Sheet 4 of 16).

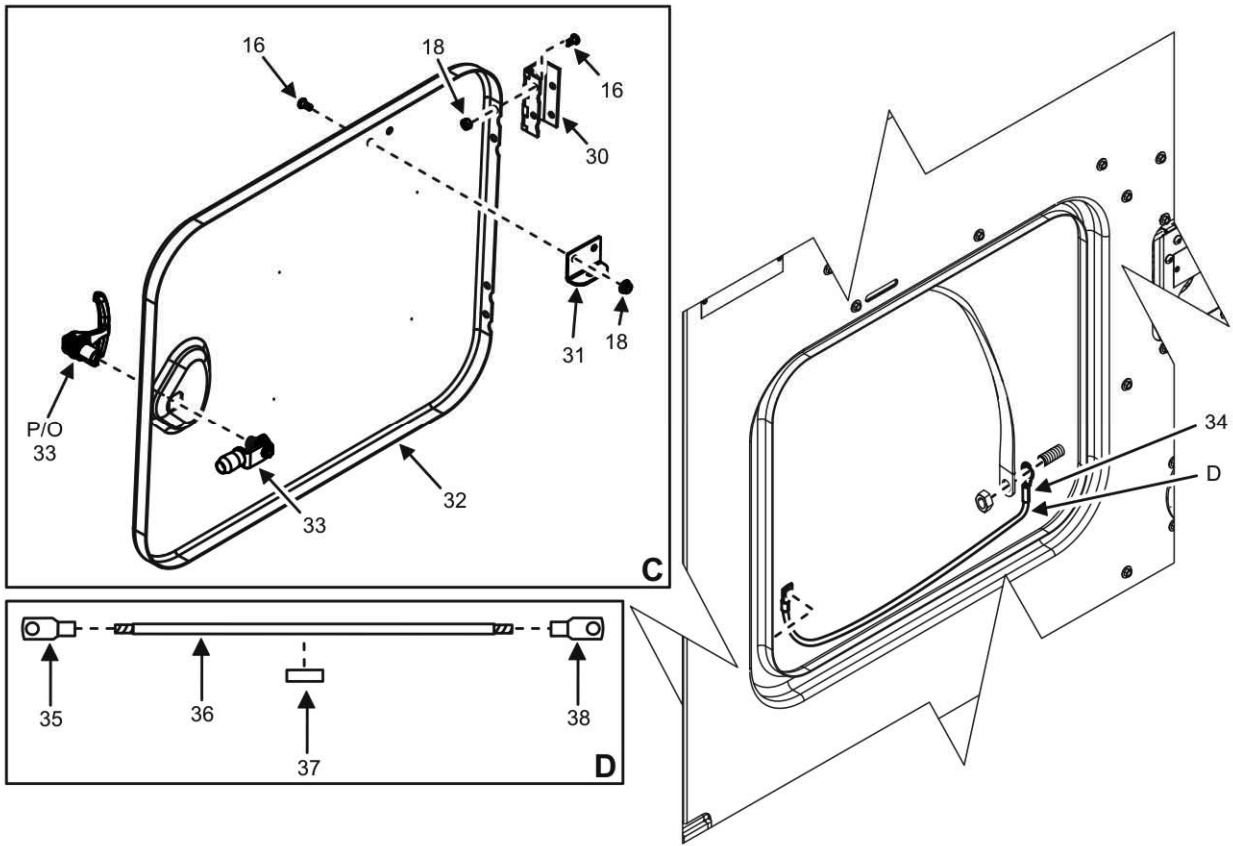


Figure 4. Housing Installation (Sheet 5 of 16).

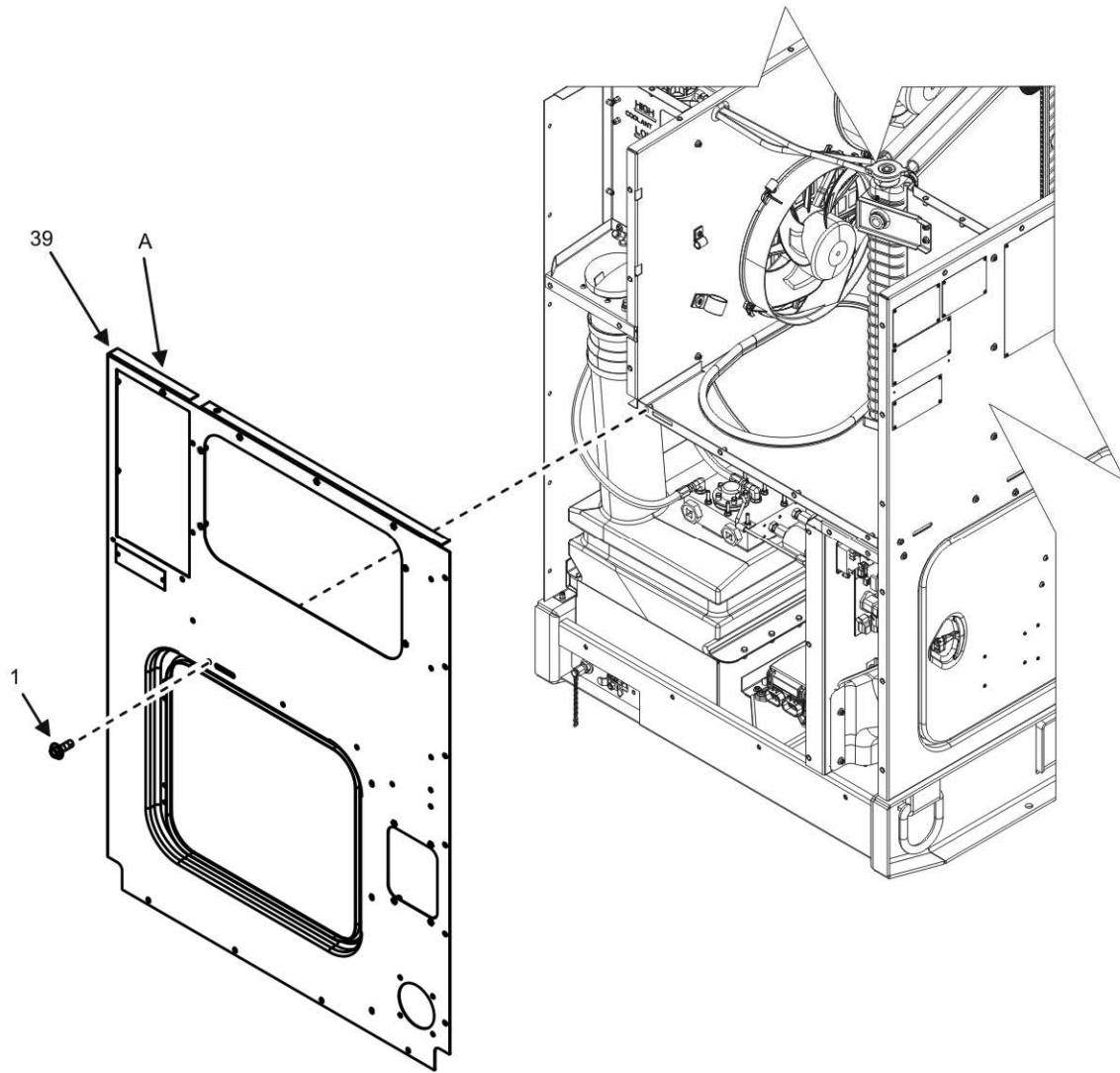


Figure 4. Housing Installation (Sheet 6 of 16).

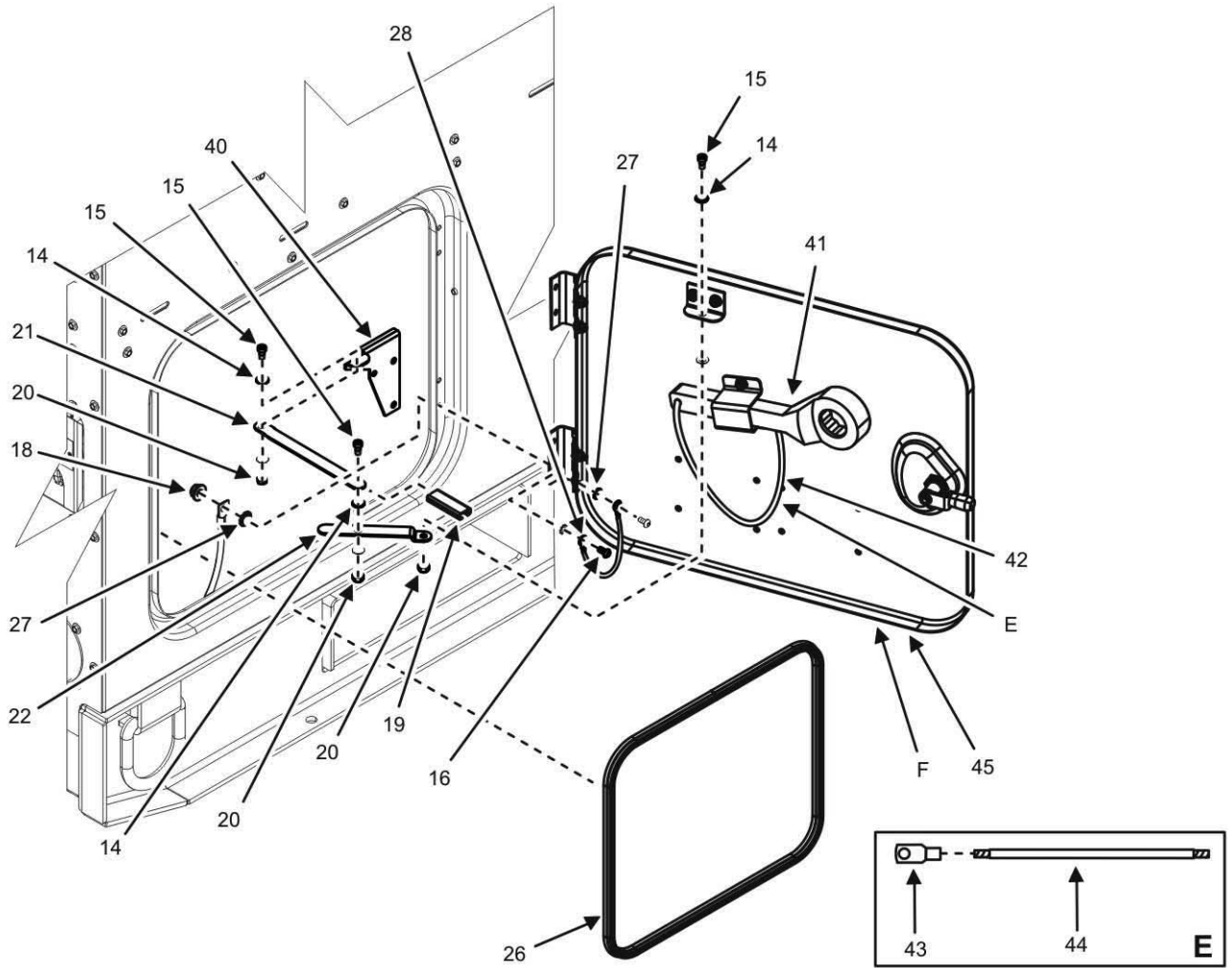


Figure 4. Housing Installation (Sheet 7 of 16).

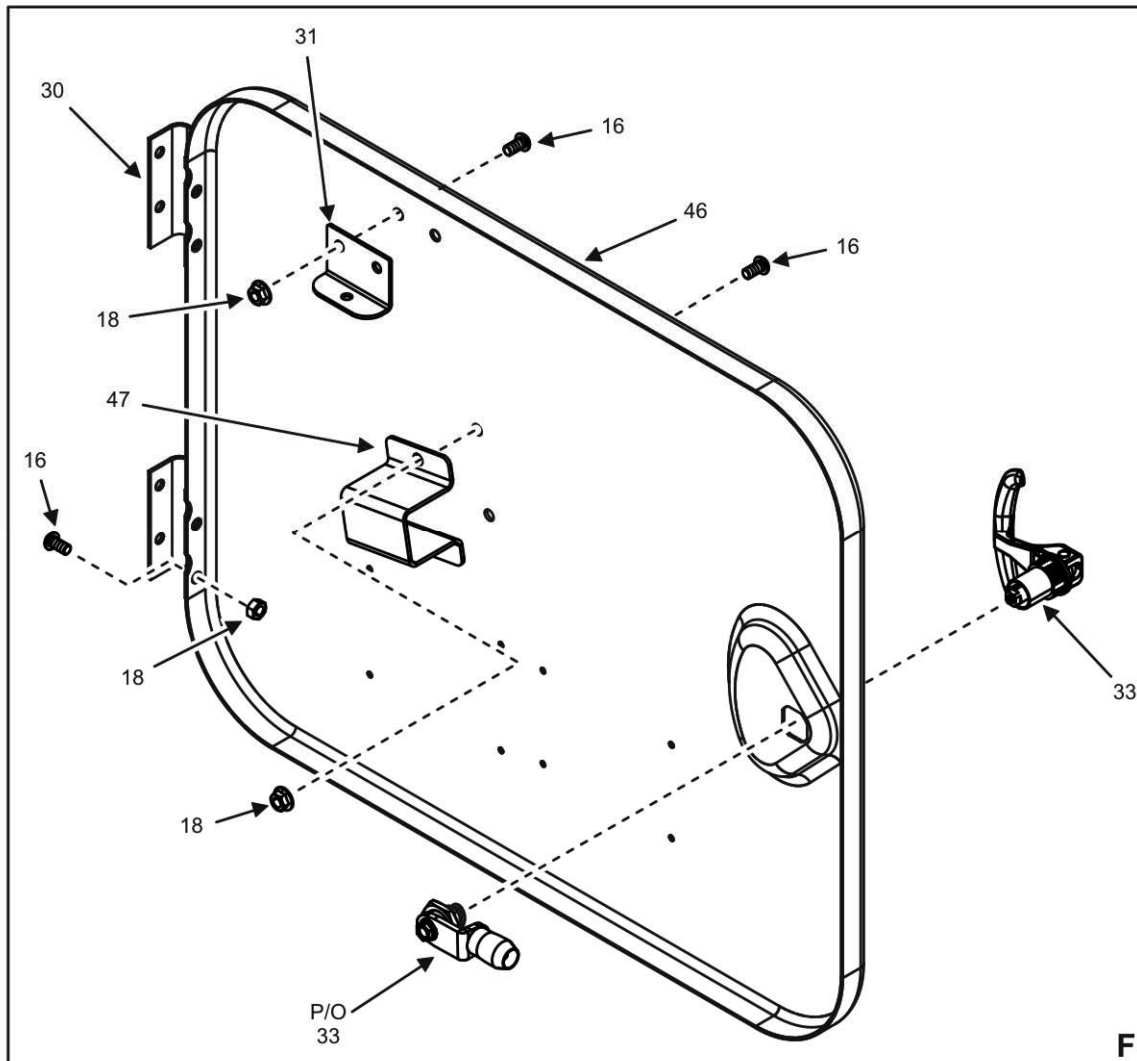


Figure 4. Housing Installation (Sheet 8 of 16).

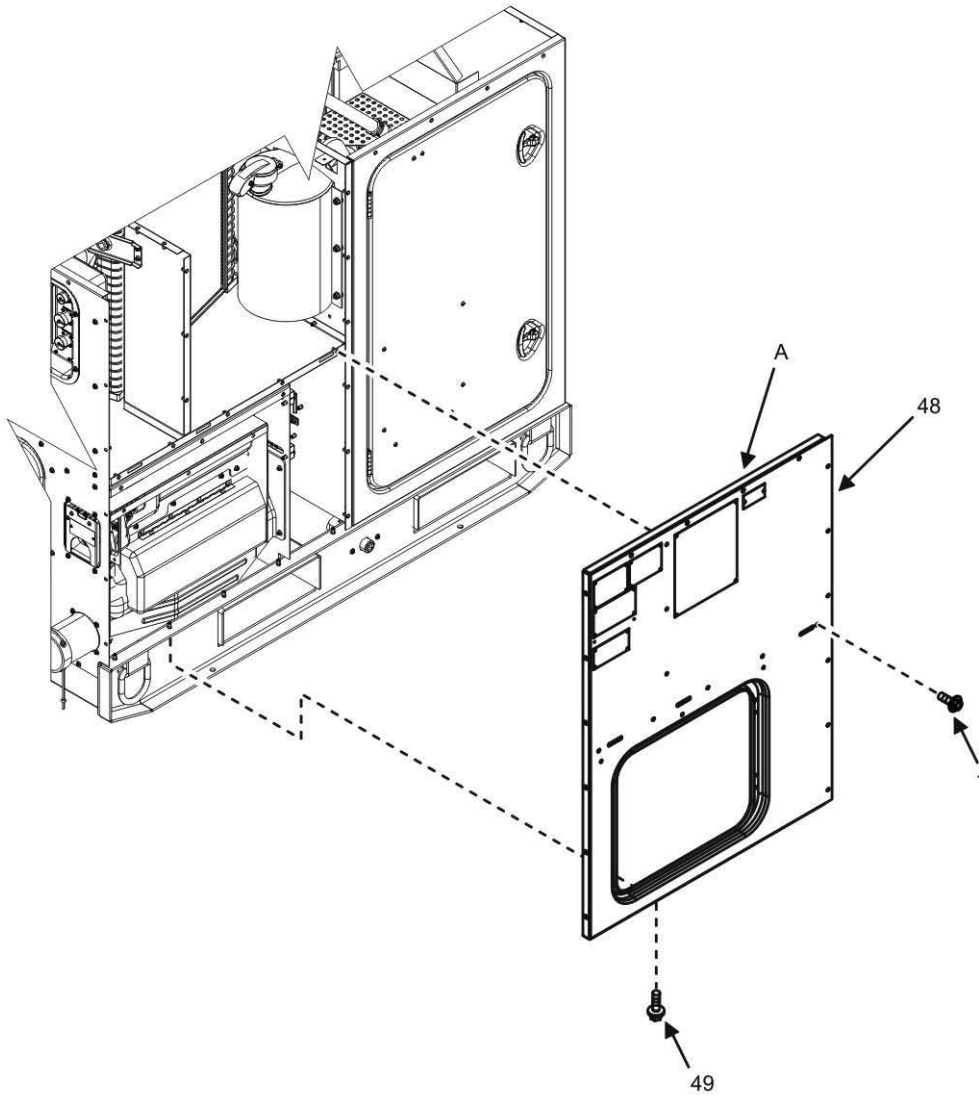


Figure 4. Housing Installation (Sheet 9 of 16).

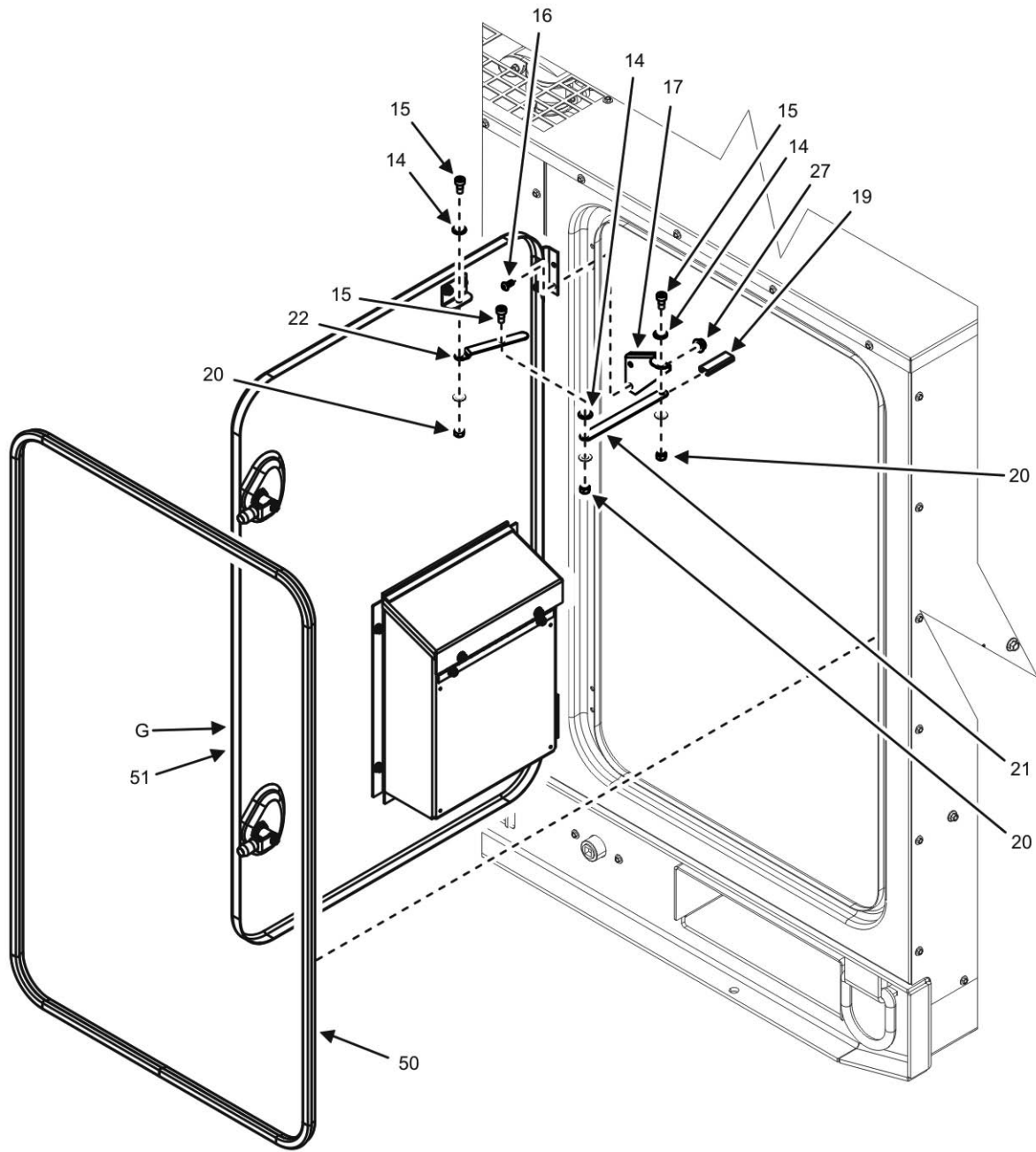


Figure 4. Housing Installation (Sheet 10 of 16).

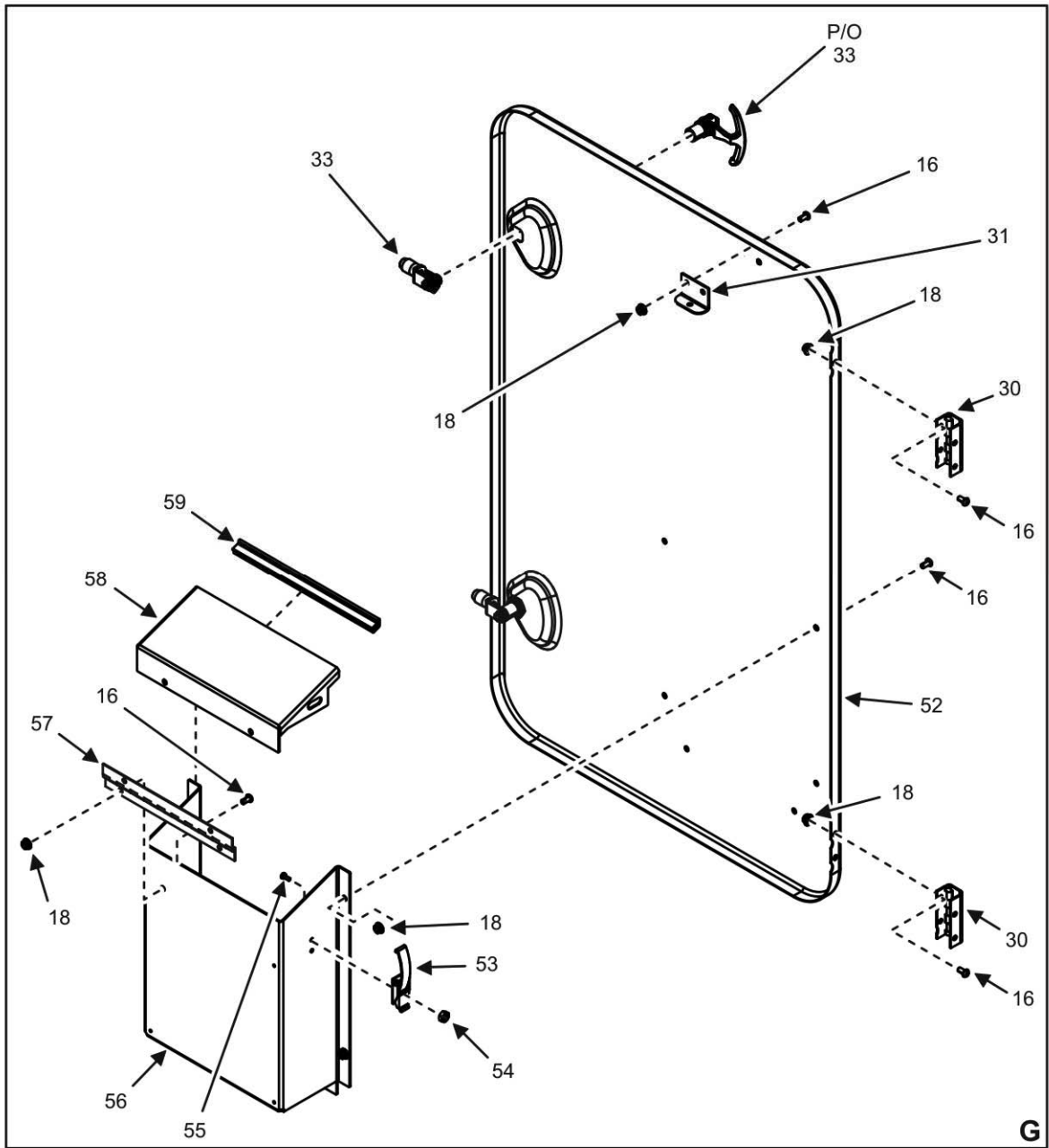


Figure 4. Housing Installation (Sheet 11 of 16).

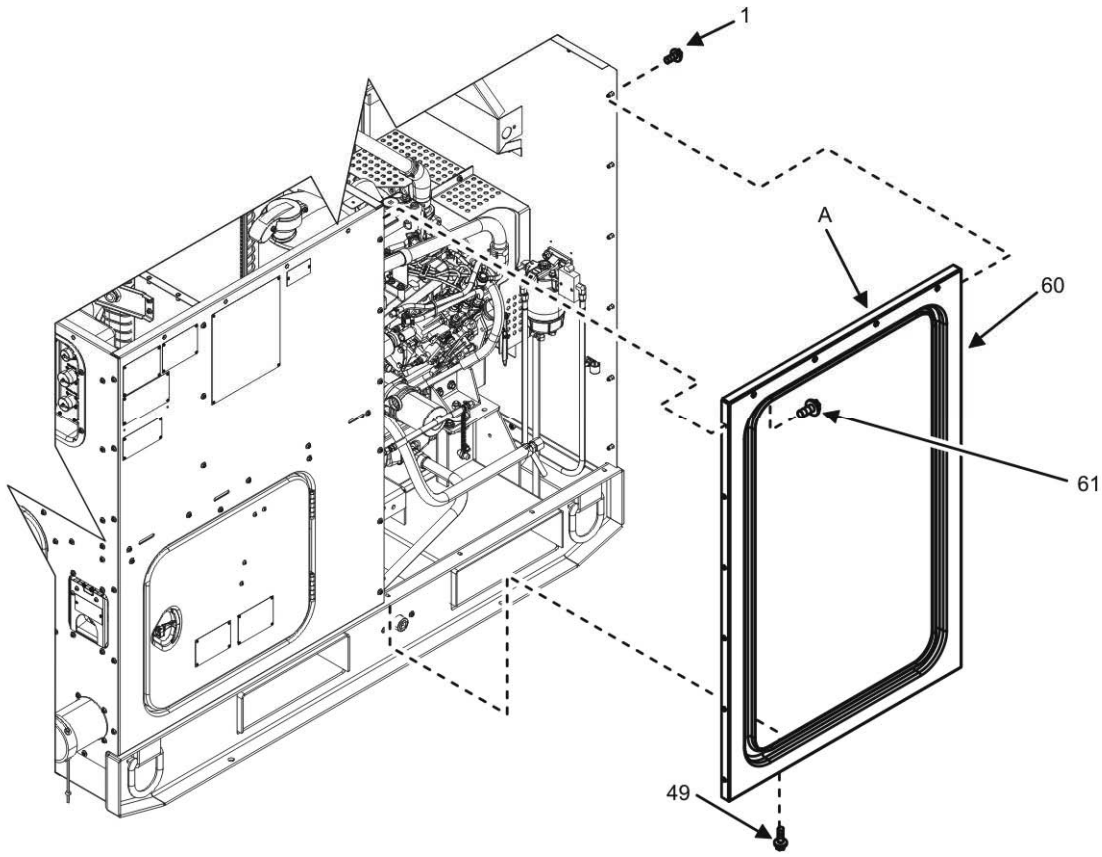


Figure 4. Housing Installation (Sheet 12 of 16 Right-Side Shown).

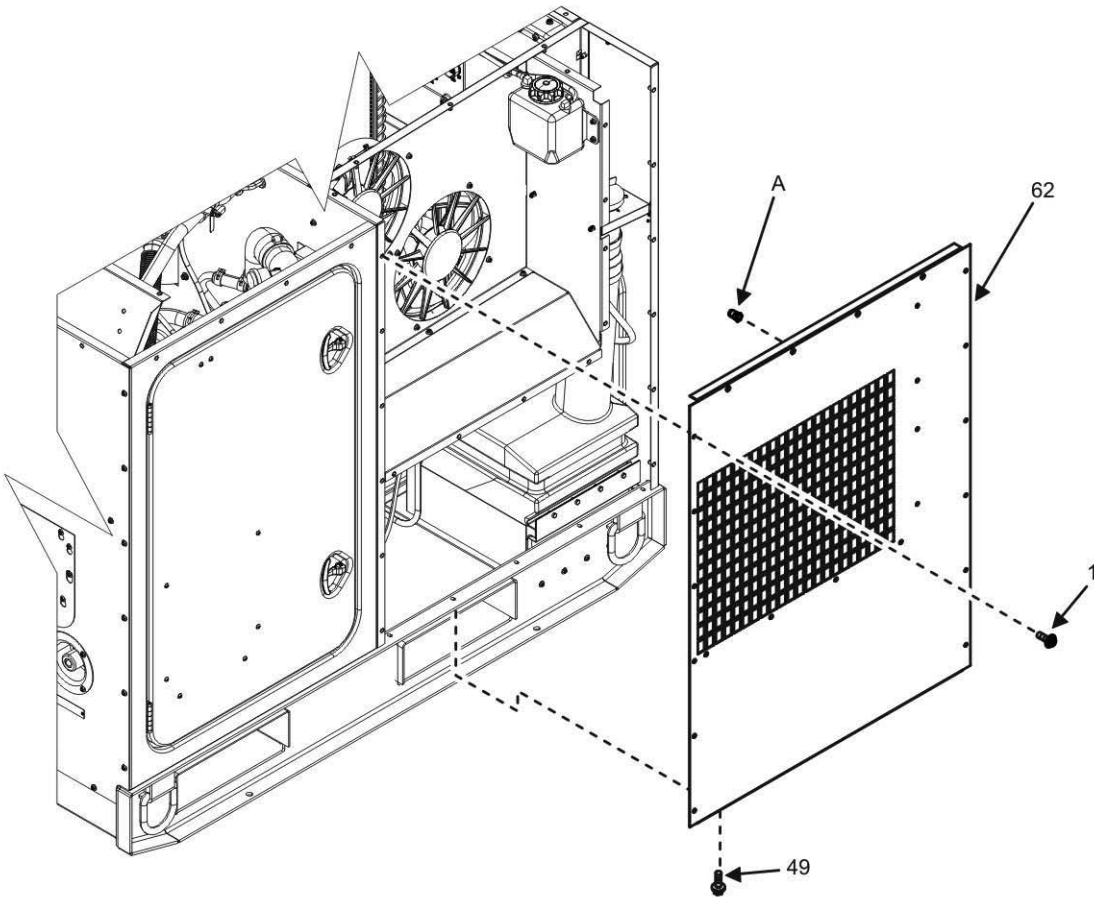


Figure 4. Housing Installation (Sheet 13 of 16).

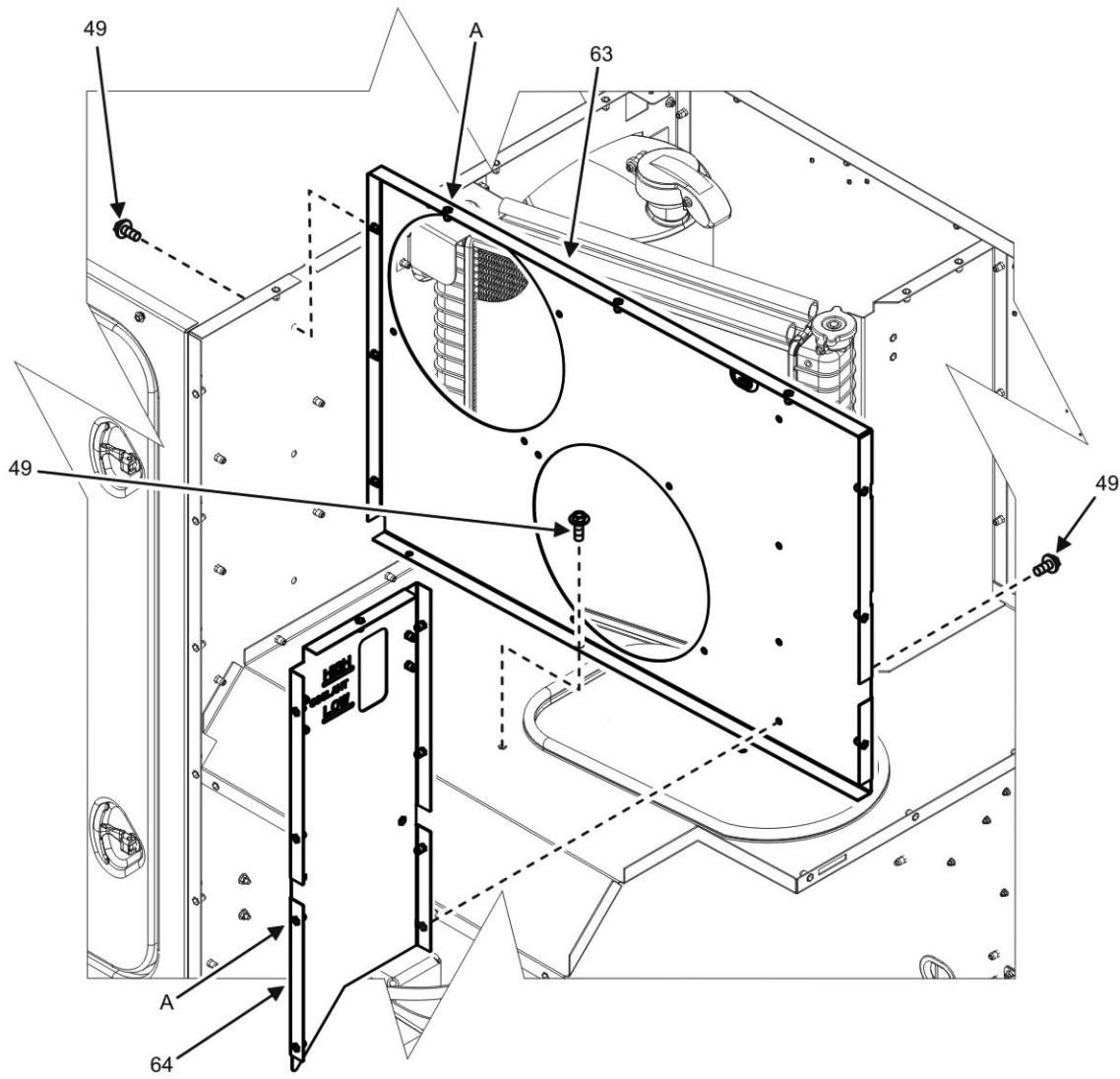


Figure 4. Housing Installation (Sheet 14 of 16).

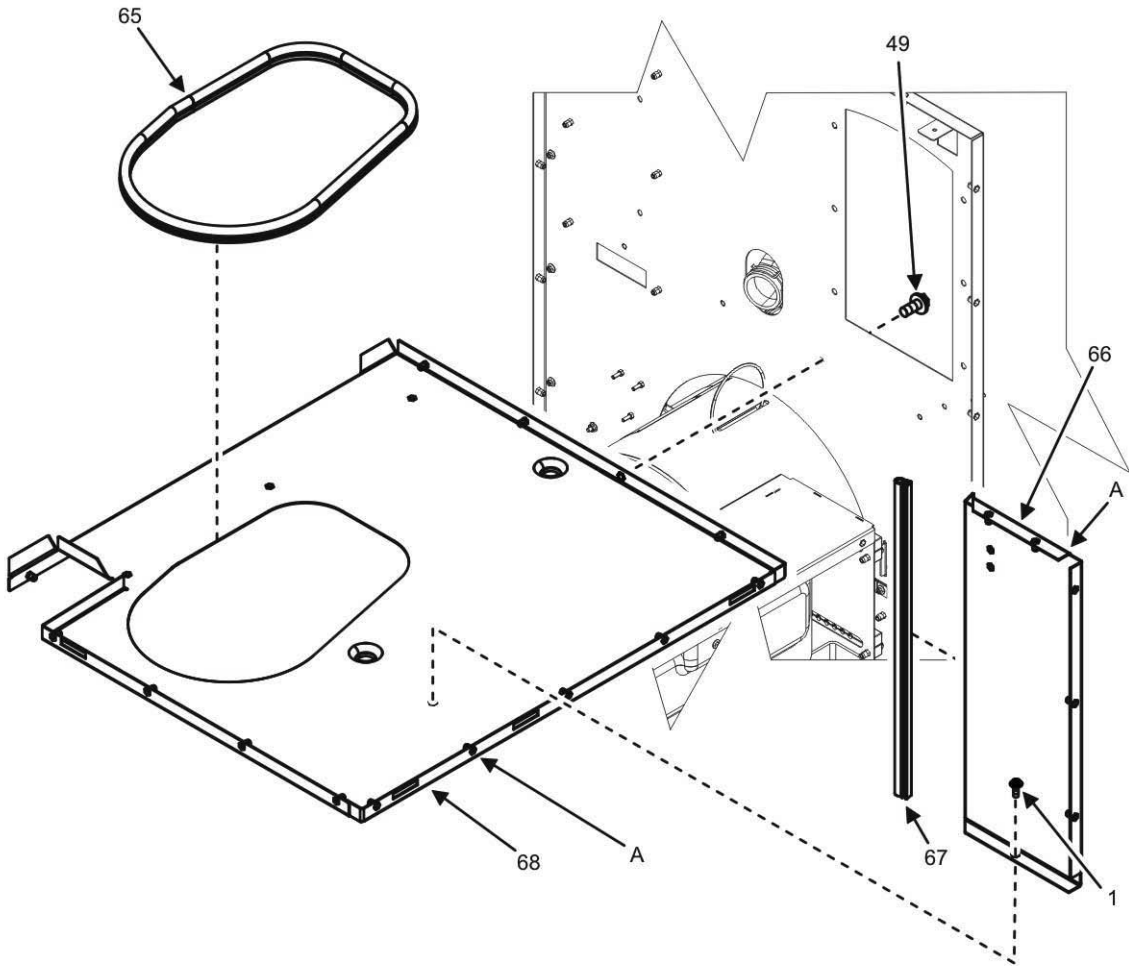


Figure 4. Housing Installation (Sheet 15 of 16).

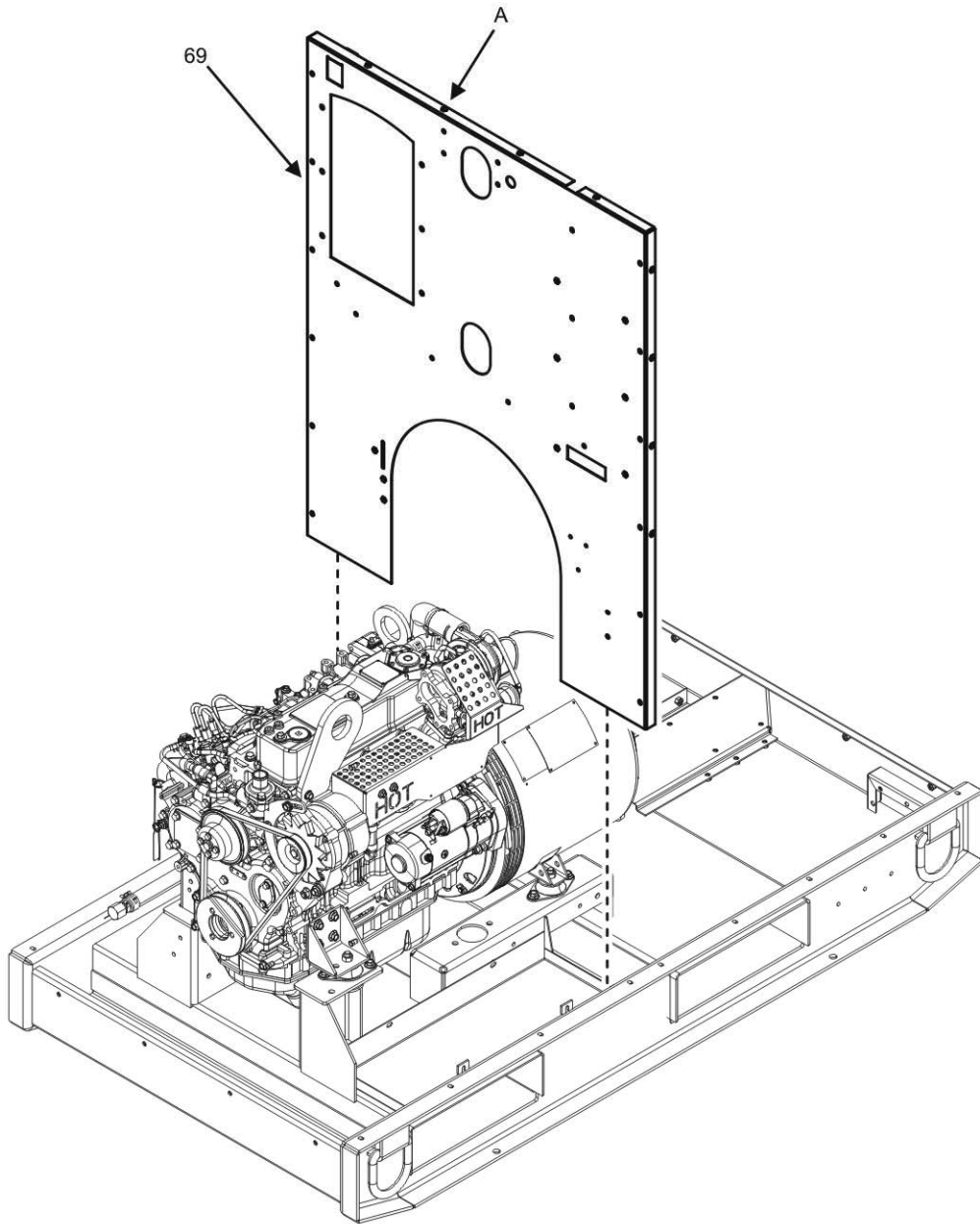


Figure 4. Housing Installation (Sheet 16 of 16).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 02	
								FIG. 4 HOUSING INSTALLATION	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0KMA3	A026G000	..SCREW, FLANGE HEAD, M6	128
2	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21283	..PANEL, TOP	1
3	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20021	..DUCT, AIR (SEE SHEET 2 FOR PARTS BREAKDOWN)	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030	...NUT, PLAIN, CLINCH	188
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A016WB4K42	..SCREW, CAP, HEXAGON, M6	17
6	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21262	..GUARD, BELT, RH (SEE SHEET 2 FOR PARTS BREAKDOWN)	1
7	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21263	..GUARD, BELT, LH (SEE SHEET 2 FOR PARTS BREAKDOWN)	1
8	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-21466	..BRACKET, TOP, GROUND (SEE SHEET 2 FOR PARTS BREAKDOWN)	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5320009321972	81349	M24243/6-A402H	...RIVET, BLIND	2
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340014681767	94222	K3-2347-07	...CATCH, CLAMPING	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21465	..BRACKET, BOTTOM, GROUND	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21583	..PANEL, ACCESS	1
13	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21194	..PANEL, ENCLOSURE, FRONT (SEE SHEET 2 FOR PARTS BREAKDOWN)	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW23X06R10MSE4A31	..WASHER, FLAT	24
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015889321	3A054	90278A331	..SCREW, SHOULDER	12
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN7380A2-M6X12	..SCREW, CAP, SOCKET HEAD	62
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21081	..BRACKET, DOOR STAY	3
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	..NUT, PLAIN, EXTENDED, M6	66
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21076	..LINK, DOOR	4
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEN04M508000CX0A36	..NUT, SELF-LOCKING, HEX	12
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4910015893803	44940	04-21074	..BRACE, DOOR STAY, TOP	4
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4910015893807	44940	04-21075	..BRACE, DOOR STAY, BOTTOM	4
23	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20290	..PLATE, RETAINER, MOUNTING	1
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5975002578055	83879	BBL300	..BUSHING, ELECTRICAL, SOCK	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2920013882776	30554	88-20218	..SLEEVE, TUBE	1
26	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21276-1	..SEAL, EDGE (MAKE FROM A1512 ON BULK ITEM LIST CUT TO LENGTH 3066 MM +/- 5 MM)	2
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW13X250000GD5A 21	..WASHER, LOCK, 1/4, EXT TOOTH	6
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21318-02	..STRAP, GROUNDING	2

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
29	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20602	..DOOR ASSEMBLY (SEE SHEET 5 FOR PARTS BREAKDOWN)	1
30	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20398	...HINGE	8
31	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21072	...BRACKET, DOOR STAY, SMALL	4
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20306	...DOOR, ACCESS	1
33	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015900063	S8812	8-325-82	...LATCH	6
34	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21153-4	..LEAD,ELECTRICAL	2
35	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001139828	96906	MS25036-148	...TERMINAL, LUG, 12-10 AWG M6 RING	2
36	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-12-65	...STRAND, WIRE (MAKE FROM 3271- 12-65 ON BULK ITEMS LIST CUT TO LENGTH 750 MM +/- 25 MM)	2
37	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG2T5-100B	...LAMINATE,LABEL COVER	2
38	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015859913	779	160300	...TERMINAL, LUG, 12-10 AWG M10 RING	2
39	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20015	..PANEL, REAR (SEE SHEET 2 FOR PARTS BREAKDOWN)	1
40	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21311	..BRACKET, OUTPUT BOX DOOR STAY	1
41	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5120013754373	30554	88-21147	..WRENCH, BOX	1
42	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21322	..CORD, LOAD WRENCH	1
43	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940006553318	96906	MS20659-41	...TERMINAL, LUG, M6, 8 AWG	1
44	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4020014769072	30554	98-19724	...FIBER ROPE ASSEMBLY	1
45	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21271	..DOOR, OUTPUT BOX ASSEMBLY (SEE SHEET 8 FOR PARTS BREAKDOWN)	1
46	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21270	...DOOR, OUTPUT BOX	1
47	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20285	...BRACKET, WRENCH MOUNTING	1
48	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20284	..PANEL, RIGHT, OUTPUT BOX (SEE SHEET 2 FOR PARTS BREAKDOWN)	1
49	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A020WB4K42	..SCREW, HEX FLANGE HEAD M6	18
50	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21276-2	..SEAL, EDGE (MAKE FROM A1512 ON BULK ITEMS LIST CUT TO LENGTH 1737 MM+/-5)	2
51	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20601	..DOOR, ASSEMBLY, RIGHT AND LEFT (SEE SHEET 11 FOR PARTS BREAKDOWN)	2
52	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20312	...DOOR, ENCLOSURE	2
53	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340013960454	94222	97-50-170-11	...CATCH, CLAMPING	2
54	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015006541	3L891	40CNFHS	...NUT, PLAIN, HEXAGON	4
55	PAFZZ	PAFZZ	PAFZZ	PAFZZ		1MMD1	C-04-21420	...SCREW,MACHINE	4
56	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21039	...BOX, TOOL	2
57	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21045	...HINGE, TOOL BOX	2

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC NAVY			(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
58	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21046	...COVER, BOX, TOOL	2
59	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21031-4	...SEAL, EDGE (MAKE FROM A1512 ON BULK ITEM LIST CUT TO LENGTH 259MM+/-3)	2
60	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20019	..PANEL, LEFT AND RIGHT DOOR (SEE SHEET 2 FOR PARTS BREAKDOWN)	2
61	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A016WB4K42	..SCREW, CAP, HEXAGON M6	12
62	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21285	..PANEL, LEFT, AIR INTAKE (SEE SHEET 2 FOR PARTS BREAKDOWN)	1
63	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20804	..DUCT, AIR (SEE SHEET 2 FOR PARTS BREAKDOWN)	1
64	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21177	..PANEL, SUPPORT	1
65	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21438-2	..SEAL, WEATHER (MAKE FROM A2539 ON BULK ITEM LIST CUT TO LENGTH 1280MM+/-5)	1
66	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20806	..BRACKET, MOUNTING, RIGHT SIDE (SEE SHEET 2 FOR PARTS BREAKDOWN)	1
67	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21438-4	..SEAL, WEATHER (MAKE FROM A2539 ON BULK ITEMS LIST CUT TO LENGTH 550 MM +/- 5)	1
68	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21288	..PANEL, RADIATOR (SEE SHEET 2 FOR PARTS BREAKDOWN)	1
69	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20800	..CROSSMEMBER, ENCLOSURE (SEE SHEET 2 FOR PARTS BREAKDOWN)	1
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
DCS INSTALLATION REPAIR PARTS LIST**

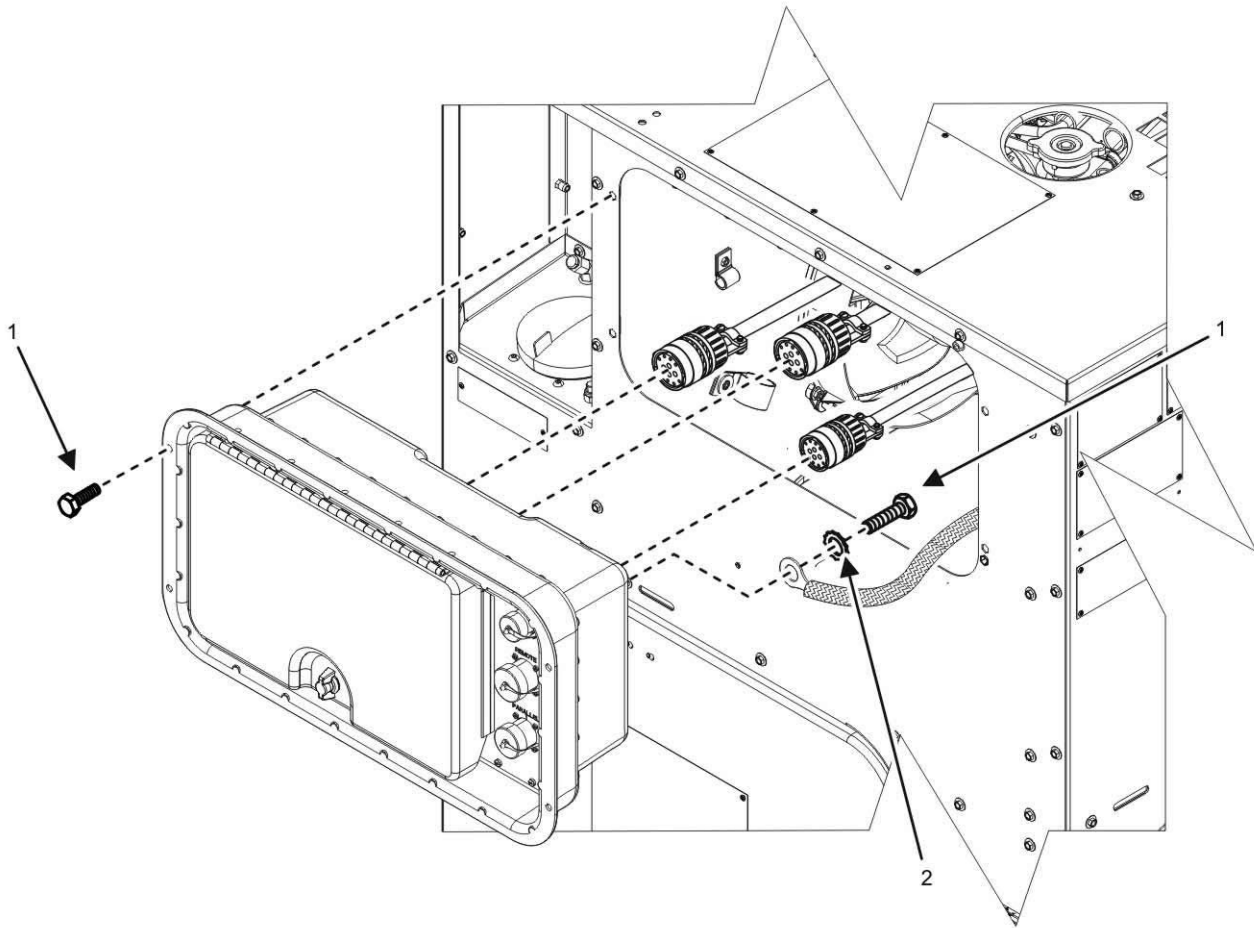


Figure 5. DCS Installation (Sheet 1 of 3).

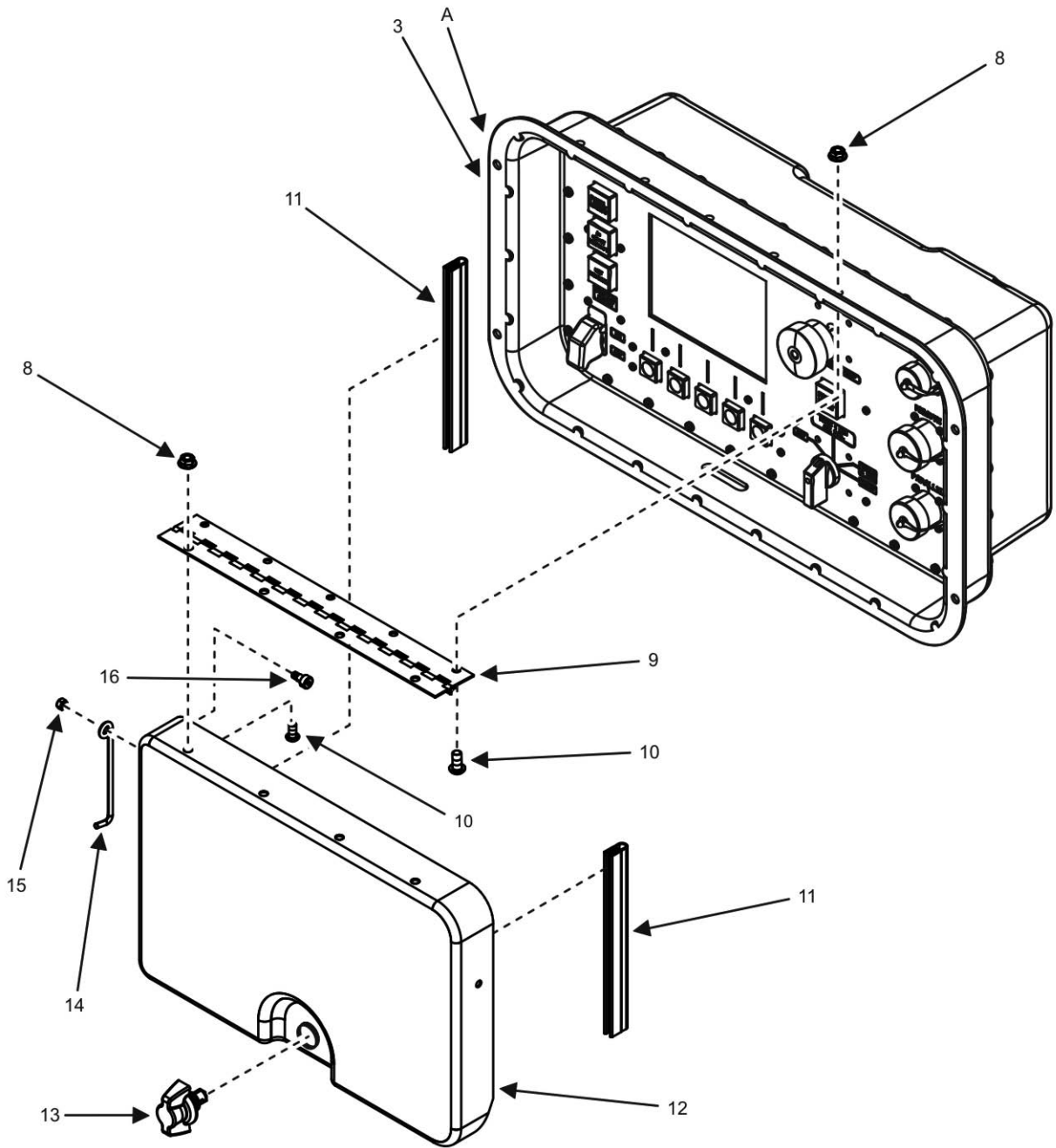


Figure 5. DCS Installation (Sheet 2 of 3).

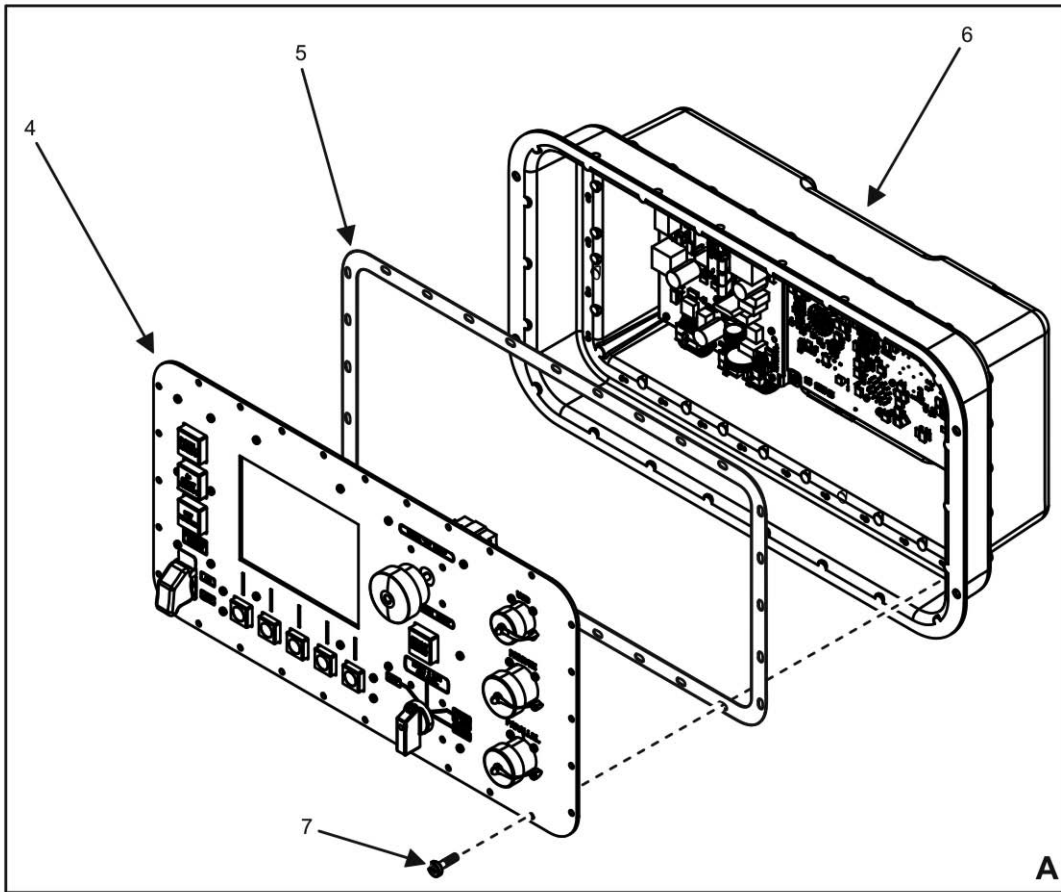


Figure 5. DCS Installation (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC FORCE		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 03	
								FIG. 5 DCS INSTALLATION	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		93907	A026G000	..SCREW, FLANGE HEAD (M6 X 1.0 X 16)	5
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW13X250000GD5A21	..WASHER, LOCK	1
3	PAFH H	PAFH H	PAFF F	PAFF F	6115015884725	44940	04-20442	..CONTROL BOX ASSEMBLY	1
4	XBFH H	XBFH H	XBFF F	XBFF F		44940	04-20414	...PANEL ASSEMBLY, DCS CONTROL (SEE FIGURE 6 FOR PARTS BREAKDOWN)	1
5	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-21569	...GASKET, CONTROL BOX	1
6	XBFH H	XBFH H	XBFF F	XBFF F		44940	04-20424	...ENCLOSURE ASSEMBLY, DCS (SEE FIGURE 7 FOR PARTS BREAKDOWN)	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		1MMD1	C-04-21421	...SCREW	28
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	..NUT (M6 X 1)	9
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20399	..HINGE	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN7380A2-M6X12	..SCREW (M6 X 12)	9
11	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21031-5	..SEAL, EDGE (MAKE FROM 04-21029 ON BULK ITEMS LIST)	2
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20313	..DOOR	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015899988	S8812	8-325-88	..LATCH	1
14	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20880	..BRACKET, SUPPORT	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEN045M508000CX0A36	..NUT, LOCK	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015889321	3A054	90278A331	..SCREW, SHOULDER (M5 X 0.8 X 12)	1
								END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
DCS CONTROL PANEL ASSEMBLY REPAIR PARTS LIST

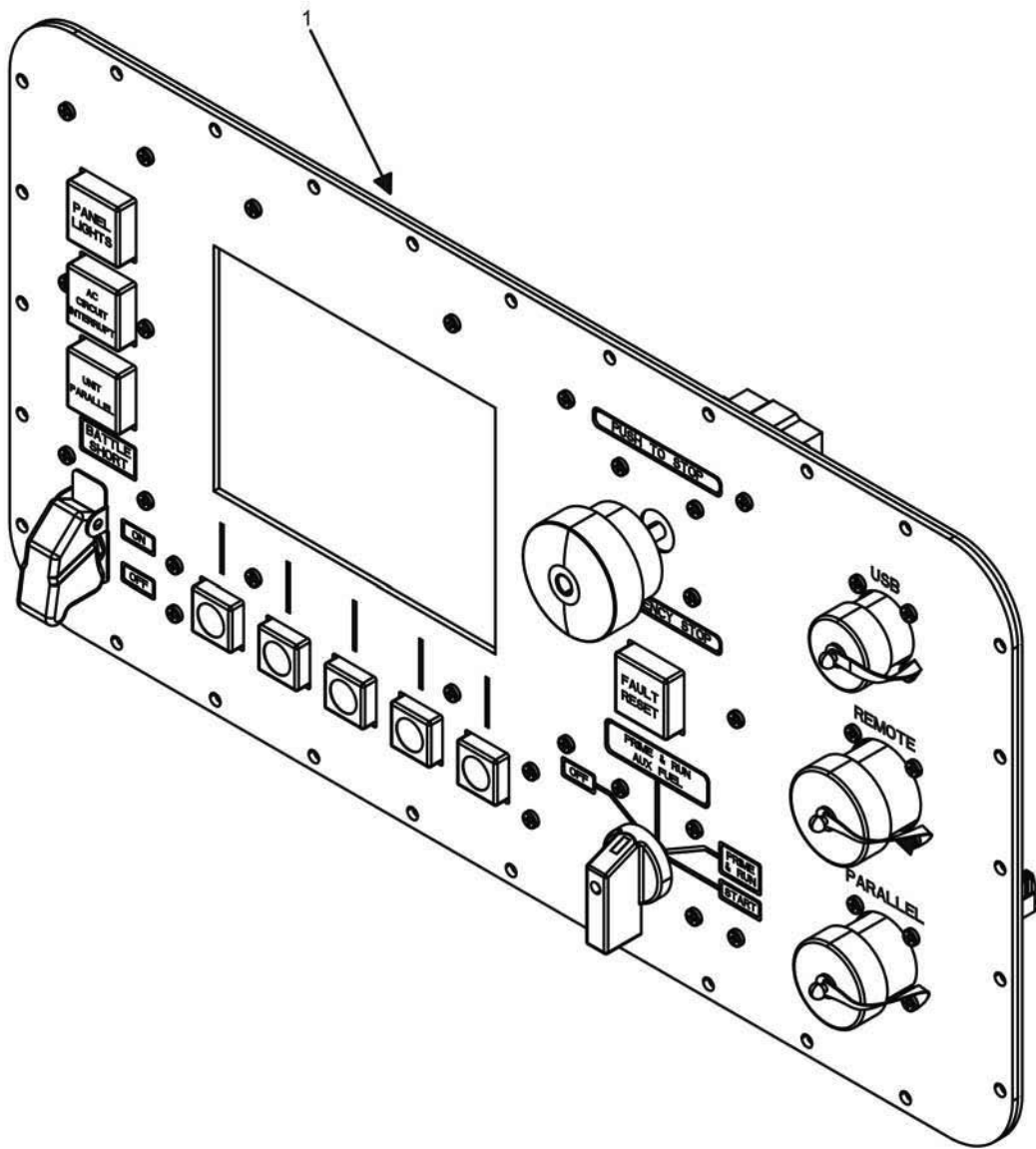


Figure 6. DCS Control Panel Assembly (Sheet 1 of 6).

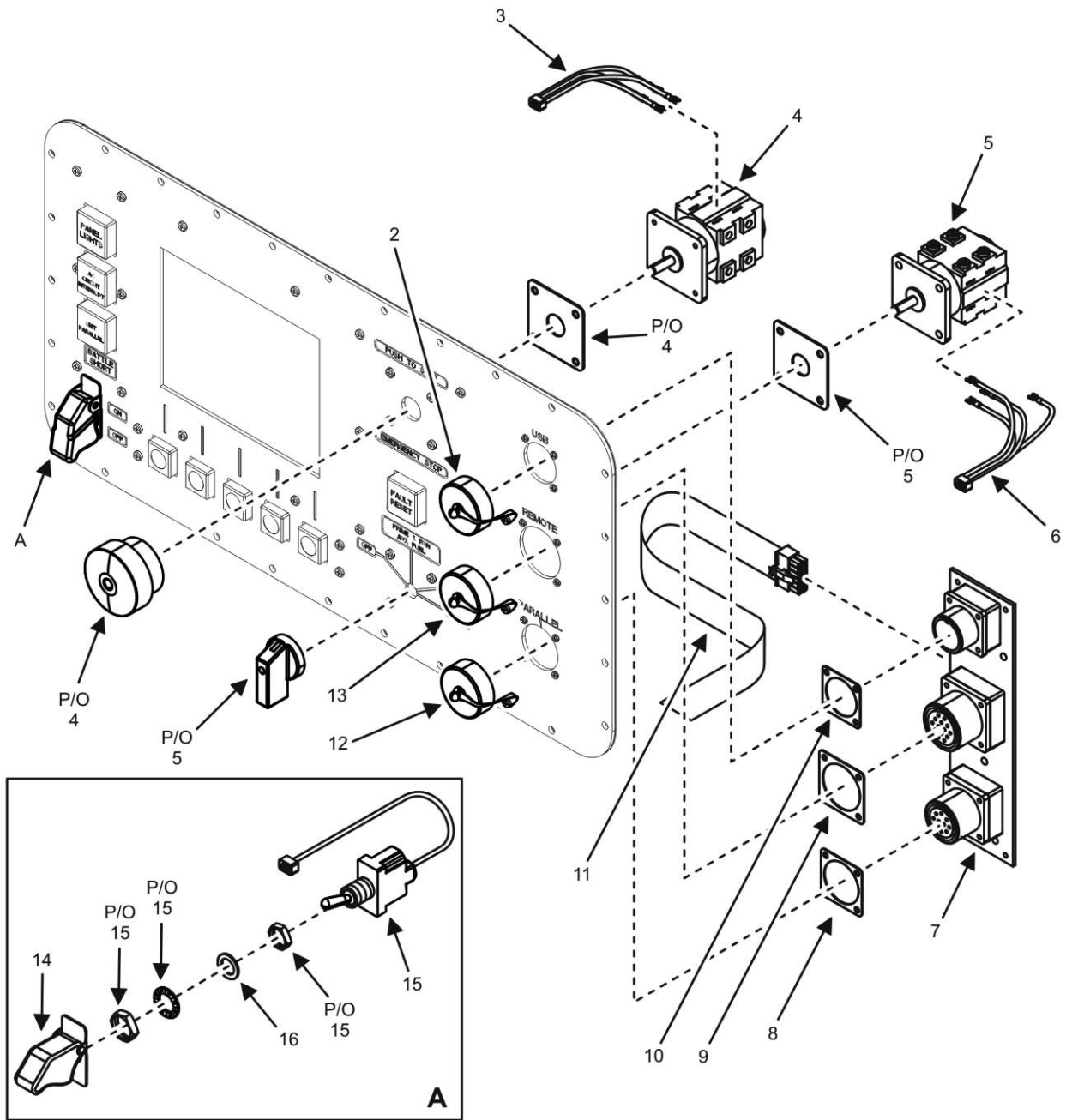


Figure 6. DCS Control Panel Assembly (Sheet 2 of 6).

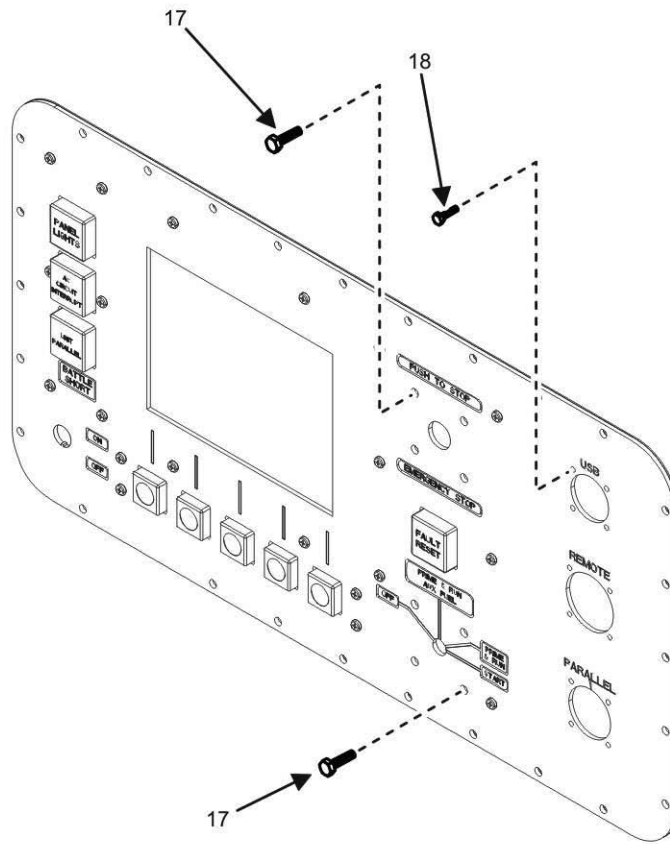


Figure 6. DCS Control Panel Assembly (Sheet 3 of 6).

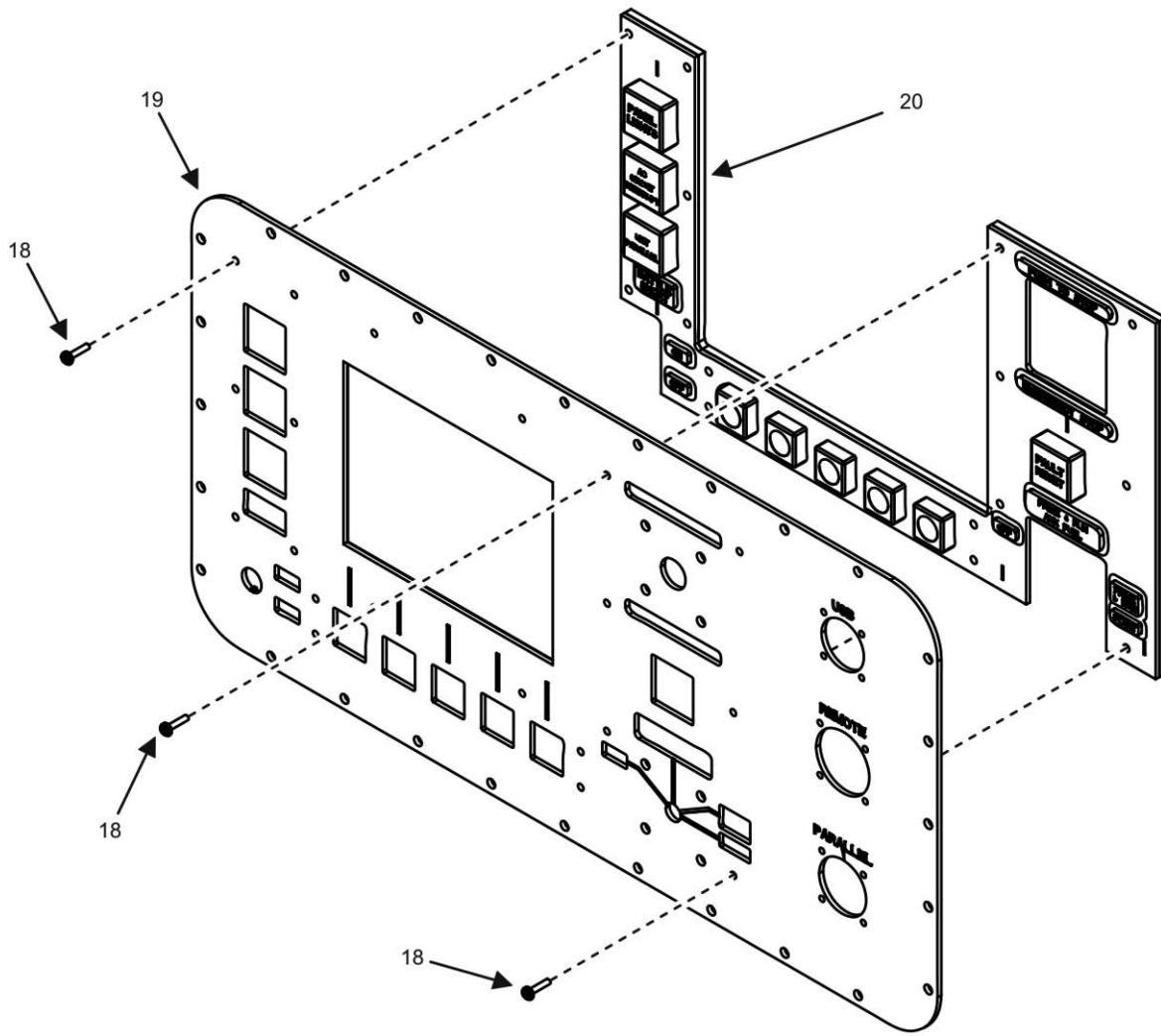


Figure 6. DCS Control Panel Assembly (Sheet 4 of 6).

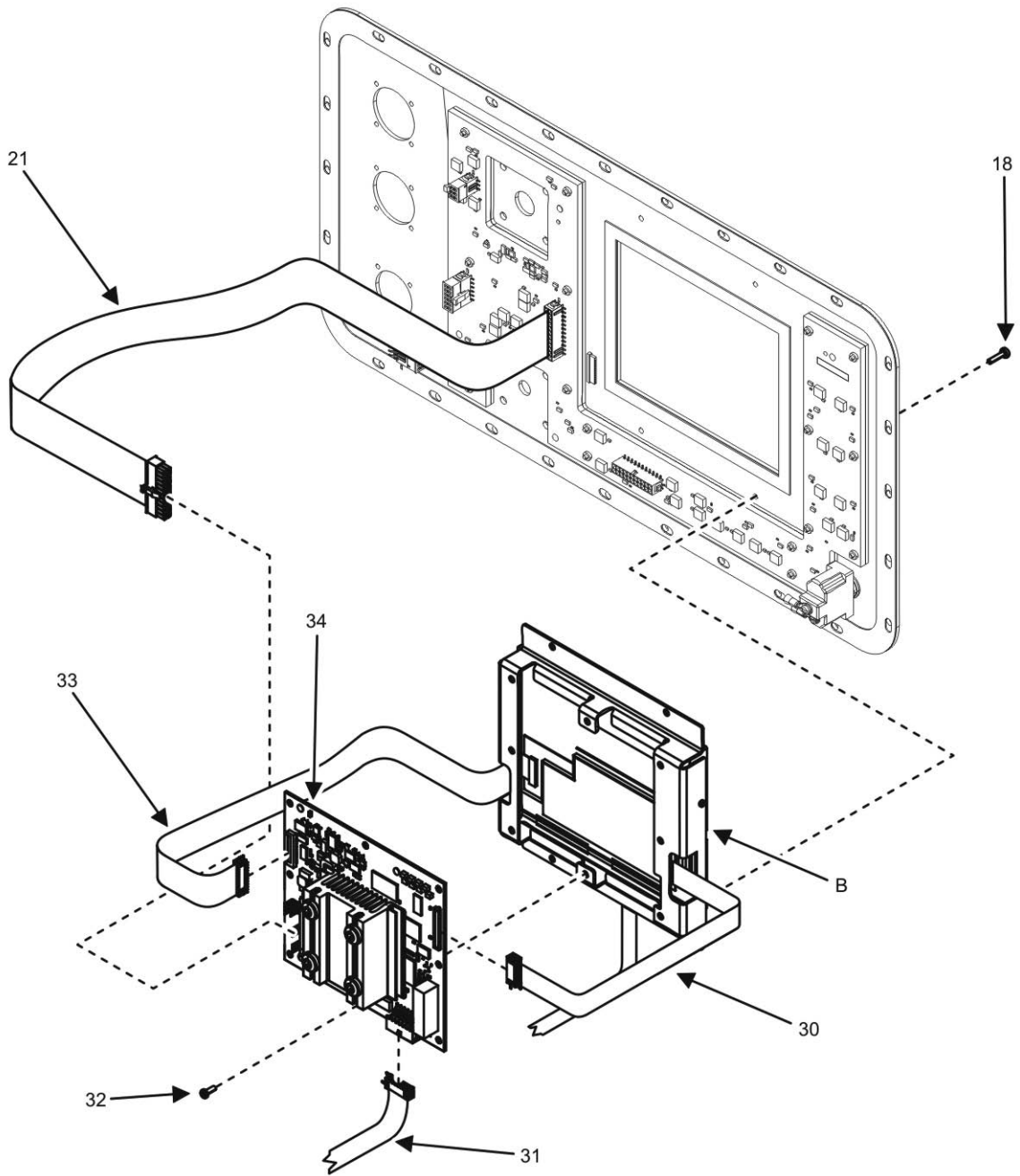


Figure 6. DCS Control Panel Assembly (Sheet 5 of 6).

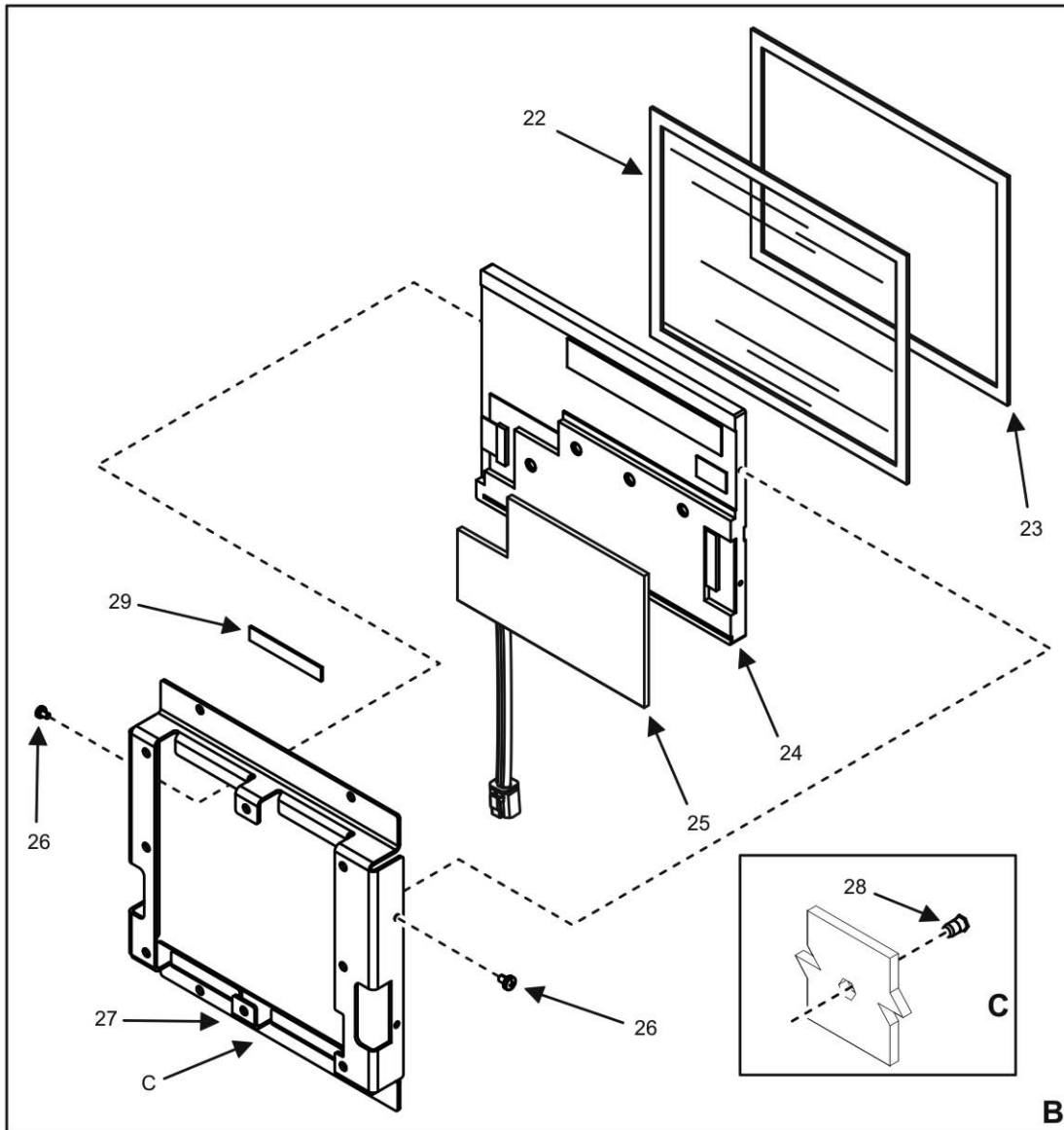


Figure 6. DCS Control Panel Assembly (Sheet 6 of 6).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	P/N	(5)	(6) DESCRIPTION AND UOC	(7) QTY.
									GROUP 0301	
									FIG. 6 DCS CONROL PANEL ASSEMBLY	
1	XBFHH	XBFHH	XBFFF	XBFFF		44940	04-20414		...PANEL ASSEMBLY, DCS CONTROL	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	MS25043-16DA		....CAP	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6150015885621	44940	04-20422		....CABLE ASSEMBLY, EMERGENCY STOP SWITCH	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5930015905539	10983	DKR12US009301E		....SWITCH, EMERGENCY STOP (INCLUDES GASKET AND KNOB)	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5930015875396	10983	DHR12US9206EF1		....SWITCH, ENGINE CONTROL (INCLUDES GASKET AND KNOB)	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6150015885606	44940	04-20421		....CABLE ASSEMBLY, ENGINE CONTROL SWITCH	1
7	PAHZZ	PAHZZ	PAFZZ	PAFZZ		44940	A206D375		....CARD, CONTROL CONNECTOR	1
8	PAFZZ	PAFZZ	PAHZZ	PAHZZ		37GZ4	A026J180		....GASKET	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015894656	37GZ4	A026J182		....GASKET	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		37GZ4	A026J177		....GASKET	1
11	PAHZZ	PAHZZ	PAFZZ	PAFZZ	6150015886024	44940	04-20441		....CABLE ASSEMBLY (J203 TO J304)	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015901601	44940	MS25043-18DW		....CAP	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	MS25043-20DA		....CAP	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5930006156731	96906	MS25224-1		....GUARD, SWITCH	1
15	PAFFF	PAFFF	PAFZZ	PAFZZ	5930015894070	44940	04-20385		....SWITCH, BATTLESHORT	1
16	PAFZZ	PAFZZ	PAFFF	PAFFF		5P209	60225		....RING, SEALING	1
17	PAHZZ	PAHZZ	PAFZZ	PAFZZ		44940	04-21701		....SCREW, THREAD- FORMING PANHEAD (10-16 TYPE B)	8
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21625		....SCREW, PAN HEAD (4-40 UNC X 0.5)	46
19	XBHZZ	XBHZZ	XBHZZ	XBHZZ		44940	04-20181		...PANEL, CONTROL	1
20	PAHZZ	PAHZZ	PAFZZ	PAFZZ		44940	04-21242		...MEMBRANE ASSEMBLY	1
21	PAHZZ	PAHZZ	PAFZZ	PAFZZ	6150015885631	44940	04-21058		...CABLE ASSEMBLY (J201 TO J404)	1
22	PAHZZ	PAHZZ	PAHZZ	PAHZZ	6110015859960	3SZW3	A026F088		...PANEL, CONTROL, LCD GLASS	1

(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
23	PAHZZ	PAHZZ	PAHZZ	PAHZZ		37GZ4	A026H815		...GASKET, DISPLAY	1
24	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5980015873102	SCR39	NL6448BC20-21C		...DISPLAY, LCD	1
25	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5340015894472	79221	A026G053		...HEATER, PANEL (INCLUDES CABLE)	1
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN7985-M2X3		...SCREW, PAN HEAD (M2 X 3.0)	4
27	XBHHH	XBHHH	XBFFF	XBFFF		44940	04-20969		...BRACKET, MOUNTING	1
28	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5310003382255	81349	M45938-1-4C		...NUT, PLAIN, CLINCH	12
29	PCFZZ	PCFZZ	PAHZZ	PAHZZ		44940	04-21204		...GASKET	4
30	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5935015885541	44940	04-20411		...CABLE ASSEMBLY, DISPLAY COMMUNICATION (LCD DISPLAY TO J402)	1
31	PAHZZ	PAHZZ	PAFZZ	PAFZZ	6150015884000	44940	04-20437		...CABLE ASSEMBLY J104 TO J403	1
32	PAFZZ	PAFZZ	PAHZZ	PAHZZ		44940	AESF5C112312WA2A26		...SCREW, PAN HEAD (4-40 UNC X 0.31)	8
33	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5935015885600	44940	04-20412		...CABLE, ASSEMBLY DISPLAY BACKLIGHT (LCD DISPLAY TO J401)	1
34	PAHZZ	PAHZZ	PAHZZ	PAHZZ		44940	A026D370		...CARD, CONTROL, DISPLAY	1
END OF FIGURE										

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
DCS ENCLOSURE ASSEMBLY REPAIR PARTS LIST**

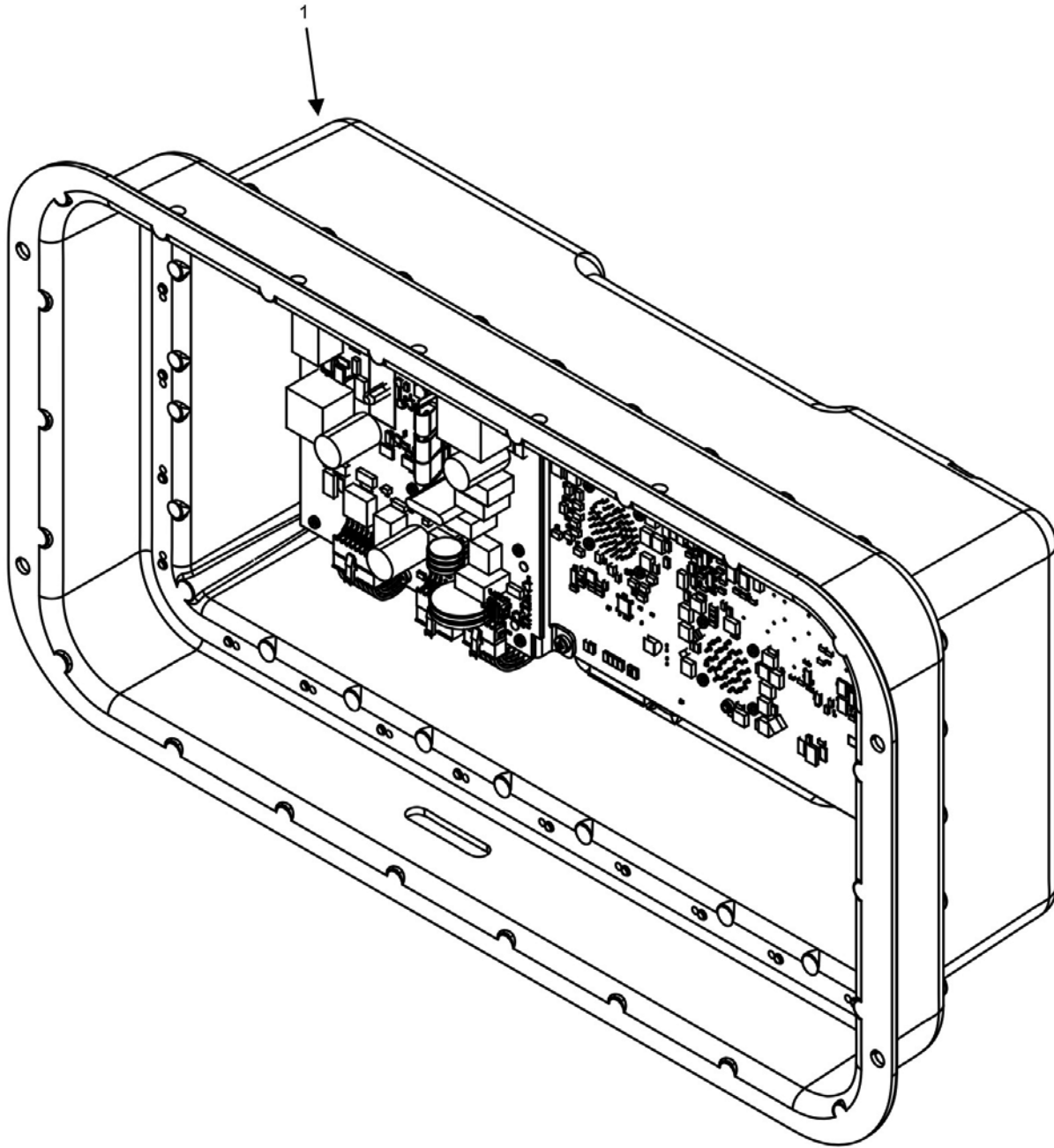


Figure 7. DCS Enclosure Assembly (Sheet 1 of 3).

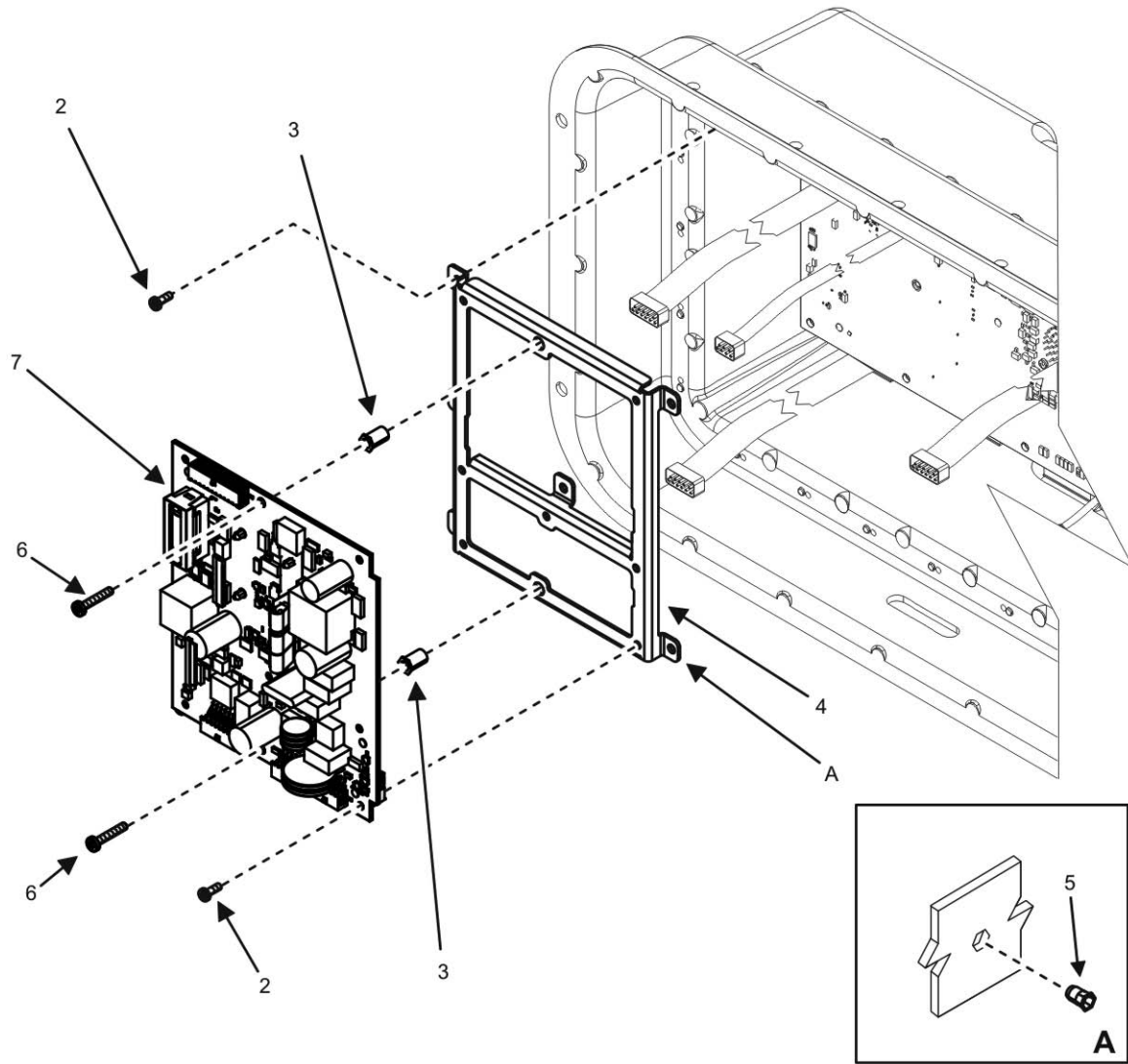


Figure 7. DCS Enclosure Assembly (Sheet 2 of 3).

