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- 6115-573-13

This copy is a reprint which includes current pages from Change 1.

TM 5-6115-573-13

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

TECHNICAL MANUAL

**OPERATOR, ORGANIZATIONAL, AND DIRECT SUPPORT
MAINTENANCE MANUAL**

**GENERATOR SETS, GASOLINE ENGINE
W/CARRYING SOUND HOUSING CASE**

PU-422B/U

0.4 KW, AC, 115V, 400 Hz and 100V, DC, 29.3V

ADMIRAL MODEL GJ4266, FSN 6115-225-0142

HENRY SPEN MODEL 909238-1A, FSN 6115-240-8729

PU-532/PPS-4

0.3 KW, AC, 115V, 400 Hz,

30V, 17 AMP, 24V, 2.5 AMP, DC

ADMIRAL MODEL G-2633, FSN 6115-889-1212

HENRY SPEN MODEL 909238-1B, FSN 6115-436-4230

HEADQUARTERS, DEPARTMENT OF THE ARMY

MARCH 1973



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WARNING
SAFETY PRECAUTIONS

To prevent burns, do not touch muffler during operation.
Always remove gasoline can from engine case during transport.
Do not lift engine generator by fuel can handle.

WARNING

Pay particular heed to specific cautions and warnings throughout this manual.

WARNING

HIGH VOLTAGE

is used in the operation of this equipment.

DEATH

or severe burns may result if personnel fail to observe safety precautions.
On gasoline engine driven generator sets utilizing magnetos, set magneto switch to OFF or STOP Position.
Do not attempt to change load connects when generator is running.
Before servicing any part of a generator set, make sure unit is completely de-energized.

WARNING

DANGEROUS GASES

are generated as a result of operating this equipment.

DEATH

or severe injury may result if personnel fail to observe safety precautions.
Always maintain metal-to-metal contact when filling the fuel can.
Do not smoke or use open flame in vicinity when filling the fuel can.
Do not attempt to fill fuel can when generator is running.
Do not operate generator sets in enclosed areas unless exhaust gases are properly vented to the outside. Exhaust discharge contains noxious and deadly fumes.
Use extreme care, should a selenium rectifier malfunction, to avoid inhalation of poisonous fumes.

CAUTION

DAMAGE

to the equipment may result if personnel fail to observe safety precautions.
If generator set is shut down by the operation of a safety device, do not attempt to operate unit until the cause has been determined and eliminated.



CHANGE }
NO. 1 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 11 February 1977

**Operator, Organizational, and Direct Support
Maintenance Manual**

for
GENERATOR SET, GASOLINE ENGINE
w/CARRYING SOUND HOUSING CASE,
PU-422B/U: 0.4 KW, AC, 115 V, 400 Hz, and 100 V, DC,
29.3 V, ADMIRAL MODEL GJ4266, NSN 6115-00-225-0142,
MODEL MIL-G-52373, NSN 6115-00-726-7933, HENRY SPEN
MODEL 909238-1A, NSN 6115-00-240-8729; PU-532/PPS-4:
0.3 KW, AC, 115 V, 400 Hz, 30 V, 17 AMP, 24 V, 2.5 AMP, DC,
ADMIRAL MODEL G-2633, NSN 6115-00-889-1212, HENRY SPEN MODEL
909238-1B, NSN 6115-00-436-4230

TM 5-6115-573-13, 8 March 1973, is changed as follows:

Title is changed to read as shown above.

Page 1-1. Paragraph 1-1 is superseded as follows:

1-1. Scope

This manual is for your use in operating and maintaining the PU-422 (Models 909238-1A, GJ4266, and MIL-G-52373) and PU-532/PPS-4 (Model 909238-1B and G-2633) Generator Sets.

Paragraph 1-7, first sentence is changed to read.

Generator Set PU-422, Models 909238-1A GJ4266 and MIL-G-52373 (fig. 1-1) and Generator Set PU-532/PPS-4, Model 909238-1B and G-2633 (fig. 1-2) are complete portable power sources.

Page 1-2. Figure 1-1 title is changed to read as follows:

"Figure 1-1. PU422 Generator Set (Model 909238-1A, GJ4266, and MIL-G-52373)."

By Order of the Secretary of the Army:

BERNARD W. ROGERS
General, United States Army
Chief of Staff

Official:

PAUL T. SMITH
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-25D, Operator requirements for Generator Sets, Engine Driven 4kw.

TECHNICAL MANUAL }
 NO. 5-6115-573-13 }

HEADQUARTERS
 DEPARTMENT OF THE ARMY
 WASHINGTON, D. C., 8 March 1973

**OPERATOR, ORGANIZATIONAL, AND DIRECT SUPPORT
 MAINTENANCE MANUAL**

**GENERATOR SETS, GASOLINE ENGINE
 W / CARRYING SOUND HOUSING CASE**

PU-422B / U

0.4 KW, AC, 115V, 400 HZ and 100V, DC, 29.3V

ADMIRAL MODEL GJ4266, FSN 6115-225-0142

HENRY SPEN MODEL 909238-1A, FSN 6115-240-8729

PU-532 / PPS-4

0.3 KW, AC, 115V, 400 HZ, 30V, 17 AMP, 24V, 2.5 AMP, DC

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HENRY SPEN MODEL 909238-1B, FSN 6115-436-4230

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* This manual supersedes TM 5-6115-573-15, 28 Jul 1970; TM 5-6115-341-15, 16 Jul 1965; and TM 5-6115-290-15, 14 October 1963, including all changes.

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

This manual is for your use in operating and maintaining the PU-422B / U (Models 909238-1A and GJ4266) and PU-532 / PPS-4 (Models 909238-1B and G-2633) generator sets.

1-2. Maintenance Forms and Records

Maintenance forms and records that you are required to use are explained in TM 38-750.

1-3. Reporting of Errors

You can improve this manual by calling attention to errors and by recommending improvements using DA Form 2028 (Recommended Changes to Publications), or by a letter, and mail directly to

Commanding General, U.S. Army Mobility Equipment Command, ATTN: AMSME-MPP, 4300 Goodfellow Boulevard, St. Louis, Mo. 63120.

1-4. Equipment Serviceability Criteria (ESC)

This equipment is not covered by an ESC.

1-5. Destruction of Army Material to Prevent Enemy Use

Refer to TM 750-244-3 for instructions to destroy material to prevent enemy use.

1-6. Administrative Storage

Refer to TM 740-90-1 for administrative storage of equipment.

Section II. DESCRIPTION AND DATA

1-7. Description

Generator set PU-422B / U, models 909238-1A and GJ4266 (fig. 1-1) and generator set PU-532 / PPS-4, models 909238-1B and G-2633 (fig. 1-2) are complete portable power sources. Each set consists of a lightweight gasoline engine and a generator (fig. 1-3) both contained in a rugged sound absorbing case, and a gasoline fuel can (fuel tank) which is mounted on top of the case when the set is operating. A separate 1-pint can, attached to the side of the gasoline can, is required for trans-

porting the lubricating oil. The oil can holds the required quantity of oil to serve as a fill for the crankcase. The generator set is operated and transported in the case. For transportation under field conditions, the entire operating installation can be man-packed using a Mark VIII Marine parkboard. The equipment is designed for use in extreme temperatures, at altitudes up to 8000 feet and in humidity up to 100 percent. The maintenance paragraphs of this manual contain detailed descriptions of unit components.

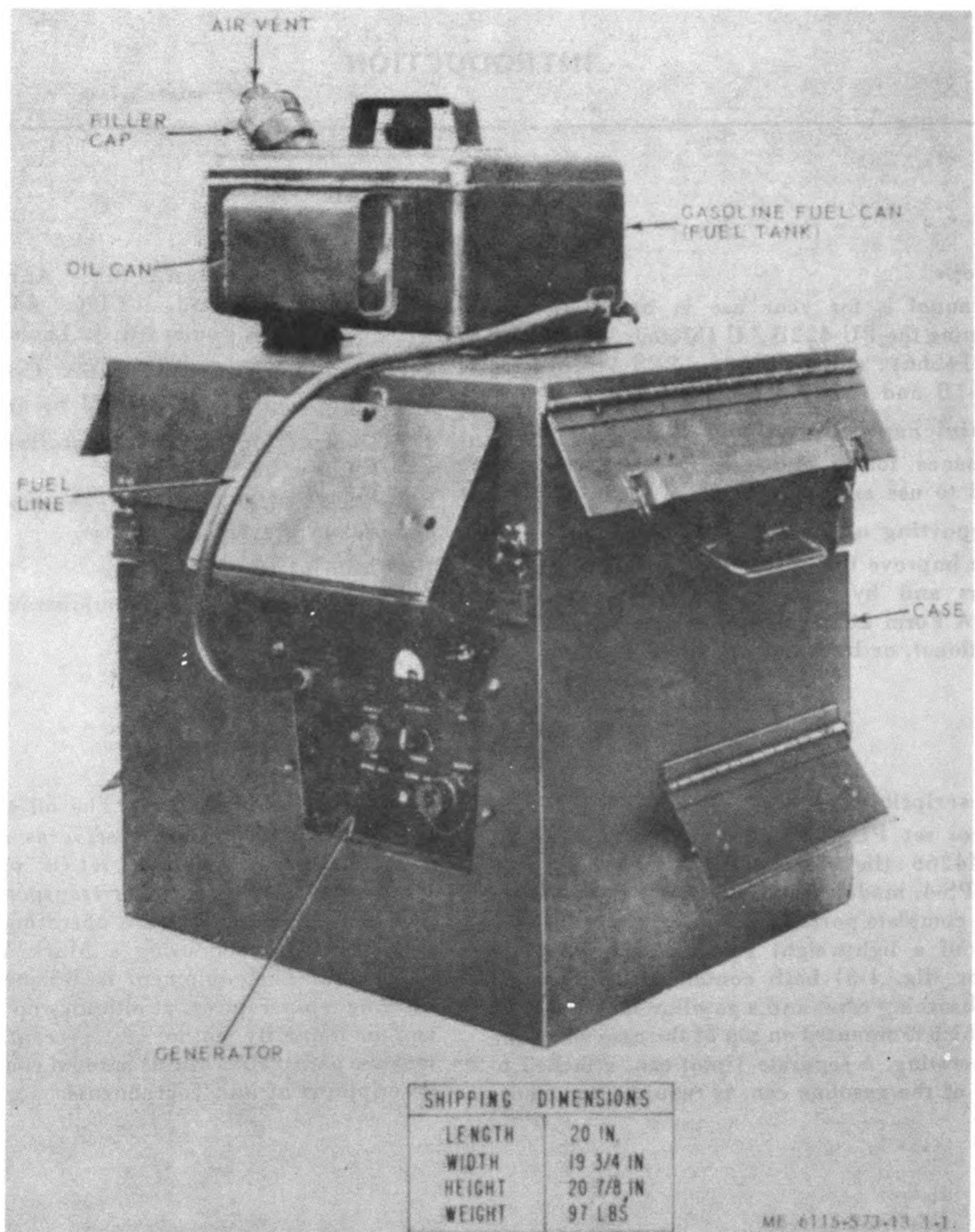


Figure 1-1. PU-422B / U generator set (Models 909238-1A and GJ4266).

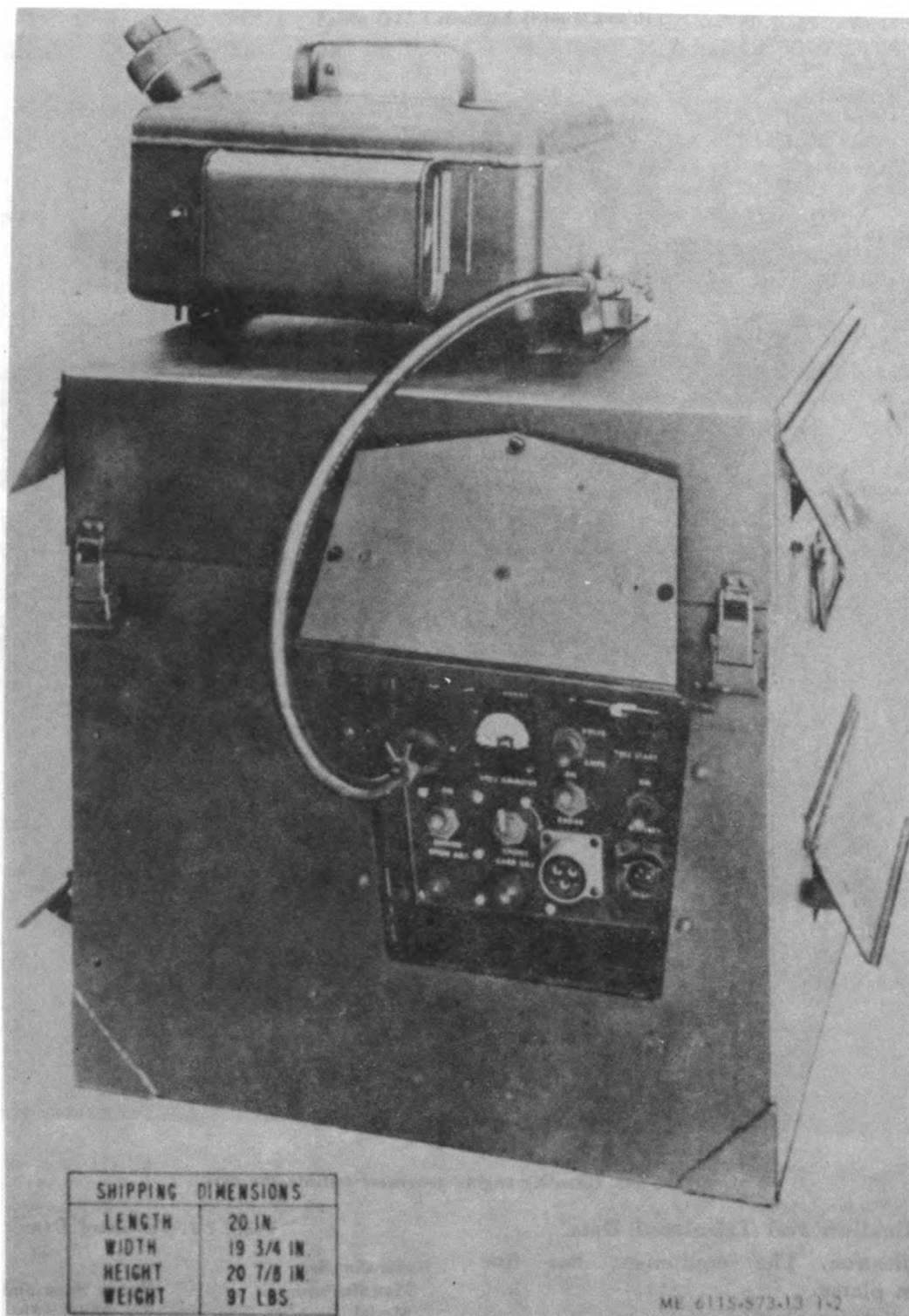


Figure 1-2. PU532 / PPS-4 generator set (Models 909238-1B and G-2633).

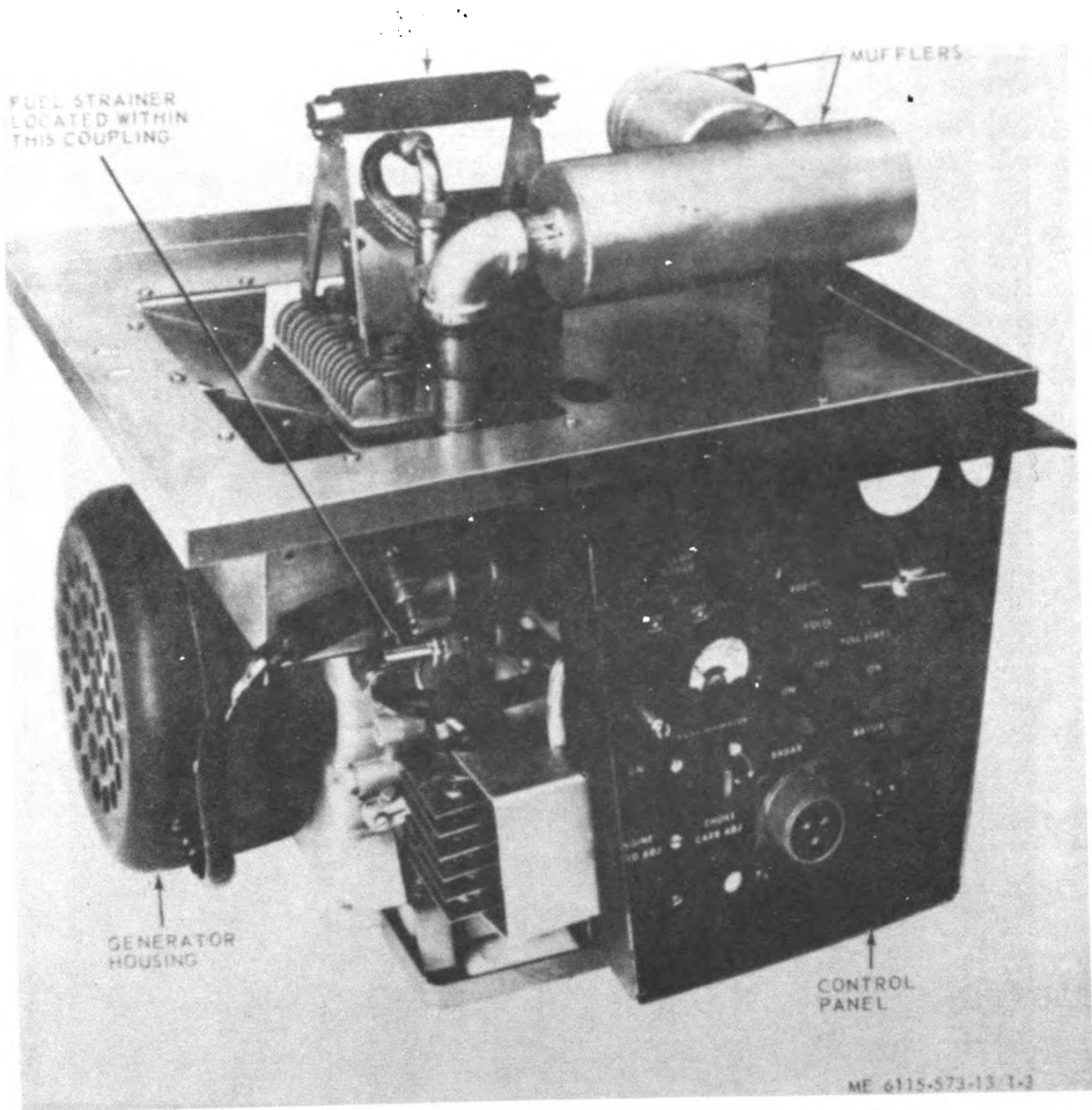


Figure 1-3. Gasoline engine generator outside the case.

1-3. Identification and Tabulated Data

a. *Identification.* The equipment has five identification plates.

- (1) Case name plate.
- (2) Engine name plate.
- (3) Generator name plate.
- (4) Operating instruction plate.
- (5) Stopping precaution plate.

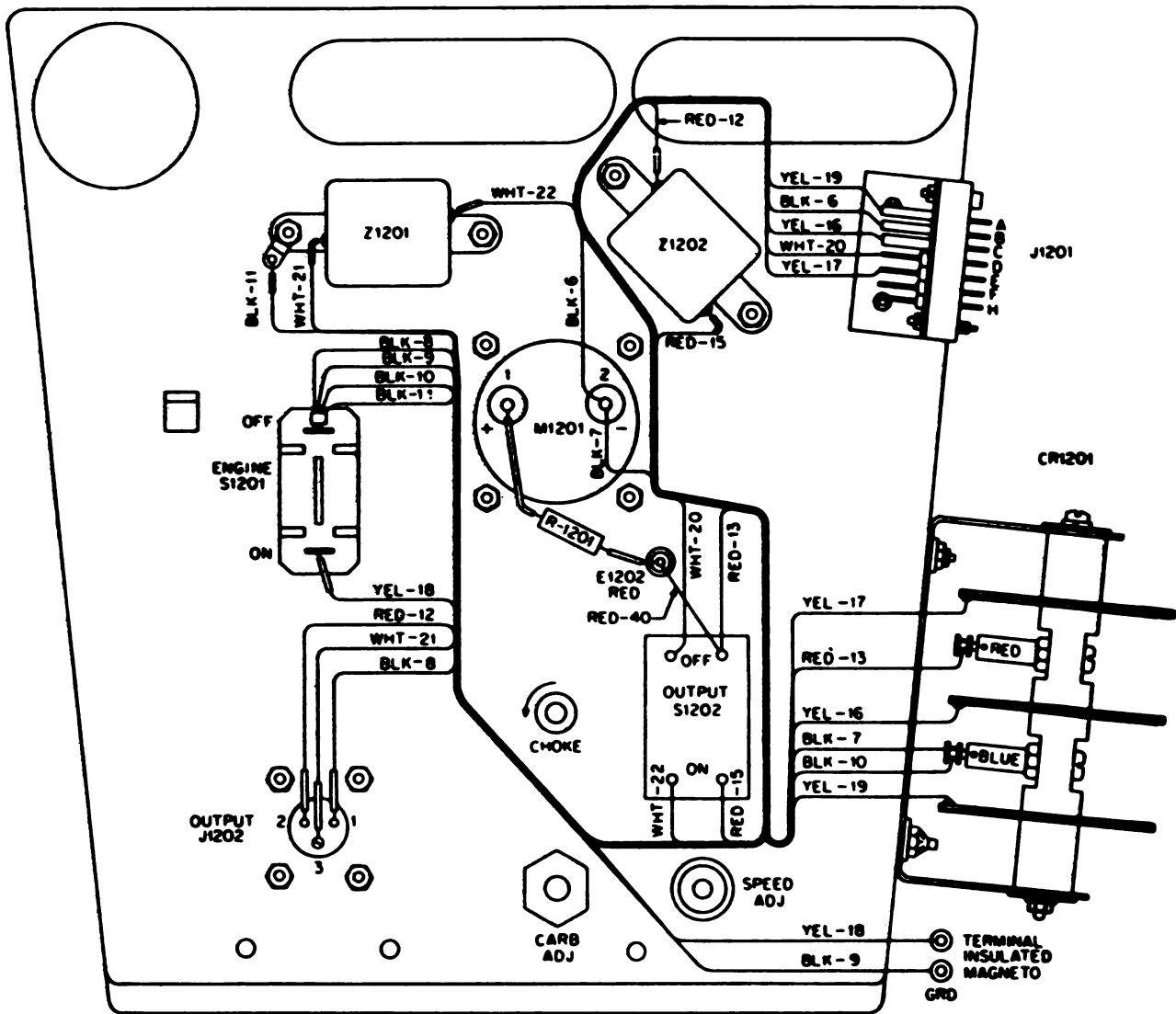
b. *Tabulated Data.* Table 1-1 contains data applicable to operator and organizational maintenance.

Table 1-1. Tabulated Data

| | |
|-----------------------|---|
| <i>Generator Set:</i> | |
| Manufacturer..... | Henry Spen and Co. |
| Model | PU-422B / U, Mfr Model 908238-1A PU-532 / PPS-4, Mfr Model 909238-1B |
| Manufacturer | Admiral Corp. |
| Model | PU-422B / U, Mfr Model GJ4266 PU-532 / PPS-4, Mfr Model G-2633 |

Table 1-1. Tabulated Data (Cont'd)

| | | | |
|---------------------|--|--------------------------------|---|
| Serial No. Range | Henry Spen Models PU-422B / U: 0001 to 0300 PU-532 / PPS-4: 0001 to 1093 | Part No. | PU-422B / U: GD4262 PU-532 / PPS-4: 70117-GC3633 |
| | Admiral Models PU-422B / U: 1 to 225 PU-532 / PPS-4: 1 to 2140 | Type | Permanent magnet |
| Electric Outputs | PU-422B / U: No. 1, 29.3 vdc, 3/4 amp No. 2, 115 vac, 400 va, 400 Hertz PU-532 / PPS-4: No. 1, 24 to 35 vdc, 0 to 17 amp (bat-charging) No. 2, 24 vdc, 2.5 amp (radar set) No. 3, 115 vac, 300 va, 400 Hertz | Rated input speed | 3428 rpm |
| | | Drive | Direct |
| | | Mounting nut torque | 7-8 foot-pounds |
| | | Number of poles | 7 pairs |
| | | Output rating | Sum of all outputs not to exceed 600 watts for PU-532 / PPS-4 and 500 watts for PU-422B / U |
| Engine: | | | |
| Manufacturer | Briggs and Stratton | Carburetor: | |
| Model | 60432, Type 0189-01 Modified | Manufacturer | Briggs and Stratton |
| Type | Air cooled - 4 stroke cycle | Model | 296108 |
| Number of Cylinders | 1 | Wiring Diagram: | |
| Bore | 2 3/8 in. | PU-422B / U | Refer to figure I-4. |
| Stroke | 1 1/2 in. | PU-532 / PPS-14 | Refer to foldout 1, located in back of manual. |
| Piston displacement | 6.61 cu. in. | Schematic Diagram: | |
| Compression ratio | 6.5:1 | PU-422B / U | Refer to foldout 2. |
| Governed speed | 3428 rpm nominal | PU-532 / PPS-4 | Refer to foldout 3. |
| Air cleaner | Dry type | Dimensions and Weights: | |
| Ignition system | Magneto (with integral high tension wire) | Overall length | 1 ft., 5 1/4 in. |
| Spark plug gap | 0.030 in. | Overall width | 1 ft., 6 1/4 in. |
| Magneto points gap | 0.020 in. | Overall height | 2 ft., 3 3/4 in. |
| Type of lubrication | Splashed oil | Net weight (empty) | 65 1/2 lbs. |
| | | Net weight (filled) | 80 3/4 lbs. |
| | | Shipping dimensions | |
| | | Length | 20 in. |
| | | Width | 19 3/4 in. |
| | | Height | 20 7/8 in. |
| | | Weight | 97 lbs. |
| Generator: | | | |
| Manufacturer | Henry Spen and Co. | Torque Data: | |
| Part No. | PU-422B / U: 600525-1 PU-532 / PPS-4: 600526-1 | Connecting rod screws | 8 foot-pounds |
| Manufacturer | Admiral Corp. | Rotor fastening screw | 7-8 foot-pounds. |



Device Legend

| | | | |
|---------------|----------------------|--------------|----------------------------------|
| C1201 | Ignition capacitor | J1202 | Connector, output |
| CR1201 | Rectifier assembly | M1201 | Voltmeter |
| E1201 | Spark plug | P1201 | Connector, generator |
| E1202 | Terminal, standoff | R1201 | Resistor, 40.2-kilohm resistance |
| EB1201 | Breaker contacts | S1201 | Switch, engine on-off |
| G1201 | Generator | S1202 | Switch, output on-off |
| G1202 | Permanent magnet | Z1201 | Filter, dc output |
| J1201 | Connector, generator | Z1202 | Filter, ac output |

ME 6115-573-13/1-4

Figure 1-4. Practical wiring diagram (PU-422B/U).