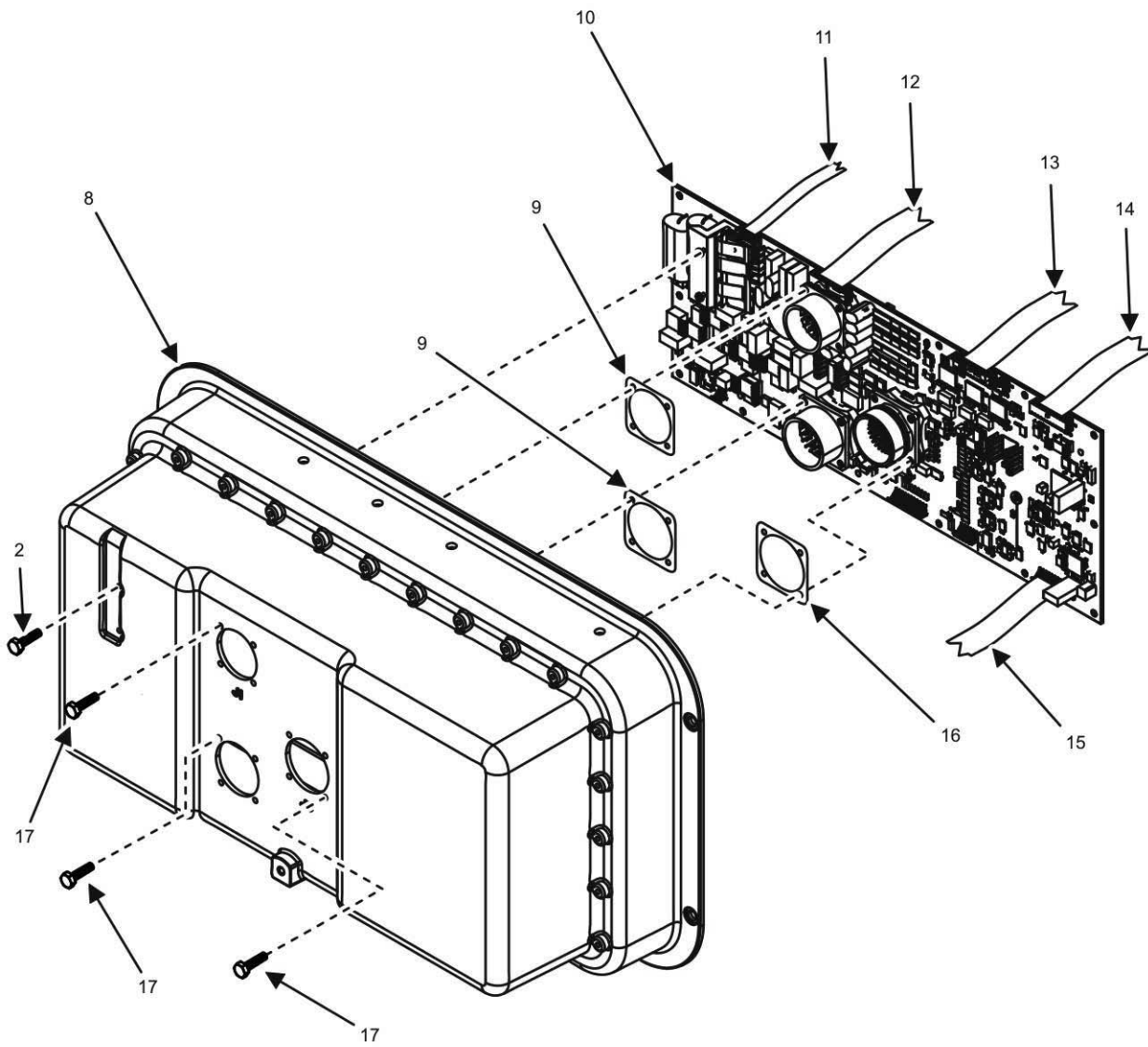


Figure 7. DCS Enclosure Assembly (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0302	
								FIG. 7 DCS ENCLOSURE ASSEMBLY	
1	XBFHH	XBFHH	XBFFF	XBFFF		44940	04-20424	...DCS ENCLOSURE ASSEMBLY	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		MMD1C	04-21420	...SCREW, LOCKING, PAN HEAD (M4 X 10)	12
3	PAHZZ	PAHZZ	PAFZZ	PAFZZ		46384	SOS-85.1-12	...STAND OFF	2
4	XBHHH	XBHHH	XBFFF	XBFFF		44940	04-21402	...BRACKET	1
5	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5310003382255	81349	M45938-1-4C	...NUT, PLAIN, CLINCH	7
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21422	...SCREW, PAN HEAD (M4 X 22)	2
7	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5998015887145	44940	A026D949	...CARD, CONTROL, POWER	1
8	XBHZZ	XBHZZ	XBFZZ	XBFZZ		44940	04-20650	...BOX, CONTROL	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015900070	37GZ4	A026E709	...GASKET	2
10	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5998015877618	44940	A026F215	...CARD, CONTROL, MAIN	1
11	PAHZZ	PAHZZ	PAHZZ	PAHZZ	6150015885253	44940	04-20439	...CABLE ASSEMBLY J17 TO J305	1
12	PAHZZ	PAHZZ	PAHZZ	PAHZZ	6150015885103	44940	04-20438	...CABLE ASSEMBLY J15 TO J202	1
13	PAHZZ	PAHZZ	PAFZZ	PAFZZ	6150015883995	44940	04-20436	...CABLE, ASSEMBLY (J9 TO J101)	1
14	PAHZZ	PAHZZ	PAFZZ	PAFZZ	6150015883992	44940	04-20434	...CABLE, ASSEMBLY (J13 TO J103)	1
15	PAHZZ	PAHZZ	PAFZZ	PAFZZ	6150015883988	44940	04-20435	...CABLE, ASSEMBLY (J11 TO J102)	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ		37GZ4	A026E707	...GASKET	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21626	...SCREW (6-32)	12
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
INTAKE AIR INSTALLATION REPAIR PARTS LIST**

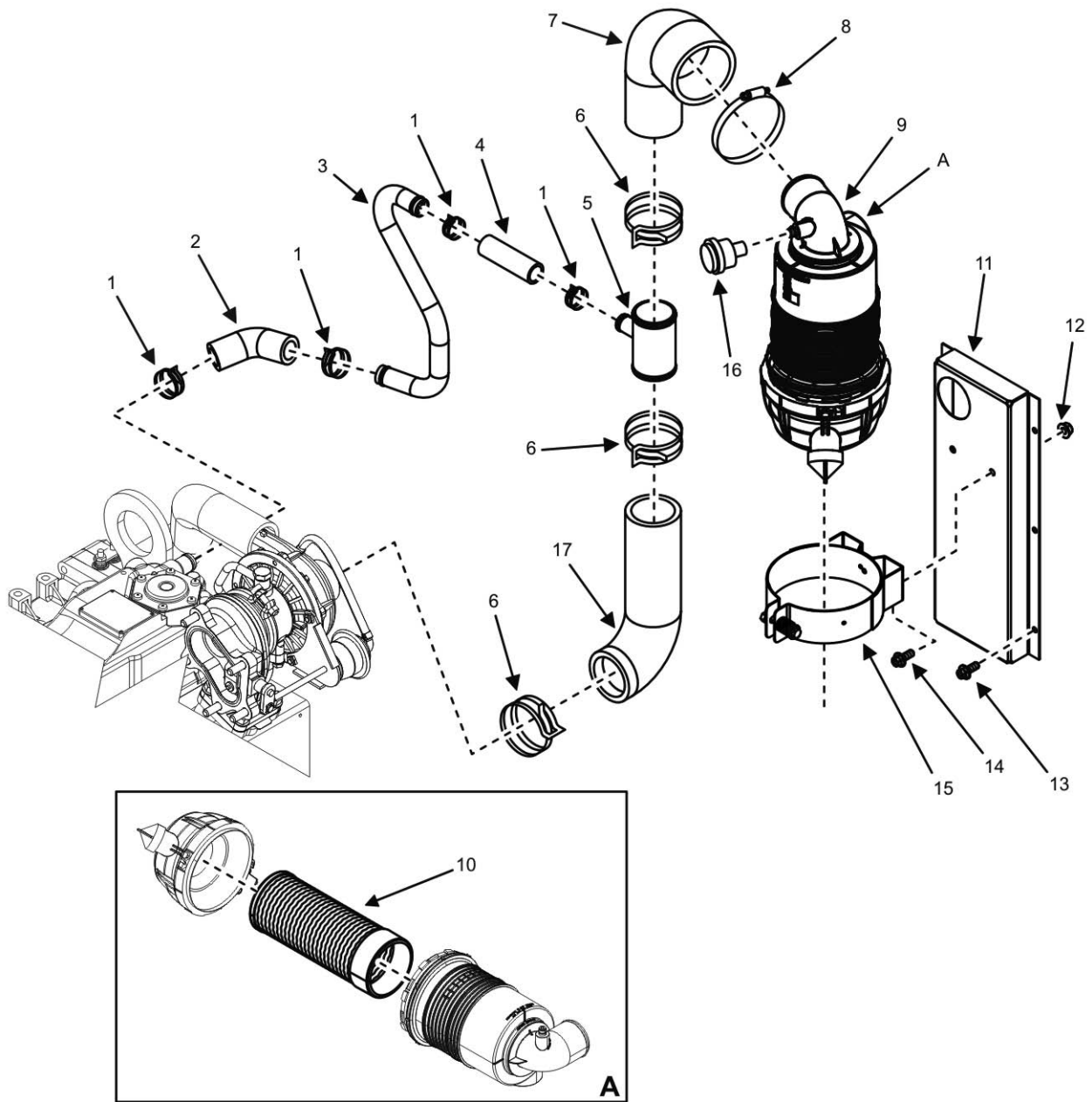


Figure 8. Intake Air Installation (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	P/N	(5)	(6) DESCRIPTION AND UOC	(7) QTY.
									GROUP 04	
									FIG. 8 INTAKE AIR INSTALLATION	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-29		..CLAMP, TYPE CTB	4
2	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-21250		..HOSE, BREATHER 15KW	1
3	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21225		..TUBE, BREATHER	1
4	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20751		..HOSE, BREATHER 19MM ID X 80MM	1
5	XBFZZ	XBFZZ	XBFZZ	XBFZZ		OAK42	129009-03050		.....JOINT, BREATHER	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-61		..CLAMP, TYPE CTB	3
7	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20803		..HOSE, AIR	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508SLF44		..CLAMP, HOSE	1
9	PAFFF	PAFFF	PAFFF	PAFFF		33457	AH0883000		..AIR CLEANER	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AF26168		...ELEMENT, FILTER	1
11	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20808		..BRACKET, AIR FILTER	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M8		..NUT, HEX FLANGE M8 X1.25	2
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A016WB4K42		..SCREW, HEX FLANGE HEAD M6 X 1 X 16	6
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B020WB4K42		....SCREW, HEX FLANGE HEAD M8 X 1.25 X 20	2
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		33457	3918198S		..CLAMP	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ		33457	04-20993		..INDICATOR, SERVICE, AIR CLEANER	1
17	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20802		..HOSE, AIR 15KW	1
									END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
EXHAUST INSTALLATION REPAIR PARTS LIST

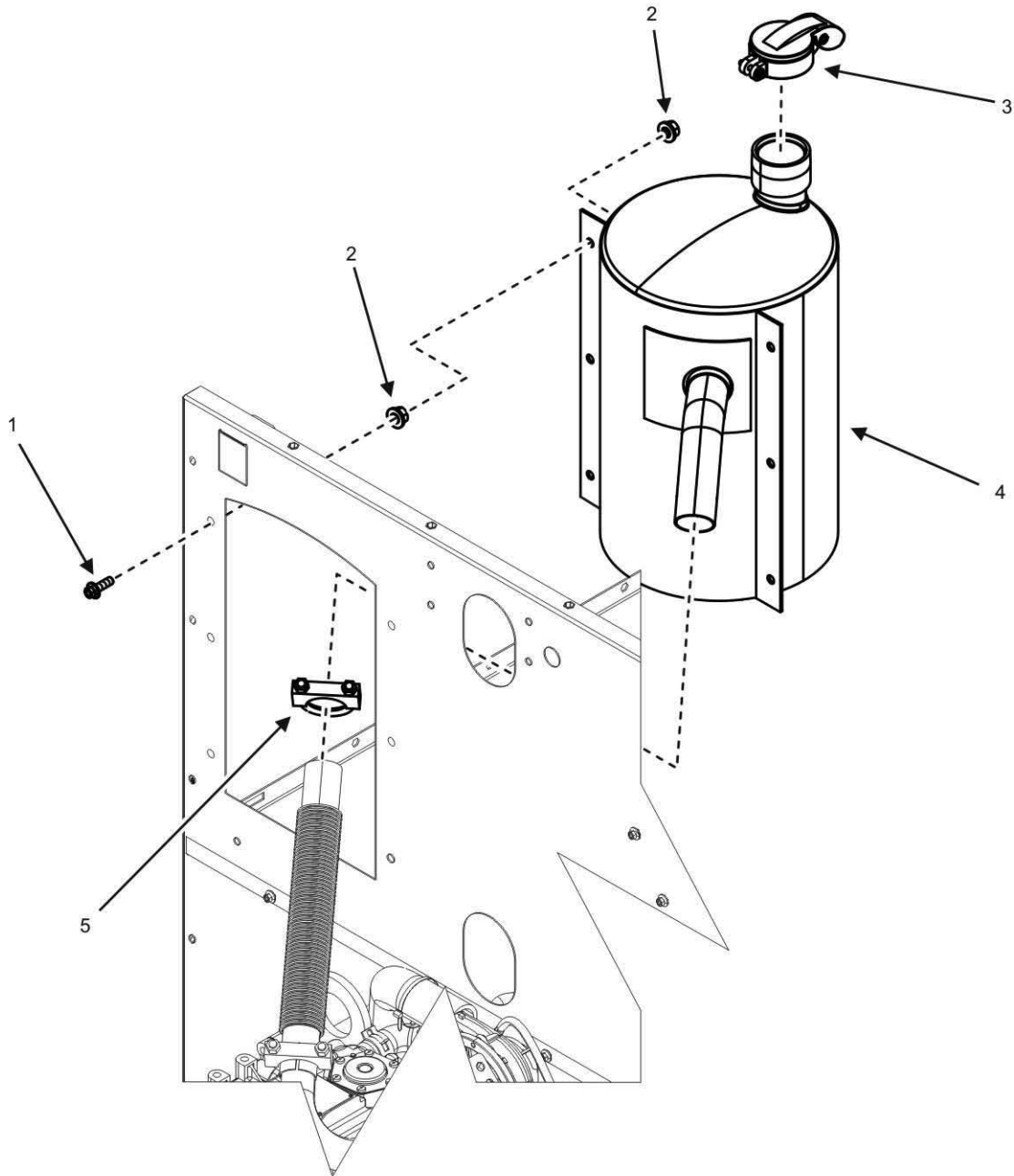


Figure 9. Exhaust Installation (Sheet 1 of 2).

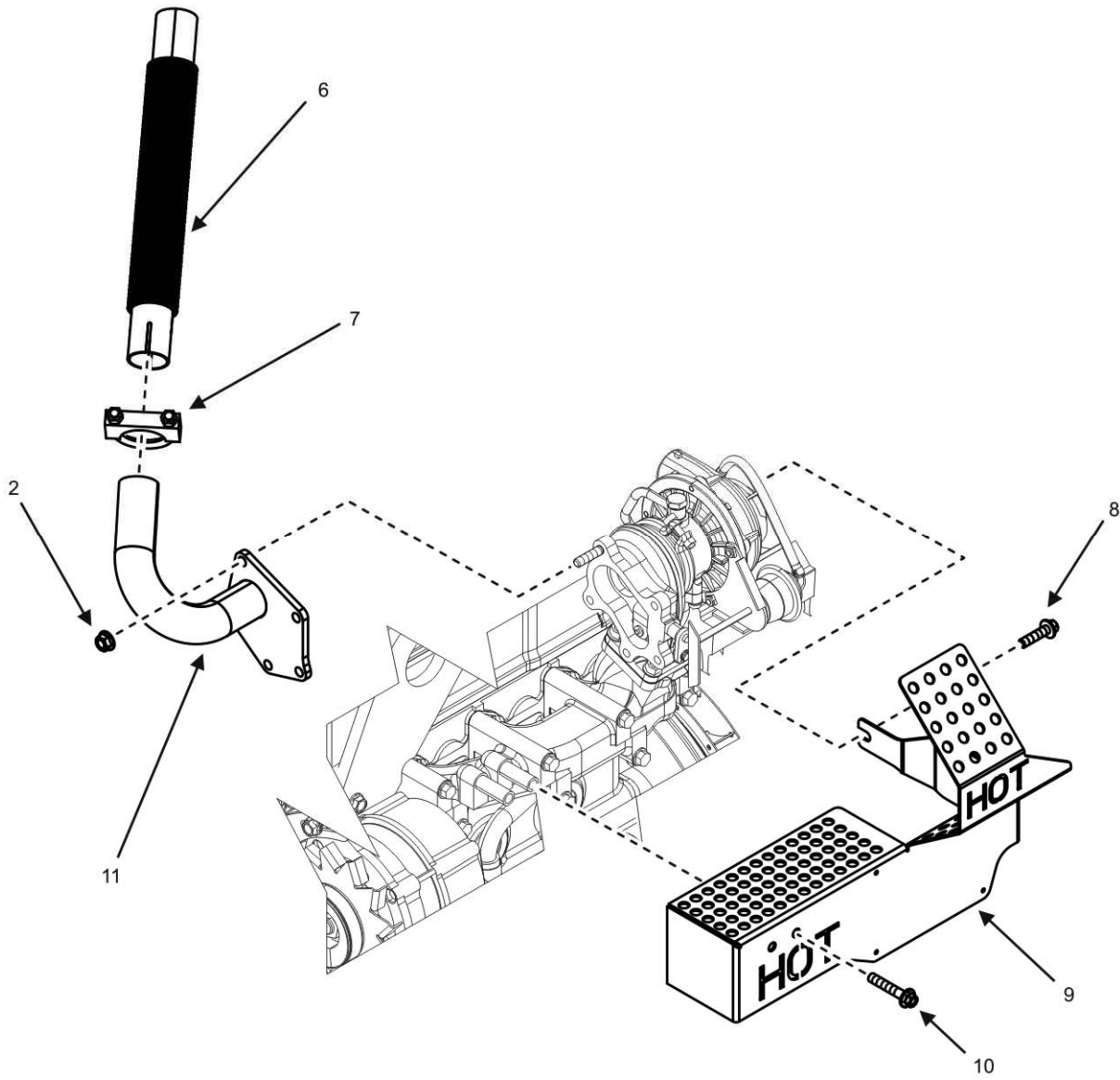


Figure 9. Exhaust Installation (Sheet 2 of 2).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC NAVY FORCE			(3) NSN	(4) CAGEC P/N		(5)	(6) DESCRIPTION AND UOC	(7) QTY.
									GROUP 05	
									FIG. 9 EXHAUST INSTALLATION	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B025WB4K42		..SCREW, HEX FLANGE HEAD M8	6
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M8		..NUT, HEX FLANGE M8	17
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		4JTC3	7		..CAP, RAIN EXHAUST	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		33457	202231A		..MUFFLER	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015894100	14934	PC163A1		..CLAMP, LOOP	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21603		..PIPE, EXHAUST	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		14934	PC150A1		..CLAMP, LOOP	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B016WB4K42		....SCREW, HEX FLANGE M8	1
9	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21345		....SHIELD, HEAT	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B045WB4K42		....SCREW, HEX FLANGE, M8	2
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21302		..ELBOW, EXHAUST	1
									END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
COOLING SYSTEM INSTALLATION REPAIR PARTS LIST**

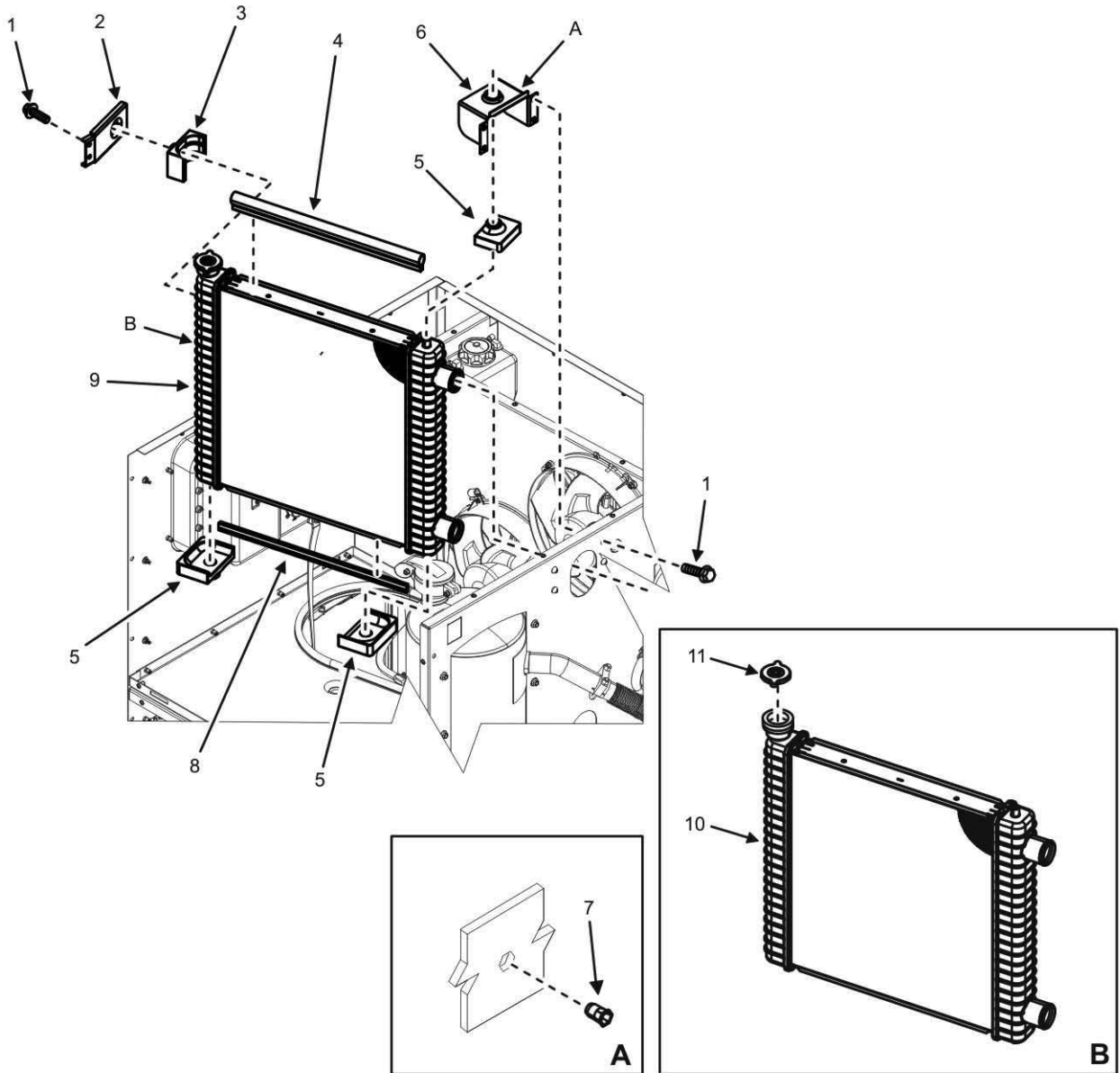


Figure 10. Cooling System Installation (Sheet 1 of 4).

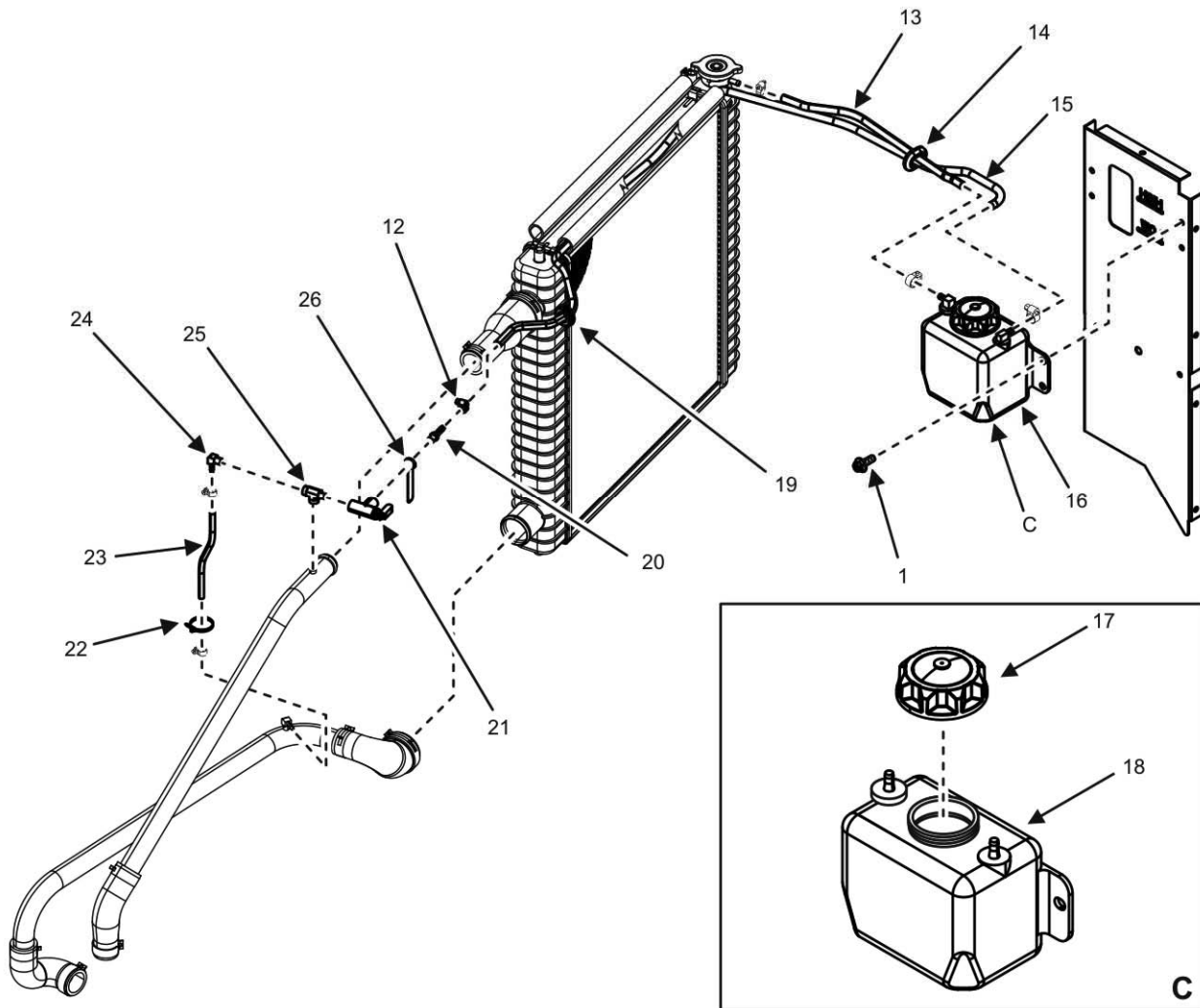


Figure 10. Cooling System Installation (Sheet 2 of 4).

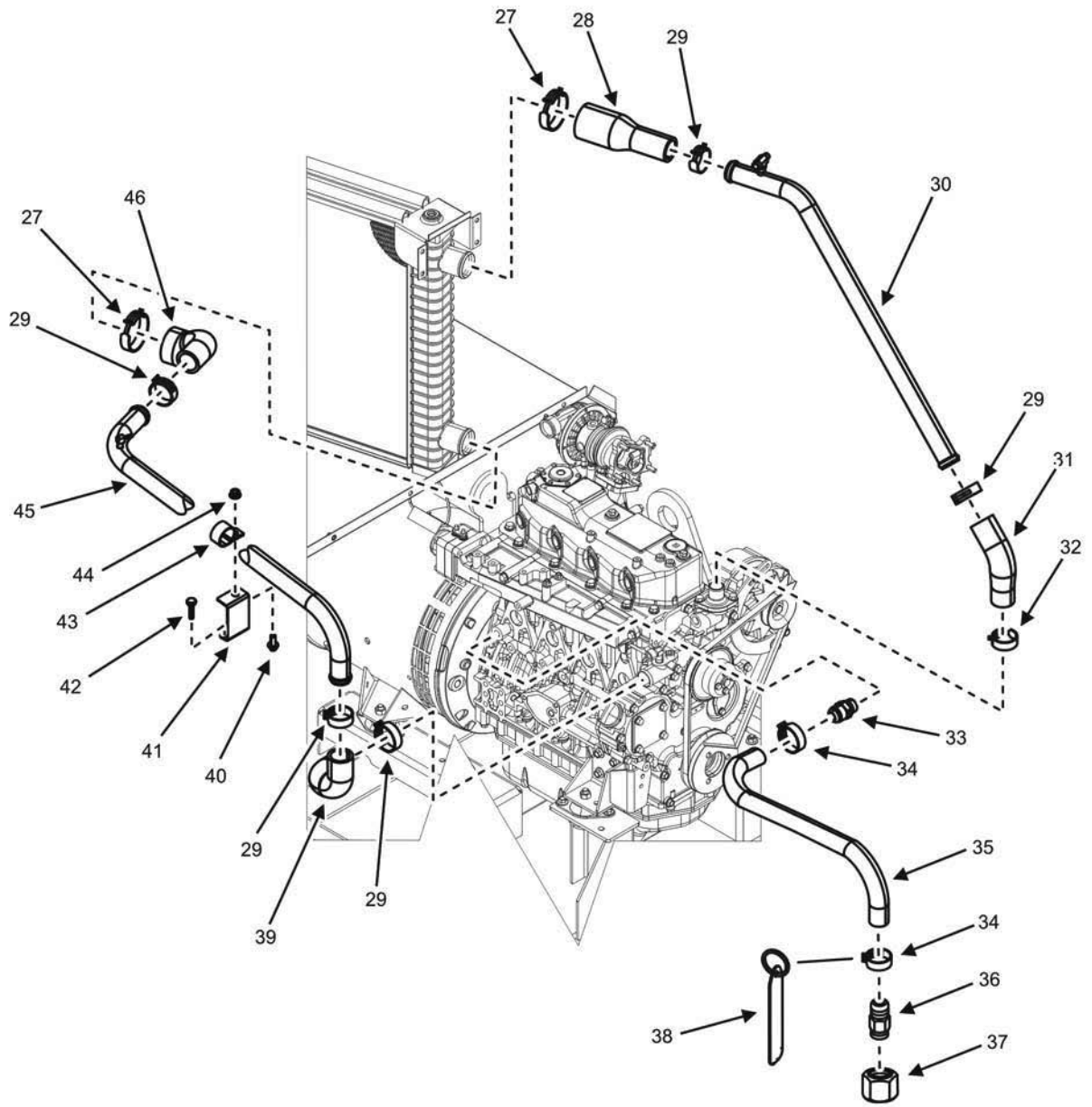


Figure 10. Cooling System Installation (Sheet 3 of 4).

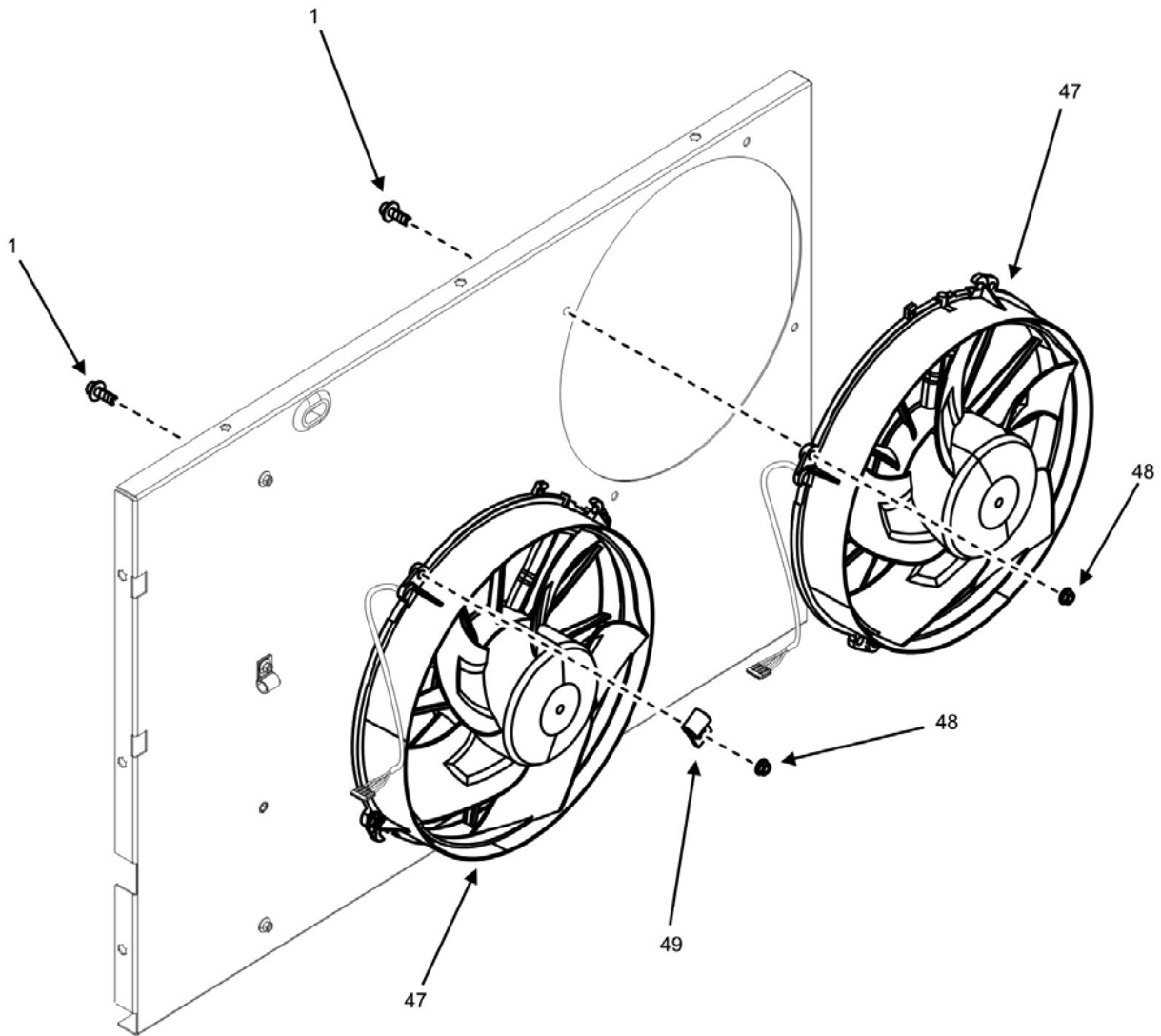


Figure 10. Cooling System Installation (Sheet 4 of 4).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 06	
								FIG. 10 COOLING SYSTEM INSTALLATION	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A016WB4K 42	..SCREW, HEX FLANGE HEAD M6 X 1 X 16	18
2	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20805	..BRACKET, RADIATOR	1
3	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20864	..MOUNT, RADIATOR	1
4	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21030-2	..SEAL, EDGE (MAKE FROM A3709 ON BULK ITEMS LIST CUT TO LENGTH 470 MM +/- 5)	2
5	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20863	..MOUNT, RADIATOR	3
6	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21257	..BRACKET, RADIATOR	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030	...NUT, PLAIN, CLINCH	4
8	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21031-2	..SEAL, EDGE (MAKE FROM A1512 ON BULK ITEMS LIST CUT TO LENGTH 470 MM +/- 5)	2
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21168-1	..RADIATOR ASSEMBLY	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	0130-8256-01-010 L	...RADIATOR	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	JSKG12	...CAP, FILLER OPENING	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730008716729	61424	6202	..CLAMP, HOSE	6
13	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21437-3	..HOSE, VENT, RADIATOR (MAKE FROM 3058529 ON BULK ITEMS LIST CUT TO LENGTH 406 MM +/- 10)	1
14	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5325002708890	96906	MS35489-22	..GROMMET, NONMETALLIC	1
15	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21070-6	..HOSE, VENT, RADIATOR (MAKE FROM 3058529 ON BULK ITEMS LIST CUT TO LENGTH AS REQUIRED)	1
16	PBFFF	PBFFF	PBFFF	PBFFF	2815015905312	0E3E3	070520BE	..TANK, COOLANT	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2930015882852	0E3E3	080061BE	...CAP, COOLANT	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2815015906391	0E3E3	062200AE	...TANK, COOLANT	1
19	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5325001850001	96906	MS35489-46	..GROMMET, NONMETALLIC	1
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730005951078	93061	125HBL-4-2	..ADAPTER, STRAIGHT PIPE	1
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4820013671836	70411	SP2529VT	..VALVE, CHECK	1

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5975015886525	6383	PLTS-M30	..STRAP, TIEDOWN ELECTRICAL (AS REQUIRED)	1
23	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21223-4	..HOSE, NONMETALLIC (MAKE FROM 58001904800300 ON BULK ITEMS LIST CUT TO LENGTH 610 MM +/- 10)	1
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ123123431460 B	..ELBOW, FLANGE TO PIPE	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730002479105	30780	1-8MR0S	..TEE, PIPE	1
26	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21598	..PLATE, INFORMATIONAL	1
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-61	..CLAMP	2
28	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20795	..HOSE, COOLANT	1
29	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-44	..CLAMP	5
30	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20797	..TUBE, COOLANT	1
31	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20794	..HOSE, COOLANT	1
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-35	..CLAMP	1
33	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21124	..ADAPTER, TUBE	1
34	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-29	..CLAMP	2
35	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21208-2	..HOSE, NONMETALLIC (MAKE FROM 30- 10-0003 ON BULK ITEMS LIST CUT TO LENGTH 893.50 MM +/- 10)	1
36	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ12318-12430160B	..ADAPTER, TUBE	1
37	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	04-21224	..CAP, PIPE	1
38	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21599	..PLATE, INFORMATIONAL	1
39	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20801	..HOSE, COOLANT	1
40	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44941	AES10M08B025WB4K 42	..SCREW, HEX FLANGE HEAD M8 X 1.25 X 20	1
41	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21596	..BRACKET, MOUNTING	1
42	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B016WB4K 42	..SCREW, HEX FLANGE HEAD M8 X 1.25 X 16	2
43	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340004044100	75272	COV2113	..CLAMP, LOOP	1
44	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M8	..NUT, HEX FLANGE M8 X 1.25	1
45	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20798	..TUBE, COOLANT	1
46	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20796	..HOSE, COOLANT	1
47	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	W3G300-ER38	..FAN, ENGINE COOLING	2
48	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	..NUT, HEX FLANGE M6 X 1	8
49	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015868472	75272	COV-0813	..CLAMP, LOOP	1

END OF FIGURE

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
FUEL SYSTEM INSTALLATION REPAIR PARTS LIST

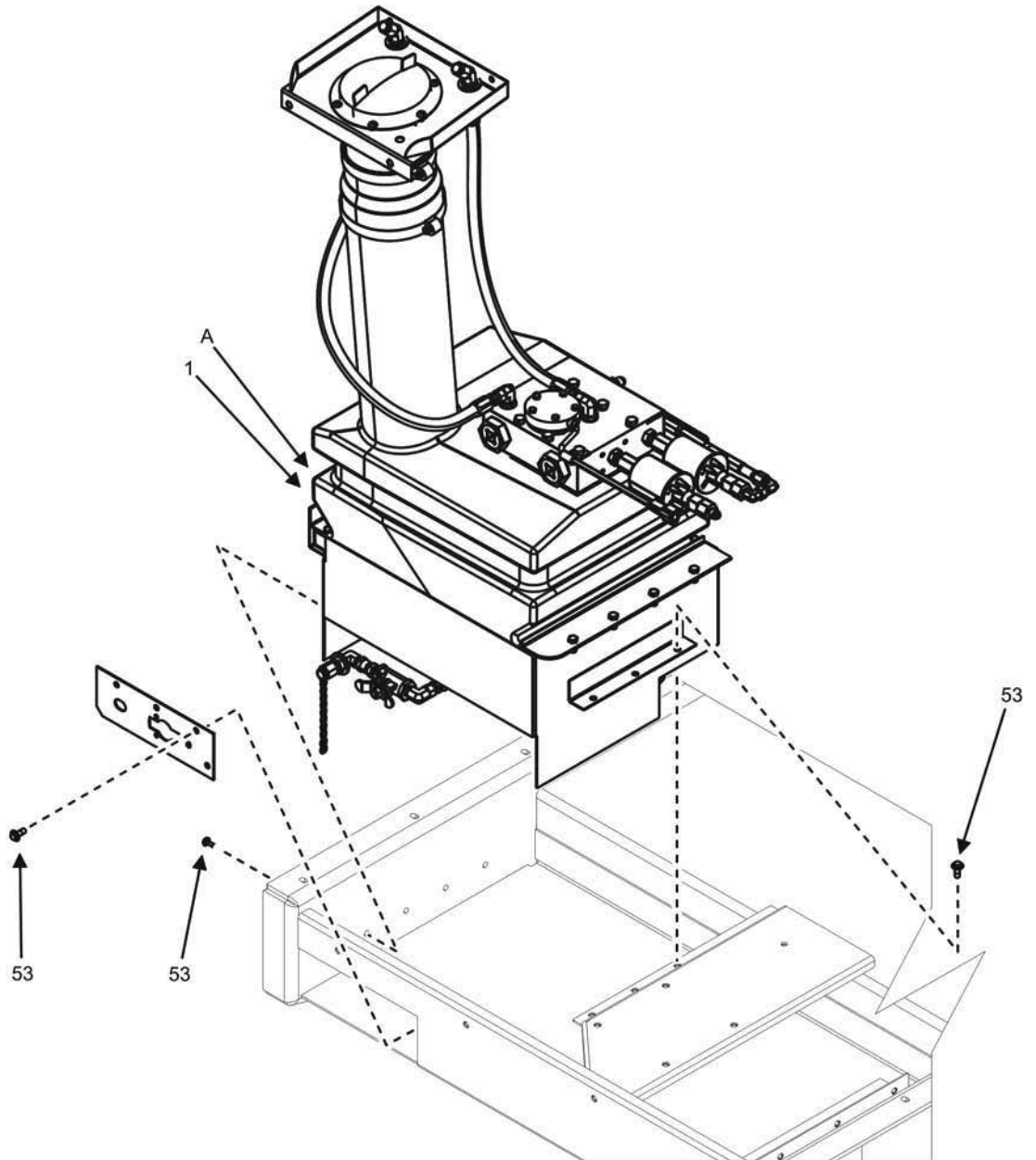


Figure 11. Fuel System Assembly (Sheet 1 of 6).

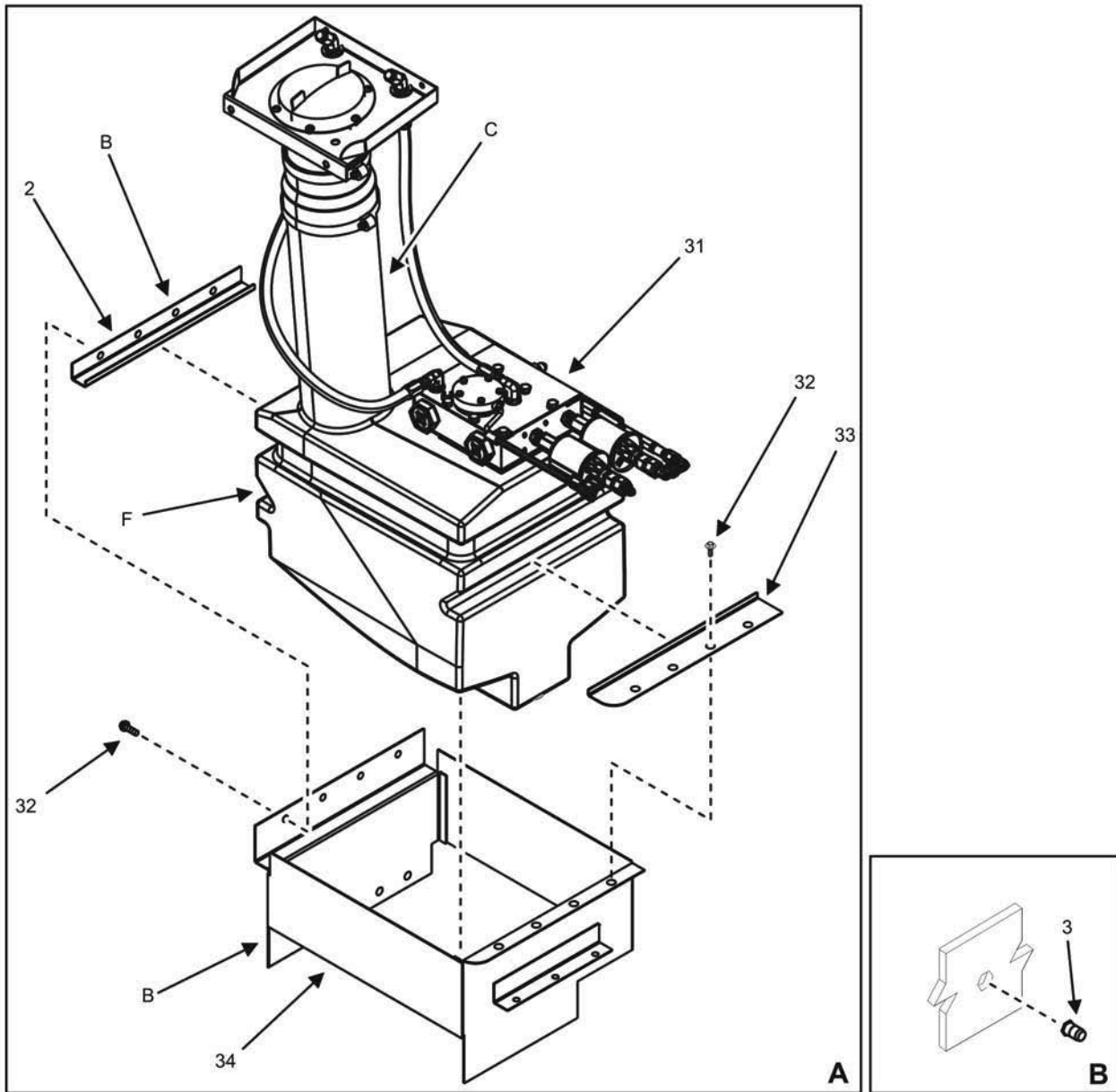


Figure 11. Fuel System Assembly (Sheet 2 of 6).

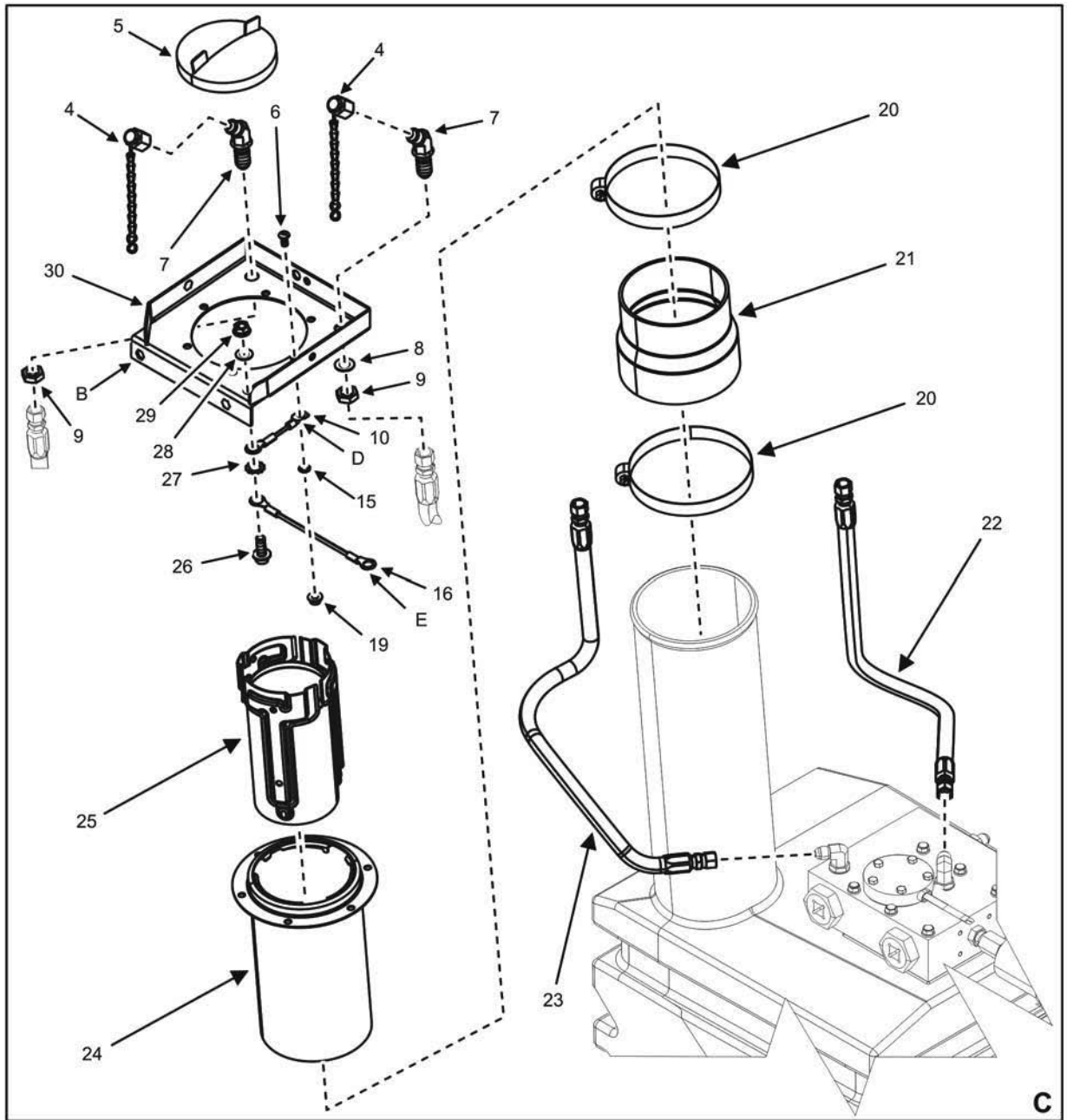


Figure 11. Fuel System Assembly (Sheet 3 of 6).

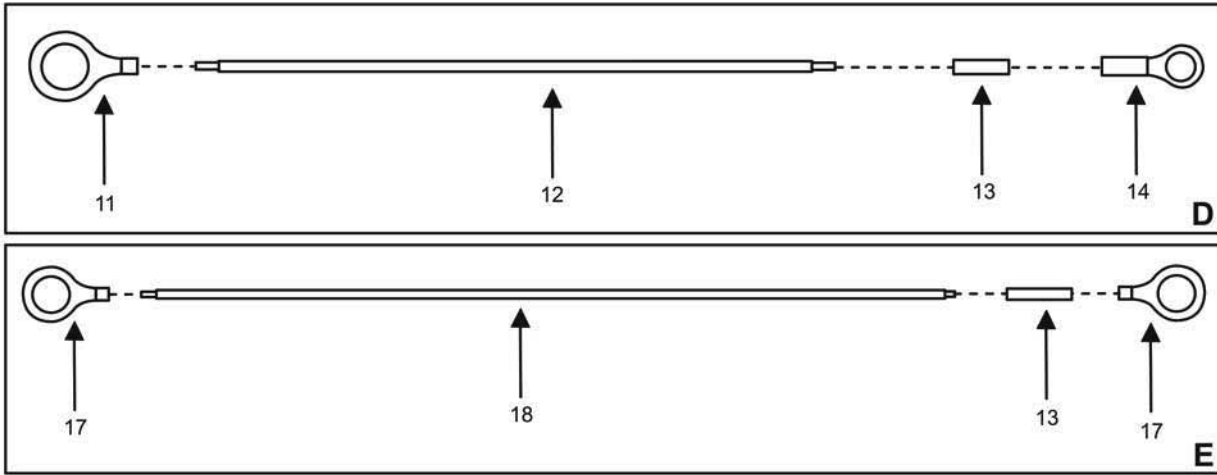


Figure 11. Fuel System Assembly (Sheet 4 of 6).

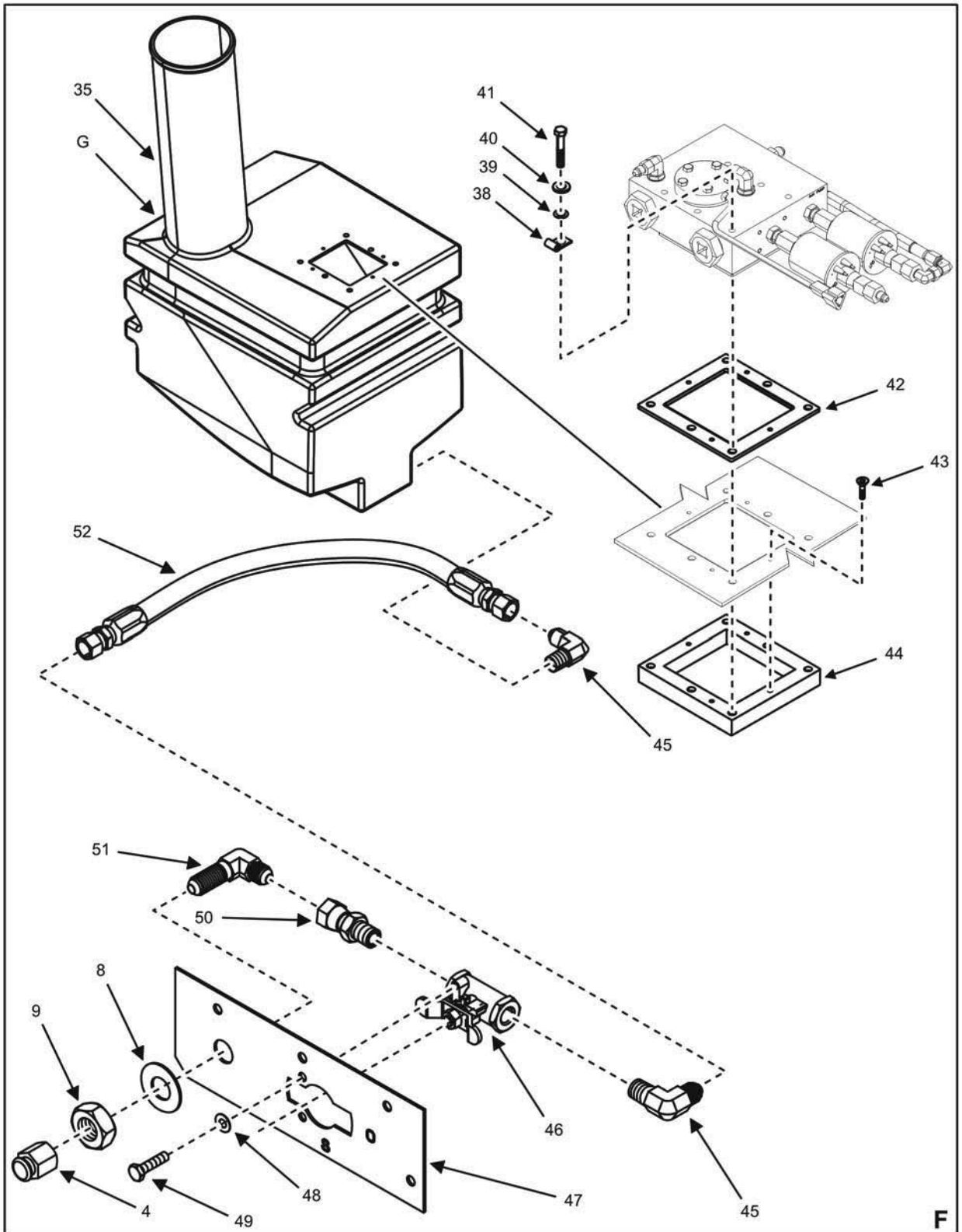


Figure 11. Fuel System Assembly (Sheet 5 of 6).

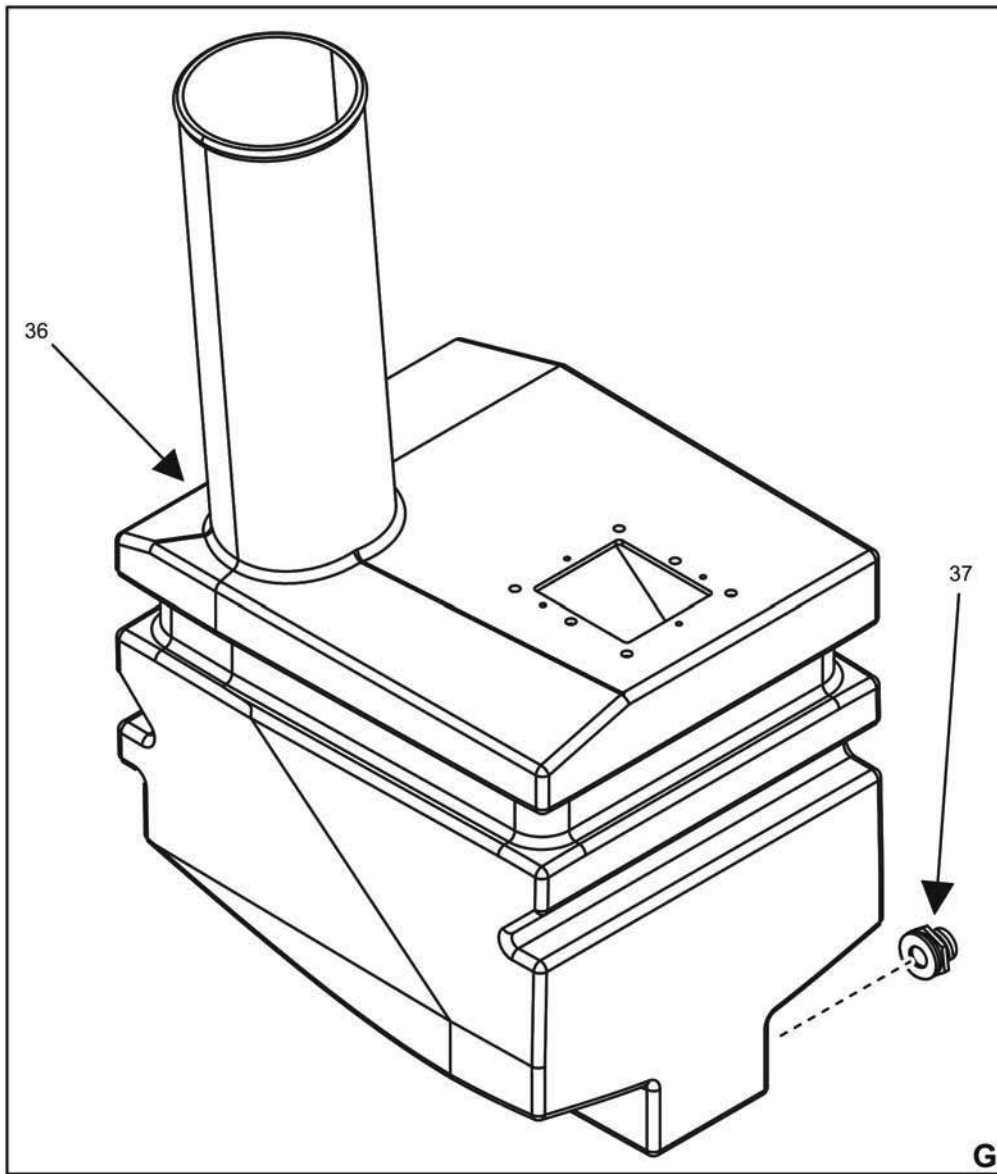


Figure 11. Fuel System Assembly (Sheet 6 of 6).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC NAVY			(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
							GROUP 07		
							FIG. 11 FUEL SYSTEM ASSEMBLY		
1	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20379	...FUEL SYSTEM ASSEMBLY 15KW (SEE SHEETS 2 - 6 FOR PARTS BREAKDOWN)	1
2	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20960	....BRACKET, MOUNTING	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030	....NUT, PLAIN, CLINCH	14
4	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-21043	....CAP, TUBE	3
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2590001419758	30554	88-20016	....CAP, FILLER OPENING	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN7380A2-M6X12	....SCREW, SOCKET HEAD BUTTON M6 X 1 X 12	6
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5145070801B	....ELBOW, FLANGE TO PIPE	2
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN126-M5	....WASHER, FLAT M5	4
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5145070118C	....NUT, HEX JAM 1/2-20 INCH	3
10	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21153-1	....LEAD, ELECTRICAL (SEE SHEET 4 FOR PARTS BREAKDOWN)	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015897807	00779	2-320577-3	.....TERMINAL, LUG	1
12	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-12-65	....STRAND, WIRE (MAKE FROM 3271-12-65 ON BULK ITEMS LIST CUT TO LENGTH 150MM +/- 25)	1
13	MFFZZ	MFFZZ	MFFZZ	MFFZZ		53421	TAG2T5-100B	....LAMINATE, LABEL COVER	2
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001139828	96906	MS25036-148	.....TERMINAL, LUG	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW13X250000GD5A 21	....WASHER, LOCK 1/4 EXTERNAL TOOTH	1
16	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21153-3	....LEAD, ELECTRICAL(SEE SHEET 4 FOR PARTS BREAKDOWN)	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015859913	00779	160300	.....LUG, TEMINAL	2
18	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-12-65	....STRAND, WIRE (MAKE FROM 3271-12-65 ON BULK ITEMS LIST CUT TO LENGTH 1920MM +/- 25)	1
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	....NUT, HEX FLANGE M6 X 1	6
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508F72	....CLAMP	2
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015893753	44940	04-21352	....COUPLING, HOSE	1
22	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-21439-19	....LINE, FUEL	1
23	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-21439-20	....LINE, FUEL	1

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
24	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20202	....MODULE, FUEL FILLER	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20203	....TUBE, FUEL FILL	1
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES01C375A00BS8A	....BOLT, HEX	
							11	HEAD 3/8-16 X 1	1
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW20M10C000DB8A	....WASHER, LOCK M10 EXTERNAL TOOTH	1
							31		
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014664926	30554	88-20564-14	....WASHER, FLAT	1
29	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014702044	30554	88-20568-3	....NUT, LOCK 3/8-16	1
30	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20838	....BRACKET, FUEL SYSTEM	1
31	XCFFF	XCFFF	XCFFF	XCFFF		44940	04-20614	....MANIFOLD, FUELING (SEE FIGURE 12 FOR PARTS BREAKDOWN)	1
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN931-M6X16	....SCREW, CAP, HEXAGON M6 X 1 X 16	8
33	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20959	....BRACKET	1
34	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20971	....SUPPORT, FUEL SYSTEM	1
35	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20356	....TANK (SEE SHEET 6 FOR PARTS BREAKDOWN)	1
36	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20502	....TANK, FUEL	1
37	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015890851	1DS87	P35900661	....CONNECTOR, HOSE, BULK	1
38	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340004256432	75272	C0V-0613Z1	....CLAMP, LOOP	1
39	PAFZZ	PAFZZ	PAFZZ	PAFZZ		4JMM9	RS6220	....WASHER, SEALING	6
40	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW25X266062GA6K	....WASHER-FLAT 1/4	6
41	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES07M06A070WB4A	....SCREW-HHC M6 X 1 X 70	6
42	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20536	....GASKET	1
43	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AESZAC190375WA1F	....SCREW, HEX HEAD 10-24 INCH X 3/8 INCH	2
44	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20535	....RETAINER, GASKET	1
45	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5975010963170	44940	SAEJ5145-4070202C	....FITTING, TUBE ELBOW	2
46	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4820015891015	93061	XV502P-4-04	....VALVE, BALL	1
47	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21387	....BRACKET, VALVE	1
48	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015894140	3A054	95395A250	....WASHER, FLAT, 1/2 INCH BRASS	2
49	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW25X266062GA6K	....SCREW, FLAT HEAD	2
							41		
50	PAFZZ	PAFZZ	PAFZZ	PAFZZ		98441	5-4 F6X-S	....ADAPTER, COUPLING	1
51	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015894365	93061	5 WETX-B	....CONNECTOR, BULKHEAD	1
52	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-21439-18	....LINE, FUEL	1
53	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0KMA3	A026G000	....SCREW, FLANGE HEAD M6 X 1 X 16	11

END OF FIGURE

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
FUEL MANIFOLD ASSEMBLY REPAIR PARTS LIST**

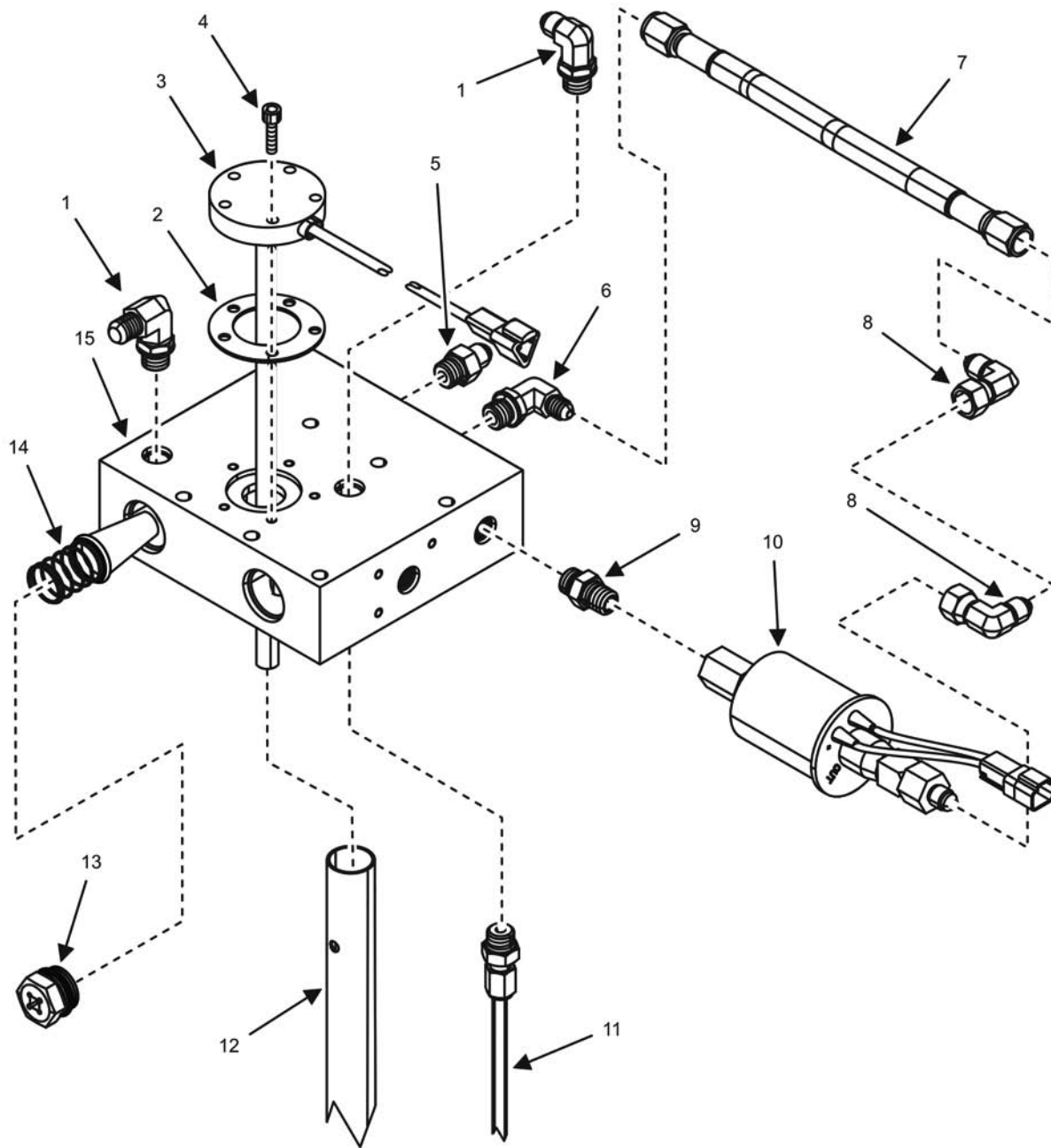


Figure 12. Fuel System Assembly (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0701	
								FIG. 12 FUEL SYSTEM ASSEMBLY	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5145- 6070220C	.....FITTING, TUBE ELBOW	2
2	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330015888942	42DK1	P-1403.1	.....GASKET	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		55752	FSCMN-03	.....SENSOR, FUEL LEVEL	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN931-M5X30	.....SCREW, HEX HEAD M5 X 0.8 X 30	5
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730012089235	81343	SAE J514 5-6 070120C	.....FITTING, CONNECTOR	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5144-6070220 C	.....FITTING, TUBE ELBOW	1
7	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20053	.....LINE, FUEL	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5975015906706	44940	SAEJ5144070221C	.....FITTING, ELBOW	2
9	XAFZZ	XAFZZ	XAFZZ	XAFZZ	5975008330508	44940	SAEJ5146- 4080102C	.....FITTING, CONNECTOR	2
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4320015870865	71425	0149-2769	.....PUMP, FUEL, ELECTRIC	2
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20622	.....TUBE, FUEL	2
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20613	.....PIPE, FUEL	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20406	.....PLUG, THREADED	2
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20618	.....STRAINER, FUEL	2
15	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20534	.....MANIFOLD, FUEL	1
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
FUEL FILTER/WATER SEPARATOR ASSEMBLY REPAIR PARTS LIST**

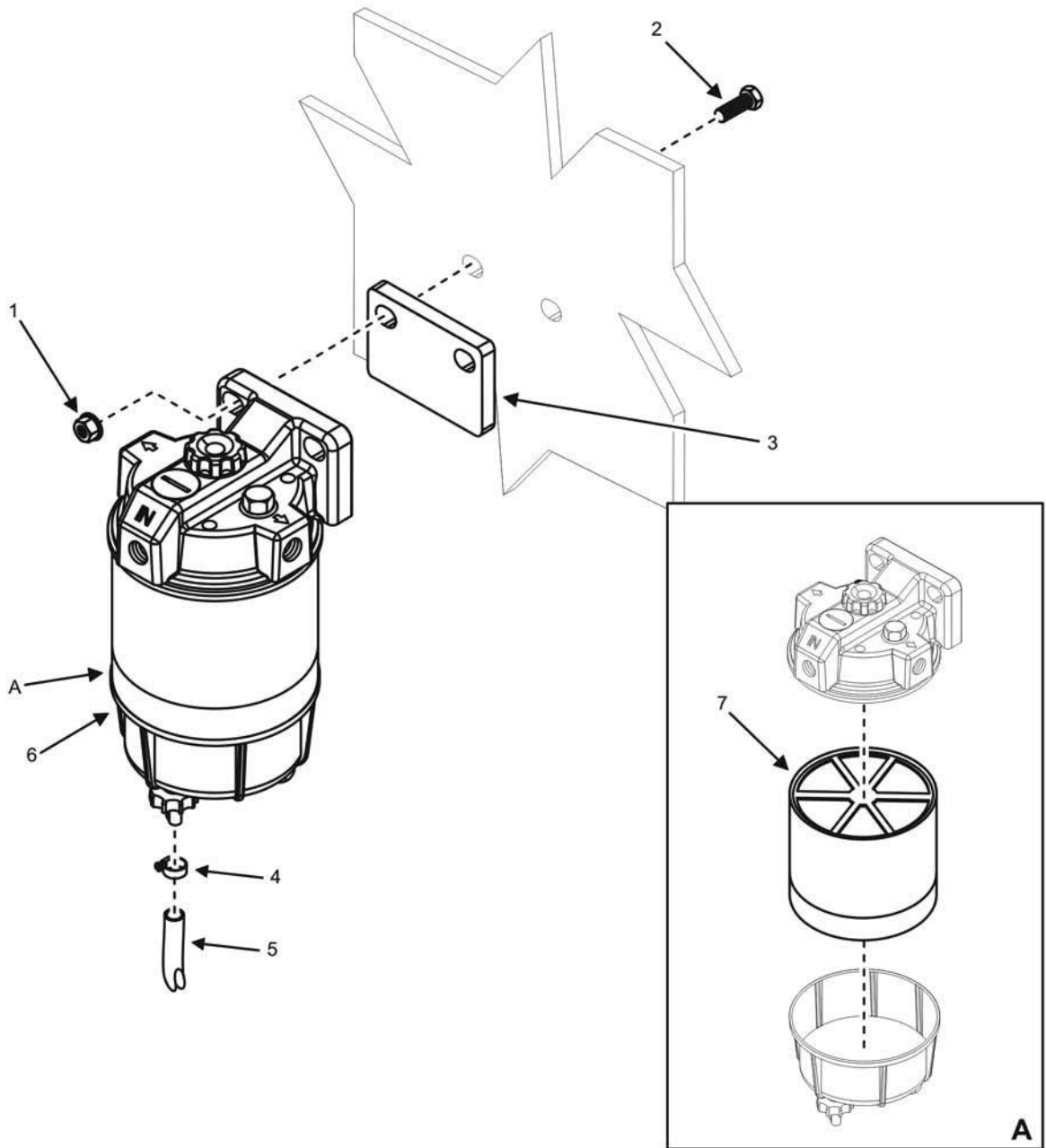


Figure 13. Fuel Filter/Water Separator Assembly (Sheet 1 of 3).

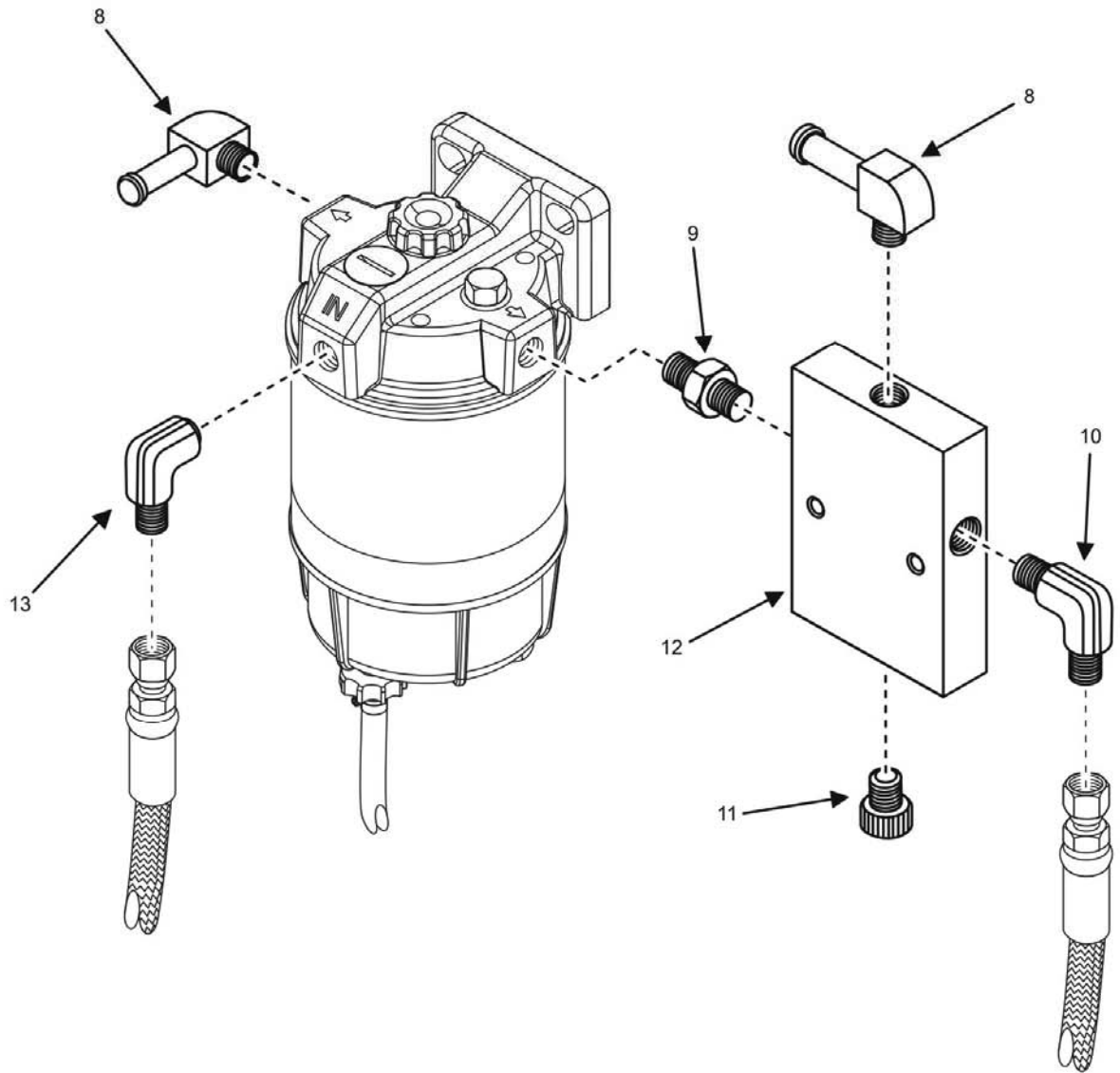


Figure 13. Fuel Filter/Water Separator Assembly (Sheet 2 of 3).

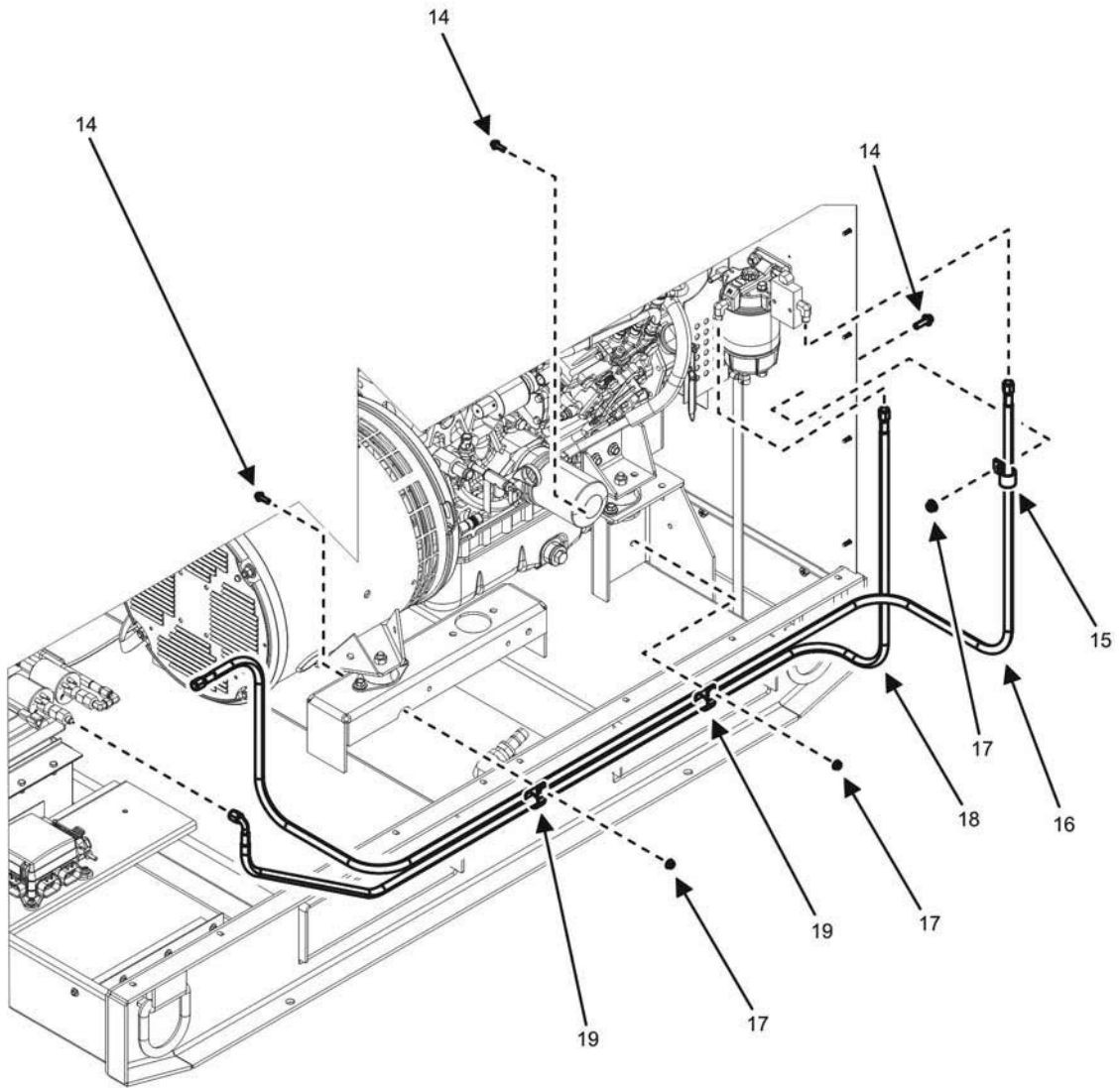


Figure 13. Fuel Filter/Water Separator Assembly (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0702	
								FIG. 13 FUEL FILTER/WATER SEPARATOR ASSEMBLY	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M10	..NUT, HEX FLANGE M10 X 1.5	2
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M10C030WB4K 42	..SCREW	2
3	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21504	..SPACER	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730008716729	61424	6202	..CLAMP, HOSE	1
5	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4720015893798	44940	04-21485	..HOSE, FUEL (MAKE FROM 42190109 ON BULK ITEMS LIST CUT TO 500 MM +/- 10)	1
6	PAFFF	PAFFF	PAFFF	PAFFF	4930011741451	55752	215R2	..SEPARATOR, FUEL-WATER	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2940015880924	55752	R15S	..FILTER, ELEMENT	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		93061	Q269HB-5-4	..FITTING, HOSE BARB	2
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5144-4140137 C	..NIPPLE, PIPE	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5975010963170	44940	SAEJ5145-4070202 C	..FITTING, TUBE ELBOW	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5144140109C	..PLUG, PIPE	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20884	..MANIFOLD, ASSEMBLY, FUEL	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5144-4070202 C	..ADAPTER, PIPE	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B025WB4K 42	..SCREW, HEX FLANGE HEAD M8 X 1.25 X 25	3
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340004044101	75272	COV1313	..CLAMP, LOOP	1
16	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-21439-10	..LINE, FUEL	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M8	..NUT, HEX FLANGE M8 X 1.25	3
18	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-21439-9	..LINE, FUEL	1
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340004044100	75272	COV2113	..CLAMP, LOOP	2
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
OUTPUT BOX INSTALLATION REPAIR PARTS LIST**

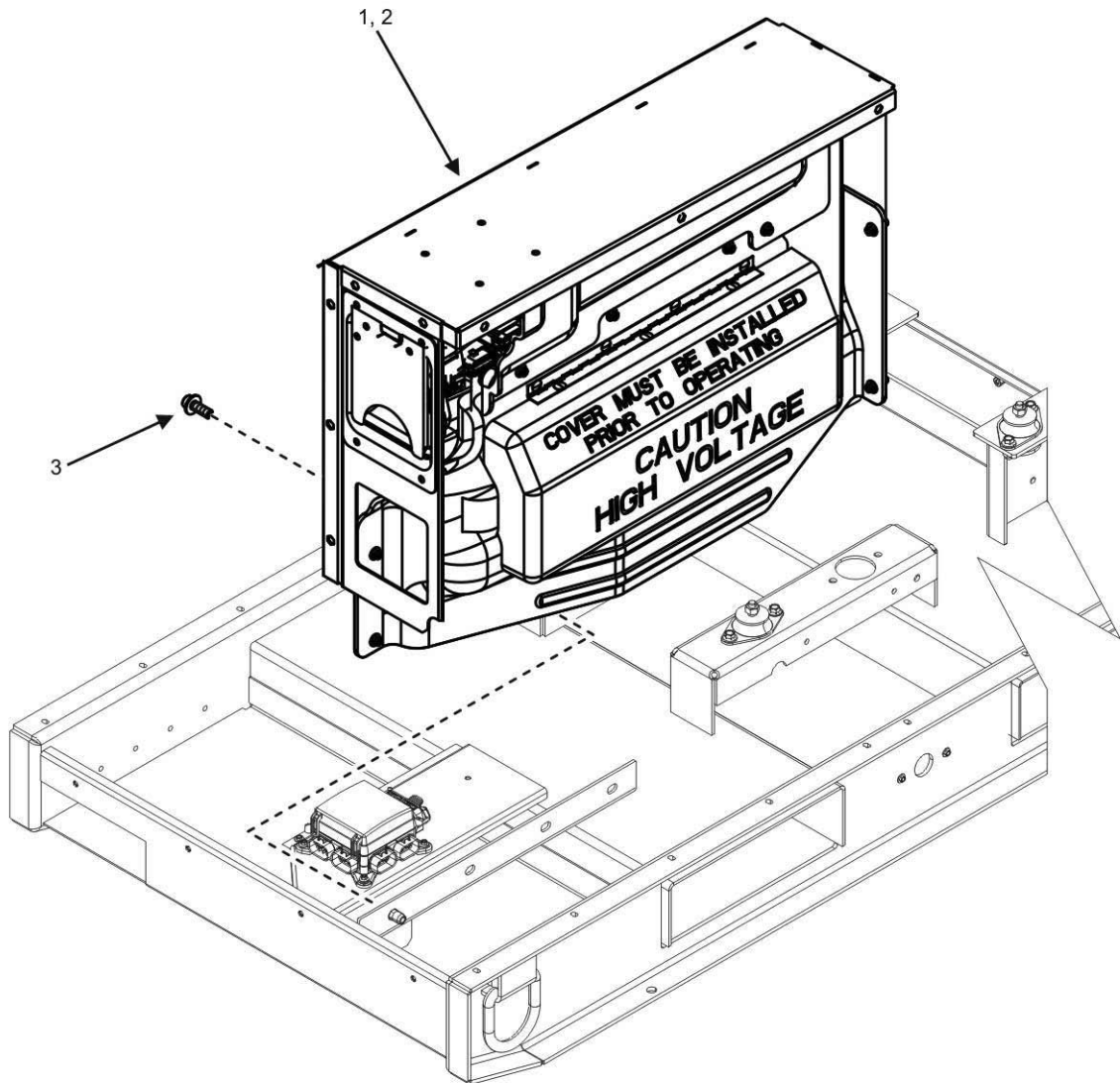


Figure 14. Output Box Installation (Sheet 1 of 2).

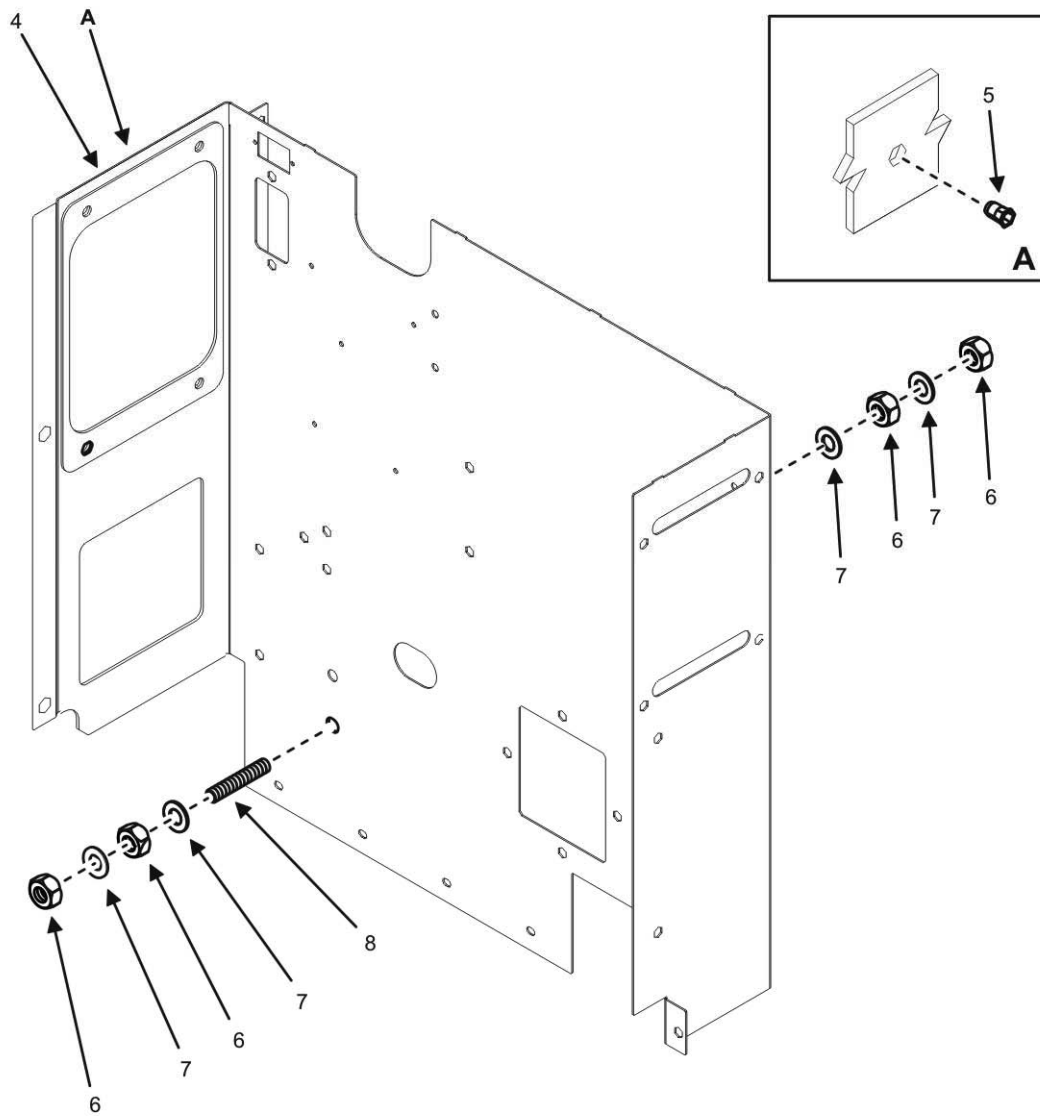


Figure 14. Output Box Installation (Sheet 2 of 2).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC NAVY FORCE			(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
							GROUP 08		
							FIG. 14 OUTPUT BOX INSTALLATION		
1	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20456-3	...OUT PUT BOX ASSEMBLY (SEE FIGURES 15 – 21 FOR PARTS BREAKDOWN) UOC: 98J	1
2	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20456-4	...OUT PUT BOX ASSEMBLY (SEE FIGURES 15 – 21 FOR PARTS BREAKDOWN) UOC: 98K	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		OKMA3	A026G000	...SCREW	7
4	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20634	...PANEL, OUT PUT BOX	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030	....NUT, PLAIN, CLINCH	36
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEN15M10C000WA2A A1	....NUT, HEX (M10X1.5)	4
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW20X010000BD8A 21	....WASHER, LOCK M10 EXTERNAL STAR	4
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5307015884044	44940	04-21292	....STUD, PLAIN (M10X1.5X55)	1
							END OF FIGURE		

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
CONTACTOR REPAIR PARTS LIST**

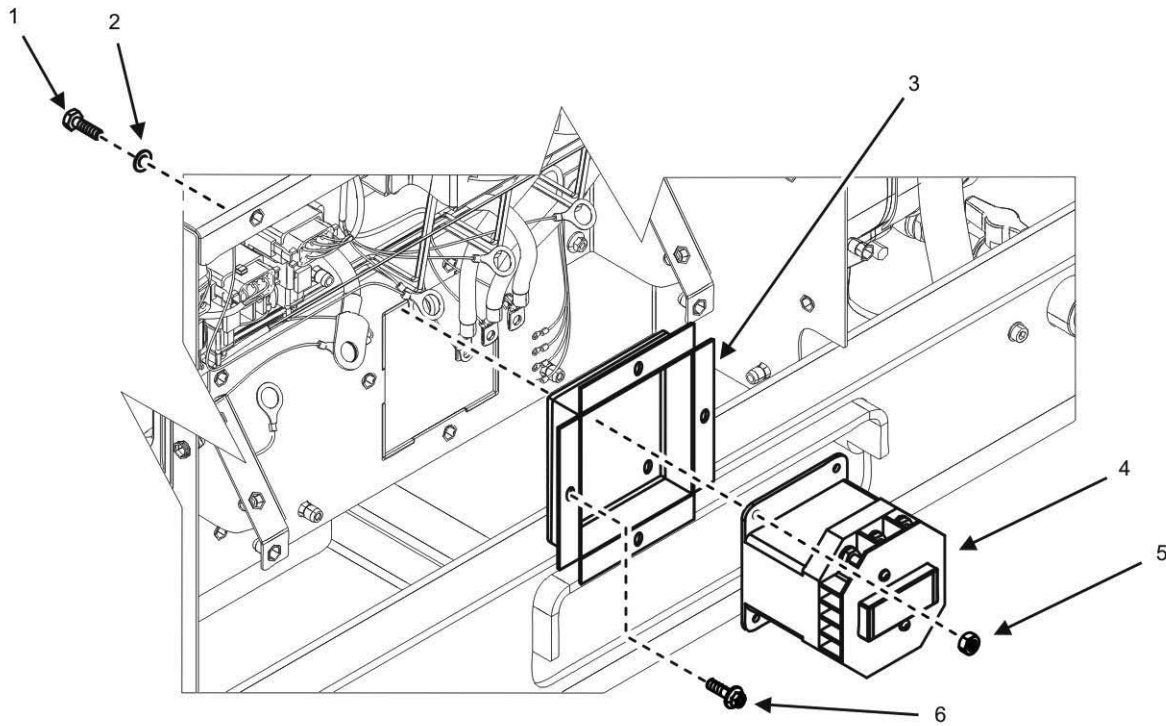


Figure 15. Contactor (Sheet 1 of 3).

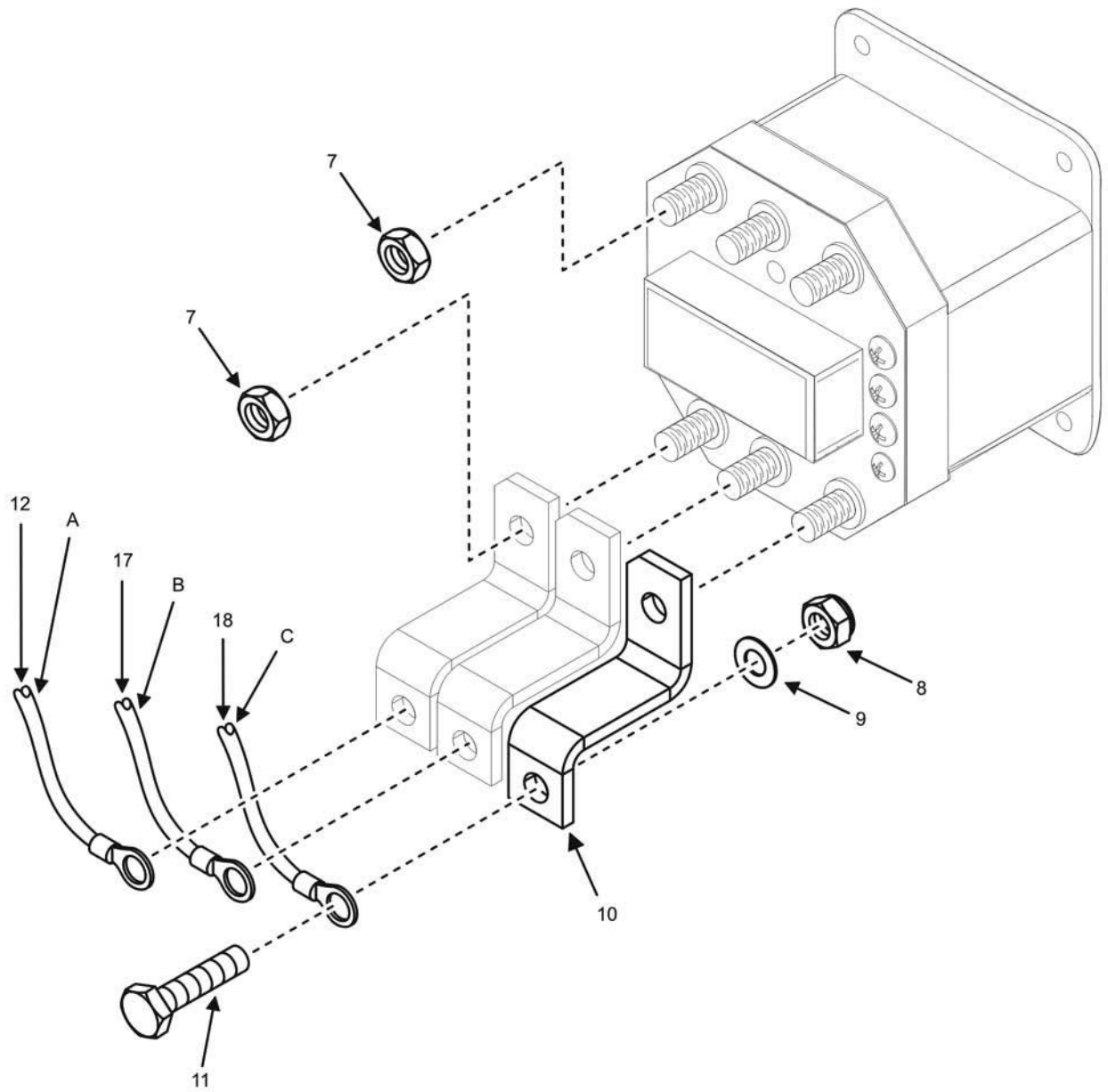


Figure 15. Contactor (Sheet 2 of 3).