1-9. Differences in Models

This manual covers generator sets manufactured by Henry Spen and Co. as models 909238-1A (PU-422B / U) and 909238-1B (PU-532 / PPS-4), and by Admiral Corp. as models GJ4266 (PU-422B / U) and G-2633 (PU-532 / PPS-4). The PU-422B / U generator set has an electrical power output of 115 VAC at 400 Hertz and a +30 VDC output. The PU-532 / PPS-4 generator set, in

addition to having a 115 VAC utility output, also has available a ± 24 VDC output for radar and other electronic equipment, and a variable DC voltage of 24 to 35 VDC for charging storage batteries. On the Admiral Corp. model G-2633 (PU-532 / PPS-4), units with serial numbers 2131 through 2140 have an improved flywheel containing three magnets and a magneto coil containing a permanently attached ignition lead.

CHAPTER 2

OPERATING INSTRUCTIONS

WARNING

If equipment fails to operate, refer to troubleshooting procedures in Chapter 3.

Section I. OPERATING PROCEDURES

2-1. Controls and Instruments (PU-422B / U)

a. Rope Starter. The rope starter (1, fig. 2-1) turns the engine over for starting. Pull the handle outward to rotate the engine flywheel. The rope is rethreaded automatically by a spring action. The starter is automatically disengaged when the engine starts.

b. Engine Switch. The engine switch (2) is connected across the engine breaker points. When the switch is off, the breaker points will not operate. When the switch is on, the ground is removed from the ignition system permitting the engine to be started. This switch must be in the ON position to start and run the engine.

c. Engine Speed Adjust. The speed adj thumb nut (3) controls a vernier adjustment, mechanically linked to the governor. It, therefore, permits the engine governor counter-balancing spring tension to be manually adjusted and thus controls the speed of the gasoline engine. It should be set so that the unit operates at a desirable controlled speed, i.e., generating desired electrical outputs.

d. Carburetor Adjust. The carb adj knob (4) adjusts the gasoline-to-air mixture of the car-

buretor. It should be set to provide smooth operation of the engine.

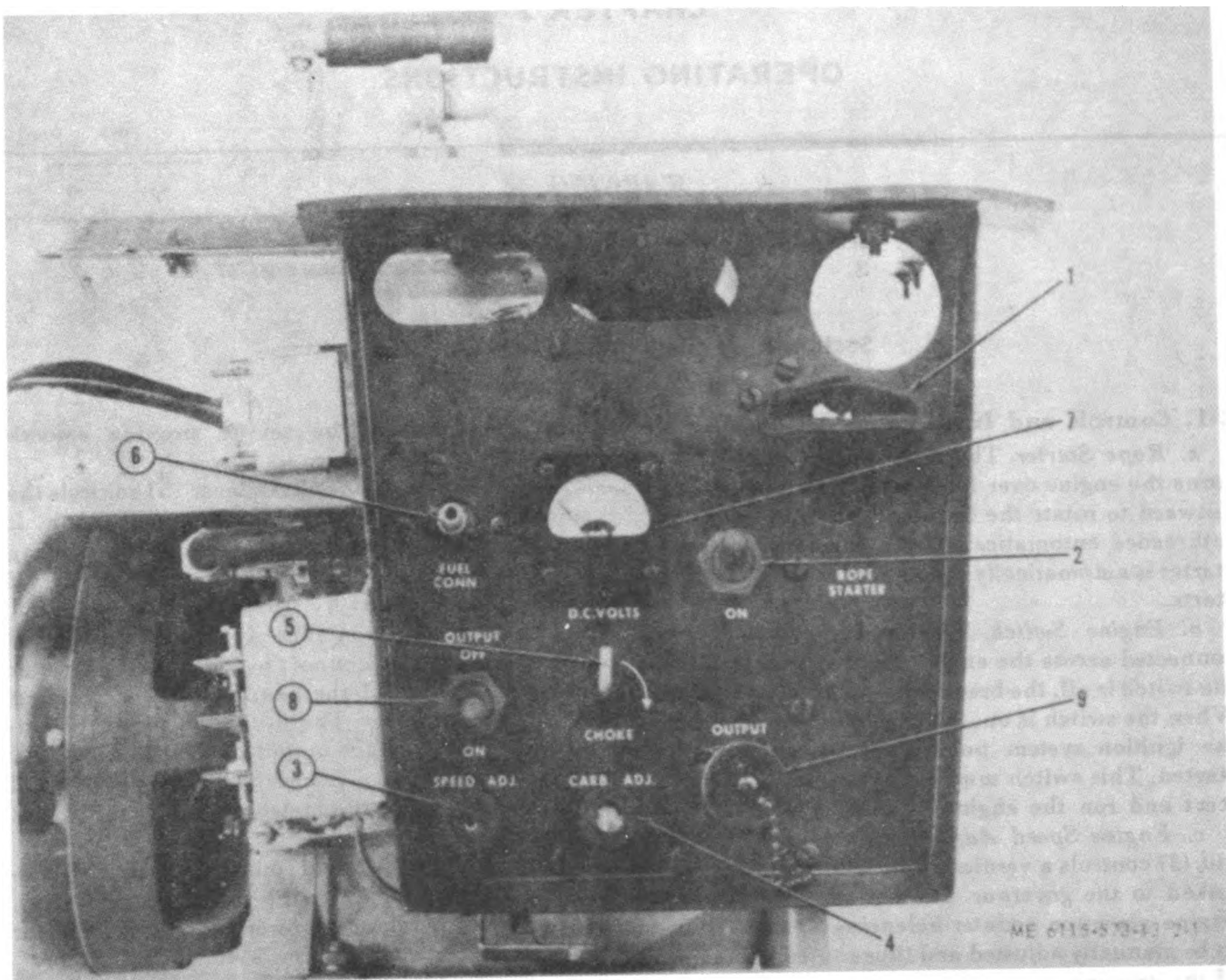
e. Choke Lever. The choke lever (5) controls the amount of filtered air flowing to the carburetor. It is used (turning lever clockwise) only when starting a cold engine. It is normally retained in the off position (handle up) by spring action.

f. Fuel Connector. The fuel conn inlet (6) provides a quick disconnect between the carburetor and the fuel line of the gasoline can.

g. DC Voltmeter. The d.c. volts meter (7) indicates the d-c voltage output of the generator set. After the engine is warmed up and supplying full power to the load, the meter pointer should be in the red area of the scale.

h. Output Switch. The output switch (8) controls a-c and d-c power to the output connector (9). When OFF, it removes power from the connector and when ON, applies power to the connector.

i. Output Connector. The output connector (9) is the means of connecting electrical load to the generator set. Power is applied only when the output switch (8) is in the ON position.



- 1 Rope starter
- 2 Engine switch
- 3 Speed adjust control knob
- 4 Carburetor adjust control knob

- 5 Choke lever
- 6 Fuel connector inlet
- 7 DC voltmeter
- 8 Output switch
- 9 Output connector

Figure 2-1. Controls and instruments (PU-422B/U).

2-2. Controls and Instruments (PU-532 / PPS-4)

a. *Rope Starter.* The pull start (1, fig. 2-2) functions as described in paragraph 2-1 a.

b. *Engine Switch.* The engine switch (2) functions as described in paragraph 2-1 b.

c. *Engine Speed Adjust.* The speed adj. (3) functions as described in paragraph 2-2 c.

d. *Carburetor Adjust.* The carb adj (4) functions as described in paragraph 2-2 d.

e. *Choke Lever.* The choke (5) functions as described in paragraph 2-2 e.

f. *Fuel Connector.* The fuel conn (6) functions as described in paragraph 2-2 f.

g. *Battery Switch.* The battery switch (7) is used to apply the generator output to the battery connector (8). The output is used for charging storage batteries. Battery charging power is therefore available when the switch is ON.

h. *Battery Connector.* The purpose of the battery connector (8) is to supply 17 amperes at 29 volts for charging battery BB-422 / U only. It can be used at the same time that power is being supplied from the other outlets. It may be necessary to readjust the SPEED ADJ (3) to provide the proper outputs for battery charging.

i. *Radar Switch.* The radar switch (9) is used to

apply the generator output to the radar connector (10). The output is used for operating radar equipment. Radar power is therefore available when the switch is ON.

j. Radar Connector. The radar connector (10) is used to supply 24 volts at 2.5 amperes to the radar set only. Radar Set AN / PPS-4 is designed to operate from this outlet.

k. Panel Meter. The volt ammeter (11) is used for measuring output voltage and current of the battery-charging circuits. The dual function of the meter is accomplished by means of a meter switch (12) which inserts the meter in series in the circuit to measure current or in parallel to measure voltage.

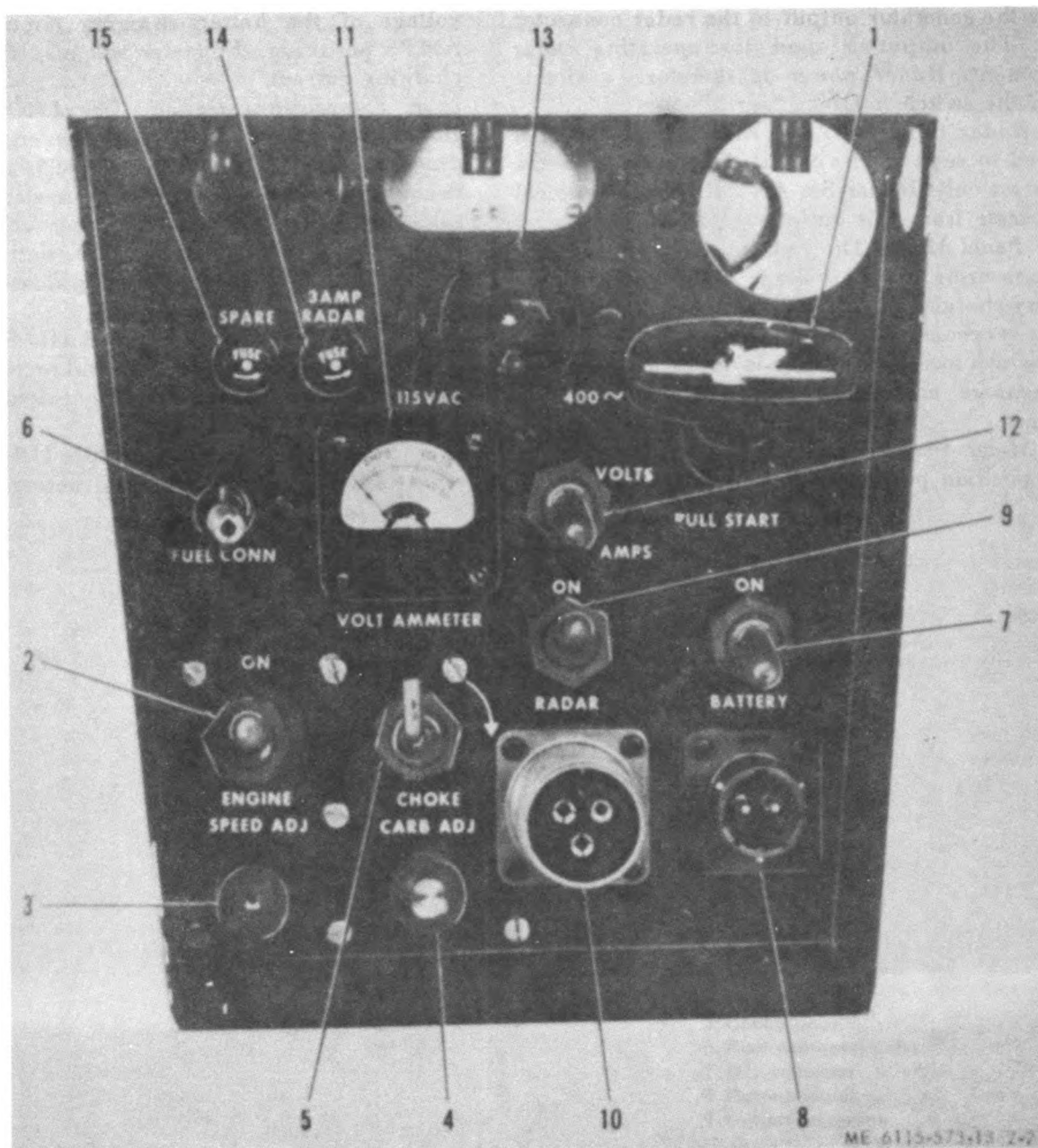
l. Meter Switch. The meter switch (12) in the volts position permits the meter (11) to read the

voltage of the battery-charging circuit. In the AMPS position, the meter will read the battery-charging current.

m. Convenience Outlet. The 115 VAC 400 Hertz convenience outlet (13) is energized at all times, so long as the generator set is running. It becomes a power supply source for electric lights, soldering irons, heaters, and other utilities. The maximum load capacity is 300 watts. Do not operate 60 Hertz motor driven appliances from this outlet.

n. Radar Fuse. The 3 AMP RADAR fuse (14) is used to protect the regulator and rectifiers in the generator set regulator circuit from damage due to overload.

o. Spare Fuse. The SPARE fuse (15) is used to replace the RADAR fuse when necessary.