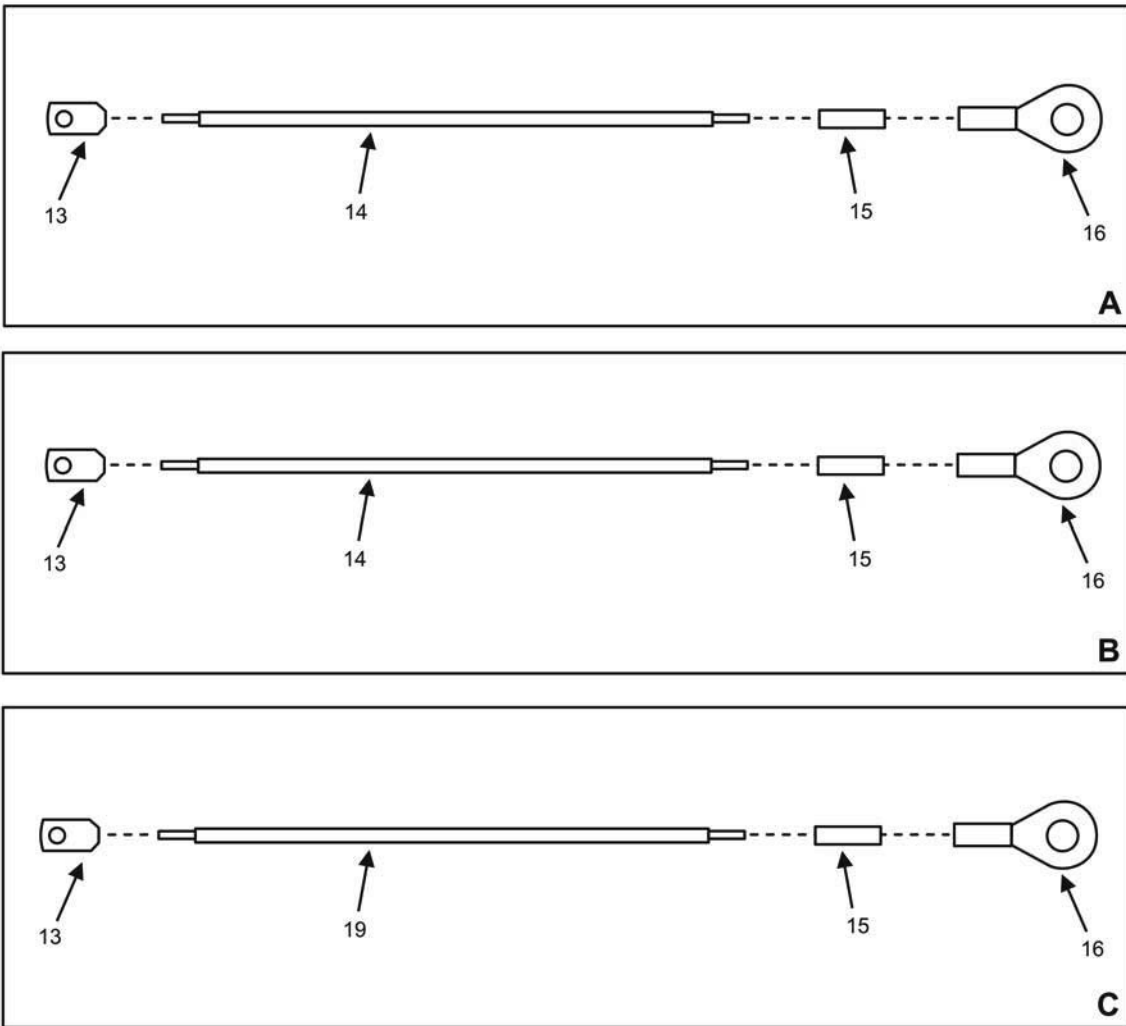


Figure 15. Contactor (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0801	
								FIG. 15 CONTACTOR	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN931-M4X16	....SCREW, HEX HEAD	4
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014849183	1KWT0	085295	....WASHER, FLAT M4	4
3	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21377	....PANEL OUTPUT BOX	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		01XD4	CT150E24E2S	....CONTACTOR, ELECTRICAL	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M4	....NUT, HEX FLANGE M4 X 0.	4
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A020WB4K42	....SCREW, HEX HEAD FLANGE M6 X 1 X 20	4
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEN12F250000CH2A31	....NUT, HEX 1/4-28 6	6
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		1MMD1	M6CNNEBR/985	....NUT, LOCK, M6 BRASS	3
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW25X266031UB5A11	....WASHER, FLAT	6
10	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21357	....BUSBAR, LOAD CONTACTOR	3
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES07M06A018UB5A11	....SCREW, HEX HEAD M6 X 16	3
12	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20275	....LEAD, ELECTRICAL K1 TO L1 (SEE SHEET 3 FOR PARTS BREAKDOWN)	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940005045877	00779	36808	....TERMINAL, LUG M6, 6 AWG	3
14	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-6-133	.... STRAND, WIRE (MAKE FROM 3271-6-133 ON BULK ITEMS LIST CUT TO LENGTH 208MM + 25)	2
15	MFFZZ	MFFZZ	MFFZZ	MFFZZ		53421	TAG9T3-100B	....LAMINATE, LABEL COVER	3
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940008990260	00779	321598	....TERMINAL, LUG M12, 6 AWG	3
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20276	....LEAD, ELECTRICAL K2 TO L2 (SEE SHEET 3 FOR PARTS BREAKDOWN)	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20277	....LEAD, ELECTRICAL K3 TO L3 (SEE SHEET 3 FOR PARTS BREAKDOWN)	1

(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
19	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-6-133		.....STRAND, WIRE (MAKE FROM 3271-6- 133 ON BULK ITEMS LIST CUT TO LENGTH 243 MM + 25)	1
END OF FIGURE										

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
OUTPUT TERMINAL BOARD REPAIR PARTS LIST**

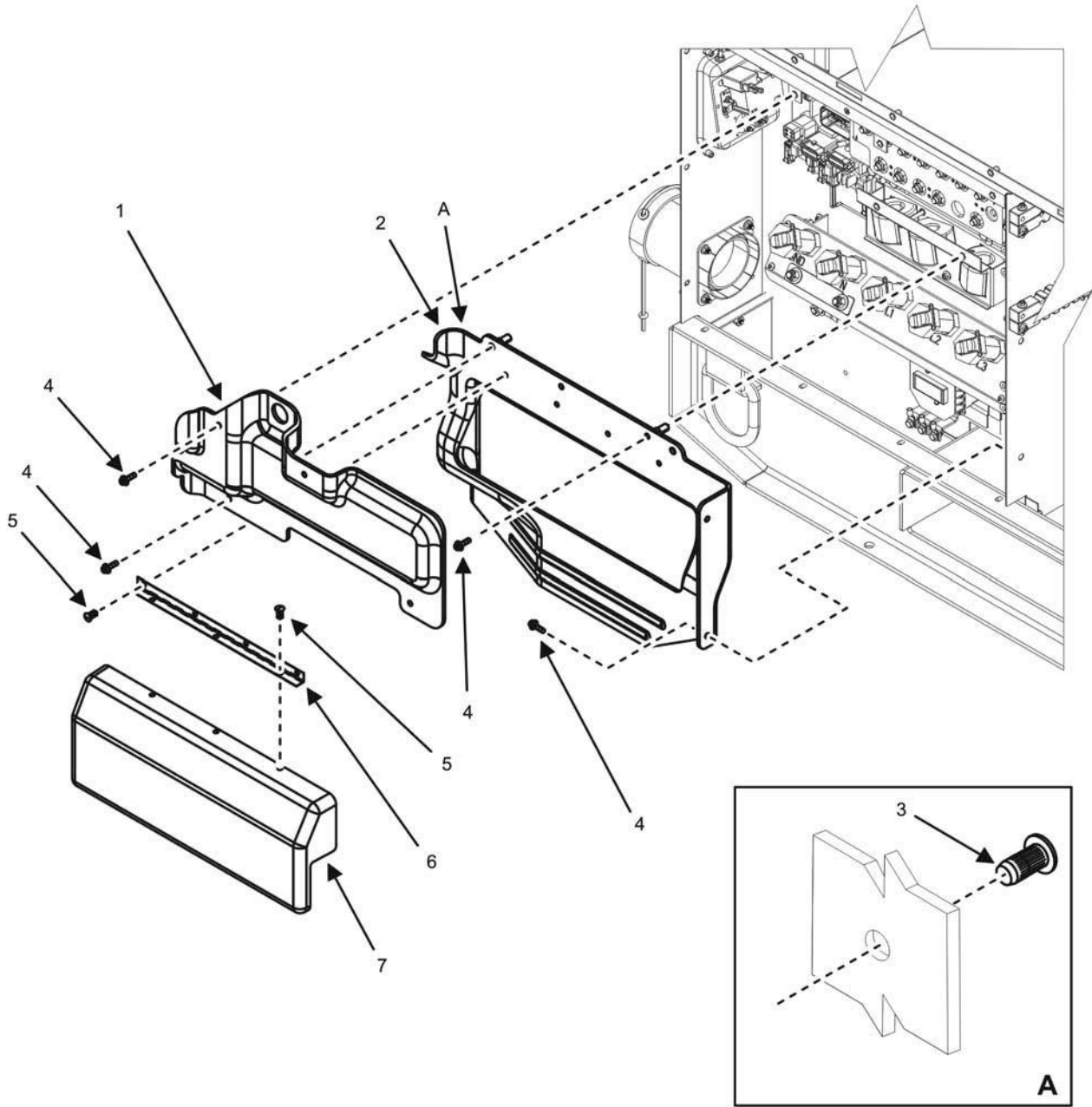


Figure 16. Output Terminal Board (Sheet 1 of 3).

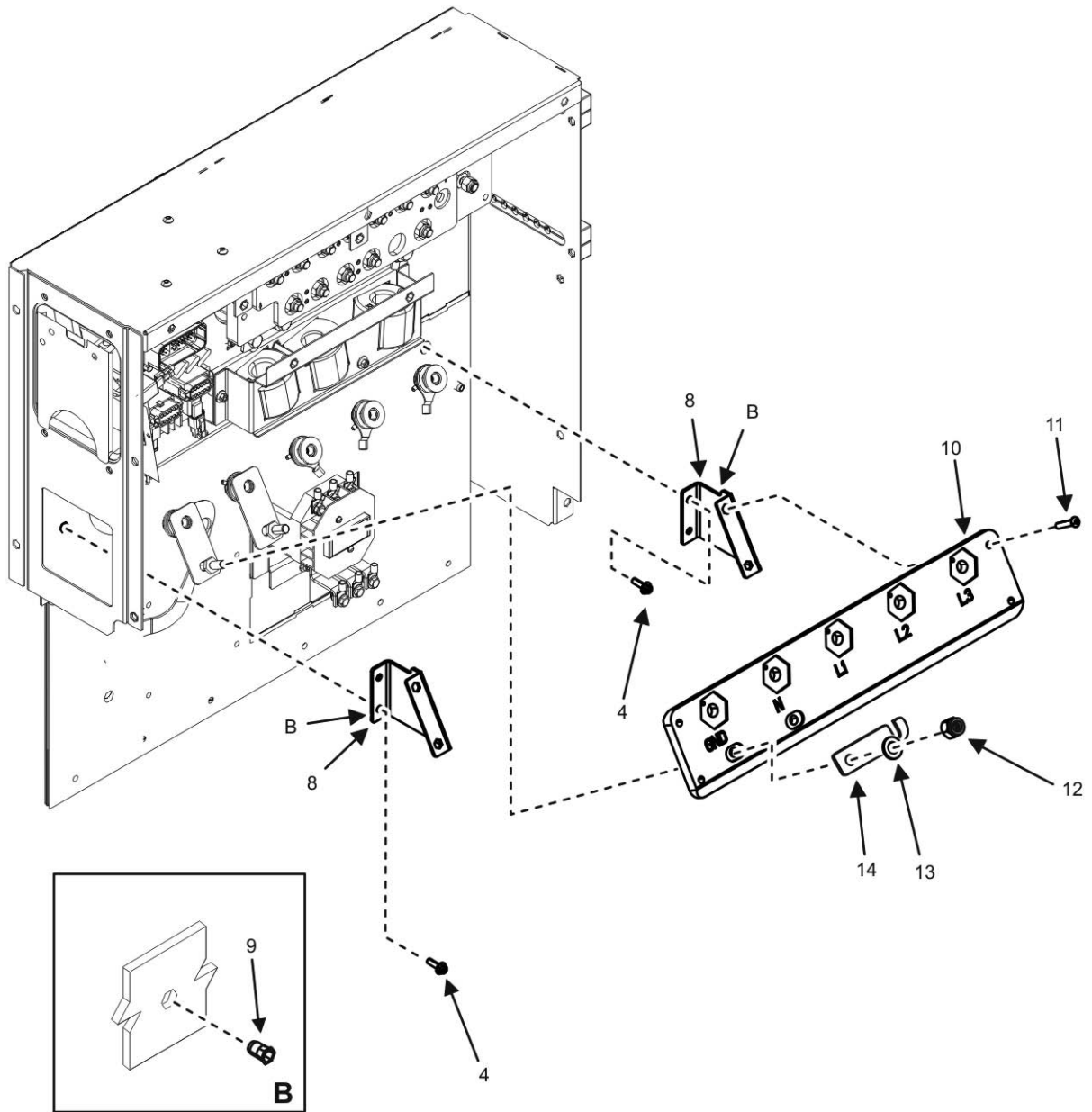


Figure 16. Output Terminal Board (Sheet 2 of 3).

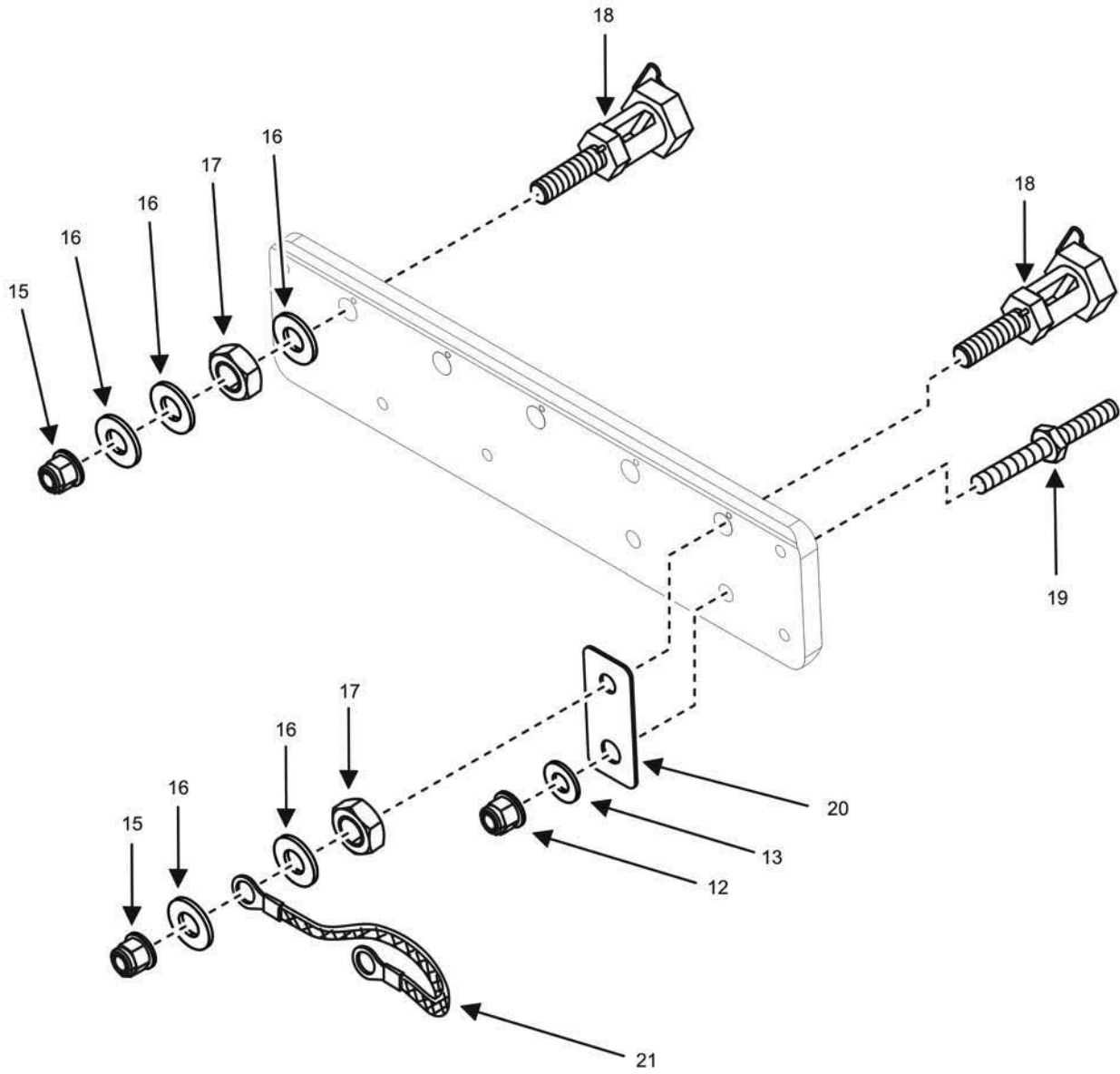


Figure 16. Output Terminal Board (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
GROUP 0802									
FIG. 16 OUTPUT TERMINAL BOARD									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21252	.....GUARD, OUTPUT BOX	1
2	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-21251	.....GUARD, OUTPUT BOX	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5325015851529	78276	ALS4-610-6.6	.....INSERT, THREADED	2
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A020WB4K 42	.....SCREW, HEX FLANGE HEAD M6 X 1 X 20	14
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015897994	09772	354-310102-00	.....CLIP	7
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20364	.....HINGE, DOOR SHIELD	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21253	.....DOOR, ACCESS	1
8	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20906	.....BRACKET, MOUNTING	2
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030	.....NUT, PLAIN, CLINCH	4
10	PBFZZ	PBFZZ	PBFZZ	PBFZZ		44940	04-20236	.....CONNECTION BOARD	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	B1834C06030N	.....SCREW, SOCKET HEAD BUTTON M6 X 1 X 30	4
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014702044	30554	88-20568-3	.....NUT, LOCK	4
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014664926	30554	88-20564-14	.....WASHER, FLAT	4
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20665	.....BUSBAR, NEUTRAL	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		1MMD1	50CNNESS	.....NUT, LOCK	5
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015894140	3A054	95395A250	.....WASHER, FLAT	15
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310001898467	30554	88-22336-1	.....NUT, PLAIN, HEXAGON	5
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940002372703	96906	MS39347-5	.....TERMINAL, STUD	5
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940010038579	30554	72-2236	.....TERMINAL, STUD	2
20	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20666	.....BUSBAR, GROUND	2
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6145015886489	5T0Q1	EM4H710	.....STRAP, GROUNDING	1
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
VOLTAGE SELECTION BOARD REPAIR PARTS LIST**

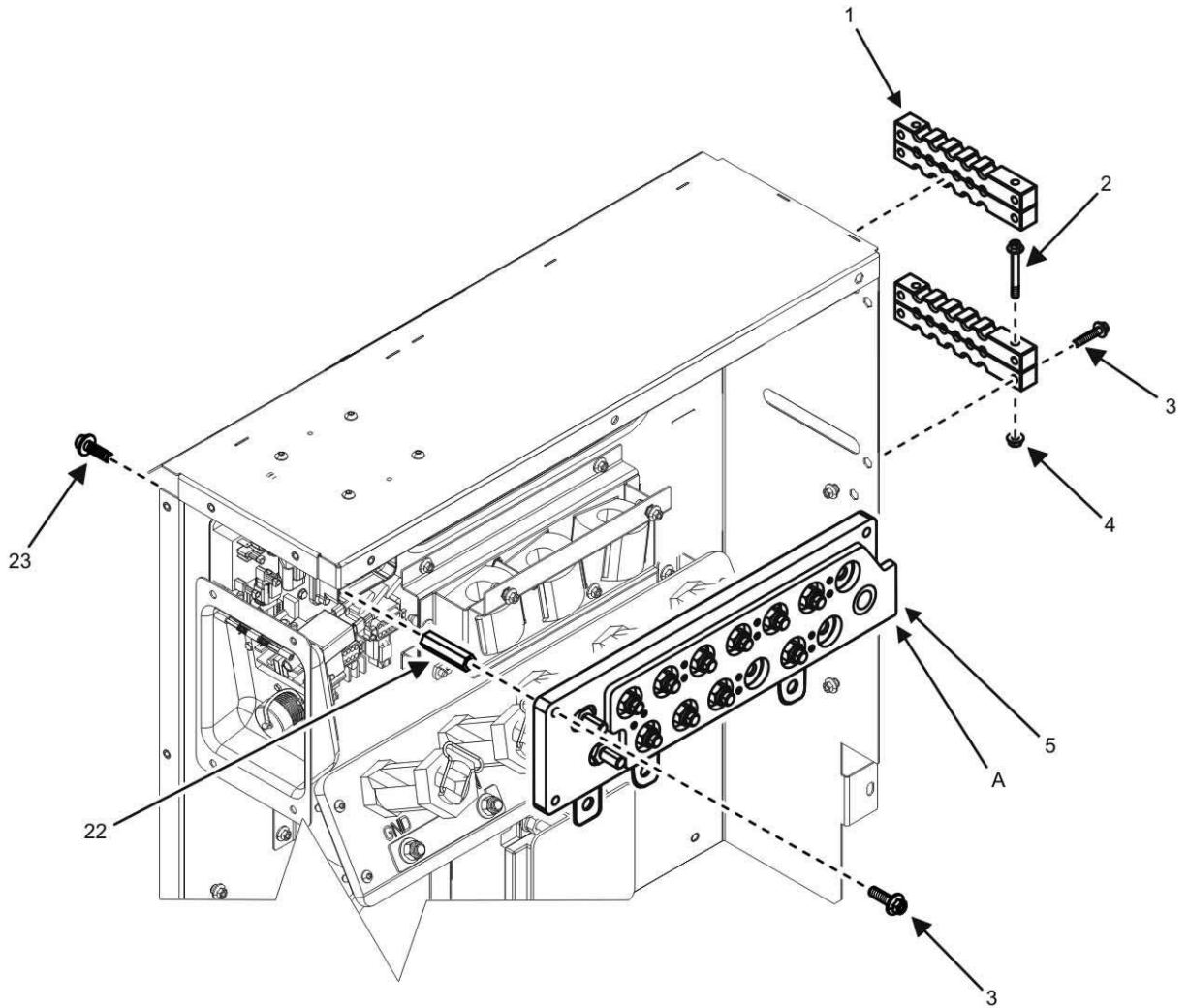


Figure 17. Voltage Selection Board (Sheet 1 of 6).

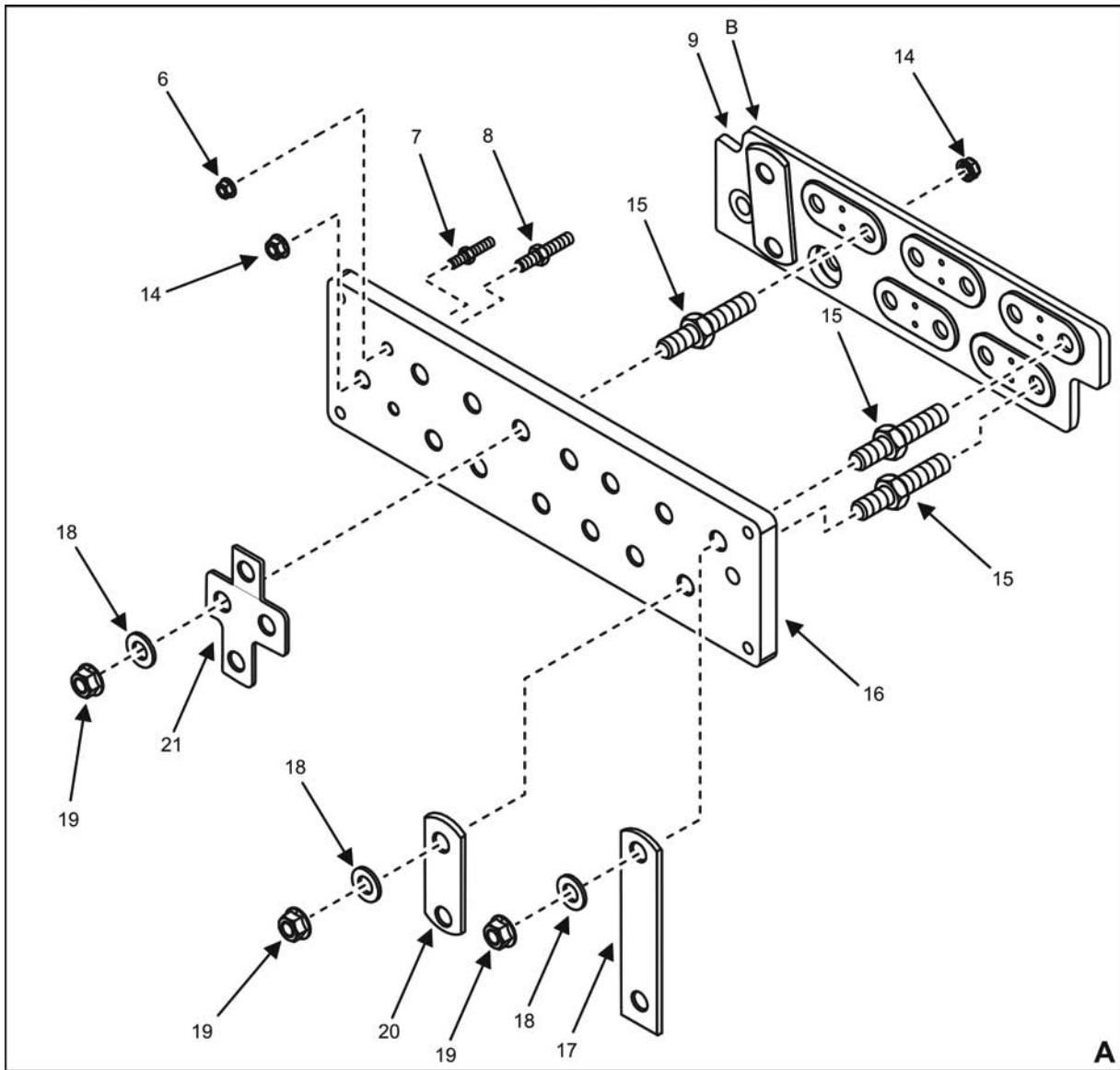


Figure 17. Voltage Selection Board (Sheet 2 of 6).

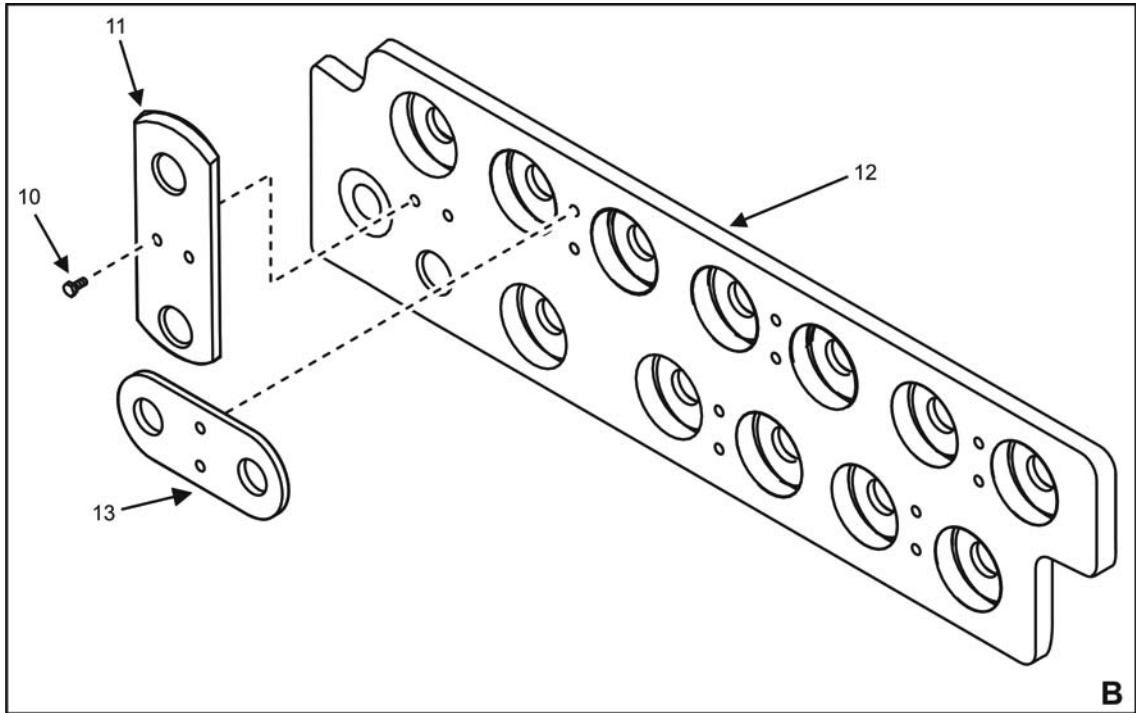


Figure 17. Voltage Selection Board (Sheet 3 of 6).

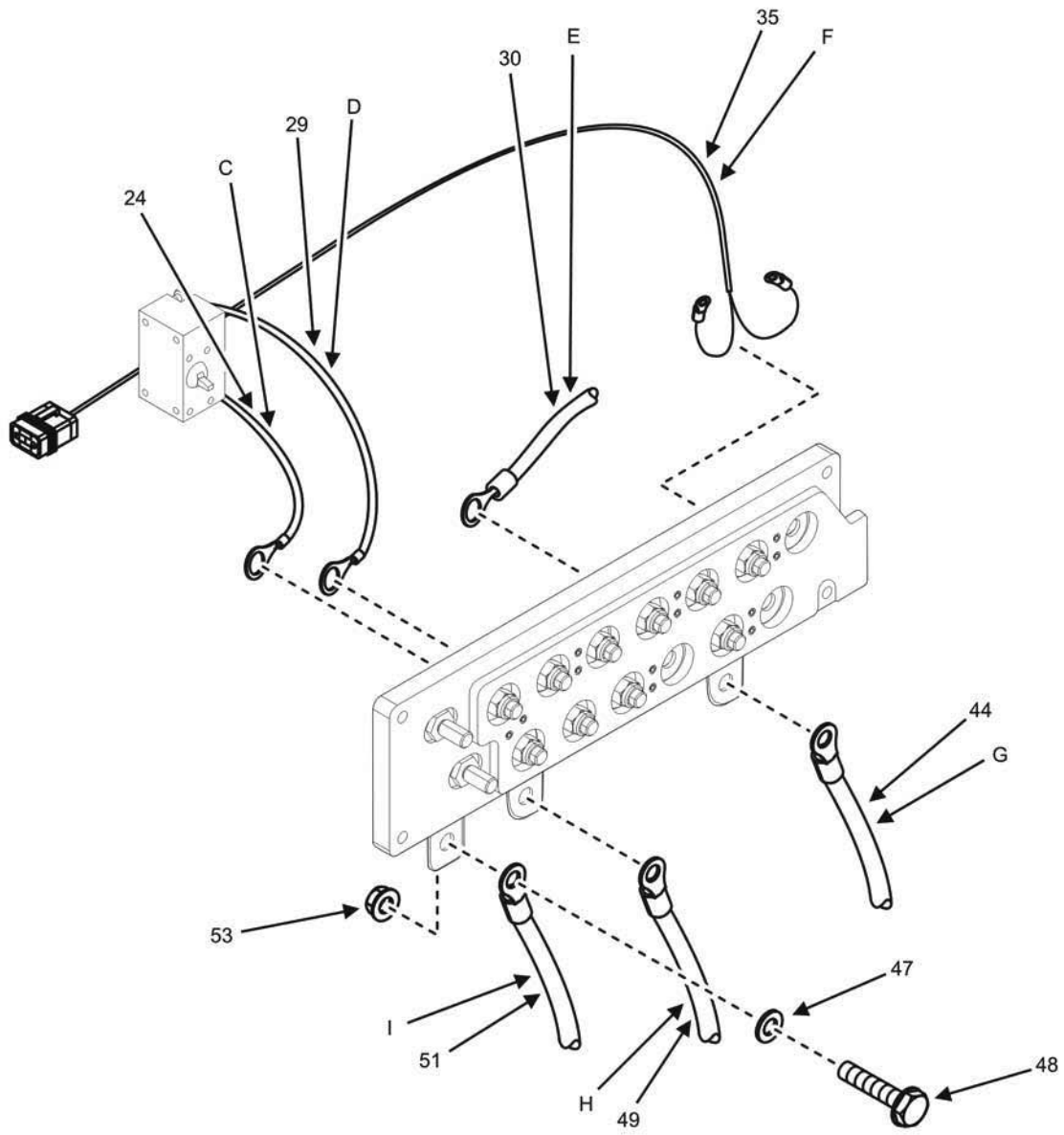


Figure 17. Voltage Selection Board (Sheet 4 of 6).

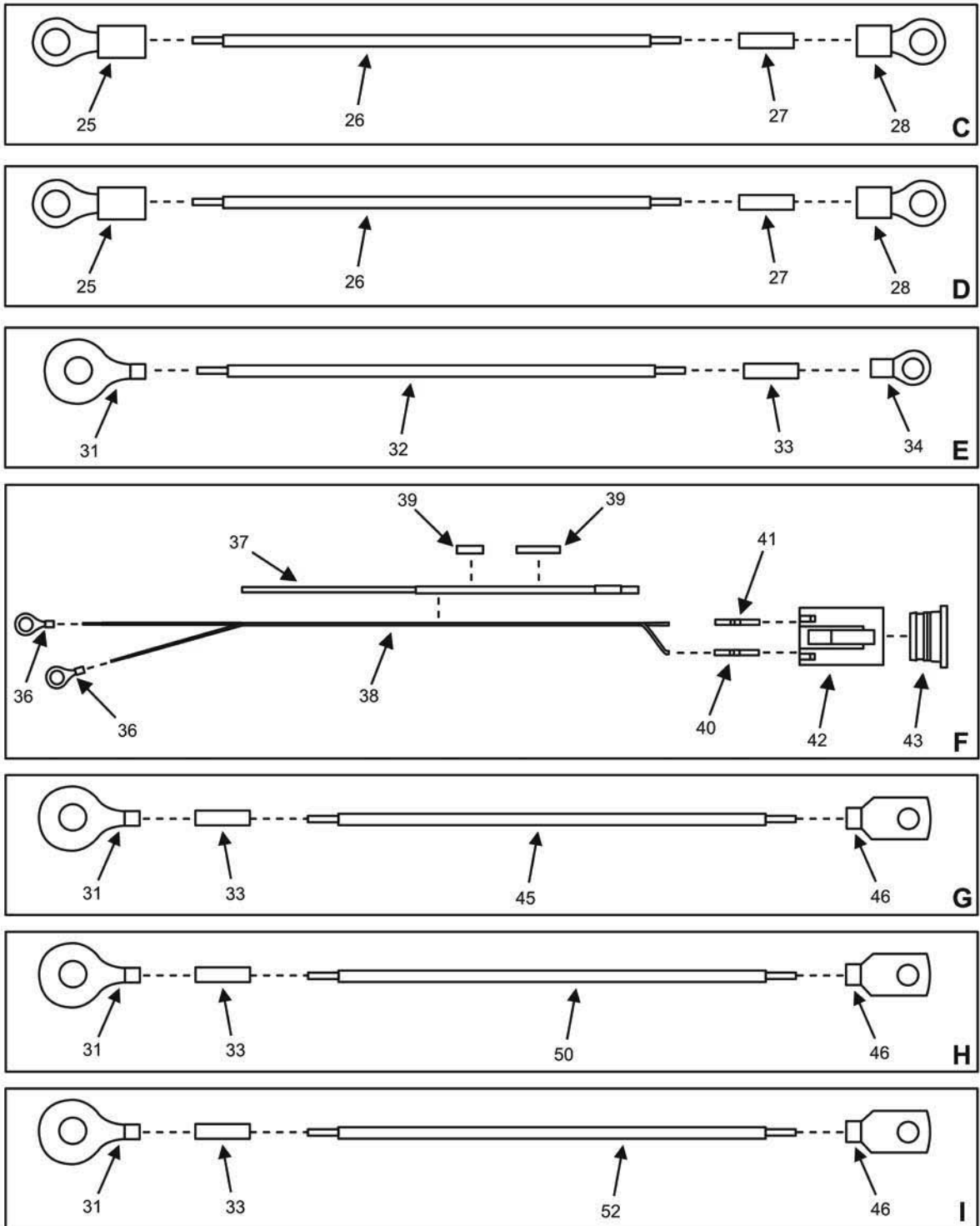


Figure 17. Voltage Selection Board (Sheet 5 of 6).

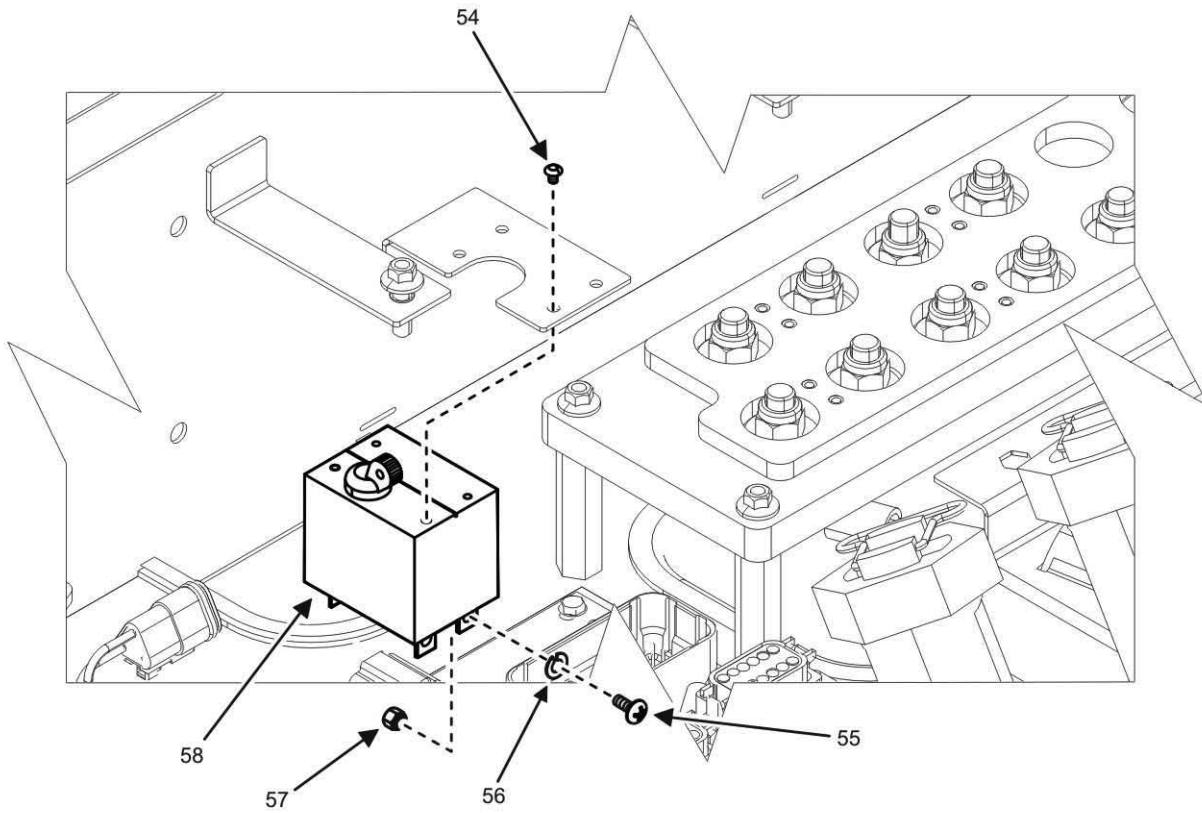


Figure 17. Voltage Selection Board (Sheet 6 of 6).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0803	
								FIG. 17 VOLTAGE SELECTION BOARD	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21481	....RETAINER, FINGER	4
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A050WB4K 42	....SCREW, HEX FLANGE HEAD M6 X 1 X 50	4
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A030WB4K 42	....SCREW, HEX FLANGE HEAD M6 X 1 X 30	8
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	....NUT, PAIN M6 X 1	4
5	PAFFF	PAFFF	AFFZZ	AFFZZ		44940	04-21444	....RECONNECTION BOARD	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEN04164000UC8A1	.....NUT, PLAIN, HEXAGON	2
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21446	.....STUD, PLAIN	2
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940010038579	30554	72-2236	.....TERMINAL, STUD	1
9	PAFFF	PAFFF	AFFZZ	AFFZZ		44940	04-20913	.....BOARD, RECONNECTION	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5325012707376	57771	A2672	.....EYELET, METALLIC	12
11	XAFZZ	XAFZZ	XAFZZ	XAFZZ		44940	04-21479	.....BUSBAR, COPPER	1
12	XAFZZ	XAFZZ	XAFZZ	XAFZZ		44940	04-21434	.....BOARD, RECONNECTION	1
13	XAFZZ	XAFZZ	XAFZZ	XAFZZ		44940	04-20787	.....BUSBAR, COPPER	5
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014702044	30554	88-20568-3	.....NUT, SELF-LOCKING	14
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21443	.....STUD, PLAIN	12
16	XBFZZ	XBFZZ	XBFZZ	XBFZZ	5940015907509	44940	04-21435	.....BOARD, RECONNECTION	1
17	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21494	.....BUSBAR, LOAD	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEWX26X19RUA2A11	..... WASHER, FLAT	18
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	M45913/1-010F BB	.....NUT, SELF-LOCKING	12
20	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21495	.....BUSBAR, LOAD	2
21	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21448	.....BUSBAR, COPPER	1
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20791	....SPACER, MOUNTING	4
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A020WB4K 42	....SCREW, HEX FLANGE HEAD M6 X 1 X 20	4
24	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-21496-2	....LEAD, ELECTRICAL S501 TO CB502 (UOC 98K ONLY)	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015860272	00779	2-36160-1	.....TERMINAL, RING #10, 16-14 AWG	2
26	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26	.....WIRE, STRANDED 16 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST CUT TO LENGTH)	2

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
27	MFFZZ	MFFZZ	MFFZZ	MFFZZ		53421	TAG2T5-100B	.....LAMINATE, LABEL COVER	2
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6150015894339	00779	2-324955-1	.....TERMINAL, RING #8/M4, 16-14 AWG	2
29	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-21496-1	.....LEAD, ELECTRICAL S501 TO CB502 (UOC 98K ONLY)	1
30	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-21347	.....LEAD, ELECTRICAL NEUTRAL	1
31	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940006886010	96906	MS20659-10	.....TERMINAL, RING 3/8, 6 AWG	4
32	MFFZZ	MFFZZ	MFFZZ	MFFZZ		OX4C9	3271-6-133	.....STRAND, WIRE (MAKE FROM 3271- 6-133 ON BULK ITEMS LIST CUT TO LENGTH 1042 MM + 25)	1
33	MFFZZ	MFFZZ	MFFZZ	MFFZZ		53421	TAG9T3-100B	.....LAMINATE, LABEL COVER	4
34	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940005045877	00779	36808	.....TERMINAL, RING M12, 6 AWG	1
35	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20901	.....HARNESSE, WIRING J503 TO S501	1
36	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940005494904	K1636	34108	.....TERMINAL, RING #8 INCH STUD, 22-16 AWG	2
37	MFFZZ	MFFZZ	MFFZZ	MFFZZ		3SXL3	EY-1877	.....INSULATION SLEEVING (MAKE FROM EY-1877 ON BULK ITEMS LIST CUT TO LENGTH AS NEEDED)	1
38	MFFZZ	MFFZZ	MFFZZ	MFFZZ		OX4C9	3271-20-10	.....STRAND, WIRE (MAKE FROM 3271- 20-10 ON BULK ITEMS LIST CUT TO LENGTH AS NEEDED)	1
39	MFFZZ	MFFZZ	MFFZZ	MFFZZ		53421	TAG26T6-100B	.....LAMINATE, LABEL	2
40	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012036687	11139	2ER654	.....CONTACT, ELECTRICAL	2
41	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935011741235	11139	114017	.....PLUG, END SEAL, ELECTRICAL	2
42	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014846537	11139	DT06-4S	.....CONNECTOR, PLUG, ELECTRICAL	1
43	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014830852	11139	W4S	.....CONNECTOR, RECEPTACLE	1
44	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20280	.....LEAD, ELECTRICAL K3 TO T3 SEE	1

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
45	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-6-133	.....WIRE, STRANDED (MAKE FROM 3271-6-133 ON BULK ITEMS LIST CUT TO LENGTH 300 MM + 25)	1
46	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940008990260	00779	321598	.....TERMINAL, RING M6, 6 AWG	3
47	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014664926	30554	88-20564-14	....WASHER, FLAT 3/8	3
48	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES01C375A00BS8A 11	....BOLT, MACHINE	3
49	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20279	....LEAD, ELECTRICAL K2 TO T2	1
50	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-6-133	.....WIRE, STRANDED (MAKE FROM 3271-6-133 ON BULK ITEMS LIST CUT TO LENGTH 296 MM + 25)	1
51	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20278	....LEAD, ELECTRICAL K1 TO T1	1
52	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-6-133	.....WIRE, STRANDED (MAKE FROM 3271-6-133 ON BULK ITEMS LIST CUT TO LENGTH 302 MM + 25)	1
53	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014702044	30554	88-20568-3	.....NUT, LOCK 3/8- 16 UNC-28	4
54	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES46M30540MWA3A 41	....SCREW, BUTTON HEAD SOCKET M3 X 0.5 X 4 (UOC 98K ONLY)	4
55	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES07M06A018UB5A 11	....SCREW, HEX HEAD M6 X 16	1
56	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW13X25000GD5A 21	....WASHER, LOCK	1
57	PAFZZ	PAFZZ	PAFZZ	PAFZZ		1MMD1	M6CNNEBR/985	....NUT, SELF- LOCKING	1
58	PAFFF	PAFFF	PAFFF	PAFFF	6150015900171	81541	IUG66-1-43-10.0-AB-01	....CIRCUIT BREAKER (UOC 98K ONLY)	1
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
HOUR METER REPAIR PARTS LIST**

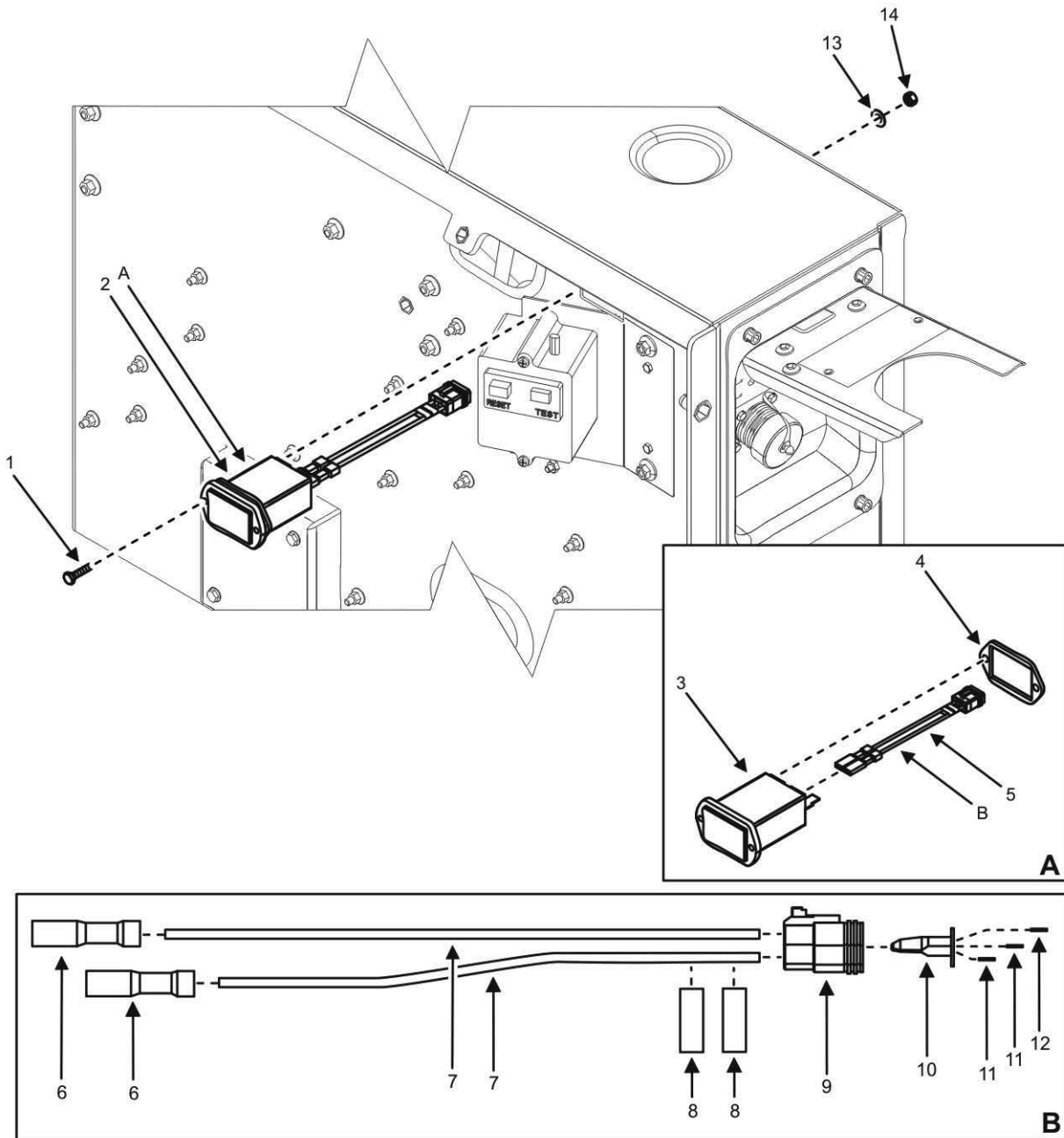


Figure 18. Hour Meter (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0804	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN933-M3X16	FIG. 18 HOUR METER....SCREW, HEX HEAD M3 X 0.5	2
2	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20232	....HOUR METER ASSEMBLY	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6645013929615	74400	85094-12	....METER, TIME	1
4	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330015894667	74400	81683	....GASKET	1
5	PAFFF	PAFFF	PAFFF	PAFFF	6150015860411	44940	04-20453	....WIRING HARNES	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015860213	30554	88-20275-3	..... TERMINAL, DISCONNECT	2
7	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26	.....WIRE, STRANDED 16 AWG (MAKE FROM 3271- 16-26 ON BULK ITEMS LIST CUT TO LENGTH 172.3MM +/-3)	1
8	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG2T5-100B	.....LAMINATE, LABEL	2
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015238855	11139	DT06-3S	.....CONNECTOR, PLUG 3 PIN	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935011741235	11139	114017	.....PLUG, END SEAL, ELECTRICAL SIZE 12, 16	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012036687	45152	2ER654	.....CONTACT, ELECTRICAL	2
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014708342	11139	W3S	.....POLARIZING KEY, ELECTRICAL	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310993711050	KE489	DIN 125 M3	....WASHER, FLAT M3	2
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310992501842	U5503	0301-0003	....NUT, HEX M3 X 0.5	2
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
CONVENIENCE RECEPTACLE ASSEMBLY REPAIR PARTS LIST**

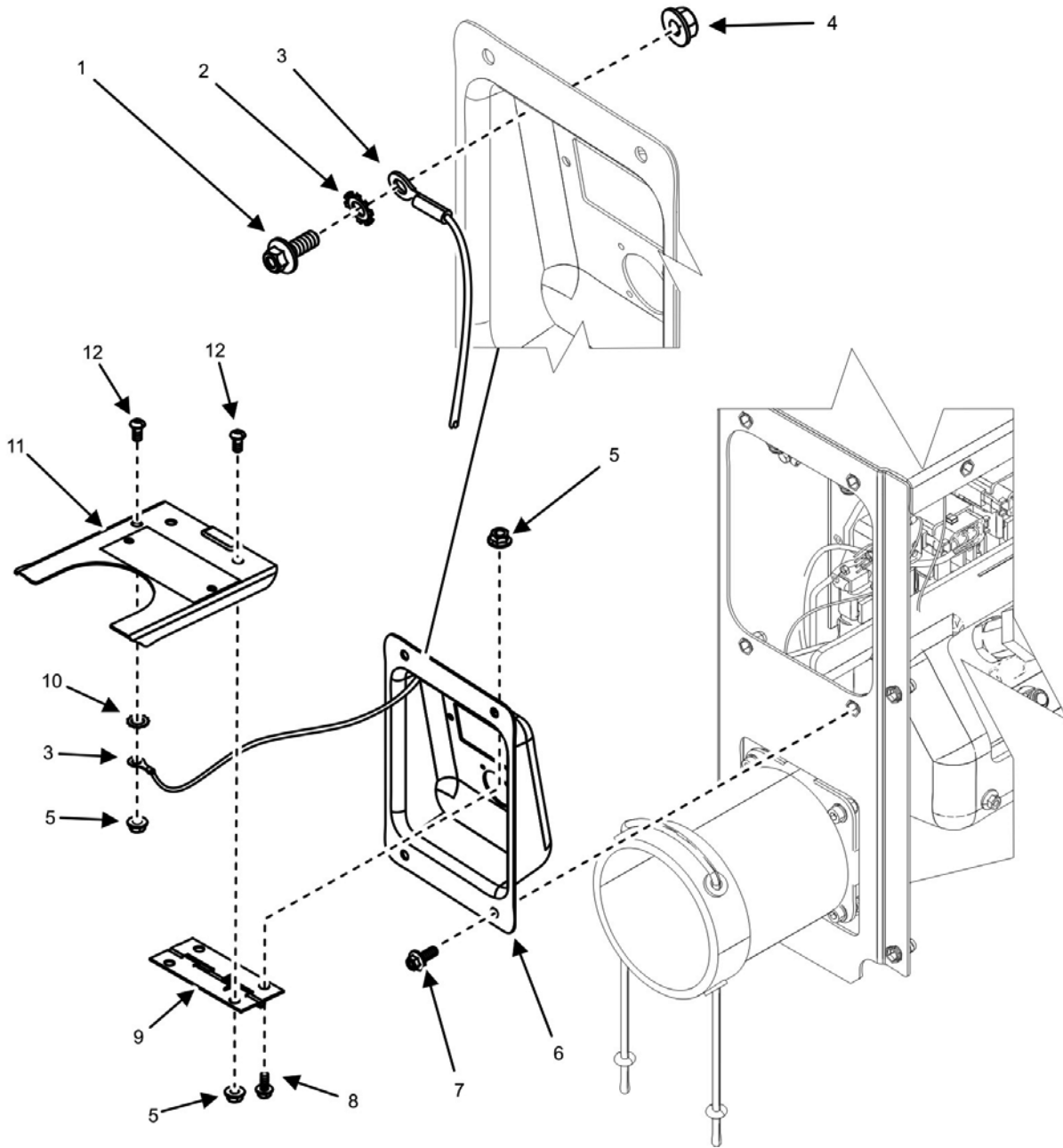


Figure 19. Convenience Receptacle Assembly (Sheet 1 of 7).

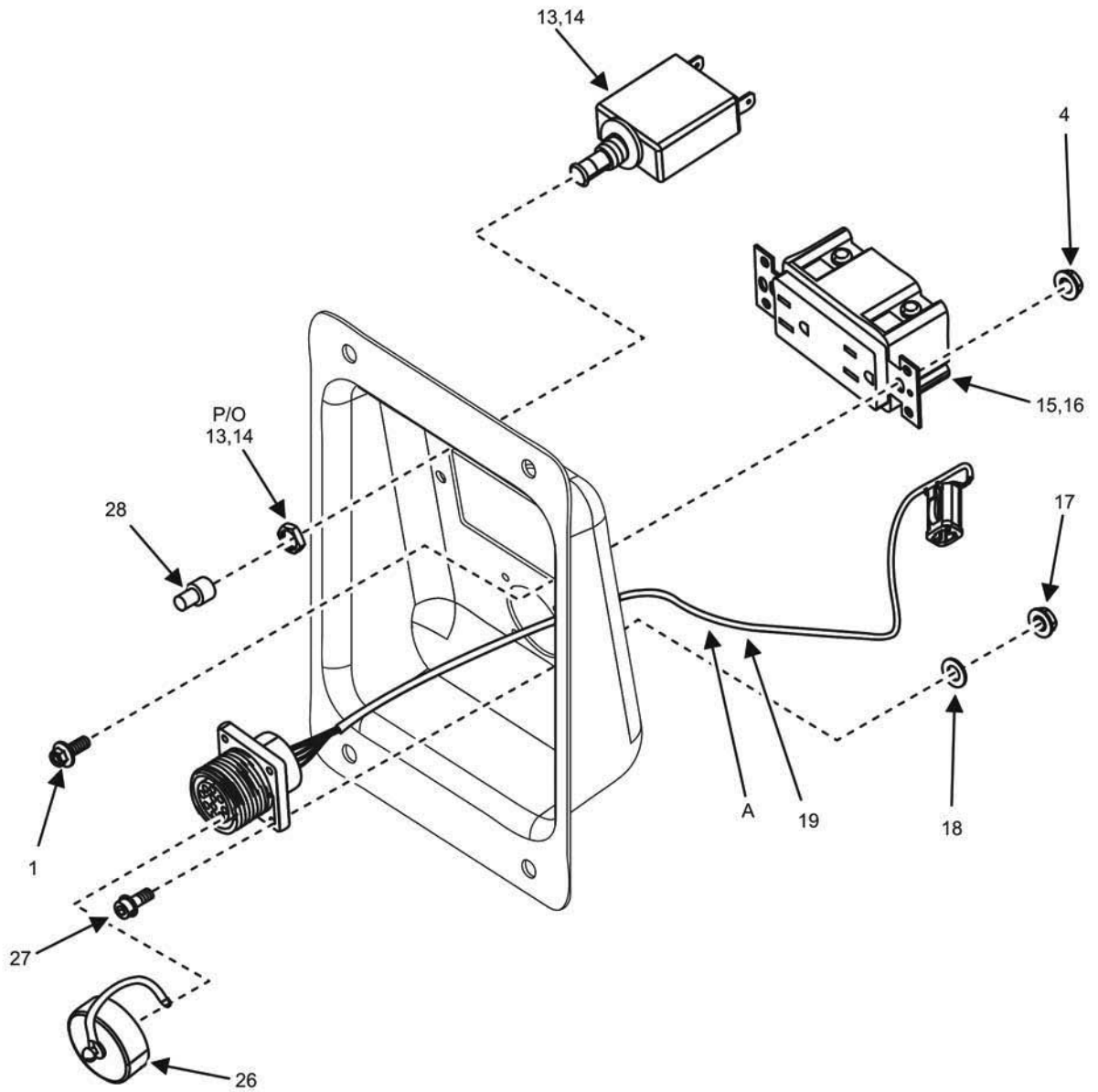


Figure 19. Convenience Receptacle Assembly (Sheet 2 of 7).

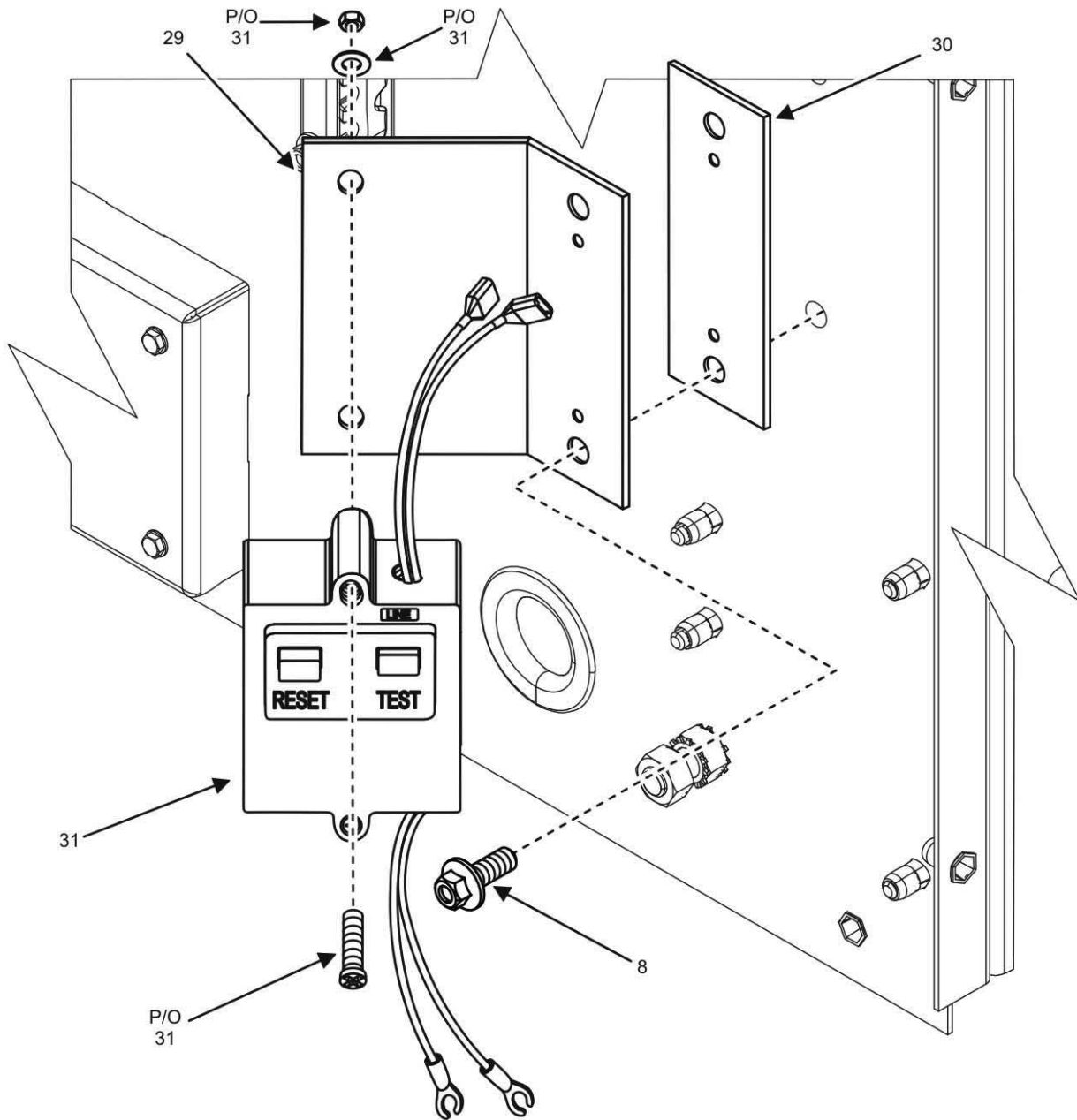


Figure 19. Convenience Receptacle Assembly (Sheet 3 of 7).

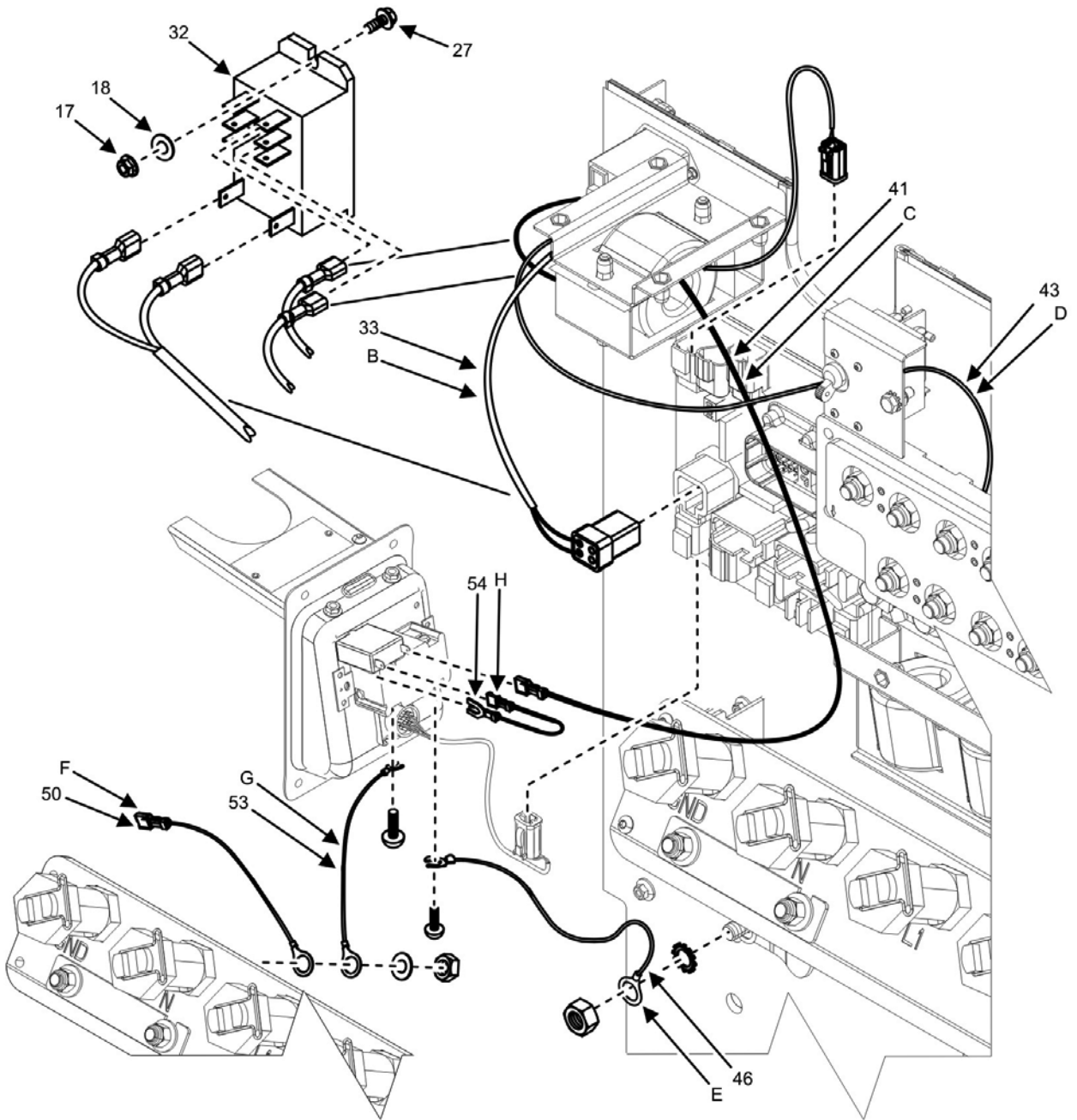


Figure 19. Convenience Receptacle Assembly (Sheet 4 of 7).

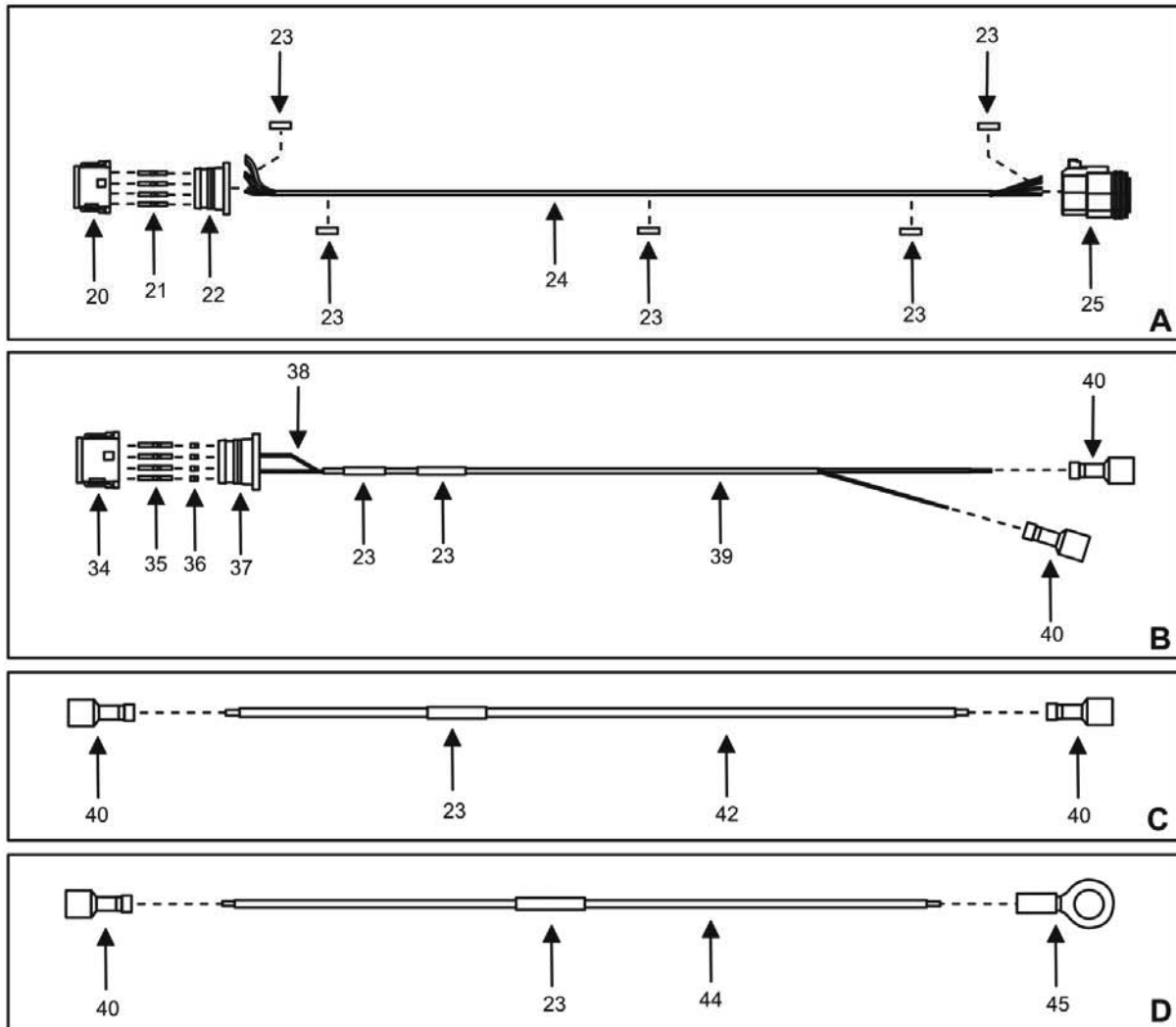


Figure 19. Convenience Receptacle Assembly (Sheet 5 of 7).

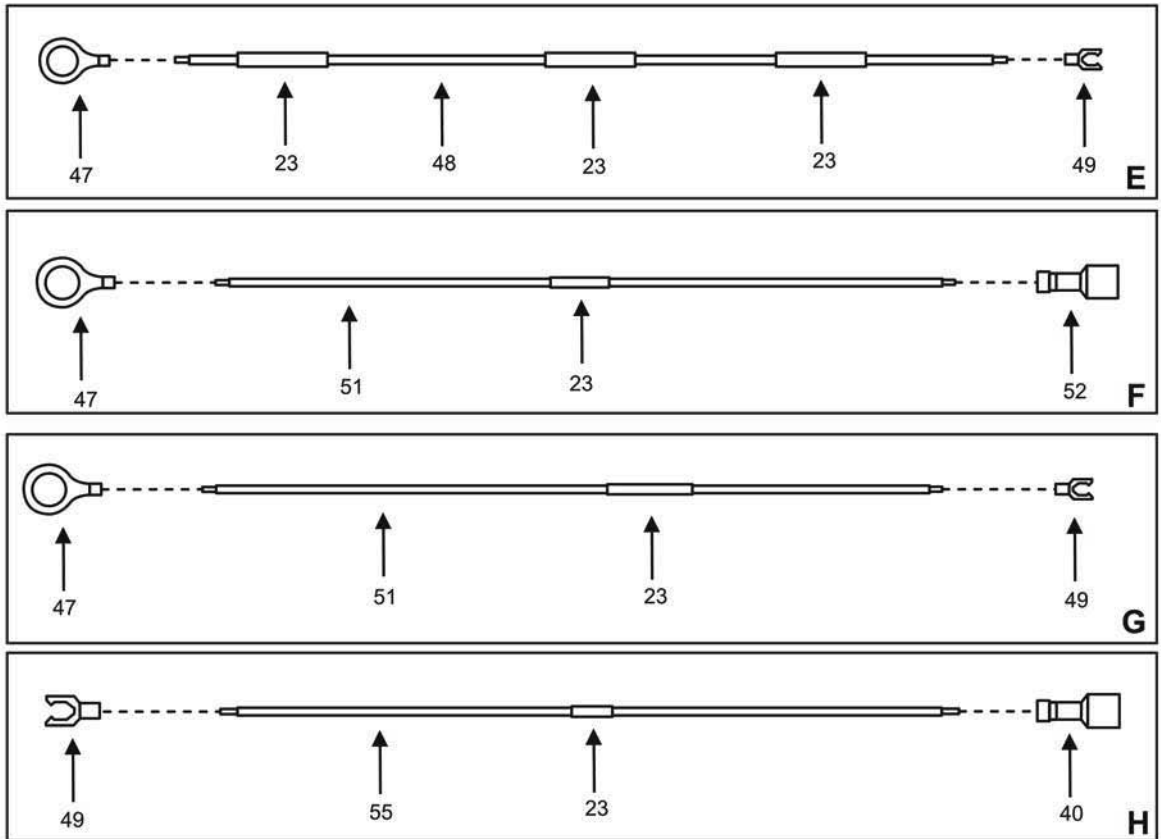


Figure 19. Convenience Receptacle Assembly (Sheet 6 of 7).

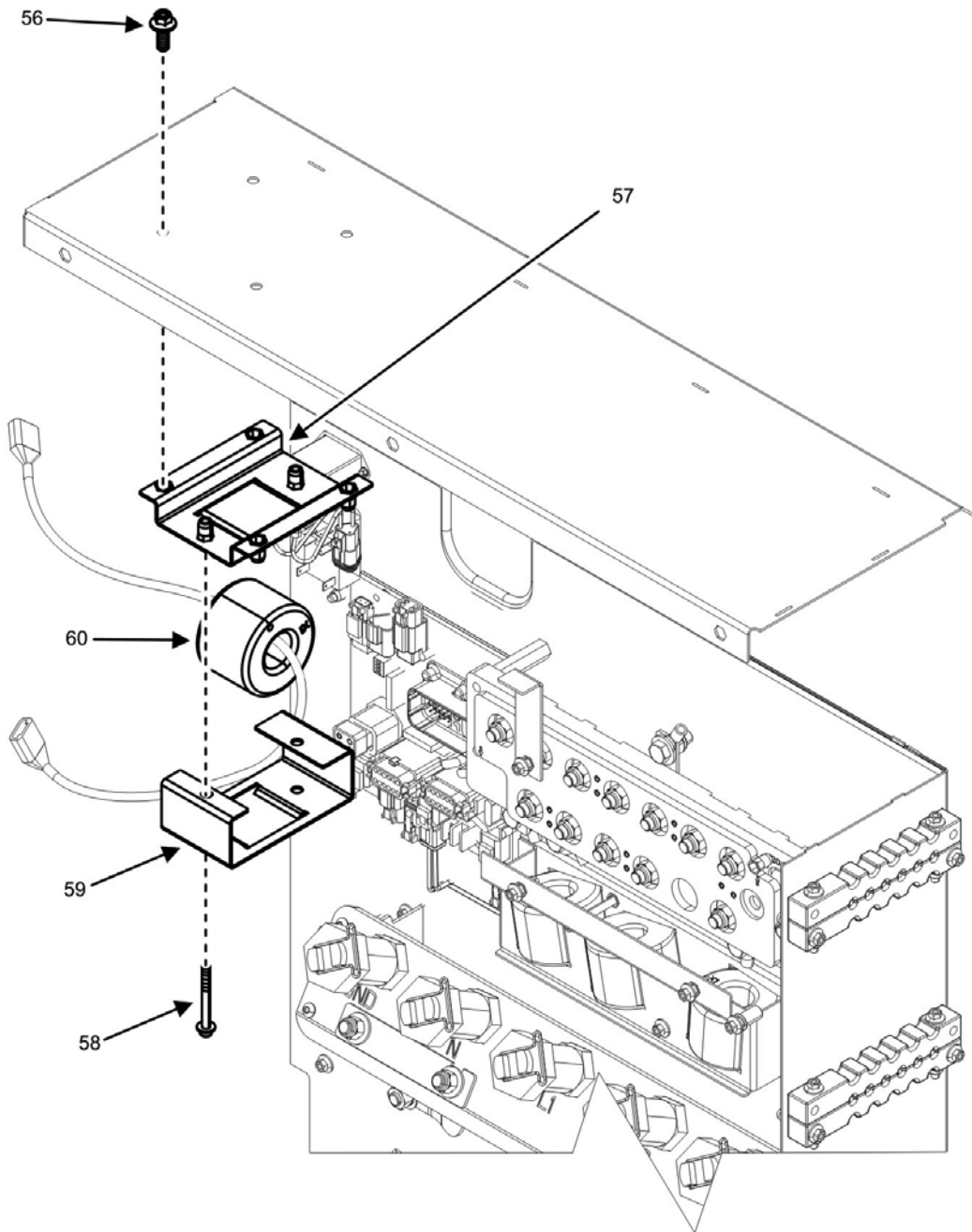


Figure 19. Convenience Receptacle Assembly (Sheet 7 of 7).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0805	
								FIG. 19 CONVENIENCE RECEPTACLE ASSEMBLY	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN931-M4X16	....SCREW, HEX HEAD	3
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW13X164000GD5A 21	....WASHER LOCK, #8, EXT TOOTH	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21318-1	....STRAP, ELECTRICAL GROUND	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M4	....NUT, HEX FLANGE (M4X0.7)	3
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	....NUT, HEX FLANGE (M6X1)	5
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20246	....HOUSING, RECEPTACLE, GFI BOX	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0KMA3	A026G000	....SCREW, FLANGE HEAD	4
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A020WB4K 42	....SCREW, HEX FLANGE HEAD (M6X1X20)	4
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20732	....HINGE, DOOR SPRING LOADED, CLOSED	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW13X250000GD5A 21	....WASHER, LOCK 1/4 EXT TOOTH	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015878549	44940	04-20248	....PANEL, DOOR GFI BOX	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN7380A2-M6X12	....SCREW, CAP, SOCKET	3
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5925015860232	82647	PR11-62-15.0A-XX-V	....CIRCUIT BREAKER UOC: 98J	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ		82647	PR11-42-15.0A-XX-V	....CIRCUIT BREAKER UOC: 98K	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015900270	74545	GFTR20BK	....RECEPTACLE, DUPLEX UOC: 98J	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ		74545	DR20BLKWRTR	....RECEPTACLE, DUPLEX UOC: 98K	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310992501842	U5503	0301-0003	....NUT, HEX (M3X0.5)	6
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310993711050	KE489D	DIN 125 3	....WASHER, FLAT M3	6
19	PAFFF	PAFFF	PAFFF	PAFFF	6150015860561	44940	04-20255	....HARNES, WIRING (J502 TO J522) (SEE SHEET 5 FOR PARTS BREAKDOWN)	1
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014846537	11139	DT06-4S	....CONNECTOR, PLUG 4 PIN	1
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012036687	45152	2ER654	....CONTACT, SOCKET, 12 -16 AWG	4
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014830852	11139	W4S	....WEDGE, PLUG 4 PIN	1

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
23	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG3T3-100B	.....LAMINATE, LABEL COVER	18
24	MFFZZ	MFFZZ	MFFZZ	MFFZZ	6145012521449	16428	89418	.....CABLE, SHIELDED FOUR CONDUCTOR (MAKE FROM 89418 ON BULK ITEMS LIST, CUT TO LENGTH 339 MM + 25 MM)	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015906702	44940	MS3102R18-19SN	.....CONNECTOR, PLUG 4 PIN	1
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015901601	44940	MS25043-18DW	.....COVER, ELECTRICAL CONNECTOR	1
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN933-M3X16	.....SCREW, HEX HEAD (M3X0.5X16)	6
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5930015900170	97539	1231/72	.....BOOT, TERMINAL CIRCUIT BREAKER	1
29	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21674	.....BRACKET, MOUNTING RELAY UOC: 98K	1
30	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20669	.....BRACKET, MOUNTING RELAY UOC: 98J	1
31	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21695	.....INTERRUPTER, GROUND FAULT 400 HZ UOC: 98K	1
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5945014586605	77342	T92S11D22-24	.....RELAY, SOLID STATE	1
33	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20257	.....LEAD ELECTRICAL, J508 TO RELAY (SEE SHEET 5 FOR PARTS BREAKDOWN)	1
34	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015121010	11139	WP-4S	.....WEDGE, PLUG 4 PIN	1
35	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012801438	12361	7-826-000092	.....CONTACT, SOCKET 14-12 AWG	2
36	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935011741235	11139	114017	.....CONNECTOR, PLUG SIZE 12, 16	2
37	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012036687	45152	2ER654	.....CONTACT, SOCKET 12-16 AWG	4
38	MFFZZ	MFFZZ	MFFZZ	MFFZZ		OX4C9	3271-14-41	.....WIRE, STRANDED 14 AWG (MAKE FROM 3271-14-41 ON BULK ITEMS LIST, CUT TO 277 MM + 25)	1
39	MFFZZ	MFFZZ	MFFZZ	MFFZZ		3SXL3	EY-1877	.....SLEEVE, BRAIDED TPE YARN (MAKE FROM EY-1877 ON BULK ITEMS LIST, CUT TO LENGTH AS REQUIRED)	1
40	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015860213	30554	88-20275-3	.....TERMINAL, DISCONNECT	8

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
41	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20922	....LEAD ELECTRICAL, K501 TO CB501 (SEE SHEET 5 FOR PARTS BREAKDOWN)	1
42	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26	.....WIRE, STRANDED 16 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST, CUT TO LENGTH 329 MM + 25)	1
43	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-21497	....LEAD ELECTRICAL, K501 TO S501 (SEE SHEET 5 FOR PARTS BREAKDOWN)	1
44	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26	.....WIRE, STRANDED 16 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST, CUT TO LENGTH 385 MM + 25)	1
45	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015860272	00779	2-36160-1	.....TERMINAL, RING M10, 16-14 AWG	1
46	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20982	....LEAD ELECTRICAL, J100 GND TO GND (SEE SHEET 6 FOR PARTS BREAKDOWN)	1
47	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4210015628664	00779	50981	.....TERMINAL, RING, M12 16-14 AWG	1
48	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26	.....WIRE, STRANDED 16 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST, CUT TO LENGTH 434 MM + 25 MM)	1
49	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015860671	00779	53831	.....TERMINAL, SPADE M4, 22-16 AWG	1
50	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-21703	....LEAD ELECTRICAL, RECEPTACLE NEUTRAL (SEE SHEET 6 FOR PARTS BREAKDOWN) UOC: 98K	1
51	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26	.....WIRE, STRANDED 16 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST, CUT TO LENGTH 350 MM + 25 MM)	1
52	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940011390853	30554	88-20275-4	.....TERMINAL, RECEPTACLE	1

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
53	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-21537	....LEAD ELECTRICAL, RECEPTACLE NEUTRAL (SEE SHEET 6 FOR PARTS BREAKDOWN) UOC: 98J	1
54	PAFFF	PAFFF	PAFFF	PAFFF	6150015861846	44940	04-20267	....LEAD ELECTRICAL, CB501 TO J100 UOC: 98J	1
55	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26	....WIRE, STRANDED 16 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST, CUT TO LENGTH 139 MM + 25 MM)	1
56	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES46M06A018CZ7A 31	....SCREW, BUTTON HEAD (M6X1.0)	4
57	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20105	....BRACKET, MOUNTING, CURRENT TRANSFORMER	1
58	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A055WB4K 42	....SCREW, HEX FLANGE HEAD (M6X1X55)	2
59	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20109	....BRACKET, MOUNTING, CURRENT TRANSFORMER	1
60	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0SFN7	A026F118	....TRANSFORMER, CURRENT 55 AMP	1
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
TRANSFORMERS REPAIR PARTS LIST**

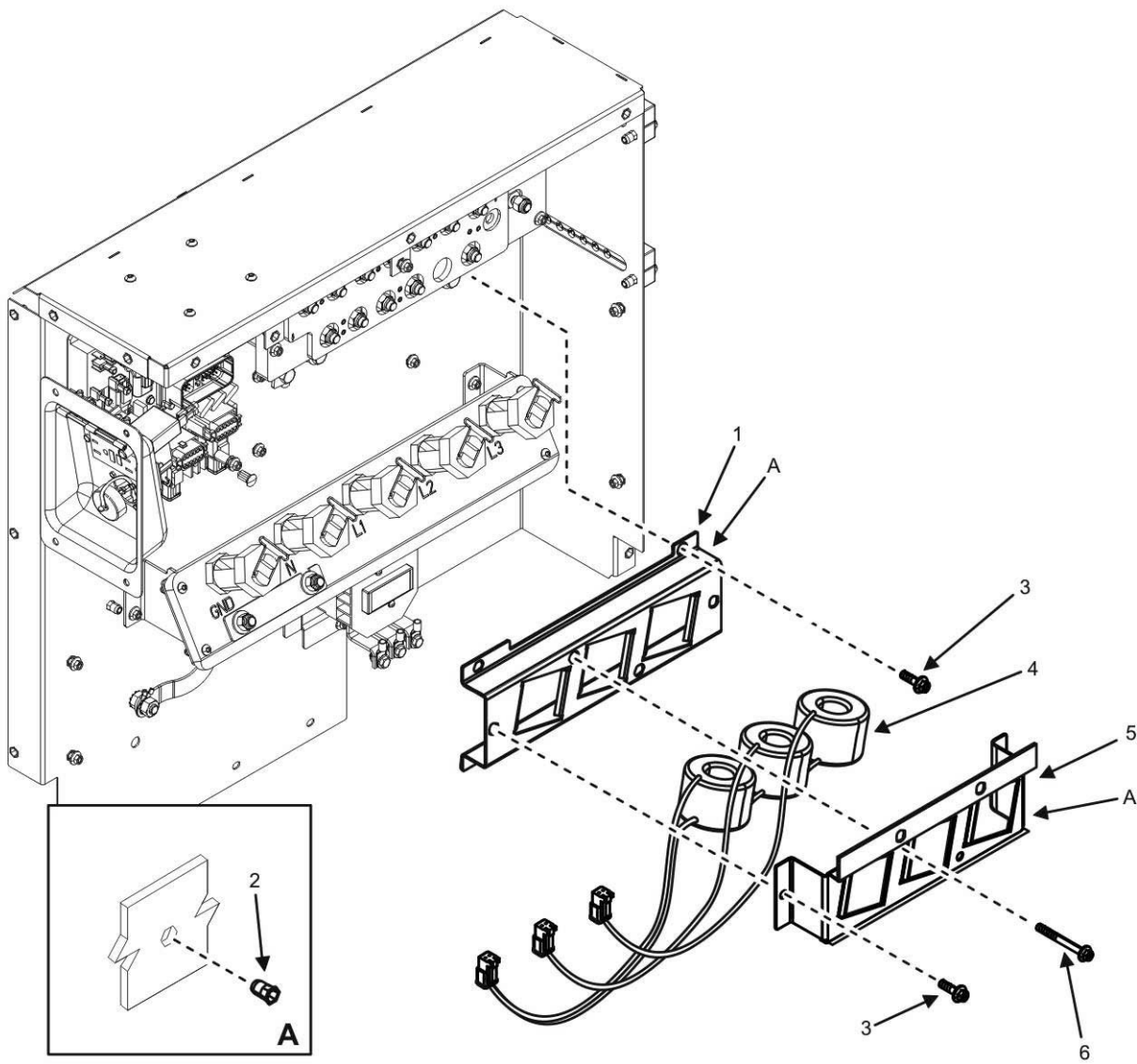


Figure 20. Transformers (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC NAVY FORCE			(3) NSN	(4) CAGEC P/N		(5)	(6) DESCRIPTION AND UOC	(7) QTY.
									GROUP 0806	
									FIG. 20 TRANSFORMERS	
1	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20961		....BRACKET, MOUNTING	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030		.....NUT, PLAIN, CLINCH	6
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A020WB4K 42		....SCREW, HEX FLANGE HEAD M6 X 1 X 20	6
4	PCFZZ	PCFZZ	PAFZZ	PCFZZ		0SFN7	A026F118		....TRANSFORMER, CURRENT	3
5	PAFFF	PAFFF	XBFFF	PAFFF		44940	04-20847		....BRACKET, MOUNTING	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A055WB4K 42		....SCREW, HEX FLANGE HEAD M6 X 1 X 55	2
									END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
PRINTED CIRCUIT BOARD MODULE REPAIR PARTS LIST**

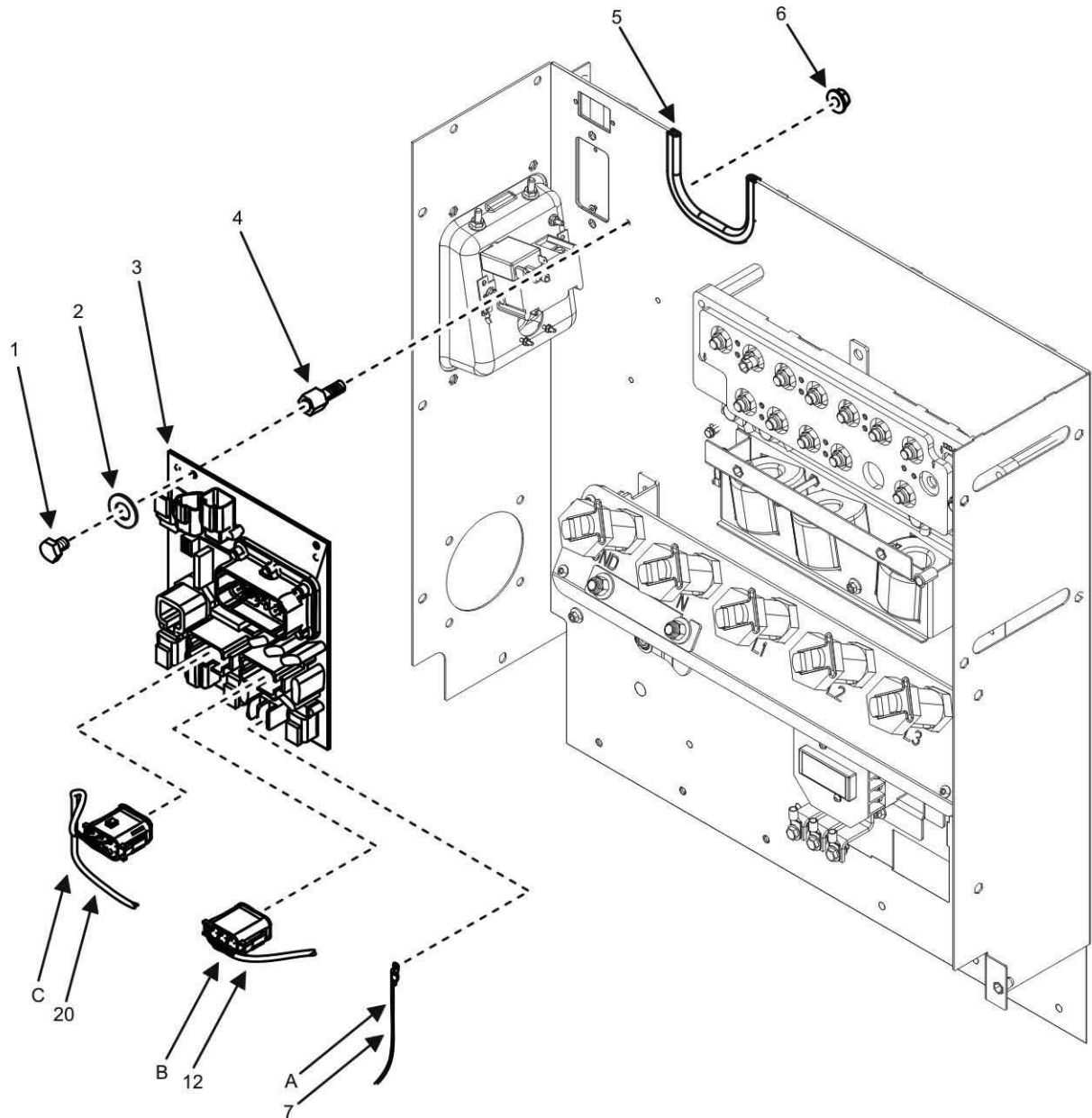


Figure 21. Printed Circuit Board Module (Sheet 1 of 2).

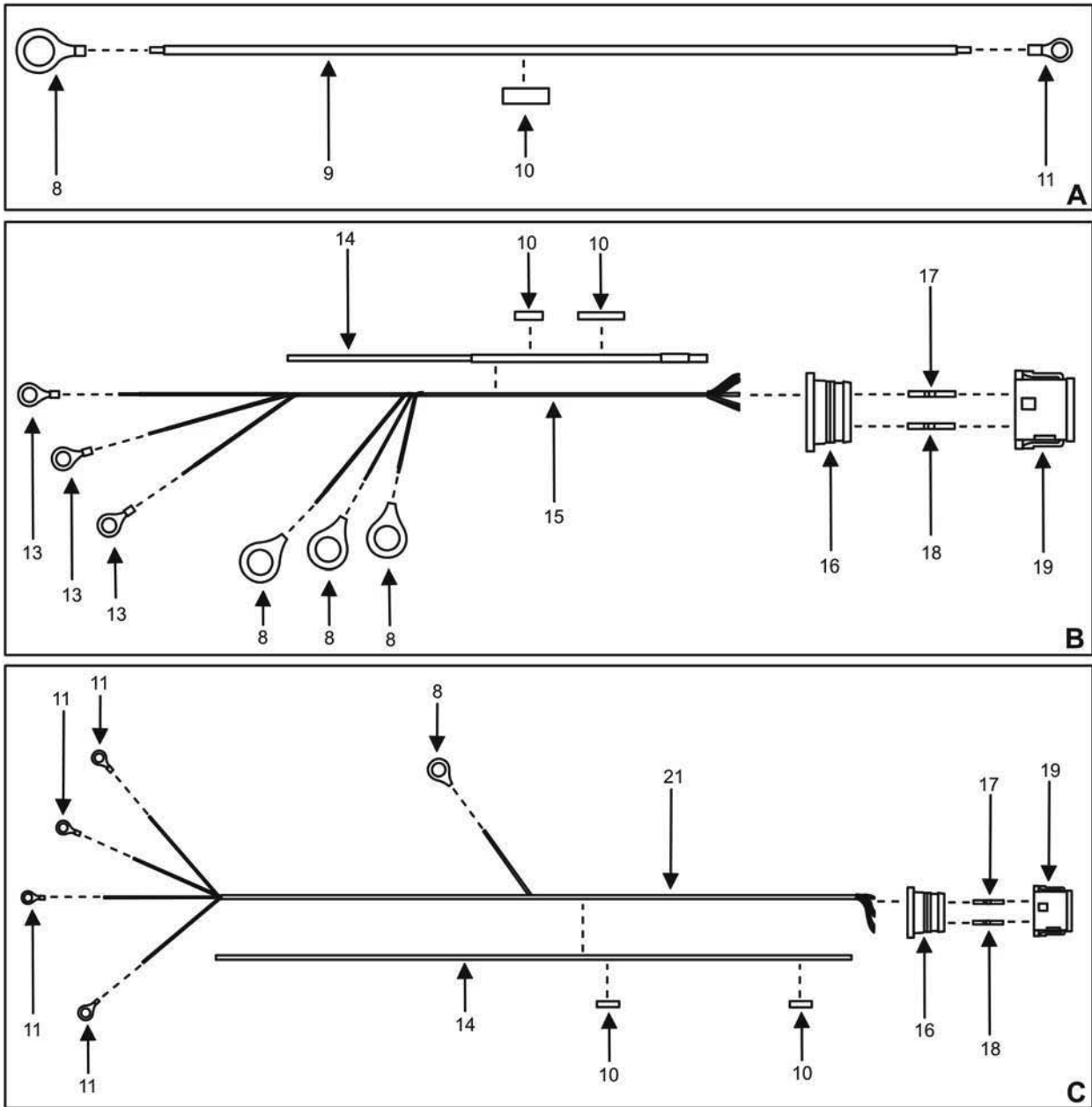


Figure 21. Printed Circuit Board Module (Sheet 2 of 2).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0801	
								FIG. 21 PRINTED CIRCUIT BOARD MODULE	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN931-M4X6	....SCREW, HEX HEAD	5
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014849183	1KWT0	085295	....WASHER, FLAT	5
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5998015860344	44940	A026K431	....MODULE, PRINTED CIRCUIT BOARD	1
4	XBFZZ	XBFZZ	XBFZZ	XBFZZ	5365015908328	04729	MMF1203M	....SPACER, MOUNTING	5
5	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	06F16M4 04-20902-3	....EDGING (MAKE FROM A3521 ON BULK ITEMS LIST CUT TO LENGTH	
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M4	204 MM +/- 5 MM) ....NUT, PLAIN, HEXAGON	1
7	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20988	....LEAD, ELECTRICAL	5
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4210015628664	00779	50981	A2-TB511 TO T501.....TERMINAL RING	1
9	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26	M12, 16-14 AWG....STRAND, WIRE (MAKE FROM 3271-16-26 ON BULK ITEMS LIST CUT TO LENGTH	5
10	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG2T5-100B	590 MM + 50 MM) .....LAMINATE, LABEL COVER	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940002582074	00779	34105	.....TERMINAL RING	5
12	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-21358	#6/M3.5, 22-16 AWG....HARNESS, WIRING	5
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ		00779	2-34113-2	J501 TO K1/TB501.....TERMINAL RING	1
14	MFFZZ	MFFZZ	MFFZZ	MFFZZ		3SXL3	EY-1877	.....INSULATION SLEEVING (MAKE FROM EY-1877 ON BULK ITEMS LIST CUT TO LENGTH AS	3
15	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26	NEEDED) ....STRAND, WIRE 16 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST CUT TO LENGTH	2
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014541789	11139	W12S	590 MM + 50 MM) ....WEDGE, PLUG 12 PIN	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012036687	45152	2ER654	....CONTACT, ELECTRICAL	2
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935011741235	11139	114017	....PLUG, END SEAL	11
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014953353	45152	7HA302	....CONNECTOR, PLUG, ELECTRICAL	13
20	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20711	....HARNESS, WIRING	1
21	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26	J511 TO K1/TB501....STRAND, WIRE 16 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST CUT TO LENGTH 863 MM + 50)	1
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
POWER PLANT INSTALLATION REPAIR PARTS LIST**

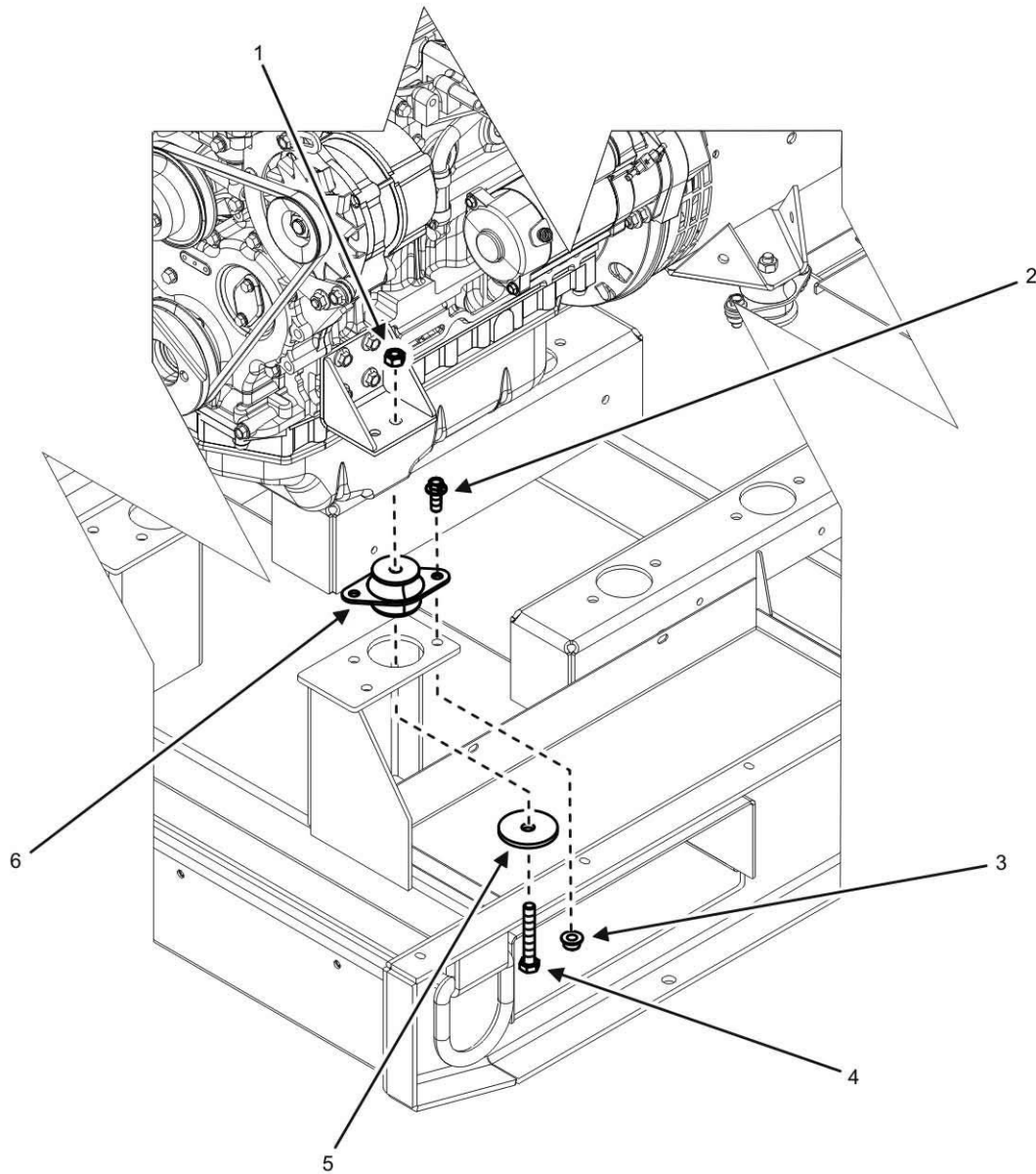


Figure 22. Power Plant Installation (Sheet 1 of 4).

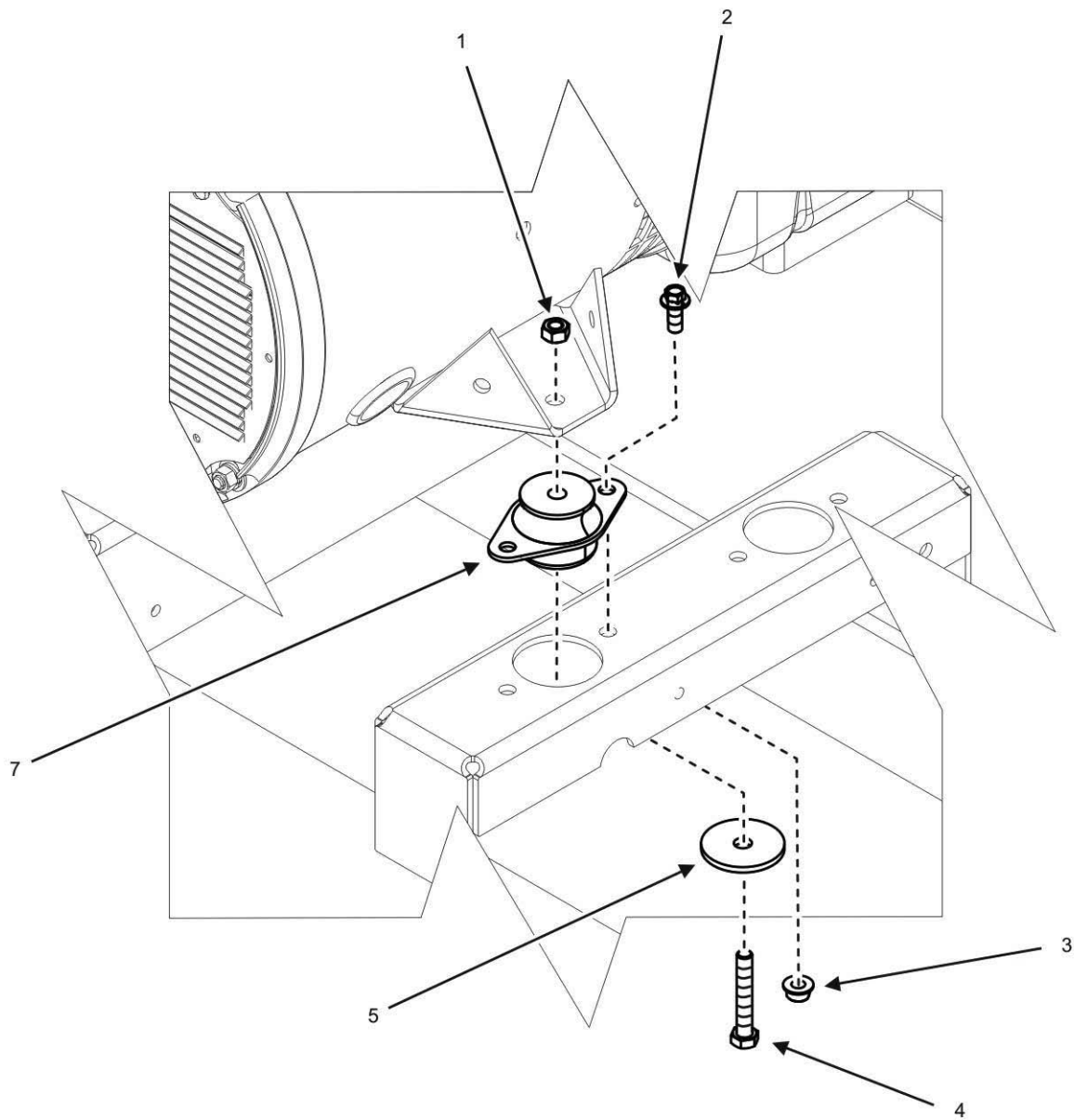


Figure 22. Power Plant Installation (Sheet 2 of 4).

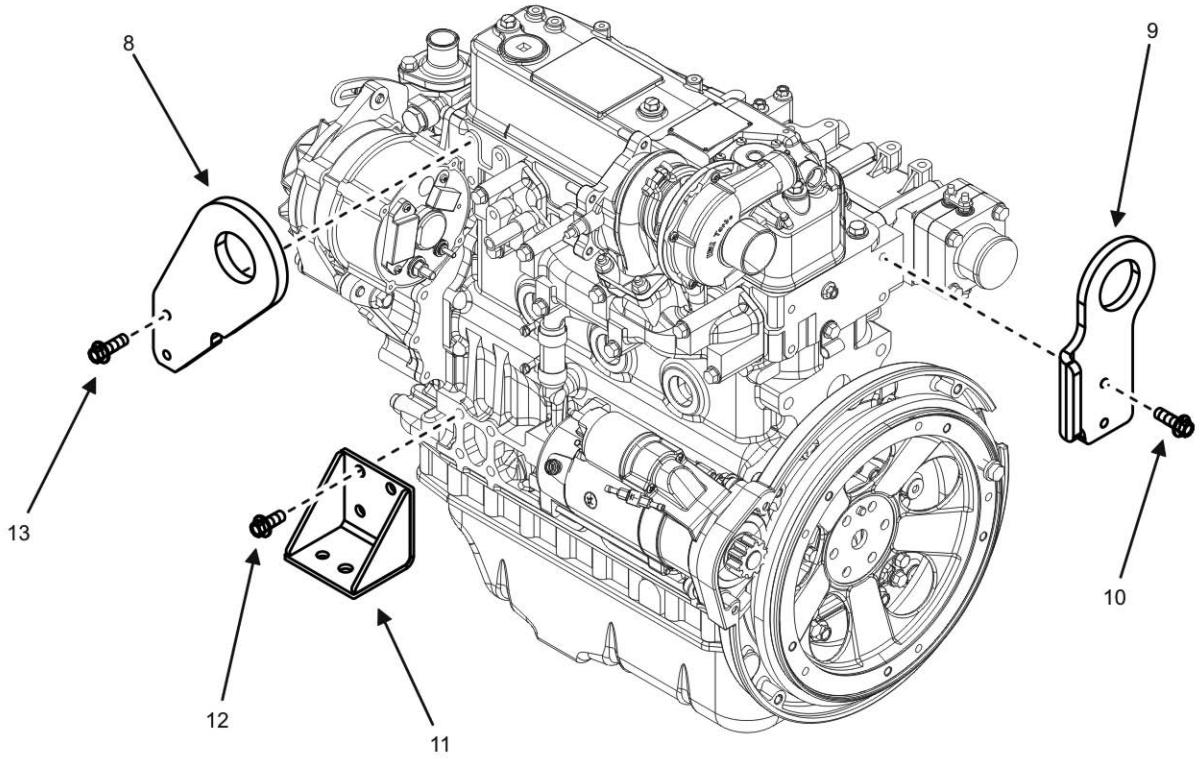


Figure 22. Power Plant Installation (Sheet 3 of 4).

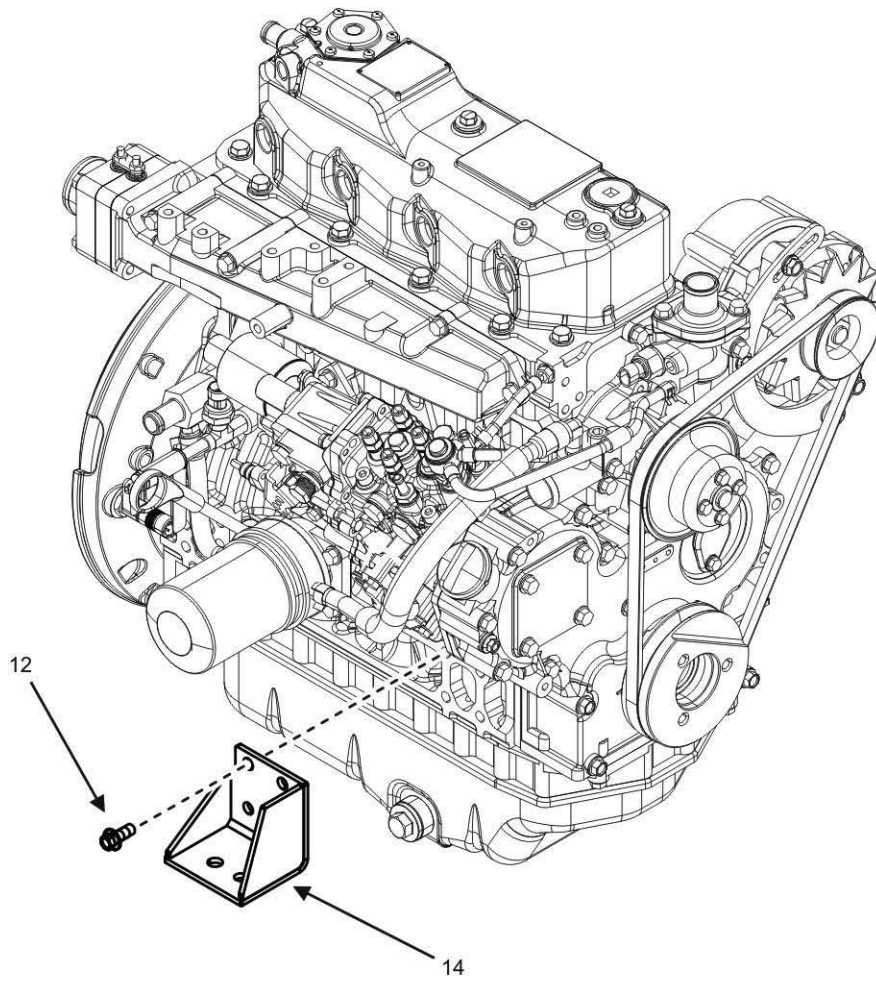


Figure 22. Power Plant Installation (Sheet 4 of 4).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC NAVY			(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 09	
								FIG. 22 POWERPLANT INSTALLATION	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEN04C438000WB0FY1	...NUT, HEX (7/16 - 14, GRADE 8)	4
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M10C025WB4K42	...SCREW, HEX FLANGE (M10 X 1.5 X 25)	8
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M10	...NUT, HEX FLANGE (M10 X 1.5)	8
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES01C438B75WA6FY1	...BOLT, HEX HEAD (7/16 - 14, GRADE 8)	4
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015860557	44940	04-20749-2	...WASHER, SNUBBING, HARDENED	4
6	PCFZZ	PCFZZ	PCFZZ	PCFZZ		81860	29550-3	...ISOLATOR, VIBRATION, ENGINE MOUNT	2
7	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5340015903803	81860	29550-5	...ISOLATOR, VIBRATION, GENERATOR MOUNT	2
8	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21410	...BRACKET, ENGINE LIFTING (SIDE)	1
9	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21411	...BRACKET, ENGINE LIFTING (FRONT)	1
10	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	AES10M08B020WB4K42	...SCREW, HEX FLANGE HEAD (M8 X 1.25 X 20)	2
11	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20729	...BRACKET, ENGINE MOUNTING (LH)	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M10C020WB4K42	...SCREW, HEX HEAD (M10 X 1.5 X 20)	8
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B025WB4K42	...SCREW, HEX FLANGE HEAD (M8 X 1.25 X 25)	2
14	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20728	...BRACKET, ENGINE MOUNTING (RH)	1
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
AC GENERATOR ASSEMBLY, 50/60 HZ REPAIR PARTS LIST**

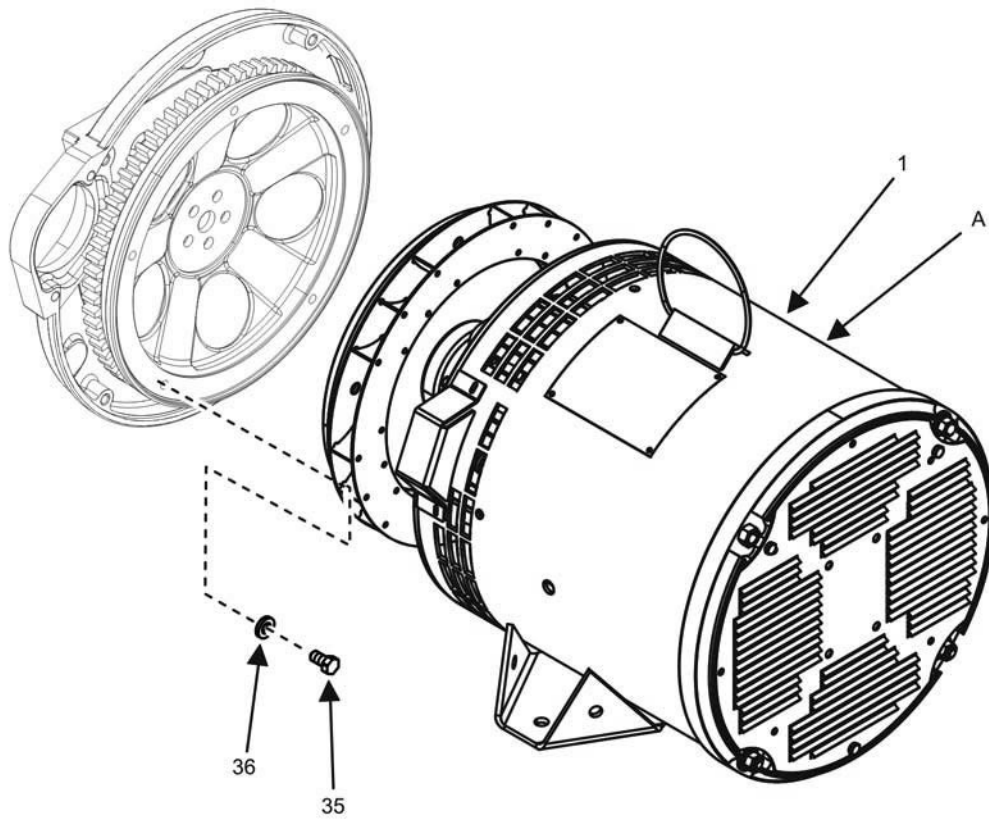


Figure 23. AC Generator Assembly, 50/60 Hz (Sheet 1 of 3).

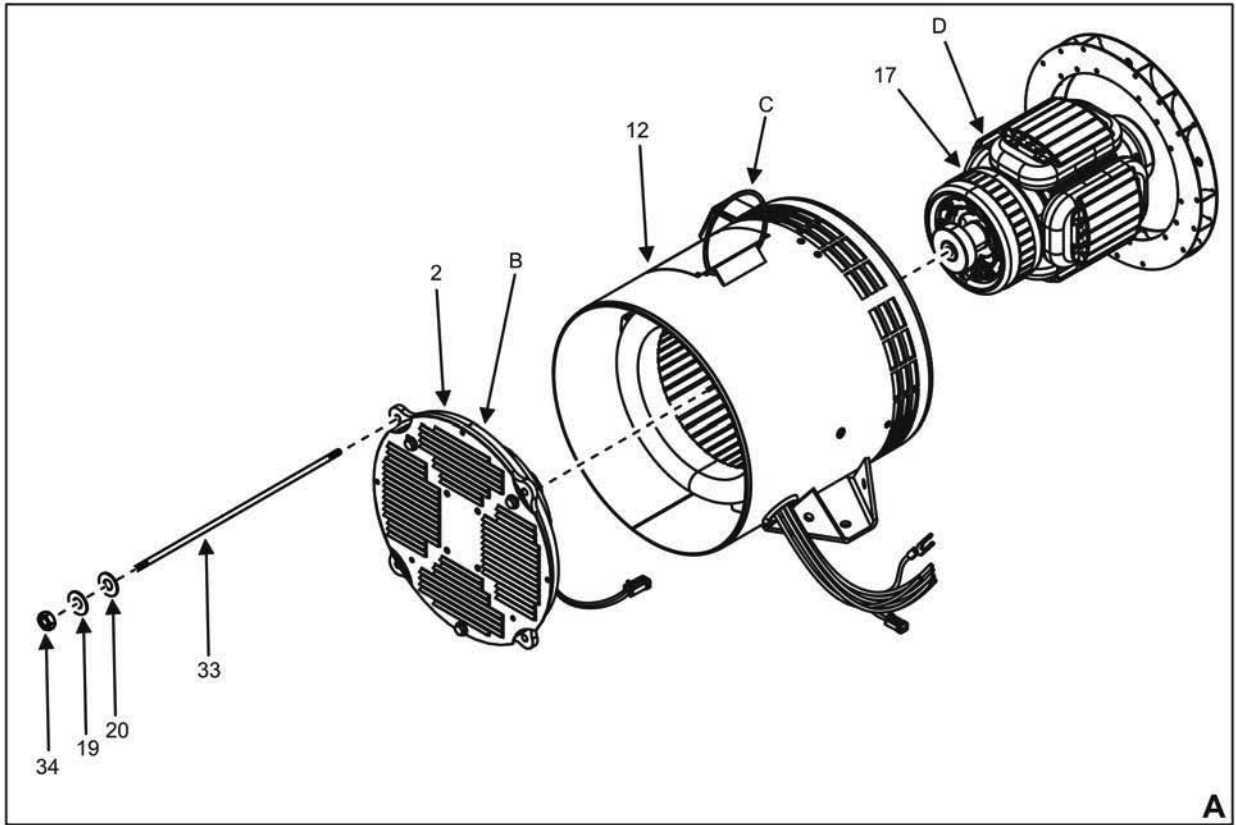


Figure 23. AC Generator Assembly, 50/60 Hz (Sheet 2 of 3).

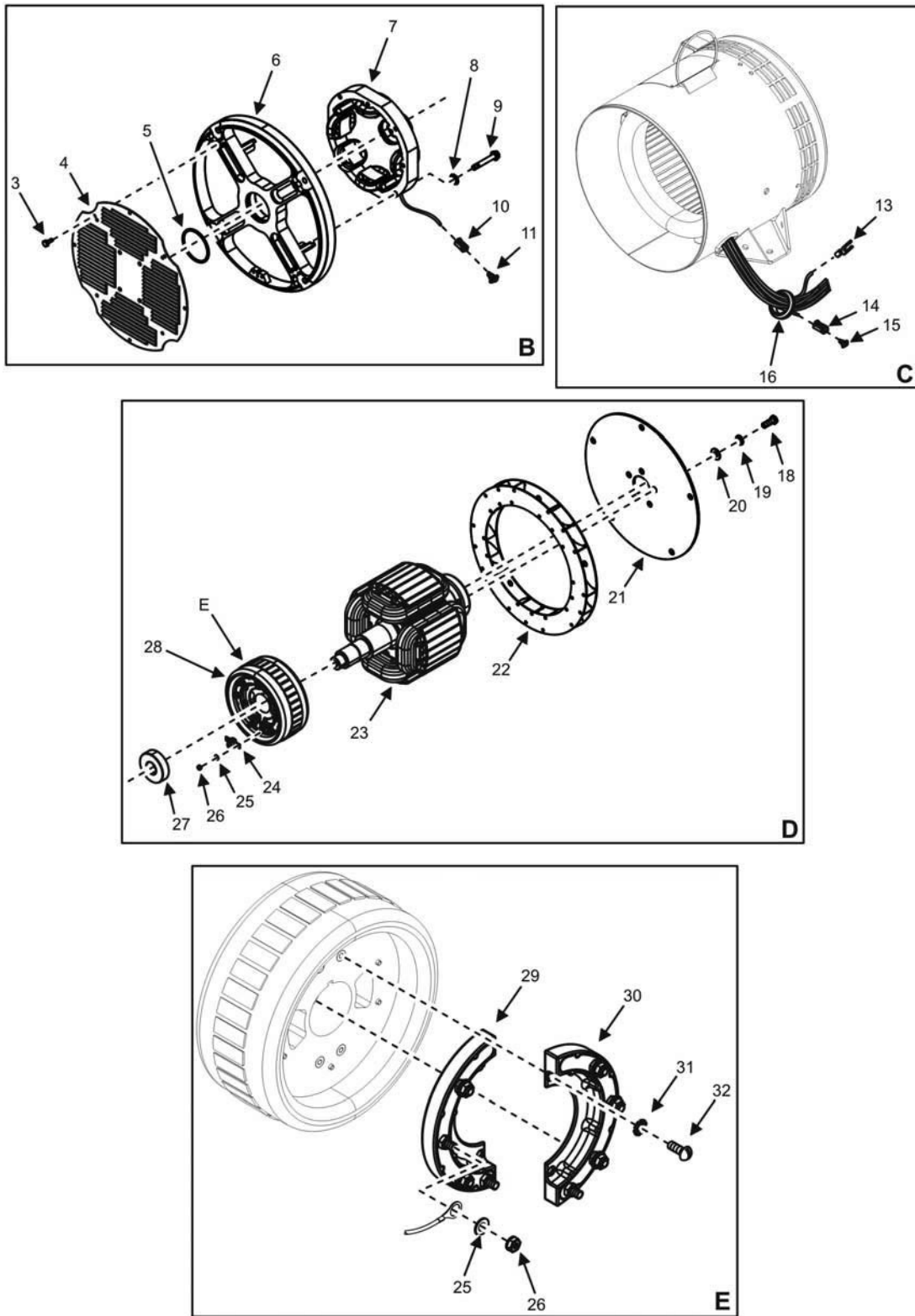


Figure 23. AC Generator Assembly, 50/60 Hz (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0901	
								FIG. 23 AC GENERATOR ASSEMBLY, 50/60 HZ	
1	PAFHH	PAFHH	PAFDD	PAFDD		44940	0200-3218-02	...GENERATOR ASSEMBLY, 15 KW, 50/60 HZ (SEE SHEET 2 FOR PARTS BREAKDOWN) UOC: 98J	1
2	PAFFF	PAFFF	PAFFF	PAFFF		44940	A026F712	....ENDBELL ASSEMBLY (SEE SHEET 3 FOR PARTS BREAKDOWN) UOC: 98J	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305013390822	44940	815-0181	.....SCREW, CAP, HEXAGON HEAD UOC: 98J	1
4	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	88-20230	.....COVER, INLET UOC: 98J	3
5	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5331009738598	44940	509-0094	.....O-RING UOC: 98J	1
6	XAFZZ	XAFZZ	XAFZZ	XAFZZ		44940	0211-0435	.....ENDBELL UOC: 98J	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6115015887288	44940	A026F710	.....STATOR, EXCITER UOC: 98J	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010779650	44940	853-0013	.....WASHER, LOCK UOC: 98J	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305013661153	44940	815-0774	.....SCREW, TAPPING UOC: 98J	4
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015860359	44940	0323-2539	.....CONNECTOR, RECEPTACLE UOC: 98J	4
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2540015893534	44940	0323-1501	.....WEDGE, RECEPTACLE UOC: 98J	1
12	PAFFF	PAFFF	PAFFF	PAFFF	2920015885220	44940	A026E305	....STATOR, GENERATOR (SEE SHEET 3 FOR PARTS BREAKDOWN) UOC: 98J	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940013692874	98410	C-8718-08	.....TERMINAL LUG UOC: 98J	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015860093	44940	0323-2538	.....CONNECTOR, PLUG, ELECTRICAL UOC: 98J	12
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	0323-1500	.....WEDGE, PLUG UOC: 98J	1
16	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4730011097901	44940	503-0183	.....GROMMET UOC: 98J	1

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
17	PAFHH	PAFHH	PAFFF	PAFFF	6115015887317	44940	0201-3649-02	....ROTOR, GENERATOR (SEE SHEET 3 FOR PARTS BREAKDOWN) UOC: 98J	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305011742761	44940	0800-0050	.....SCREW, CAP, HEXAGON HEAD UOC: 98J	5
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010609104	44940	0850-0050	.....WASHER, LOCK UOC: 98J	9
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015878556	44940	0526-0390	.....WASHER, FLAT UOC: 98J	9
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	88-20225	.....DISC, DRIVE UOC: 98J	1
22	XBHZZ	XBHZZ	XBFZZ	XBFZZ		30554	88-20219	.....FAN UOC: 98J	1
23	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	0201-3650-02	....ROTOR, ASSEMBLY, WOUND UOC: 98J	1
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5905013291699	44940	304-0807	.....RESISTOR, VOLTAGE SENSITIVE UOC: 98J	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010518089	44940	526-0008	.....WASHER, FLAT UOC: 98J	12
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010492745	44940	870-0131	.....NUT, PLAIN, ASSEMBLED UOC: 98J	8
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3110011609663	44940	510-0112	.....BEARING, ROTOR UOC: 98J	1
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ	611515877589	44940	A026J838	.....EXCITER, ROTOR UOC: 98J	1
29	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5961010212232	44940	358-0069	.....RECTIFIER, POSITIVE UOC: 98J	1
30	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5961010198003	44940	358-0070	.....RECTIFIER, NEGATIVE UOC: 98J	1
31	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010607181	44940	853-0008	.....WASHER, LOCK UOC: 98J	4
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305011904461	44940	813-0100	.....SCREW UOC: 98J	4
33	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	A026C356	....STUD UOC: 98J	4
34	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310004808509	44940	862-0003	....NUT, PLAIN, HEXAGON HEAD UOC: 98J	4
35	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20769-1	...BOLT, MACHINE UOC: 98J	5
36	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW24X37N062BD6FY1	...WASHER, FLAT UOC: 98J	5
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
AC GENERATOR ASSEMBLY, 400 HZ REPAIR PARTS LIST**

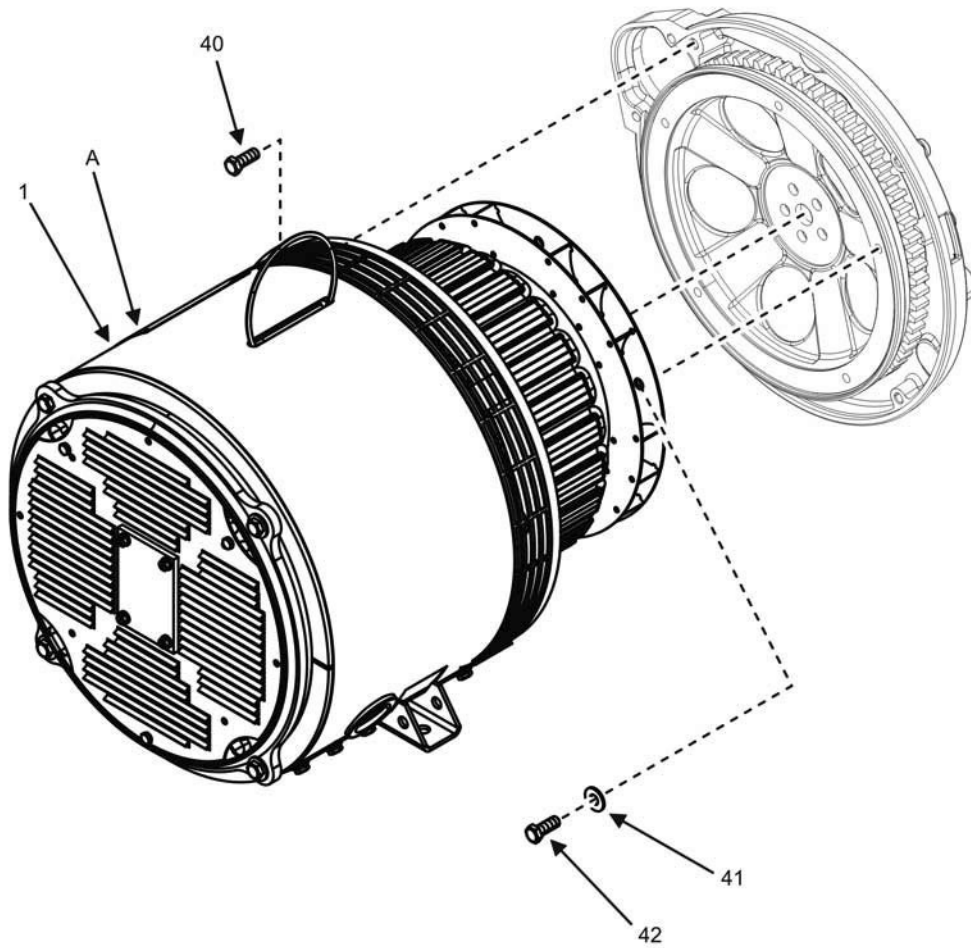


Figure 24. AC Generator Assembly, 400 Hz (Sheet 1 of 3).

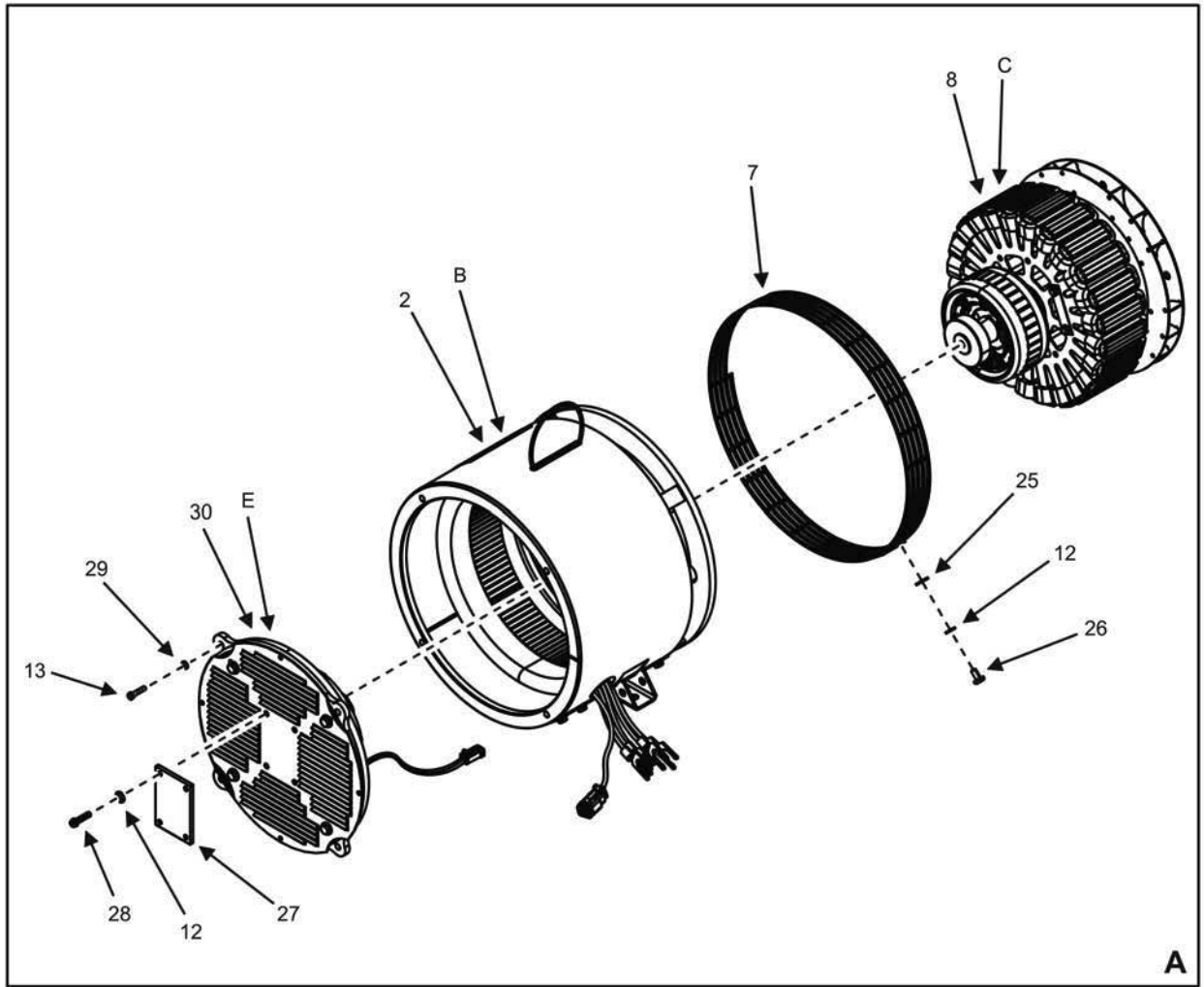


Figure 24. AC Generator Assembly, 400 Hz (Sheet 2 of 3).

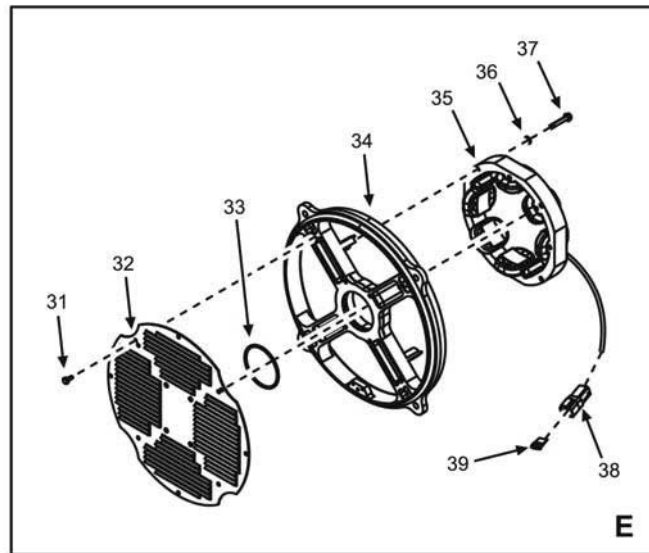
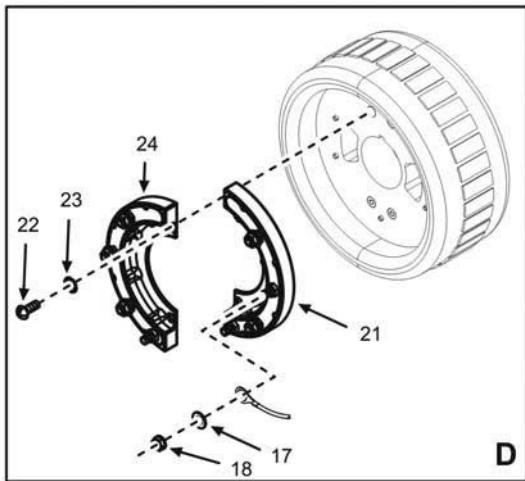
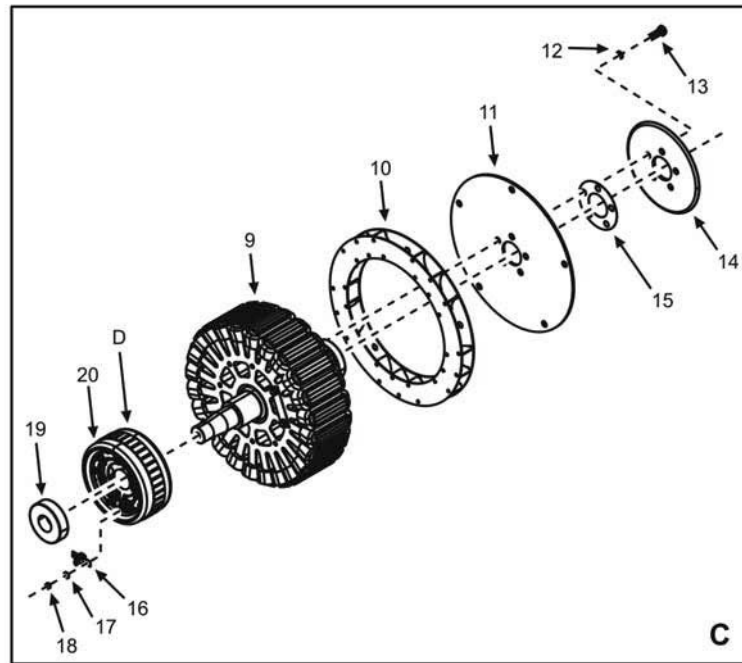
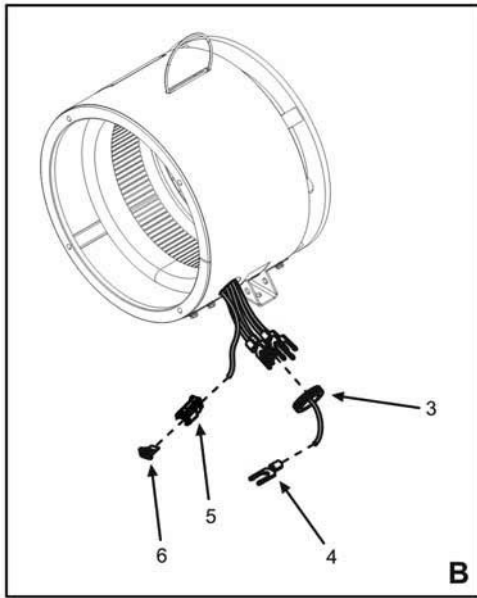


Figure 24. AC Generator Assembly, 400 Hz (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0901	
								FIG. 24 AC GENERATOR ASSEMBLY, 400 HZ	
1	PAFHH	PAFHH	PAFDD	PAFDD		44940	0200-3219-02	...GENERATOR ASSEMBLY, 15 KW, 400 HZ (SEE SHEET 2 FOR PARTS BREAKDOWN) UOC: 98K	1
2	PAFFF	PAFFF	PAFFF	PAFFF	2920015885580	44940	A026E311	....STATOR, GENERATOR (SEE SHEET 3 FOR PARTS BREAKDOWN) UOC: 98K	1
3	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	0508-0055	....GROMMET UOC: 98K	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940013692874	98410	C-8718-08	....TERMINAL LUG UOC: 98K	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015860093	44940	0323-2538	....CONNECTOR, PLUG, ELECTRICAL UOC: 98K	12
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	0323-1500	....WEDGE, PLUG UOC: 98K	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	0234-0895	...SCREEN ASSEMBLY UOC: 98K	1
8	PAFFF	PAFFF	PAFFF	PAFFF		44940	A026H437	....ROTOR, GENERATOR (SEE SHEET 3 FOR PARTS BREAKDOWN) UOC: 98K	1
9	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	A026G778	....ROTOR, ASSEMBLY, WOUND UOC: 98K	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	88-20219	....FAN UOC: 98K	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	88-20225	....DISC, DRIVE UOC: 98K	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010096570	44940	0850-0040	....WASHER, LOCK UOC: 98K	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310011742761	44940	0800-0050	....SCREW, HEXAGON HEAD UOC: 98K	10
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	88-20227	....DISC, RETENTION UOC: 98K	9
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	88-20226	....SPACER, ROTOR RETAINER UOC: 98K	1

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5905013291699	44940	304-0807	.....RESISTOR, VOLTAGE SENSITIVE UOC: 98K	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010518089	44940	526-0008	.....WASHER, FLAT UOC: 98K	12
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010492745	44940	870-0131	.....NUT, PLAIN, ASSEMBLED UOC: 98K	8
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3110011609663	44940	510-0102	.....BEARING, ROTOR UOC: 98K	1
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6115015877589	44940	A026J838	.....EXCITER, ROTOR (SEE SHEET 3 FOR PARTS BREAKDOWN) UOC: 98K	1
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5961010198003	44940	358-0070	.....RECTIFIER, NEGATIVE UOC: 98K	1
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305011904461	44940	813-0100	.....SCREW UOC: 98K	4
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010607181	44940	853-0008	.....WASHER, LOCK UOC: 98K	4
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5961010212232	44940	358-0069	.....RECTIFIER, POSITIVE UOC: 98K	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310013700052	44940	0526-0015	....WASHER, FLAT UOC: 98K	1
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305010623344	44940	0800-0003	....SCREW UOC: 98K	1
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	88-20229	....PLATE, RETENTION UOC: 98K	1
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	0815-0259	....SCREW, HEXAGON HEAD UOC: 98K	4
29	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015878556	44940	0526-0390	....WASHER, FLAT UOC: 98K	4
30	PAFFF	PAFFF	PAFFF	PAFFF		44940	A026F713	....ENDBELL ASSEMBLY (SEE SHEET 3 FOR PARTS BREAKDOWN) UOC: 98K	1
31	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305013390822	44940	815-0181	.....SCREW, CAP, HEXAGON HEAD UOC: 98K	3
32	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	88-20230	.....COVER, INLET UOC: 98K	1
33	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	509-0099	.....O-RING UOC: 98K	1
34	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	0211-0427	.....ENDBELL UOC: 98K	1
35	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6115015887288	44940	A026F710	.....STATOR, EXCITER UOC: 98K	1

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
36	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310010779650	44940	853-0013	.....WASHER, LOCK UOC: 98K	4
37	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305013661153	44940	815-0774	.....SCREW, TAPPING UOC: 98K	4
38	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015860359	44940	0323-2539	.....CONNECTOR, RECEPTACLE UOC: 98K	1
39	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2540015893534	44940	0323-1501	.....WEDGE, RECEPTACLE UOC: 98K	1
40	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ58A574C3B08CY20	...SCREW, FLANGE HEAD UOC: 98K	4
41	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW24X37N062BD6FY1	...WASHER, FLAT UOC: 98K	5
42	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20769-1	...BOLT, MACHINE UOC: 98K	5
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
ENGINE ASSEMBLY REPAIR PARTS LIST**

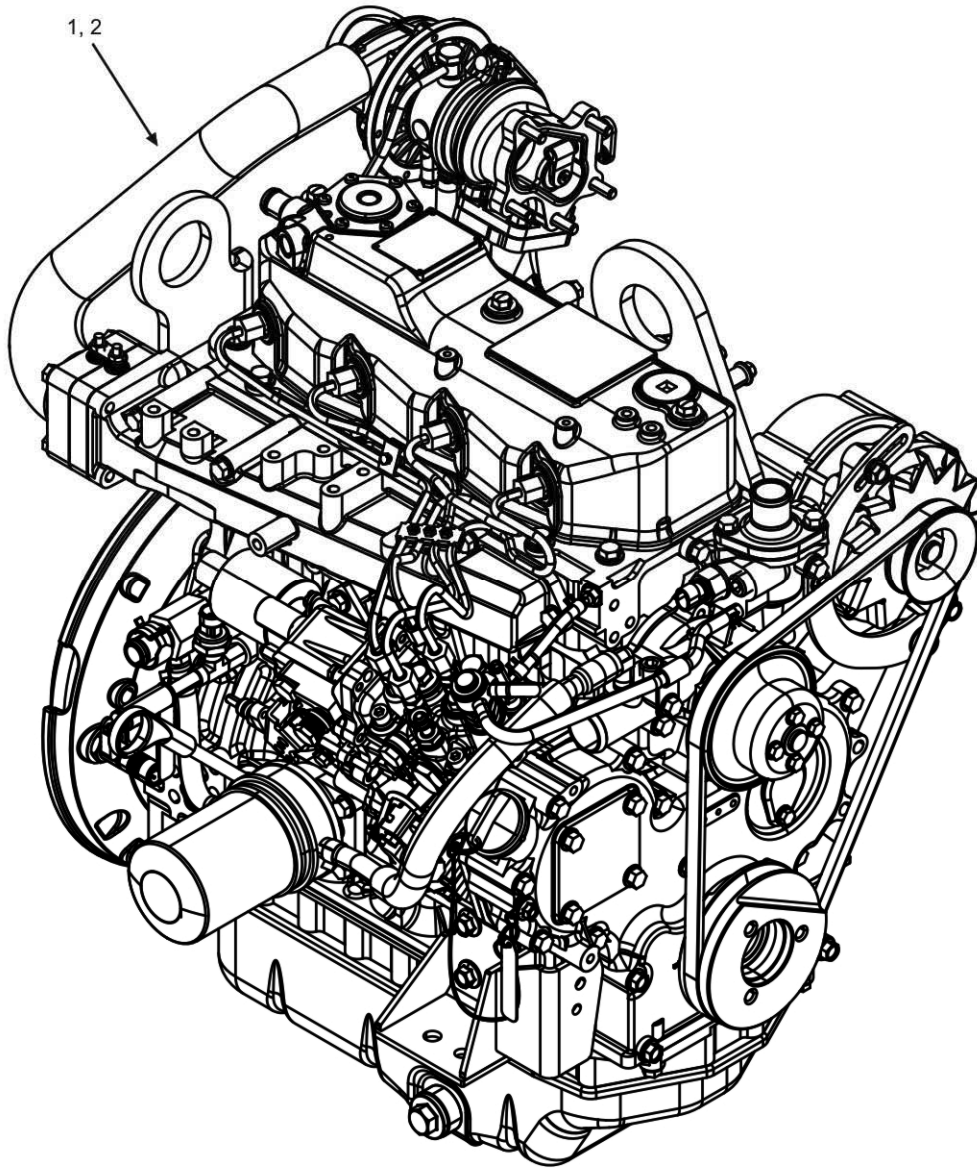


Figure 25. Engine Assembly (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC NAVY FORCE			(3) NSN	(4) CAGEC	P/N	(5)	(6) DESCRIPTION AND UOC	(7) QTY.
									GROUP 0902	
1	PAFHH	PAFHH	PAFDD	PAFDD		44940	04-20159-1		FIG. 25 ENGINE ASSEMBLY ...ASSEMBLY, ENGINE (SEE FIGURES 26-53 FOR PARTS BREAKDOWN) UOC: 98J	1
2	PAFHH	PAFHH	PAFDD	PAFDD		44940	04-20159-2		...ASSEMBLY, ENGINE (SEE FIGURES 26-53 FOR PARTS BREAKDOWN) UOC: 98K	1
									END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
 AMMPS 15KW GENERATOR SET
 LUBRICATION SYSTEM REPAIR PARTS LIST

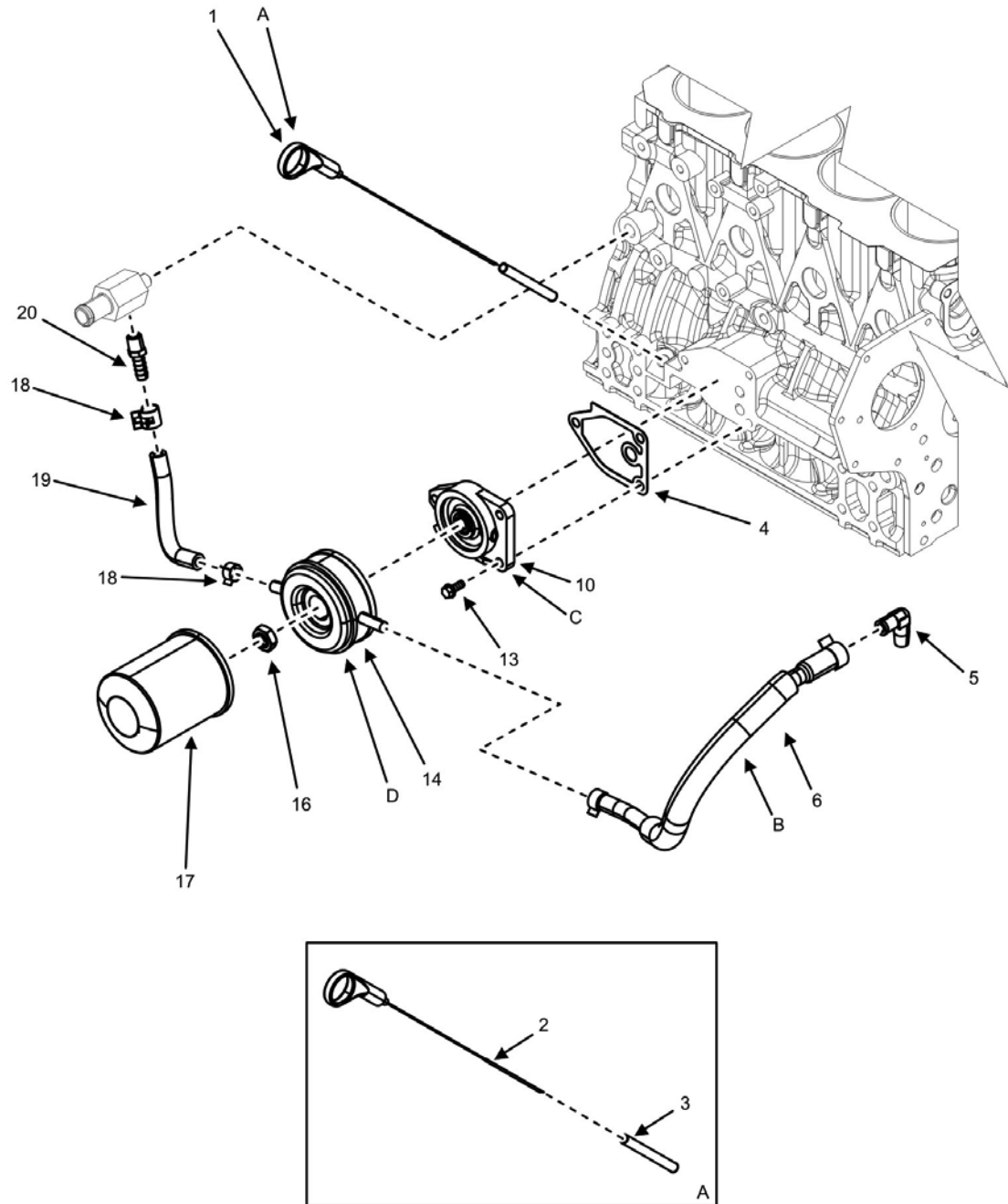


Figure 26. Lubrication System (Sheet 1 of 4).

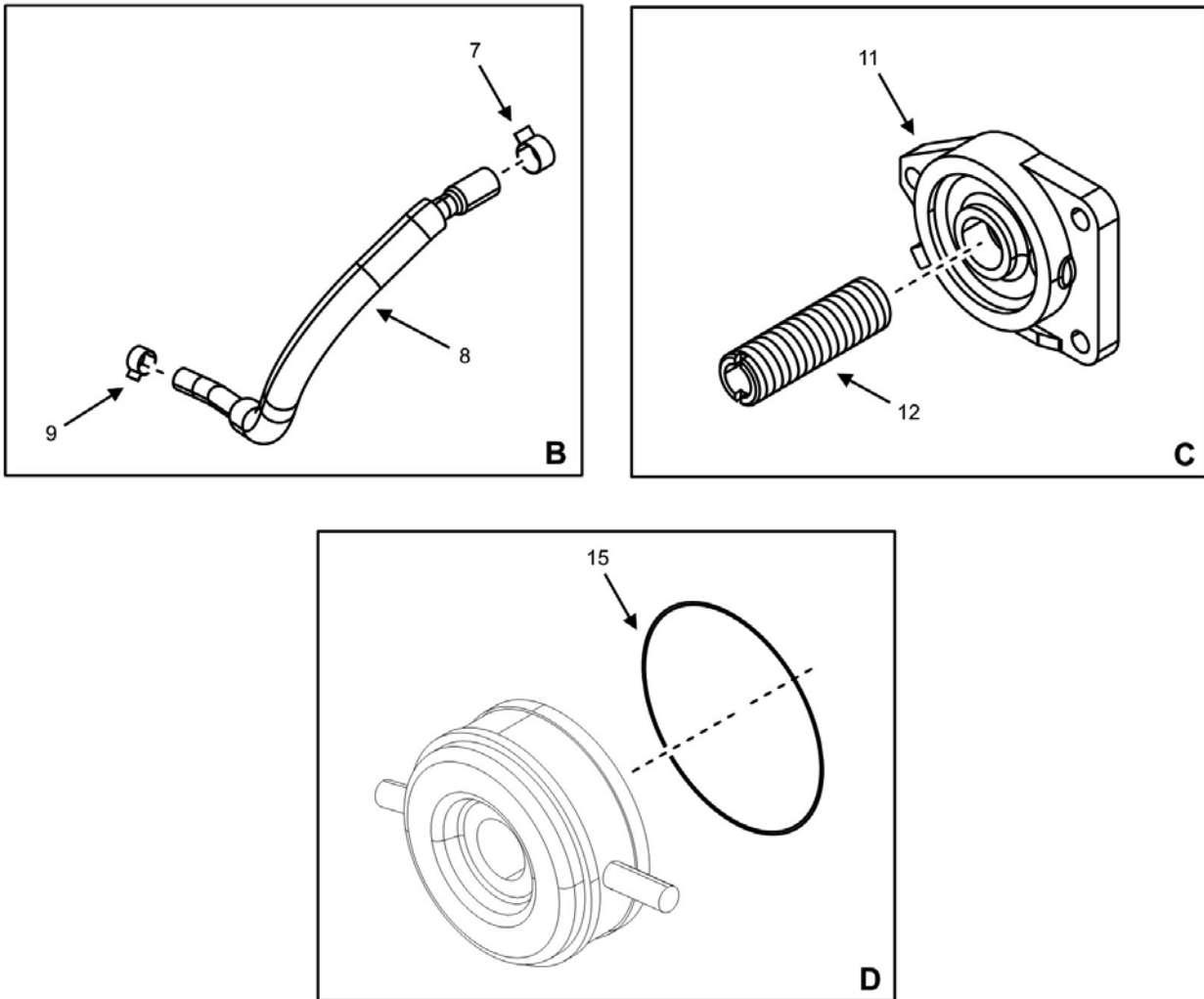


Figure 26. Lubrication System (Sheet 2 of 4).

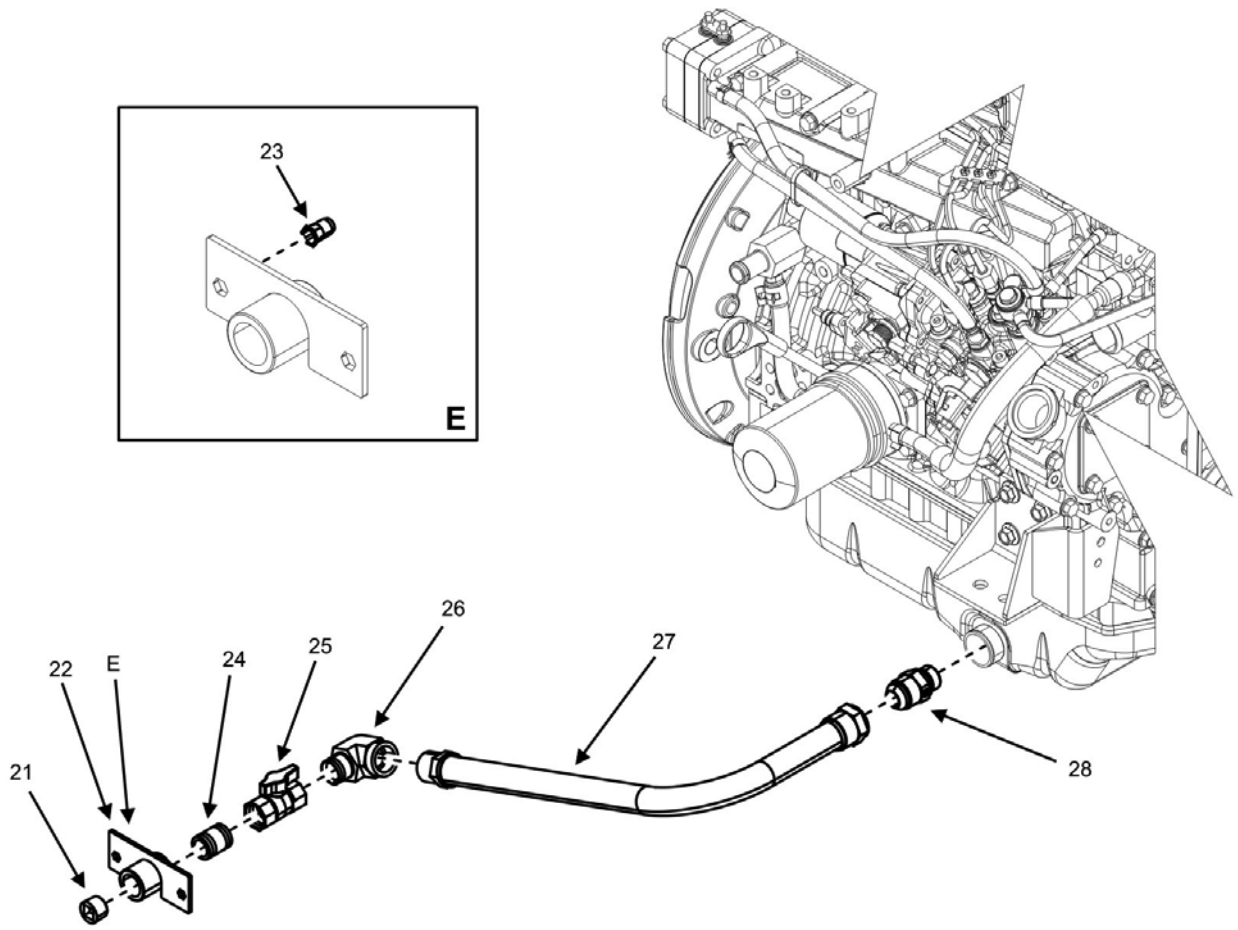


Figure 26. Lubrication System (Sheet 3 of 4).

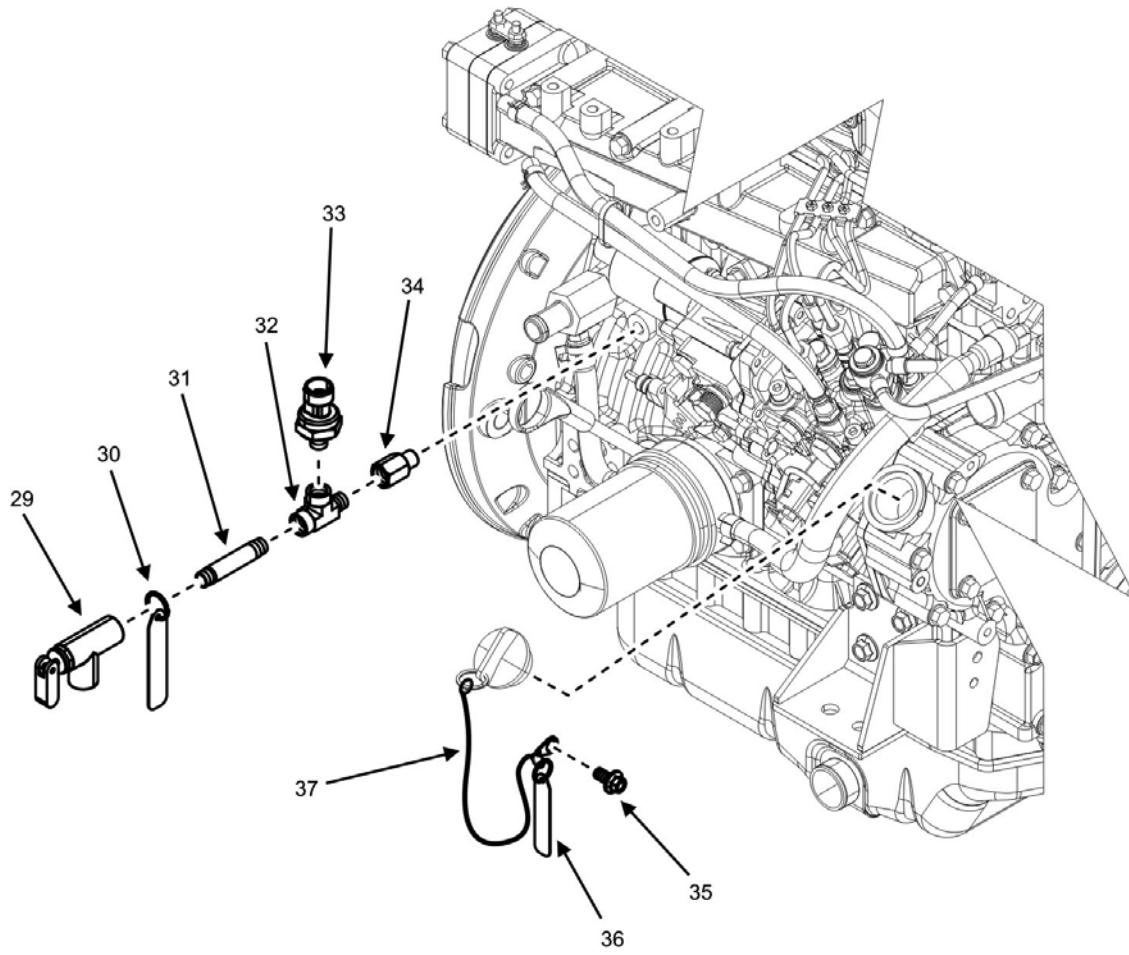


Figure 26. Lubrication System (Sheet 4 of 4).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC FORCE		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090201	
								FIG. 26 LUBRICATION SYSTEM	
1	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-21454	....ASSEMBLY, DIPSTICK TUBE	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		01943	RFQ29352	.....DIPSTICK, LUBRICATION OIL	1
3	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21456	.....TUBE, DIPSTICK	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015467545	0AK42	129150-35111	.....GASKET	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015468861	0AK42	129103-49301	.....ELBOW, PT (1/4)	1
6	PCFFF	PCFFF	PCFFF	PCFFF	4720015468868	0AK42	129508-49040	.....PIPE, COOLER OUTLET (SEE SHEET 2 FOR PARTS BREAKDOWN)	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015468864	0AK42	171008-03990	.....CLIP, HOSE	1
8	PCFZZ	PCFZZ	PCFZZ	PCFZZ	3120015468851	0AK42	119940-59130	.....TUBE, CORRUGATED	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4720015467538	0AK42	23080-015000	.....CLAMP	1
10	XBFFF	XBFFF	XBFFF	XBFFF		0AK42	129006-35100	.....BRACKET ASSEMBLY, FILTER (SEE SHEET 2 FOR PARTS BREAKDOWN)	1
11	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	119802-35110	.....BRACKET, FILTER	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5307015470405	0AK42	129417-35150	.....STUD (LENGTH 67MM)	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015468913	0AK42	26106-080202	.....BOLT (M8 X 20 PLATED)	3
14	PAFFF	PAFFF	PAFFF	PAFFF	2930015468053	0AK42	129508-33010	.....COOLER ASSEMBLY, LUBE OIL (SEE SHEET 2 FOR PARTS BREAKDOWN)	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5331015899924	0AK42	129508-33050	.....O-RING	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015468881	0AK42	129417-33110	.NUT, OIL COOLER	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	119005-35160	.....STRAINER (80 X 100 L.O.)	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-16	.....CLAMP	2
19	PCFFF	PCFFF	PCFFF	PCFFF	4720015468857	0AK42	129508-49030	.....PIPE, COOLER INLET (CUT HOSE TO LENGTH AND DISCARD SUPPLIED CLAMPS)	1
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730011588417	93061	125HBL-6-4	.....ADAPTER, STRAIGHT, PIPE	1
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20166	.....PLUG, PIPE (3/4 INCH NPT)	1
22	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20162	.....BULKHEAD, OIL DRAIN HOSE	1
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ		F3A2G	639101-76030	.....NUT, CLINCH	2

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	P/N	(5)	(6) DESCRIPTION AND UOC	(7) QTY.
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730002783724	01276	2083-12-12S		.....ADAPTER, NIPPLE HOSE (NPT MALE)	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ		6J746	490111110710		.....VALVE, SHUTOFF (NPT FEMALE)	1
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730002030030	21450	454112		.....FITTING, ELBOW (3/4F – NPT TO 3/4M – NPT)	1
27	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44430	256512-00205-473812-474112		.....HOSE, OIL	1
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ		45X75	12M22F82EDMX		.....ADAPTER, HOSE (1 1/16 JIC X TO M22)	1
29	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4820013671836	70411	SP2529VT		.....VALVE, OIL SAMPLING	1
30	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21597		.....LABEL, INFORMATION	1
31	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730001961481	96906	04-20135		.....FITTING, NIPPLE (NPT MALE)	1
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730002479105	30780	1-8MR0S		.....FITTING, PIPE TEE (1/8 INCH NPT)	1
33	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730013669017	22863	P4055-5001-1		.....SENDER, OIL PRESSURE	1
34	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730013669017	98441	1/8-1/8 F3HGS		.....ADAPTER, STRAIGHT (BSPT MALE TO NPT FEMALE)	1
35	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B016WB4K42		.....SCREW, HEX FLANGE HEAD (M8 X 1.25 X 16)	2
36	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21299		.....PLATE, ENGINE OIL CHANGE	1
37	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21295		.....LANYARD, OIL FILL CAP	1
END OF FIGURE										

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
ENGINE SPEED SENSOR REPAIR PARTS LIST**

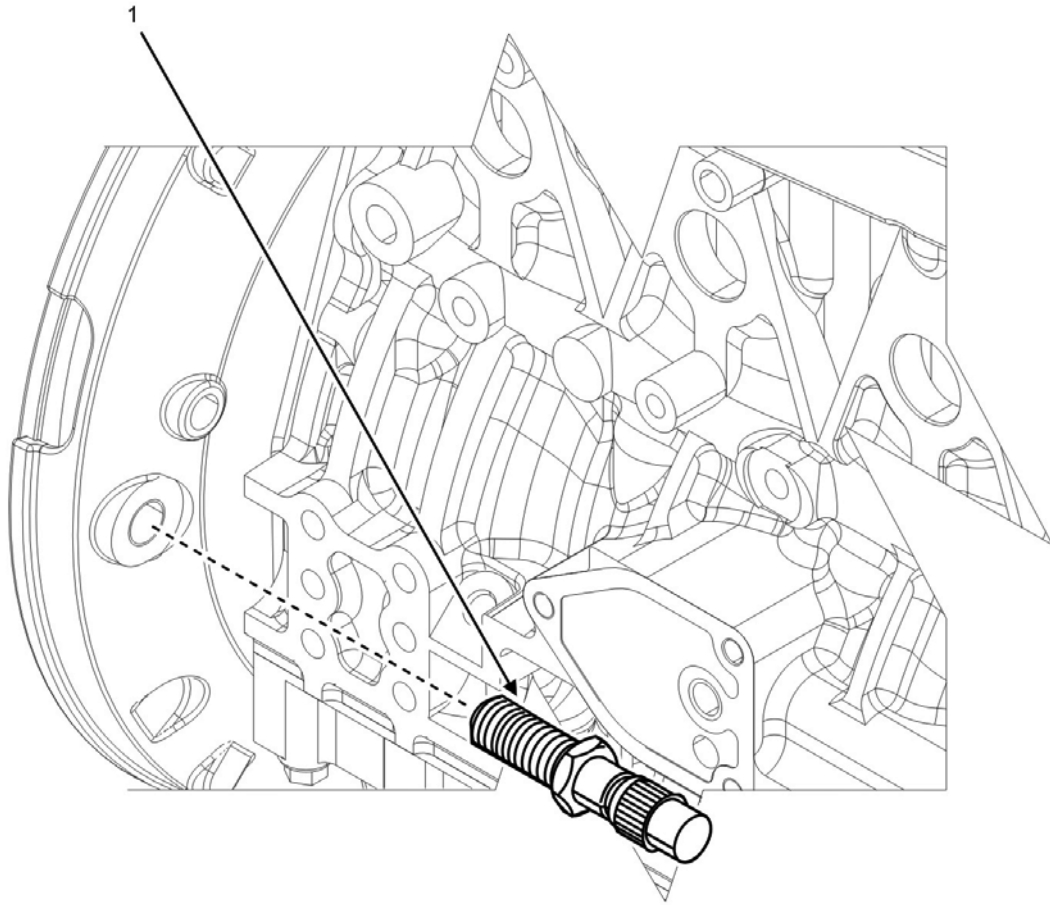


Figure 27. Engine Speed Sensor (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC FORCE		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	5000G	GROUP 090202 FIG. 27 ENGINE SPEED SENSOR SENSOR, MAGNETIC SPEED END OF FIGURE	1

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
FUEL INJECTORS AND LINES REPAIR PARTS LIST

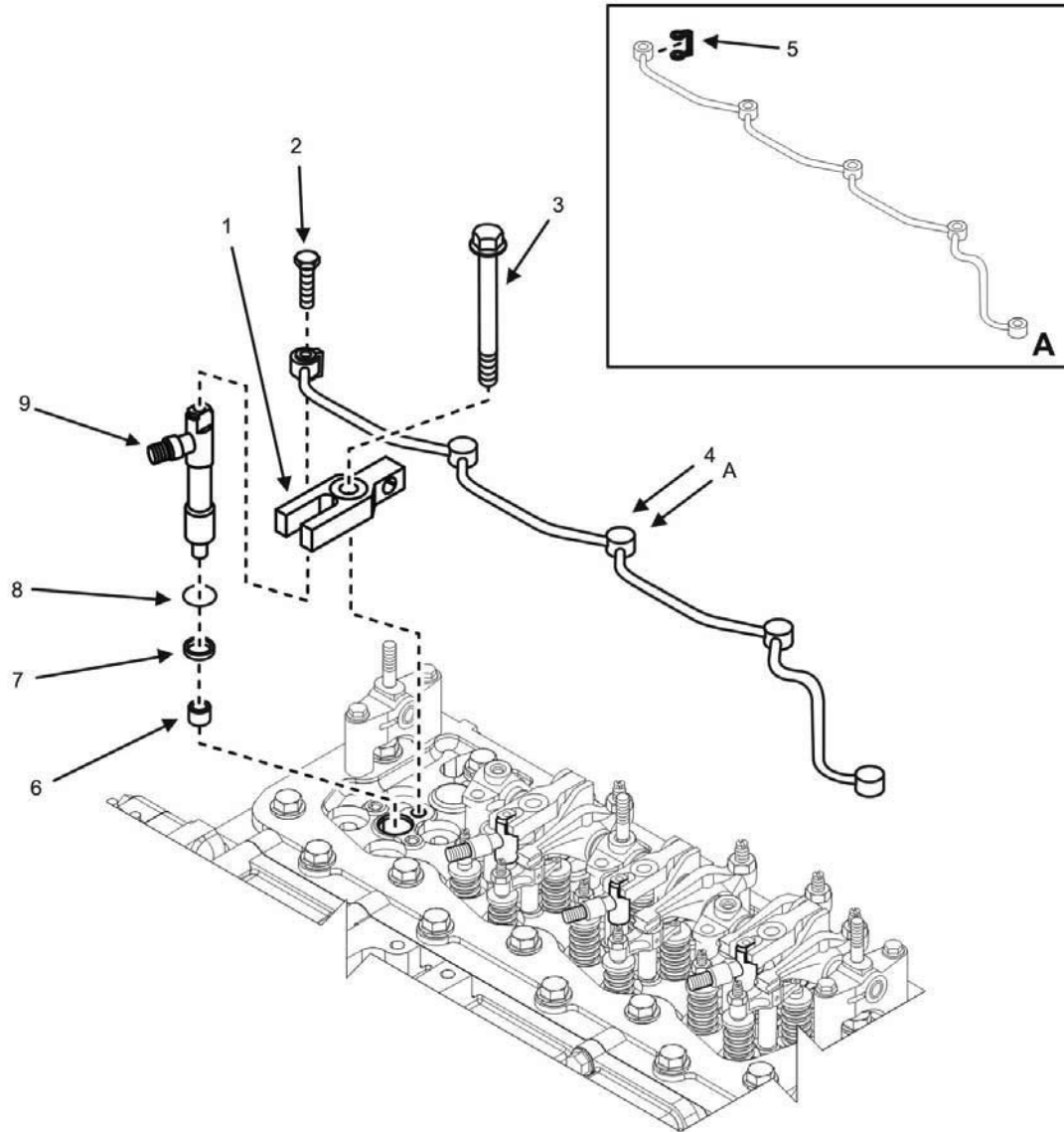


Figure 28. Fuel Injector (Sheet 1 of 2).

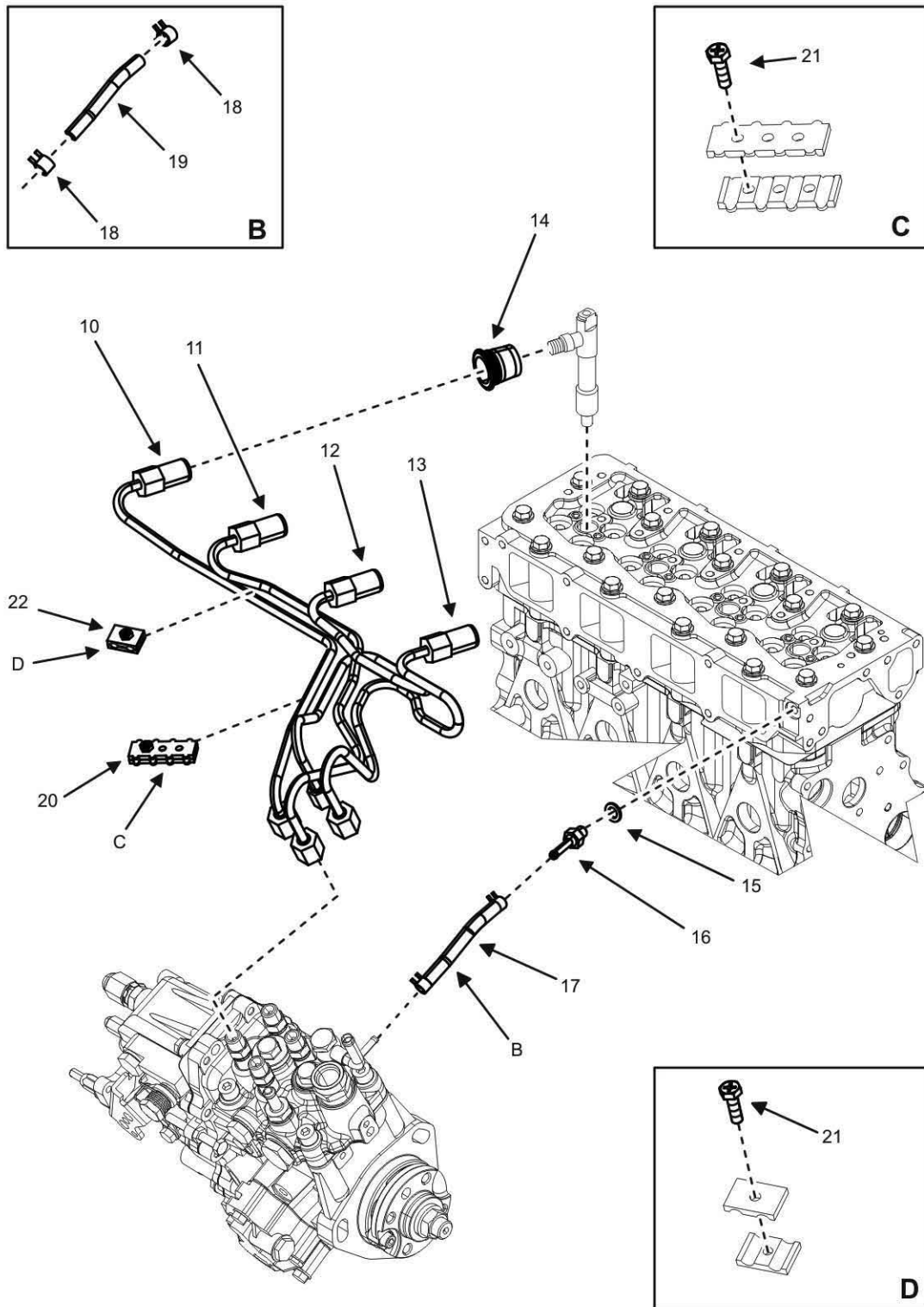


Figure 28. Fuel Injector (Sheet 2 of 2).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090203	
								FIG. 28 FUEL INJECTORS AND LINES	
1	PAHZZ	PAHZZ	PAHZZ	PAHZZ		0AK42	129508-11900	.....RETAINER, NOZZLE	4
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015463527	0AK42	123907-59540	.....BOLT, JOINT (M6)	5
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015470595	0AK42	129907-11950	.....BOLT (M8 X 75)	4
4	PAFFF	PAFFF	PAFFF	PAFFF	4710015468886	0AK42	129508-59550	.....PIPE ASSEMBLY, RETURN	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015468883	0AK42	123907-59550	.....PACKING	5
6	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4720015463578	0AK42	119802-11870	.....PROTECTOR, NOZZLE	4
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2815015464587	0AK42	119625-11880	.....SEAT, NOZZLE	4
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5331015468517	0AK42	24311-000120	.....PACKING, (P 12.0)	4
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	729530-53100	.....VALVE ASSEMBLY, INJECTION	4
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4710015469905	0AK42	129508-59920	.....PIPE ASSEMBLY, INJECTION	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4710015464250	0AK42	129508-59910	.....PIPE ASSEMBLY, INJECTION	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4710015463530	0AK42	129508-59930	.....PIPE ASSEMBLY, INJECTION	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4710015464254	0AK42	129508-59940	.....PIPE ASSEMBLY, INJECTION	1
14	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330015469903	0AK42	123907-11601	.....SEAL	4
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015468875	0AK42	22190-080002	.....SEAL WASHER (8S)	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015469935	0AK42	123907-59560	.....JOINT	1
17	PAFFF	PAFFF	PAFFF	PAFFF		0AK42	129508-59570	.....PIPE ASSEMBLY, RETURN	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340013237844	0AK42	124722-59050	.....CLIP, HOSE	2
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4720015467874	0AK42	129508-59510	.....PIPE, FUEL RETURN	1
20	PAFFF	PAFFF	PAFFF	PAFFF	5340015463539	0AK42	129550-59120	.....RETAINER, PIPE	1
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	129150-59131	.....BOLT, HEX SOCKET (M4 X 14)	4
22	PAFFF	PAFFF	PAFFF	PAFFF	5340015470471	0AK42	119305-59120	.....RETAINER	2
								END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
 AMMPS 15KW GENERATOR SET
 FUEL INJECTION PUMP REPAIR PARTS LIST

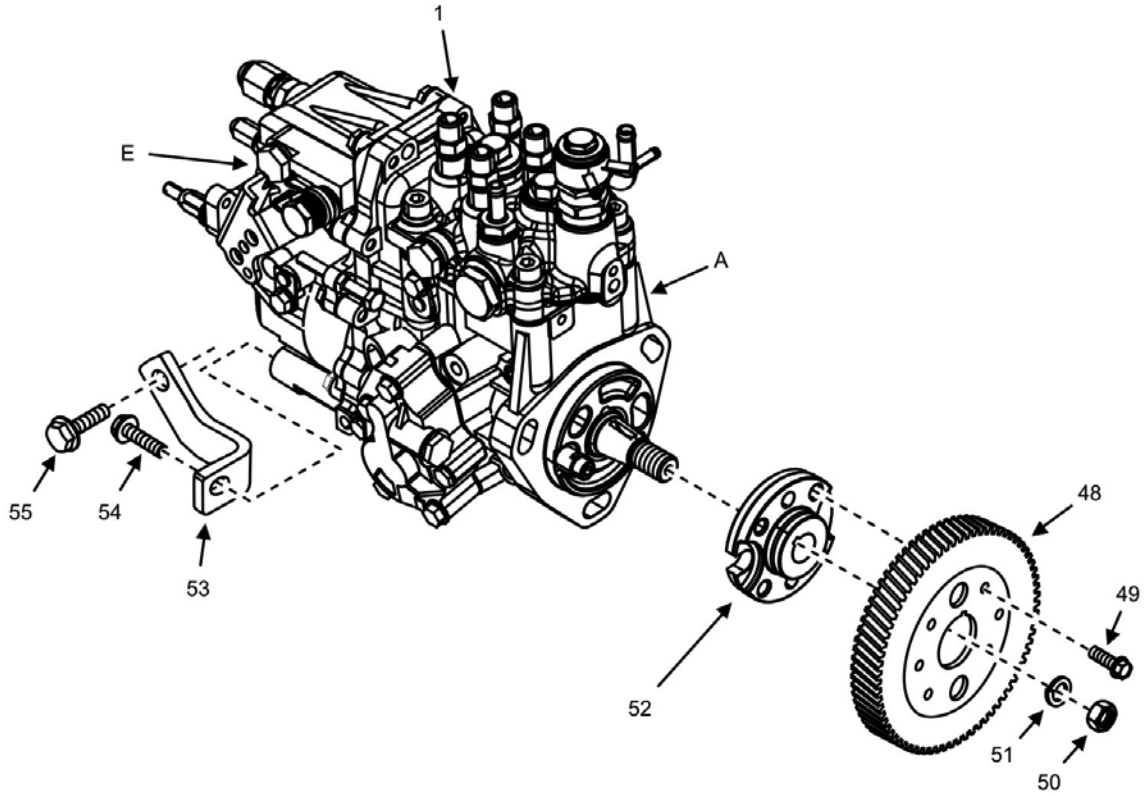


Figure 29. Fuel Injection Pump (Sheet 1 of 4).

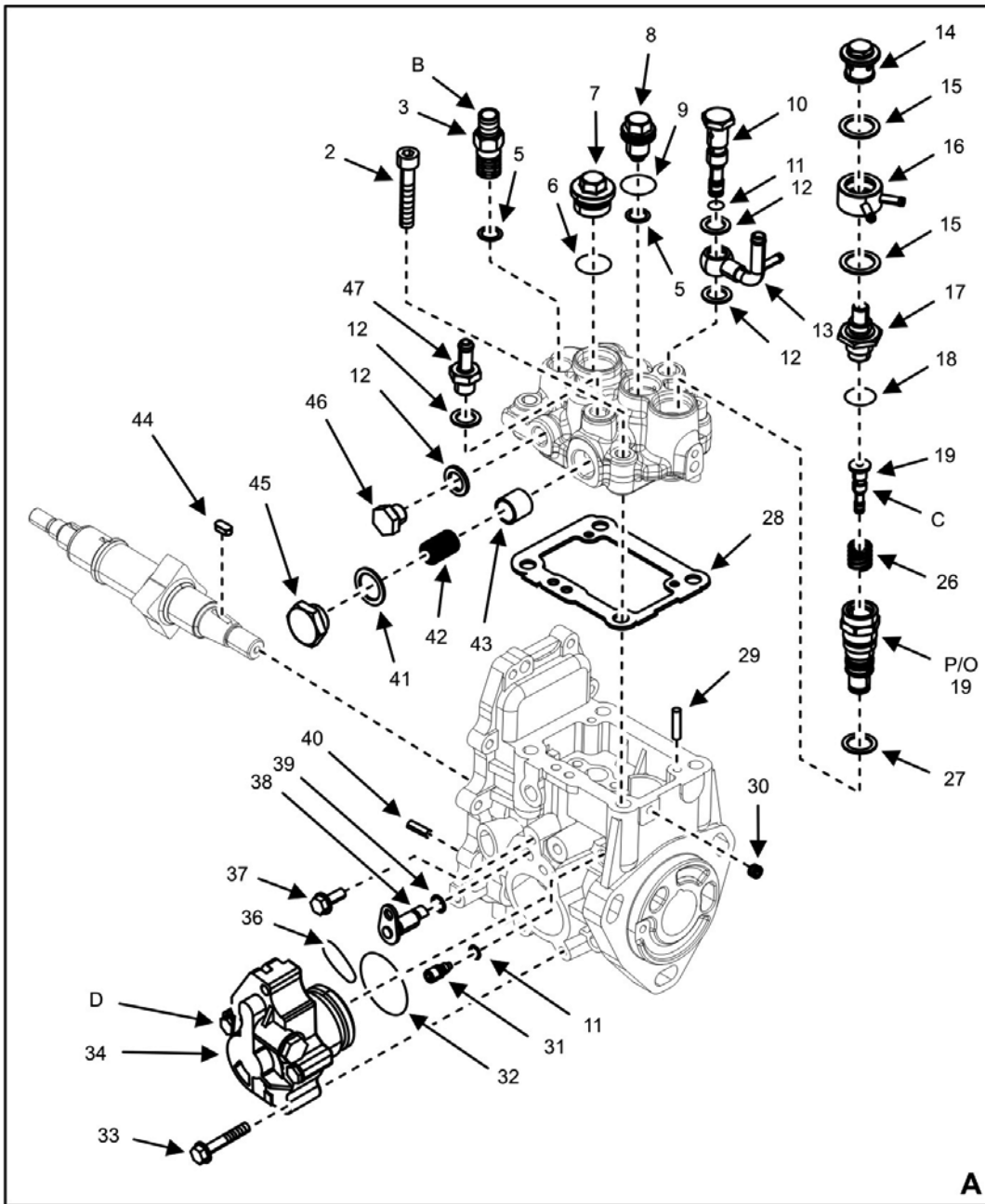


Figure 29. Fuel Injection Pump (Sheet 2 of 4).

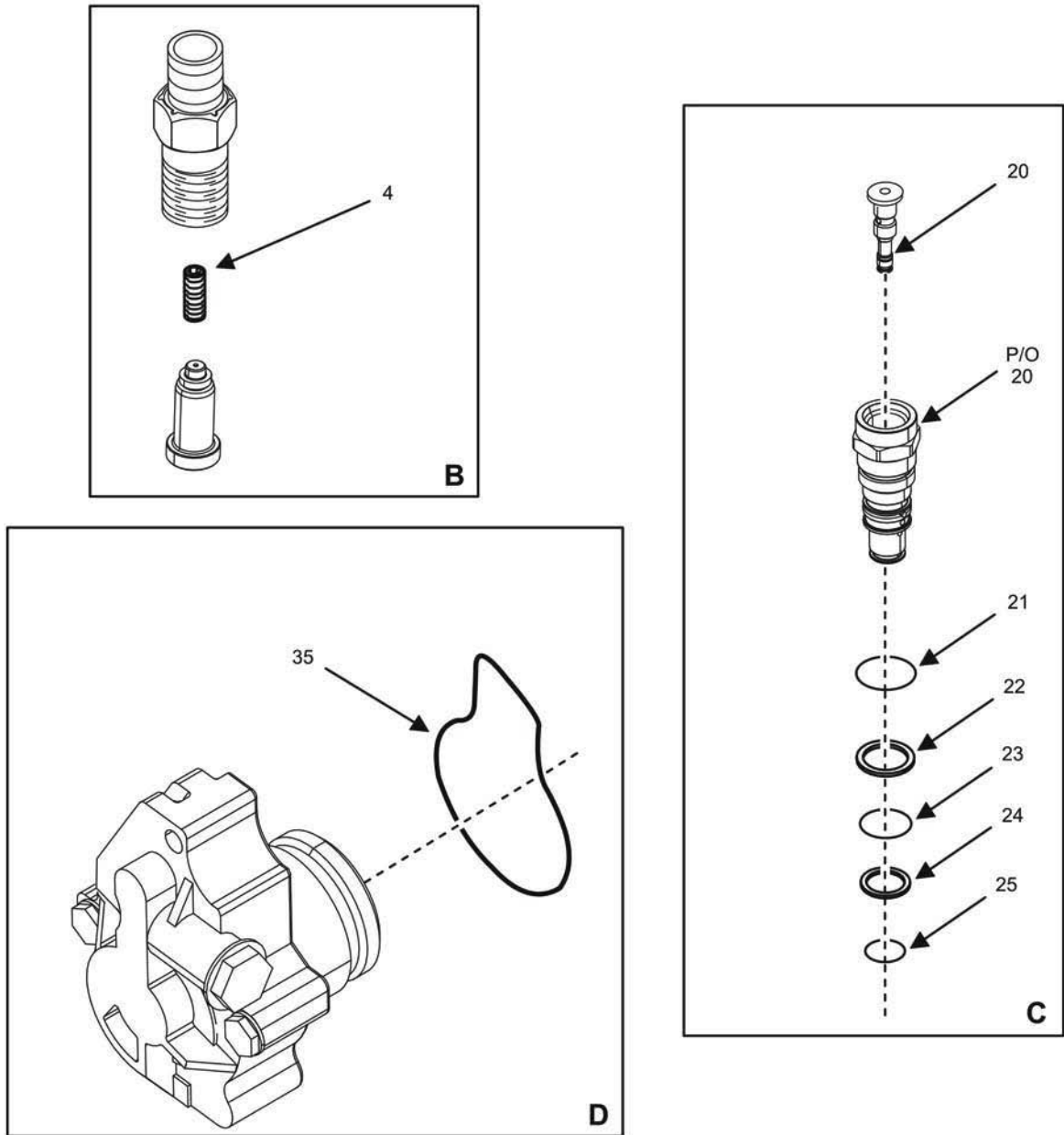


Figure 29. Fuel Injection Pump (Sheet 3 of 4).