- | | |
|----------------------------------|---|
| 1 Pull start | 8 Battery connector |
| 2 Engine switch | 9 Radar switch |
| 3 Speed adjust control knob | 10 Radar connector |
| 4 Carburetor adjust control knob | 11 Volt ammeter |
| 5 Choke lever | 12 Meter switch |
| 6 Fuel connector inlet | 13 115 VAC 400 Hertz convenience outlet |
| 7 Battery switch | 14 3 AMP radar fuse |
| | 15 Spare fuse |

Figure 2-2. Controls and instruments (PU-532 / PPS-4).

2-3. Preparation for Starting

a. Perform any necessary installation or setting-up instructions (para 4-2).

b. Perform the necessary daily preventive maintenance services (para 3-4).

c. Replace engine in case. Place case cover on top of case and tighten fasteners.

d. Open the front-panel access door and hook it on the upper bracket on the case. In case of rain, hook it on the lower bracket (fig. 4-1).

e. Clamp gas can on case cover and connect fuel line to fuel conn inlet on the control panel (6, fig. 2-1 and 2-2). Do not attempt to remove vent.

CAUTION

All air vents must be open during operation.

f. Open air vent on gasoline can by turning vent screw counterclockwise until slight resistance is felt.

g. Open fuel valve on gasoline can by turning shutoff valve handle counterclockwise.

2-4. Starting

a. Starting Engine.

(1) Set the output switch (8, fig. 2-1), on the PU-422B / U to OFF and the battery and radar switches (7 and 9, fig. 2-2) on the PU-532 / PPS-4 to OFF.

(2) Set the engine switch to ON.

(3) Rotate the carb adj control clockwise until it resists further rotation. Then turn this knob counterclockwise $1\frac{1}{2}$ turns.

(4) On cold engines, using the left hand, rotate the choke lever $\frac{1}{4}$ turn clockwise and hold it against the spring return tension. On engines that retain heat from a previous period of operation, do not move the choke lever.

(5) Pull rope starter (PULL START) handle once. Release choke lever and allow it to return to its normal position. Start engine by pulling the rope starter (PULL START). If engine does not start after three successive pulls, repeat the choking action. If engine still does not start, check gas flow and spark; if normal, refer to paragraph b below for starting a flooded engine.

(6) When the engine starts, release the choke lever at a rate that will keep the engine running smoothly.

(7) After engine has started, allow several minutes for warm-up.

(8) If engine does not run smoothly, turn carb adj clockwise until engine just misses. Then turn carb adj counterclockwise past smooth operating point until engine runs unevenly. Set carb adj to midpoint between these limits.

b. Starting Flooded Engine. Engine flooding occurs when the engine is overchoked, particularly when the engine is warm. Start a flooded engine as follows:

(1) Close carburetor needle valve by turning

the CARB ADJ clockwise (fig. 2-1 and fig. 2-2).

(2) Remove the spark plug.

(3) Clean and dry the spark plug and reinstall it in the cylinder head. A small flame will rapidly dry the plug.

(4) With no further adjustments, make certain the engine switch is ON. Then pull the rope starter to start the engine. A number of pulls may be necessary before engine will start. When engine starts, allow it to run until the carburetor begins to run dry and the engine begins to misfire. The carb adj control on the front panel may now be adjusted between $\frac{3}{4}$ and 1 turn counterclockwise for continued smooth operation of the engine. If engine stops before adjustment is complete, set carb adj and restart engine without choking.

(5) Repeat the starting operation with the choke fully opened.

2-5. Stopping

a. Short Periods. Follow steps (1) and (2) below when the generator set will not be used for short periods of time (1 hour or less).

(1) Disconnect load from the generator set by moving the output switch (8, fig. 2-1) on the PU-422B / U to OFF, the battery and radar switches (7 and 9, fig. 2-2) on the PU-532 / PPS-4 to OFF; remove any plug which may have been inserted in the 115 FAC receptacle (13, fig. 2-2).

(2) Stop the engine by placing engine switch on OFF.

b. Long Periods. Follow steps (1) through (5) below when the generator set will not be used for long periods of time (over 1 hour).

(1) Remove load (para a above).

(2) Tightly close the fuel shutoff valve in the fuel line on gas can.

(3) Disconnect the fuel line from the fuel connector on the control panel and allow the engine to run until the carburetor runs dry. Inspect the fuel line to make certain the automatic shutoff valve is operating and that the fuel line is not leaking. Then, connect the fuel line to the transport clamp on the gas can (fig. 2-3).

(4) Close the vent on the gasoline can by turning vent screw clockwise.

(5) Close all external air vents in the case.

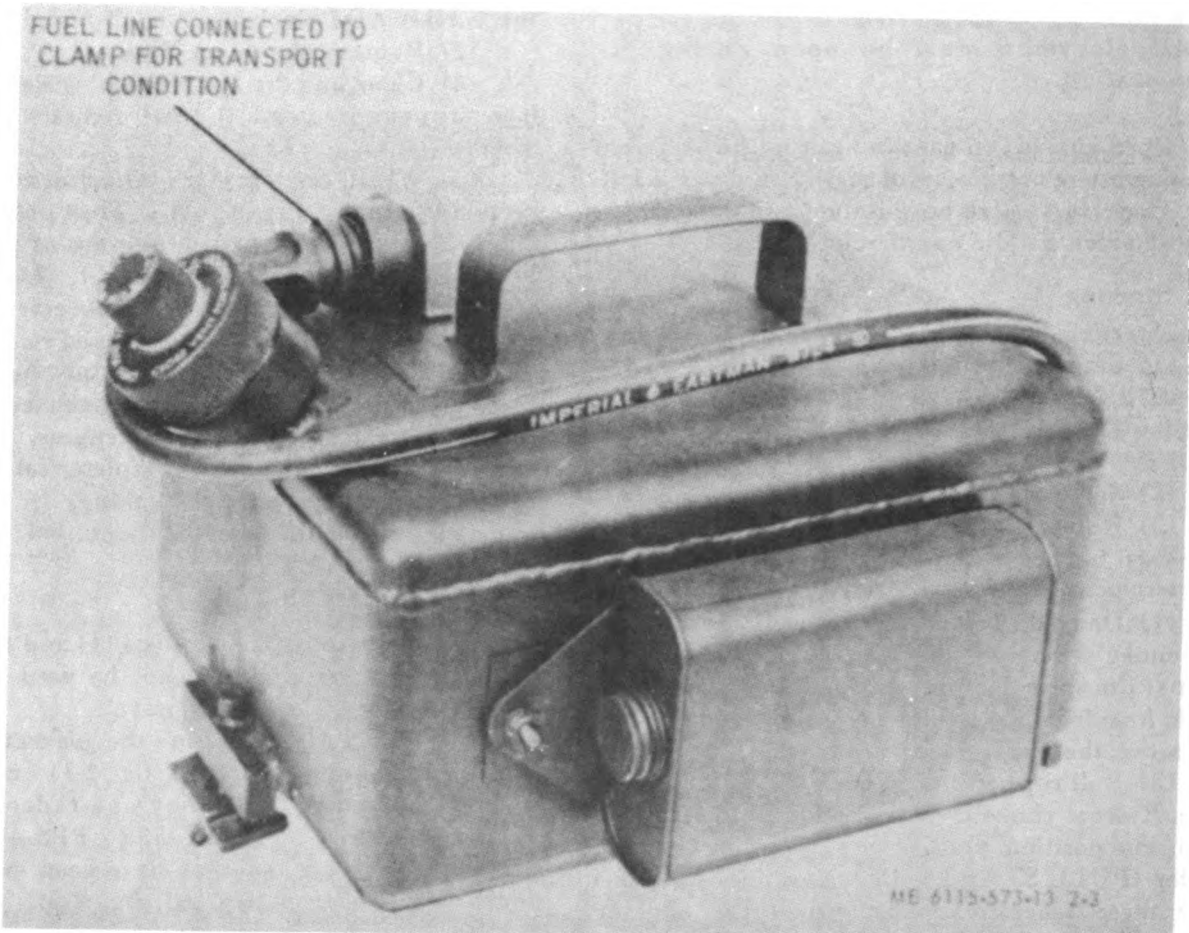


Figure 2-3. Gasoline fuel can with fuel line.

2-6. Operation Under Normal Conditions

a. Generator Set PU-422B / U.

(1) Start the generator set as instructed in paragraphs 2-3 and 2-4.

(2) Adjust speed adj control (3, fig. 2-1) until the DC volts meter (7) registers in the red area.

CAUTION

Except in cases of emergency, the engine should be allowed a minimum of 5 minutes to warm up before proceeding to step (3) and applying the load. This is especially necessary in cold weather.

(3) Supply power to the load by moving OUTPUT switch (8) to ON.

(4) Adjust speed adj control (3) until the DC volts meter pointer is in the red area of the scale.

NOTE

Check oil every 4 hours during continuous operation.

(5) Stop the engine as described in paragraph 2-5.

b. Generator Set PU-532 / PPS-4.

(1) Start the engine as instructed in paragraphs 2-3 and 2-4. Allow the engine to warm up for 5 minutes before applying the load.

CAUTION

Except in cases of emergency, the engine should be allowed a minimum of 5 minutes to warm up before proceeding to step (2) and applying the load. This is especially necessary in cold weather.

(2) Move the battery and radar switches (7 and 9, fig. 2-2) to ON, depending upon which equipment is being used. Power will be available at the 115 VAC receptacle (13) whenever the engine is running.

(3) The engine speed can be raised or lowered (thereby changing the battery charging voltage or rate, and the output frequency at the convenience outlet) by turning the speed adj knob (3) clockwise

or counterclockwise, respectively. When using the RADAR output (10), move the speed adjust to a position where under "no load", the battery voltage meter indicates 36 volts, or more.

NOTE

The engine governor will automatically control the

engine speed by varying the throttle lever position with respect to the load applied, and within the limits set by the SPEED ADJ.

(4) Stop the engine as described in paragraph 2-5.

Section II. OPERATION UNDER UNUSUAL CONDITIONS

2-7. Operation in Extreme Cold

a. If possible, keep the unit in a heated enclosure between operating periods.

b. Drain and clean fuel strainer and fuel filter as necessary.

c. Keep the fuel tank full at all times, to prevent excessive condensation of water in the tank.

NOTE

Starting in extreme cold may require heating of the intake manifold, cylinder head, crankcase, and recoil starter.

d. Use the highest octane unleaded gasoline available for easy starting in extreme cold.

e. In extremely cold temperatures, additional choking is required to start the unit. Avoid too much choking; it will cause carburetor and spark plug flooding.

f. Use extra care to insure that the engine reaches normal operating temperature before applying the load or completely releasing the choke.

g. If the unit is operated in an enclosed space, take extra precautions to insure that all connections for piping the exhaust outside of the building are secure and gas tight.

h. Lubricate with a lighter weight oil. See table 3-1.

2-8. Operation in Extreme Heat

a. *Indoor Ventilation.* If the power unit is operated indoors, allow sufficient room around the equipment for air circulation and ventilate the room with exhaust fans.

WARNING

Never operate the power units indoors without providing leakproof piping to vent the exhaust fumes to the outside of the building. The exhaust fumes contain carbon monoxide, a colorless, odorless, tasteless gas, which is deadly poisonous if continuously inhaled.

b. *Cooling.* Check the cooling fins on the cylinder and cylinder head to make sure they are clean and undamaged.

c. *Load.* If possible, operate the unit at less than the full rated load, to minimize the danger of overheating. Make sure that the power unit is not overloaded.

d. *Shade.* Provide shade to protect the unit from the direct rays of the sun. Engine power decreases 1 percent at each 10° F. that the air is above a standard temperature of 60° F.

CAUTION

Secure the fuel can firmly to avoid spilling fuel on the generator set.

e. For operation at high ambient temperature, elevate the fuel can an additional 8 inches above the generator accoustical housing.

2-9. Operation in Dusty or Sandy Areas

a. *Protection.* Shield the generator set from dust and sand. Take advantage of natural barriers which offer protection from blowing sand and dust.

b. *Fuel.* Strain all fuel before pouring it into the fuel can. Use precautions to prevent sand from entering the fuel can while it is being poured. Service the air cleaner and fuel filters frequently to keep the fuel system free of sand and dirt.

c. *Cleaning.* Clean the generator set frequently. Clean area around oil filler cap before inspecting, or before adding engine oil. Keep vent door closed when engine generator is not in use.

2-10. Operation Under Rainy or Humid Conditions

a. If the unit is not operating, close the vent doors on the carrying case to prevent the gathering of moisture.

b. If the unit is outside and not operating, protect it with a tarpaulin, or with a canvas or other waterproof covering.

c. Clean the generator set frequently. Clean area around oil filler cap before inspecting, or before adding engine oil. Keep vent doors closed when engine generator is not in use.

d. Keep the fuel tank full, to minimize the effects of condensation.

2-11. Operation in Salt-Water Areas

a. *General.* Salt water corrodes metal. Avoid allowing the unit to come into contact with salt water. Wash the equipment with clean, fresh water. Be careful, however, that the fresh water does not contaminate the fuel system or damage the electrical equipment.

b. *Paint and Protection.* Remove rust immediately, and paint all exposed, nonpolished.

metallic surfaces (but not the mufflers or cooling fins). Coat exposed parts of polished steel or other ferrous metals with standard-issue rust-proofing material if available, or cover parts with a light coat of grease.

2-12. Operation at High Altitudes

a. Engine power output decreases at the rate of 3½ percent for each 1000-foot increase in elevation above sea level. The generator output will decrease accordingly as engine output decreases. The generator set is designed to operate at elevations up to 5,000 feet above sea level without special service or adjustment. Beyond 5,000 feet, the 3½ percent derating factor may have to be considered if maximum power output is desired.

b. Reduced output of the engine at higher elevations is a normal condition which cannot be prevented, but maximum performance can be maintained by following all servicing instructions carefully. See that the air cleaner filter element is not clogged. Be sure that the equipment is clean and free from objects that might restrict the flow of air to the unit. Instructions for cleaning the air filter appear in paragraph 4-20.

CAUTION

Secure the fuel can firmly to avoid spilling fuel on the generator set.

c. For operation above 5000 feet altitude, elevate the fuel can an additional 8 inches above the generator accoustical housing.

CHAPTER 3

OPERATOR / CREW MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION INSTRUCTIONS

3-1. General Lubrication Information

a. This section contains the lubrication instructions necessary to properly lubricate the generator sets.

b. Perform only those steps listed at the times listed.

3-2. Detailed Lubrication Information

a. *General.* Keep all lubricants in closed containers and in a clean, dry place away from external heat. Allow no dust, dirt, or other foreign material to mix with lubricants. Keep all lubrication equipment clean and ready for use.

b. *Cleaning.* Keep all external parts not requiring lubrication, clean of lubricants.

c. *Points of Lubrication.*

(1) Refer to table 3-1 for applicable lubricants.

(2) Refer to figure 3-1. Check level every 4 hours; drain and refill (para 3-9) every 25 hours; capacity is ½ quart.

Table 3-1. Crankcase Oil Specifications

| Temperature range (°F.) | Specification | |
|-------------------------|---------------|-------------|
| -10 and below | MIL-L-10295A | Grade OE-S |
| -10 to +32 | MIL-L-2104 | Grade OE-10 |
| +32 and above | MIL-L-2104 | Grade OE-30 |

NOTE

MIL-L-6082, Grade 1065 oil is to be used when MIL-G-5572 gasoline is used.

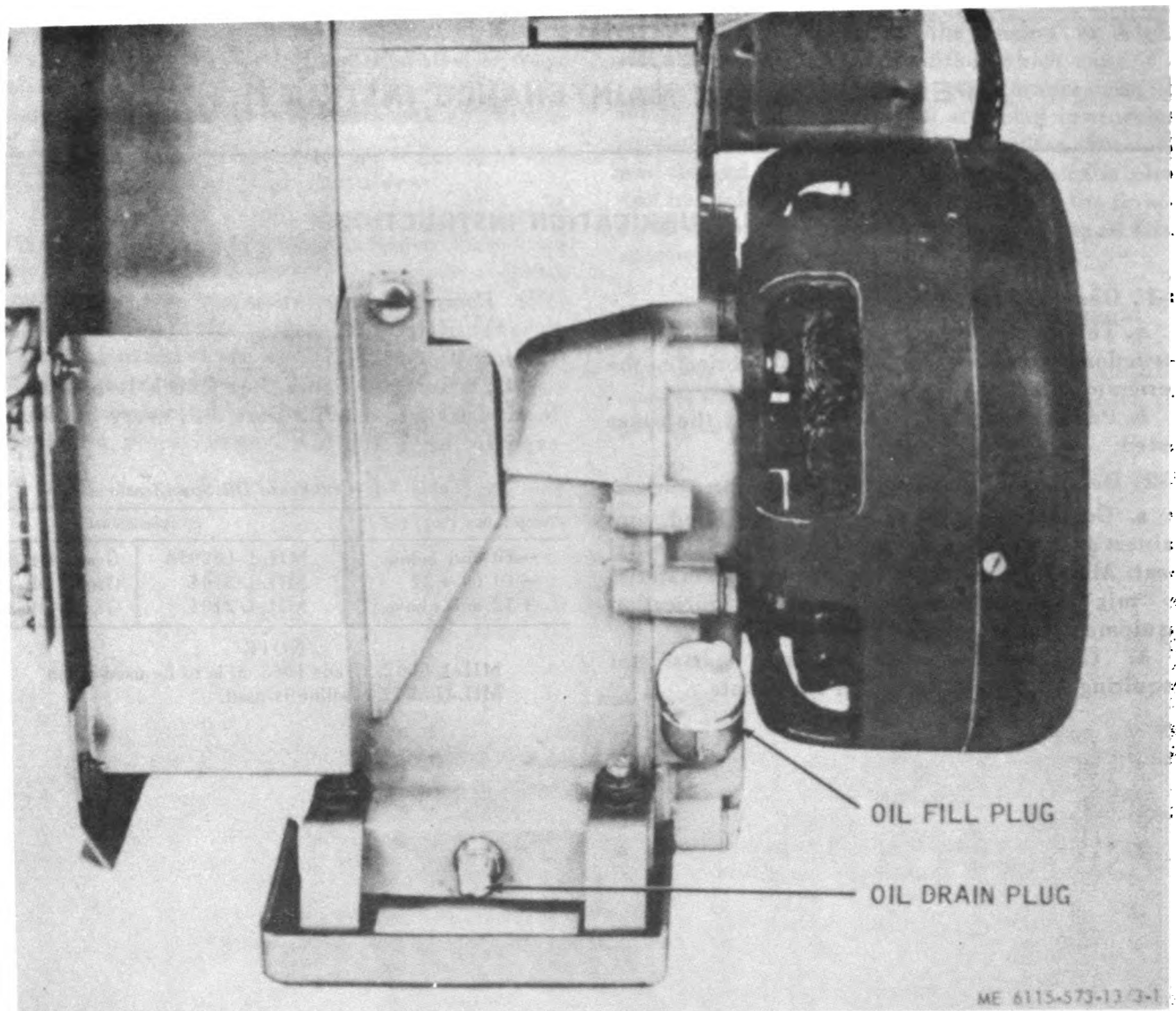


Figure 3-1. Oil fill and oil drain plugs.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

3-3. General

To insure that the generator set is ready for operation at all times, it must be inspected systematically so that defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance checks and services to be performed are listed and described in paragraph 3-4. The item numbers indicate the sequence of minimum inspection requirements. Defects discovered during operation of the unit will be noted for future correction to be made as soon as operation has ceased. Stop

operation immediately if a deficiency is noted during operation which would damage the equipment if operation were continued. All deficiencies and shortcomings will be recorded together with the corrective action taken on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) at the earliest possible opportunity.

3-4. Preventive Maintenance Checks and Services

Refer to table 3-2 for the operator's daily preventive maintenance checks.

Table 3-2. Operator / Crew Preventive Maintenance Checks and Services

| B—Before Operation Time required: 0.5 | | | D—During Operation 0.1 | A—After Operation Time required: |
|--|---|---|---|-------------------------------------|
| Interval and Sequence no. | | | Item to be inspected Procedure | Work time (M / H) |
| B | D | A | | |
| 1 | | | FUEL CAN Inspect for cracks, dents, leaks, and worn threads. Wet the filter with gasoline, and add fuel as required; loosen vent cap before starting (para 3-7). | 0.1 |
| 2 | | | FILLER CAP AND FUEL FILTER Remove cap and extract filter from fuel can. Inspect cap for cracks, damaged or missing vent nut or air vent gasket, and for worn or broken threads. Replace a damaged cap. Check filter for wear or other damage and replace if necessary (para 3-7). | 0.1 |
| 3 | | | OIL LEVEL With engine in a level position, remove oil fill plug and check oil level. Oil should reach top of the threads of the oil fill opening. Add oil if needed. <i>Note</i> ; During continuous operation, check every 4 hours. | 0.1 |
| 4 | 6 | | CONTROLS AND INSTRUMENTS Inspect for damage and loose mounting. With the unit operating, inspect for correct operation. | 0.2 |
| 5 | | | CARRYING CASE Inspect for dents, broken hinges or handles. Check inside case for tears in sound absorbing material. | 0.1 |

Section III. TROUBLESHOOTING

3-5. General

a. This section contains troubleshooting information for locating and correcting most of the operating troubles which may develop in the generator set. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help you to determine probable causes and corrective actions to take. You should perform the tests/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or not covered by listed corrective actions, notify your supervisor.

3-6. Troubleshooting

Refer to table 3-3 for troubleshooting procedures.

Table 3-3. TROUBLESHOOTING

| MALFUNCTION | TEST OR INSPECTION | CORRECTIVE ACTION |
|---|--|--|
| 1. Engine Fails to Start or Starts With Difficulty. | | |
| | Step 1. Check for fuel in fuel can. | Fill fuel can. |
| | Step 2. Check for closed air vent. | Open air vent. |
| | Step 3. Check for water or dirt in fuel can. | Drain, clean, and refill fuel can with correct fuel. |
| 2. Engine Overheats or Lacks Power. | | |
| | Step 1. Inspect for partially closed choke. | Open choke fully. |
| | Step 2. Check for overloaded generator set. | Reduce load. |

Section IV. MAINTENANCE PROCEDURES

3-7. Fuel Can, Filler Cap, and Fuel Line

a. Inspection and Replacement.

(1) Inspect the fuel can (fig. 1-1) for cracks, dents, leaks, worn threads or other damage.

(2) Remove the filler cap and extract the fuel filter from neck of can. Inspect cap for cracks, damaged or missing vent nut or air vent gasket, and for worn or damaged threads. Check filter for wear. Replace an unserviceable cap or filter with a serviceable like item.

(3) Inspect filler cap gasket for cracks, deterioration, and distortion; replace if damaged.

b. Service.

(1) Wash cap and filter with approved cleaning solvent and dry thoroughly.

(2) Fill fuel can as follows:

(a) Loosen vent cap.

(b) Wet fuel filter with gasoline.

(c) Add fuel as required.

3-8. Carrying Case and Cover

a. *General.* The generator set is enclosed in a sound absorbing carrying case (fig. 3-2) consisting of a lower main case and a detachable cover. The inside of the case and cover are covered with a flexible sound absorbing material which must remain intact and undamaged. To remove the cover, lift the four latching fasteners and lift up the cover.

b. *Inspection and Replacement.* Inspect the carrying case for dents, holes, and broken latches and handles. Check the sound absorbent material for tears or other damage. Replace an unserviceable carrying case with a serviceable like item.

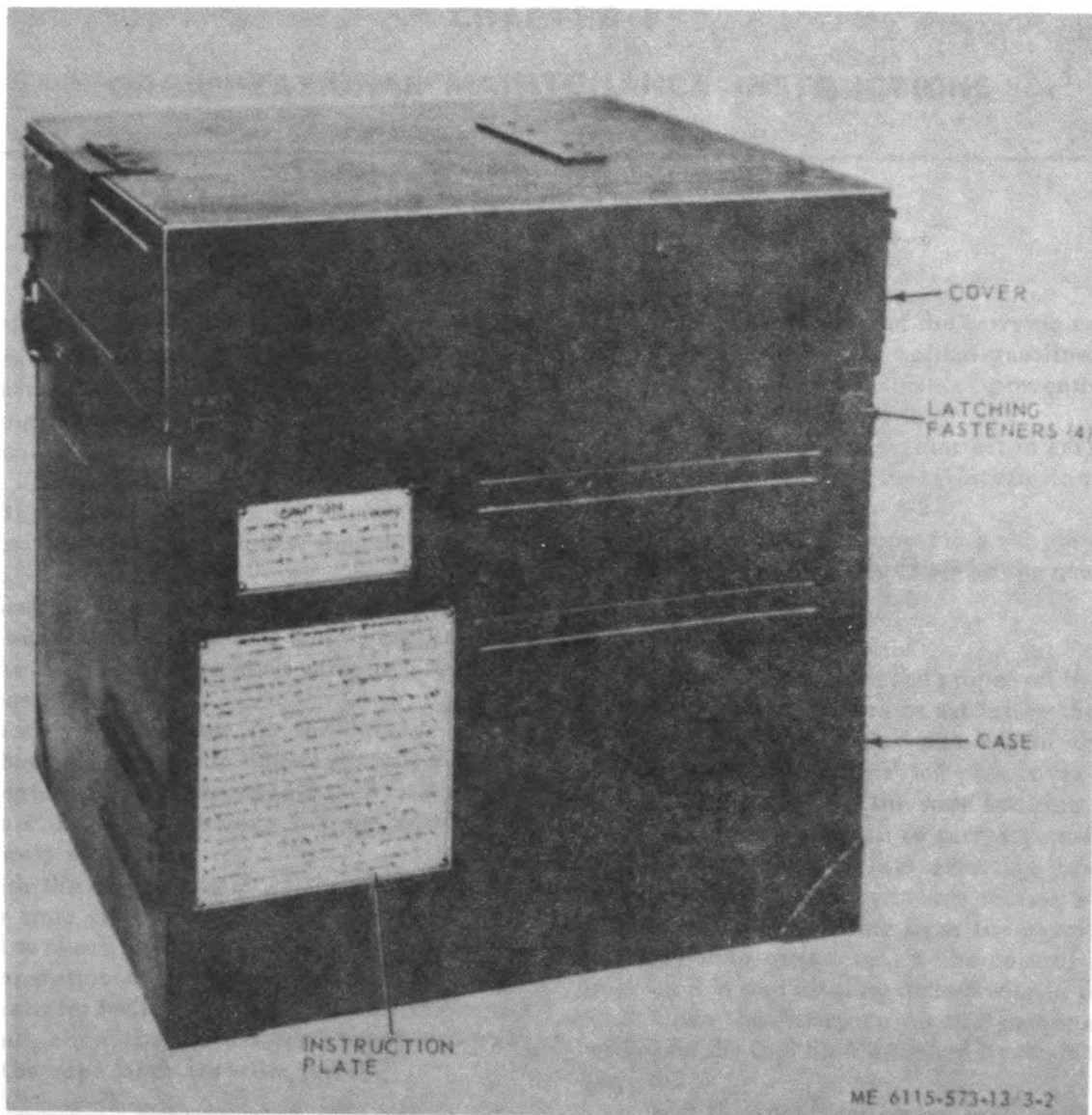


Figure 3-2. Generator set carrying case.