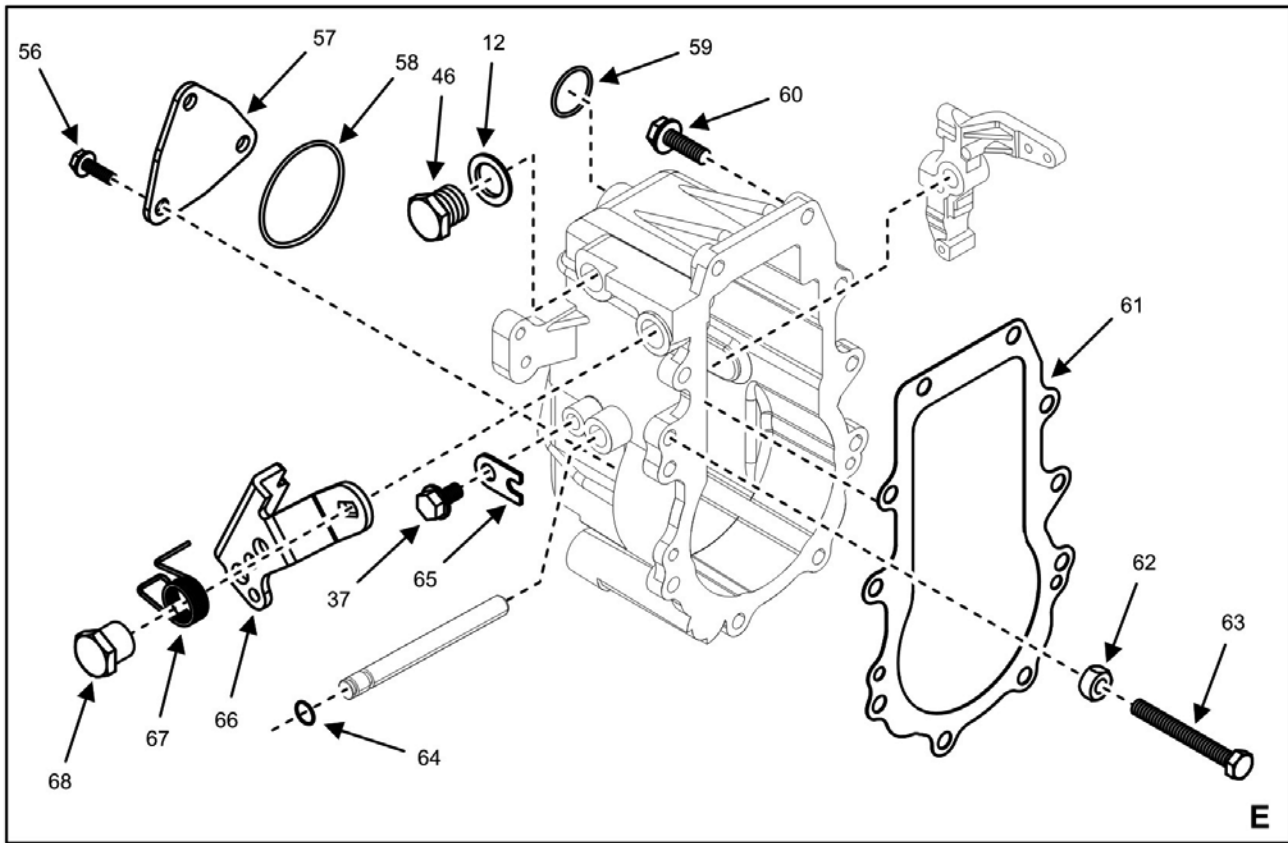


Figure 29. Fuel Injection Pump (Sheet 4 of 4).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
GROUP 090204									
FIG. 29 FUEL INJECTION PUMP									
1	PAFHH	PAFHH	PAFHH	PAFHH		0AK42	729584-51310	.....FUEL INJECTION PUMP ASSEMBLY (SEE SHEETS 2 THROUGH 4 FOR PARTS BREAKDOWN)	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	26450-080452	.....BOLT (M8 X 45)	4
3	XBHHH	XBHHH	XBHHH	XBHHH		0AK42	129509-51390	.....SETTING, DELIVERY(SEE SHEET 3 FOR PARTS BREAKDOWN)	4
4	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	158563-51330	.....SPRING, DELIVERY	4
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	158552-51571	.....PACKING, BARREL PLUG	5
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015896551	0AK42	158601-51550	.....PLUG	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	24356-010200	.....PACKING (1020)	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015896652	0AK42	119802-51560	.....PLUG, BARREL	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	24356-010180	.....O-RING	1
10	PAFZZ	PAFZZ	XBFZZ	XBFZZ		0AK42	158601-51650	.....JOINT, OVERFLOW	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	158563-51281	.....O-RING	2
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	22190-120002	.....SEAL WASHER (12)	5
13	PAFZZ	PAFZZ	XBFZZ	XBFZZ		0AK42	158552-51670	.....JOINT, OVERFLOW	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015896558	0AK42	158601-51570	.....PLUG, WATER PUMP	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	22190-180002	.....WASHER (18)	3
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4710015897688	0AK42	158553-51551	.....JOINT, COOLING WATER	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4820015897657	0AK42	158553-51640	.....ELEMENT, THERMO	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	158553-51660	.....O-RING (P14)	1
19	XBHHH	XBHHH	XBHHH	XBHHH		0AK42	119802-51590	.....TIMER SET (SEE SHEET 3 FOR PARTS BREAKDOWN)	1
20	XBHHH	XBHHH	XBHHH	XBHHH		0AK42	119802-51600	.....TIMER	1
21	PAHZZ	PAHZZ	PAHZZ	PAHZZ		0AK42	24356-010200	.....PACKING (1020)	1
22	XBHHH	XBHHH	XBHHH	XBHHH		0AK42	119802-51680	.....BACKUP RING	1
23	XBHHH	XBHHH	XBHHH	XBHHH		0AK42	119802-51690	.....O-RING	1
24	XBHZZ	XBHZZ	XBHZZ	XBHZZ		0AK42	24372-000150	.....RING, BACKUP (T2 P 15)	1
25	XBHHH	XBHHH	XBHHH	XBHHH		0AK42	158553-51670	.....O-RING (1011)	1
26	XBHZZ	XBHZZ	XBHZZ	XBHZZ		0AK42	158553-51630	.....SPRING, TIMER	1
27	XBHZZ	XBHZZ	XBHZZ	XBHZZ		0AK42	158553-51680	.....PACKING, TIMER	1
28	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5330015899937	0AK42	158552-51600	.....PACKING, HEAD	1
29	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	22312-050140	.....PARALLEL PIN (5 X 14)	2
30	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	158557-51570	.....PLUG	1
31	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	158600-51270	.....STOPPER, TAPPET	1
32	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	158552-52400	.....O-RING (4E S42)	1
33	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	158553-51770	.....BOLT	4
34	XBFZZ	XBFZZ	PAFZZ	PAFZZ		0AK42	158552-52150	.....PUMP ASSEMBLY, FUEL FEED (SEE SHEET 3 FOR PARTS BREAKDOWN)	1
35	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	158552-52500	.....O-RING, PUMP	1
36	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	158552-52310	.....O-RING, PUMP	1
37	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	26106-060102	.....BOLT (6 X 10) PLATED	2
38	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	158552-51580	.....LIFTER	1
39	XBFZZ	XBFZZ	PAFZZ	PAFZZ		0AK42	24311-000070	.....O-RING (1A P-7.0)	1
40	XBFZZ	XBFZZ	PAFZZ	PAFZZ		0AK42	22351-050010	.....SPRING PIN (5 X 10)	2

(1) ITEM NO.	ARMY	(2) SMR CODE		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
		AIR FORCE	USMC						
41	PAFZZ	PAFZZ	PAFZZ	PAFZZ			22190-180002	.....WASHER, 18	1
42	XBHZZ	XBHZZ	XBHZZ	XBHZZ		0AK42	158552-51781	.....SPRING, ACTUATOR	1
43	XBHZZ	XBHZZ	XBHZZ	XBHZZ		0AK42	158601-51770	.....PISTON	1
44	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	119802-51090	.....KEY, WOODRUFF (4 X 16)	1
45	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015896544	0AK42	158601-51790	.....PLUG	1
46	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340013237785	0AK42	23887-120002	.....PLUG, HEX (M12)	2
47	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	119934-59910	.....JOINT, PIPE	1
48	PAHZZ	PAHZZ	PAHZZ	PAHZZ	3040015464092	0AK42	119802-25901	.....GEAR, DRIVE MOTION	1
49	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5306015464266		129150-25301	.....BOLT, MACHINE	4
50	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5310015469272	0AK42	26776-140002	.....NUT, SELF- LOCKING, HEX M14	1
51	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5310015463576	0AK42	22217-140000	.....WASHER, SPLIT	1
52	PAHZZ	PAHZZ	PAHZZ	PAHZZ	3040015464092	0AK42	158552-51151	.....ADAPTER, HOUSING	1
53	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	129508-51250	.....RETAINER, PUMP	1
54	PAFZZ	PAFZZ	PAFZZ	PAFZZ	53060615468913	0AK42	26106-080202	.....BOLT (M8 X 20 PLATED)	1
55	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015468037	0AK42	26106-080302	.....BOLT (M8 X 30 PLATED)	1
56	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015267343	0AK42	26106-060142	.....BOLT (M6 X 14 PLATED)	3
57	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	158563-61060	.....COVER, GOVERNOR CASE	1
58	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	24341-000360	.....O-RING (1A S-36.0)	1
59	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	158552-61900	.....O-RING	1
60	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306014317457	0AK42	26106-060202	.....BOLT (M6 X 20 PLATED)	10
61	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	158553-61050	.....PACKING, CASE	1
62	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014314065	0AK42	26756-060002	.....LOCK NUT (6)	1
63	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	129155-61460	.....BOLT, IDLE	1
64	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	129155-51280	.....O-RING (S6)	1
65	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	119660-61901	.....RETAINER, SHAFT	1
66	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	158552-61441	.....LEVER, REGULATOR	1
67	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	119807-61420	.....SPRING, RETURN	1
68	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	129255-61410	.....NUT	1

END OF FIGURE

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
THERMOSTAT REPAIR PARTS LIST**

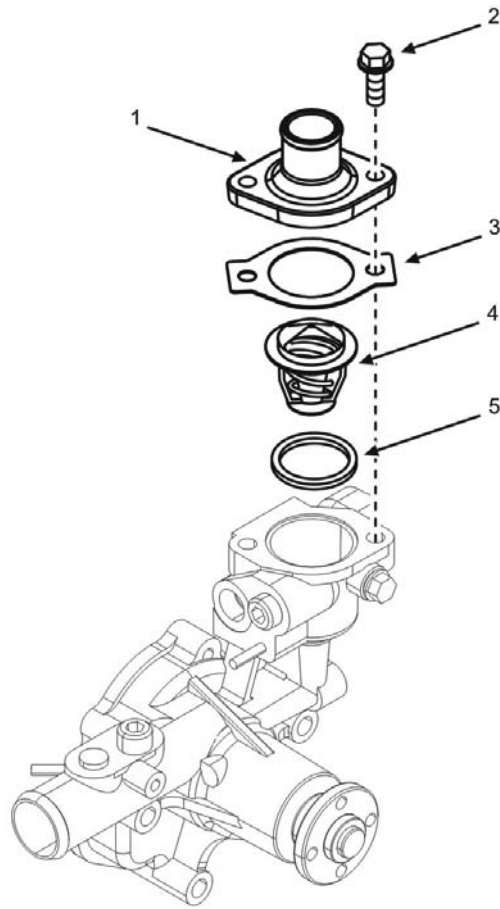


Figure 30. Thermostat (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC FORCE		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090205	
								FIG. 30 THERMOSTAT	
1	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	129350-49530	.....COVER, THERMOSTAT	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015468052	0AK42	26106-080222	.....BOLT (M8 X 22 PLATED)	2
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330997278075	S8543	129795-49551	.....GASKET, COVER	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	129457-49801	.....THERMOSTAT	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015470461	0AK42	129150-49811	.....GASKET, THERMOSTAT	1
								END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
 AMMPS 15KW GENERATOR SET
 WATER PUMP REPAIR PARTS LIST

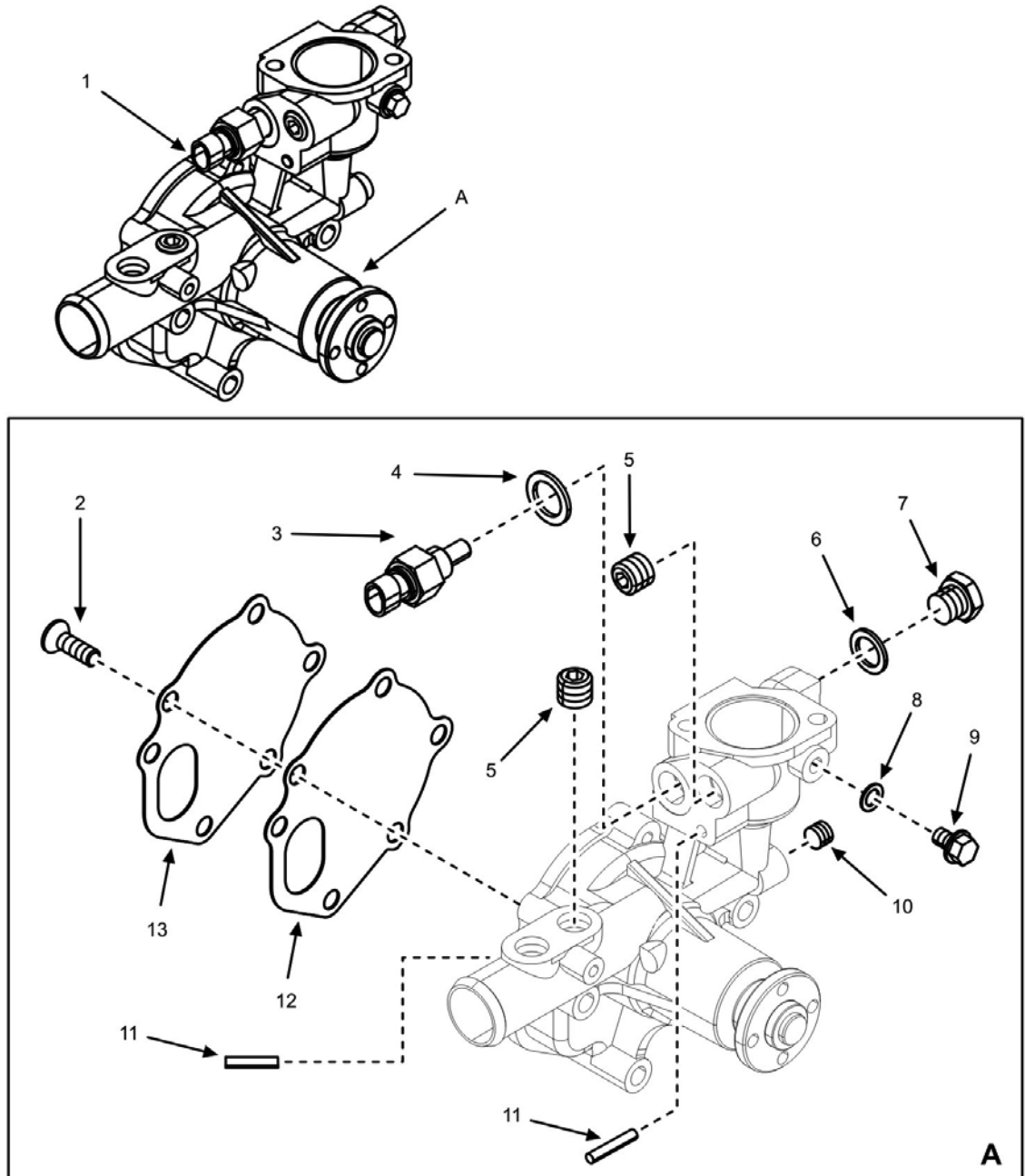


Figure 31. Water Pump (Sheet 1 of 2).

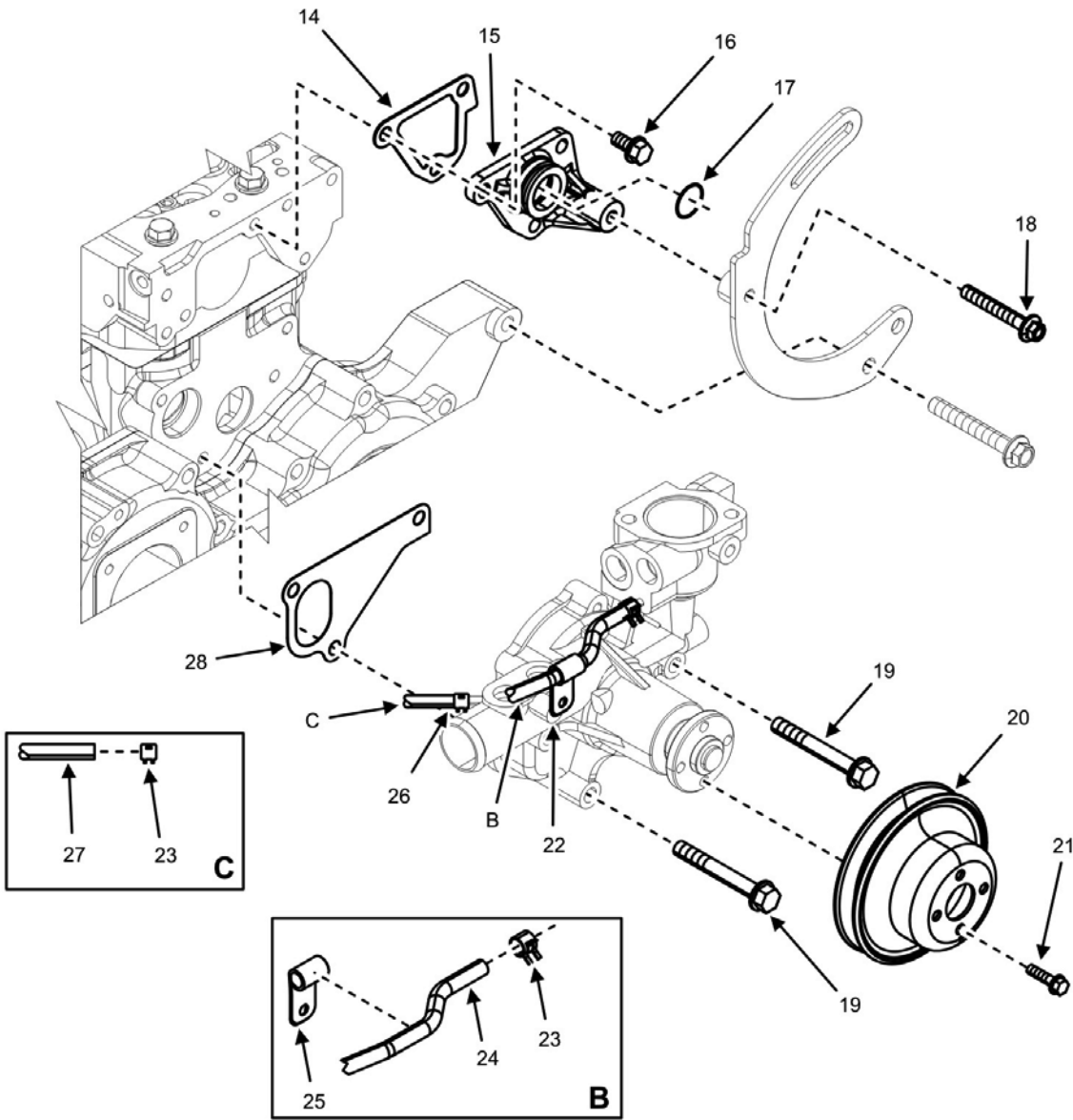


Figure 31. Water Pump (Sheet 2 of 2).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
GROUP 090206									
FIG. 31 WATER PUMP									
1	PAFFF	PAFFF	PAFFF	PAFFF	2930015380889	0AK42	129508-42001	.....PUMP ASSEMBLY, WATER	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015468870	0AK42	121850-42410	.....SCREW	3
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		82647	5D24-0698	.....SENSOR, TEMPERATURE	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		39428	9804A241	.....WASHER, SEALING	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015468903	0AK42	129916-49740	.....PLUG, (R03)	2
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015468898	0AK42	124465-44950	.....GASKET, 16	2
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4370015464242	0AK42	121450-42450	.....PLUG (M16)	2
8	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330014546389	0AK42	23414-080000	.....GASKET 8, ROUND	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305144697436	S4163	26106-080122	.....BOLT (M8 X 12 PLATED)	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015464247	0AK42	23876-010000	.....PLUG (PT 1/8 INCH)	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015469253	0AK42	119802-49113	.....JOINT, PIPE	2
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015470629	0AK42	129100-42051	.....GASKET, WATER PUMP	1
13	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	129100-42121	.....PLATE	1
14	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330015463538	0AK42	124395-49840	.....GASKET, CASE	1
15	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	129004-42040	.....JOINT, PUMP	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015470515	0AK42	26106-080162	.....BOLT (M8 X 16 PLATED)	3
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5331015470466	0AK42	129486-42140	.....O-RING (G30)	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B055WB4K 42	.....SCREW, HEX FLANGE (M8X1.25X55)	1
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015470515	0AK42	26106-080602	.....BOLT, (M8 X 60) PLATED	3
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3020015899930	0AK42	129403-42380	.....V-PULLEY, WATER PUMP	1
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305013006264	19207	12485434-074	.....BOLT (M6 X 12 PLATED)	4
22	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	129004-49610	.....PIPE, WATER MP2 A	1
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340013237844	0AK42	124722-59050	.....CLIP, HOSE	4
24	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4720015468893	0AK42	129004-49711	.....PIPE, WATER MP2 A	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015468917	0AK42	119802-49730	.....CLAMP, PIPE	1
26	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	129004-49620	.....PIPE, WATER MP2 B	1
27	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4720015468124	0AK42	129004-49721	.....PIPE, WATER MP2 B	1
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015468895	0AK42	129486-42021	.....GASKET, WATER PUMP	1
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
BATTERY-CHARGING ALTERNATOR AND BELT REPAIR PARTS LIST**

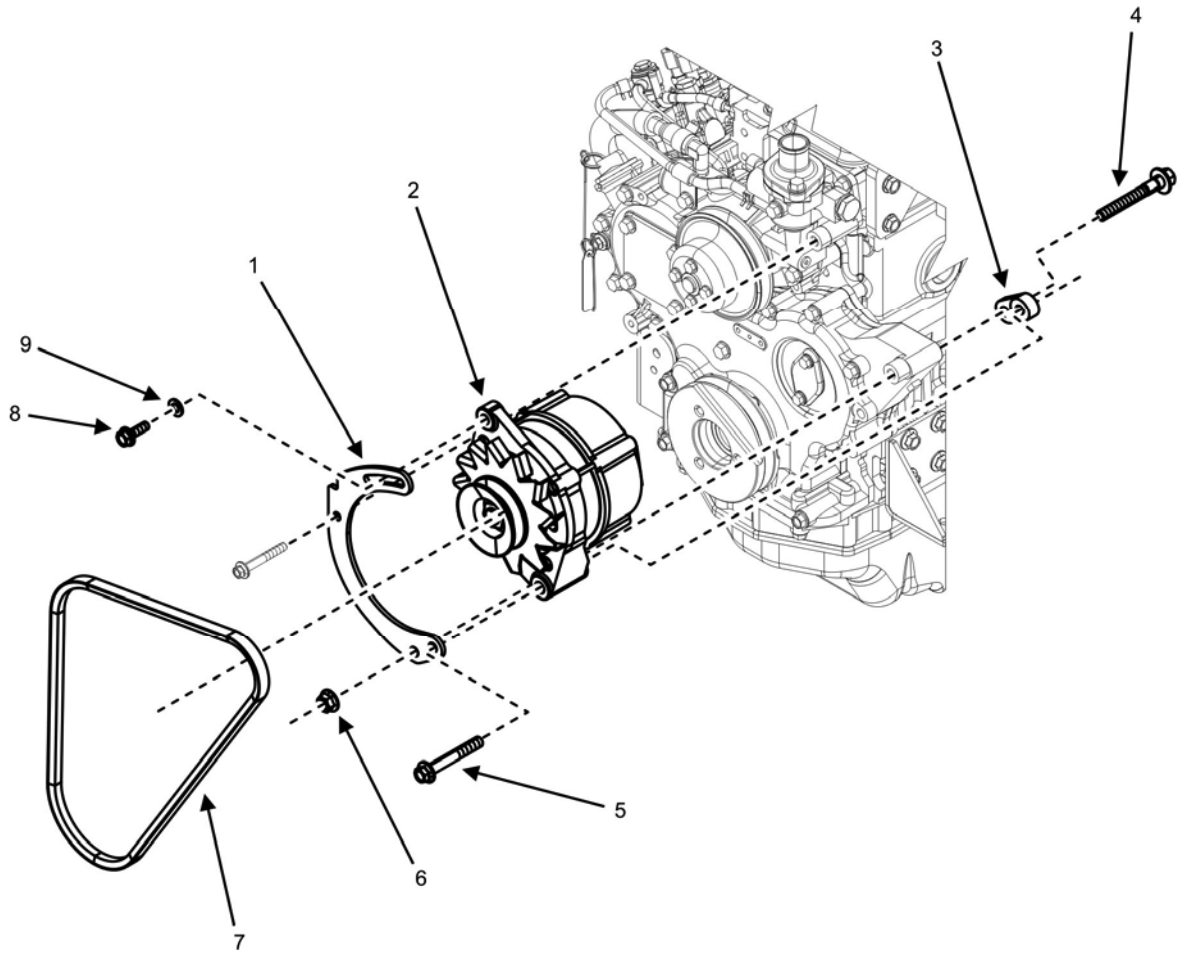


Figure 32. Battery-Charging Alternator and Belt (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC NAVY FORCE			(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
							GROUP 090207		
							FIG. 32 BATTERY- CHARGING ALTERNATOR AND BELT		
1	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20859	....BRACKET, ALTERNATOR ADJUST	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	11.203.849	....ALTERNATOR, BATTERY- CHARGING	1
3	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20857	....MEMBER, ALTERNATOR SUPPORT	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20858	....STUD, ALTERNATOR	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M10C070WB4K 42	....SCREW, HEX FLANGE (M10X1.25X70)	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M10	...NUT, HEX FLANGE M10X1.5	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3030008652700	81348	A-A-52155/2P-40A 1R	....BELT, V-DRIVE 1/2 IN X 40 1/8 IN	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B025WB4K 42	....SCREW , HEX FLANGE (M8X1.25X25)	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN126-M8	....WASHER, FLAT M8	1
							END OF FIGURE		

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
STARTER REPAIR PARTS LIST**

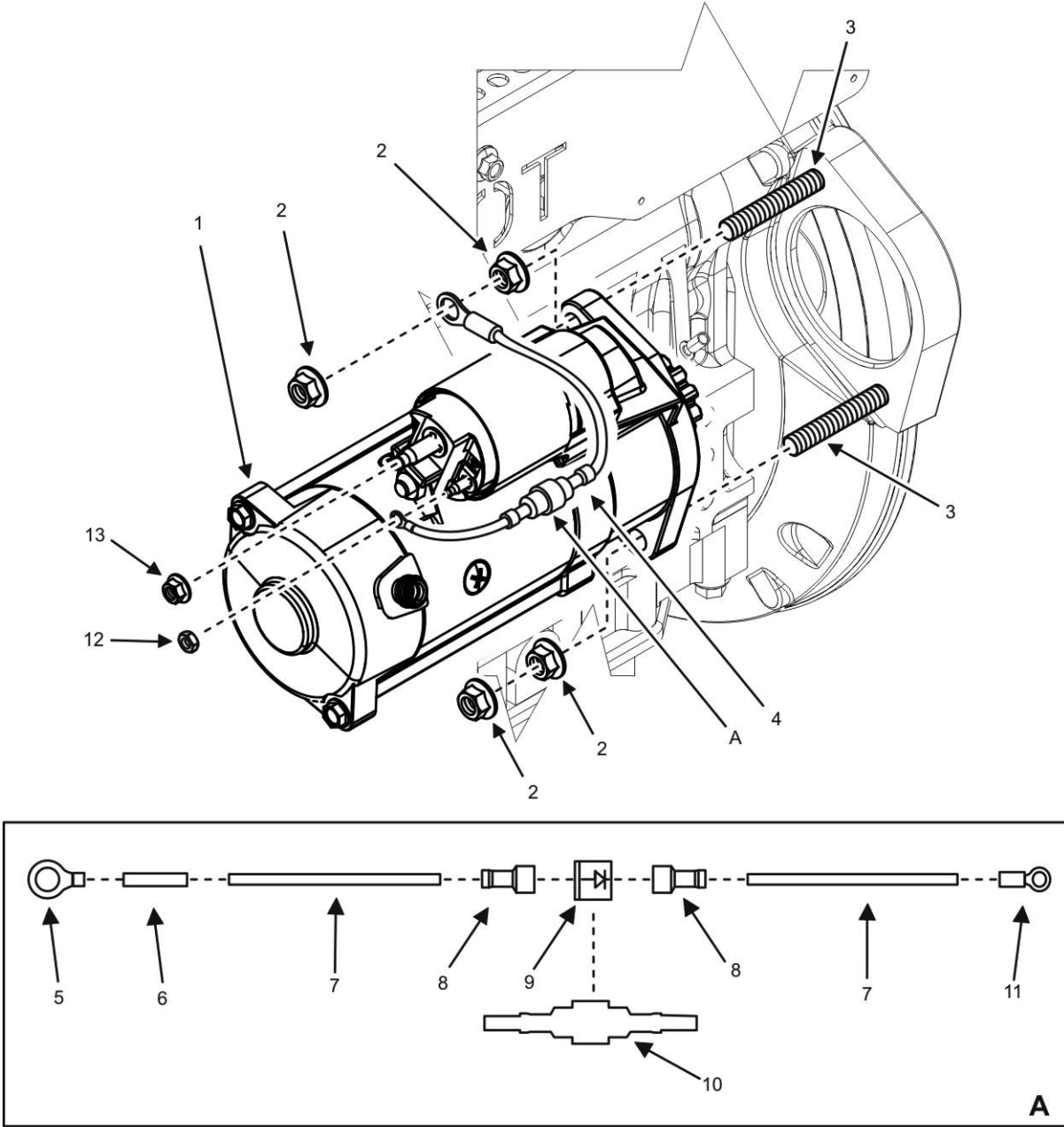


Figure 33. Starter (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC NAVY FORCE			(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090208	
								FIG. 33 STARTER	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	11.131.457	....MOTOR, STARTER, 24 VOLT	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M10	....NUT, HEX FLANGE (M10 X 1.5)	4
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20771	....STUD (M10 X 1.5 X 60)	2
4	PAFFF	PAFFF	PAFFF	PAFFF	6150015860281	44940	04-21425	....LEAD, ELECTRICAL	1
5	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG2T5-100B	....LAMINATE, LABEL COVER	1
6	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26	....STRAND, WIRE (MAKE FROM 3271-16-26 ON BULK ITEMS LIST, CUT TO LENGTH 300 MM + 35 MM)	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015860213	30554	88-20275-3	....TERMINAL, DISCONNECT	2
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5961015860276	44940	04-21416	....SEMICONDUCTOR DEVICE	1
9	MFFZZ	MFFZZ	MFFZZ	MFFZZ		30554	88-20541-15	....SLEEVING, INSULATING (MAKE FROM 88-20541-15 ON BULK ITEMS LIST, CUT TO LENGTH AS NEEDED)	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015859905	779	160140	....TERMINAL, LUG	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015860272	779	2-36160-1	....TERMINAL, LUG	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN943-M5	....NUT, HEX (M5 X 0.8)	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M8	.NUT, HEX FLANGE (M8 X 1.25)	1
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
GOVERNOR ACTUATOR REPAIR PARTS LIST**

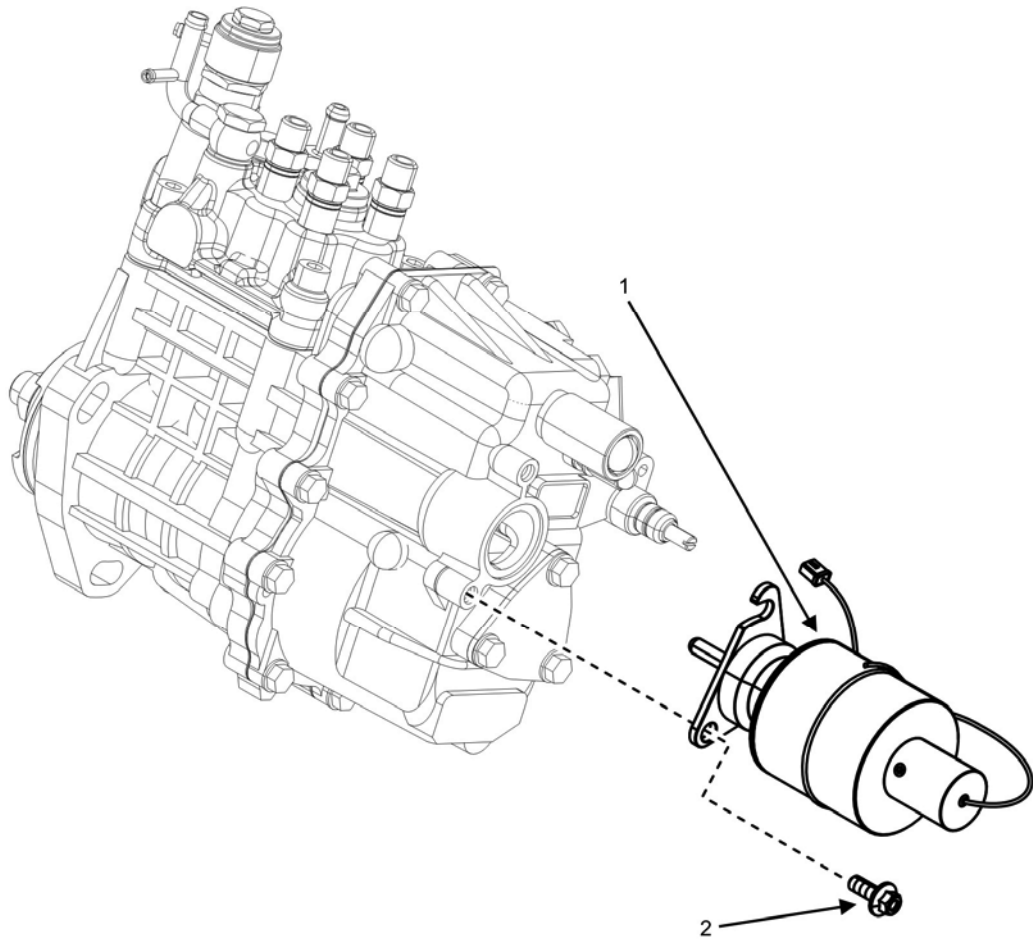


Figure 34. Governor Actuator (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC NAVY			(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090209	
								FIG. 34 GOVERNOR ACTUATOR	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	9291	....GOVERNOR ACTUATOR	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A016WB4K 42	...SCREW, CAP HEX HEAD	2
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
INTAKE MANIFOLD REPAIR PARTS LIST**

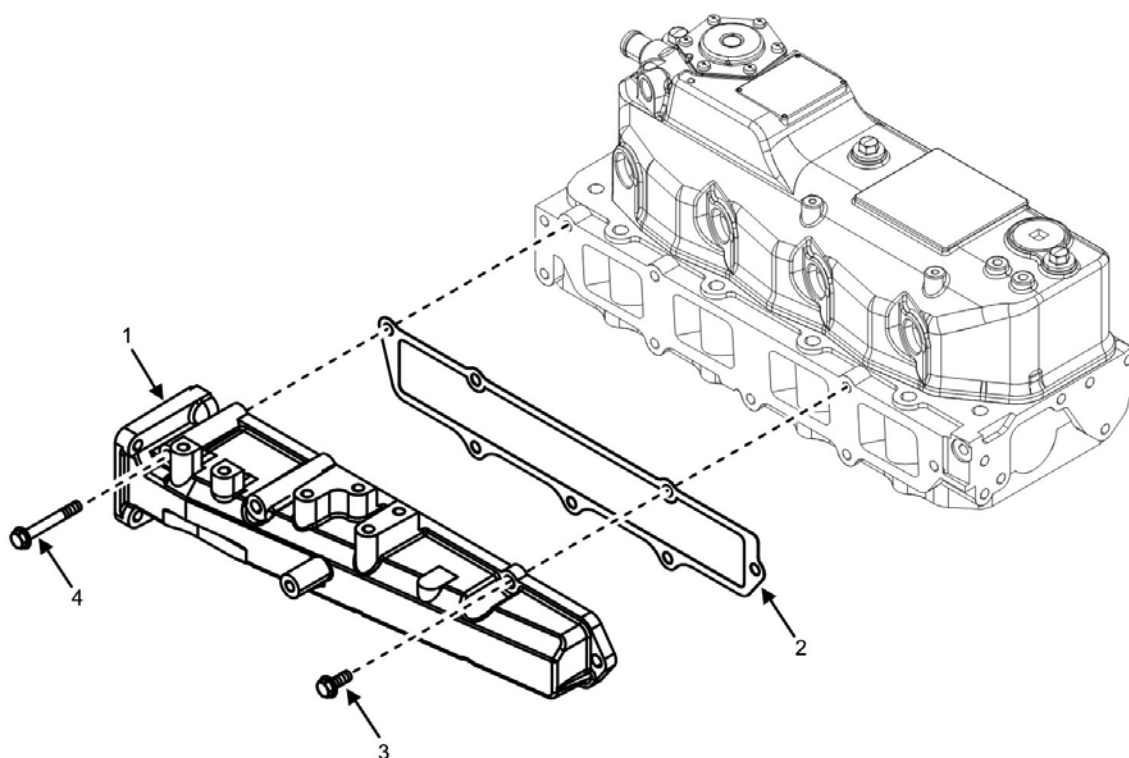


Figure 35. Intake Manifold (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC NAVY FORCE			(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090210	
								FIG. 35 INTAKE MANIFOLD	
1	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	129508-12100	.....MANIFOLD, AIR INTAKE	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015464259	0AK42	129508-12110	.....GASKET, MANIFOLD	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015468913	0AK42	26106-080202	.....BOLT (M8 X 20 PLATED)	5
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015468565	0AK42	26106-080802	.....BOLT (M8 X 80 PLATED)	2
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
EXHAUST MANIFOLD REPAIR PARTS LIST**

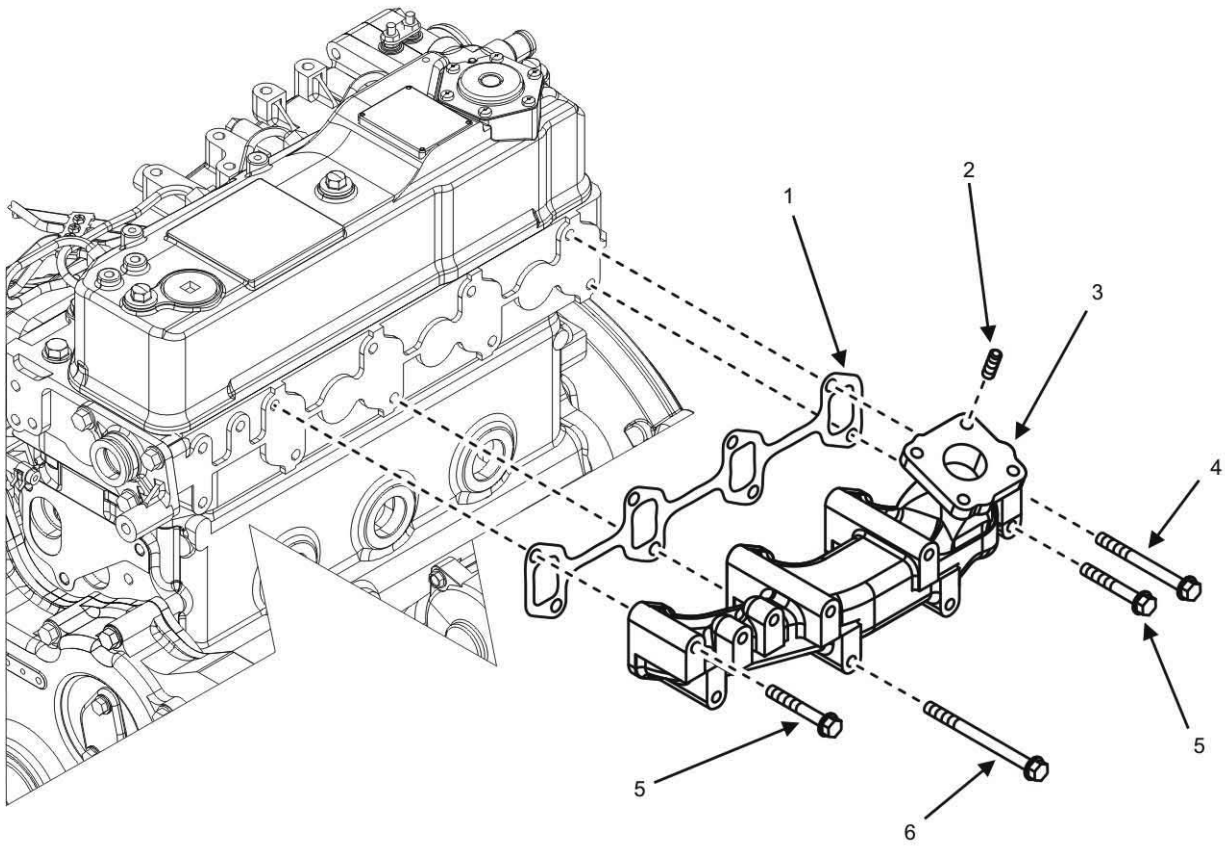


Figure 36. Exhaust Manifold (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090211	
								FIG. 36 EXHAUST MANIFOLD	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330014554061	0AK42	129550-13110	.....GASKET, EXHAUST MANIFOLD	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015468540	0AK42	119131-18320	.....STUD, M8X22	4
3	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	129403-13120	.....MANIFOLD, EXHAUST	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015464268	0AK42	119802-13670	.....BOLT, MACHINE, M8X85	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015470056	0AK42	119802-13650	.....BOLT, MACHINE, M8X65	3
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015463568	0AK42	129693-44310	.....BOLT, MACHINE,	4
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
OIL PAN AND STRAINER REPAIR PARTS LIST**

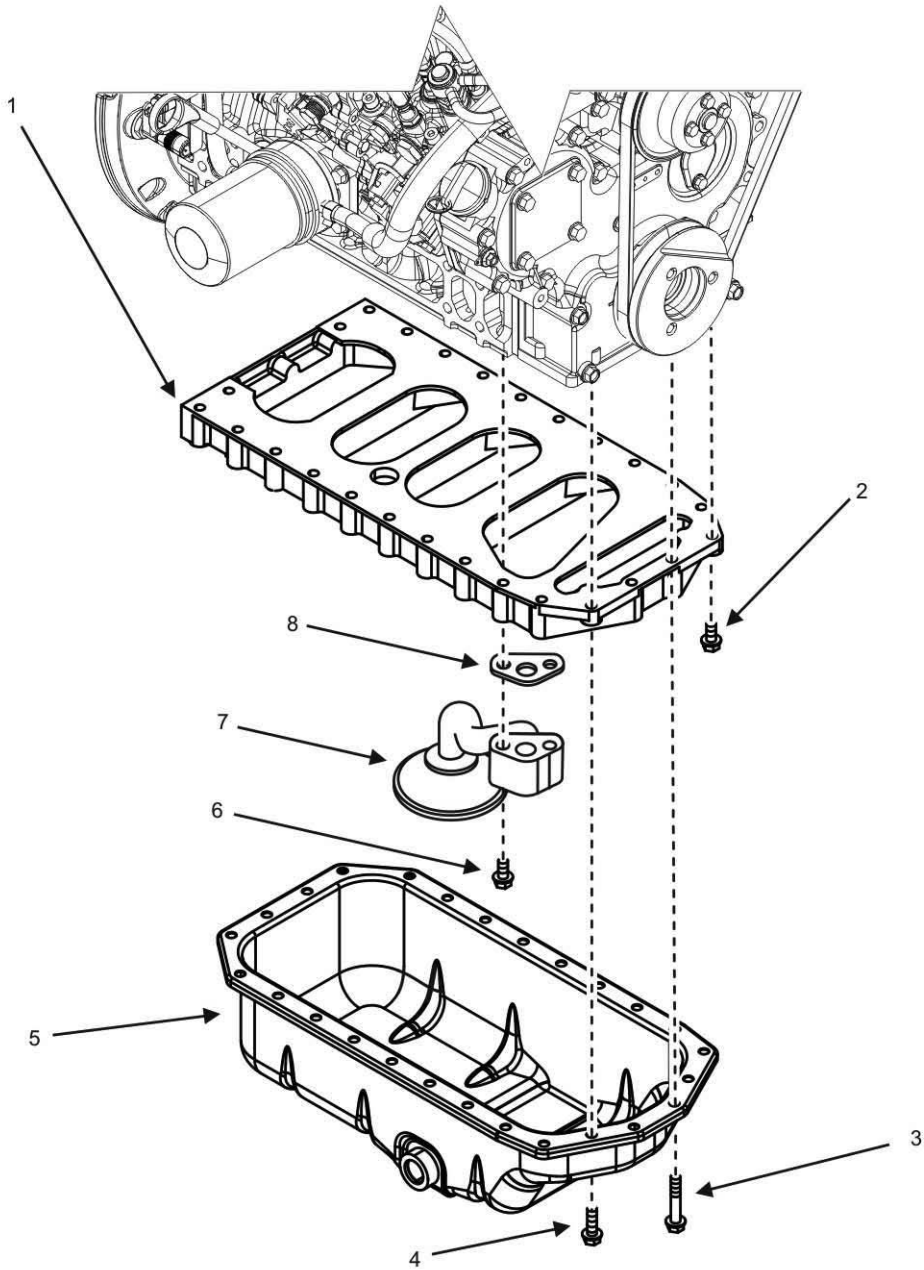


Figure 37. Oil Pan and Strainer (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090212	
								FIG. 37 OIL PAN AND STRAINER	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0B8S3	129400-01730	.....SPACER, OIL SUMP	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015472404	0AK42	26106-080252	.....BOLT (M8 X 25 PLATED)	2
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306013886230	0AK42	26106-080452	.....BOLT (M8 X 45 PLATED)	25
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305013886229	0AK42	26106-080162	.....BOLT (M8 X 16 PLATED)	4
5	PAFFF	PAFFF	PAFFF	PAFFF		0B8S3	129400-01770	.....PAN, LUBRICATING OIL	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306014317461	0AK42	26106-080352	.....BOLT (M8 X 35 PLATED)	2
7	XBHZZ	XBHZZ	XBFZZ	XBFZZ		0B8S3	129436-35091	.....PIPE STRAINER, OIL INLET	1
8	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330015466844	0AK42	129150-35042	.....GASKET, PIPE	1
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
FLYWHEEL REPAIR PARTS LIST**

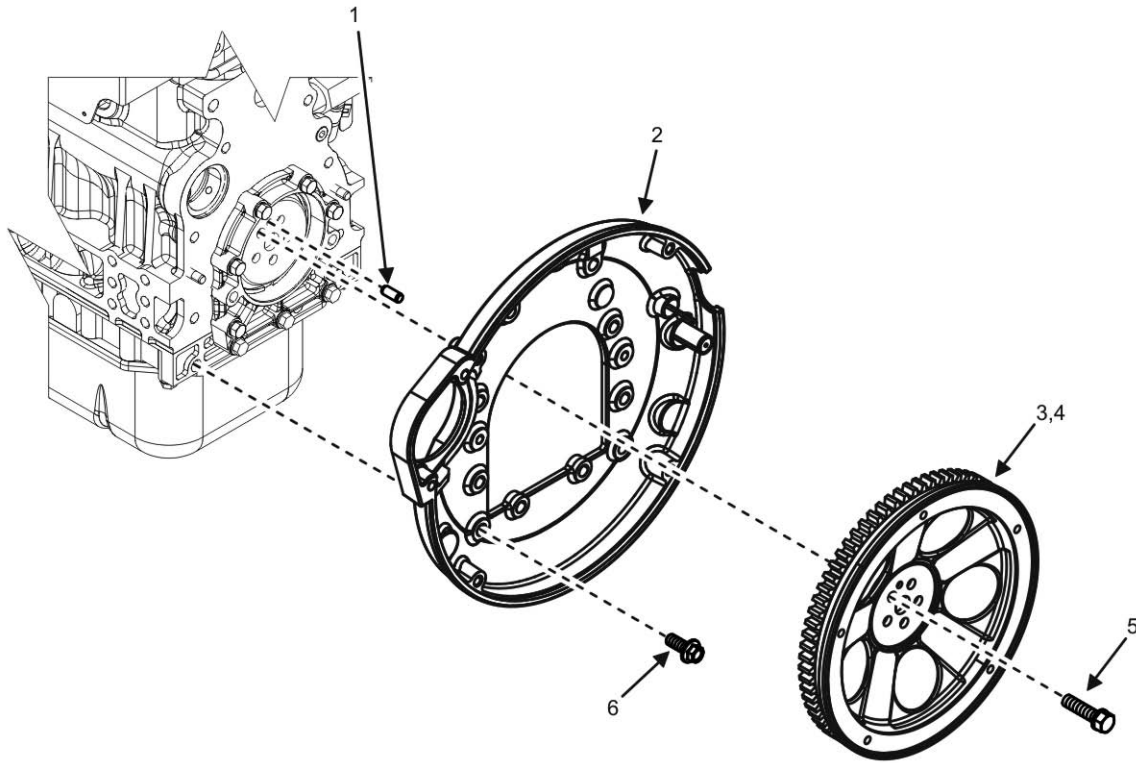


Figure 38. Flywheel (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC FORCE		NAVY	(3) NSN	(4) CAGEC	P/N	(5)	(6) DESCRIPTION AND UOC	(7) QTY.
									GROUP 090213	
									FIG. 38 FLYWHEEL	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN1481-M3X40		....PIN, SPRING	1
2	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20171		....HOUSING, FLYWHEEL	1
3	PBFZZ	PBFZZ	PBFZZ	PBFZZ		44940	04-21623		....FLYWHEEL UOC: 98J	1
4	PBFZZ	PBFZZ	PBFZZ	PBFZZ		44940	04-20220		....FLYWHEEL UOC: 98K	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES07M10B020WB4K41		....SCREW, HEX FLANGE HEAD (M10 X 1.25 X 20)	6
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES07M10C025WB4K42		....SCREW, HEX FLANGE HEAD (M10 X 1.5 X 25)	10
									END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
CRANKCASE REAR BEARING COVER REPAIR PARTS LIST**

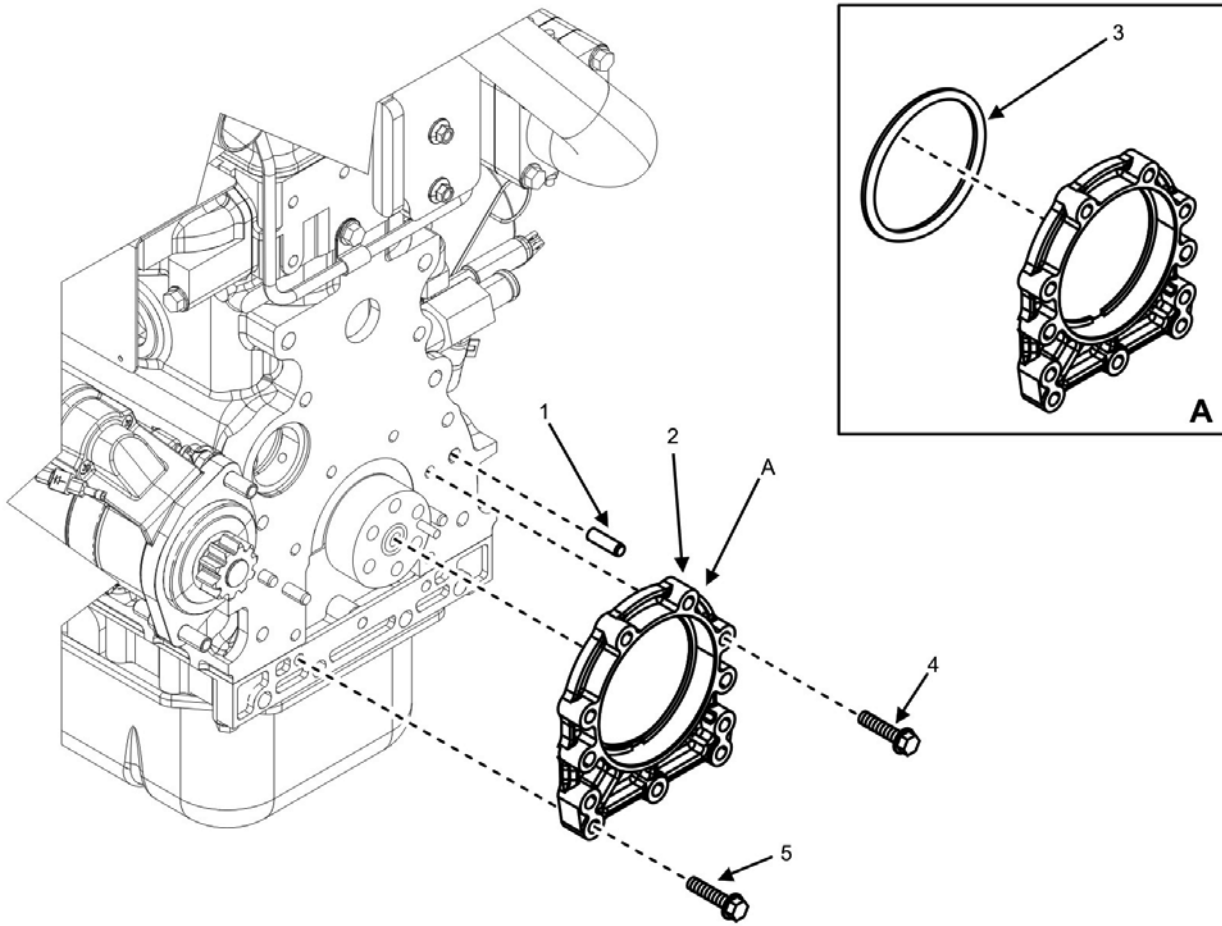


Figure 39. Crankcase Rear Bearing Cover (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090214	
								FIG. 39 CRANKCASE REAR BEARING COVER	
1	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5315015469902	0AK42	129100-01580	.....PIN, SHOULDER HEADLESS (M8 X 16)	4
2	PCFFF	PCFFF	PCFFF	PCFFF		0B8S3	129100-01640	.....CASE ASSEMBLY, OIL SEAL	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330014544384	0AK42	129795-01780	.....SEAL, OIL	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015468899	0AK42	129486-01670	.....BOLT (M8 X 30)	6
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306014317461	0AK42	26106-080352	.....BOLT (M8 X 35)	5
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
INTAKE AIR HEATER REPAIR PARTS LIST**

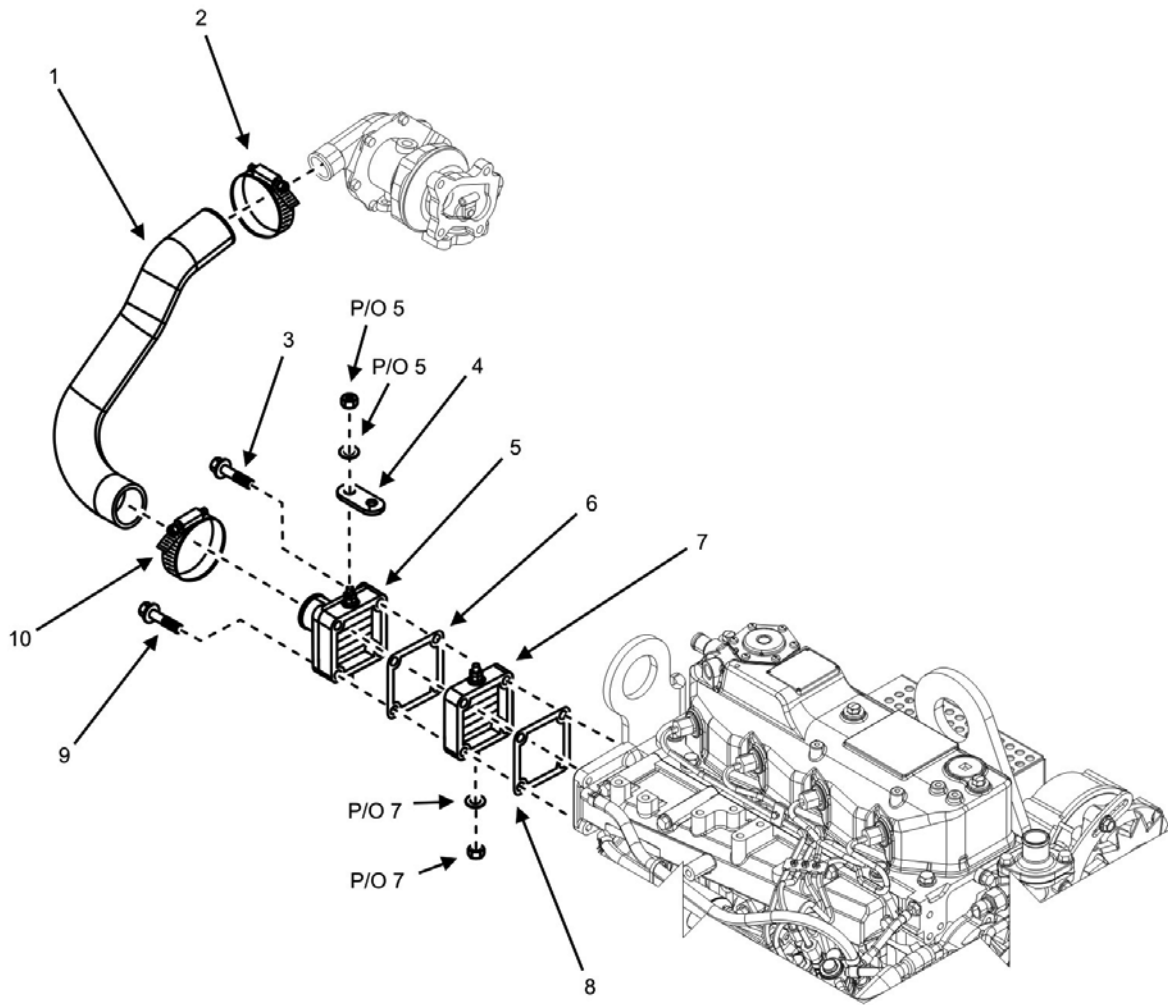


Figure 40. Intake Air Heater (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090215	
								FIG. 40 INTAKE AIR HEATER	
1	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4720015897377	0AK42	129584-12060	.....HOSE, INTAKE	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015897697	0AK42	23000-048000	.....CLAMP, HOSE 48	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015470515	0AK42	26106-080602	.....BOLT, M8 X 60 PLATED	2
4	PBFZZ	PBFZZ	PBFZZ	PBFZZ		44940	04-20091	.....BUSBAR, COPPER	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	129120-77502	.....HEATER, AIR	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330014774043	0AK42	129100-77510	.....GASKET, AIR HEATER	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	129100-77501	.....HEATING ELEMENT	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330014195480	0AK42	129150-77511	.....GASKET, AIR HEATER	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305014773508	0AK42	26106-080552	.....BOLT, M8 X 55 PLATED	2
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015897767	0AK42	23000-060000	.....CLAMP, HOSE 60	1
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
TURBOCHARGER REPAIR PARTS LIST**

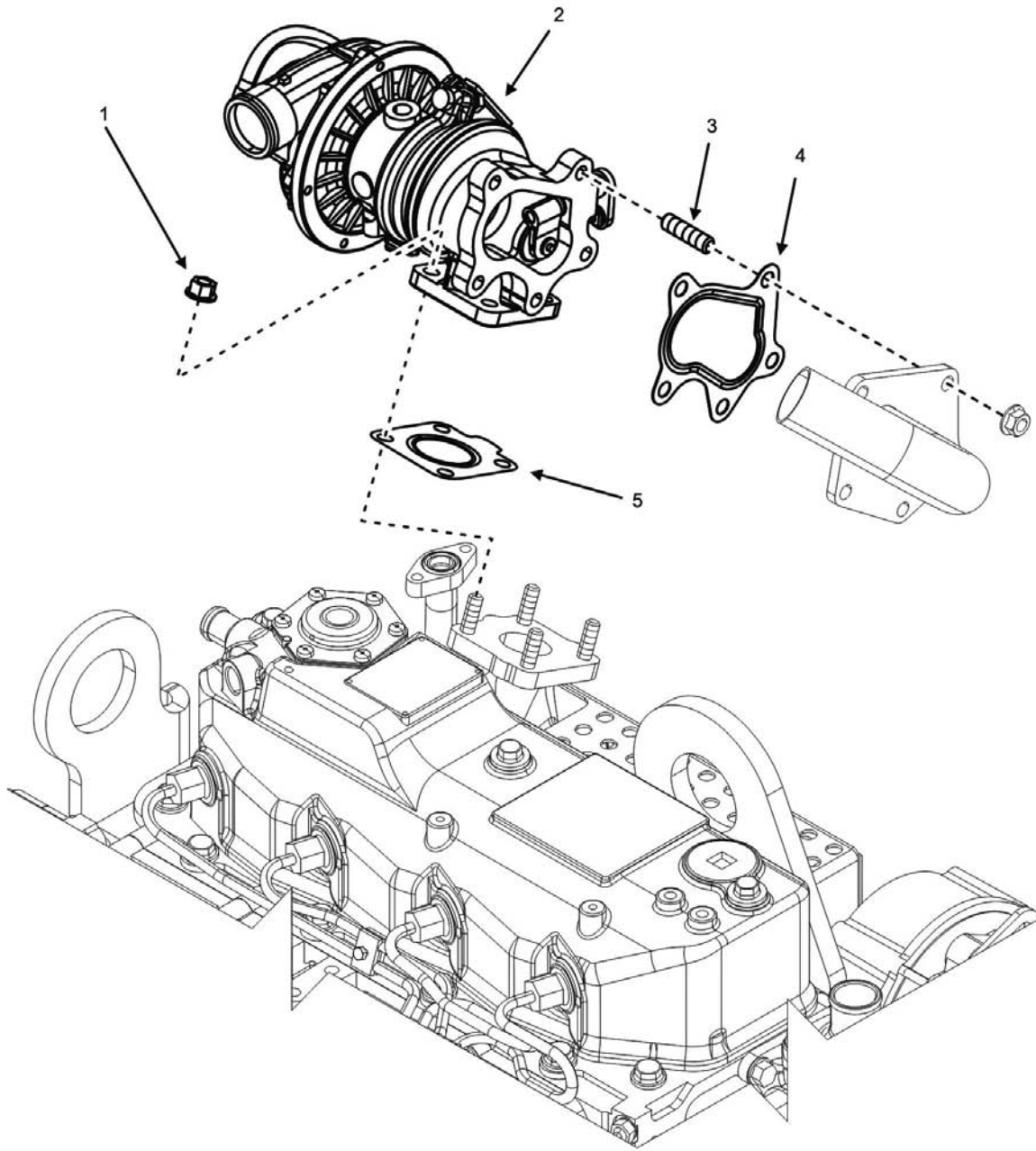


Figure 41. Turbocharger (Sheet 1 of 3).

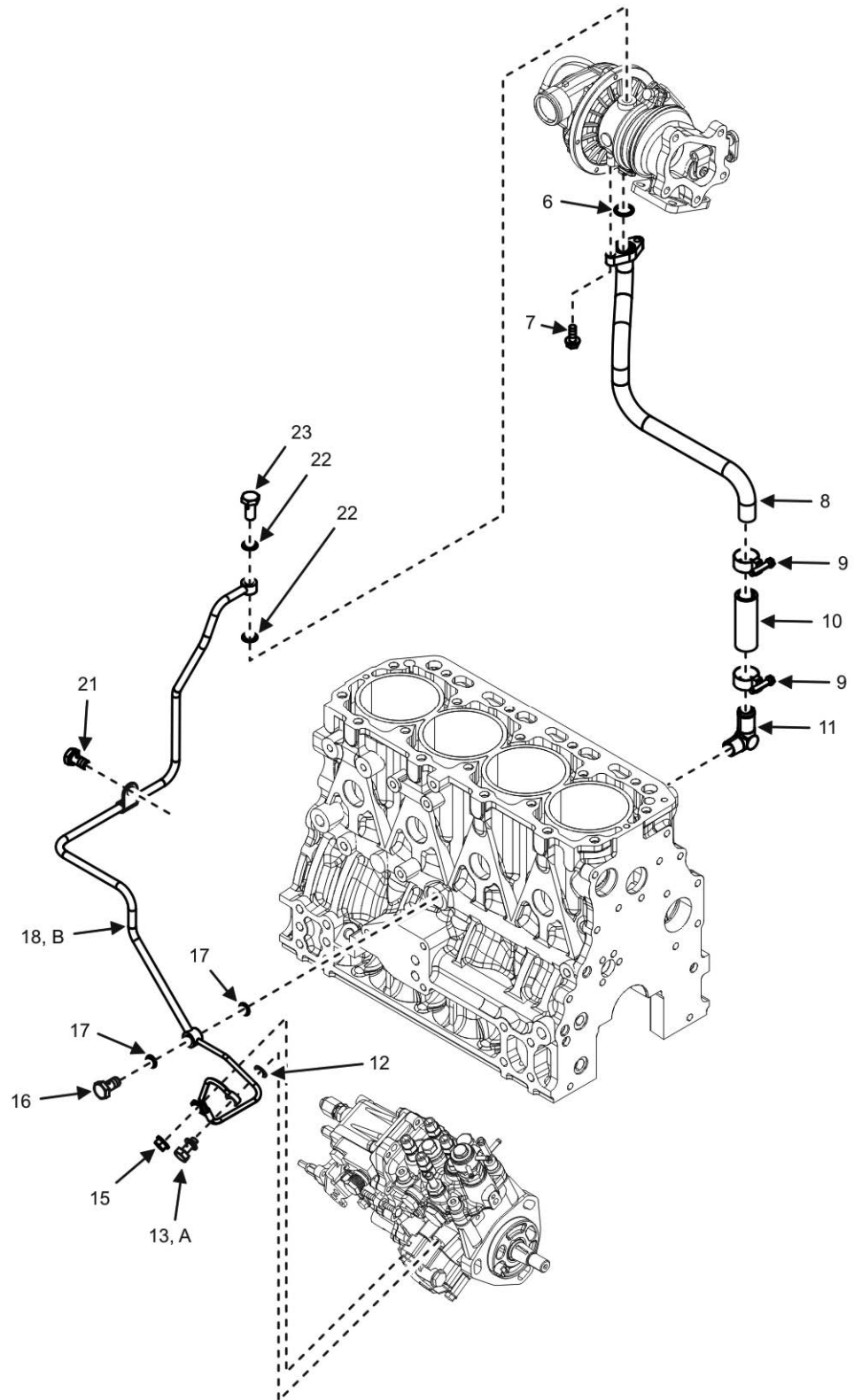


Figure 41. Turbocharger (Sheet 2 of 3).

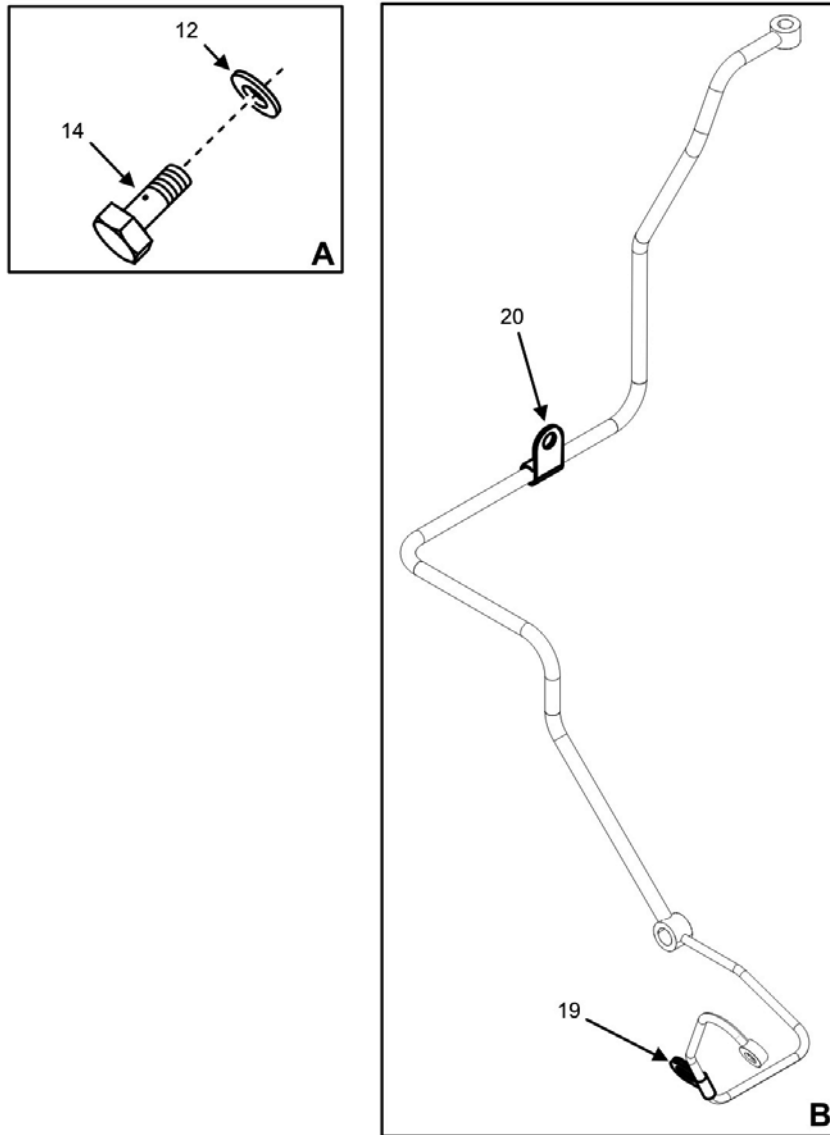


Figure 41. Turbocharger (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090216	
								FIG. 41 TURBOCHARGER	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015468927	0AK42	26306-080002	.....NUT, M8	4
2	PAFFF	PAFFF	PAFFF	PAFFF	2950015379970	0AK42	2129508-18010	.....TURBINE	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5307015468878	0AK42	129418-18320	.....STUD, LOCKED IN	5
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015466855	0AK42	129508-18080	.....GASKET, TURBINE OUTLET	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015468879	0AK42	129508-18090	.....GASKET, TURBINE INLET	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	24316-000160	.....O-RING (4D P- 16.0)	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305013886229	0AK42	26106-060162	.....BOLT (M6 X 16 PLATED)	2
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	129508-39600	.....PIPE, OIL RETURN	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015897716	0AK42	23000-025000	.....CLAMP (25)	2
10	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4720015877875	0AK42	123901-39820	.....HOSE, RETURN	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4720015877393	0AK42	124070-13300	.....ELBOW (PT3/8)	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015468875	0AK42	22190-080002	.....SEAL WASHER (8S)	1
13	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	129005-59830	.....BOLT ASSEMBLY, JOINT (SEE SHEET 3 FOR PARTS BREAKDOWN)	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015469263	0AK42	23857-030000	.....BOLT, JOINT (3)	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	531001388826	0AK42	26366-060002	.....NUT (M6)	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015469886	0AK42	124160-39140	.....BOLT, JOINT (M10)	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015469316	0AK42	22190-100002	.....WASHER (M10)	2
18	PAFFF	PAFFF	PAFFF	PAFFF	4710015469222	0AK42	129508-39450	.....PIPE ASSEMBLY, LUBRICATING OIL (SEE SHEET 3 FOR PARTS BREAKDOWN)	1
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015977490	0AK42	119802-39500	.....RETAINER, PIPE	1
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015903449	0AK42	124223-39900	.....RETAINER, PIPE	1
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305144697436	0AK42	26106-080122	.....BOLT (M8 X 12 PLATED)	1
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015468869	0AK42	23414-100000	.....GASKET, ROUND (M10)	2
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015291138	0AK42	121252-39150	.....BOLT, PIPE JOINT	1
								END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
CYLINDER HEAD REPAIR PARTS LIST

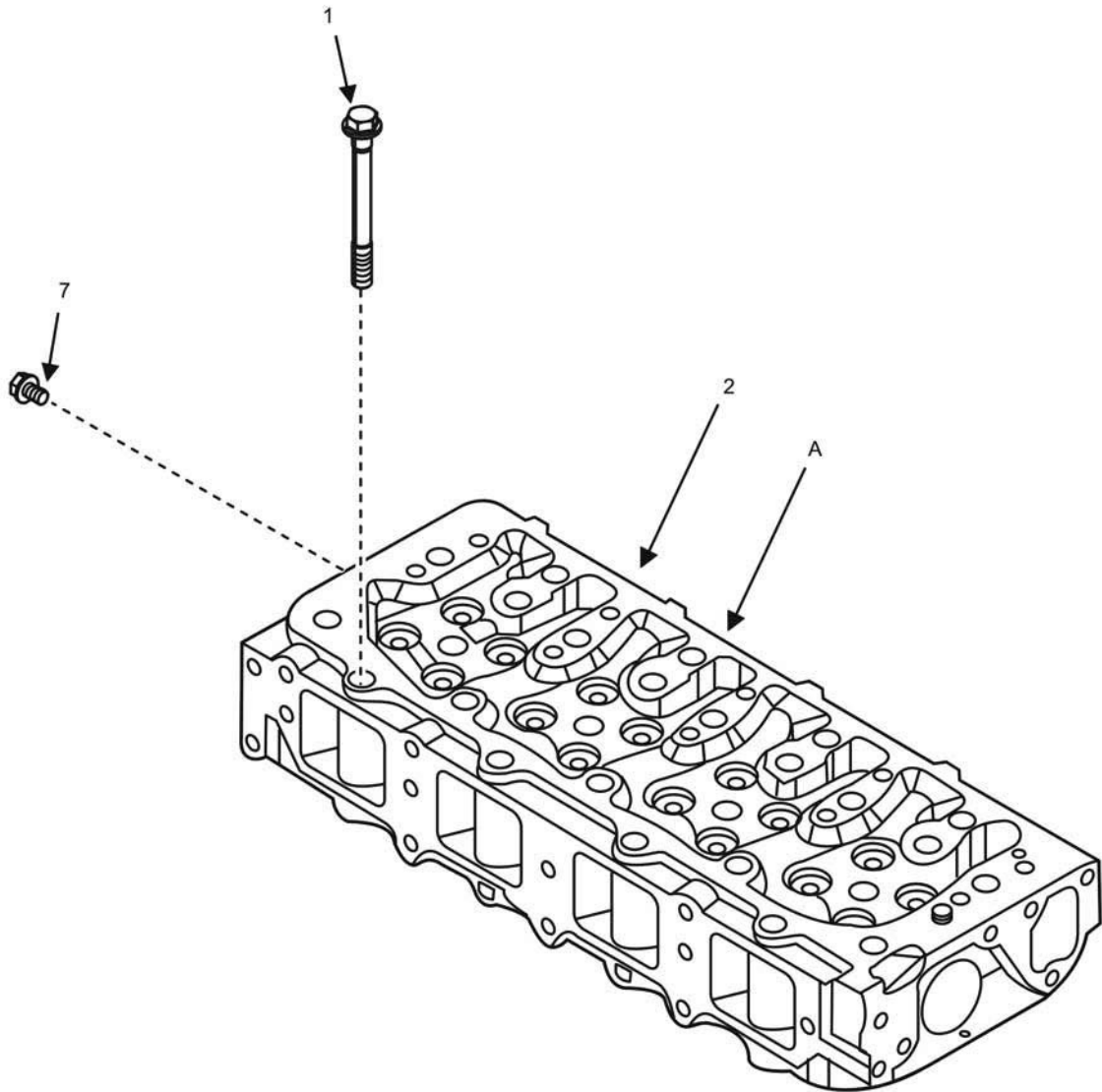


Figure 42. Cylinder Head (Sheet 1 of 2).

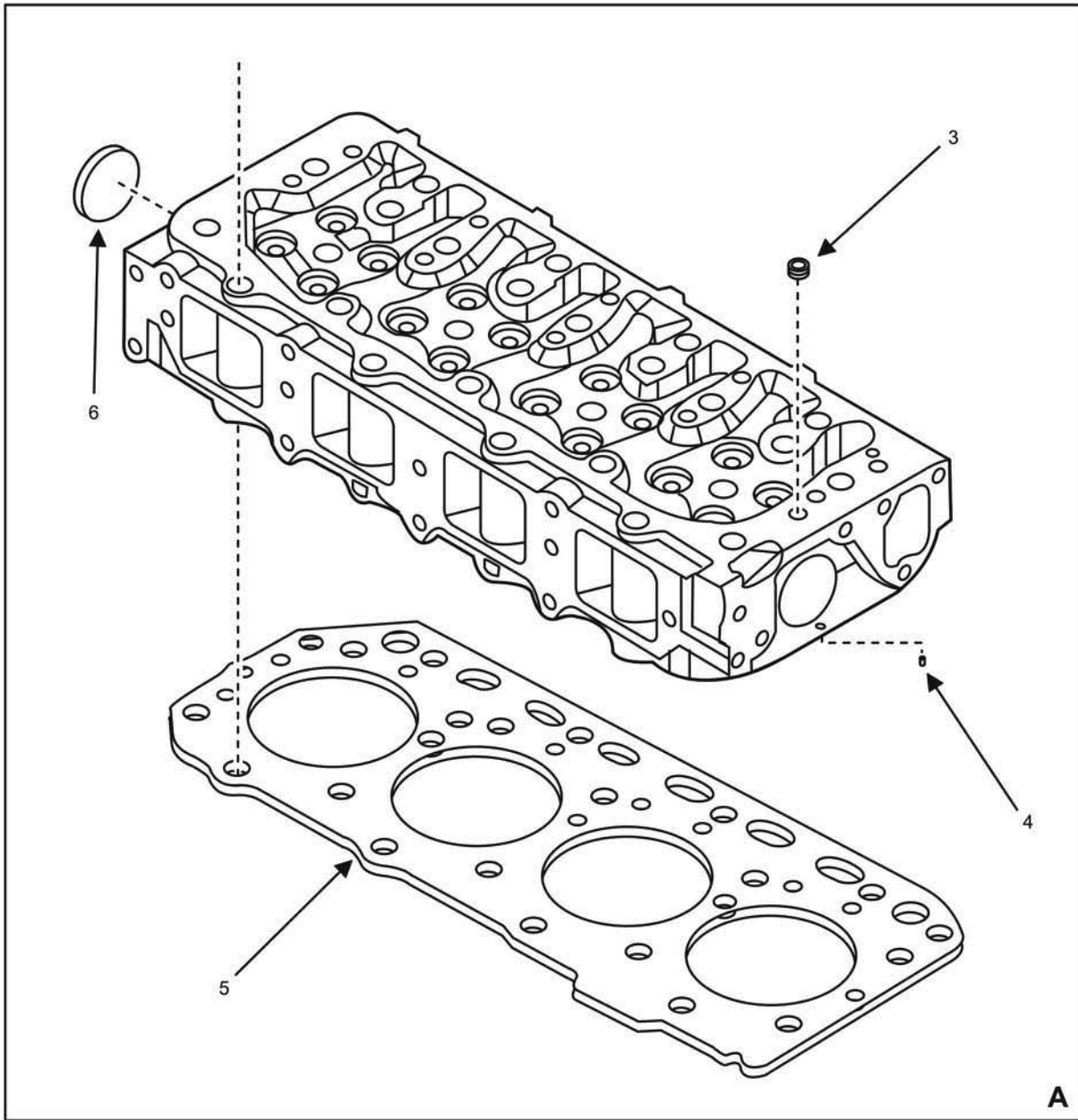


Figure 42. Cylinder Head (Sheet 2 of 2).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC FORCE		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090217	
								FIG. 42 CYLINDER HEAD	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015470465	0AK42	129150-01200	.....BOLT, CYLINDER HEAD	18
2	PAFHH	PAFHH	PAFHH	PAFHH		0AK42	129509-11700	.....CYLINDER HEAD ASSEMBLY (SEE SHEET 2 FOR PARTS BREAKDOWN)	1
3	PAHZZ	PAHZZ	PAHZZ	PAHZZ	4730015464247	0AK42	23876-020000	.....PLUG, SCREW (PT 1/4)	4
4	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5315015470091	0AK42	22351-060012	.....SPRING PIN (6 X 12)	2
5	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330015467537	0AK42	129508-01330	.....GASKET, HEAD	1
6	PAHZZ	PAHZZ	PAHZZ	PAHZZ		0AK42	27241-400000	.....PLUG, EXPANSION (40)	2
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	26106-080162	.....BOLT (M8 X 16 PLATED)	4
								END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
 AMMPS 15KW GENERATOR SET
 VALVE COVER REPAIR PARTS LIST

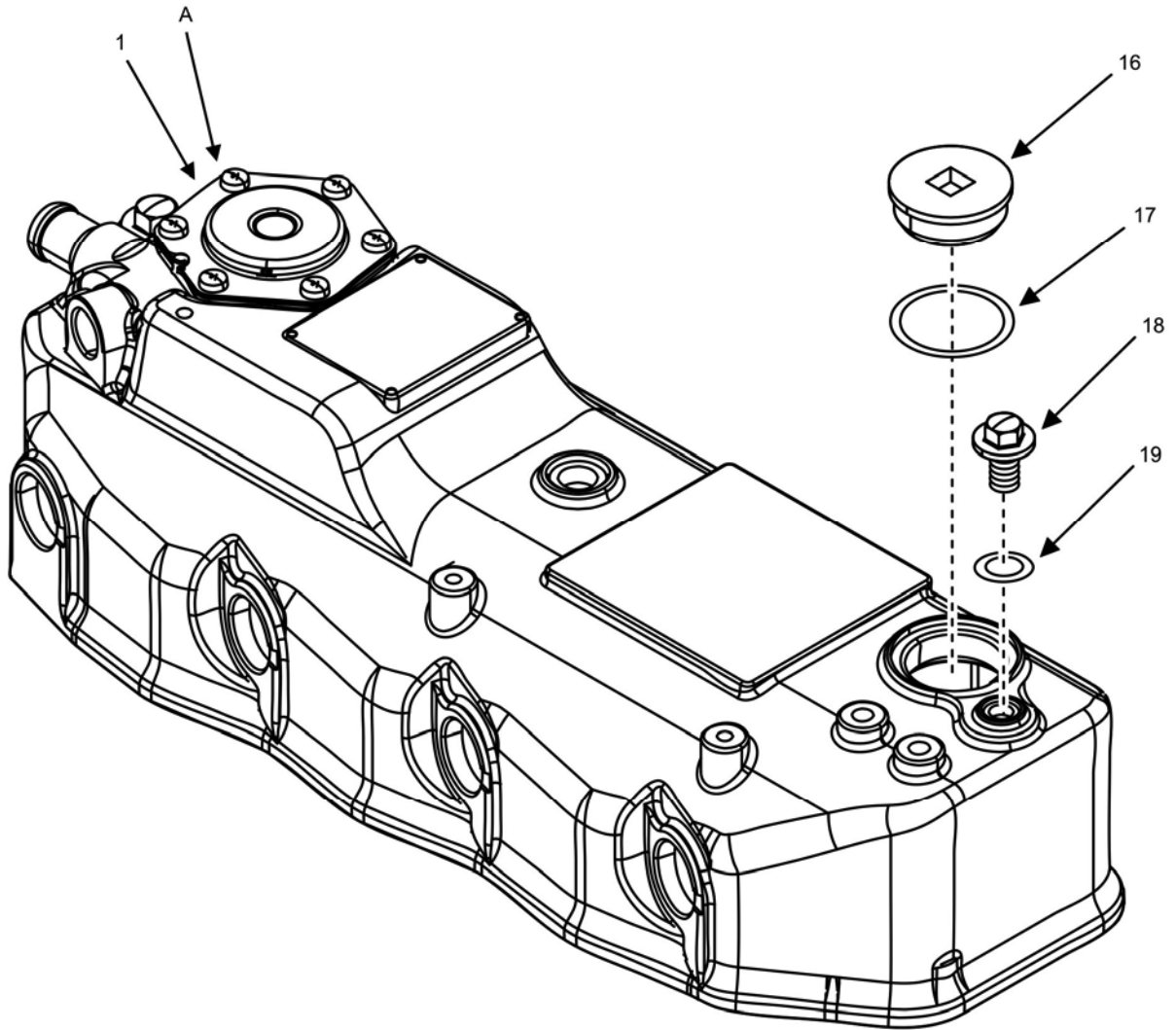


Figure 43. Valve Cover (Sheet 1 of 2)

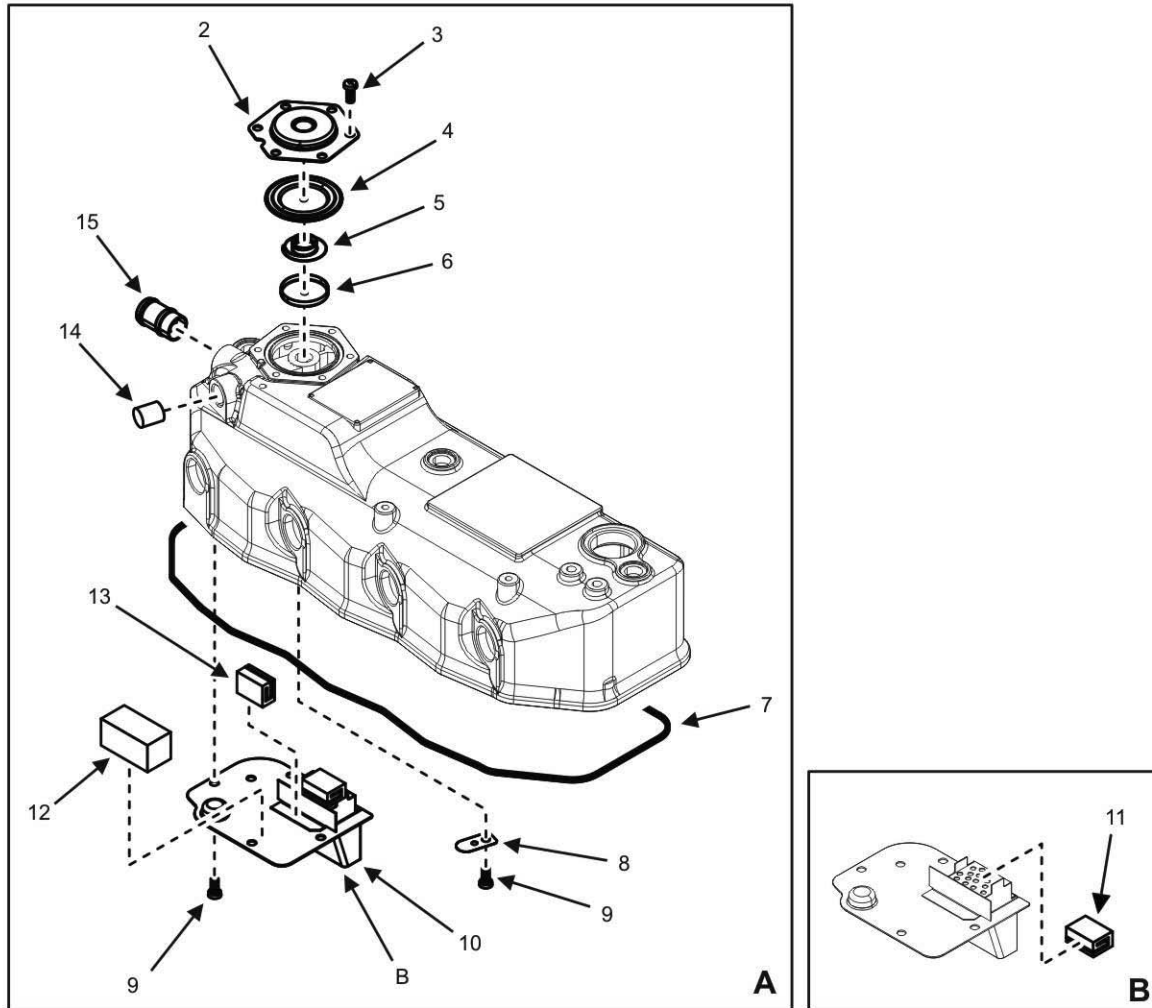


Figure 43. Valve Cover (Sheet 2 of 2).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC FORCE		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 09020101	
								FIG. 43. VALVE COVER	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	129584-11350	..ASSEMBLY, VALVE COVER (SEE SHEET 2 FOR PARTS BREAKDOWN)	1
2	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	123907-03120	.....PLATE, BREATHER	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015468629	0AK42	22857-500100	.....SCREW, M5X10	11
4	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	123907-03100	.....DIAPHRAGM	1
5	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	123907-03140	.....SPRING, DIAPHRAGM	1
6	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	123907-03110	.....PLATE, CENTER	1
7	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330015468924	0AK42	129508-11310	.....GASKET, VALVE COVER	1
8	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	129009-11340	.....SPRING, PLATE	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015468629	0AK42	22857-500100	.....SCREW, M5X10	5
10	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	129508-03010	.....PLATE, BAFFLE	1
11	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	119802-03070	.....BAFFLE, BREATHER	1
12	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	129907-03070	.....BAFFLE, BREATHER	1
13	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	129150-03070	.....BAFFLE, BREATHER	1
14	XBFZZ	XBFZZ	XBFZZ	XBFZZ	2815015897060	0AK42	119640-61400	.....PLUG	1
15	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	129001-11340	.....PIPE, BREATHER	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2930015569612	0AK42	119807-11770	.....PLUG, OIL FILLER	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5331015468126	0AK42	24311-000320	.....O-RING 1A P- 32.0	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5355015469841	0AK42	124160-11360	.....FASTENER	3
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5331015468517	0AK42	24311-000120	.....PACKING, P12.0	3
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
ENGINE VALVES REPAIR PARTS LIST**

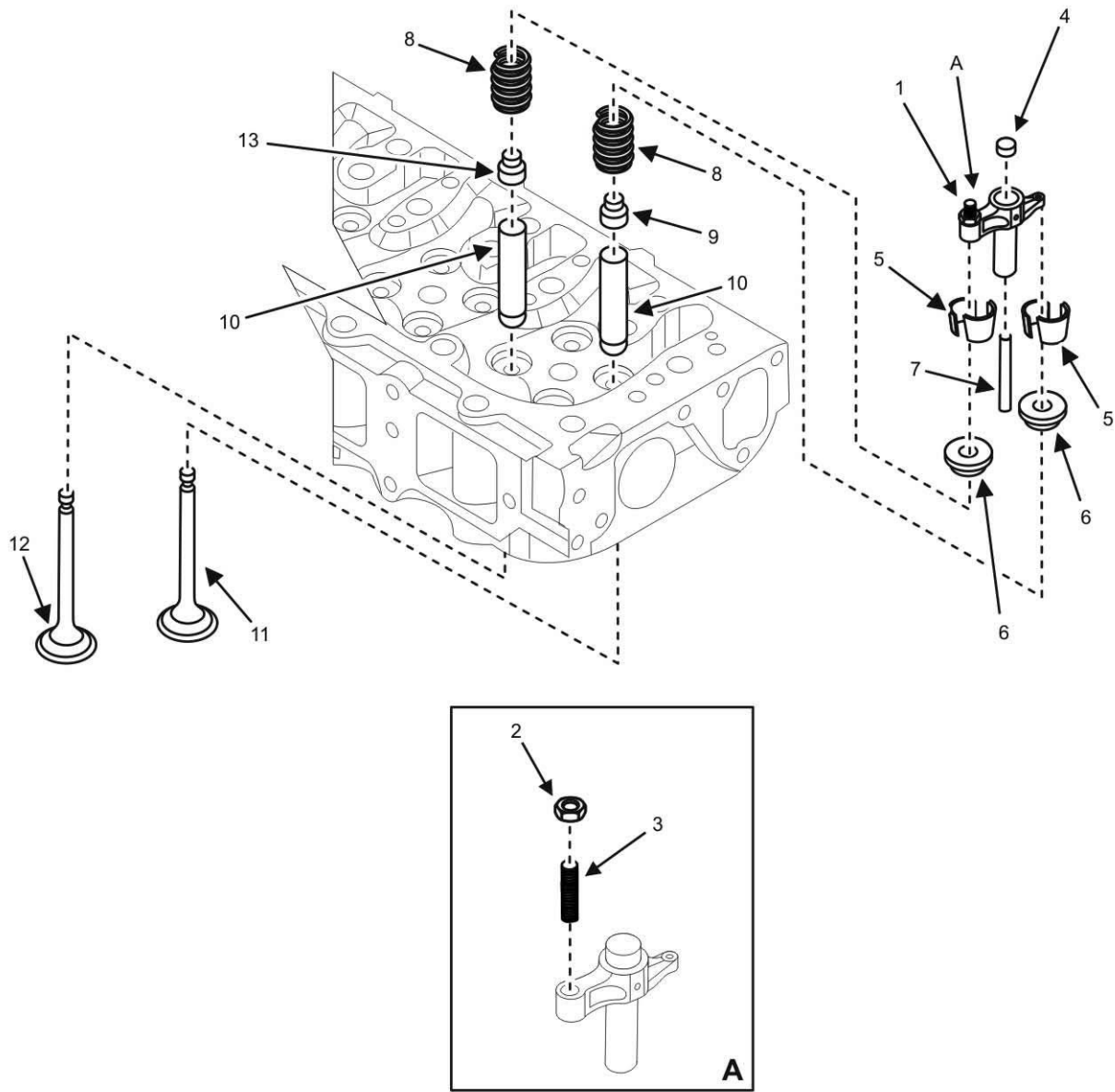


Figure 44. Engine Valves (Sheet 1 of 1).

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 9020102	
								FIG. 44 ENGINE VALVES	
1	XBFFF	XBFFF	XBFFF	XBFFF		0AK42	129672-11510	.....BRIDGE ASSEMBLY, VALVE	8
2	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5310015468916	0AK42	129150-11750	.....NUT, M8	8
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015468911	0AK42	123907-11830	.....ADJUSTER, BRIDGE	8
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2815015897056	0AK42	123907-11550	.....SEAT, VALVE BRIDGE	8
5	PAHZZ	PAFZZ	PAHZZ	PAFZZ	5365015470563	0AK42	119717-11190	.....COLLET	32
6	PAHZZ	PAHZZ	PAHZZ	PAHZZ	2815015464567	0AK42	129508-11180	.....RETAINER, SPRING	16
7	PAFZZ	PAHZZ	PAFZZ	PAHZZ	5305015464572	0AK42	129508-11820	.....GUIDE, VALVE BRIDGE	8
8	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5360015470442	0AK42	129508-11130	.....SPRING, VALVE	16
9	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5330015468902	0AK42	119717-11340	.....SEAL, VALVE STEM INTAKE	8
10	PAHZZ	PAHZZ	PAHZZ	PAHZZ	2815015464327	0AK42	119717-11800	.....GUIDE, VALVE	16
11	PAHZZ	PAHZZ	PAHZZ	PAHZZ	2815015469997	0AK42	129508-11100	.....VALVE, INTAKE	8
12	PAHZZ	PAHZZ	PAHZZ	PAHZZ	4820015463548	0AK42	129508-11110	.....VALVE, EXHAUST	8
13	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5330015468128	0AK42	119717-11350	.....SEAL, VALVE STEM EXHAUST	8
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
ROCKER ARMS AND PUSH RODS REPAIR PARTS LIST**

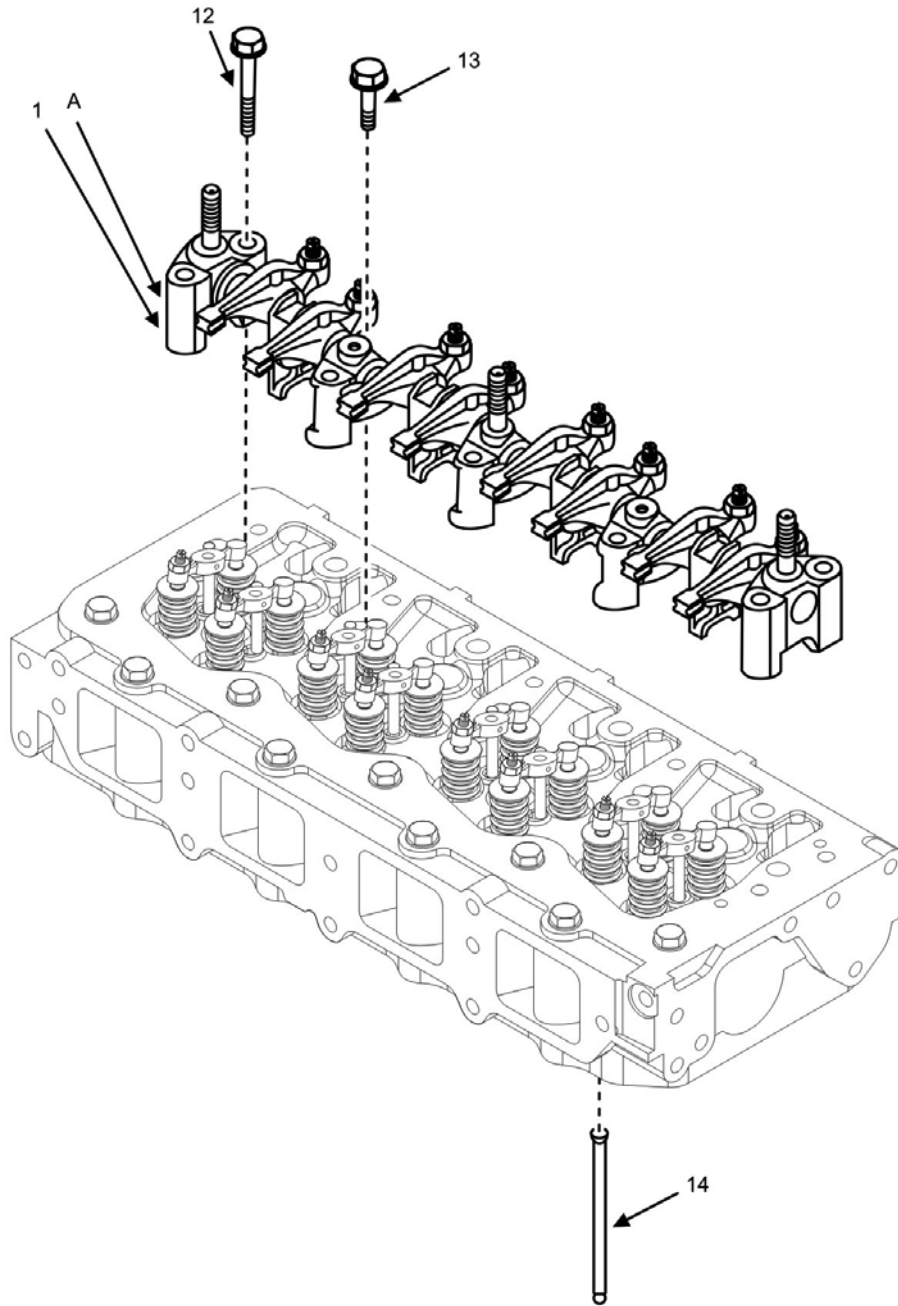


Figure 45. Rocker Arms and Push Rods (Sheet 1 of 3).

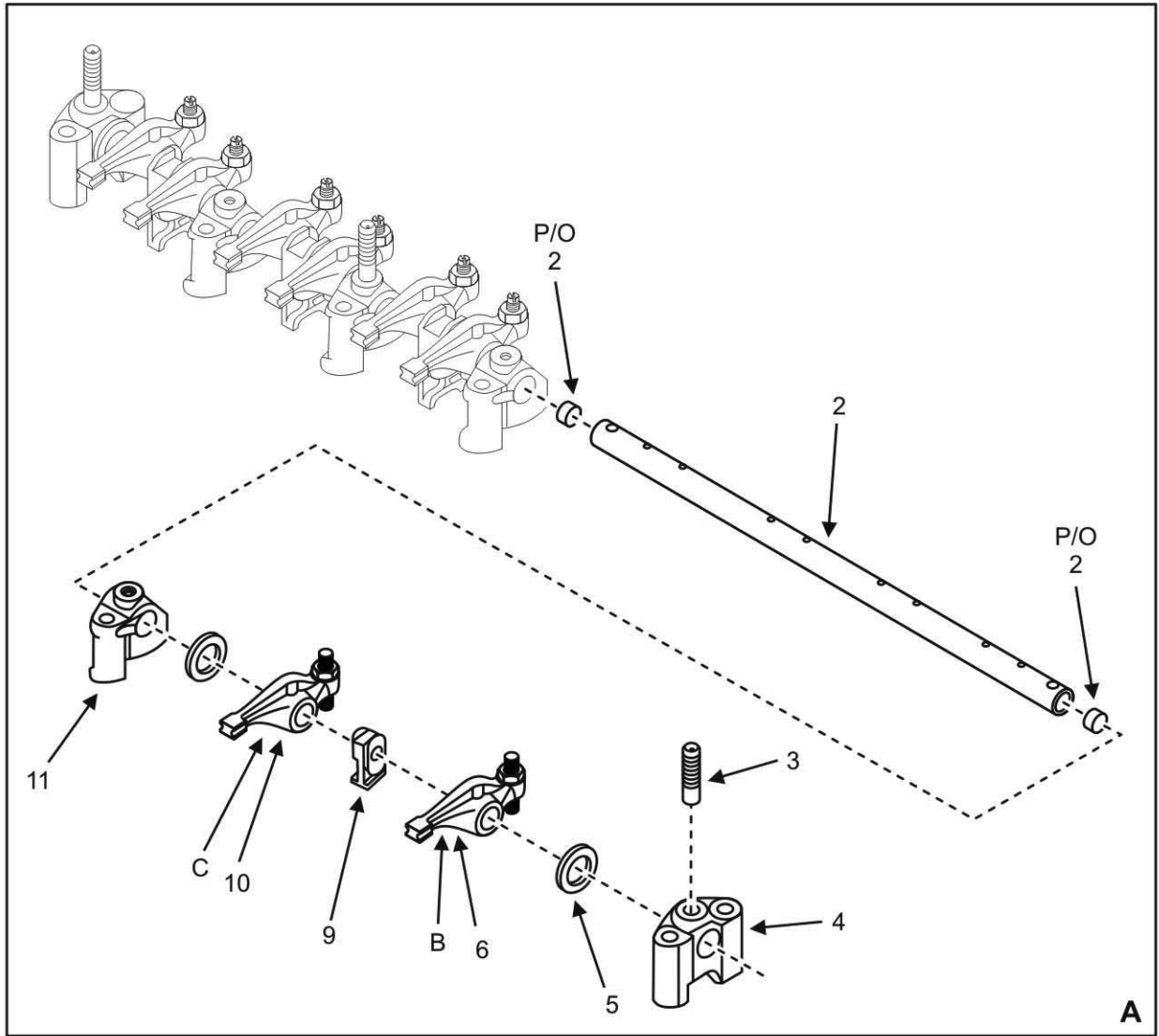


Figure 45. Rocker Arms and Push Rods (Sheet 2 of 3).

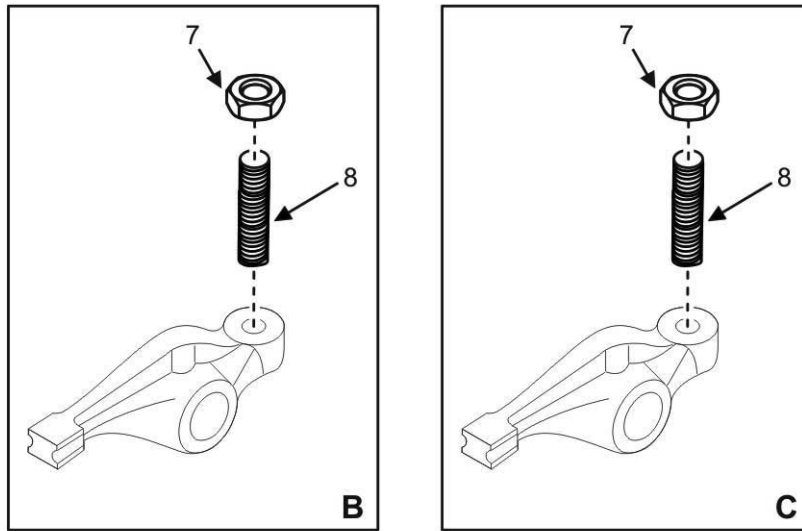


Figure 45. Rocker Arms and Push Rods (Sheet 3 of 3).

(1) ITEM NO.	ARMY	AIR FORCE	(2) SMR CODE USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QT Y.
								GROUP 09020103	
								FIG. 45 PUSH RODS AND ROCKER ARMS	
1	XBHHH	XBHHH	XBFFF	XBFFF		0AK42	129508-11241	.....SHAFT ASSEMBLY, ROCKER ARM (SEE SHEET 2 FOR PARTS BREAKDOWN)	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	129508-11250	.....SHAFT, ROCKER	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5307015470090	0AK42	26226-080352	.....STUD M8 X 35 PLATED	3
4	PBHZZ	PBHZZ	PBFZZ	PBFZZ		0AK42	129508-11260	.....SUPPORT, ARM A	2
5	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5310015468918	0AK42	129508-11280	.....WASHER, FLAT	8
6	PAHHH	PAHHH	PAFFF	PAFFF		0AK42	129508-11660	.....ARM KIT, ROCKER INTAKE (SEE SHEET 3 FOR PARTS BREAKDOWN)	4
7	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5310015468916	0AK42	129150-11750	.....NUT, M8	8
8	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5315015468568	0AK42	129150-11230	.....SCREW, VALVE ADJUST	8
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	129508-11920	.....PEDESTAL, RETAINER	4
10	PAHHH	PAHHH	PAFFF	PAFFF		0AK42	129508-11650	.....ARM KIT, ROCKER EXHAUST (SEE SHEET 3 FOR PARTS BREAKDOWN)	4
11	PBHZZ	PBHZZ	PBFZZ	PBFZZ		0AK42	129508-11270	.....SUPPORT ARM B	3
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015464263	0AK42	26106-080502	.....BOLT, MACHINE	7
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015464263	0AK42	26106-080252	.....BOLT, MACHINE	3
14	PAHZZ	PAHZZ	PAFZZ	PAFZZ	2920015464582	0AK42	129150-14400	.....PUSH ROD	8
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
SHORT BLOCK ASSEMBLY REPAIR PARTS LIST**

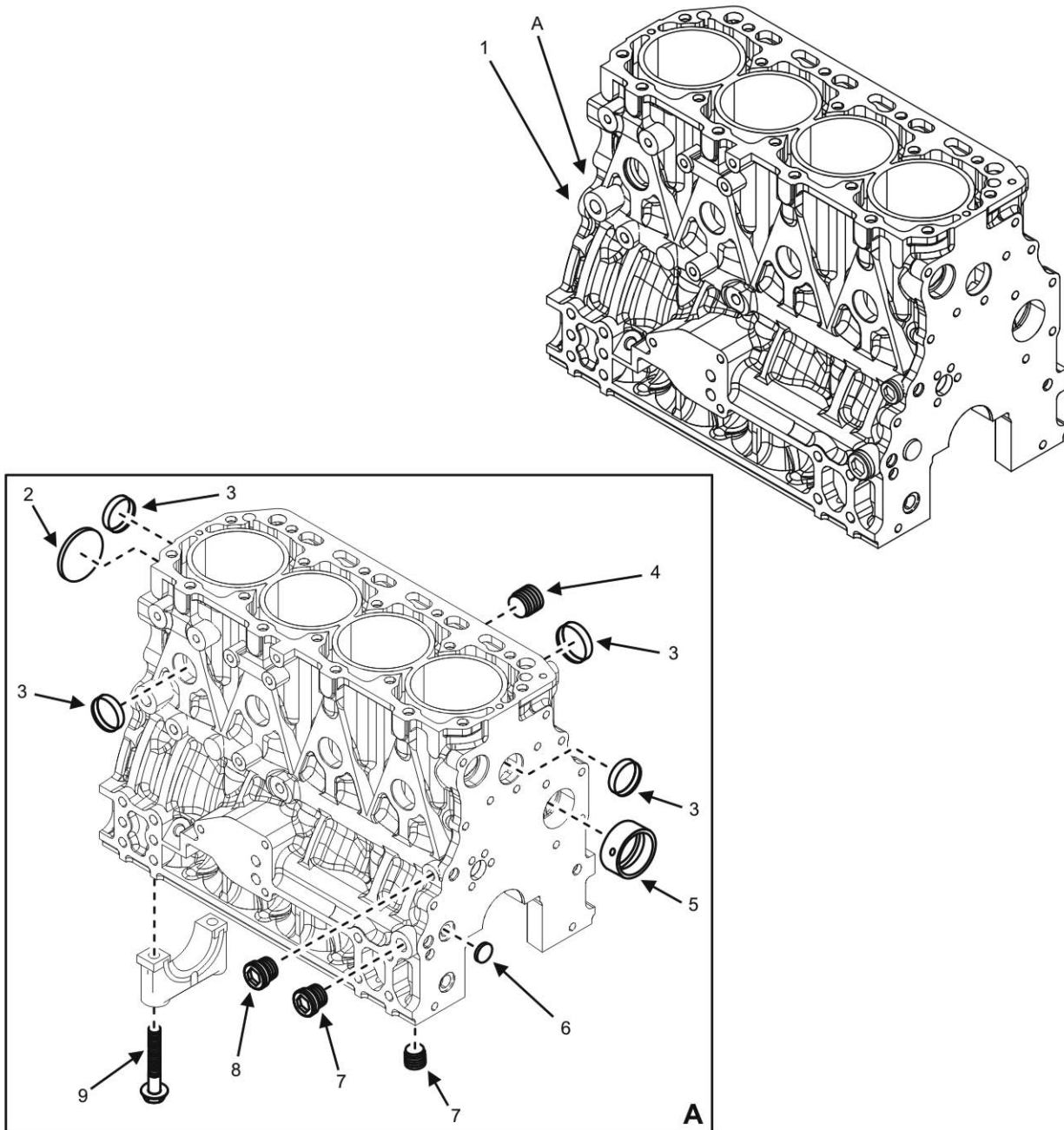


Figure 46. Short Block Assembly (Sheet 1 of 1)

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC FORCE		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090218	
								FIG. 46 SHORT BLOCK ASSEMBLY	
1	XAFHH	XAFHH	XAFDD	XAFDD		0AK42	729508-01560	.....ASSEMBLY, SHORT BLOCK	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	129001-01250	.....PLUG, 50	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	27241-300000	.....PLUG, 30	8
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	171051-01921	.....PLUG, NPTF1	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5365015899908	0AK42	129795-02412	.....BUSHING, CAMSHAFT A	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	27241-120000	.....PLUG, 12	2
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	124160-01910	.....PLUG, PT 1/4	3
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	124060-01050	.....PLUG, PT 1/8	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015464269	0AK42	129150-02020	.....BOLT, METAL CAP	10
10	PCFFF	PCFFF	PCFFF	PCFFF	5330015900226	0AK42	729508-92850	.....SET, ENGINE GASKET (NOT SHOWN)	1
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
CONNECTING PISTONS AND CONNECTING RODS REPAIR PARTS LIST**

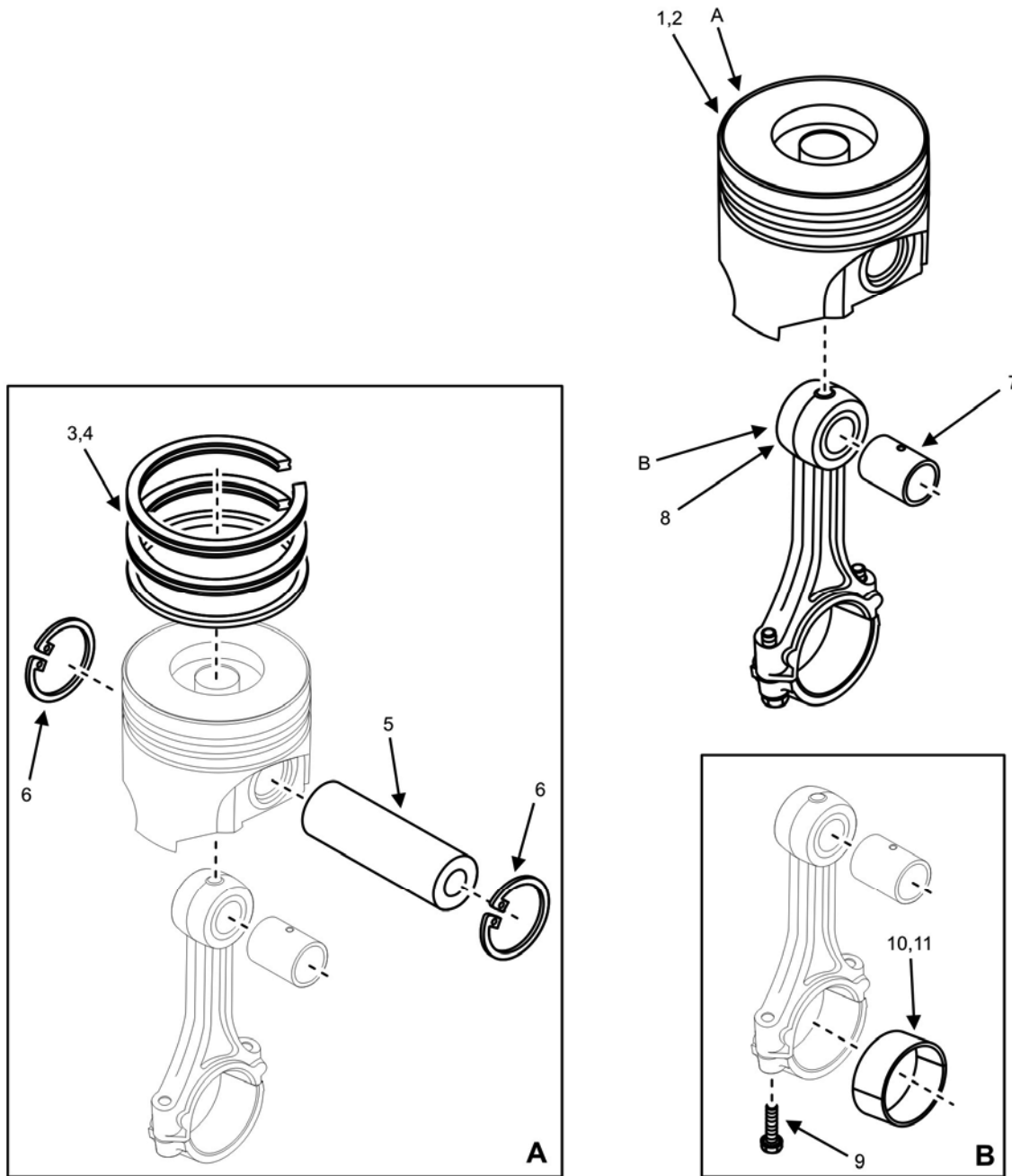


Figure 47. Connecting Rods and Pistons (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 09021801	
								FIG. 47 CONNECTING RODS AND PISTONS	
1	PAHHH	PAHHH	PAFFF	PAFFF	2815015380978	0AK42	129508-22080	.....PISTON ASSEMBLY (STD)	4
2	PAHHH	PAHHH	PAFFF	PAFFF	2815015380800	0AK42	129508-22900	.....PISTON ASSEMBLY (+0.25MM)	4
3	PAHZZ	PAHZZ	PAFZZ	PAFZZ	2815015464717	0AK42	129004-22500	.....RING SET, STD.	4
4	PAHZZ	PAHZZ	PAFZZ	PAFZZ	2815015468047	0AK42	129004-22950	.....RING SET, (+0.25MM)	4
5	PAHZZ	PAHZZ	PAFZZ	PAFZZ	2815015464721	0AK42	129202-22300	.....PIN, PISTON (26, L70)	4
6	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5340015466859	0AK42	22252-000260	.....CLIP, RETAINING 26	8
7	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5364015468936	0AK42	129100-23910	.....BUSHING, PISTON PIN	4
8	PAHHH	PAHHH	PAFFF	PAFFF	2815015380835	0AK42	729402-23100	.....ROD ASSEMBLY, CONNECTING	4
9	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5306015464275	0AK42	121550-23200	.....BOLT, CONNECTING ROD	4
10	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3120015899877	0AK42	129150-23601	.....BUSHING, CRANKPIN, (STD)	8
11	PAHZZ	PAHZZ	PAFZZ	PAFZZ		0AK42	129150-23611	.....BUSHING, CRANKPIN (+0.25MM)	4
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
CRANKSHAFT REPAIR PARTS LIST**

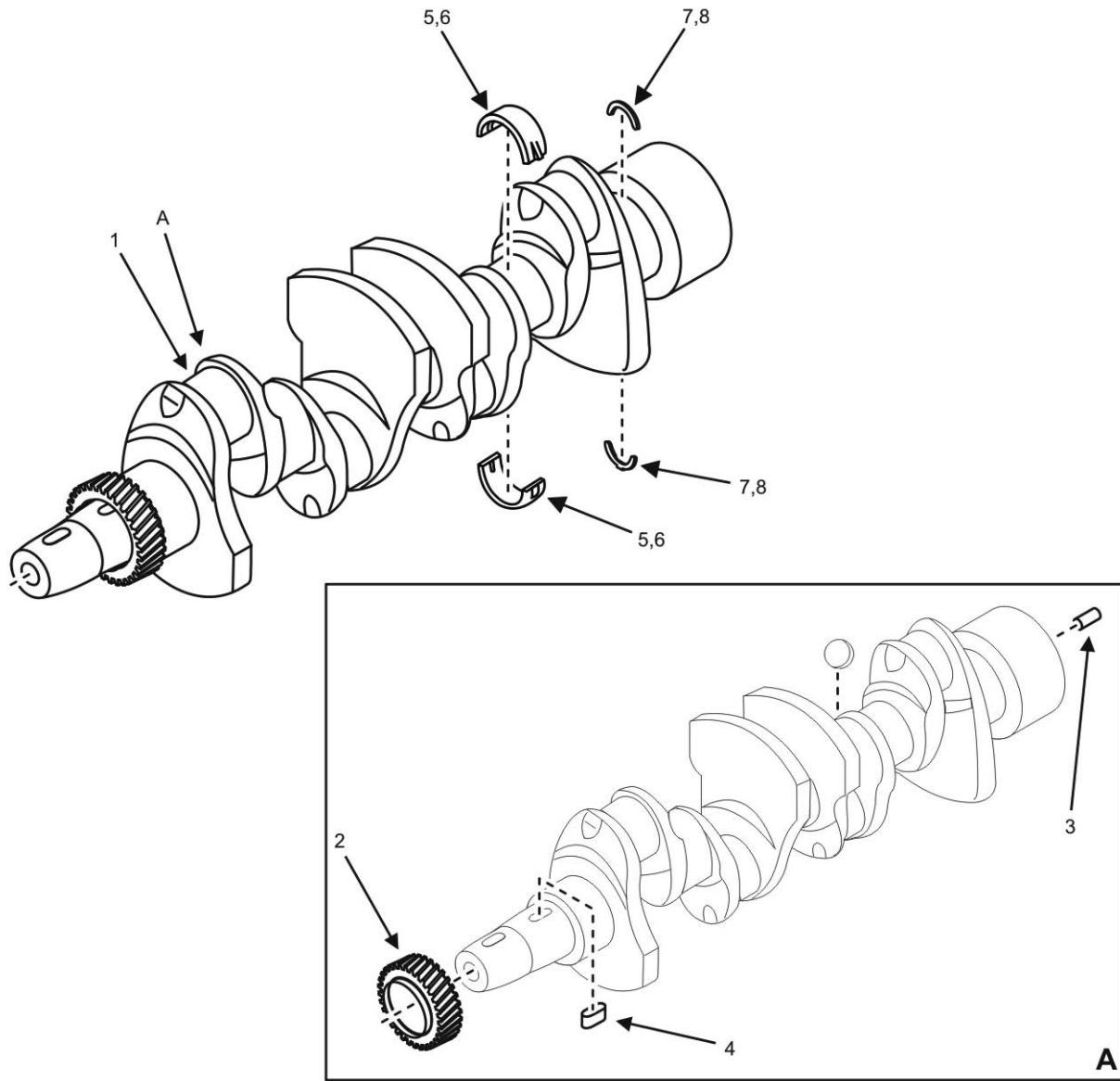


Figure 48. Crankshaft (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC FORCE		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 09021802	
								FIG. 48. CRANKSHAFT	
1	PAHHH	PAHHH	PAHHH	PAHHH		0AK42	129509-21000	.....CRANKSHAFT ASSEMBLY	1
2	XAHZZ	XAHZZ	XAHZZ	XAHZZ		0AK42	119803-21200	.....GEAR, CRANKSHAFT	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5315015469902	0AK42	129100-01580	.....PARALLEL PIN, M8X16	1
4	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5315014659931	0AK42	22512-070140	.....KEY, SHAFT	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3110015797536	0AK42	129001-02931	.....BEARING, SLEEVE (STD)	2
6	PAHZZ	PAHZZ	PAHZZ	PAHZZ	3120015899883	0AK42	129150-02871	.....BEARING, SLEEVE (-.25mm)	5
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3130015899890	0AK42	129150-02931	.....BEARING, THRUST (STD)	2
8	PAHZZ	PAHZZ	PAHZZ	PAHZZ	3120015899874	0AK42	129150-02941	.....BEARING, THRUST (.25OS)	1
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
GEAR CASE COVER REPAIR PARTS LIST**

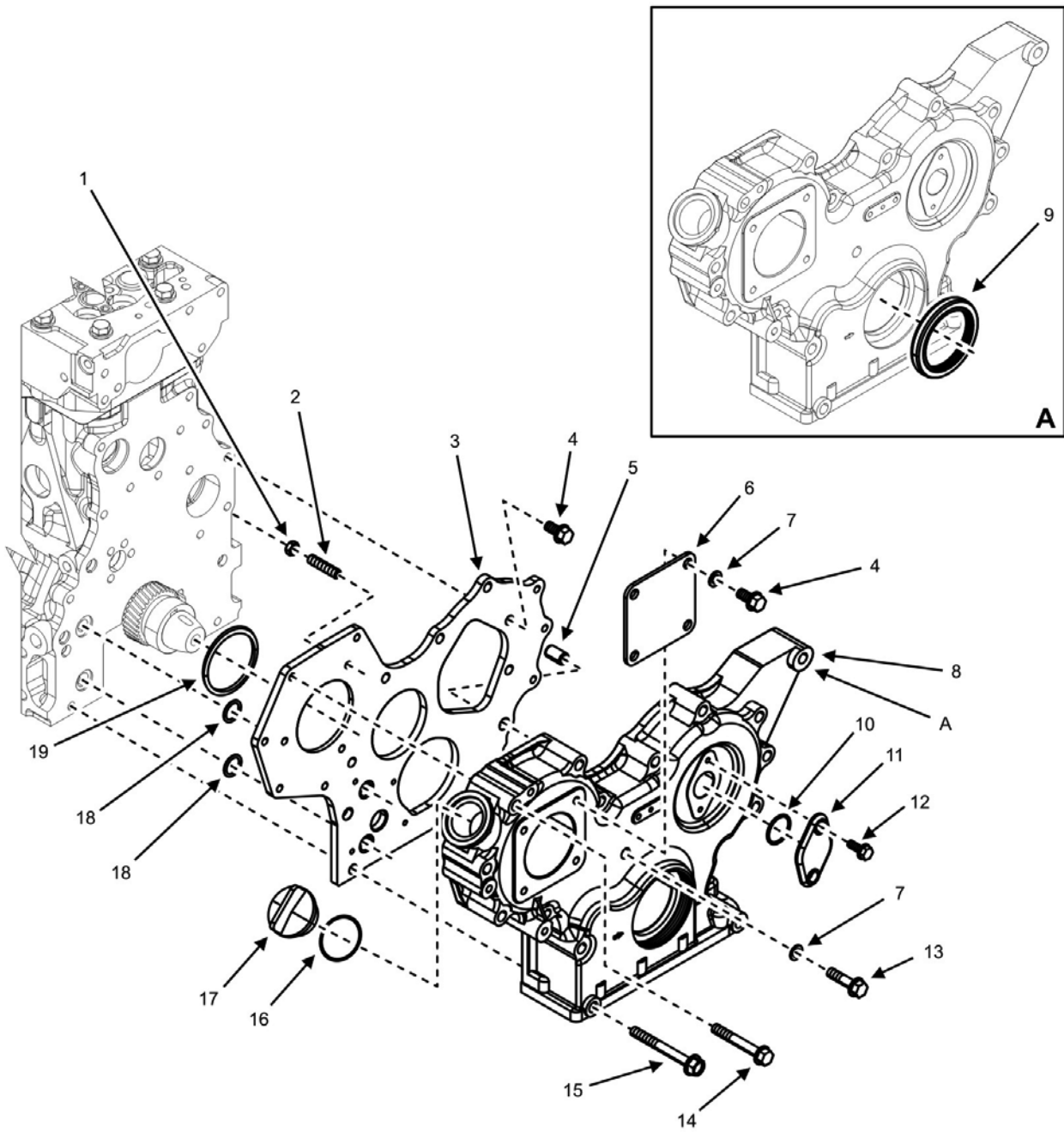


Figure 49. Gear Case Cover (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 09021803	
								FIG. 49 GEAR CASE COVER	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015468927	0AK42	26306-080002	.....NUT, M8	4
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	119802-01561	.....STUD, M8X25	3
3	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0AK42	129803-01520	.....FLANGE, GEAR CASE	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5301011580835	56161	10502560	.....BOLT, M8X16 PLATED	7
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	129795-01950	.....PIPE, KNOCK	2
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015907511	0AK42	124240-01871	.....COVER, PUMP	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015468875	0AK42	22190-080002	.....SEAL, WASHER 8S	6
8	PAFFF	PAFFF	PAFFF	PAFFF	5340015899898	0AK42	119803-01500	.....COVER ASSY, GEAR CASE	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015801468	0AK42	119934-01800	.....SEAL, OIL	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5331015464255	0AK42	24341-000240	.....O-RING 1A S- 24.0	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2990015897053	0AK42	121023-01551	.....COVER, TACHOMETER	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305013886229	0AK42	26106-060162	.....BOLT, M6X16 PLATED	2
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015468037	0AK42	26106-080302	.....BOLT, M8X30 PLATED	2
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305014773508	0AK42	26106-080552	.....BOLT, M8X55 PLATED	14
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015899935	0AK42	26106-080852	.....BOLT, M8X85 PLATED	3
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5331015468126	0AK42	24311-000320	.....O-RING 1A P- 32.0	2
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2930015569612	0AK42	119807-11770	.....COVER, FILLER	2
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5331015470529	0AK42	119609-32040	.....O-RING, P16	2
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5331015468510	0AK42	121850-51960	.....O-RING, F.I. PUMP	1
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
HARMONIC BALANCER REPAIR PARTS LIST**

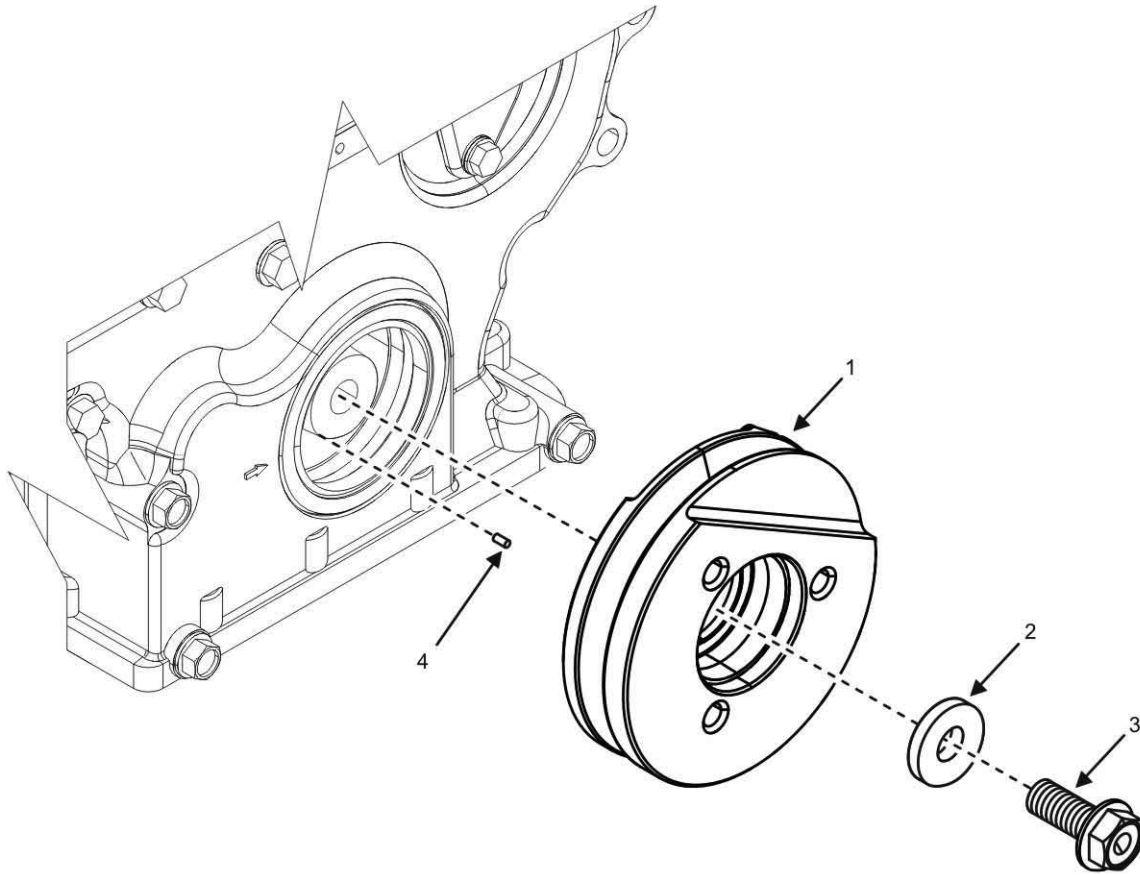


Figure 50. Harmonic Balancer (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 09021804	
								FIG. 50 HARMONIC BALANCER	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3020015474625	0AK42	119802-21660	.....BALANCER, HARMONIC	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015469888	0AK42	129795-21661	.....WASHER	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306015469891	0AK42	121850-21680	.....BOLT, HARMONIC BALANCER	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5315015468877	0AK42	22351-030010	.....SPRING PIN (3 X 10)	1
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
CAMSHAFT AND GEAR REPAIR PARTS LIST**

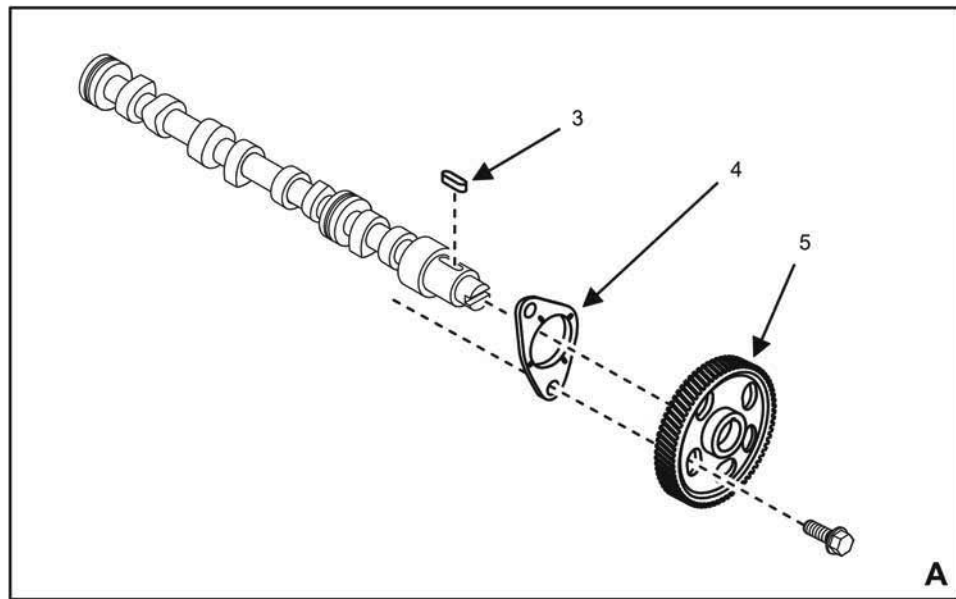
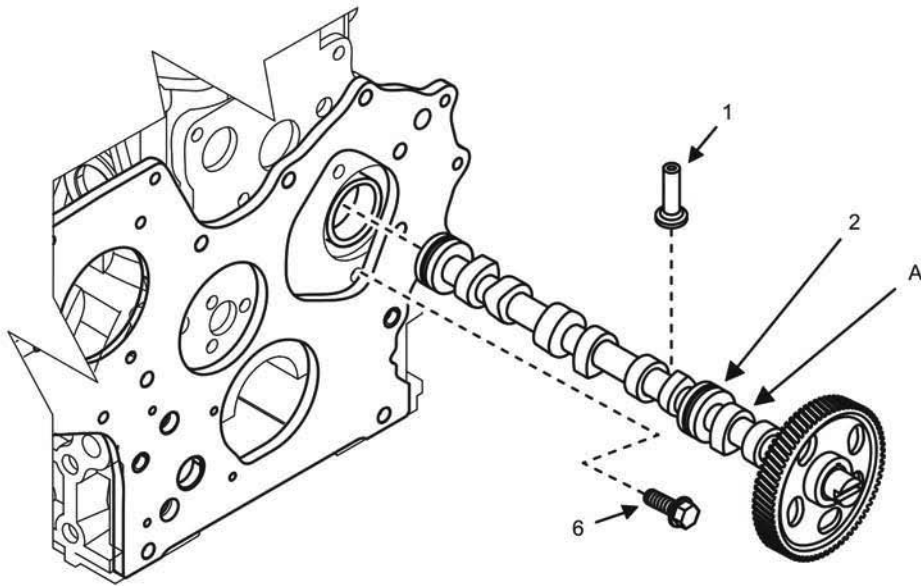


Figure 51. Camshaft and Gear (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC FORCE		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 09021805	
								FIG. 51 CAMSHAFT AND GEAR	
1	PAHZZ	PAHZZ	PAHZZ	PAHZZ	2815015467688	0AK42	129150-14200	.....TAPPET	8
2	PAHHH	PAHHH	PAHHH	PAHHH	2815015380974	0AK42	129508-14580	.....CAMSHAFT ASSEMBLY	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5315014659931	0AK42	22512-070140	.....KEY (7 X 14)	1
4	PAHZZ	PAHZZ	PAHZZ	PAHZZ	2815015464309	0AK42	129150-02450	.....METAL THRUST	1
5	PAHZZ	PAHZZ	PAHZZ	PAHZZ	3020014554443	0AK42	129150-14101	.....GEAR, CAMSHAFT	1
6	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5306015468929	0AK42	26106-080142	.....BOLT (8 X 14 PLATED)	2
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
IDLER GEAR REPAIR PARTS LIST**

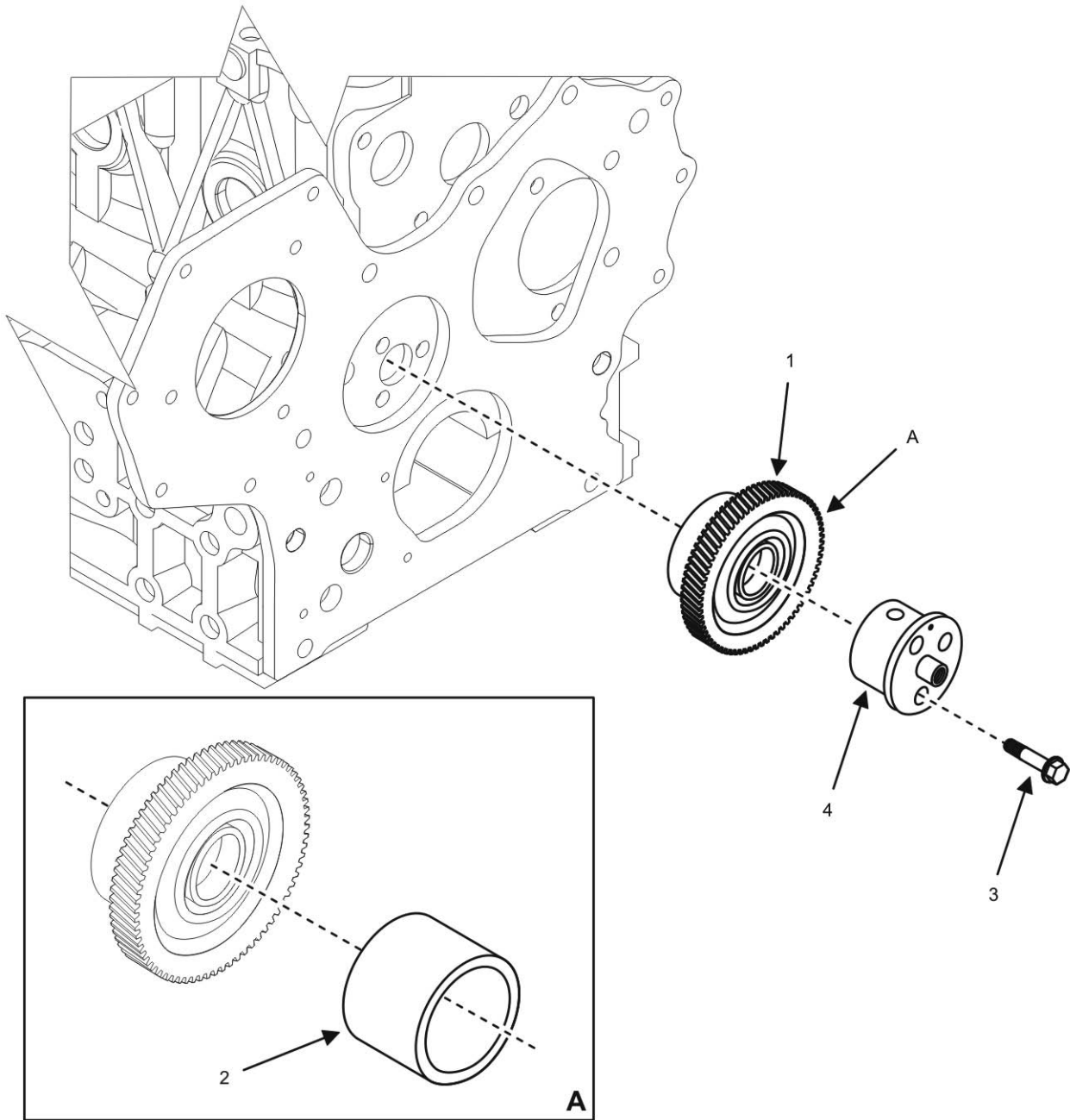


Figure 52. Idler Gear (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 09021806	
								FIG. 52 IDLER GEAR	
1	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3020015899927	0AK42	119802-25101	.....GEAR, IDLER, DRIVE MOTION	1
2	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5365015899904	0AK42	119802-25071	.....BUSHING, IDLER GEAR	1
3	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5306015470081	0AK42	26106-080402	.....BOLT, MACHINE, M8X40	3
4	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3020015899928	0AK42	119803-25050	.....GEARSHAFT, IDLER	1
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
OIL PUMP AND GEAR REPAIR PARTS LIST**

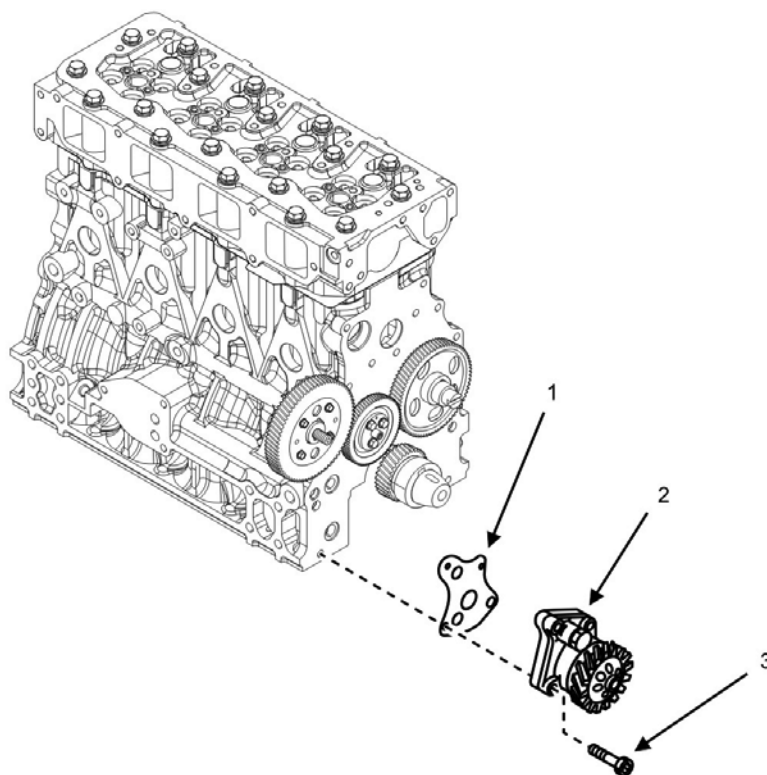


Figure 53. Oil Pump and Gear (Sheet 1 of 1).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 09021807	
								FIG. 53 OIL PUMP AND GEAR	
1	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5330014556877	0AK42	129150-32020	.....GASKET	1
2	PAHZZ	PAHZZ	PAHZZ	PAHZZ	2815015896590	0AK42	129418-32000	.....OIL PUMP ASSY, ENGINE	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0AK42	26450-060252	.....BOLT, MACHINE M6 X 25	4
								END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
ENGINE WIRING HARNESS REPAIR PARTS LIST

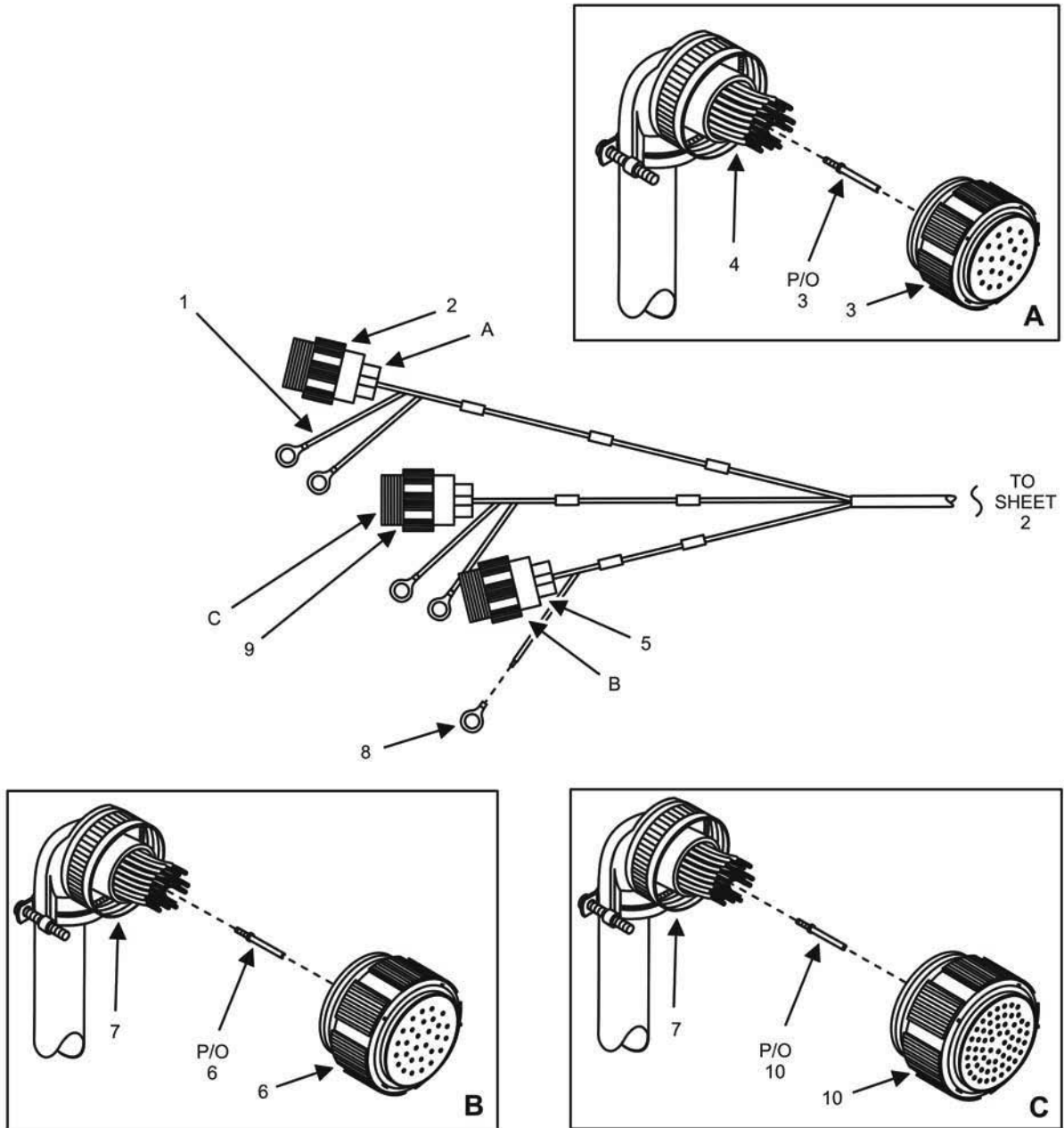


Figure 54. Engine Wiring Harness (Sheet 1 of 14).

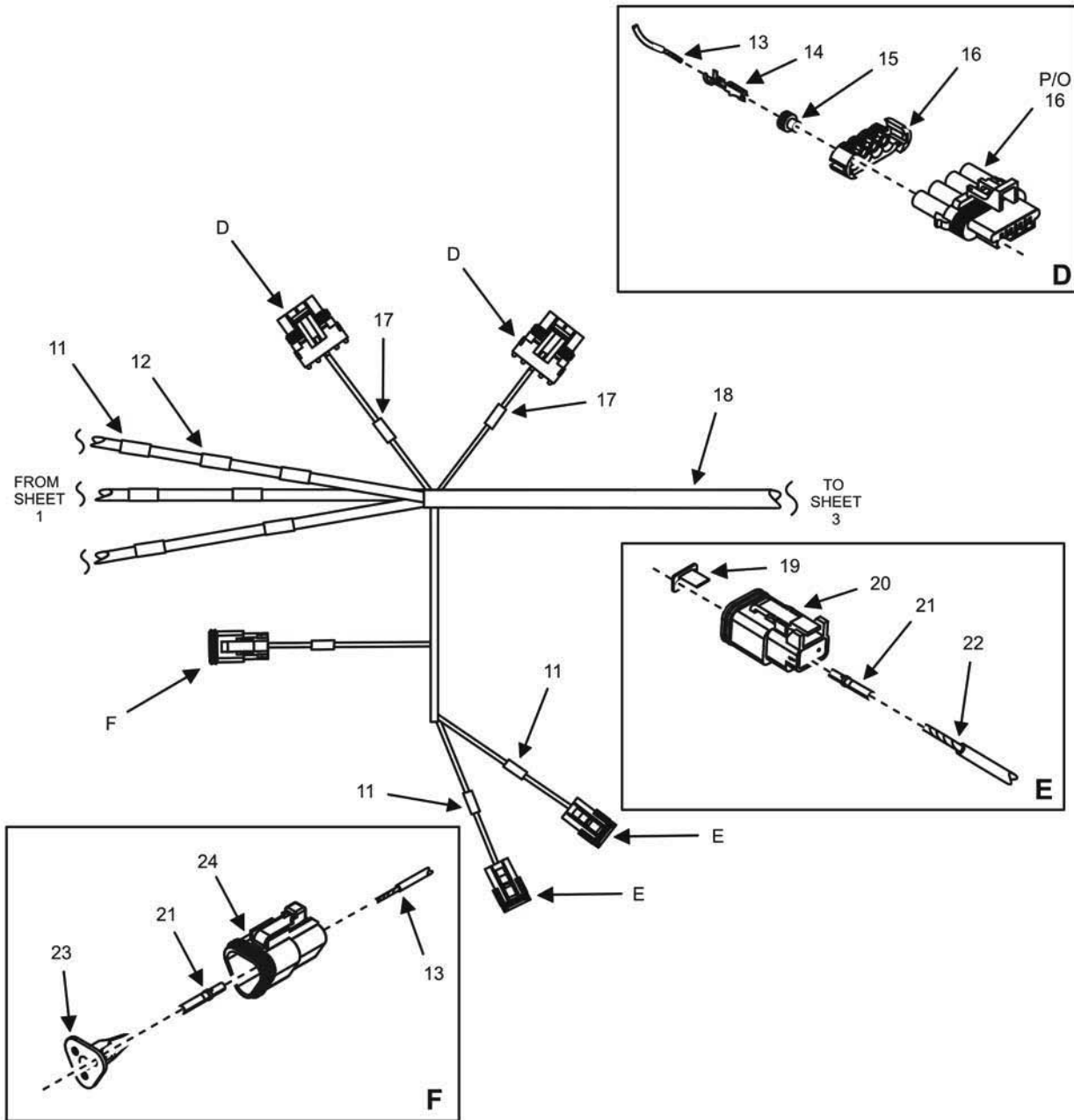


Figure 54. Engine Wiring Harness (Sheet 2 of 14).

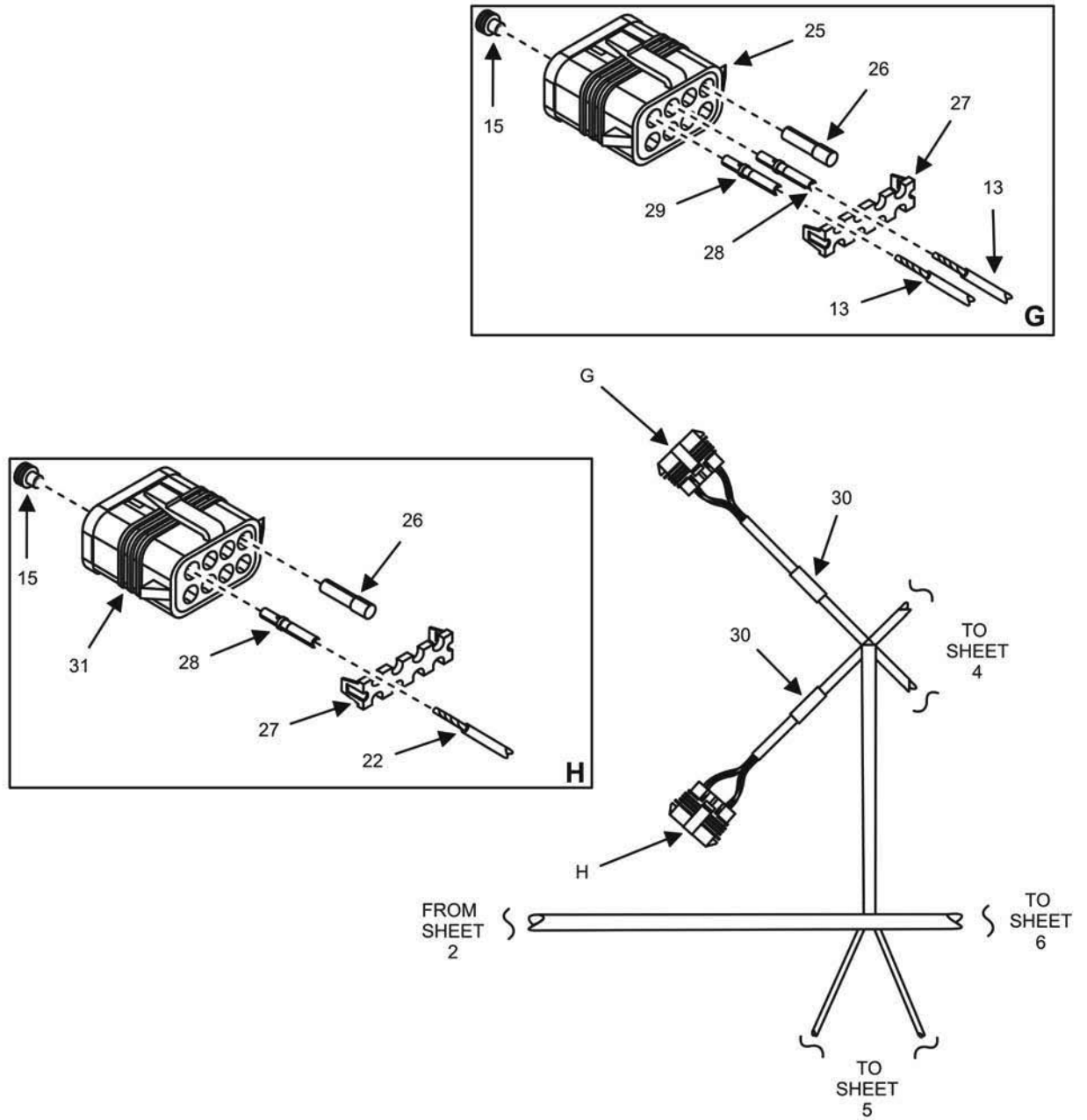


Figure 54. Engine Wiring Harness (Sheet 3 of 14).

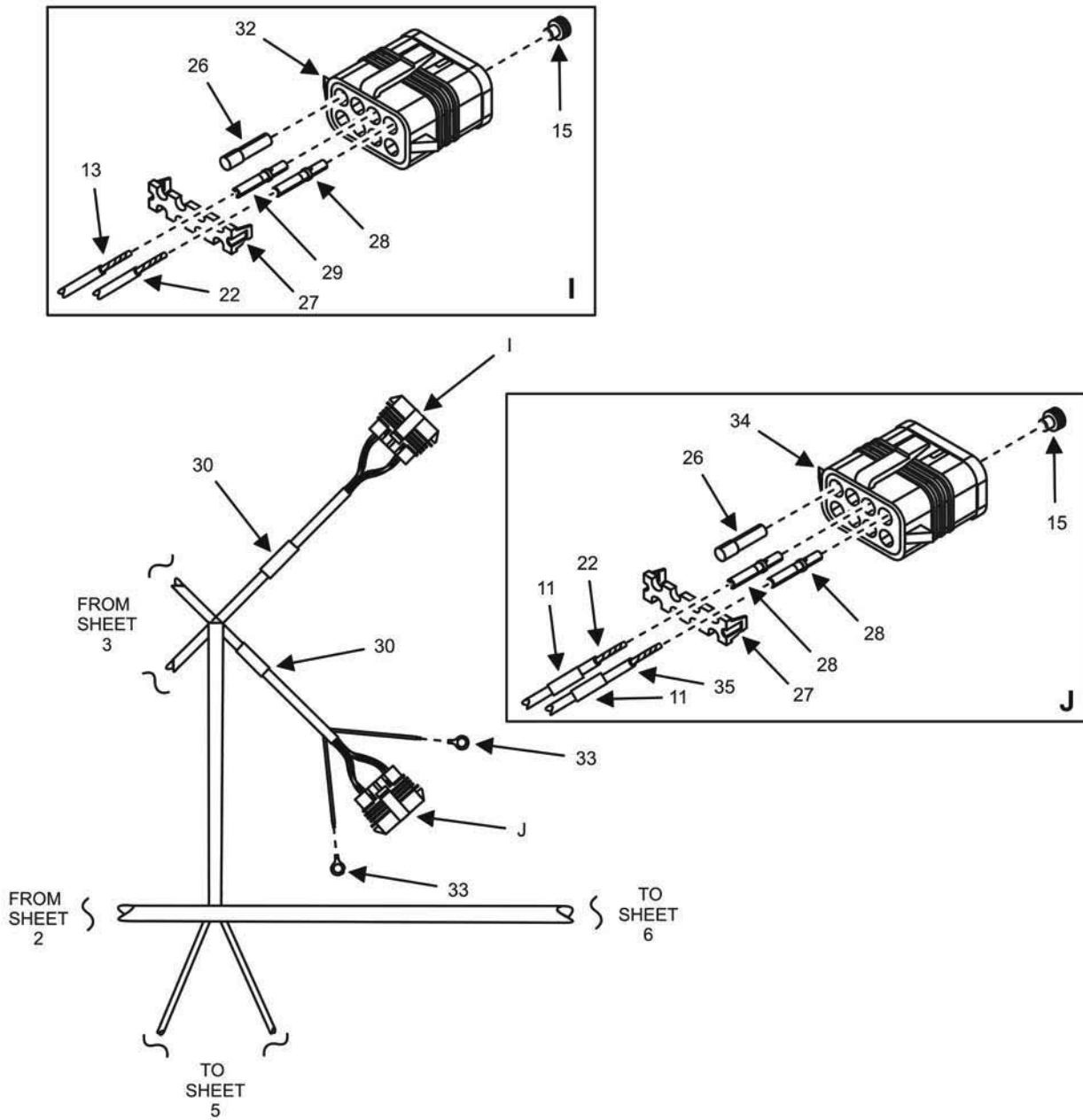


Figure 54. Engine Wiring Harness (Sheet 4 of 14).

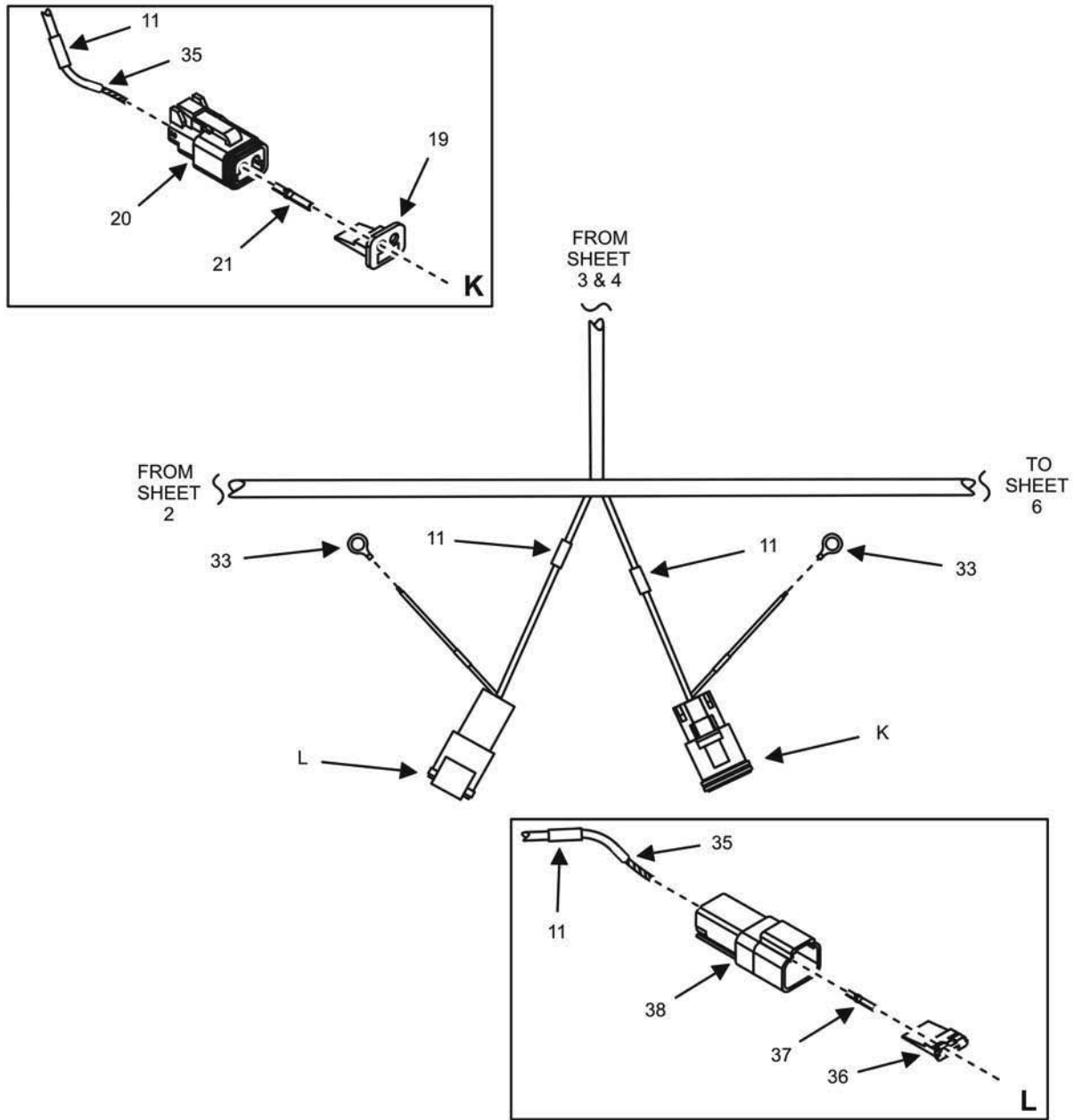


Figure 54. Engine Wiring Harness (Sheet 5 of 14).

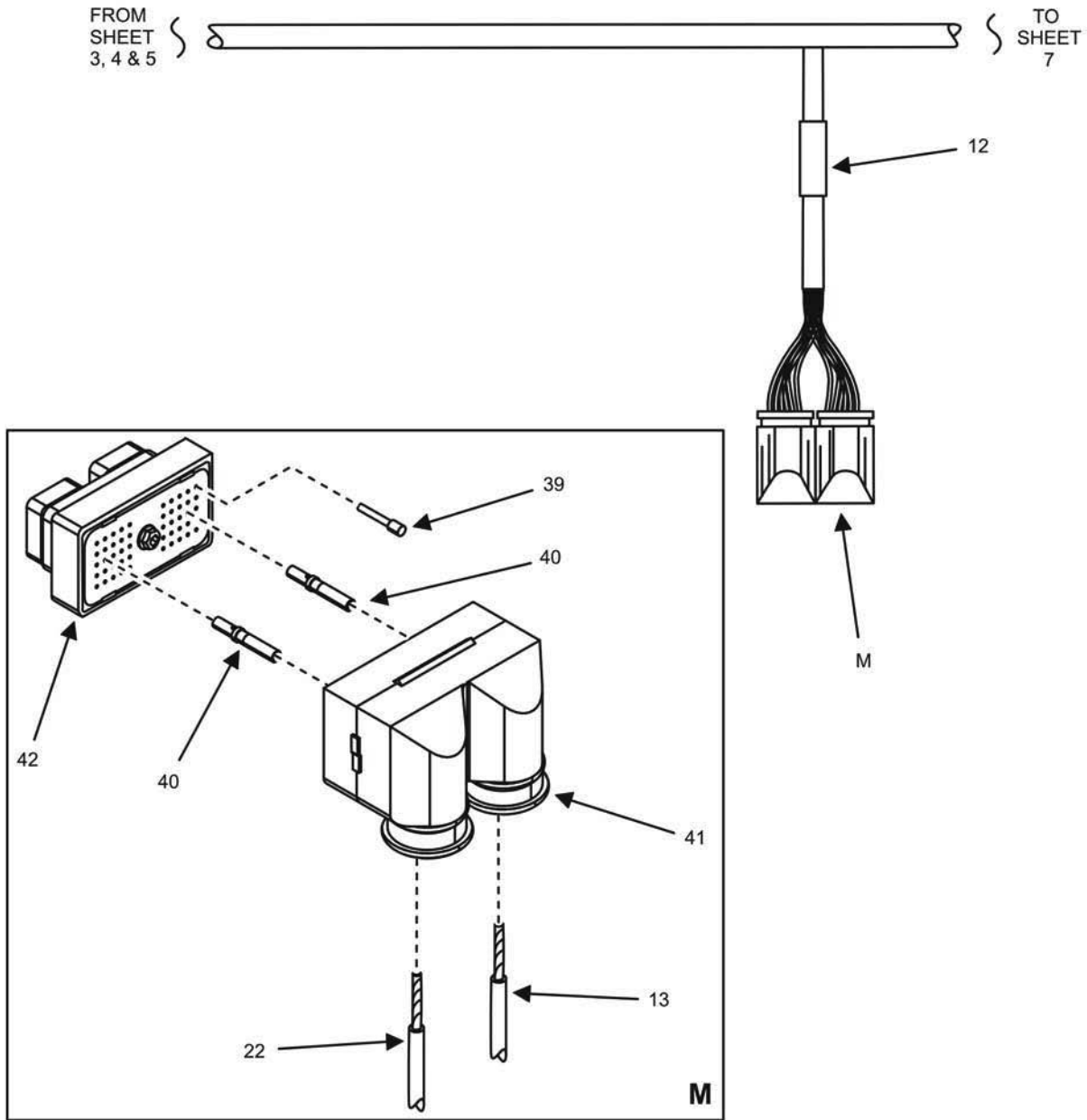


Figure 54. Engine Wiring Harness (Sheet 6 of 14).

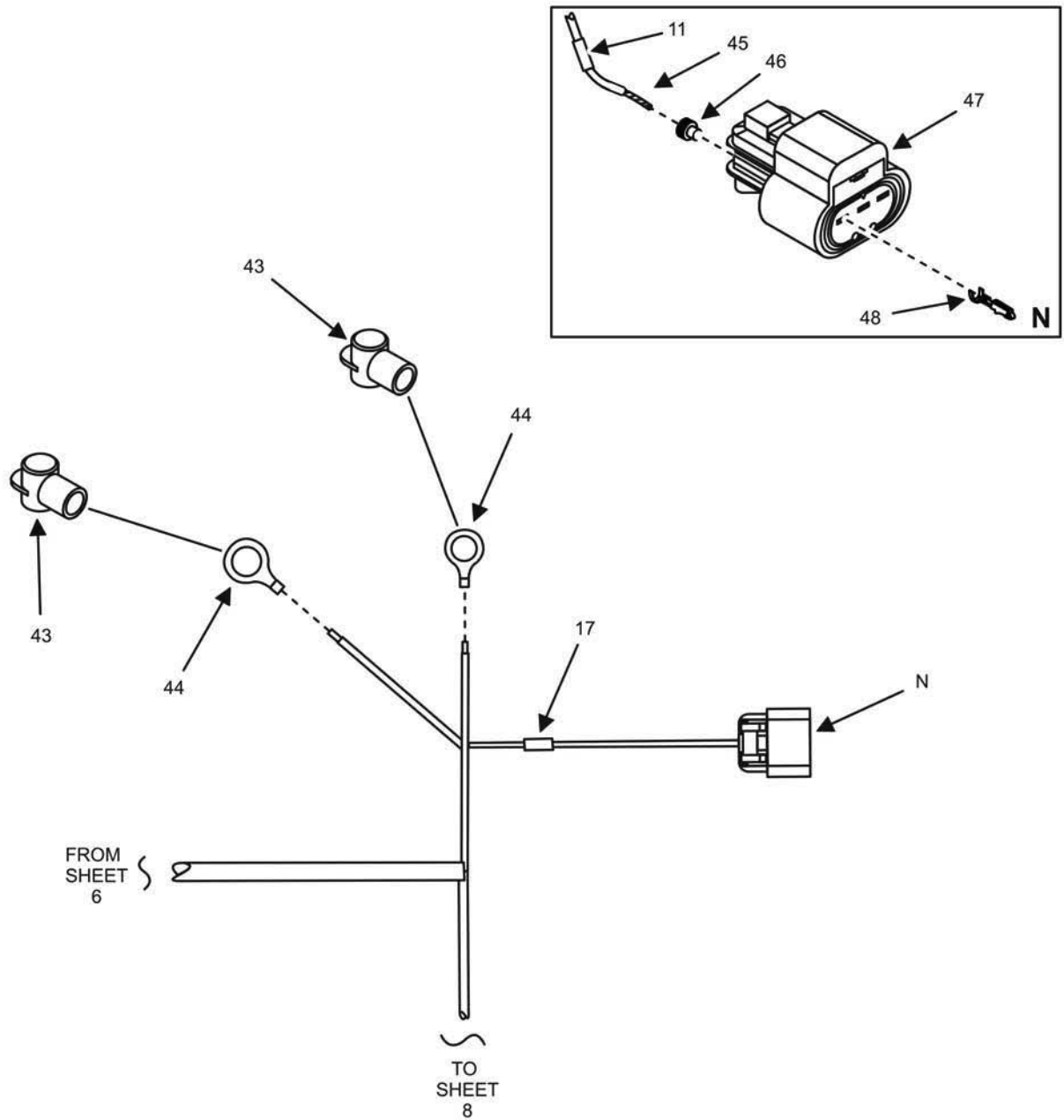


Figure 54. Engine Wiring Harness (Sheet 7 of 14).

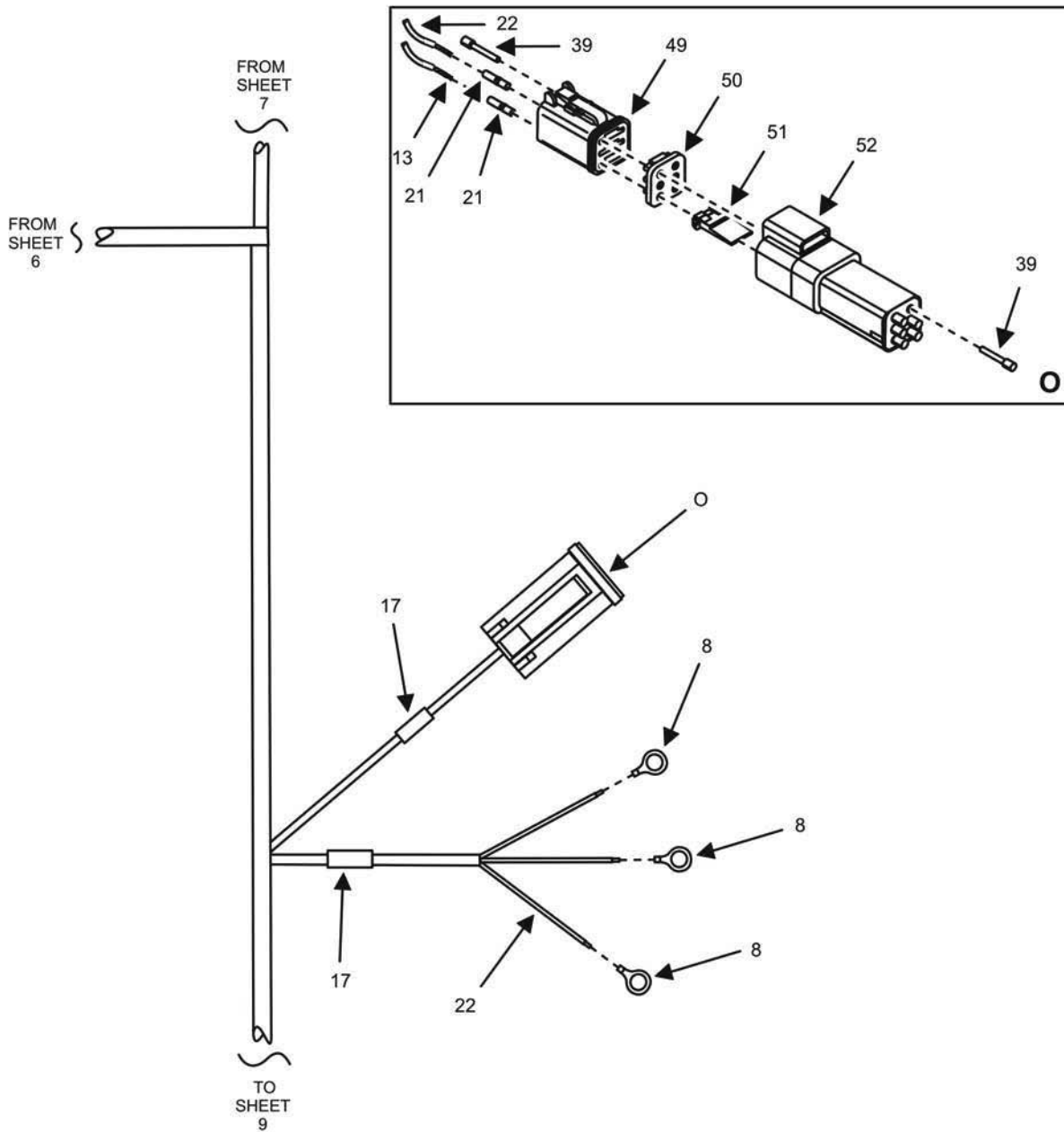


Figure 54. Engine Wiring Harness (Sheet 8 of 14).

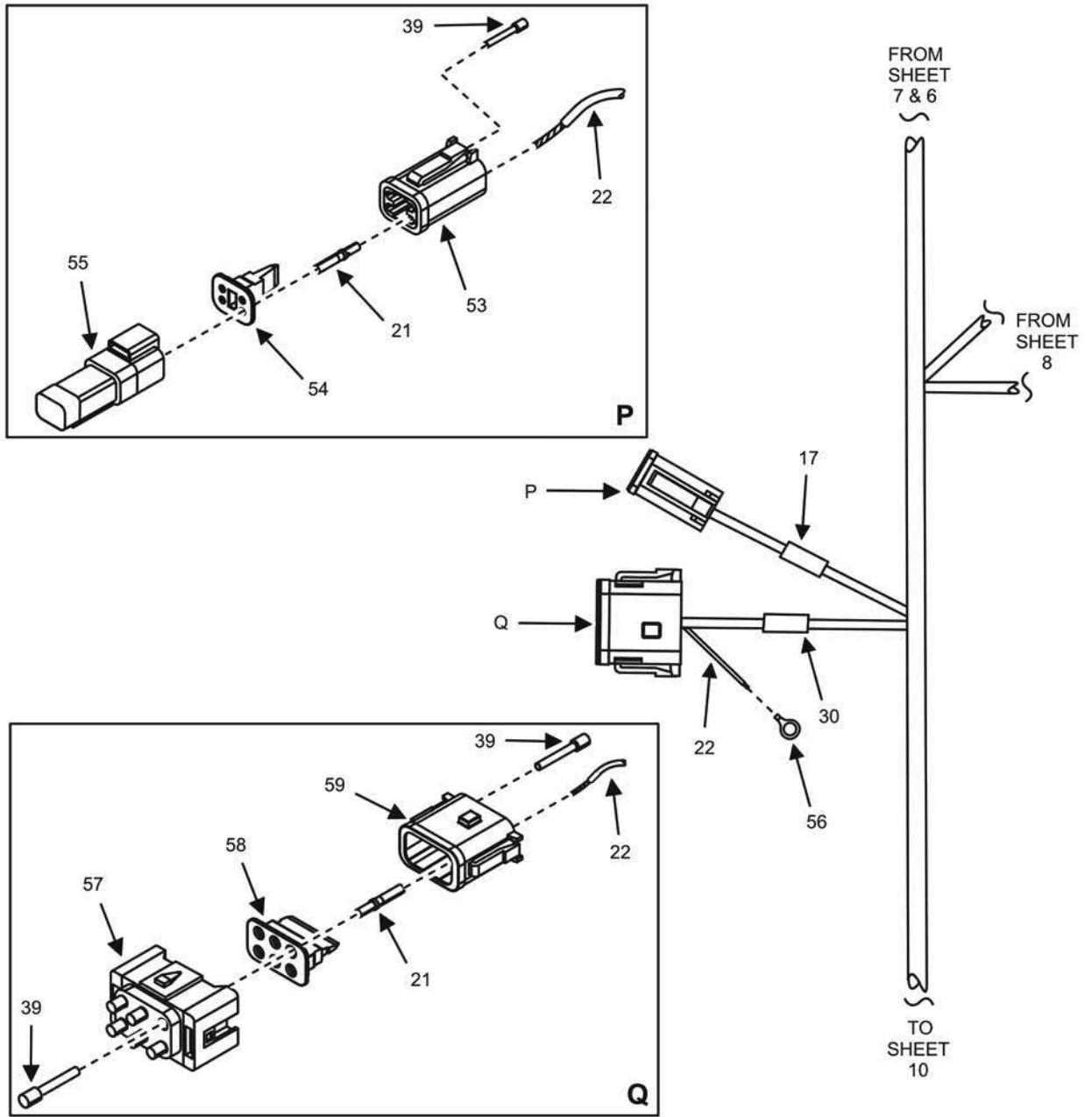


Figure 54. Engine Wiring Harness (Sheet 9 of 14).

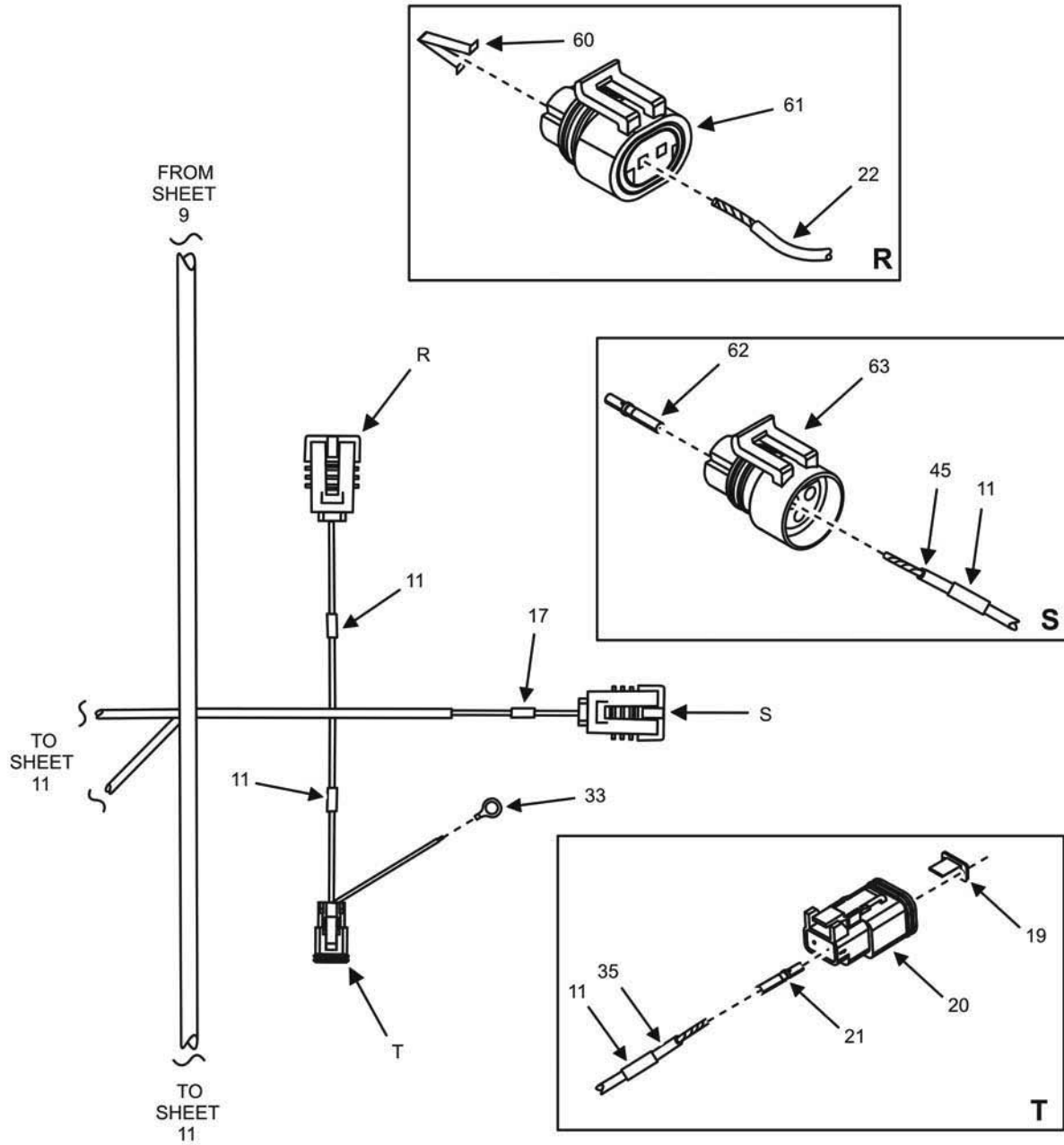


Figure 54. Engine Wiring Harness (Sheet 10 of 14).

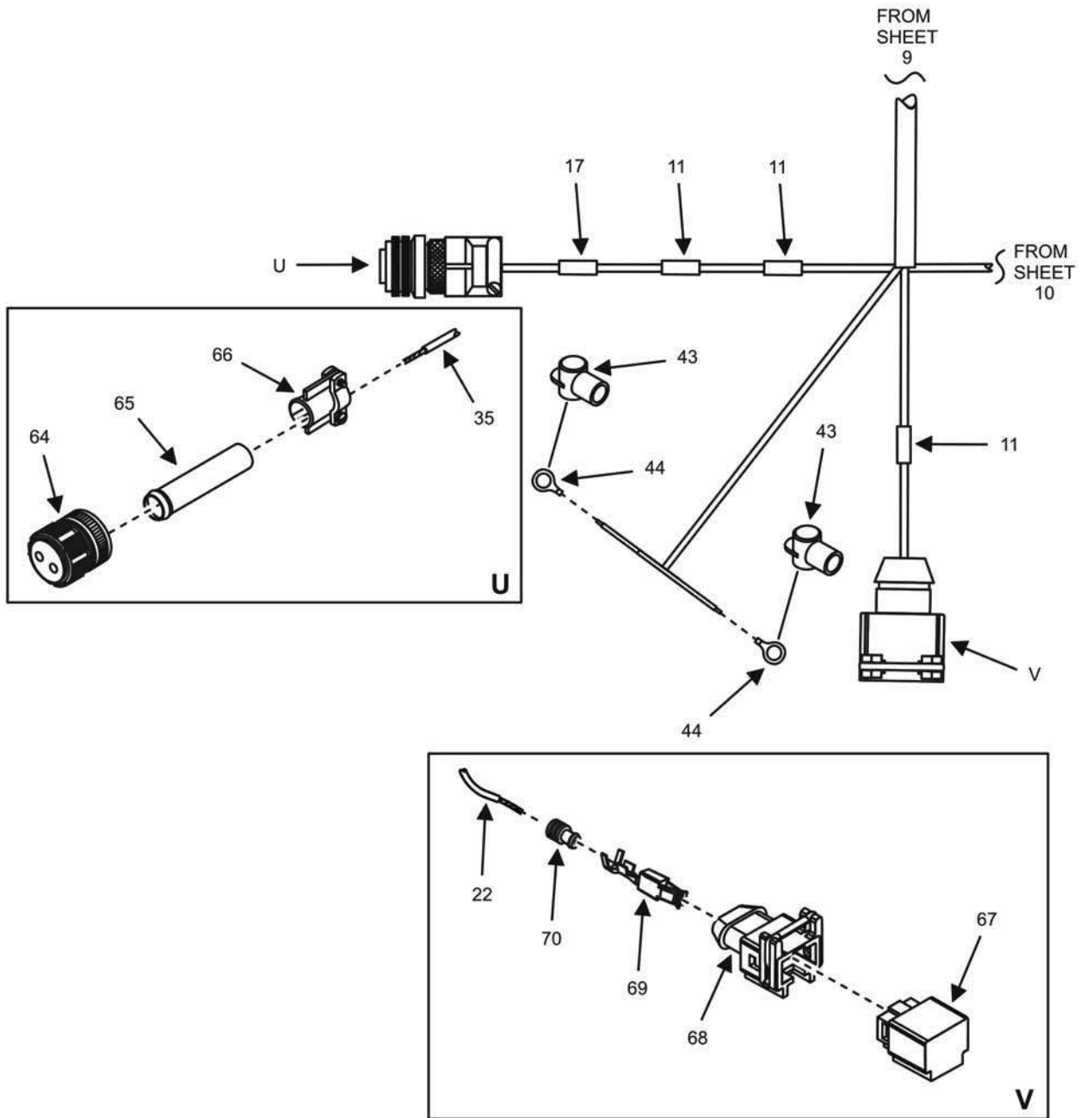


Figure 54. Engine Wiring Harness (Sheet 11 of 14).

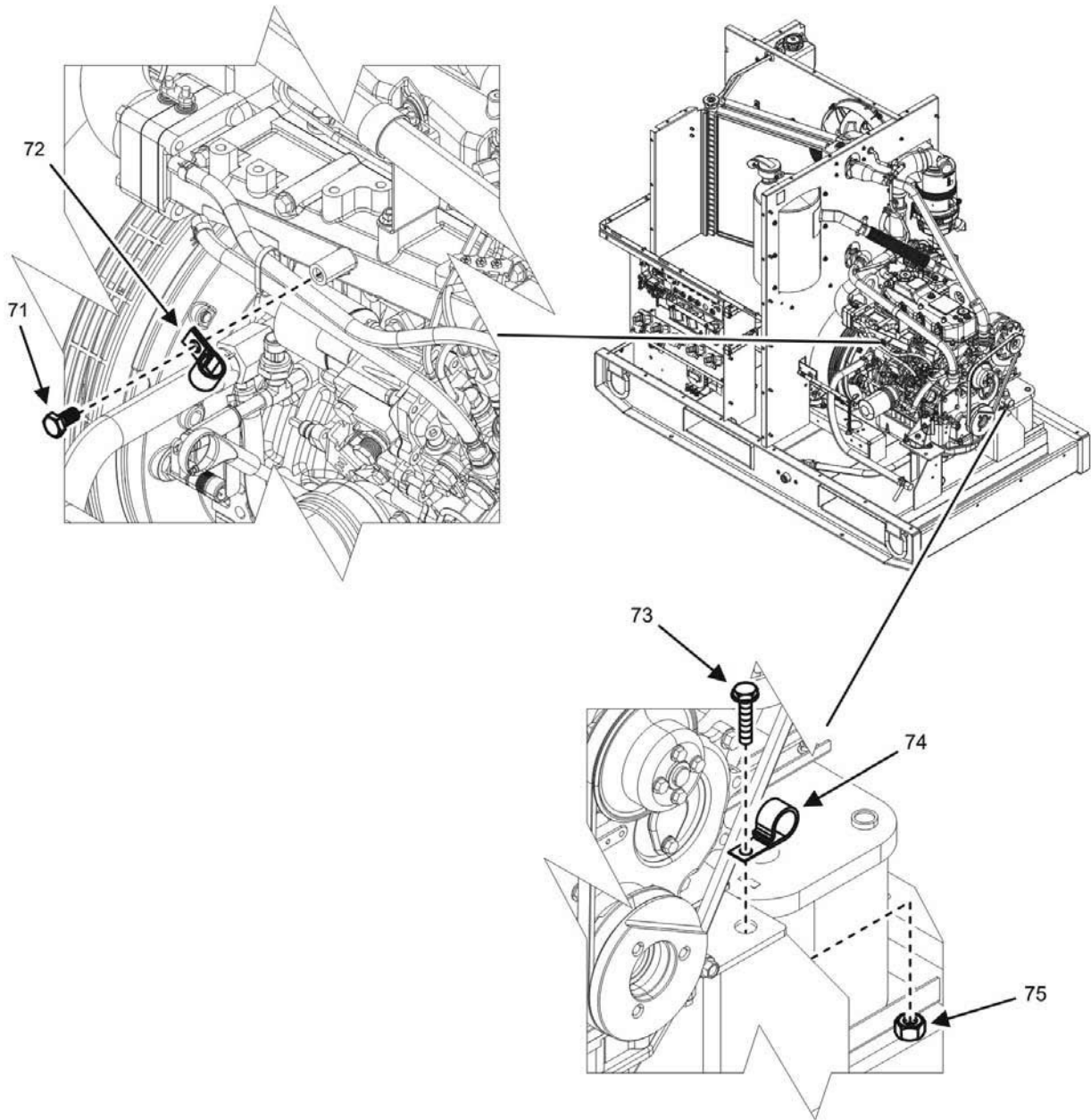


Figure 54. Engine Wiring Harness (Sheet 12 of 14).