3-9. Generator Assembly

a. Inspection. Inspect the generator set (fig. 1-3) for dents or breaks on the engine housing, generator housing, control panel, and instruments. Make certain the air filter, mufflers, carrying handle, and panel are securely mounted.

b. Service.

(1) Remove cover from carrying case (para 3-8 a) and remove generator set from case. Place set on a hard level surface.

(2) Remove oil fill plug (fig. 3-1).

(3) Fill crankcase with proper oil (para 3-2 d) until oil level reaches top threads of oil fill opening.

(4) Replace oil fill plug and tighten securely.

(5) Replace generator set in carrying case. Be sure control panel fits within control panel cut-out.

(6) Replace cover on carrying case.

(7) Refer to paragraph 3-2 c for additional lubrication procedure.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF MATERIEL

4-1. Inspecting and Servicing Equipment

a. Remove the carrying case cover from the case by releasing the four latching fasteners (fig. 3-2) and lifting up the cover.

b. Remove the generator set from the carrying case by lifting upward. Use the carrying handle (Fig. 1-3) mounted on top of the engine. Place the generator set in a convenient location for inspection.

c. Check the carrying case for dents, bends, and broken hardware. The sound absorbing material inside the case and cover must remain intact and undamaged.

d. Check the generator set for damage to the engine housing, generator housing, control panel, instruments, and other components. Make certain air cleaner, mufflers, carrying handle, and panels are securely mounted.

e. With the engine switch in the OFF position, pull the rope starter (or PULL START) slowly outward to check for free rotation of the engine and proper operation of the starter mechanism. When the rope starter (or PULL START) reaches the end of its pull, allow the starter mechanism to slowly retract the rope back into the panel.

WARNING

Gasoline in the carrying case can cause explosion or fire when the engine is started.

f. Inspect the interior of the carrying case as well as the generator set for spilled gasoline.

g. Perform all applicable preventive maintenance services (para 4-8).

h. Do not replace generator set in carrying case until completion of installation instructions described in paragraph 4-2.

i. Maintenance and operating supplies required for initial 8 hours of operation for the generator set are contained in table 4-0.

4-2. Installation

a. Fill crankcase with the proper oil (para 3-9 b).

b. Position the generator set inside the carrying case so the control panel fits within the control panel cut-out. Place carrying case cover on top of case and secure using the four latching fasteners.

c. Secure gasoline can to carrying case cover by sliding front bracket into retaining bracket and securing rear bracket by means of wing nut (fig. 4-1). Connect the fuel line from the gasoline can to the fuel conn connector on the control panel, by pushing it in and rotating it clockwise $\frac{1}{4}$ turn.

d. Open the filler cap on the gasoline can and withdraw the fuel filter attached by chain to the cap (fig. 4-2).

e. Wet the fuel filter screen with clean gasoline.

f. Replace the fuel filter in the filler pipe.

Table 4-0. Maintenance and Operating Supplies

| (1) Component application | (2) Federal stock number | (3) Description | (4) Quantity required F initial operation | (5) Quantity required F/8 hrs operation | (6) Notes |
|---------------------------------|--|---|---|---|--|
| Crankcase | 9150-265-9433 9150-265-9425 9150-242-7602 9130-160-1818 | Oil, Lubricating 1 qt cans as follows: (2) OE-30 (2) OE-10 (2) OE-5 Fuel, Gasoline: Bulk | 1 pt 1 pt 1 pt 5 gal | (1) (1) (1) 2 gal (3) | (1) Includes quantity of oil to fill engine oil system as follows: 1 pt crankcase (2) See C9100-1L for additional data and requisitioning procedure (3) Fuel Tank Capacity (4) Average Fuel Consumption is 1 qt per hour of continuous operation. |

g. Pour the gasoline slowly through the fuel filter into the tank. Do not permit the gasoline to overflow the fuel filter.

h. After filling the tank, withdraw the fuel filter and shake out the trapped water and dirt from fuel filter.

i. Replace the fuel filter and filler cap.

NOTE

The fuel filter screen will stop water only if it is completely wetted first with pure gasoline.

j. For outdoor installation, all that is required is a hard, level surface on which to set the unit. No mounting bolts or other devices are required. Provide shelter for operation during inclement weather. Position the unit to provide adequate air circulation around it and make sure that the exhaust fumes are carried away from operating personnel.

WARNING

Do not operate the generator set in an enclosed area unless the exhaust gases are piped to the outside. Inhalation of exhaust fumes will result in serious illness or death.

k. The generator set is designed for outdoor operation. If the unit is to be operated indoors, however, use flexible exhaust tubing directly connected to the exhaust muffler, to vent the exhaust fumes out of the building. Keep the tubing as short and straight as possible. Use 1 inch inside diameter tubing if the distance to the outside is less than 10 feet. Use 1½ inch inside diameter tubing if the distance is greater than 10 feet. Make sure that all exhaust connections are tight and the room is well ventilated. Provide adequate ventilation around the generator set to prevent it from overheating.

prevent damage during transport. If transport vehicle is not available, the generator and the gasoline can be transported separately by attachment to a Marine Corps pack board.

4-4. Reinstallation After Movement

Follow the procedure given for installation instructions in paragraph 4-2.

Section III. REPAIR PARTS, SPECIAL TOOLS, AND EQUIPMENT

4-5. Special Tools and Equipment

No special tools or equipment are required by organizational maintenance personnel for the maintenance of the generator set.

4-6. Maintenance Repair Parts

Repair parts and equipment are listed and illustrated in the repair parts and special tools list covering organizational maintenance for this equipment.

Section IV. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (QUARTERLY)

4-7. General

To insure that the generator set is ready for operation at all times, it must be inspected systematically so that defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance checks and services to be performed are listed and described in paragraph 4-8. The item numbers indicate the sequence of minimum inspection requirements. Defects discovered during operation of the unit will be noted for future correction, to be made as soon as operation has ceased. Stop operation immediately if a deficiency is noted

during operation which would damage the equipment if operation were continued. All deficiencies and shortcomings will be recorded together with the corrective action taken on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) at the earliest possible opportunity.

4-8. Preventive Maintenance Checks and Services

Refer to table 4-1 for the organizational preventive maintenance checks and services.

Table 4-1. Organizational Preventive Maintenance Checks and Services

Q—Quarterly

Total man-hours required : 2.0

| Sequence number | Item to be inspected Procedure | Work time (M / H) |
|-----------------|---|----------------------|
| 1 | FUEL CAN, VALVE, AND LINE Clean can, valve, and line bi-monthly. Inspect can for leaks or dents. Replace un-serviceable items (para 4-15). | 0.5 |
| 2 | SPARK PLUG Inspect spark plug for carbon deposits and for burned or improperly gapped electrodes. Clean and regap plugs to 0.030 inch if necessary. Replace plug if electrodes are badly burned or if body is cracked (para 4-19). <i>Note:</i> When running consecutive light power load hours, weekly cleaning of spark plug is required. | 0.2 |
| 3 | CLUTCH ASSEMBLY The clutch assembly is located in the starter and blower housing assembly. Remove entire cover; lubricate oil hole in open end. Apply oil sparingly to saturate the felt pad. | 0.5 |
| 4 | AIR FILTER Clean weekly (para 4-20). | 0.1 |
| 5 | STARTER Inspect recoil starter for insecure mounting, a frayed or badly kinked rope, and erratic operation. Forward unit to DS for repairs or replacement. | 0.1 |
| 6 | CARBURETOR Adjust carburetor as required (para 4-22). | 0.1 |
| 7 | FUEL STRAINER AND FEED LINE Inspect strainer for cracks, deterioration, or other damage. Check feed line for cracks, dents, damaged fittings, and distortion (para 4-21). Replace damaged items, if necessary. | 0.5 |

Section V. TROUBLESHOOTING

4-9. General

a. This section contains troubleshooting information for locating and correcting most of the organizational troubles which may develop in the generator set. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help you to determine probable causes and corrective actions to take. You should perform the tests/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or not covered by listed corrective actions, notify your supervisor.

4-10. Troubleshooting

Refer to table 4-1 for troubleshooting procedures.

Table 4-2. TROUBLESHOOTING

| MALFUNCTION | TEST OR INSPECTION | CORRECTIVE ACTION |
|--|--|---|
| 1. Engine Fails to Start or Starts With Difficulty | Step 1. Check for carbon on spark plug. | Clean spark plug. |
| | Step 2. Check spark plug gap. | Regap plug to 0.030 in. (para 4-19). |
| | Step 3. Check for defective spark plug. | Replace spark plug (para 4-19). |
| | Step 4. Check for improper carburetor adjustment. | Adjust carburetor (para 4-22). |
| | Step 5. Check top of piston and inside cylinder head for carbon. | Clean piston and cylinder head (para 4-23). |
| | Step 6. Check for clogged exhaust valves. | Clean exhaust valves (para 4-23). |
| 2. Engine Overheats or Lacks Power | Step 1. Check for clogged exhaust valves. | Clean exhaust valves (para 4-23). |
| | Step 2. Check carburetor needle valve adjustment. | Adjust needle valve (para 4-22). |
| | Step 3. Check for clogged cylinder and cylinder head cooling fins. | Clean fins. |
| | Step 4. Check for incorrect spark plug. | Install correct spark plug (para 4-19). |
| | Step 5. Check top of piston and inside cylinder head for carbon. | Clean piston and cylinder head (para 4-23). |
| | Step 6. Check for dirty fuel strainer. | Clean fuel strainer (para 4-21). |
| 3. Engine Misses or Runs Erratically | Step 1. Check for fouled spark plug. | Clean and regap spark plug to 0.030 in. (para 4-19). |
| | Step 2. Check for clogged filter in fuel feed line. | Clean fuel line filter (para 4-21). |
| 4. Excessive Smoke From Exhaust | Check carburetor for too rich mixture. | Adjust carburetor (para 4-22). |
| 5. Poor Engine Compression | Step 1. Check for loose cylinder head. | Replace gasket and tighten cylinder head mounting screws (para 4-23). |
| | Step 2. Check for loose spark plug. | Tighten spark plug. |
| 6. Engine Governor Fails to Control Engine Speed | Check for loose engine control bracket. | Tighten bracket fastening screws. |

Section VI. RADIO INTERFERENCE SUPPRESSION

4-11. General Methods Used to Attain Proper Suppression

Essentially, suppression is attained by providing a low-resistance path to ground for the stray currents. The methods used include shielding the ignition and high-frequency wires and grounding the frame with a bonding strap. For general information on radio interference suppression, see TM 11-483.

4-12. Interference Suppression Components

a. Shielded Spark Plug. The generator set is provided with a shielded spark plug (fig. 4-3) to ground the stray currents of the engine ignition system.

b. Shielded Ignition Cable. The generator set uses a shielded ignition cable (fig. 4-3) to ground stray currents from the engine ignition system.