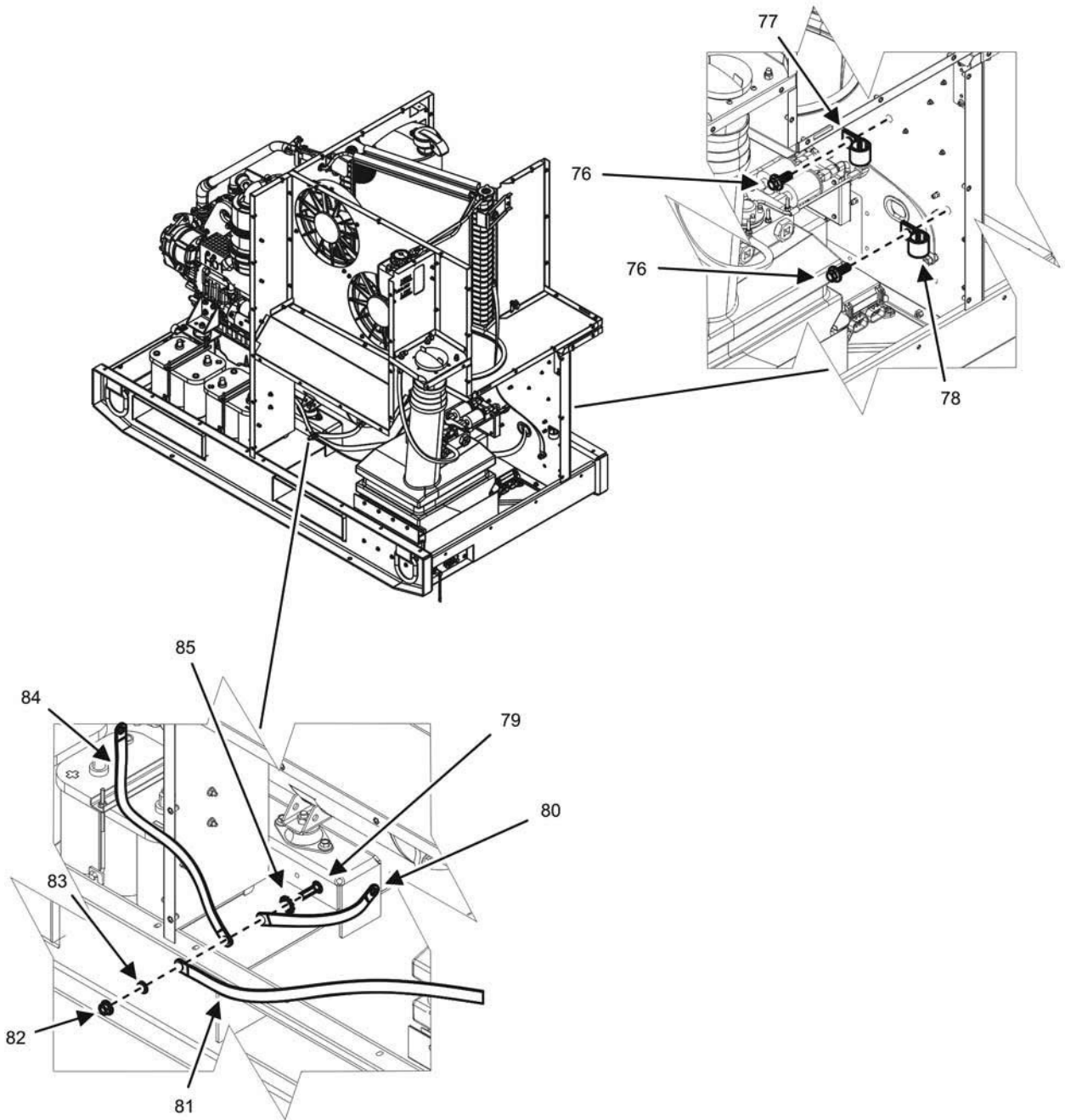


Figure 54. Engine Wiring Harness (Sheet 13 of 14).

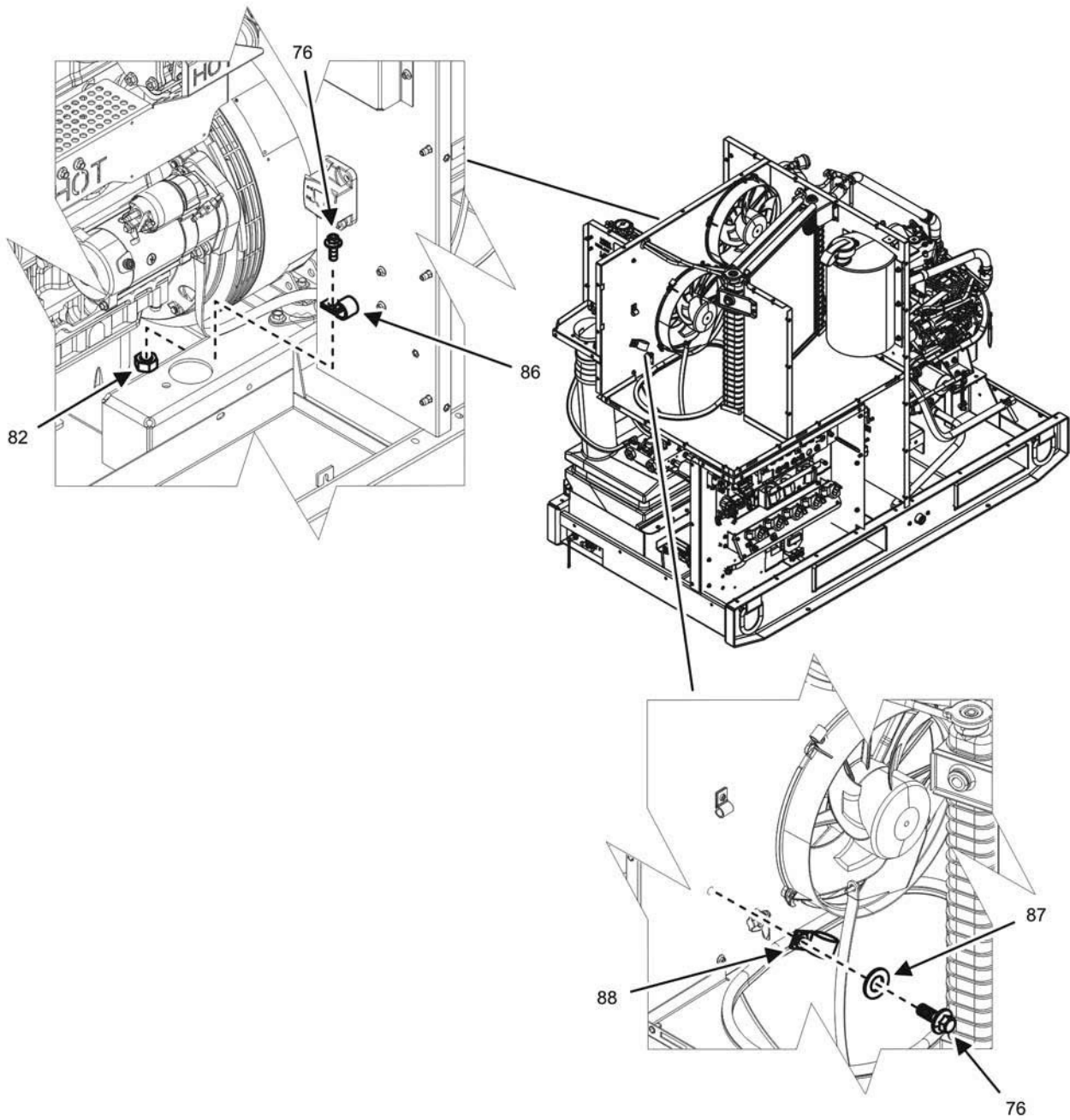


Figure 54. Engine Wiring Harness (Sheet 14 of 14).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 10	
								FIG. 54 ENGINE WIRING HARNESS	
1	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20012	...WIRING HARNESS, ENGINE	1
2	XCFFF	XCFFF	XCFFF	XCFFF		44940	04-20478	....CONNECTOR, 21 PIN	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935013250384	81349	D38999/26WH21SN	....CONNECTOR, PLUG, ELECTRICAL	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014142582	81349	M85049/39-23W	....BACKSHELL, ELECTRICAL	1
5	XCFFF	XCFFF	XCFFF	XCFFF		44940	04-20479	....CONNECTOR, 29 PIN	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935012502524	81349	D38999/26WJ29SN	....CONNECTOR, PLUG, ELECTRICAL	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935013897312	81349	M85049/39-25W	....CLAMP, CABLE, ELECTRICAL	2
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940002582074	00779	34105	....TERMINAL, LUG	8
9	XCFFF	XCFFF	XCFFF	XCFFF		44940	04-20480	....CONNECTOR, 61 PIN	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935011862240	81349	D38999/26WJ61SN	....CONNECTOR, PLUG, ELECTRICAL	1
11	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG2T5-100B	....LAMINATE, LABEL, COVER	40
12	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG3T3-100B	....LAMINATE, LABEL, COVER	5
13	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-20-10	....STRAND, WIRE, 20 AWG (MAKE FROM 3271-20-10 ON BULK ITEMS LIST, CUT TO LENGTH AS REQUIRED)	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999013234929	77060	12089188	....CONTACT, ELECTRICAL, 18-20 AWG	8
15	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5975013105011	77060	12015323	....BOOT, DUST AND MOISTURE	28
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935013088599	45152	1788880	....CONNECTOR, BODY, PLUG, 4 PIN	2
17	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG22T2-100B	....LAMINATE, LABEL, COVER	8
18	MFFZZ	MFFZZ	MFFZZ	MFFZZ		3SXL3	EY-1877	....INSULATION SLEEVING (MAKE FROM EY-1877 ON BULK ITEMS LIST, CUT TO LENGTH AS REQUIRED)	1
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014468180	11139	W2S	....CONNECTOR, BODY, PLUG, WEDGE 2 PIN	4

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014475814	11139	DT06-2S	....CONNECTOR, BODY, PLUG, 2 PIN	4
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012036687	45152	2ER654	....CONTACT, ELECTRICAL, 22-16 AWG	22
22	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	0X4C9	3271-16-26	....STRAND, WIRE, 16 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST, CUT TO LENGTH AS REQUIRED)	1
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014708342	11139	W3S	....POLARIZING KEY, ELECTRICAL	1
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015238855	11139	DT06-3S	....CONNECTOR, PLUG, ELECTRICAL, 3 PIN	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015699460	71400	32006-A22	....CONNECTOR, PLUG, BLACK ELECTRICAL	1
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935013399574	77060	12010300	....PLUG, END SEAL, ELECTRICAL	12
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015704538	71400	32006-TP2	....CONNECTOR BODY, MODULAR	4
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015181334	77060	12077412	....TERMINAL, QUICK DISCONNECT, 14 - 16 AWG	17
29	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015273588	77060	12077411	....TERMINAL, QUICK DISCONNECT	3
30	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG9T3-100B	....LAMINATE, LABEL, COVER	5
31	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015885261	1UW16	32006-B22	....CONNECTOR, PLUG, GREY ELECTRICAL	1
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015699470	71400	32006-D22	....CONNECTOR, PLUG, BLUE ELECTRICAL	1
33	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001434773	81343	MS25036-105	....TERMINAL, LUG, 3/8 RING, 22-18 AWG	5
34	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015699542	71400	32006-C22	....CONNECTOR, PLUG, GREEN ELECTRICAL	1
35	MFFZZ	MFFZZ	MFFZZ	MFFZZ	6145012530121	16428	88760	....CABLE, SPECIAL PURPOSE, 18 AWG (MAKE FROM 88760 ON BULK ITEMS LIST, CUT TO LENGTH AS REQUIRED)	1
36	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015191808	11139	W2P	....RETAINER, ELECTRICAL	1
37	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012163648	11139	0460-202-16141	....CONTACT, ELECTRICAL, 16-20 AWG	2

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
38	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015065555	0FW39	12422624	....CONNECTOR, PLUG, ELECTRICAL	1
39	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015885265	11139	0413-217-1605	....CONNECTOR, PLUG, ELECTRICAL	37
40	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999015722092	11139	1062-20-0122	....CONTACT, ELECTRICAL, 22-16 AWG	34
41	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015885256	11139	0528-001-5005	....CONNECTOR, PLUG, HOUSING, 50 PIN	1
42	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015877612	11139	DRC26-50S04	....CONNECTOR, PLUG, ELECTRICAL, 50 PIN	1
43	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5930015876626	58961	218N1F02	....BOOT, DUST AND MOISTURE	4
44	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015860272	00779	2-36160-1	....TERMINAL, LUG, 16-14 AWG	4
45	MFFZZ	MFFZZ	MFFZZ	MFFZZ		16428	88770	....CABLE, ELECTRICAL, 18 AWG (MAKE FROM 88770 ON BULK ITEMS LIST, CUT TO LENGTH AS REQUIRED)	1
46	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5340015891081	1V6F3	15366021	....SEAL	3
47	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015859802	1V6F3	15326808	....CONNECTOR, RECEPTACLE	1
48	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999015876962	1V6F3	12191819	....CONTACT, PIN, 16-18 AWG	3
49	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015399272	45152	2HB188	....CONNECTOR, PLUG, ELECTRICAL	1
50	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015152283	19207	12485651-125	....SECONDARY LOCKNUT	1
51	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015231409	11139	W6P	....CONNECTOR, RECEPTACLE	1
52	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015152433	45152	2HB193	....CONNECTOR, RECEPTACLE, CAP	1
53	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014846537	11139	DT06-4S	....CONNECTOR, PLUG, ELECTRICAL	1
54	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014830852	11139	W4S	....CONNECTOR, RECEPTACLE, WEDGE	1
55	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015235410	11139	DT04-4P-EP13	....CONNECTOR, RECEPTACLE, ELECTRICAL	1
56	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940002835281	81343	MS25036-109	....TERMINAL, LUG	1
57	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015230711	93408	622-2967-009	....CONNECTOR, RECEPTACLE	1
58	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014541789	11139	W12S	....RETAINER, ELECTRICAL	1
59	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015877601	11139	DT06-08SA	....CONNECTOR, PLUG, ELECTRICAL	1
60	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999015885530	1V6F3	12124076	....CONTACT, SOCKET, 20-18 AWG	2

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
61	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014660260	77060	12162193	...CONNECTOR, PLUG, ELECTRICAL	1
62	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940013705059	77060	12103881	...TERMINAL, QUICK DISCONNECT	3
63	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015033305	77060	12065287	...CONNECTOR BODY, PLUG	1
64	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015905546	77820	97-3106A-10SL-4S(624)	...CONNECTOR, ELECTRICAL MAGNETIC SENSOR	1
65	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5365005985282	96906	MS3420-4	...BUSHING, RUBBER	1
66	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	M85049-38C-4A	...CLAMP	1
67	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015886862	37GZ4	20593C400	...CAP, CONNECTOR	1
68	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015716514	00779	963040-3	...CONNECTOR BODY, PLUG	1
69	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015600703	00779	929939-1	...TERMINAL, LUG, 16-20 AWG	2
70	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015602740	00779	828904-1	...SEAL, PLAIN	2
71	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B016WB4K42	...SCREW, HEX FLANGE, M8	1
72	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340004256432	75272	C0V-0613Z1	...CLAMP, LOOP	1
73	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M10C020WB4K42	...SCREW, HEX FLANGE, M10	1
74	PAFZZ	PAFZZ	PAFZZ	PAFZZ		75272	CJV-17	...CLAMP, J	1
75	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M10	...NUT, PLAIN, EXTENDED, M10	2
76	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A016WB4K42	...SCREW, CAP, HEXAGON, M6	7
77	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340004044101	75272	C0V1313	...CLAMP, LOOP	3
78	PAFZZ	PAFZZ	PAFZZ	PAFZZ		75272	COV-2013	...CLAMP, LOOP	1
79	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES07M10C040WB4K41	...SCREW, HEX HEAD, M10	1
80	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6145015886588	5T0Q1	EM4E393	...STRAP, GROUNDING	1
81	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6145015886563	5T0Q1	EM4D147	...STRAP, GROUNDING	1
82	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	...NUT, PLAIN, EXTENDED, M6	2
83	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW16X010000GE1K41	...WASHER, LOCK, M10	1
84	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6145015886398	5T0Q1	EM4A080	...STRAP, GROUNDING	1
85	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW13X375000GD5A21	...WASHER, LOCK, EXTERNAL TOOTH, 3/8	1
86	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015903818	75272	C0V-0809	...CLAMP, LOOP	1
87	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW24037N078BD6FY1	...WASHER, FLAT	1
88	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015903819	75272	C0V-2217	...CLAMP, LOOP	1

END OF FIGURE

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
POWER WIRING HARNESS REPAIR PARTS LIST**

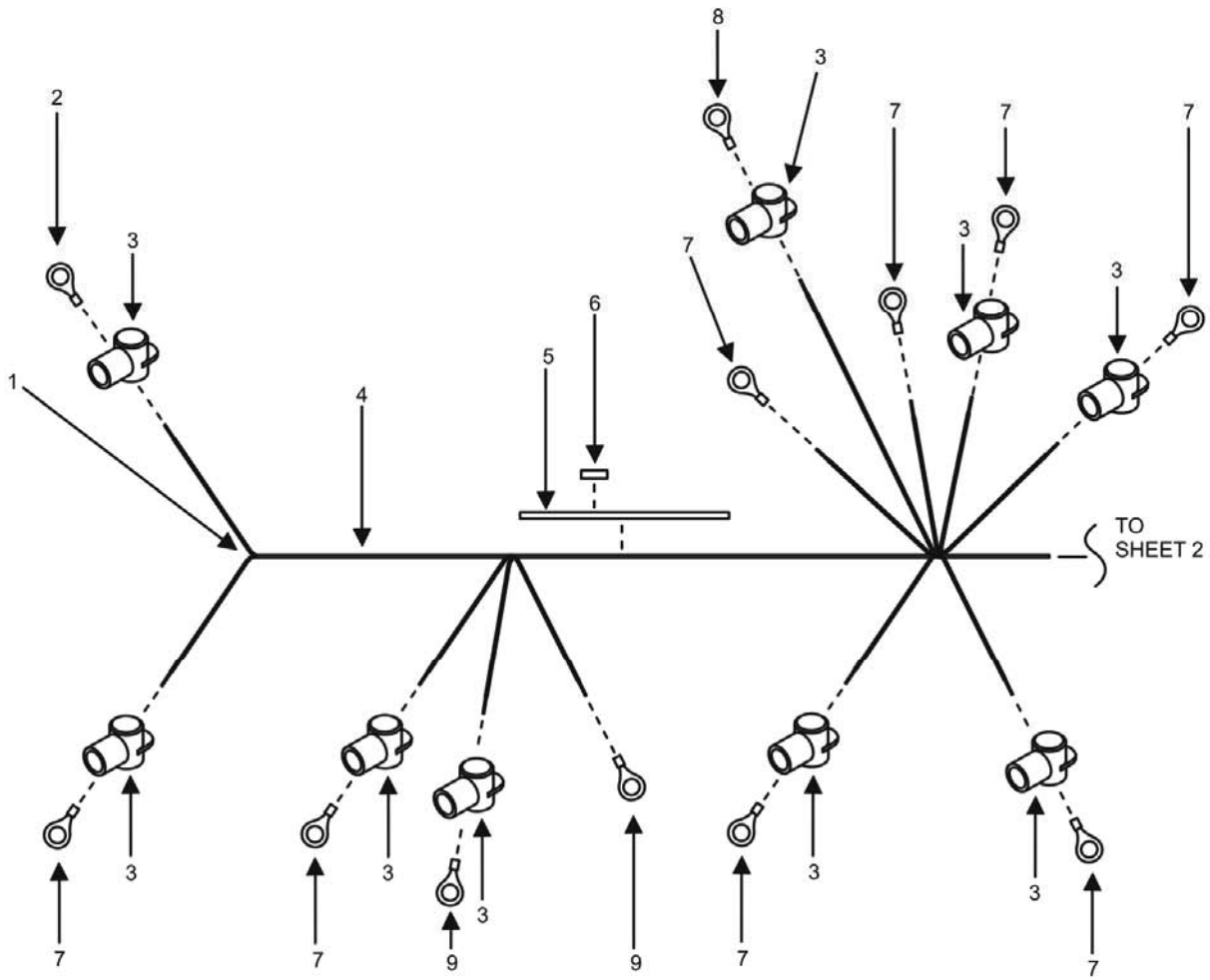


Figure 55. Power Wiring Harness (Sheet 1 of 3).

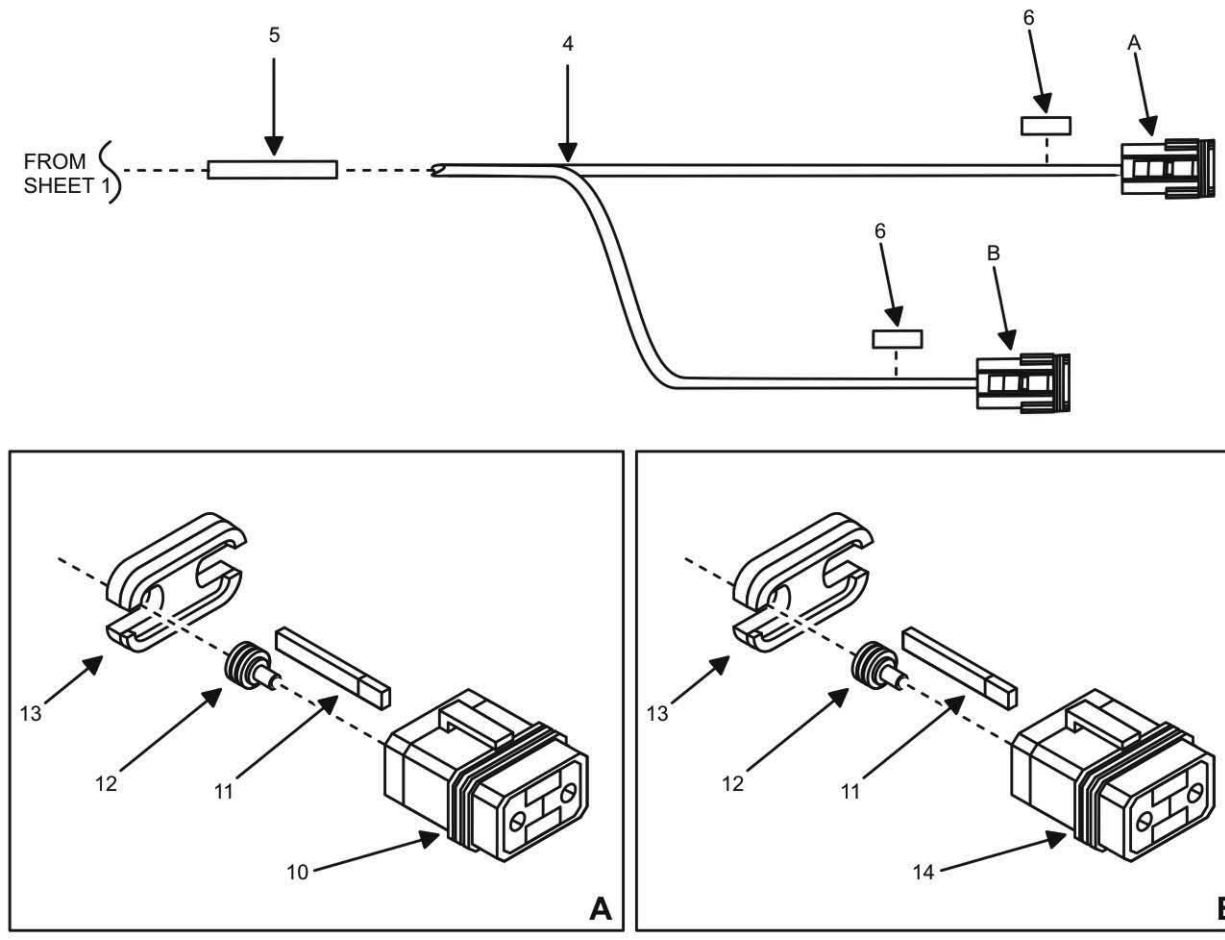


Figure 55. Power Wiring Harness (Sheet 2 of 3).

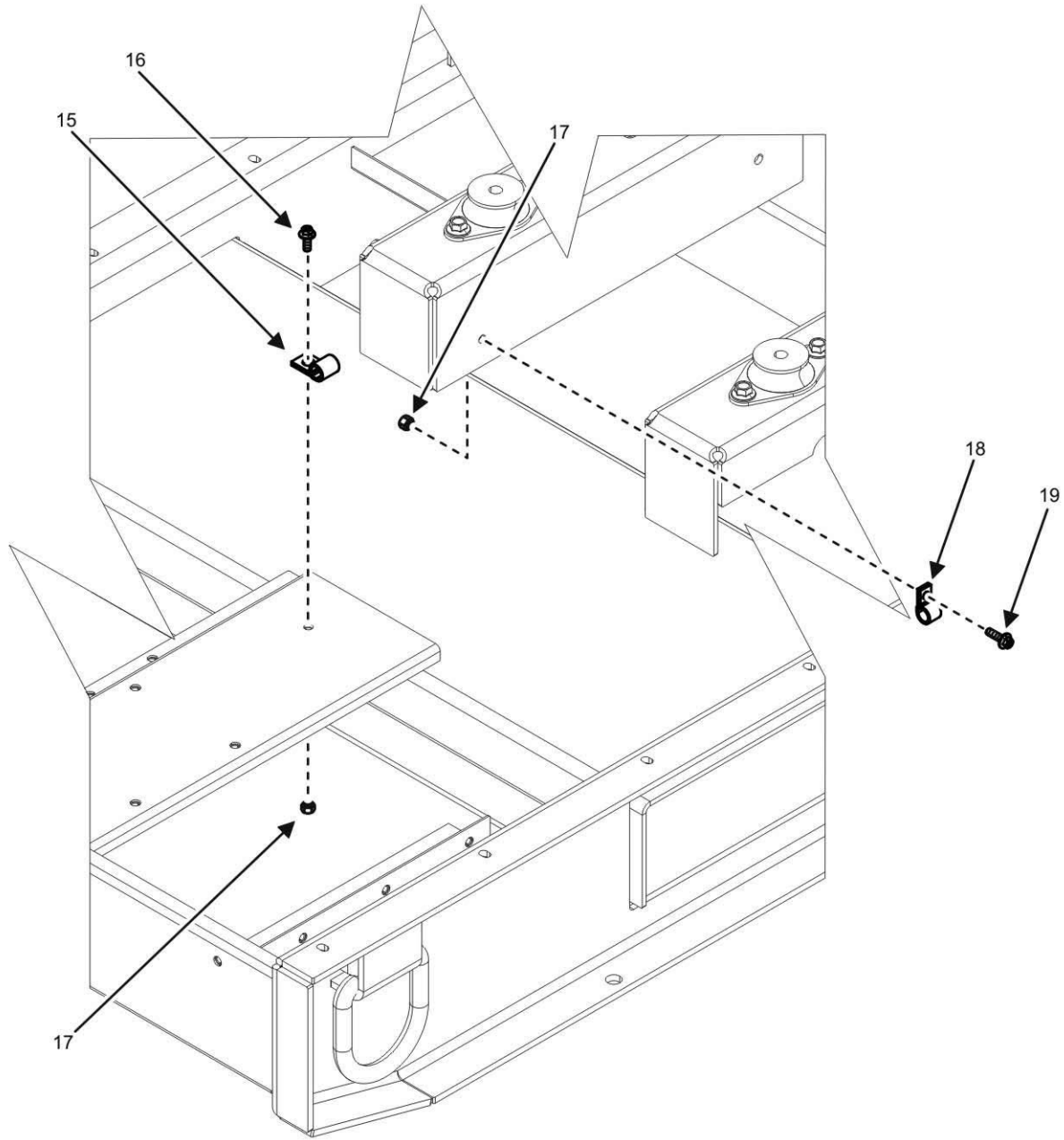


Figure 55. Power Wiring Harness (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC		NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
GROUP 11									
FIG. 55 POWER WIRING HARNESS									
1	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-21099	...HARNESS, POWER	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940008649985	30554	88-22119-19	....TERMINAL, LUG, RING	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		58961	234N3T02	....BOOT, DUST AND MOISTURE	9
4	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-10-105	....STRAND, WIRE, 10 AWG (MAKE FROM 3271-10-105 ON BULK ITEMS LIST, CUT TO LENGTH AS NEEDED)	1
5	MFFZZ	MFFZZ	MFFZZ	MFFZZ		3SXL3	EY-1877	....INSULATION SLEEVING (MAKE FROM EY-1877 ON BULK ITEMS LIST, CUT TO LENGTH AS NEEDED)	1
6	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG2T5-100B	....LAMINATE, LABEL COVER	3
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001139819	96906	MS20659-106	....TERMINAL, LUG, RING, M8, 12-10 AWG	8
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	88-22119-17	....TERMINAL, LUG, RING	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940008231581	00779	35112	....TERMINAL, LUG, RING, 3/8 IN, 12-10 AWG	2
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015699506	71400	32004-A2	....CONNECTOR, PLUG, ELECTRICAL	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015876981	1V6F3	12110127	....TERMINAL, TAPER, RECEPTACLE	2
12	PCFZZ	PCFZZ	PCFZZ	PCFZZ	2530015035000	1V6F3	12010295	....BOOT, VEHICULAR COMP	4
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015704557	71400	32004-TP2	....CONNECTOR BODY, RECEPTACLE COVER	2
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ		1UW16	32004-B2	....CONNECTOR, PLUG, ELECTRICAL	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015868472	75272	COV-0813	..CLAMP, LOOP	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A016WB4K 42	..SCREW, CAP, HEXAGON, M6	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	..NUT, PLAIN, EXTENDED, M6	2
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015903818	75272	COV-0809	..CLAMP, LOOP	1
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A020WB4K 42	..SCREW, HEX FLANGE, M6	1
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
WINTERIZATION KIT INSTALLATION REPAIR PARTS LIST**

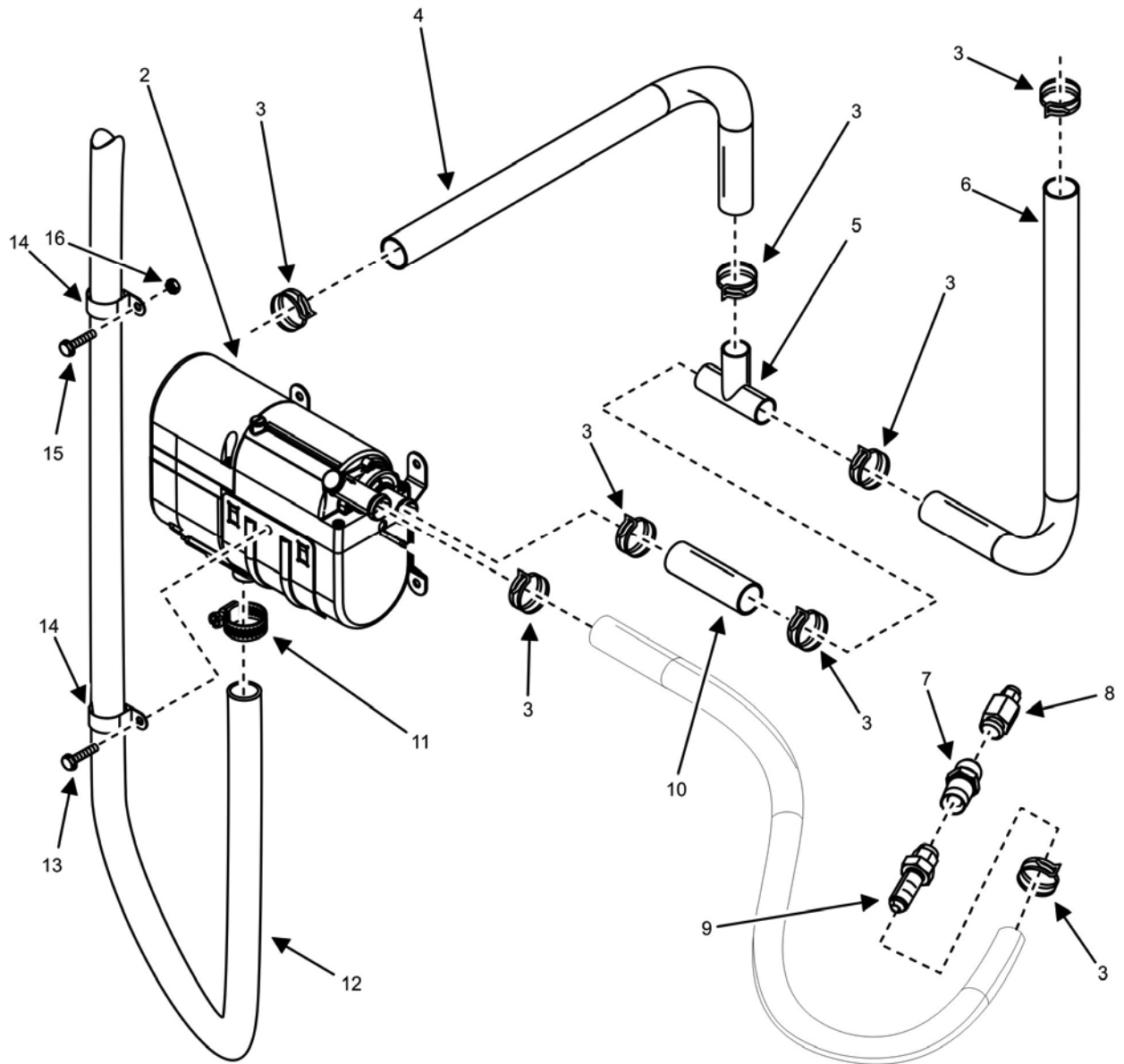


Figure 56. Winterization Kit (Sheet 1 of 4).

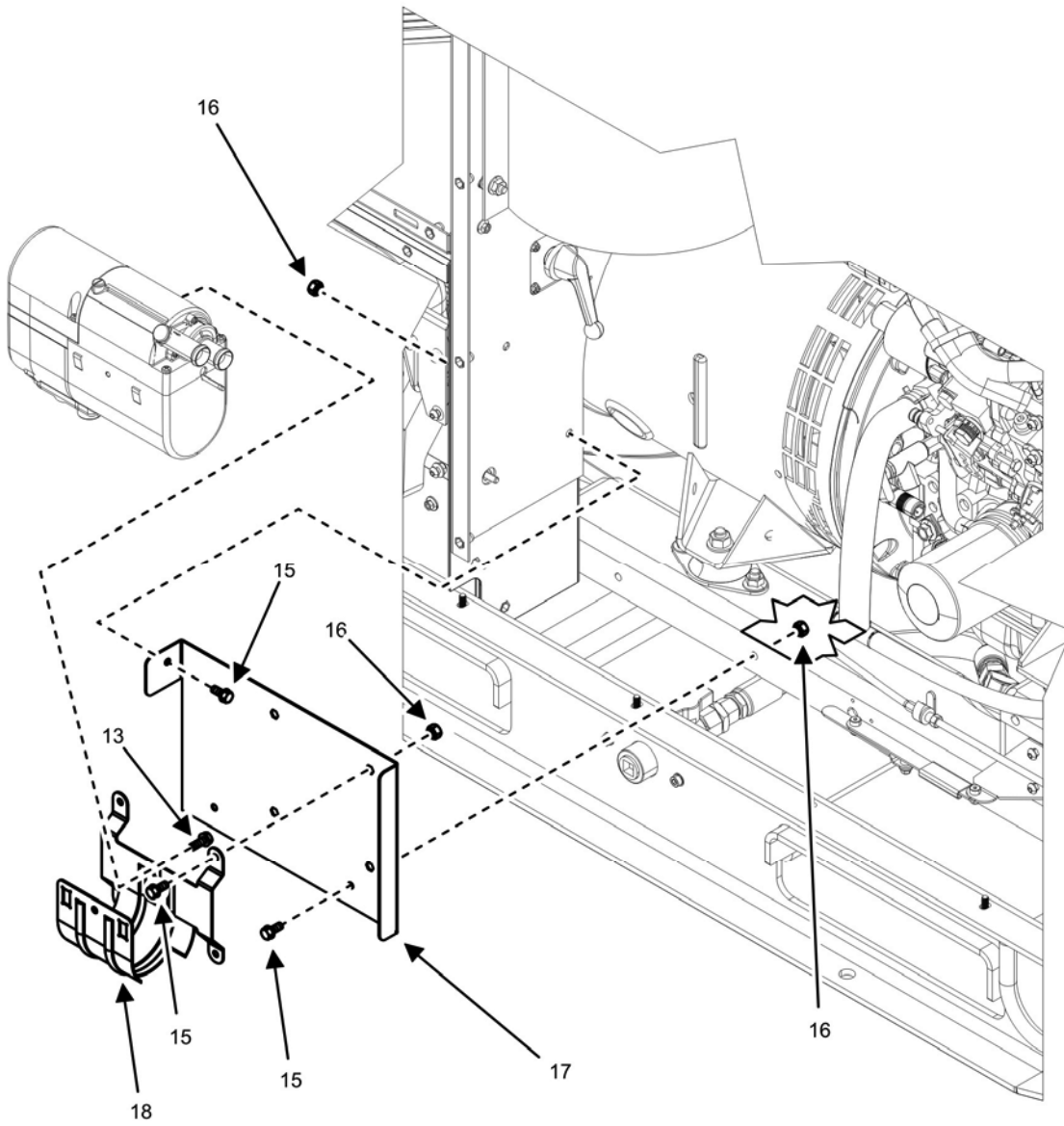


Figure 56. Winterization Kit (Sheet 2 of 4).

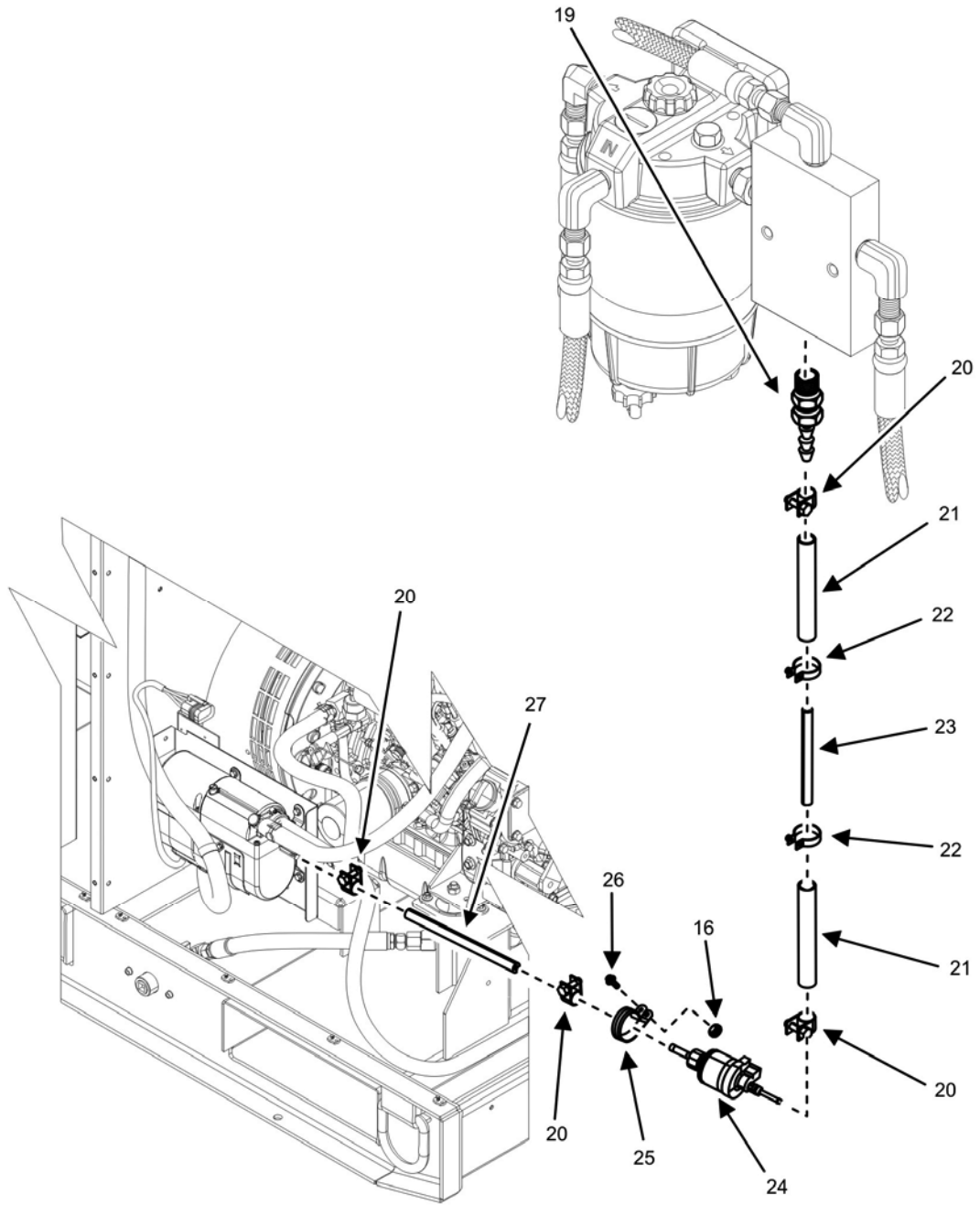


Figure 56. Winterization Kit (Sheet 3 of 4).

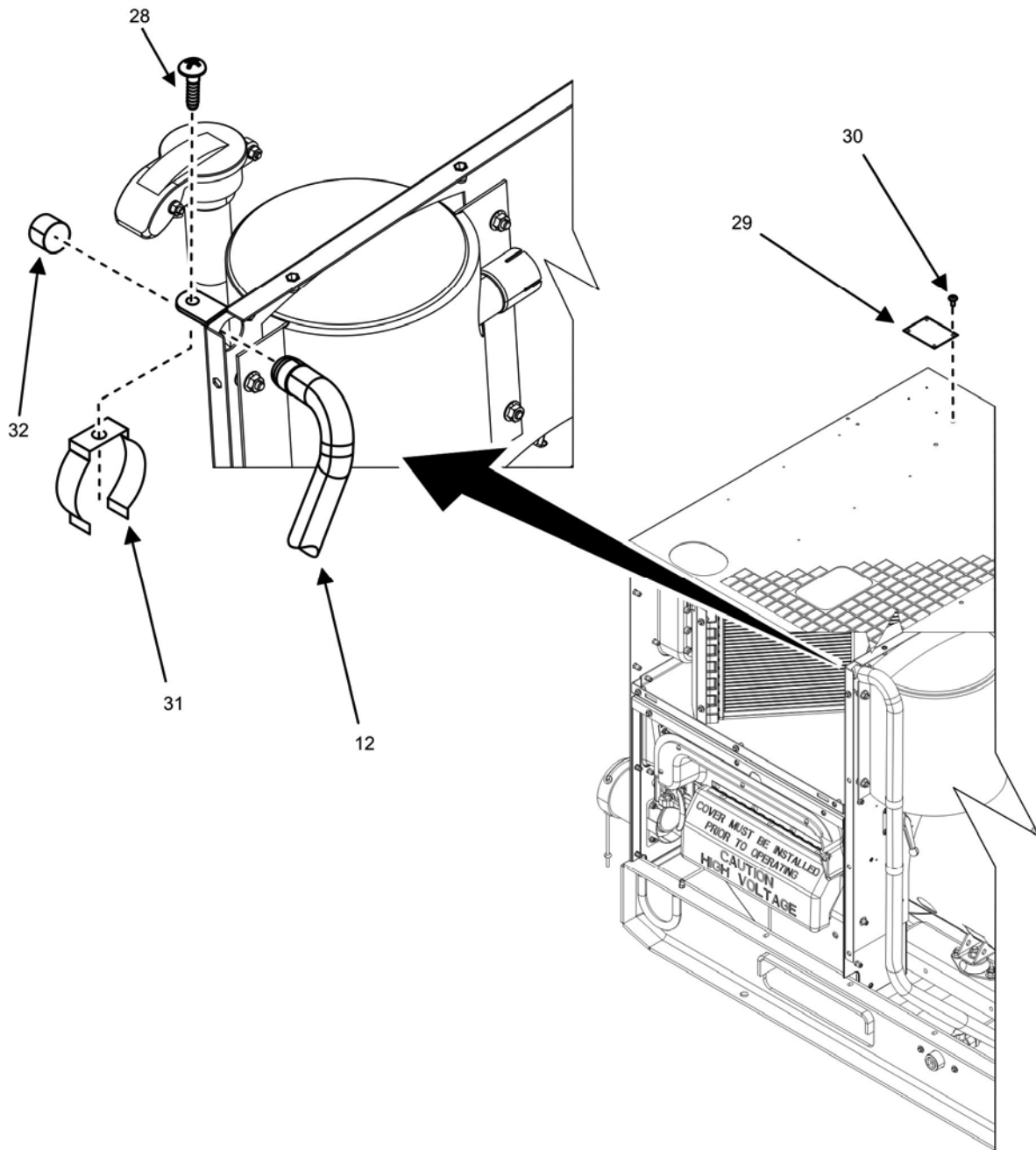


Figure 56. Winterization Kit (Sheet 4 of 4).

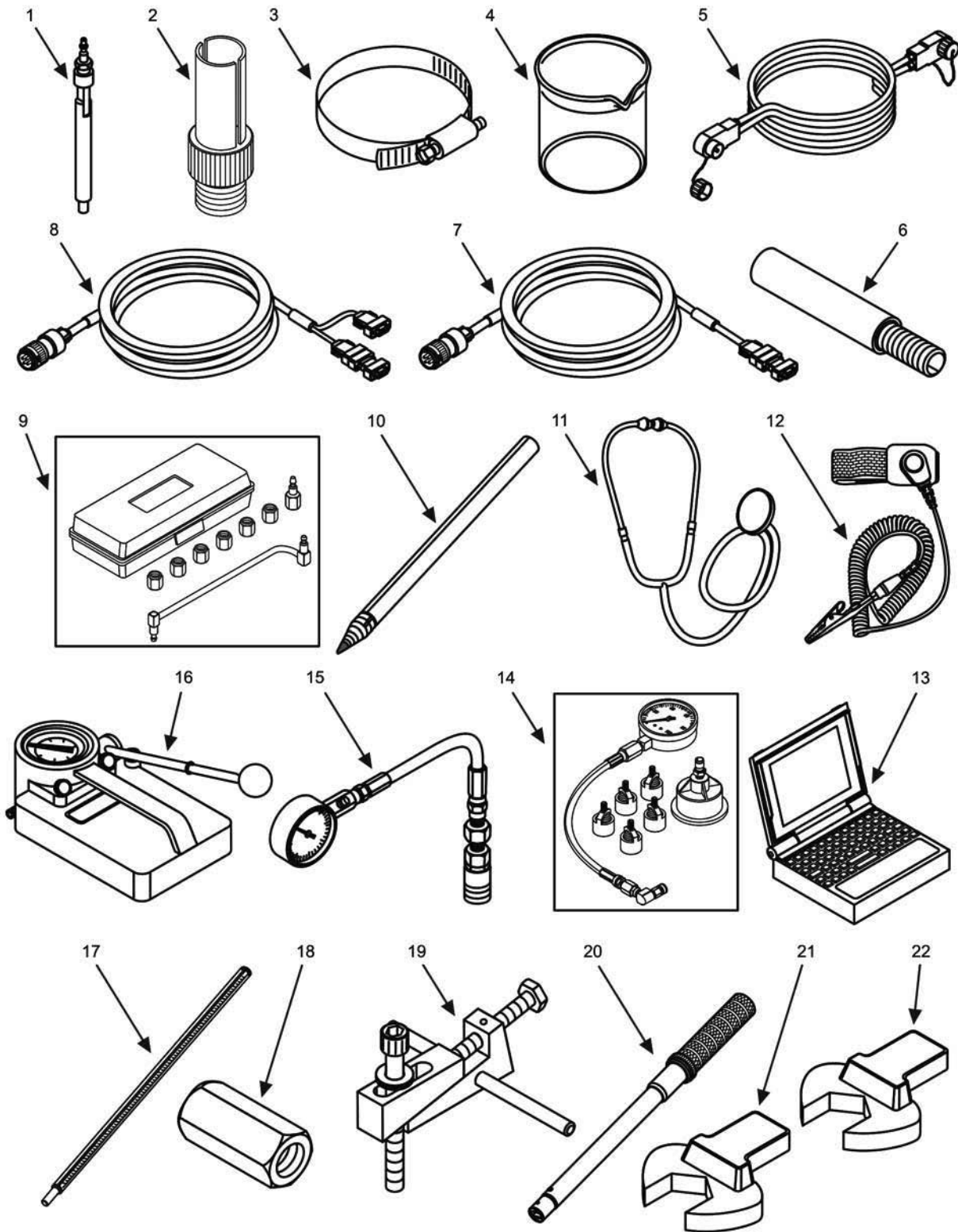
(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC FORCE		NAVY	(3) NSN	(4) CAGEC	P/N	(5)	(6) DESCRIPTION AND UOC	(7) QTY.
									GROUP 12	
									FIG. 56 WINTERIZATION KIT INSTALLATION	
1	KFFFF	KFFFF	KFFFF	KFFFF		44940	04-21146		..KIT WINTERIZATION (NOT SHOWN)	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		38453	04-21206		..HEATER, ASSEMBLY	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-29		..CLAMP, TYPE CTB	8
4	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21208-1		..HOSE, NONMETALLIC 3/4 INCH ID (MAKE FROM 30- 10-0003 ON BULK ITEMS LIST AND CUT TO LENGTH 225.44 MM +/- 10 MM)	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		3A054	91355K54		..ADAPTER, TEE 3/4 INCH OD BARB	1
6	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21208-4		..HOSE, NONMETALLIC 3/4 INCH ID (MAKE FROM 30- 10-0003 ON BULK ITEMS LIST AND CUT TO LENGTH 353.04 MM +/- 10 MM)	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5975015886200	44940	SAEJ5148-6140139C		..ADAPTER, PIPE 3/8-18 NPTF X 1/2- 14 NPTF	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		98441	3/8X3/8F3HG		..ADAPTER, PIPE NPT FEMALE TO BSPT MALE	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ12318-12430160B		..ADAPTER, TUBE	2
10	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21208-3		..HOSE, NONMETALLIC 3/4 INCH ID (MAKE FROM 30- 10-0003 ON BULK ITEMS LIST AND CUT TO LENGTH 85 MM +/- 10 MM)	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		38453	50-40-0018		..CLAMP, TUBE 30MM ID	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21551-1		..TUBE, FLEXIBLE EXHAUST	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A012WB4K42		..SCREW, HEX FLANGE HEAD M6 X 1 X 12	2

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340005505943	81343	MS122916	..CLAMP, TUBE	2
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A016WB4K42	....SCREW, HEX FLANGE HEAD M6 X 1 X 16	8
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	....NUT, HEX FLANGE M6 X 1	4
17	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21129	..BRACKET, HEATER	1
18	XBFZZ	XBFZZ	XBFZZ	XBFZZ		38453	50-60-0045	..BRACKET, HEATER	1
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730014491233	93061	125HB-3-4	..ADAPTER, HOSE .25 INCH NPT MALE TO BARB	1
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508D11	..CLAMP, HOSE	4
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ		38453	40-10-0017	..HOSE, FUEL 5MM ID	2
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508D9	..CLAMP, HOSE	2
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21547-1	..TUBE, FLEXIBLE	1
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2910200027185	1C645	25-1942-45-00-00	..PUMP, FUEL	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ		38453	50-60-0028	..CLAMP, TUBE	1
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A030WB4K42	..SCREW, HEX FLANGE HEAD M6 X 1 X 30	1
27	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-20852	..HOSE, FUEL 5/32 INCH ID (MAKE FROM 40-10-0016 ON BULK ITEMS LIST AND CUT TO 560 MM +/- 10 MM)	1
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ		1MMD1C	04-21420	..SCREW, PAN HEAD M4 X 10 STEEL ZINC LOCKING	1
29	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	04-21676	..PLATE, OPERATING INSTRUCTIONS	1
30	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5320009321972	81349	M24243/6-A402H	..RIVET, BLIND	4
31	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015883558	78553	C22275-020-4	..CLIP	1
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ		38453	60-30-0025	..CAP, TUBE	1
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
BULK ITEMS LIST**

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					FIG. BULK	
1	PAFZZ		16428	88770	CABLE, ELECTRICAL	1
2	PAFZZ		16428	89418	CABLE, POWER, ELECTRICAL	1
3	PAFZZ		44940	04-21376	CABLE, SHIELDED	1
4	PAFZZ		44940	090130SWC8	CABLE, SHIELDED, 6 CONDUCTOR	1
5	PAFZZ	6145012530121	16428	88760	CABLE, SPECIAL, PURPOSE	1
6	PAFZZ		30554	88-22487	COATING	1
7	PAFZZ		30554	88-22802	COATING, PROTECTIVE	1
8	PCFZZ		C4643	A2539	EDGING	1
9	PCFZZ		C4643	A3521	EDGING	1
10	PCFZZ	4720014792748	45152	3058529	HOSE, NONMETALLIC	1
11	PCFZZ		24161	42190109	HOSE, NONMETALLIC	1
12	PCFZZ		73842	58001904800300	HOSE, NONMETALLIC	1
13	PCFZZ		38453	30-10-0003	HOSE, NONMETALLIC	1
14	PCFZZ		38453	40-10-0005	HOSE, NONMETALLIC	1
15	PCFZZ		38453	40-10-0016	HOSE, NONMETALLIC	1
16	PAFZZ		30554	88-20541-1	INSULATION SLEEVING	1
17	PAFZZ		3SXL3	EY-1877	INSULATION SLEEVING	1
18	PAFZZ	8030000822508	81346	ASTM D5363	PRIMER, SEALING, COMPOUND	1
19	PCFZZ		C4643	A1512	SEAL, EDGE	1
20	PCFZZ		C4643	A3709	SEAL, EDGE	1
21	PCFZZ		C4643	A3921	SEAL, EDGE, BULB	1
22	PAFZZ	8030014790487	05972	56541	SEALING COMPOUND	1
23	PAFZZ	8030013963362	05972	68035	SEALING COMPOUND	1
24	PAFZZ	8030000585398	05970	85-12	SEALING COMPOUND	1
25	PAFZZ		85901	ATUM 24/6-0	SLEEVE, HEAT SHRINK	1
26	PAFZZ		30554	88-20541-15	SLEEVING, INSULATION	1
27	PAFZZ		0X4C9	3271-12-65	STRAND, WIRE	1
28	PAFZZ	4010015906749	0X4C9	3271-16-26	STRAND, WIRE	1
29	PAFZZ		0X4C9	3271-20-10	STRAND, WIRE	1
30	PAFZZ		0X4C9	321-14-41	STRAND, WIRE	1
31	PAFZZ		0X4C9	3271-6-133	STRAND, WIRE	1
32	PAFZZ		0X4C9	3271-10-105	STRAND, WIRE	1
33	PAFZZ		38453	60-30-0012	TUBE, FLEXIBLE	1
					END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
SPECIAL TOOLS LIST**



(1) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER (NSN)	(4) CAGEC	(5) PART NUMBER (P/N)	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					SPECIAL TOOLS FIG. 57	
1	PAFZZ		0J1H4	YAN15ENGCOMAD	ADAPTER, COMPRESSION TEST	
2	PAFZZ		0AK42	158090-51831	ADAPTER, FUEL INJECTION PUMP PLUNGER	
3	PAFZZ	5340015400592	0AK42	23000-013000	BAND, RETAINING	
4	PAFZZ	6640009575578	14674	1080-500	BEAKER, LABORATORY	
5	PAFZZ	6520014993317	1H4E2	4202042	CABLE, AUXILIARY WITH NATO PLUG	
6	PAFZZ		44940	04-21226	CABLE, LOCAL CONTROL	
7	PAFZZ		44940	04-21227	CABLE, REMOTE CONTROL	
8	PAFZZ		0AK42	303613	EXTENSION, DIAL INDICATOR	
9	PAFZZ	4730015619098	15852	DT-6022	KIT, NOZZLE	
10	PAFZZ	7510015696365	22980	21628	METAL MARKING PENCIL	
11	PAFZZ	6515015093952	9C381	6783017462	STETHOSCOPE	
12	PAFZZ	5920014913509	20999	4720	STRAP, WRIST, ELECTROSTATIC DISCHARGE	
13	PAFZZ	6625014938968	18876	13580880	TEST SET, ELECTRONIC SYSTEMS	
14	PAFZZ		47M91	3289	TEST SET, OIL SYSTEMS PRESSURE	
15	PAFZZ	4910015624340	55719	MT33C	TESTER, CYLINDER COMPRESSION	
16	PAFZZ	4910009106666	15852	DT1300	TESTER, DIESEL FUEL INJECTOR NOZZLE	
17	PAFZZ	6685002422184	1DWR0	ASTM 10F	THERMOMETER, SELF-INDICATING	
18	PAFZZ		0AK42	129470-92305	TOOL, FUEL INJECTOR REMOVAL	
19	PAFZZ		0J1H4	01METRIC	TOOL, RIVET NUT	
20	PAFZZ		636D0	64-154	TORQUE TUBE, 5-75 FT-LB	
21	PAFZZ		636D0	64-309	TORQUE WRENCH HEAD END, 1/4" X 3/8" DRIVE, 5/8"	
22	PAFZZ		636D0	64-308	TORQUE WRENCH HEAD END, 1/4" X 3/8" DRIVE, 9/16"	
					END OF FIGURE	

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
NSN INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
4720000213320	1	31	5945008557478	2	20
8030000585398	BULK	24	5940008649985	55	2
8030000822508	BULK	18	3030008652700	32	7
5940001139819	55	7	4730008716729	10	12
5940001139828	4	35		13	4
	11	14	5975008783791	1	23
2590001419758	11	5	5940008990260	15	16
5940001434773	54	33		17	46
5325001850001	10	19	5320009321972	1	6
5310001898467	16	17		4	9
4730001961481	26	31		56	30
4730002030030	26	26	5331009738598	23	5
5940002048966	1	35	5940010038579	16	19
5940002372703	16	18		17	8
4730002479105	10	25	5310010096570	24	12
	26	32	5961010198003	23	30
5975002578055	4	24		24	21
5940002582074	21	11	5961010212232	23	29
	54	8		24	24
5325002708890	10	14	5310010492745	23	26
4730002783724	26	24		24	18
5940002835281	54	56	5310010518089	23	25
5310003382255	6	28		24	17
	7	5	5310010607181	23	31
5340004044100	10	43		24	23
	13	19	5310010609104	23	19
5340004044101	13	15	5305010623344	24	26
	54	77	5310010779650	23	8
5340004256432	11	38		24	36
	54	72	5975010963170	11	45
5310004808509	23	34		13	10
5940005045877	15	13	5935010979974	2	17
	17	34	4730011097901	23	16
5940005494904	17	36	5940011390853	19	52
5340005505943	56	14	5301011580835	49	4
4730005951078	10	20	4730011588417	26	20
5365005985282	54	65	3110011609663	23	27
5930006156731	6	14		24	19
5940006553318	4	43	5310011688140	2	19
5930006831625	2	23	5935011741235	17	41
5940006886010	17	31		18	10
5940008231581	55	9		19	36
5975008330508	12	9		21	18

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
4930011741451	13	6	5306013886230	37	3
5305011742761	23	18	5310013888826	41	15
5310011742761	24	13	5935013897312	54	7
5935011862240	54	10	6645013929615	18	3
5305011904461	23	32	5340013960454	4	53
	24	22	8030013963362	BULK	23
5999012036687	17	40	5935014142582	54	4
	18	11	5330014195480	40	8
	19	21	5310014314065	29	62
	19	37	5306014317457	29	60
	21	17	5306014317461	37	6
	54	21		39	5
4730012089235	12	5	5935014468180	54	19
5999012163648	54	37	5935014475814	54	20
5935012502524	54	6	4730014491233	56	19
6145012521449	19	24	5935014541789	21	16
6145012530121	54	35		54	58
	BULK	5	5330014544384	39	3
5325012707376	17	10	5330014546389	31	8
5999012801438	19	35	5330014554061	36	1
5305013006264	31	21	3020014554443	51	5
5935013088599	54	16	5330014556877	53	1
5975013105011	54	15	5945014586605	19	32
5999013234929	54	14	5315014659931	48	4
5340013237785	29	46		51	3
5340013237844	28	18	5935014660260	54	61
	31	23	5310014664926	11	28
5935013250384	54	3		16	13
5905013291699	23	24		17	47
	24	16	5340014681767	4	10
5305013390822	23	3	5310014702044	11	29
	24	31		16	12
5935013399574	54	26		17	14
5305013661153	23	9		17	53
	24	37	5935014708342	18	12
4730013669017	26	33		54	23
	26	34	4020014769072	4	44
4820013671836	10	21	5305014773508	40	9
	26	29		49	14
5940013692874	23	13	5330014774043	40	6
	24	4	8030014790487	BULK	22
5310013700052	24	25	4720014792748	BULK	10
5940013705059	54	62	5935014830852	17	43
5120013754373	4	41		19	22
6140013788232	2	6		54	54
2920013882776	4	25	5935014846537	17	42
5305013886229	37	4		19	20
	41	7		54	53
	49	12	5310014849183	15	2

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
	21	2	5306015464275	47	9
5935014953353	21	19	2815015464309	51	4
5310015006541	4	54	2815015464327	44	10
5935015033305	54	63	2815015464567	44	6
2530015035000	55	12	5305015464572	44	7
5935015065555	54	38	2920015464582	45	14
5935015121010	19	34	2815015464587	28	7
5310015152283	54	50	2815015464717	47	3
5935015152433	54	52	2815015464721	47	5
5940015181334	54	28	5330015466844	37	8
5935015191808	54	36	5330015466855	41	4
5935015230711	54	57	5340015466859	47	6
5935015231409	54	51	5330015467537	42	5
5935015235410	54	55	4720015467538	26	9
5935015238855	18	9	5330015467545	26	4
	54	24	2815015467688	51	1
5306015267343	29	56	4720015467874	28	19
5940015273588	54	29	5306015468037	29	55
5306015291138	41	23		49	13
5970015315648	BULK	16	2815015468047	47	4
2950015379970	41	2	5306015468052	30	2
2815015380800	47	2	2930015468053	26	14
2815015380835	47	8	4720015468124	31	27
2930015380889	31	1	5331015468126	43	17
2815015380974	51	2		49	16
2815015380978	47	1	5330015468128	44	13
5935015399272	54	49	5331015468510	49	19
5306015463527	28	2	5331015468517	28	8
4710015463530	28	12		43	19
5330015463538	31	14	5306015468540	36	2
5340015463539	28	20	5306015468565	35	4
4820015463548	44	12	5315015468568	45	8
5306015463568	36	6	5305015468629	43	3
5310015463576	29	51		43	9
4720015463578	28	6	3120015468851	26	8
3040015464092	29	48	4720015468857	26	19
	29	52	4730015468861	26	5
4370015464242	31	7	4730015468864	26	7
4730015464247	31	10	4720015468868	26	6
	42	3	5330015468869	41	22
4710015464250	28	11	5305015468870	31	2
4710015464254	28	13	5310015468875	28	15
5331015464255	49	10		41	12
5330015464259	35	2		49	7
5306015464263	45	12	5315015468877	50	4
	45	13	5307015468878	41	3
5306015464266	29	49	5330015468879	41	5
5306015464268	36	4	5310015468881	26	16
5306015464269	46	9	5330015468883	28	5

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
4710015468886	28	4	5365015470563	44	5
4720015468893	31	24	5306015470595	28	3
5330015468895	31	28	5330015470629	31	12
5330015468898	31	6	5306015472404	37	2
5306015468899	39	4	3020015474625	50	1
5330015468902	44	9	2930015569612	43	16
4730015468903	31	5		49	17
5305015468911	44	3	5940015600703	54	69
5306015468913	26	13	5330015602740	54	70
	29	54	6115015617634	1	1
	35	3	6115015617674	1	2
5310015468916	44	2	4210015628664	19	47
	45	7		21	8
5340015468917	31	25	5925015694427	3	3
5310015468918	45	5	5925015696394	3	5
5330015468924	43	7	5935015699460	54	25
5310015468927	41	1	5935015699470	54	32
	49	1	5935015699506	55	10
5306015468929	51	6	5935015699542	54	34
5364015468936	47	7	5935015704538	54	27
4710015469222	41	18	5935015704557	55	13
4730015469253	31	11	5925015715799	3	4
5306015469263	41	14	5935015716514	54	68
5310015469272	29	50	5999015722092	54	40
5310015469316	41	17	3110015797536	48	5
5355015469841	43	18	5330015801468	49	9
5306015469886	41	16	5325015851529	16	3
5310015469888	50	2	5935015859802	54	47
5306015469891	50	3	5940015859905	33	10
5315015469902	39	1	5940015859913	4	38
	48	3		11	17
5330015469903	28	14	6110015859960	6	22
4710015469905	28	10	6150015860026	1	32
4730015469935	28	16	5935015860093	23	14
2815015469997	44	11		24	5
5306015470056	36	5	5940015860213	18	6
5306015470081	52	3		19	40
5307015470090	45	3		33	7
5315015470091	42	4	5925015860232	19	13
5307015470405	26	12	5940015860272	17	25
5360015470442	44	8		19	45
5330015470461	30	5		33	11
5306015470465	42	1		54	44
5331015470466	31	17	5961015860276	33	8
5340015470471	28	22	6150015860281	33	4
5306015470515	31	16	5998015860344	21	3
	31	19	5935015860359	23	10
	40	3		24	38
5331015470529	49	18	6150015860411	18	5

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5935015860557	22	5	6145015886489	16	21
6150015860561	19	19	5975015886525	2	11
5940015860671	19	49		10	22
6150015861846	19	54	6145015886563	54	81
5340015868472	10	49	6145015886588	54	80
	55	15	5935015886862	54	67
4320015870865	12	10	5998015887145	7	7
5980015873102	6	24	6115015887288	23	7
5930015875396	6	5		24	35
5930015876626	54	43	6115015887317	23	17
5999015876962	54	48	5330015888942	12	2
5940015876981	55	11	5305015889321	4	15
4720015877393	41	11		5	16
6115015877589	23	28	4730015890851	11	37
	24	20	4820015891015	11	46
5935015877601	54	59	5340015891081	54	46
5935015877612	54	42	2540015893534	23	11
5998015877618	7	10		24	39
4720015877875	41	10	5310015893727	4	4
5340015878549	19	11		10	7
5310015878556	23	20		11	3
	24	29		14	5
2940015880924	13	7		16	9
2930015882852	10	17		20	2
5340015883558	56	31	4730015893753	11	21
6150015883988	7	15	4720015893798	13	5
6150015883992	7	14	4910015893803	4	21
6150015883995	7	13	4910015893807	4	22
6150015884000	6	31	5930015894070	6	15
5307015884044	14	8	4730015894100	9	5
6115015884725	5	3	5310015894140	11	48
6150015885103	7	12		16	16
2920015885220	23	12	6150015894339	17	28
6150015885253	7	11	5935015894365	11	51
5935015885256	54	41	5340015894472	6	25
5935015885261	54	31	5330015894656	6	9
5935015885265	54	39	5330015894667	18	4
5999015885530	54	60	5925015894819	2	22
5935015885541	6	30	4730015896544	29	45
2920015885580	24	2	4730015896551	29	6
5935015885600	6	33	4730015896558	29	14
6150015885606	6	6	2815015896590	53	2
6150015885621	6	3	4730015896652	29	8
6150015885631	6	21	2990015897053	49	11
6150015886024	6	11	2815015897056	44	4
5975015886200	56	7	2815015897060	43	14
6145015886398	54	84	4720015897377	40	1

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
4820015897657	29	17		19	44
4710015897688	29	16		19	48
4730015897697	40	2		19	51
4730015897716	41	9		19	55
4730015897767	40	10		21	9
5940015897807	11	11		21	15
5340015897994	16	5	4010015906749	21	21
3120015899874	48	8		33	6
3120015899877	47	10		54	22
3120015899883	48	6		BULK	28
3130015899890	48	7	5940015907509	17	16
5340015899898	49	8	5340015907511	49	6
5365015899904	52	2	5365015908328	21	4
5365015899908	46	5	5330015977490	41	19
5331015899924	26	15	5305144697436	31	9
3020015899927	52	1		41	21
3020015899928	52	4	2910200027185	56	24
3020015899930	31	20	5310992501842	18	14
5306015899935	49	15		19	17
5330015899937	29	28	5310993711050	18	13
5340015899988	5	13		19	18
5340015900063	4	33	5330997278075	30	3
5330015900070	7	9			
5930015900170	19	28			
6150015900171	17	58			
5330015900226	46	10			
5935015900270	19	15			
5340015901601	6	12			
	19	26			
5330015903449	41	20			
5340015903803	22	7			
5340015903818	54	86			
	55	18			
5340015903819	54	88			
2815015905312	10	16			
5930015905539	6	4			
5935015905546	54	64			
2815015906391	10	18			
5935015906702	19	25			
5975015906706	12	8			
4010015906749	17	26			
	18	7			
	19	42			

END OF WORK PACKAGE

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
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PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
A026C356	23	33	AEN04M508000CX0A36	4	20
A026D370	6	34	AEN12F250000CH2A 31	15	7
A026D949	7	7	AEN15M10C000WA2A A1	14	6
A026E305	23	12	AES01C375A00BS8A 11	11	26
A026E311	24	2		17	48
A026E707	7	16	AES01C438B75WA6FY1	22	4
A026E709	7	9	AES07M06A018UB5A 11	15	11
A026F088	6	22		17	55
A026F118	19	60	AES07M06A070WB4A A1	11	41
	20	4	AES07M10B020WB4K41	38	5
A026F215	7	10	AES07M10C025WB4K42	38	6
A026F710	23	7	AES07M10C040WB4K 41	54	79
	24	35	AES10M06A012WB4K42	56	13
A026F712	23	2	AES10M06A016WB4K 42	2	21
A026F713	24	30		10	1
A026G000	2	9		34	2
	4	1		54	76
	5	1		55	16
	11	53		56	15
	14	3	AES10M06A016WB4K42	3	7
	19	7		4	5
A026G053	6	25		4	61
A026G778	24	9		8	13
A026H437	24	8	AES10M06A020WB4K 42	15	6
A026H815	6	23		16	4
A026J177	6	10		17	23
A026J180	6	8		19	8
A026J182	6	9		55	19
A026J838	23	28	AES10M06A020WB4K42	4	49
	24	20	AES10M06A030WB4K 42	17	3
A026K431	21	3	AES10M06A030WB4K42	56	26
A1512	BULK	19	AES10M06A050WB4K 42	17	2
A206D375	6	7	AES10M06A055WB4K 42	19	58
A2539	BULK	8		20	6
A2672	17	10	AES10M08B016WB4K 42	10	42
A3521	BULK	9	AES10M08B016WB4K42	9	8
A3709	BULK	20		26	35
A3921	BULK	21		54	71
A-A-52155/2P-40A 1R	32	7	AES10M08B020WB4K42	8	14
AA55804-3B 9FT	1	23		22	10
AEN04164000UC8A1	17	6	AES10M08B025WB4K 42	10	40
AEN045M508000CX0A36	5	15		13	14
AEN04C438000WB0FY1	22	1		32	8

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
AES10M08B025WB4K42	9	1		24	4
	22	13	CJV-17	54	74
AES10M08B045WB4K42	9	10	COV-0813	10	49
AES10M08B055WB4K 42	31	18		55	15
AES10M10C020WB4K 42	54	73	COV-2013	54	78
AES10M10C020WB4K42	22	12	COV2113	10	43
AES10M10C025WB4K42	22	2		13	19
AES10M10C030WB4K 42	13	2	CT150E24E2S	15	4
AES10M10C070WB4K 42	32	5	D38999/26WH21SN	54	3
AES46M06A018CZ7A 31	19	56	D38999/26WJ29SN	54	6
AES46M30540MWA3A 41	17	54	D38999/26WJ61SN	54	10
AESF5C112312WA2A26	6	32	DHR12US9206EF1	6	5
AESZAC190375WA1F Y1	11	43	DIN 125 3	19	18
AEW13X164000GD5A 21	19	2	DIN 125 M3	18	13
AEW13X250000GD5A 21	4	27	DIN126-M5	11	8
	11	15	DIN126-M8	32	9
	17	56	DIN1481-M3X40	38	1
	19	10	DIN6923-M10	13	1
AEW13X250000GD5A21	5	2		22	3
AEW13X375000GD5A 21	54	85		32	6
AEW16X010000GE1K 41	54	83		33	2
AEW20M10C000DB8A 31	11	27		54	75
AEW20X010000BD8A 21	14	7	DIN6923-M4	15	5
AEW23X06R10MSE4A31	4	14		19	4
AEW24037N078BD6FY1	54	87		21	6
AEW24X37N062BD6FY1	23	36	DIN6923-M5	2	15
	24	41	DIN6923-M6	2	1
AEW25X266031UB5A 11	15	9		4	18
AEW25X266062GA6K 41	11	40		5	8
	11	49		10	48
AEWX26X19RUA2A11	17	18		11	19
AF26168	8	10		17	4
AH0883000	8	9		19	5
ALS4-610-6.6	16	3		54	82
ASTM D5363	BULK	18		55	17
ATUM 24/6-0	1	34		56	16
	BULK	25	DIN6923-M8	8	12
B1834C06030N	16	11		9	2
BBL300	4	24		10	44
C-04-21420	4	55		13	17
COV-0613Z1	11	38		33	13
	54	72	DIN7380A2-M5X25	2	18
COV-0809	54	86	DIN7380A2-M6X12	4	16
	55	18		5	10
COV1313	13	15		11	6
	54	77		19	12
COV-2217	54	88	DIN7985-M2X3	6	26
C22275-020-4	56	31	DIN931-M4X16	15	1
C-8718-08	23	13		19	1

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
DIN931-M4X6	21	1	MMF1203M06F16M4	21	4
DIN931-M5X30	12	4	MS 3101E	1	39
DIN931-M6X16	11	32	MS 3106E	1	33
DIN933-M3X16	18	1	MS122916	56	14
	19	27	MS20659-10	17	31
DIN934M5	2	19	MS20659-106	55	7
DIN943-M5	33	12	MS20659-41	4	43
DKR12US009301E	6	4	MS24523-31	2	23
DR20BLKWRTR	19	16	MS25036-102	1	35
DRC26-50S04	54	42	MS25036-105	54	33
DT04-4P-EP13	54	55	MS25036-109	54	56
DT06-08SA	54	59	MS25036-148	4	35
DT06-2S	54	20		11	14
DT06-3S	18	9	MS25043-16DA	6	2
	54	24	MS25043-18DW	6	12
DT06-4S	17	42		19	26
	19	20	MS25043-20DA	6	13
	54	53	MS25224-1	6	14
EM4A080	54	84	MS3102R18-19SN	19	25
EM4D147	54	81	MS3420-4	54	65
EM4E393	54	80	MS35489-22	10	14
EM4H710	16	21	MS35489-46	10	19
EY-1877	17	37	MS39347-5	16	18
	19	39	NL6448BC20-21C	6	24
	21	14	P-1403.1	12	2
	54	18	P35900661	11	37
	55	5	P4055-5001-1	26	33
	BULK	17	PC150A1	9	7
FA1493FFF3000	1	31	PC163A1	9	5
FSCMN-03	12	3	PLTS-M30	2	11
GFTR20BK	19	15		10	22
HAB-80-S	2	13	PR11-42-15.0A-XX-V	19	14
IUG66-1-43-10.0-AB-01	17	58	PR11-62-15.0A-XX-V	19	13
JSKG12	10	11	Q269HB-5-4	13	8
K3-2347-07	4	10	R15S	13	7
M24243/6-A402H	1	6	RFQ29352	26	2
	4	9	RS6220	11	39
	56	30	SAE J514 5-6 070120C	12	5
M45913/1-010F BB	17	19	SAEJ123123431460 B	10	24
M45938-1-4C	6	28	SAEJ12318-12430160B	10	36
	7	5		56	9
M6CNNEBR/985	15	8	SAEJ1508CTB-16	26	18
	17	57	SAEJ1508CTB-29	8	1
M85049/39-23W	54	4		10	34
M85049/39-25W	54	7		56	3
M85049-38C-4A	54	66	SAEJ1508CTB-35	10	32
MEP-1050	1	1	SAEJ1508CTB-44	10	29
MEP-1051	1	2	SAEJ1508CTB-61	8	6

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
	10	27	WP-4S	19	34
SAEJ1508D11	56	20	XV502P-4-04	11	46
SAEJ1508D9	56	22	7	9	3
SAEJ1508F72	11	20	6202	10	12
SAEJ1508SLF44	8	8		13	4
SAEJ5144070221C	12	8	9291	34	1
SAEJ5144140109C	13	11	34105	21	11
SAEJ5144-4070202 C	13	13		54	8
SAEJ5144-4140137 C	13	9	34108	17	36
SAEJ5144-6070220 C	12	6	35112	55	9
SAEJ5145070118C	11	9	36808	15	13
SAEJ5145070801B	11	7		17	34
SAEJ5145-4070202 C	13	10	50981	19	47
SAEJ5145-4070202C	11	45		21	8
SAEJ5145-6070220C	12	1	53831	19	49
SAEJ5146-4080102C	12	9	56541	BULK	22
SAEJ5148-6140139C	56	7	60225	6	16
SAEJ58A574C3B08CY20	24	40	68035	BULK	23
SOS-85.1-12	7	3	81683	18	4
SP2529VT	10	21	85295	15	2
	26	29		21	2
T92S11D22-24	19	32	88760	54	35
TAG22T2-100B	54	17		BULK	5
TAG26T6-100B	17	39	88770	54	45
TAG2T5-100B	4	37		BULK	1
	11	13	89418	19	24
	17	27		BULK	2
	18	8	114017	17	41
	21	10		18	10
	33	5		19	36
	54	11		21	18
	55	6	160140	33	10
TAG3T3-100B	1	36	160300	4	38
	19	23		11	17
	54	12	321598	15	16
TAG9T3-100B	15	15		17	46
	17	33	454112	26	26
	54	30	1788880	54	16
W12S	21	16	3058529	BULK	10
	54	58	10502560	49	4
W2P	54	36	11674728	2	17
W2S	54	19	12010295	55	12
W3G300-ER38	10	47	12010300	54	26
W3S	18	12	12015323	54	15
	54	23	12065287	54	63
W4S	17	43	12077411	54	29
	19	22	12077412	54	28
	54	54	12089188	54	14
W6P	54	51	12103881	54	62

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
12110127	55	11	04-20232	18	2
12124076	54	60	04-20236	16	10
12162193	54	61	04-20246	19	6
12191819	54	48	04-20248	19	11
12422624	54	38	04-20255	19	19
15326808	54	47	04-20257	19	33
15366021	54	46	04-20267	19	54
42190109	BULK	11	04-20275	15	12
490111110710	26	25	04-20276	15	17
58001904800300	BULK	12	04-20277	15	18
0130-8256-01-010 L	10	10	04-20278	17	51
0149-2769	12	10	04-20279	17	49
0200-3218-02	23	1	04-20280	17	44
0200-3219-02	24	1	04-20284	4	48
0201-3649-02	23	17	04-20285	4	47
0201-3650-02	23	23	04-20290	4	23
0211-0427	24	34	04-20306	4	32
0211-0435	23	6	04-20312	4	52
0234-0895	24	7	04-20313	5	12
0301-0003	18	14	04-20356	11	35
	19	17	04-20364	16	6
0323-1500	23	15	04-20379	11	1
	24	6	04-20385	6	15
0323-1501	23	11	04-20398	4	30
	24	39	04-20399	5	9
0323-2538	23	14	04-20406	12	13
	24	5	04-20411	6	30
0323-2539	23	10	04-20412	6	33
	24	38	04-20414	5	4
0413-217-1605	54	39		6	1
04-20012	54	1	04-20421	6	6
04-20015	4	39	04-20422	6	3
04-20019	4	60	04-20424	5	6
04-20021	4	3		7	1
04-20053	12	7	04-20434	7	14
04-20091	40	4	04-20435	7	15
04-20105	19	57	04-20436	7	13
04-20109	19	59	04-20437	6	31
04-20135	26	31	04-20438	7	12
04-20159-1	25	1	04-20439	7	11
04-20159-2	25	2	04-20441	6	11
04-20162	26	22	04-20442	5	3
04-20166	26	21	04-20453	18	5
04-20171	38	2	04-20456-3	14	1
04-20181	6	19	04-20456-4	14	2
04-20202	11	24	04-20478	54	2
04-20203	11	25	04-20479	54	5
04-20209	3	1	04-20480	54	9
04-20220	38	4	04-20499	1	41

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
04-20502	11	36	04-20857	32	3
04-20534	12	15	04-20858	32	4
04-20535	11	44	04-20859	32	1
04-20536	11	42	04-20863	10	5
04-20586	2	7	04-20864	10	3
04-20601	4	51	04-20880	5	14
04-20602	4	29	04-20884	13	12
04-20613	12	12	04-20901	17	35
04-20614	11	31	04-20902-3	21	5
04-20618	12	14	04-20906	16	8
04-20622	12	11	04-20913	17	9
04-20634	14	4	04-20922	19	41
04-20645	2	16	04-20959	11	33
04-20650	7	8	04-20960	11	2
04-20665	16	14	04-20961	20	1
04-20666	16	20	04-20969	6	27
04-20669	19	30	04-20971	11	34
04-20673-2	2	5	04-20982	19	46
04-20674-3	2	8	04-20988	21	7
04-20674-4	2	4	04-20993	8	16
04-20675-3	2	12	04-21011-3	1	19
04-20675-4	2	14	04-21016	1	25
04-20711	21	20	04-21017-1	1	28
04-20728	22	14	04-21022-5	1	17
04-20729	22	11	04-21022-6	1	18
04-20732	19	9	04-21023-5	1	11
04-20749-2	22	5	04-21023-6	1	12
04-20751	8	4	04-21024-5	1	15
04-20761	1	40	04-21024-6	1	16
04-20769-1	23	35	04-21025	1	24
	24	42	04-21026	1	5
04-20771	33	3	04-21030-2	10	4
04-20787	17	13	04-21031-2	10	8
04-20791	17	22	04-21031-4	4	59
04-20794	10	31	04-21031-5	5	11
04-20795	10	28	04-21039	4	56
04-20796	10	46	04-21043	11	4
04-20797	10	30	04-21045	4	57
04-20798	10	45	04-21046	4	58
04-20800	4	69	04-21058	6	21
04-20801	10	39	04-21070-6	10	15
04-20802	8	17	04-21072	4	31
04-20803	8	7	04-21074	4	21
04-20804	4	63	04-21075	4	22
04-20805	10	2	04-21076	4	19
04-20806	4	66	04-21077-5	1	13
04-20808	8	11	04-21077-6	1	14
04-20838	11	30	04-21078-5	1	9
04-20847	20	5	04-21078-6	1	10
04-20852	56	27	04-21081	4	17

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
04-21099	55	1	04-21347	17	30
04-21124	10	33	04-21352	11	21
04-21129	56	17	04-21357	15	10
04-21146	56	1	04-21358	21	12
04-21150	1	3	04-21376	BULK	3
04-21151	1	4	04-21377	15	3
04-21153-1	11	10	04-21380	1	22
04-21153-3	11	16	04-21381	1	30
04-21153-4	4	34	04-21387	11	47
04-21168-1	10	9	04-21402	7	4
04-21177	4	64	04-21410	22	8
04-21194	4	13	04-21411	22	9
04-21204	6	29	04-21416	33	8
04-21206	56	2	04-21420	7	2
04-21208-1	56	4		56	28
04-21208-2	10	35	04-21421	5	7
04-21208-3	56	10	04-21422	7	6
04-21208-4	56	6	04-21425	33	4
04-21223-4	10	23	04-21434	17	12
04-21224	10	37	04-21435	17	16
04-21225	8	3	04-21437-3	10	13
04-21228	1	32	04-21438-2	4	65
04-21236	1	8	04-21438-4	4	67
04-21237	1	20	04-21439-10	13	16
04-21240	1	21	04-21439-18	11	52
04-21242	6	20	04-21439-19	11	22
04-21250	8	2	04-21439-20	11	23
04-21251	16	2	04-21439-9	13	18
04-21252	16	1	04-21443	17	15
04-21253	16	7	04-21444	17	5
04-21257	10	6	04-21446	17	7
04-21262	4	6	04-21448	17	21
04-21263	4	7	04-21454	26	1
04-2127 6-1	4	26	04-21456	26	3
04-2127 6-2	4	50	04-21465	4	11
04-21270	4	46	04-21466	4	8
04-21271	4	45	04-21469	2	3
04-21283	4	2	04-21470	2	2
04-21285	4	62	04-21475-1	1	27
04-21288	4	68	04-21479	17	11
04-21292	14	8	04-21481	17	1
04-21295	26	37	04-21485	13	5
04-21299	26	36	04-21494	17	17
04-21302	9	11	04-21495	17	20
04-21311	4	40	04-21496-1	17	29
04-21318-02	4	28	04-21496-2	17	24
04-21318-1	19	3	04-21497	19	43
04-21322	4	42	04-21504	13	3
04-21343	2	24	04-21537	19	53
04-21345	9	9	04-21547-1	56	23

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
04-21551-1	56	12	119802-11870	28	6
04-21569	5	5	119802-13650	36	5
04-21583	4	12	119802-13670	36	4
04-21596	10	41	119802-21660	50	1
04-21597	26	30	119802-25071	52	2
04-21598	10	26	119802-25101	52	1
04-21599	10	38	119802-25901	29	48
04-21603	9	6	119802-35110	26	11
04-21623	38	3	119802-39500	41	19
04-21625	6	18	119802-49113	31	11
04-21626	7	17	119802-49730	31	25
04-21674	19	29	119802-51090	29	44
04-21676	56	29	119802-51560	29	8
04-21695	19	31	119802-51590	29	19
04-21701	6	17	119802-51600	29	20
04-21703	19	50	119802-51680	29	22
0460-202-16141	54	37	119802-51690	29	23
0508-0055	24	3	119803-01500	49	8
0526-0015	24	25	119803-21200	48	2
0526-0390	23	20	119803-25050	52	4
	24	29	119807-11770	43	16
0528-001-5005	54	41		49	17
062200AE	10	18	119807-61420	29	67
070520BE	10	16	119934-01800	49	9
0800-0003	24	26	119934-59910	29	47
0800-0050	23	18	119940-59130	26	8
	24	13	121023-01551	49	11
080061BE	10	17	121252-39150	41	23
0815-0259	24	28	121450-42450	31	7
0850-0040	24	12	121550-23200	47	9
0850-0050	23	19	121850-21680	50	3
090130SWC8	BULK	4	121850-42410	31	2
09130SWC8	1	37	121850-51960	49	19
1/8-1/8 F3HGS	26	34	1231/72	19	28
1062-20-0122	54	40	123901-39820	41	10
11.131.457	33	1	123907-03100	43	4
11.203.849	32	2	123907-03110	43	6
119005-35160	26	17	123907-03120	43	2
119131-18320	36	2	123907-03140	43	5
119305-59120	28	22	123907-11550	44	4
119609-32040	49	18	123907-11601	28	14
119625-11880	28	7	123907-11830	44	3
119640-61400	43	14	123907-59540	28	2
119660-61901	29	65	123907-59550	28	5
119717-11190	44	5	123907-59560	28	16
119717-11340	44	9	124060-01050	46	8
119717-11350	44	13	124070-13300	41	11
119717-11800	44	10	124160-01910	46	7
119802-01561	49	2	124160-11360	43	18
119802-03070	43	11	124160-39140	41	16

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
124223-39900	41	20	129150-25301	29	49
124240-01871	49	6	129150-32020	53	1
124395-49840	31	14	129150-35042	37	8
124465-44950	31	6	129150-35111	26	4
124722-59050	28	18	129150-49811	30	5
	31	23	129150-59131	28	21
12485434-074	31	21	129150-77511	40	8
12485651-125	54	50	129155-51280	29	64
125HB-3-4	56	19	129155-61460	29	63
125HBL-4-2	10	20	129202-22300	47	5
125HBL-6-4	26	20	129255-61410	29	68
129001-01250	46	2	129350-49530	30	1
129001-02931	48	5	129400-01730	37	1
129001-11340	43	15	129400-01770	37	5
129004-22500	47	3	129403-13120	36	3
129004-22950	47	4	129403-42380	31	20
129004-42040	31	15	129417-33110	26	16
129004-49610	31	22	129417-35150	26	12
129004-49620	31	26	129418-18320	41	3
129004-49711	31	24	129418-32000	53	2
129004-49721	31	27	129436-35091	37	7
129005-59830	41	13	129457-49801	30	4
129006-35100	26	10	129486-01670	39	4
129009-03050	8	5	129486-42021	31	28
129009-11340	43	8	129486-42140	31	17
129100-01580	39	1	129508-01330	42	5
	48	3	129508-03010	43	10
129100-01640	39	2	129508-11100	44	11
129100-23910	47	7	129508-11110	44	12
129100-42051	31	12	129508-11130	44	8
129100-42121	31	13	129508-11180	44	6
129100-77501	40	7	129508-11241	45	1
129100-77510	40	6	129508-11250	45	2
129103-49301	26	5	129508-11260	45	4
129120-77502	40	5	129508-11270	45	11
129150-01200	42	1	129508-11280	45	5
129150-02020	46	9	129508-11310	43	7
129150-02450	51	4	129508-11650	45	10
129150-02871	48	6	129508-11660	45	6
129150-02931	48	7	129508-11820	44	7
129150-02941	48	8	129508-11900	28	1
129150-03070	43	13	129508-11920	45	9
129150-11230	45	8	129508-12100	35	1
129150-11750	44	2	129508-12110	35	2
	45	7	129508-14580	51	2
129150-14101	51	5	129508-18080	41	4
129150-14200	51	1	129508-18090	41	5
129150-14400	45	14	129508-22080	47	1
129150-23601	47	10	129508-22900	47	2
129150-23611	47	11	129508-33010	26	14

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
129508-33050	26	15	158553-51680	29	27
129508-39450	41	18	158553-51770	29	33
129508-39600	41	8	158553-61050	29	61
129508-42001	31	1	158557-51570	29	30
129508-49030	26	19	158563-51281	29	11
129508-49040	26	6	158563-51330	29	4
129508-51250	29	53	158563-61060	29	57
129508-59510	28	19	158600-51270	29	31
129508-59550	28	4	158601-51550	29	6
129508-59570	28	17	158601-51570	29	14
129508-59910	28	11	158601-51650	29	10
129508-59920	28	10	158601-51770	29	43
129508-59930	28	12	158601-51790	29	45
129508-59940	28	13	171008-03990	26	7
129509-11700	42	2	171051-01921	46	4
129509-21000	48	1	187080F-03-1	2	22
129509-51390	29	3	1-8MR0S	10	25
129550-13110	36	1		26	32
129550-59120	28	20	202231A	9	4
129584-11350	43	1	20593C400	54	67
129584-12060	40	1	2083-12-12S	26	24
129672-11510	44	1	2129508-18010	41	2
129693-44310	36	6	215R2	13	6
129795-01780	39	3	218N1F02	54	43
129795-01950	49	5	22190-080002	28	15
129795-02412	46	5		41	12
129795-21661	50	2		49	7
129795-49551	30	3	22190-100002	41	17
129803-01520	49	3	22190-120002	29	12
129907-03070	43	12	22190-180002	29	15
129907-11950	28	3		29	41
129916-49740	31	5	22217-140000	29	51
12M22F82EDMX	26	28	22252-000260	47	6
158552-51151	29	52	22310-200	3	5
158552-51571	29	5	22312-050140	29	29
158552-51580	29	38	22320-200	3	3
158552-51600	29	28	22330-200	3	4
158552-51670	29	13	22351-030010	50	4
158552-51781	29	42	22351-050010	29	40
158552-52150	29	34	22351-060012	42	4
158552-52310	29	36	22512-070140	48	4
158552-52400	29	32		51	3
158552-52500	29	35	22857-500100	43	3
158552-61441	29	66		43	9
158552-61900	29	59	228N3V02	2	10
158553-51551	29	16	23000-025000	41	9
158553-51630	29	26	23000-048000	40	2
158553-51640	29	17	23000-060000	40	10
158553-51660	29	18	23080-015000	26	9
158553-51670	29	25	2-320577-3	11	11

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
2-324955-1	17	28	26106-080452	37	3
2-34113-2	21	13	26106-080502	45	12
23414-080000	31	8	26106-080552	40	9
23414-100000	41	22		49	14
234N3T02	55	3	26106-080602	31	19
2-36160-1	17	25		40	3
	19	45	26106-080802	35	4
	33	11	26106-080852	49	15
	54	44	26226-080352	45	3
23857-030000	41	14	26306-080002	41	1
23876-010000	31	10		49	1
23876-020000	42	3	26366-060002	41	15
23887-120002	29	46	26450-060252	53	3
24311-000070	29	39	26450-080452	29	2
24311-000120	28	8	26756-060002	29	62
	43	19	26776-140002	29	50
24311-000320	43	17	27241-120000	46	6
	49	16	27241-300000	46	3
24316-000160	41	6	27241-400000	42	6
24341-000240	49	10	29550-3	22	6
24341-000360	29	58	29550-5	22	7
24356-010180	29	9	2ER654	17	40
24356-010200	29	7		18	11
	29	21		19	21
24372-000150	29	24		19	37
25-1942-45-00-00	56	24		21	17
256512-00205-473812-474112	26	27		54	21
26106-060102	29	37	2HB188	54	49
26106-060142	29	56	2HB193	54	52
26106-060162	41	7	3/8X3/8F3HG	56	8
	49	12	30-10-0003	BULK	13
26106-060202	29	60	301-1C-S-D2-B120-7031	3	2
26106-080122	31	9	304-0807	23	24
	41	21		24	16
26106-080142	51	6	31S-276-0U	3	6
26106-080162	31	16	32004-A2	55	10
	37	4	32004-B2	55	14
	42	7	32004-TP2	55	13
26106-080202	26	13	32006-A22	54	25
	29	54	32006-B22	54	31
	35	3	32006-C22	54	34
26106-080222	30	2	32006-D22	54	32
26106-080252	37	2	32006-TP2	54	27
	45	13	321-14-41	BULK	30
26106-080302	29	55	3271-10-105	55	4
	49	13		BULK	32
26106-080352	37	6	3271-12-65	4	36
	39	5		11	12
26106-080402	52	3		11	18

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
	BULK	27	510-0102	24	19
3271-14-41	19	38	510-0112	23	27
3271-16-26	17	26	526-0008	23	25
	18	7		24	17
	19	42	5-4 F6X-S	11	50
	19	44	5D24-0698	31	3
	19	48	60-30-0012	BULK	33
	19	51	60-30-0025	56	32
	19	55	622-2967-009	54	57
	21	9	639101-76030	26	23
	21	15	72-2236	16	19
	21	21		17	8
	33	6	729402-23100	47	8
	54	22	729508-01560	46	1
3271-20-10	BULK	28	729508-92850	46	10
	17	38	729530-53100	28	9
	54	13	729584-51310	29	1
3271-6-133	BULK	29	7-826-000092	19	35
	15	14	7HA302	21	19
	15	19	8002-002/MDL. NO. 34	2	6
	17	32	813-0100	23	32
	17	45		24	22
	17	50	815-0181	23	3
	17	52		24	31
	BULK	31	815-0774	23	9
354-310102-00	16	5		24	37
358-0069	23	29	828904-1	54	70
	24	24	8-325-82	4	33
358-0070	23	30	8-325-88	5	13
	24	21	85094-12	18	3
39101-76030	4	4	85-12	BULK	24
	10	7	853-0008	23	31
	11	3		24	23
	14	5	853-0013	23	8
	16	9		24	36
	20	2	862-0003	23	34
3918198S	8	15	870-0131	23	26
40-10-0005	BULK	14		24	18
40-10-0016	BULK	15	88-20016	11	5
40-10-0017	56	21	88-20075	1	7
40CNFHS	4	54	88-20110	1	26
5 WETX-B	11	51	88-20218	4	25
5000G	27	1	88-20219	23	22
503-0183	23	16		24	10
50-40-0018	56	11	88-20225	23	21
50-60-0028	56	25		24	11
50-60-0045	56	18	88-20226	24	15
509-0094	23	5	88-20227	24	14
509-0099	24	33	88-20229	24	27
50CNNESS	16	15	88-20230	23	4

PART NUMBER	FIG.	ITEM
	24	32
88-20275-3	18	6
	19	40
	33	7
88-20275-4	19	52
88-20541-1	1	38
88-20541-14	BULK	16
88-20541-15	33	9
	BULK	26
88-20564-14	11	28
	16	13
	17	47
88-20568-3	11	29
	16	12
	17	14
	17	53
88-21147	4	41
88-21776	1	29
88-22119-17	55	8
88-22119-19	55	2
88-22202	2	20
88-22336-1	16	17
88-22487	BULK	6
88-22802	BULK	7
90278A331	4	15
	5	16
91355K54	56	5
929939-1	54	69
95395A250	11	48
	16	16
963040-3	54	68
97-3106A-10SL-4S(624)	54	64
97-50-170-11	4	53
9804A241	31	4
98-19724	4	44

END OF WORK PACKAGE

CHAPTER 7
SUPPORTING INFORMATION
FOR
AMMPS 15KW GENERATOR SET

CHAPTER 7
SUPPORTING INFORMATION

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FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
REFERENCES

SCOPE

This WP lists all the field manuals, forms, technical manuals, and miscellaneous publications referenced in this TM.