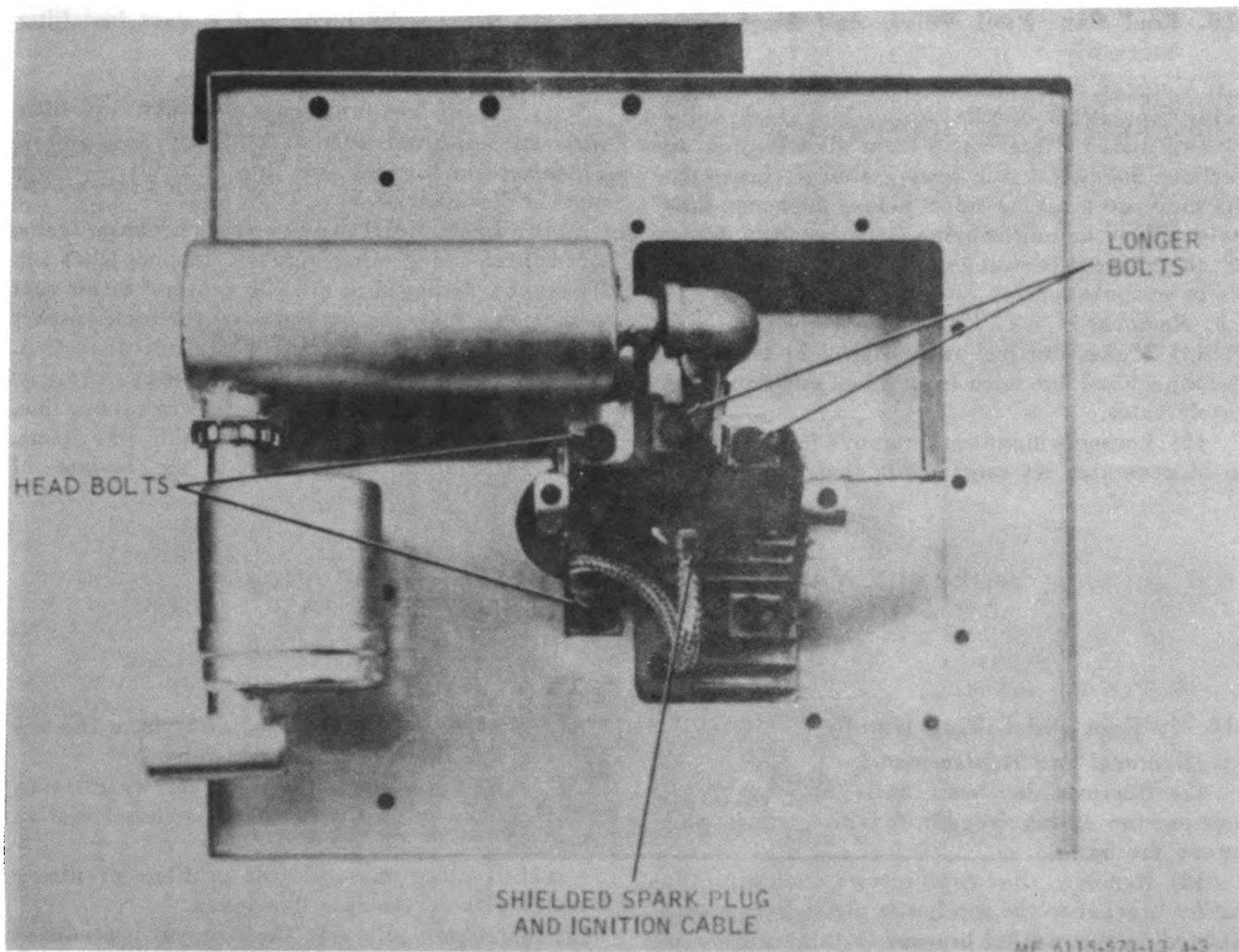


Figure 4-3. Interference suppression shielding.

c. Metallic Housing. The entire generator system is operated within a metallic housing that tends to suppress most of the radio interference signal components.

4-13. Replacement of Suppression Components

a. Spark Plug. Refer to paragraph 4-19 and replace the spark plug.

b. Shielded Ignition Cable. Forward unit to direct support to replace the shielded ignition cable.

Section VII. MAINTENANCE OF FUEL CAN AND ACCESSORY ITEMS

4-14. General

A gasoline fuel can is supplied to operate the generator set. The fuel can (fig. 2-3) is a rectangular container with a fuel inlet, a fuel intake filter, a handle, a standard pipe fitting with a valve at the outlet, and a replaceable fuel line. The fuel inlet has an internal strainer to filter the gasoline. It also has a metal cap with a controllable air vent to allow equalization of pressure inside the container. Provision is made for mounting the fuel can to the

top of the carrying case. The fuel line (fig. 4-1) has a female connector for quick connection to the generator set control panel. The fuel line connector has an internal ball-type check valve to prevent fuel from leaking and foreign matter from entering the line. A separate 1-pint can that can be attached to the side of the fuel can is required for transporting the lubricating oil. It holds the required quantity of oil to serve as a fill for the crankcase.

4-15. Fuel Can, Fuel Valve, and Fuel Line Assembly

a. General. The fuel can serves as a fuel tank during operation of the unit. The fuel valve prevents a sticky float valve from allowing fuel to overflow the carburetor during shutoff intervals. The air vent must be open before fuel can flow freely. When the unit is being transported to a new site, the air vent is shut to prevent accidental fuel loss or evaporation.

b. Removal.

(1) Make sure fuel valve (fig. 4-1) is closed. Disconnect fuel line from front panel and from fuel shutoff valve.

(2) Loosen wingnut and remove fuel can from top of generator set case; drain fuel.

(3) Remove filler cap and extract fuel filter (fig. 4-2) from neck of fuel can.

c. Cleaning, Inspection, and Replacement.

(1) Wash fuel tank, cap, fuel line, and filter with an approved solvent and dry thoroughly. Flush solvent through fuel line and can reversing normal direction of flow.

(2) Inspect fuel can for cracks, dents, leaks, worn threads and other damage. Inspect filler cap for cracks, damaged or missing vent nut or air vent gasket, and for worn or damaged threads. Inspect filler cap gasket for cracks, wear, and distortion. Inspect fuel valve for breaks and leaks.

(3) Replace unserviceable fuel can, cap, line, filler, gasket, or valve with serviceable like items.

d. Installation. Installation is the reverse of removal.

Section VIII. MAINTENANCE OF MUFFLERS, TOP AND CYLINDER HEAD BAFFLE PLATES, AND LIFTING HANDLE

4-16 Mufflers and Lifting Handle

a. Removal and Replacement.

(1) Remove the head bolts (E, fig. 4-4), securing the lifting handle to the engine, and remove the handle.

(2) Remove the two screws holding the muffler bracket to the top baffle plate. Loosen the nut holding the muffler bracket to the mufflers so

the bracket can be repositioned away from the top baffle plate. Remove the spark plug.

(3) Remove the muffler system by rotating counterclockwise so exhaust pipe unscrews at elbow.

(4) Replace unserviceable mufflers or lifting handle, with serviceable like items.

b. Installation. Reverse the removal procedures described in *a* above.

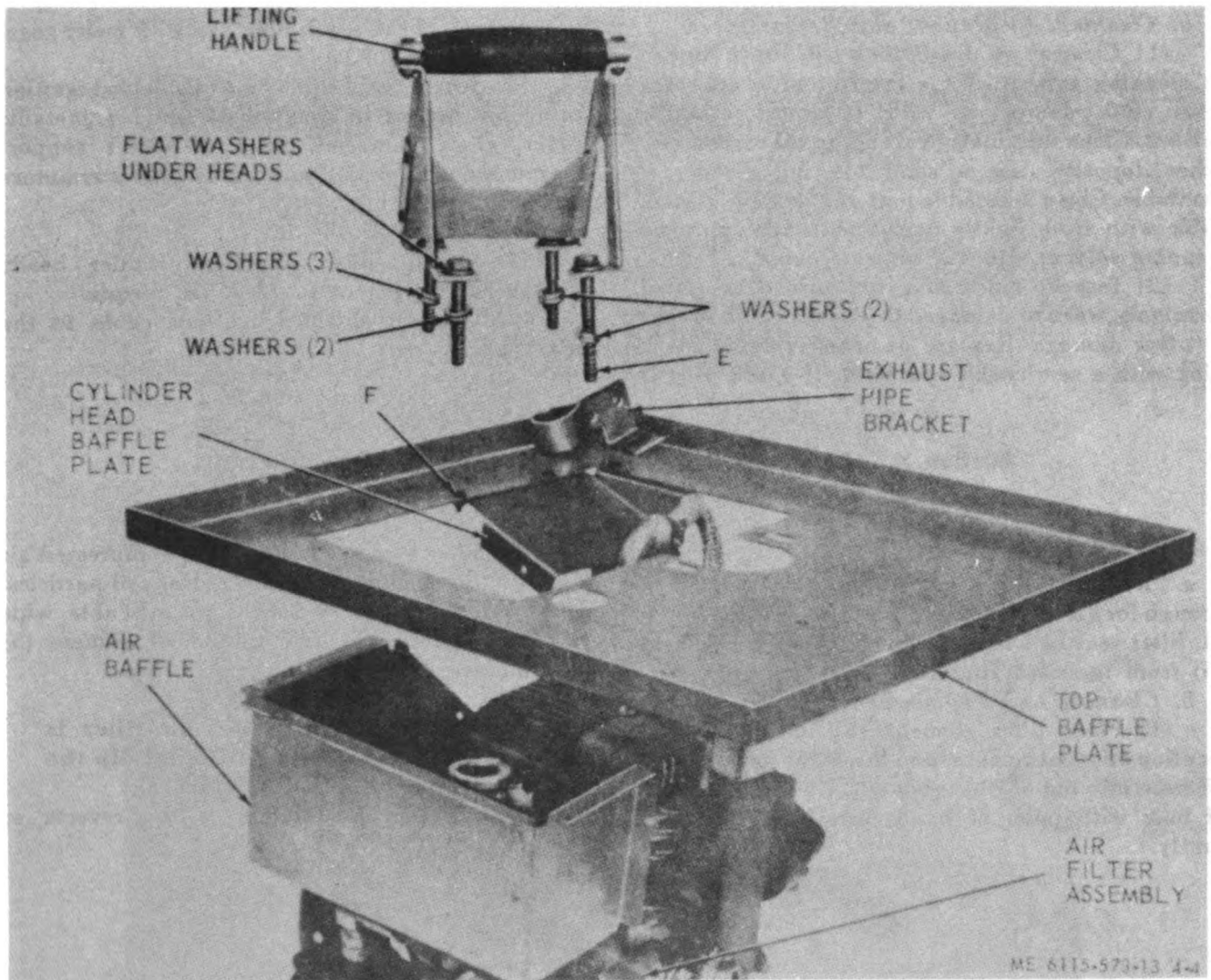


Figure 4-4. Top baffle plate, cylinder head baffle plate, and lifting handle, removal and installation.

4-17. Top Baffle Plate and Cylinder Head Baffle Plate

a. Removal and Replacement.

(1) Remove the mufflers and lifting handle (para 4-16).

(2) Remove all screws (F, fig. 4-4) from the top baffle plate except those securing the nameplate.

(3) Remove screws securing the cylinder head baffle plate to the top baffle plate and separate the two plates.

(4) Replace an unserviceable plate with a serviceable like item.

b. Installation. Reverse the removal procedures described in a above.

Section IX. MAINTENANCE OF IGNITION SYSTEM

4-18. General

The ignition system components covered in this section are the spark plug and shielded ignition cable. Additional maintenance instructions for the cable are given in direct support maintenance (Chapter 6).

4-19. Spark Plug and Shielded Ignition Cable

a. Spark Plug Removal.

(1) Disconnect shielded ignition cable (fig. 4-3) from spark plug by loosening the nut.

(2) Remove spark plug from cylinder head.

b. Cleaning, Inspection, and Replacement.

(1) Clean spark plug with a stiff brush dipped in cleaning solvent. Wipe exterior of spark plug with cloth dampened with approved cleaning solvent. Clean terminals by scraping off carbon and other deposits. Use a sand blasting cleaner if available. Clean accessible part of shielded ignition cable with cloth lightly dampened with approved cleaning solvent. Do not saturate cable.

(2) Inspect spark plug for burned or pitted terminals, worn or damaged threads, and for cracks or other damage. Replace an unserviceable spark plug with a serviceable like item. If spark plug is

undamaged, check spark plug gap with feeler gage. Gap should be 0.030 inch.

(3) Inspect accessible part of shielded ignition cable for breaks or fraying of braided metallic covering. If damaged, refer to direct support maintenance for replacement of cable and armature coil as an assembly.

c. Installation.

(1) Install spark plug in cylinder head; tighten spark plug to 12-16 ft-lbs. torque.

(2) Connect shielded ignition cable to the spark plug.

Section X. MAINTENANCE OF ENGINE AND ACCESSORIES

4-20. Air Filter

a. Removal. With engine stopped and cool enough for safety, remove self-locking nut (3, fig. 4-5), filter seal (4), filter element washers, and seat (6) from threaded stud (2).

b. Cleaning and Replacement.