FIELD MANUALS

FM 4-25.11	First Aid
FM 5-424	Theater of Operations Electrical Systems

FORMS

AFI 21-101	Aircraft and Equipment Maintenance Management
AFI 33-201	Air Force Instruction, Communications Security
AFR 900-4	Product Quality Deficiency Report (PQDR)
Air Force Technical Order (AFTO) Form 22	Technical Manual (TM) Change Recommendation and Reply
AR 25-30	The Army Publishing Program
AR 700-138	Army Logistics Readiness and Sustainability
CTA 8-10	Army Medical Department Expendable/Durable Items
CTA 50-909	Field and Garrison Furnishings and Equipment
CTA 50-970	Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items)
DA Form 2028	Recommended Changes to Publications and Blank Forms
DA Form 2258	Depreservation Guide for Vehicles and Equipment
DA Form 2404	Equipment Inspection and Maintenance Worksheet
DA Form 5988E	Equipment Inspection and Maintenance Worksheet (electronic version)
DA PAM 738-751	Functional Users Manual for The Army Maintenance Management System — Aviation (TAMMS-A)
DA PAM 750-8	TAMMS Users Manual
MCO P4855.10	Product Quality Deficiency Report (PQDR)
SF 361	Transportation Discrepancy Report
SF 368	Product Quality Deficiency Report (PQDR)

TECHNICAL MANUALS

NMWR 9-6115-751	National Maintenance Work Requirement (NMWR) for Generator Set, Skid Mounted 15 kW Advanced Medium Mobile Power Sources (AMMPS)
TM 1-1500-344-23	Aircraft Weapon Systems Cleaning and Corrosion Control
TM 4700-15/1	Tactical Equipment Records Procedures
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command)
TM 9-6115-751-10	Operator's Manual For Generator Set, Skid Mounted 15kW Advanced Medium Mobile Power Sources (AMMPS)
TM 9-6115-757-13&P	Operator and Field Maintenance Manual Including Repair Parts and Special Tools List For Generator Set, Trailer Mounted 15 kW Advanced Medium Mobile Power Sources (AMMPS)
TO 00-20	Series of Technical Orders

MISCELLANEOUS DOCUMENTS

A-A-52557A	Fuel Oil, Diesel; for Posts, Camps and Stations
A-A-52624A	Commercial Item Description: Antifreeze, Multi-engine Type
MIL-A-53009A	Military Specification, Additive, Antifreeze Extender, Liquid Cooling Systems
MIL-A-46153C	Military Specification, Antifreeze, Ethylene Glycol, Inhibited, Heavy Duty, Single Package
MIL-C-0010597F(ME)	Military Specification, Cleaning Compound with Conditioner for Engine Cooling Systems
MIL-DLT-83133G	Turbine Fuel, Aviation, Kerosene Type, JP-8 (NATO F-34), NATO F-35, and JP-8+100 (NATO F-37)
MIL-L-46152E	Military Specification, Lubricating Oil, Internal Combustion Engine, Administrative Service
MIL-PRF-2104H	Performance Specification, Lubrication Oil, Internal Combustion Engine, Combat/Tactical Service
MIL-PRF-21260E	Performance Specification, Lubrication Oil, Internal Combustion Engine, Preservative Break-In
MIL-PRF-22191F	Performance Specification, Barrier Materials, Transparent, Flexible, Heat-Sealable
MIL-PRF-46167D	Performance Specification, Lubrication Oil, Internal Combustion Engine, Arctic
MIL-STD-129	Military Marking Practices for Shipment and Storage
SAE-AMS-T-22085	Tapes, Pressure-Sensitive, Adhesive, Preservation and Sealing
TB-43-0211	Army Oil Analysis Program (AOAP) Guide for Leaders and Users

END OF WORK PACKAGE

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION

INTRODUCTION

The Army Maintenance System MAC

This introduction provides a general explanation of all maintenance and repair functions authorized at the two maintenance levels under the Two-Level Maintenance System concept.

This MAC (immediately following the introduction) designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component shall be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

Field – includes two subcolumns, Crew (C) and Maintainer (F).

Sustainment – includes two subcolumns, Below Depot (H) and Depot (D).

The maintenance to be performed at field and sustainment levels is described as follows:

1. Crew maintenance. The responsibility of a using organization to perform maintenance on its assigned equipment. It normally consists of inspecting, servicing, lubricating, adjusting, and replacing parts, minor assemblies, and subassemblies. The replace function for this level of maintenance is indicated by the letter "C" in the third position of the SMR code. A "C" appearing in the fourth position of the SMR code indicates complete repair is possible at the crew maintenance level.
2. Maintainer maintenance. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "F" appearing in the third position of the SMR code. An "F" appearing in the fourth position of the SMR code indicates complete repair is possible at the field maintenance level. Items are returned to use after maintenance is performed at this level.
3. Below depot sustainment. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "H" appearing in the third position of the SMR code. An "H" appearing in the fourth position of the SMR code indicates complete repair is possible at the below depot sustainment maintenance level. Items are returned to the supply system after maintenance is performed at this level.
4. Depot sustainment. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "D" or "K" appearing in the third position of the SMR code. Depot sustainment maintenance can be performed by either depot personnel or contractor personnel. A "D" or "K" appearing in the fourth position of the SMR code indicates complete repair is possible at the depot sustainment maintenance level. Items are returned to the supply systems after maintenance is performed at this level.

The tools and test equipment requirements table (immediately following the MAC) list the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.

The remarks table (immediately following the tools and test equipment requirements) contain supplemental instructions and explanatory notes for a particular maintenance function.

Maintenance Functions

Maintenance functions are limited to and defined as follows:

1. **Inspect.** To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel). This includes scheduled inspection and gaugings and evaluation of cannon tubes.
2. **Test.** To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards on a scheduled basis, i.e., load testing of lift devices and hydrostatic testing of pressure hoses.
3. **Service.** Operations required periodically to keep an item in proper operating condition, e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases. This includes scheduled exercising and purging of recoil mechanisms. The following are examples of service functions:
 - a. **Unpack.** To remove from the packing box for service or when required for the performance of maintenance operations.
 - b. **Repack.** To return item to the packing box after service and other maintenance operations.
 - c. **Clean.** To rid the item of contamination.
 - d. **Touch up.** To spot paint scratched or blistered surfaces.
 - e. **Mark.** To restore obliterated identification.
4. **Adjust.** To maintain or regulate, within prescribed limits, by bringing into proper position or by setting the operating characteristics to specified parameters.
5. **Align.** To adjust specified variable elements of an item to bring about optimum or desired performance.
6. **Calibrate.** To determine and cause corrections to be made or to be adjusted on instruments of test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.
7. **Remove/Install.** To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.
8. **Paint (ammunition only).** To prepare and spray color coats of paint so that the ammunition can be identified and protected. The color indicating primary use is applied, preferably, to the entire exterior surface as the background color of the item. Other markings are to be repainted as original so as to retain proper ammunition identification.
9. **Replace.** To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC, and the assigned maintenance level is shown as the third position code of the Source, Maintenance, and Recoverability (SMR) code.
10. **Repair.** The application of maintenance services, including fault location/troubleshooting, removal/installation, disassembly/assembly procedures, and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

NOTE

The following definitions are applicable to the “repair” maintenance function:

Services. Inspect, test, service, adjust, align, calibrate, and/or replace.

Fault location/troubleshooting. The process of investigating and detecting the cause of equipment malfunction; the act of isolating a fault within a system or Unit Under Test (UUT).

Disassembly/assembly. The step-by-step breakdown (taking apart) of a spare/functional group coded item to the level of its least component that is assigned a SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).

Actions. Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

11. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like-new condition.
12. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like-new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

Explanation of Columns in the MAC

Column (1) Group Number. Column (1) lists Functional Group Code (FGC) numbers, the purpose of which is to identify maintenance-significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

Column (2) Component/Assembly. Column (2) contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

Column (3) Maintenance Function. Column (3) lists the functions to be performed on the item listed in column (2). (For a detailed explanation of these functions, refer to “Maintenance Functions” outlined above.)

Column (4) Maintenance Level. Column (4) specifies each level of maintenance authorized to perform each function listed in column (3) by indicating work time required (expressed as man hours in whole hours or decimals) in the appropriate subcolumn. This work time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work time figures are to be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC. The symbol designations for the various maintenance levels are as follows:

Field:

- C Crew maintenance
- F Maintainer maintenance

Sustainment:

- L Specialized Repair Activity (SRA)
- H Below depot maintenance
- D Depot maintenance

NOTE

The "L" maintenance level is not included in column (4) of the MAC. Functions to this level of maintenance are identified by work time figure in the "H" column of column (4), and an associated reference code is used in the REMARKS column (6). This code is keyed to the remarks, and the SRA complete repair application is explained there.

Column (5) Tools and Equipment Reference Code. Column (5) specifies, by code, those common tool sets (not individual tools), common Test, Measurement, and Diagnostic Equipment (TMDE), and special tools, special TMDE, and special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.

Column (6) Remarks Code. When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks table entries.

Explanation of Columns in the Tools and Test Equipment Requirements

Column (1) Tool or Test Equipment Reference Code. The tool or test equipment reference code correlates with a code used in column (5) of the MAC.

Column (2) Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

Column (3) Nomenclature. Name or identification of the tool or test equipment.

Column (4) National Stock Number (NSN). The NSN of the tool or test equipment.

Column (5) Tool Number. The manufacturer's part number.

Explanation of Columns in the Remarks

Column (1) Remarks Code. The code recorded in column (6) of the MAC.

Column (2) Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC.

END OF WORK PACKAGE

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
MAC**

Table 1. MAC for the AMMPS 15 kW Generator Set.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
00	GENERATOR SET	Inspect	0.6	0.3			A	
		Service		0.1			38	A
		Repair		0.2			37	B
01	DC ELECTRICAL INSTALLATION	Inspect	0.1	0.2				A
		Remove/Install		1.1			38	
		Repair		0.3			7,10,11,22,38	C
		Test		0.1			38	D
0101	RELAY PANEL ASSEMBLY	Inspect	0.1					A
		Remove/Install		0.2			38	
		Repair		0.1			38	E
		Test		0.1			38	F
		Replace		0.2			38	
02	HOUSING INSTALLATION	Inspect	0.1					A
		Remove/Install		3.5			38	
		Repair		0.2			38,40	G
03	DIGITAL CONTROL SYSTEM (DCS) INSTALLATION	Inspect	0.1	0.1				A
		Remove/Install		0.3			38	
		Repair		0.3	0.5		38	H
		Test		0.2			8,38	
		Replace		0.2			38	
0301	CONTROL PANEL ASSEMBLY	Inspect	0.1	0.1				
		Remove/Install		0.4			29,38	
		Repair		0.3	0.8		10,11,22,29,38	I
		Test		0.1			29,38	J
		Replace		0.1			29,38	

Table 1. MAC for AMMPS 15 kW Generator Set — Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
0302	DCS ENCLOSURE ASSEMBLY	Inspect		0.1				
		Remove/Install		0.4		29,38		
		Repair				1.0	10,11,22,29, 38	K
		Test				0.5	10,11,22,29, 38	L
		Replace		0.2			29,38	
04	INTAKE AIR INSTALLATION	Inspect	0.1	0.1			A, M	
		Service		0.2			A, M	
		Remove/Install		1.0			38	
		Replace		0.3			38	
05	EXHAUST INSTALLATION	Inspect	0.1				A	
		Remove/Install		0.4			38	
		Replace		0.3			38	
06	COOLING SYSTEM INSTALLATION	Inspect	0.1	0.3				
		Service		0.6			38	
		Remove/Install		4.5			38	
		Repair		0.4			38	N
		Test		0.2			30	
		Replace		0.7			38	
07	FUEL SYSTEM INSTALLATION	Inspect	0.1				A	
		Service	0.7	1.5			13,16,38,46, 48	A
		Remove/Install		2.0			13,16,38,46, 48	
		Repair		0.3			13,16,38,46, 48	O
0701	FUEL MANIFOLD ASSEMBLY	Inspect	0.1				A	
		Remove/Install		1.7			13,38,41,42, 45,46,48	
		Repair		0.3			13,38,41,42, 45,46,48	
		Test		0.1			38	
		Replace		1.7			13,38,41,42, 45,46,48	

Table 1. MAC for AMMPS 15 kW Generator Set — Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
0702	FUEL FILTER/WATER SEPARATOR INSTALLATION	Inspect	0.1				A	
		Service	0.1	0.4		44	A	
		Remove/Install		1.1		38		
		Repair		0.4		38		
		Replace		1.1		38		
08	OUTPUT BOX INSTALLATION	Inspect	0.1	0.2			A	
		Remove/Install		1.0		38		
		Repair		0.4		38,40		
0801	CONTACTOR	Inspect		0.5				
		Remove/Install		3.7		43,50,51		
		Repair		0.5		42,43,50,51	P	
		Test		0.1		43		
		Replace		1.8		43,50,51		
0802	OUTPUT TERMINAL BOARD	Inspect	0.1				A	
		Remove/Install		0.7		38,45,46,48		
		Repair		0.2		38,45,46,48		
0803	VOLTAGE SELECTION BOARD	Inspect	0.1	0.1			A	
		Remove/Install		0.8		38,45,46,48		
		Repair		0.2		38,45,46,48	Q	
		Replace		0.5		38,45,46,48		
0804	HOUR METER	Inspect	0.1				A	
		Remove/Install		0.5		38		
		Repair		0.2		10,11,22,38	R	
		Test		0.1		38		
		Replace		0.3		38		
0805	CONVENIENCE RECEPTACLE	Inspect	0.1				A	
		Remove/Install		0.6		23,38,47,48		
		Repair		0.2		10,11,22,23, 38,47,48	S	
		Test	0.1	0.1		38		
		Replace		0.3		23,38,47,48		
0806	TRANSFORMERS	Inspect		0.1				

Table 1. MAC for AMMPS 15 kW Generator Set — Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
0807	PRINTED CIRCUIT BOARD MODULE	Remove/Install		0.7			38,47,48	T
		Repair		0.1			10,11,22,38, 40,47,48	
		Test		0.1			38	
		Replace		0.2			38,47,48	
		Inspect		0.1				
		Remove/Install		0.6			10,11,22,29, 38,47,48	
		Repair		0.1			10,11,22,29, 38,47,48	
		Test		0.2			29,38	
09	POWER PLANT INSTALLATION	Replace		0.3			10,11,22,29, 38,47,48	A
		Inspect	0.1	0.1				
		Remove/Install		2.6			38,46,48	
		Repair		0.3			38,46,48	
0901	AC GENERATOR ASSEMBLY	Replace		4.0			38,46,48	V
		Inspect	0.1	0.5				
		Remove/Install		4.7			38,41,43,46, 48	
		Repair		1.5	12.0		38,47,48	
0902	ENGINE ASSEMBLY	Test		1.0			21, 38,47,48	W
		Replace		2.0			38,41,43,47, 48	
		Inspect	0.2	0.5				
		Service	0.1	0.3				
090201	LUBRICATION SYSTEM	Remove/Install		4.0			38,45,46,48	A
		Repair		1.5	4.0			
		Test		1.0			38	
		Adjust		1.0				
		Replace		2.5				
		Overhaul			12.0			
		Inspect	0.1	0.2				
		Service	0.1	0.3			38,44	
090201	LUBRICATION SYSTEM	Remove/Install		1.2			24,38,44	A
		Repair		0.4			24,38,44	

Table 1. MAC for AMMPS 15 kW Generator Set — Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
090202	ENGINE SPEED SENSOR	Replace		0.7			24,38,44	
		Inspect	0.1	0.1				
		Remove/Install		0.9			38	
090203	FUEL INJECTORS AND LINES	Replace		0.4			38	
		Adjust		0.1			38	
		Inspect		0.2				A
		Remove/Install		3.0			26,38,46,48	
090204	FUEL INJECTION PUMP	Repair		0.3			26,38,46,48	Y
		Test		0.4			6,18,35,38	
		Replace		1.4			26,38,46,48	
		Inspect	0.1	0.1				A
		Remove/Install		8.4			2,5,14,16,17 ,19,21,38,45 ,46,48	
		Repair		0.3			2,5,14,16,17 ,19,21,38,45 ,46,48	Z
		Test	0.1	0.1			2,5,14,16,17 ,19,21,38,45 ,46,48	
090205	THERMOSTAT	Adjust		0.3			2,5,14,16,17 ,19,21,38,45 ,46,48	
		Replace		4.4			2,5,14,16,17 ,19,21,38,45 ,46,48	
		Inspect		0.7				
		Remove/Install		1.2			38,48	
		Repair		0.2			38,48	
090206	WATER PUMP	Test		0.5			36	
		Replace		0.5			38,48	
		Inspect	0.1	0.2				A
		Remove/Install		1.5			16,38,48	
090207	BATTER CHARGING ALTERNATOR AND BELT	Repair		0.1			16,38,48	AA
		Replace		1.3			16,38,48	
		Inspect	0.1	0.1				
		Service		0.2			38,46,48	A
		Remove/Install		0.8			38,46,48	

Table 1. MAC for AMMPS 15 kW Generator Set — Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
090208	STARTER	Adjust		0.2			38	A
		Test		0.5			38,46,48	
		Replace		0.8			38,46,48	
		Inspect		0.1				
		Remove/Install		0.7			38	
		Repair		0.2			10,11,22,38	
		Test		0.2			38	
090209	GOVERNOR ACTUATOR	Replace		0.5			38	A
		Inspect		0.1				
		Remove/Install		0.6			38,46	
		Test		0.1			38	
090210	INTAKE MANIFOLD	Replace		0.3			38,46	A
		Inspect	0.1	0.1				
		Remove/Install		1.8			3,16,25,26,38,48	
090211	EXHAUST MANIFOLD	Replace		1.8			3,16,25,26,38,48	A
		Inspect	0.1	0.1				
		Remove/Install		2.4			26,38,48	
090212	OIL PAN AND STRAINER	Replace		1.4			26,38,48	A
		Inspect	0.1	0.1				
		Remove/Install		4.5			38,46	
090213	FLYWHEEL	Replace		0.7			38,46	A
		Inspect		0.4				
		Remove/Install		16.0			38,46	
090214	CRANKCASE REAR BEARING CASE COVER	Replace		0.5			38,46	A
		Inspect		0.1				
		Remove/Install		17.5			38	
090215	INTAKE AIR HEATER	Repair		0.5			38	CC
		Replace		1.0			38	
		Inspect		0.1				
		Remove/Install		0.9			38	
090216	TURBOCHARGER	Repair		0.1			38	DD
		Test		0.1			38	
		Replace		0.2			38	
		Inspect	0.1	0.1				

Table 1. MAC for AMMPS 15 kW Generator Set — Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
090217	CYLINDER HEAD	Remove/Install		3.5			12,38,48	A
		Repair		0.5			12,38,48	
		Test		0.3			4,14,17,28	
		Replace		1.0			12,38,48	
		Inspect		0.2				
09021701	VALVE COVER	Remove/Install		5.7			38,46	EE
		Repair		0.5	4.0		38,46	
		Test		1.6	1.0		1,34,38,46	
		Replace		5.7			38,46	
		Inspect	0.1	0.1				
09021702	ENGINE VALVES	Remove/Install		2.0			12,26,27,38, 46,48	FF
		Repair		0.2			12,26,27,38, 46,48	
		Replace		0.7			12,26,27,38, 46,48	
		Inspect		0.2	0.4			
		Remove/Install			1.0		38	
09021703	ROCKER ARMS AND PUSH RODS	Adjust		5.4			38	A
		Replace			1.0		38	
		Inspect			0.1			
090218	SHORT BLOCK ASSEMBLY	Remove/Install			2.0		38,46	GG
		Repair			2.0		38,46	
		Adjust			1.0		38,46	
		Replace			2.0		38,46	
09021801	CONNECTING RODS AND PISTONS	Inspect				0.1		A
		Remove/Install				6.0	38,46	
		Repair		0.7		12.0	38,46	
09021802	CRANKSHAFT	Replace				7.0	38,46	HH
		Inspect				0.2		
		Remove/Install				8.0	38,46	
		Repair				9.0	38,46	
		Test				0.5	38,46	II
		Replace				8.0	38,46	
		Inspect				0.2		A

Table 1. MAC for AMMPS 15 kW Generator Set — Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
09021803	GEAR CASE COVER	Remove/Install			8.0		38,46	JJ
		Repair			9.0		38,46	
		Replace			8.0		38,46	
		Test			0.5		38,46	
		Inspect		0.1				A
09021804	HARMONIC BALANCER	Remove/Install		2.5			38,46	KK
		Repair		0.5			38,46	
		Replace		2.5			38,46	
		Inspect		0.1				
09021805	CAMSHAFT AND GEAR	Remove/Install		0.6			38,46	A
		Replace		0.6			38,46	
		Inspect				0.2		
09021806	IDLER GEAR	Remove/Install			2.0		38,46	A
		Repair			1.0		38,46	
		Test			0.5		38,46	
		Adjust			0.5		38,46	
		Replace			2.0		38,46	
		Inspect			0.2			
09021807	OIL PUMP AND GEAR	Remove/Install			2.5		38,46	A
		Repair			1.0		38,46	
		Replace			2.5		38,46	
		Inspect			0.1			
10	ENGINE (MAIN) WIRING HARNES INSTALLATION	Remove/Install			2.0		38,46	A
		Test			0.5		32,38	
		Replace			2.0		38,46	
		Inspect	0.1	0.1				
11	POWER WIRING HARNES INSTALLATION	Remove/Install					38	LL
		Repair					10,11,22,38	
		Test					38	
		Replace					38	
		Inspect	0.1	0.2				
		Remove/Install		01.0			38	MM
		Repair		0.5			10,11,22,38	
		Test		0.1			38	

Table 1. MAC for AMMPS 15 kW Generator Set — Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
12	WINTERIZATION KIT INSTALLATION	Replace		0.9			38	A
		Inspect	0.1	0.1				
		Remove/Install		2.0			38	
		Repair		0.5			38	
		Test		0.3			6,38	
		Replace		1.0			38	

Table 2. Tools and Test Equipment for AMMPS 15 kW Generator Set.

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NSN	TOOL NUMBER
1	F	Adapter, Compression Test		YAN15ENGCOMAD
2	F	Adapter, Fuel Injection Pump Plunger		158090-51831
3	F	Adapter, Socket Wrench Drive, 1/4" Male-3/8" Female		KTC S0657
4	F	Air-Hydraulic Pump		KTC S0719
5	F	Band, Retaining	5340015400592	23000-013000
6	F	Beaker, Laboratory	6640009575578	1080-500
7	O,F	Cable, Auxiliary With NATO Plug	6520014993317	4202042
8	F	Cable, Local Control		04-21226
9	F	Cable, Remote Control		04-21227
10	F	Crimping, Tool, Terminal		KTC S0159
11	F	Crimping, Tool, Terminal, Hand	5120013748936	J-38852
12	F	Crowfoot Attachment Set, Socket Wrench, Flare Nut, Metric		KTC S0170
13	F	Crowfoot Attachment Set, Socket Wrench, Flare Nut, Standard		KTC S0161
14	F	Extension, Dial Indicator		303613
15	F	Forward Repair System	4940015331621	SC 4940-95-E42
16	F	Hammer, Hand, Soft Face, Dead Blow		KTC S0221
17	F	Indicator, Dial	5210004029619	J7872
18	F	Kit, Nozzle	4730015619098	DT-6022
19	F	Metal Marking Pencil	7510015696365	21628
20	F	Oiler, Hand		50-573

Table 2. Tools and Test Equipment for AMMPs 15 kW Generator Set — Continued.

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NSN	TOOL NUMBER
21	F	Puller Set, Mechanical		KTC S0269
22	F	Remover, Electrical Contact	5120011584707	114010
23	F	Screwdriver, Torx, T20, 3" Long		KTC S0342
24	F	Socket, Socket Wrench, 1/2" Dr, 6Pt, Regular, 32mm		KTC S0610
25	F	Socket, Socket Wrench, 1/4" Dr, 6Pt, Regular, 12mm		KTC S0463
26	F	Socket, Socket Wrench, 3/8" Dr, 6Pt, Regular, 12mm		KTC S0518
27	F	Socket, Socket Wrench, 3/8" Dr, 6Pt, Regular, 17mm		KTC S0523
28	F	Stethoscope	6515015093952	6783017462
29	F	Strap, Wrist, Electrostatic Discharge	5920014913509	4720
30	F	Test Kit, Radiator Pressure		KTC S0698
31	F	Test Set, Electronic Systems	6625014938968	13580880
32	F	Test Set, Oil Systems Pressure		3289
33	F	Tester, Antifreeze Solution		KTC S0699
34	F	Tester, Cylinder Compression	4910015624340	MT33C
35	F	Tester, Diesel Fuel Injector Nozzle	4910009106666	DT1300
36	F	Thermometer, Self-Indicating	6685002422184	ASTM 10F
37	F	Tool Kit, Blind, Fastener, Installation		KTC S0700
38	F,H	Tool Kit, General Mechanic's (GMTK)	5180015487634	SC 5180-95-B48
39	F	Tool Set, SATS, Base	4910014906453	SC 4910-95-A81

Table 2. Tools and Test Equipment for AMMPS 15 kW Generator Set — Continued.

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NSN	TOOL NUMBER
40	F	Tool, Rivet Nut		01METRIC
41	F	Torque Tube, 5-75 FT-LB		64-154
42	F	Torque Wrench Head End, 1/4" X 3/8" Drive, 5/8"		64-309
43	F	Torque Wrench Head End, 1/4" X 3/8" Drive, 9/16"		64-308
44	F	Wrench, Oil Filter, Strap		KTC S0982
45	F	Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 FT-LB		KTC S0991
46	F	Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB		KTC S0989
47	F	Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB		KTC S0986
48	F	Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB		KTC S0987

Table 3. Remarks for the AMMPS 15 kW Generator Set.

REMARKS CODE	REMARKS
A	Preventive Maintenance Checks and Services (PMCS)
B	Generator Set repair includes replacement of identification plates, lifting eyes, clinch nuts, and repair of Control Harness.
C	DC Electrical Installation repair includes the replacement of batteries, battery cables, NATO slave receptacle, main DC circuit breaker, and DEAD CRANK SWITCH.
D	DC Electrical Installation test includes testing of batteries, main DC circuit breaker, and DEAD CRANK SWITCH.
E	Relay Panel Assembly repair includes replacement of circuit breakers and relays.
F	Relay Panel Assembly test includes testing of circuit breakers and relays.
G	Housing Installation repair includes the replacement of access doors, panels, door latches, hinges, brackets, access covers, clinch nuts, and repair of electrical leads.
H	DCS Installation repair includes replacement of the control box assembly, control box gasket, DCS enclosure assembly, and DCS control panel assembly.
I	DCS Control Panel Assembly repair includes replacement of cable assemblies, switches, control panel, membrane assembly, gaskets, LCD display, panel heater, and circuit card assemblies.

Table 3. Remarks for the AMMPS 15 kW Generator Set — Continued.

REMARKS CODE	REMARKS
J	Control Panel Assembly test includes testing of switches and circuit card assemblies.
K	DCS Enclosure Assembly repair includes replacement of cable assemblies, gaskets, and circuit card assemblies.
L	DCS Enclosure Assembly test includes testing of circuit card assemblies.
M	Intake Air Installation inspect and service functions include the inspection and servicing of the service indicator, hose assemblies, and filter element.
N	Cooling System Installation repair includes the replacement of the radiator assembly, coolant tank assembly, and cooling fan.
O	Fuel System Installation repair function includes the replacement of the tank assembly and fuel system module.
P	Contactor repair includes the replacement and repair of electrical leads.
Q	Voltage Selection Board repair includes the replacement and repair of electrical leads and harnesses.
R	Hour Meter repair includes the replacement and repair of the wiring harness.
S	Convenience Receptacle Assembly repair includes replacement and repair of the cable assemblies.
T	Transformers repair includes replacement of clinch nuts.
U	Printed Circuit Board Module repair includes the replacement and repair of electrical leads and wiring harnesses.
V	Power Plant Installation repair includes the replacement of the engine assembly and AC generator assembly.
W	AC Generator Assembly repair includes the replacement and repair of the endbell assembly, stator assembly, rotor assembly, and exciter rotor assembly.
X	Lubrication System repair includes replacement and repair of the oil drain hose bulkhead assembly, hose assemblies, and oil cooler assembly.
Y	Fuel Injectors and Lines repair includes the replacement of the fuel injectors, hose assemblies, and fuel lines.
Z	Fuel Injection Pump repair includes the replacement and repair of the delivery setting assembly, timer set assembly, and fuel feed pump assembly.
AA	Water Pump repair includes the replacement of the fan pulley and hose assemblies.
BB	Starter repair includes the replacement and repair of the electrical lead.
CC	Crankcase Rear Bearing Case Cover repair includes the replacement of the oil seal.
DD	Intake Air Heater repair includes the replacement of the intake hose.
EE	Cylinder Head repair includes the replacement of plugs, spring pin, and head gasket.
FF	Valve Cover repair includes the replacement and repair of the valve cover assembly.
GG	Rocker Arms and Push Rods repair includes the replacement and repair of the rocker arm shaft assembly.
HH	Short Block Assembly repair includes the replacement of bushings and plugs.

Table 3. Remarks for the AMMPS 15 kW Generator Set — Continued.

REMARKS CODE	REMARKS
II	Connecting Rods and Pistons repair includes the replacement and repair of the piston assembly and connecting rod assembly.
JJ	Crankshaft repair includes the replacement and repair of the crankshaft assembly and bearing assemblies.
KK	Gear Case Cover repair includes replacement of the oil seal.
LL	Engine (Main) Wiring Harness Installation repair includes the replacement and repair of connector assemblies.
MM	Power Wiring Harness Installation repair includes the replacement and repair of connector assemblies.

END OF WORK PACKAGE

**FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
EXPENDABLE AND DURABLE ITEMS LIST**

INTRODUCTION

Scope

This work package lists expendable and durable items that you will need to operate and maintain the AMMPS 15 kW generator set. This list is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical Class V Repair Parts, and Heraldic Items), CTA 50-909, Field and Garrison Furnishings and Equipment, or CTA 8-100, Army Medical Department Expendable/Durable Items.

Explanation of Columns in the Expendable/Durable Items List

Column (1) Item No. This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item (e.g., Use brake fluid (WP 0098, Item 5)).

Column (2) Level. This column identifies the lowest level of maintenance that requires the listed item (C=Crew, F=Field/ASB, H = Below Depot).

Column (3) National Stock Number (NSN). This is the NSN assigned to the item which you can use to requisition it.

Column (4) Item Name, Description, Part Number/(CAGEC). This column provides the other information you need to identify the item. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).

Column (5) U/I. Unit of Issue (U/I) code shows the physical measure or count of an item, such as gallon, dozen, gross, etc.

Table 1. Expendable and Durable Items.

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, PART NUMBER/(CAGEC)	(5) U/I
1	F	6810-00-201-0906	Alcohol, denatured, 16 oz, 837015 (19203)	BT
2	C	6850-00-664-1403	Antifreeze, ethylene glycol, 1 gallon, A-A-52624 (58536)	GL
3	F	8145-01-440-3417	Bag, barrier, 11509521 (18876)	EA
4	H	8950-01-407-9105	Baking soda, 01900 (90038)	EA
5	F	6530-01-460-1109	Bottle, spray, 16 oz, B7548-60 (07TA6)	EA
6	F	7920-00-514-2417	Brush, acid swabbing, 803-12 (7S147)	GR
7	F	5120-01-371-9268	Brush, battery terminal, BTC3A (55719)	EA
8	C	7920-01-127-4376	Brush, wire, scratch, brass wire, 71966 (76169)	EA
9	C	5340-00-450-5718	Cap set, protective, dust and moisture seal, 10935405 (19207)	EA
10	H	6850-01-053-2540	Cleaning compound, engine cooling system, MACS SUPER FAST FLUSH 1500 (72527)	BT

Table 1. Expendable and Durable Items — Continued.

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, PART NUMBER/(CAGEC)	(5) U/I
11	F	6850-01-474-2317	Cleaning compound, solvent, BT05 (0K209)	CO
12	C	5350-00-221-0872	Cloth, abrasive, crocus, ANSI B74.18 (80204)	PG
13	C	7920-01-482-6042	Cloth, cleaning, electronics, 792000NIB0395, (1A920)	BX
14	F	8030-00-105-0270	Compound, antiseize, 1 lb can with brush top, NSBT-16N (5W425)	CN
15	F	8030-01-396-3362	Compound, sealing, 50 mL bottle, 68035 (05972)	BT
16	C	8030-01-508-9181	Compound, sealing, 5699 (05972)	TU
17	F	7930-00-068-1669	Detergent, general purpose P-D-1747 (81348)	BX
18	C	6810-00-107-1510	Distilled water, ACS, O-C-265 (81348)	DR
19	C	9140-00-286-5286	Fuel, diesel, DF-1, AA52557-1 (58536)	GL
20	C	9140-00-286-5294	Fuel, diesel, DF-2, AA52557-2 (58536)	GL
21	C	9150-01-179-1589	Grease, electrically conductive, BEMS 15030 (59364)	CA
22	C	9150-00-929-7946	Grease, general purpose, G-60/EPV (76736)	CA
23	F	6850-01-160-3868	Inhibitor, corrosion, liquid cooling system, MIL- A-53009 (81349)	QT
24	C	9150-01-518-9477	Lubricating oil, engine, 1 qt MIL-PRF-2104H OE/HDO-15/40, MIL-PRF-2104 (81349)	QT
25	C	9150-00-189-6727	Lubricating oil, engine, 1 qt MIL-PRF-2104H OE/HDO-10, 10W/QT/CN/2104 (13873)	QT
26	C	9150-00-402-2372	Lubricating oil, engine, arctic 5 gal, -65 °F (- 54°C), MIL-PRF-46167 (81349)	CN
27	H	9150-00-111-3199	Lubricating oil, engine, preservation 5 gallon, MIL-PRF-21260 (81349)	CN
28	H	7920-01-430-5028	Pad, scouring, 048011-04028 gray 6" X 9" (27293)	EA
29	H	4910-01-490-6453	Pan, drain, KTC S0255 (00NS2)	EA
30	H	9150-00-261-7899	Penetrating oil, VV-P-216 (81348)	PT
31	H	8030-00-082-2508	Primer, sealing compound, 74755 (05972)	BT
32	C	7920-00-205-3571	Rag, wiping, DDD-R-0030 (81348)	BX
33	F	8030-01-465-1390	Sealant, 56507 (05972)	EA
34	C	8520-01-133-8099	Soap, ivory, 7385T11 (39428)	EA
35	H	5975-00-074-2072	Strap, tie-down, electrical components, PLT2SC (06383)	HD
36	C	9905-00-537-8954	Tag, marker, 50 each bundle, 9905-00-537- 8954 (64067)	BD
37	C	7510-00-117-5520	Tape, pressure sensitive, black conforming to SAE-AMS-T-22085, 481 (52152)	RO
38	F		Wash, turbocharger, 974500-00400 (0AK42)	GL
39	C	8135-01-054-0738	Wire, tie, TIEWIRE16GA3-1/2LB (56319)	CL

END OF WORK PACKAGE

FIELD AND SUSTAINMENT MAINTENANCE
AMMPS 15KW GENERATOR SET
MAINTENANCE AND DEFERRED MAINTENANCE ITEMS LIST

GENERAL INFORMATION

This WP lists all maintenance items, as well as deferred maintenance items, displayed by the DCS and their corresponding maintenance prompt and interval. The interval displayed on the DCS refers to operating hours remaining until the corresponding maintenance prompt is due for maintenance. The interval in Table 1 represents the total time interval in operating hours for a maintenance item. When a maintenance prompt is deferred, a deferred maintenance item code appears within the operating hours interval given in Table 2. Maintenance items provide operator feedback in conjunction with fault and warning codes (WP 0006, Warnings and Fault Codes).

Table 1. Maintenance Item Codes and Prompts.

CODE	INTERVAL (HRS OR CALENDAR)	MAINTENANCE PROMPT
5001	50.0	[First change engine oil and filter]
5002	500.0 or 6 months	[Change engine oil and filter]
5003	500.0 or 6 months	[Change fuel filter/water separator]
5004	500.0 or 6 months	[Replace air filter]
5005	1500.0 or 1 year	[Drain coolant and flush system]
5006	500.0 or 6 months	[Inspect Aux Fuel Filter]
5007	1500.0 or 2 years	[Engine Valve check/adjust]
5008	1500.0	[Engine fuel injection nozzles check]
5009	500.0 or 6 months	[Inspect radiator cap for damage]
5010	750.0	[Replace drive belts]
5011	24.0	[Perform Daily Preventative Maintenance]
5014	1 year	[Inspect and Test Winterization Kit]
5016	250 or 3 months	[Test and Reset GFI Receptacle]
5017	250 or 3 months	[Clean Radiator, Breather, Chrg Air/Fuel Coolers]

Table 2. Deferred Maintenance Item Codes and Prompts.

CODE	INTERVAL (HRS)	MAINTENANCE PROMPT
6001	24.0	[First change engine oil and filter]
6002	48.0	[Change engine oil and filter]
6003	48.0	[Change fuel filter/water separator]
6004	48.0	[Replace air filter]
6005	72.0	[Drain coolant and flush system]
6006	48.0	[Inspect Aux Fuel Filter]
6007	72.0	[Engine Valve check/adjust]
6008	72.0	[Engine fuel injection nozzles check]
6009	48.0	[Inspect radiator cap for damage]
6010	72.0	[Replace drive belts]
6011	12.0	[Perform Daily Preventative Maintenance]
6014	72.0	[Inspect and Test Winterization Kit]
6016	24.0	[Test and Reset GFI Receptacle]
6017	24.0	[Clean Radiator, Breather, Chrg Air/Fuel Coolers]

END OF WORK PACKAGE

GLOSSARY

SCOPE

This WP defines all of the terms used in the AMMPS 15 kW generator set TM.

TERM	DEFINITION
24 VDC Electrical System	A system used to create and maintain 24 Volts Direct Current to power the generator set. The system includes two 12-volt batteries, a battery-charging alternator rotated by an engine driven V-belt, and the required wiring and support components.
AC Electrical System	This is the system that supplies Alternating Current from the generator set to the Load. The power is generated by the AC generator and transferred to the Load via the output box.
Alternating Current (AC) Circuit Interrupt Switch (AC CIRCUIT INTERRUPT)	This switch controls the operation of the AC contactor, which allows the generator set to be connected or disconnected to the load or switch box.
Automatic Voltage Regulator (AVR)	Electrical regulator designed to automatically maintain a constant voltage level. Important component in synchronous generators, it controls the output voltage of the generator by controlling its excitation.
Advanced Medium Mobile Power Sources (AMMPS)	Newest generation of battlefield electric power supply.
Battery-Charging Alternator	A small, engine-mounted power generator that creates 24 volts of Direct Current when rotated by an engine-driven belt.
Battery-Charging Alternator Belt	The engine-driven belt that rotates the battery-charging alternator.
Battleshort	A condition in which some military equipment can be placed so it does not shut down when circumstances would be damaging to the equipment or personnel.
Battleshort Switch	This switch is placed in the ON position during situations when constant power is required without disruption; it allows the system to override Faults/Warnings that would normally shutdown the generator set. In normal operation, the Battleshort Switch will be in the OFF position to protect the generator set.
CAUTION	A notation in the manual that informs the reader that possible damage to the machine may occur if conditions listed are not met.
Chemical Agent Resistant Coating (CARC)	The CARC paint is used on the housing assembly for the generator set to protect it from the environment.
Convenience Receptacle	A plug-in 110 volt electrical outlet mounted at the rear of the generator set similar to the one used in a typical American home.
Digital Control System (DCS)	The DCS, which is located at the rear of the gen set, is a microprocessor-based control that allows the operator and maintainer to start/stop the gen set, operate the contactor, adjust voltage and frequency, clear/reset generator faults, and perform other necessary functions to provide power. Contains three components: Control Box, Control Board Assembly, and Front Panel Assembly.
DCS screen	LCD with a menu-driven display format to control generator set operations.
Engine control switch	This switch provides the local control for the generator set. The Master Control Switch has four (4) positions: OFF, PRIME & RUN AUX FUEL, PRIME & RUN, and RUN.
Exhaust-Side	The side of the engine where the exhaust manifold is mounted.
External Fuel System	The system that allows fuel to be pumped from a holding device not attached to the generator set into the generator set fuel tank.

TERM	DEFINITION
Fault Code	A message displayed on the DCS when a mechanical fault is detected. The code is displayed as a number followed by a short descriptive message.
Flywheel-End	The end of the engine where the flywheel is mounted.
Front	When used to describe a direction in relation to the generator set, the front is the end of the generator set opposite of the DCS.
Fuel Pump, Auxiliary	Fuel pump used to pump fuel from an external source to the internal fuel tank of the generator set.
Fuel Pump, Main	Fuel pump used to pump fuel from the internal fuel tank of the generator set to the engine.
Inspect	A method (usually visual) used to determine damage to a component.
Intake Air Heater	A 24-volt electric heater mounted to the engine intake manifold used to heat incoming air to reduce start-up time in cold weather.
Intake Air Heater Relay	The electrical switch that controls the operation of the intake air heater.
Intake-Side	The side of the engine where the intake manifold is mounted.
Internal Fuel System	The system housed within the generator set to fuel the engine. This includes the fuel tank, main fuel pump, fuel/water separator, and the required lines, fittings, and other components.
Left-Side	The side of the machine that houses the intake air grille and a forward door. As the operator stands directly facing the DCS looking out, over the generator set, the side of the machine to his left is the left-side.
Mode I	Mode I refers to the output of the generator set expressed in cycles per seconds (Hz). Mode I is a 50/60 Hz machine.
Mode II	Mode II refers to the output of the generator set expressed in cycles per seconds Hz). Mode II is a 400 Hz machine.
NOTE	A notation in the manual that informs the reader helpful information that will assist in the completion of a maintenance task.
Ohm	The Ohm is a unit of electrical resistance. One (1) volt will cause a current of one (1) ampere to flow through a resistance of one (1) Ohm.
Phase	Phase refers to the windings of an AC generator.
Power Plant (PP)	This is two (2) AMMPS generator sets hooked up in parallel with the use of a switch box.
Power Unit (PU)	This is a single AMMPS generator set.
Rear	The end of the machine where the DCS is mounted.
Remove	A maintenance task to remove a component from the generator set.
Repair	A maintenance task to restore a component to operational condition, usually by disassembly, parts replacement, and re-assembly of the component.
Replace	A maintenance task to remove a component from the generator set with no intent to re-install the same component. The original component is to be disposed of and replaced with new component.
Right-Side	The side of the machine that houses the output box and a forward door. As the operator stands directly facing the DCS looking out, over the generator set, the side of the machine to his right is the right-side.
Service	A maintenance task performed, usually on a scheduled basis, to restore or replenish items consumed during normal operation.
Soft Key buttons	The Soft Button Keys are located below the Display Panel on the DCS. The function of each button varies with the soft key function on the Display Panel.

TERM

Test

Volt [V]

Water Pump-End

WARNING

Warning Code

Watt

Winterization kit

DEFINITION

A maintenance task to determine if a component is performing correctly or to specification.

The volt is a unit of electrical potential. A potential of one (1) volt will cause a current of one (1) ampere to flow through a resistance of one (1) Ohm.

The end of the engine where the water pump is mounted.

A notation in the manual that informs the reader that possible personal injury or death may occur if conditions listed are not met.

A message displayed on the DCS when a mechanical fault is detected that, if the cause is left untreated, will cause damage to the equipment. The code is displayed as a number followed by a short descriptive message.

A unit of electrical power. In DC circuits, wattage equals voltage multiplied by amperage. In AC circuits, wattage equals effective voltage multiplied by effective amperage multiplied by power factor multiplied by a constant dependent on the number of phases. 1,000 W are equal to one kW.

The winterization kit, located on the inside of the right-side panel, is a fuel-fired coolant heater providing the ability to heat the coolant in extreme cold conditions.

END OF WORK PACKAGE

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA				Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).		DATE 30 August 2002
TO: (Forward to proponent of publication or form) (Include ZIP Code) Commander, US Army CECOM LCMC ATTN: AMSEL-LCL-ECM Aberdeen Proving Ground, MD 21005-1846				FROM: (Activity and location) (Include ZIP Code) Jane Q. Doe, SFC 1234 Any Street Anytown, AL 34565		
PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS						
PUBLICATION/FORM NUMBER TM 11-1234-567-14			DATE 16 Sep 2001		TITLE Operator, Field and Sustainment Support Maintenance Manual for Radio, AN/ABC-123	
ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON
1	WP0005 PG 3		2			Test or Corrective Action column should identify a different WP number.
TYPED NAME, GRADE OR TITLE Jane Q. Doe, SFC				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION 123-4567		SIGNATURE

EXAMPLE

TO: (Forward to proponent of publication or form) (Include ZIP Code)				FROM: (Activity and location) (Include ZIP Code)			DATE	
PART II- REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS								
PUBLICATION/FORM NUMBER				DATE		TITLE		
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION
EXAMPLE								
PART III - REMARKS (Any general remarks, recommendations, or suggestions for improvement of publications and blank forms. Additional sheets may be used if more space is needed.)								
EXAMPLE								
TYPED NAME, GRADE OR TITLE			TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION			SIGNATURE		

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA					Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).		DATE
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PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS							
PUBLICATION/FORM NUMBER				DATE		TITLE	
ITEM	PAGE	PARA- GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON	
TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE	

TO: <i>(Forward to proponent of publication or form) (Include ZIP Code)</i>	FROM: <i>(Activity and location) (Include ZIP Code)</i>	DATE
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PART II- REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION/FORM NUMBER			DATE	TITLE				
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

PART III - REMARKS *(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

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TO: <i>(Forward to proponent of publication or form) (Include ZIP Code)</i>	FROM: <i>(Activity and location) (Include ZIP Code)</i>	DATE
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TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
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ARMY TM 9-6115-751-24&P

By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official:



JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
1107512

By Order of the Secretary of the Air Force:

NORTON A. SCHWARTZ
General, USAF
Chief of Staff, USAF

Official:

DONALD J. HOFFMAN
General, USAF
Commander, AFMC

By Order of the Marine Corps:

J. E. CAVE
Product Group Director, PG-15
Ground Transportation Engineer Systems
Marine Corps System Command

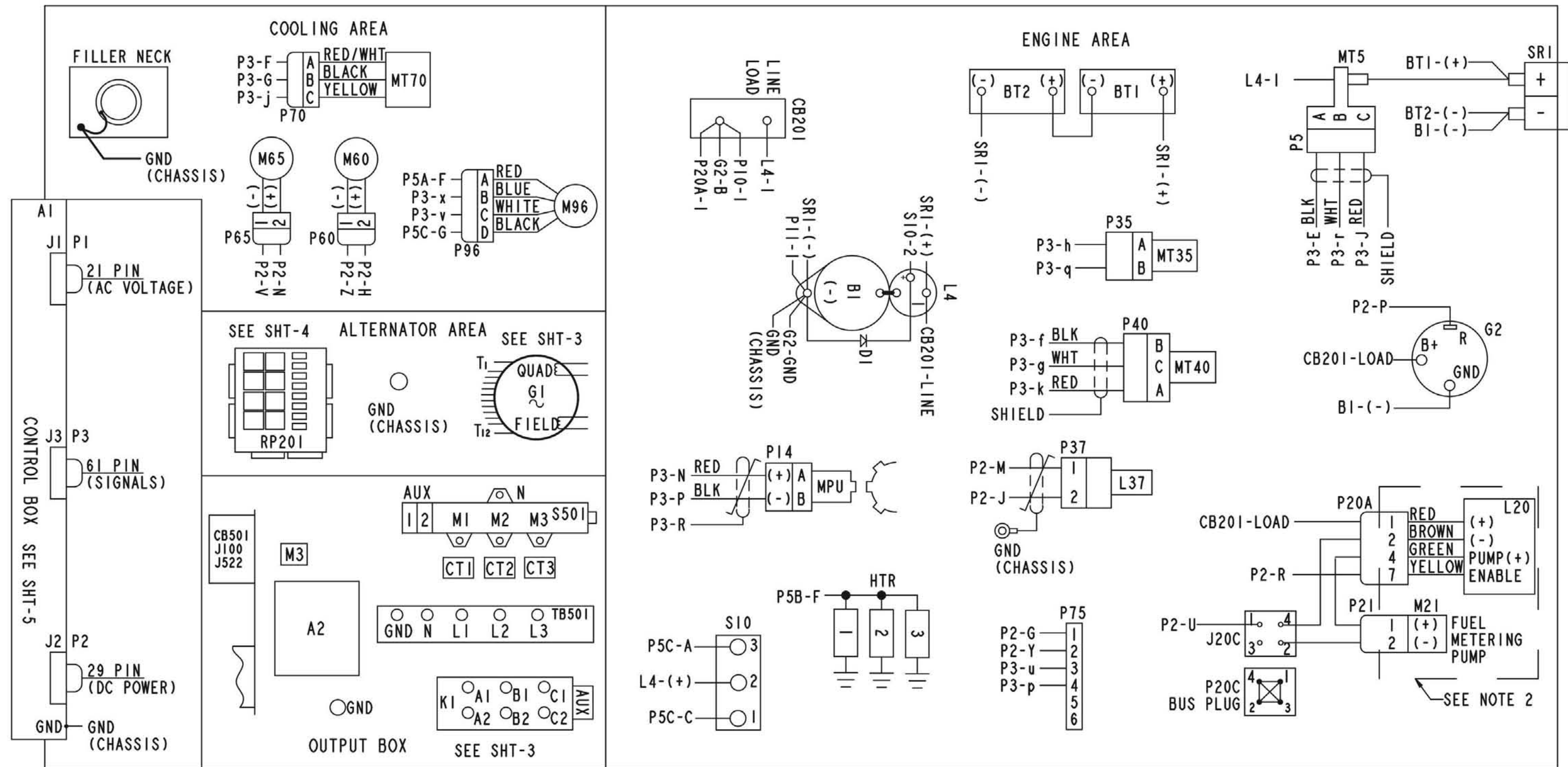
By Order of the Secretary of the Navy

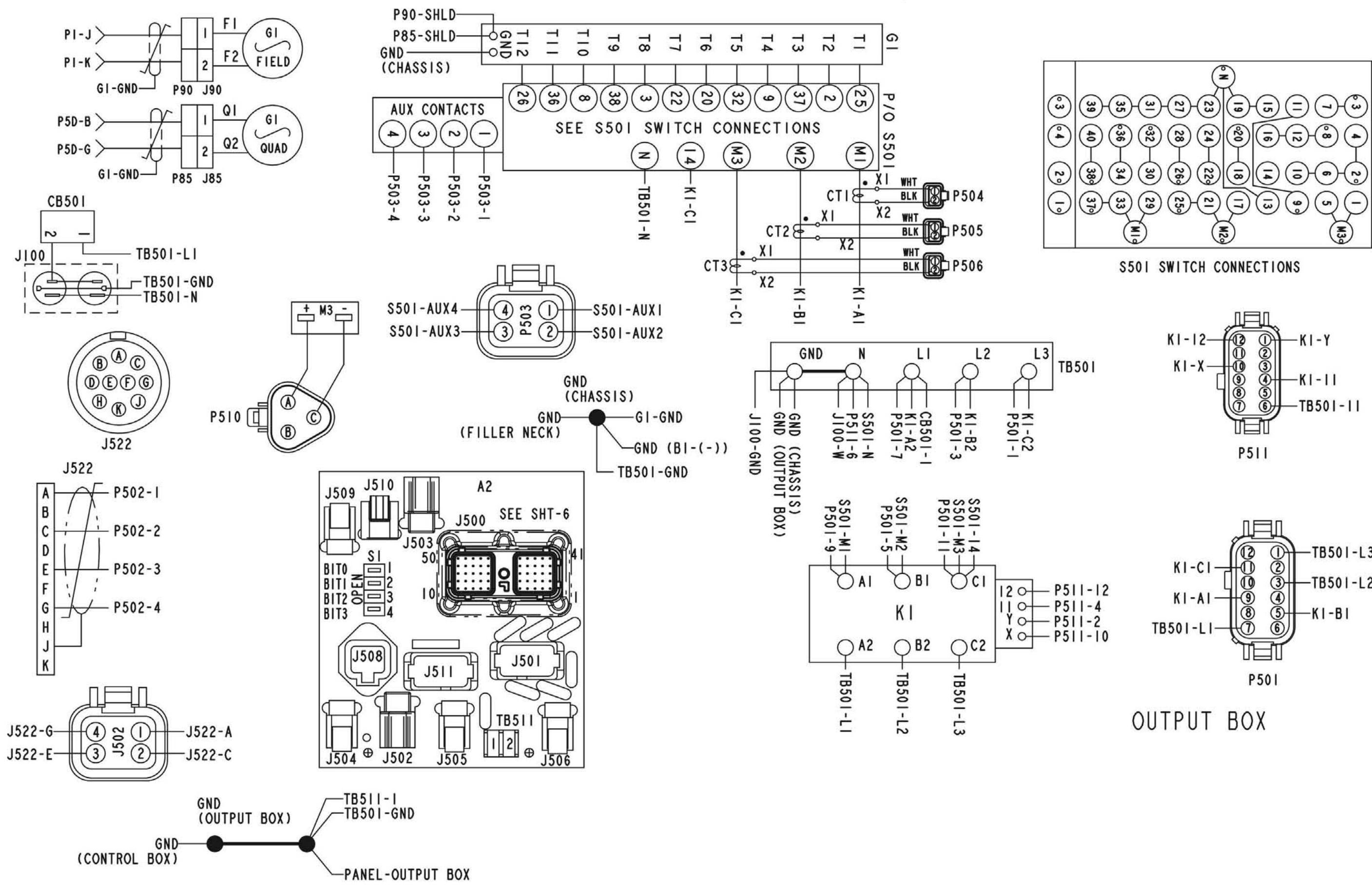
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COMMAND (NAVFAC)**

**NAVAL FACILITIES EXPENDITARY
LOGISTICS CENTER (NFELC)
CODE EXP 21**

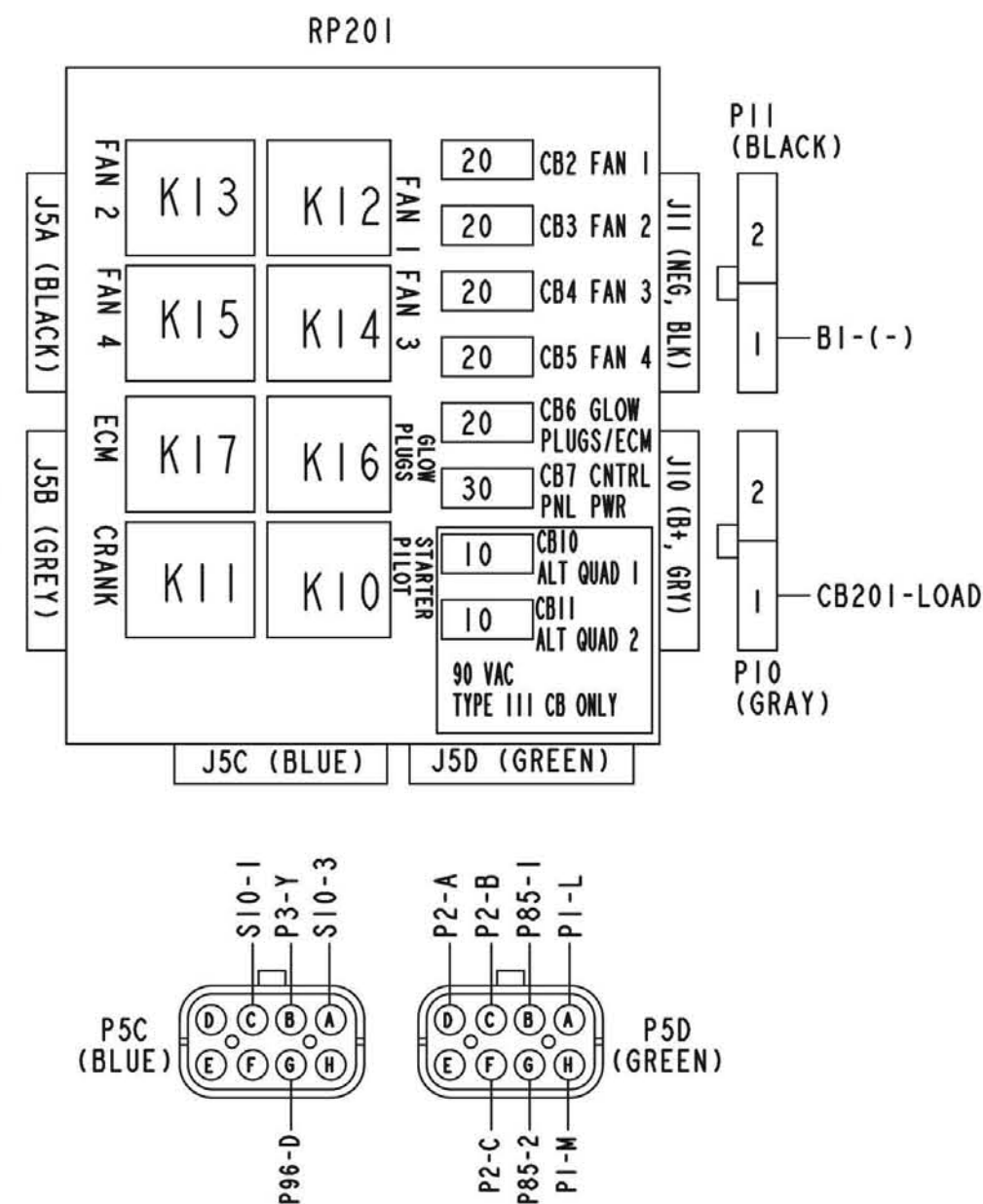
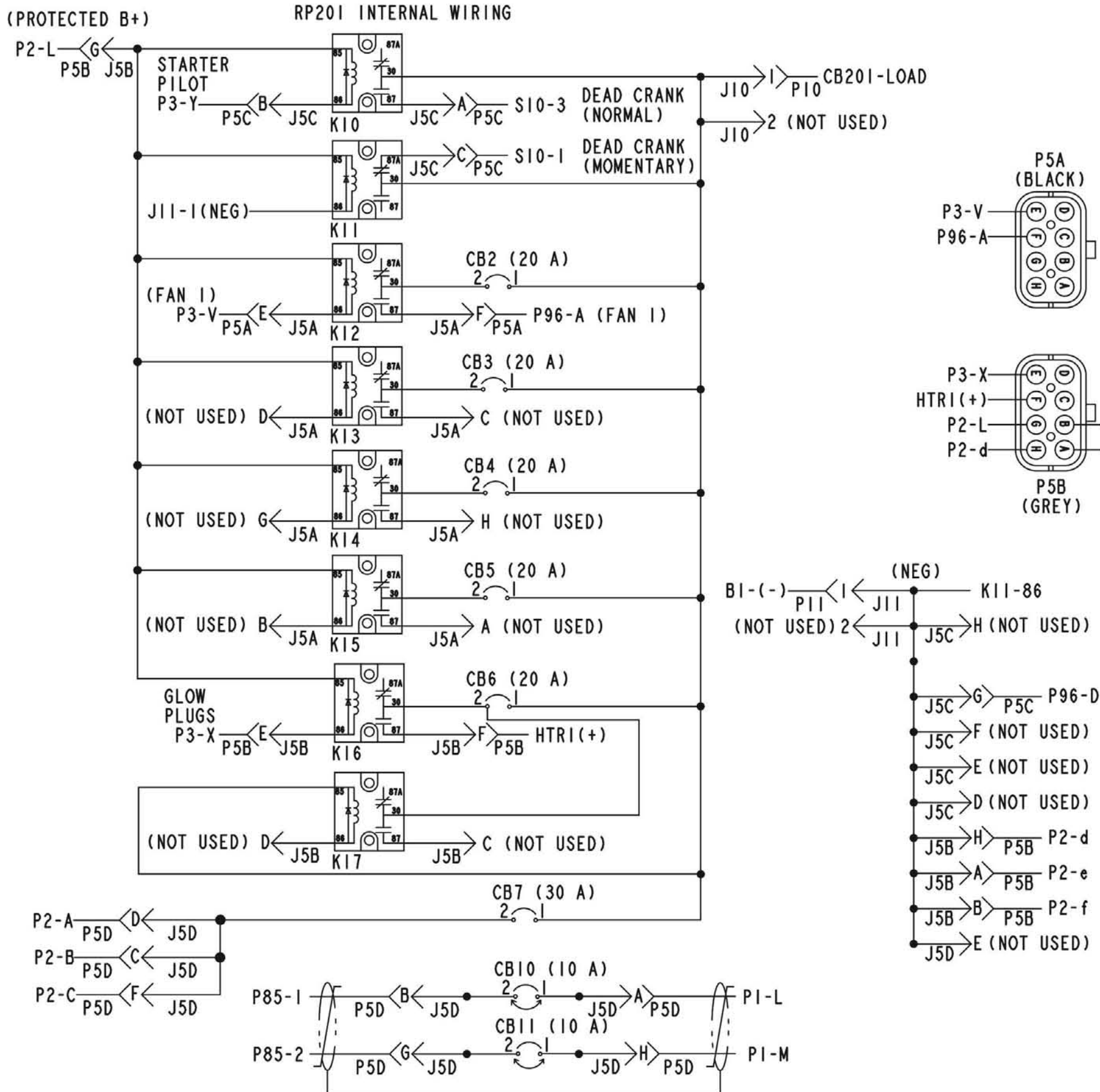
Army Distribution: To be distributed IAW the Initial Distribution Number (IDN) 257860 requirements for TM 9-6115-751-24&P.

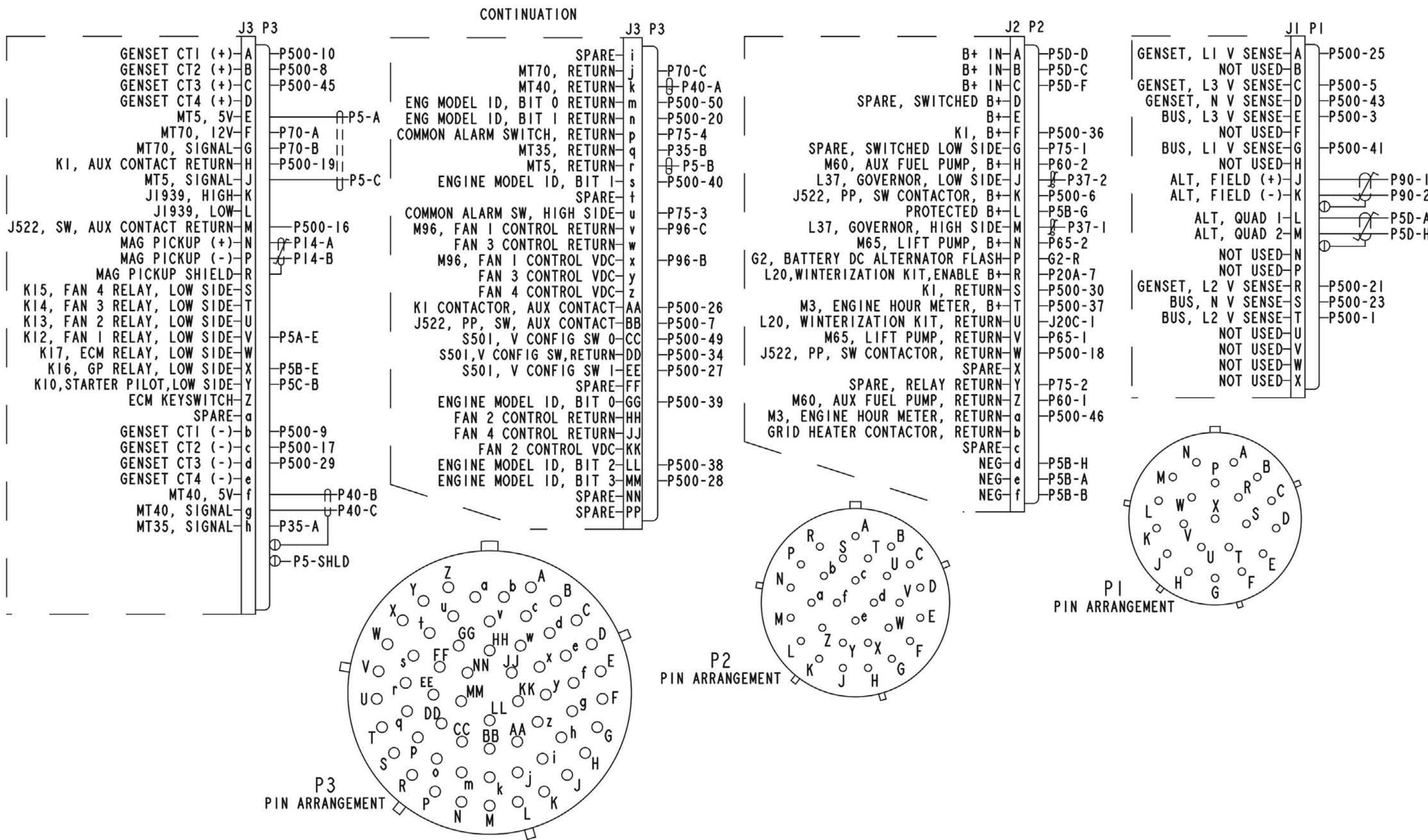
Marine Corps Distribution: To be distributed IAW PCN 184 117731 00.

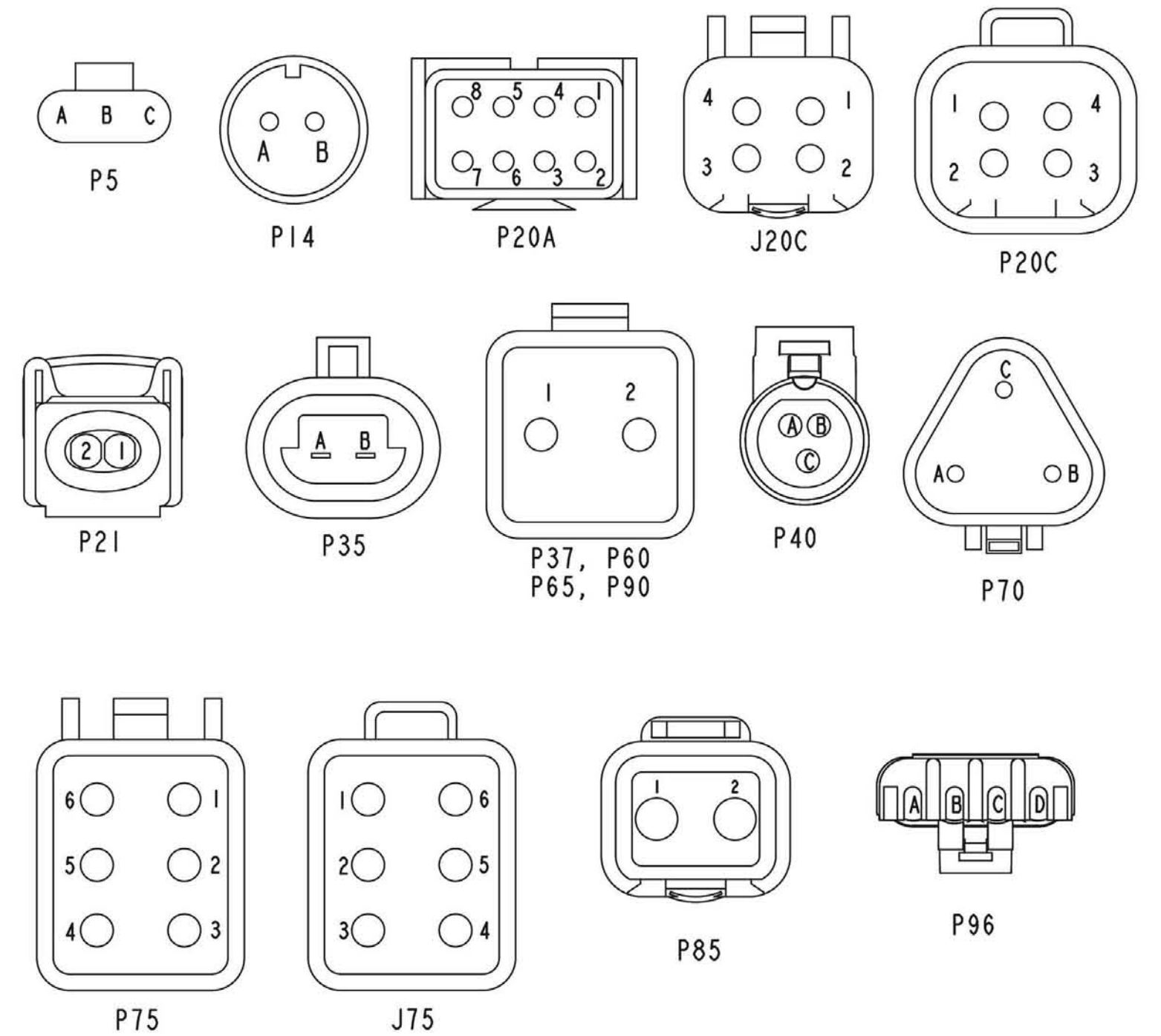
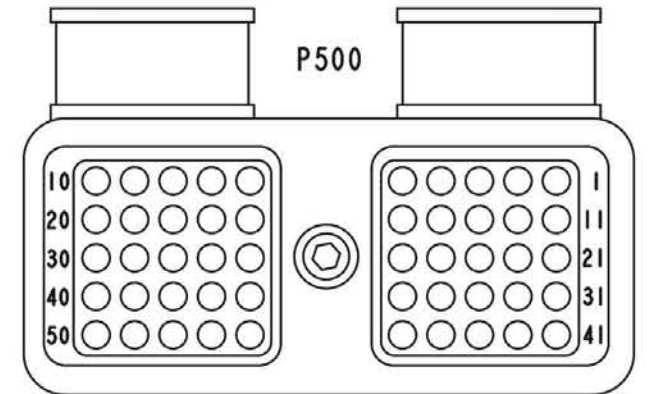
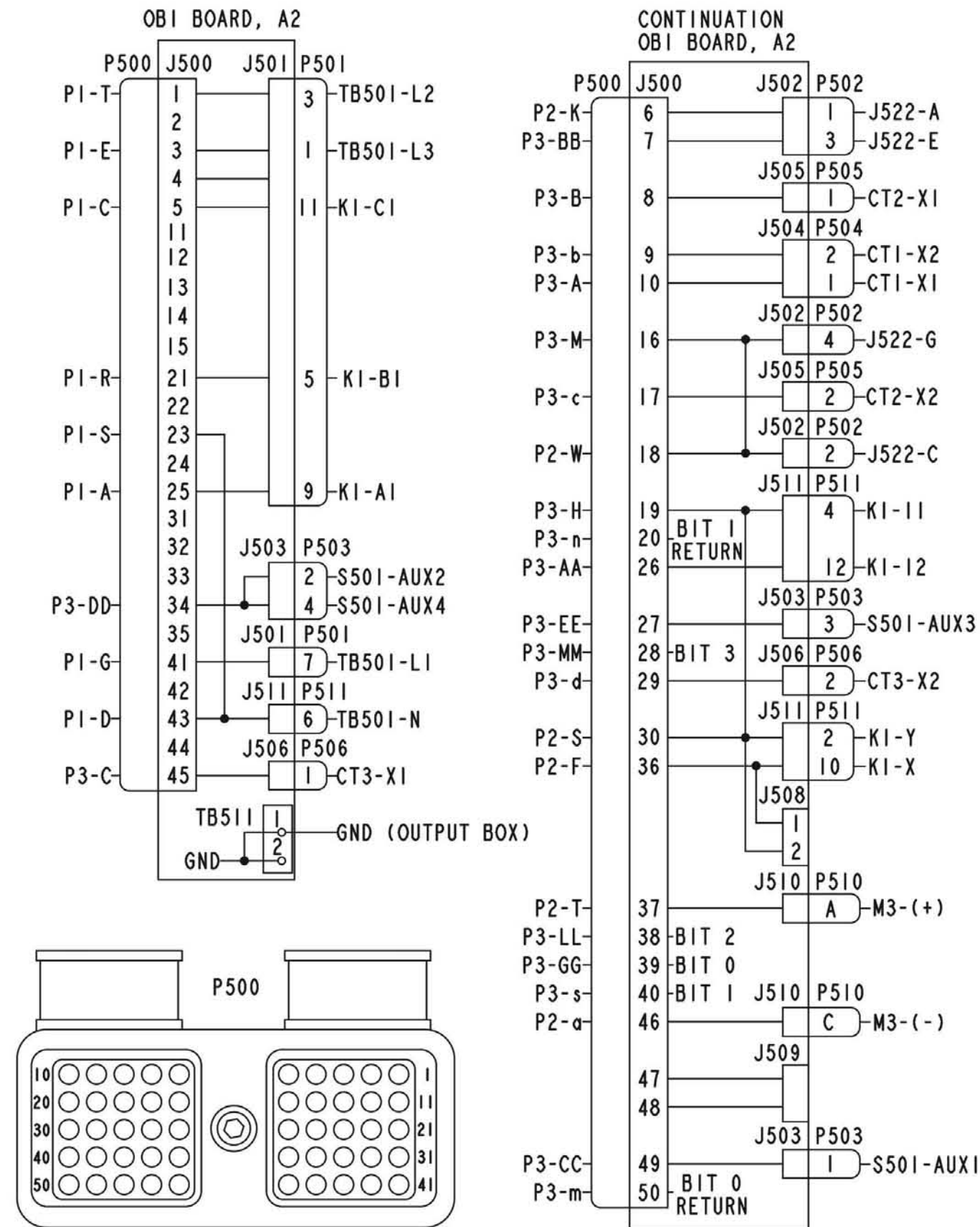




RP201 INTERNAL WIRING





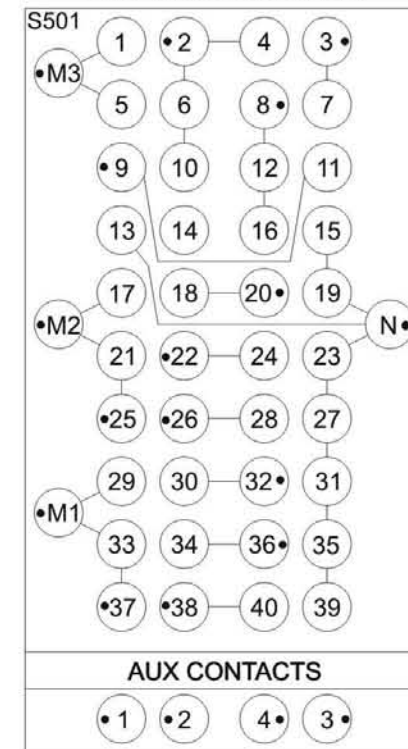


LEGEND

A1	GENSET CONTROLLER/DISPLAY	J509	RECEPTACLE CT4	P37	PLUG GOVERNOR ACTUATOR
A2	OUTPUT BOX INTERFACE BOARD	J510	RECEPTACLE HOUR METER	P40	PLUG OIL PRESSURE SENDER
B1	STARTER MOTOR	J511	RECEPTACLE CONTACTOR CONTROL	P60	PLUG AUX FUEL PUMP
BT1	BATTERY, 12V	J522	RECEPTACLE PP SW BOX CONTROL	P65	PLUG LIFT FUEL PUMP
BT2	BATTERY, 12V	K1	AC MAIN CONTACTOR	P70	PLUG FUEL LEVEL SENSOR
CB2	CIRCUIT BREAKER COOLING FAN 1	K10	STARTER, PILOT RELAY	P75	PLUG SPARES
CB3	CIRCUIT BREAKER	K11	RELAY CRANK PILOT	P85	PLUG QUAD WINDING
CB4	CIRCUIT BREAKER } NOT USED	K12	RELAY COOLING FAN1	P90	PLUG FIELD WINDING
CB5	CIRCUIT BREAKER	K13	RELAY	P96	PLUG COOLING FAN1
CB6	CIRCUIT BREAKER GLOW PLUG/ECM	K14	RELAY } NOT USED	P500	PLUG OBI
CB7	CIRCUIT BREAKER CONTROL PNL	K15	RELAY	P501	PLUG CONTACTOR
CB10	CIRCUIT BREAKER ALTERNATOR QUAD	K16	RELAY GLOW PLUG	P502	PLUG SW BOX CONTROL
CB11	CIRCUIT BREAKER ALTERNATOR QUAD	K17	RELAY ECM	P503	PLUG VOLTAGE SELECT SWITCH
CB201	CIRCUIT BREAKER MAIN DC	L1	OUTPUT TERMINAL	P504	PLUG CT1
CB501	CIRCUIT BREAKER RECEPTACLE AC	L2	OUTPUT TERMINAL	P505	PLUG CT2
CT1	CURRENT TRANSFORMER	L3	OUTPUT TERMINAL	P506	PLUG CT3
CT2	CURRENT TRANSFORMER	L4	STARTER SOLENOID	P510	PLUG HOUR METER
CT3	CURRENT TRANSFORMER	L20	WINTERIZATION KIT	P511	PLUG CONTACTOR CONTROL
D1	DIODE, L4 COIL	L37	GOVERNOR ACTUATOR	Q1/2	QUAD WINDING
FI/2	FIELD WINDING	M3	HOUR METER	RP201	RELAY PANEL
G1	AC GENERATOR	M21	FUEL METERING PUMP	S1	SWITCH ENGINE ID
G2	BATTERY CHARGING ALTERNATOR	M60	FUEL PUMP AUXILIARY	S10	DEAD CRANK SWITCH
GND	GROUND	M65	FUEL PUMP LIFT	S501	VOLTAGE RECONNECTION SWITCH
HTR	GLOW PLUG HEATER	M96	COOLING FAN 1	SRI	NATO SLAVE RECEPTACLE
J1	RECEPTACLE CONTROL AC SENSE	MPU	MAGNETIC PICKUP	TB501	OUTPUT LOAD TERMINAL BOARD
J2	RECEPTACLE CONTROL DC POWER	MT5	BATTERY CURRENT SENSOR	TB511	OBI BOARD GROUND
J3	RECEPTACLE CONTROL BOX DC SIGNALS	MT35	COOLANT TEMPERATURE SENSOR		
J5A	RECEPTACLE (BLACK) RELAY PANEL	MT40	OIL PRESSURE SENDER		
J5B	RECEPTACLE (GRAY) RELAY PANEL	MT70	FUEL LEVEL SENSOR		
J5C	RECEPTACLE (BLUE) RELAY PANEL	N	OUTPUT TERMINAL N		
J5D	RECEPTACLE (GREEN) RELAY PANEL	P1	PLUG CONTROL AC SENSE		
J10	RECEPTACLE (GRAY) B+	P2	PLUG CONTROL BOX DC POWER		
J11	RECEPTACLE (BLACK) B-	P3	PLUG CONTROL BOX DC SIGNAL		
J20C	RECEPTACLE WINTERIZATION KIT BUS	P5	PLUG BATTERY CURRENT SENSOR		
J85	RECEPTACLE QUAD WINDING	P5A	PLUG (BLACK) RELAY PANEL		
J90	RECEPTACLE FIELD WINDING	P5B	PLUG (GRAY) RELAY PANEL		
J100	RECEPTACLE GF1 CONVENIENCE	P5C	PLUG (BLUE) RELAY PANEL		
J500	RECEPTACLE OBI	P5D	PLUG (GREEN) RELAY PANEL		
J501	RECEPTACLE CONTACTOR	P10	PLUG (GRAY) B+		
J502	RECEPTACLE SW BOX CONTROL	P11	PLUG (BLACK) B-		
J503	RECEPTACLE VOLTAGE SELECT SWITCH	P14	PLUG MPU		
J504	RECEPTACLE CT1	P20A	PLUG WINTERIZATION HEATER		
J505	RECEPTACLE CT2	P20C	PLUG WINTERIZATION KIT BUS		
J506	RECEPTACLE CT3	P21	PLUG FUEL PUMP METERING		
J508	RECEPTACLE AC RELAY	P35	PLUG COOLANT TEMP SENSOR		

SCHMATIC DIAGRAM 5 KW GENSET 50/60/400 HZ SHT 1 OF 2

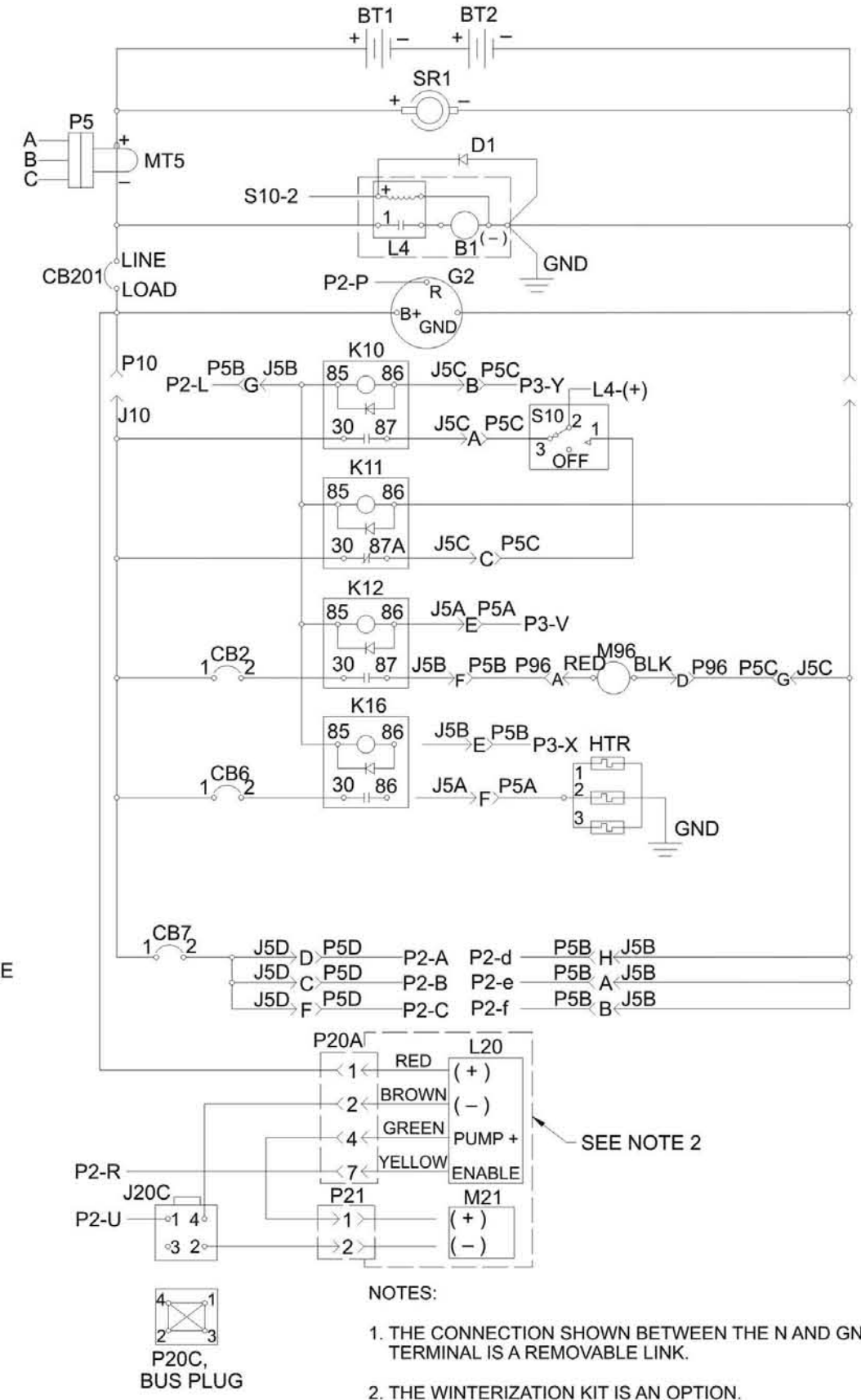
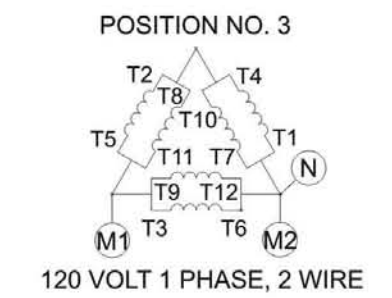
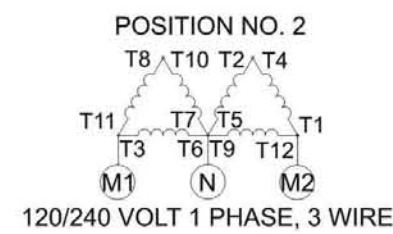
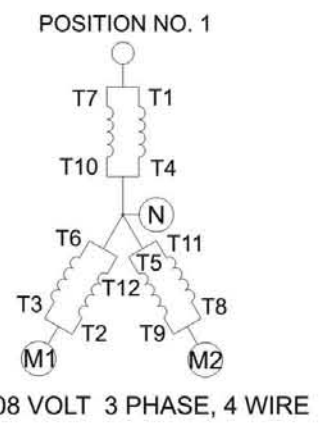
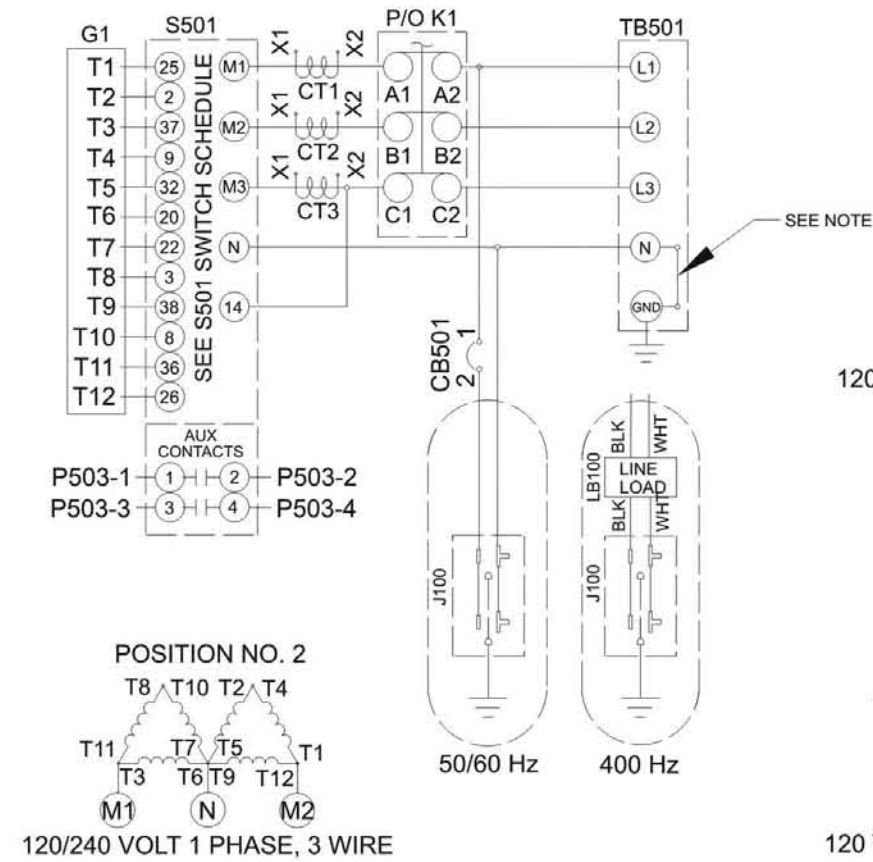
INTERNAL JUMPER



CONTACT SCHEDULE

DECK	CONTACTS HANDLE END	POSITIONS	120/208 V 3P 1P			120/240 V 1P		
			1	2	3	1	2	3
1	M3 1	T2	X					
	T8 3		X				X	
2	M3 5		X					
	T4 9	T10		X	X			
3	N 11		X	X	X			
4	N 13		X					
	N 15		X					
5	M2 17			X	X			
	N 19	T6	X	X	X			
6	M2 21	T7	X					
	N 23			X	X			
7	T1 25	T12		X	X			
	N 27		X					
8	M1 29			X	X			
	N 31	T5	X	X	X			
9	M1 33			X	X			
	N 35	T11	X					
10	T3 37	T9	X					
	N 39			X	X			

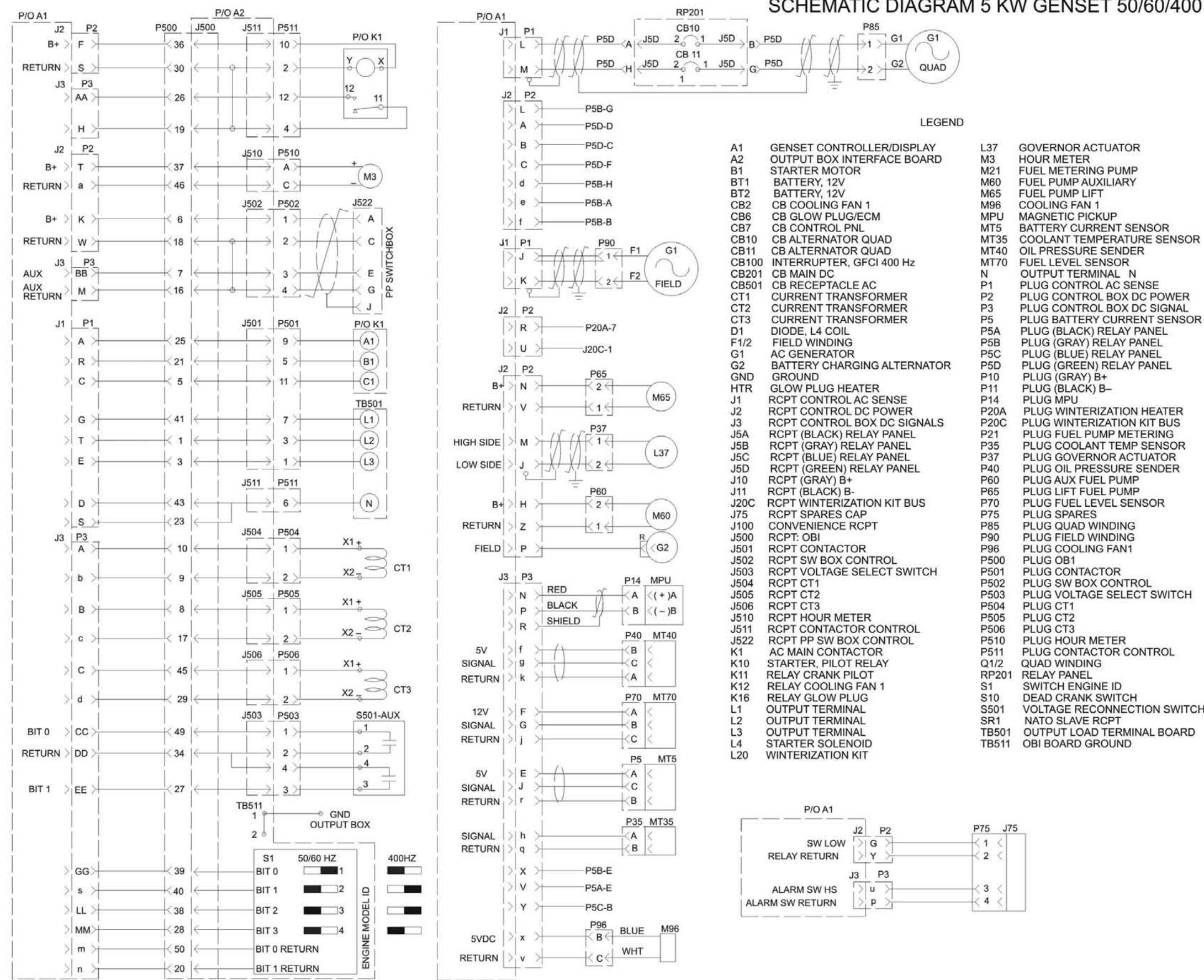
AUX CONTACTS



- NOTES:
1. THE CONNECTION SHOWN BETWEEN THE N AND GND TERMINAL IS A REMOVABLE LINK.
 2. THE WINTERIZATION KIT IS AN OPTION.

30554-04-21348

SCHEMATIC DIAGRAM 5 KW GENSET 50/60/400 HZ SHT 2 OF 2



30554-04-21348

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
 1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
 1 Kilogram = 1000 Grams = 2.2 Lb.
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
 1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
 1 Sq. Kilometer = 1,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
 1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

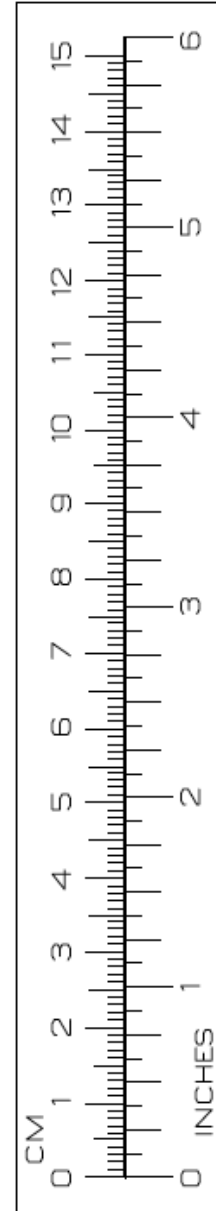
TEMPERATURE

$5/9 (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32.2° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $9/5 (^{\circ}\text{C} + 32) = ^{\circ}\text{F}$

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet.....	Square Meters	0.093
Square Yards.....	Square Meters	0.836
Square Miles.....	Square Kilometers.....	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters.....	29.573
Pints.....	Liters.....	0.473
Quarts.....	Liters.....	0.946
Gallons	Liters.....	3.785
Ounces	Grams.....	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet.....	Newton-Meters	1.356
Pounds per Square Inch.....	Kilopascals	6.895
Miles per Gallon.....	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches.....	0.394
Meters.....	Feet	3.280
Meters.....	Yards	1.094
Kilometers.....	Miles	0.621
Square Centimeters.....	Square Inches	0.155
Square Meters	Square Feet.....	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers.....	Acres	2.471
Cubic Meters	Cubic Feet.....	35.315
Cubic Meters	Cubic Yards.....	1.308
Milliliters.....	Fluid Ounces	0.034
Liters.....	Pints.....	2.113
Liters.....	Quarts.....	1.057
Liters.....	Gallons	0.264
Grams.....	Ounces	0.035
Kilograms.....	Pounds	2.205
Metric Tons.....	Short Tons.....	1.102
Newton-Meters	Pound-Feet.....	0.738
Kilopascals	Pounds per Square Inch.....	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour.....	Miles per Hour	0.621



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