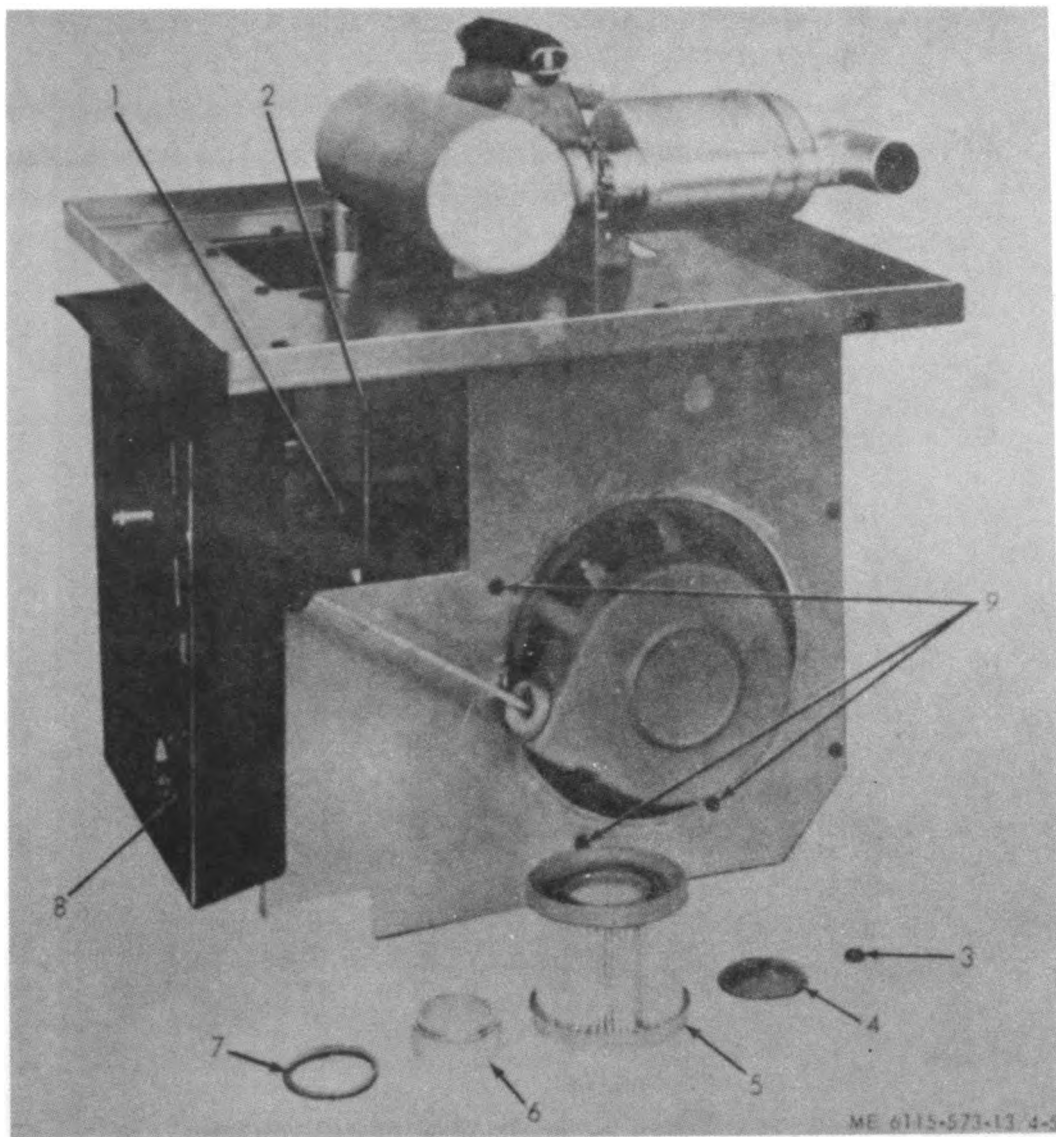
(1) Place filter element (5) in an isolated location on a flat surface, and insert the nozzle of an air hose into top of filter element. Cover remainder of hole with palm of hand, pressing downward firmly.

(2) Blow stream of clean, dry, compressed air through filter element to dislodge trapped particles. If a supply of compressed air is not available, wipe with a dry cloth. Check condition of element (5) and replace if needed.

CAUTION

The filter element of this air filter is designed to operate dry. Do not dip the filter element in oil or solvent.

c. Installation. Installation is the reverse of removal.



- 1 Idle needle valve
- 2 Threaded stud
- 3 Self-locking nut
- 4 Filter seal
- 5 Air filter element
- 6 Filter seat
- 7 Washer gasket
- 8 Control panel
- 9 Screws (3)

Figure 4-5. Air filter, removal and installation.

4-21. Fuel Strainer and Gasoline Feed Line

a. Removal (fig. 4-6).

(1) Disconnect gasoline feed line from reducer by loosening lock nut. Carefully remove fuel strainer from reducer.

(2) Remove gasoline feed line from control panel by removing the two screws.

b. Cleaning, Inspection and Replacement.

(1) Clean fuel strainer with an approved cleaning solvent and dry thoroughly. Inspect for

cracks, deterioration, or other damage. Replace an unserviceable fuel strainer with a serviceable like item.

(2) Clean gasoline feed line with an approved cleaning solvent and dry thoroughly. Inspect for cracks, dents, damaged fittings, and distortion. Replace an unserviceable line with a serviceable like item.

c. Installation. Installation is the reverse of removal.

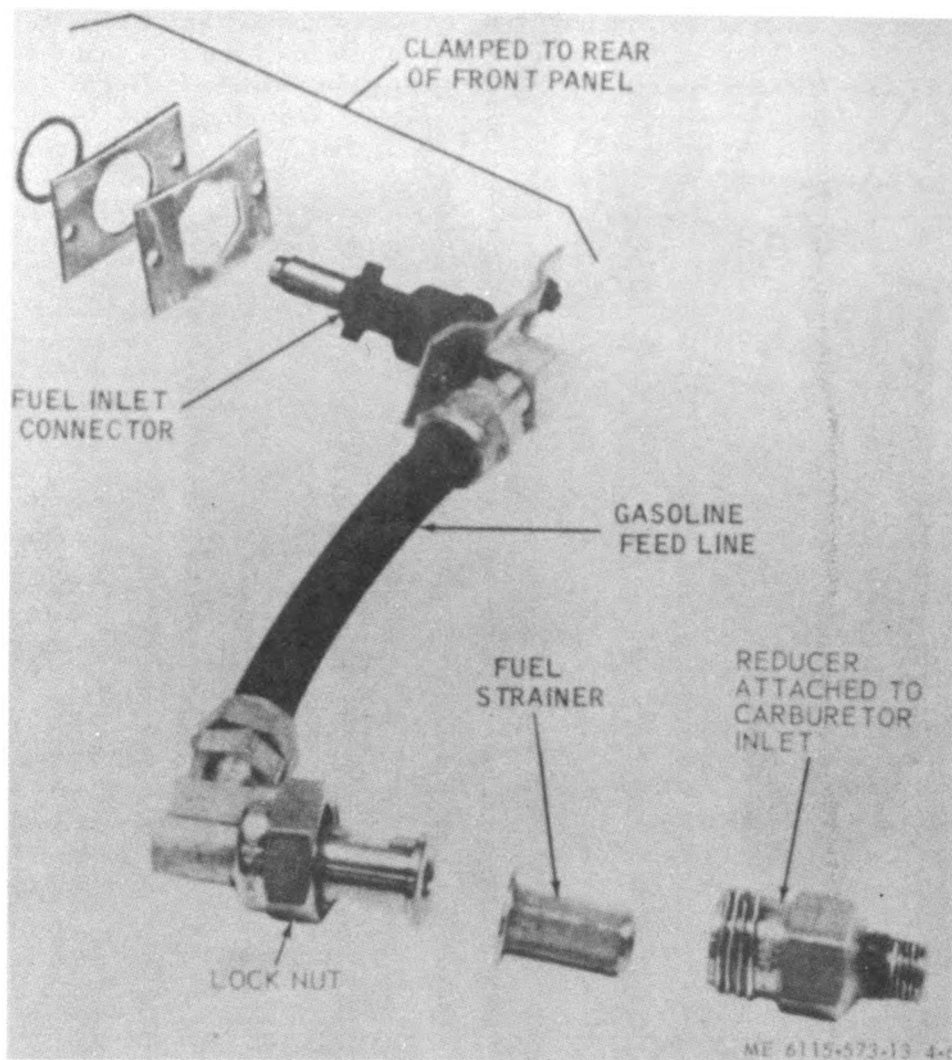


Figure 4-6. Fuel strainer and gasoline feed line, removal and installation.

4-22. Carburetor Adjustment

Adjust the carburetor as follows:

- a. Remove air filter (para 4-20).
- b. Close carburetor needle valve by turning the carb adj control (fig. 2-1 and 2-2) fully clockwise. Do not apply pressure after valve seats.
- c. Open carb adj control $1\frac{1}{2}$ turns.
- d. Close idle needle valve (1, fig. 4-5) by turning fully clockwise.
- e. Set idle needle valve out $1\frac{1}{2}$ turns.
- f. Set engine speed adj (fig. 2-1 and 2-2) for desired engine speed (3428 rpm).
- g. Turn carb adj until engine misses; then turn carb adj in opposite direction until engine again

runs unevenly. Turn control to about midrange of these two positions.

- h. Install air filter (para 4-20).

4-23. Cylinder Head

a. Removal.

- (1) Remove the lifting handle (para 4-16).

NOTE

- Do not tilt engine on side with oil in crankcase.
- (2) Remove spark plug from cylinder head.
- (3) Position piston on top dead center on compression stroke. Both valves are fully closed.
- (4) Remove the four head bolts and slip head out from under top baffle plate (fig. 4-7).

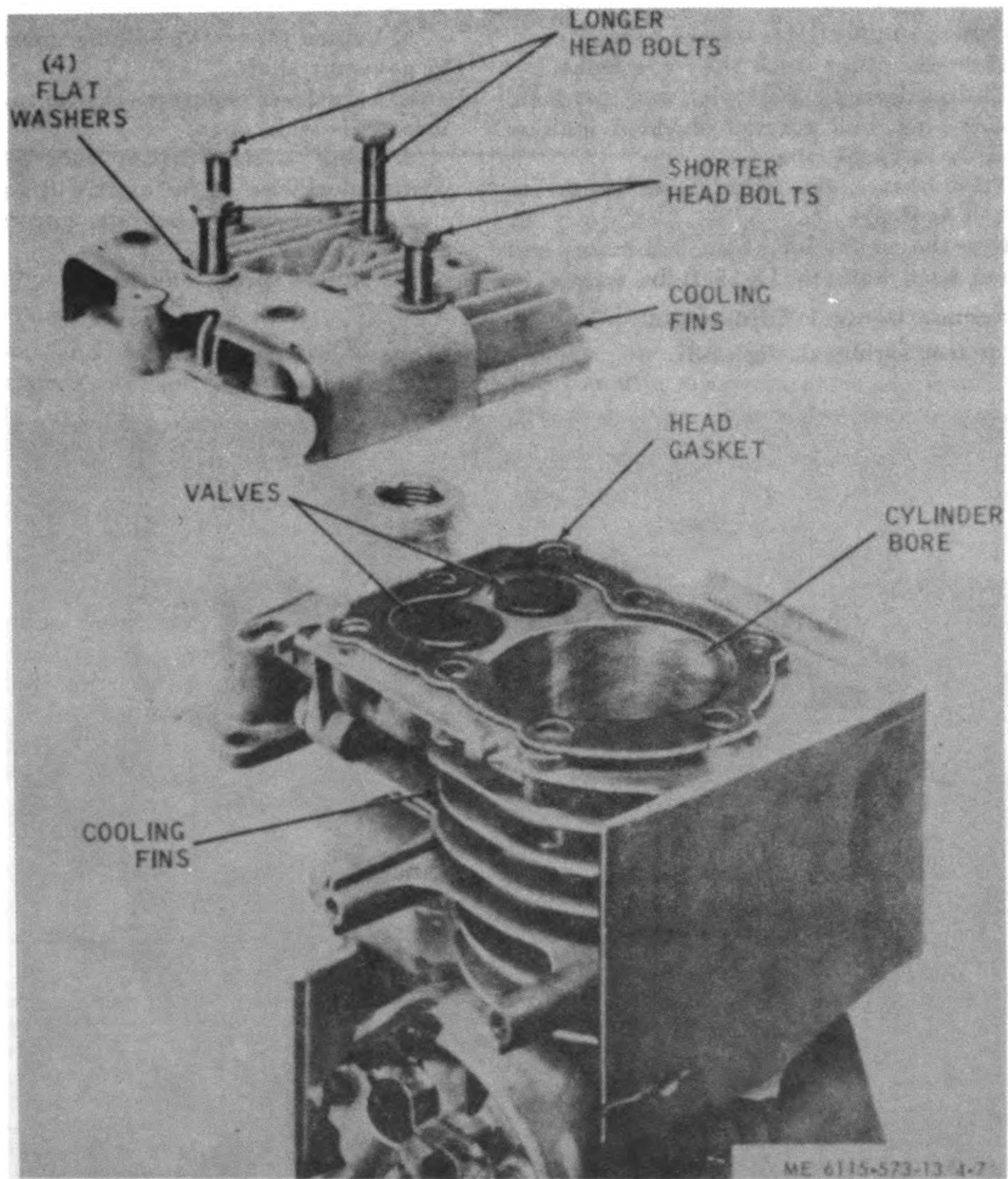


Figure 4-7. Cylinder head, removal and installation.

b. Cleaning, Inspection, and Replacement.

(1) Wash and wipe cylinder head gasket carefully with cleaning solvent and a clean cloth.

(2) Clean cylinder head thoroughly with an approved cleaning solvent. Scrape all deposits of carbon or other residue from cylinder head.

(3) Turn engine crankshaft so that piston is at top-dead-center. Scrape all carbon deposits from top of piston, top of cylinder bore, and valves. Take care not to score cylinder walls. Wipe top of piston, top of cylinder bore, and valves with cloth lightly dampened with approved cleaning solvent; dry thoroughly.

(4) Inspect cylinder head for cracks, broken cooling fins, warping, or other damage; replace damaged cylinder head with a serviceable like item.

(5) Inspect gasket for cracks, breaks, deterioration, or other damage; replace damaged gasket.

c. Installation.

(1) Position cylinder head gasket and cylinder head on cylinder; install lifting handle (para 4-16). Secure with eight head bolts and flat washers, making sure the assembly is as shown in figure 4-3. Tighten each screw a little at a time until all are snug.

CAUTION

Tightening one cylinder head mounting screw fully before installing the remaining screws may crack the cylinder head, or may result in a gasket

leak. Always tighten the screws partially one after the other until they are tight.

(2) Clean and regap spark plug to 0.030 inch. Install spark plug, and connect shielded ignition cable securely to spark plug.

(3) Turn over engine with recoil starter to make sure it is free.

(4) Run the engine for about 5 minutes and then tighten head bolts to 12-15 ft-lbs torque.

4-24. Governor Control Adjustment

a. Disconnect spring (1, fig. 4-8).

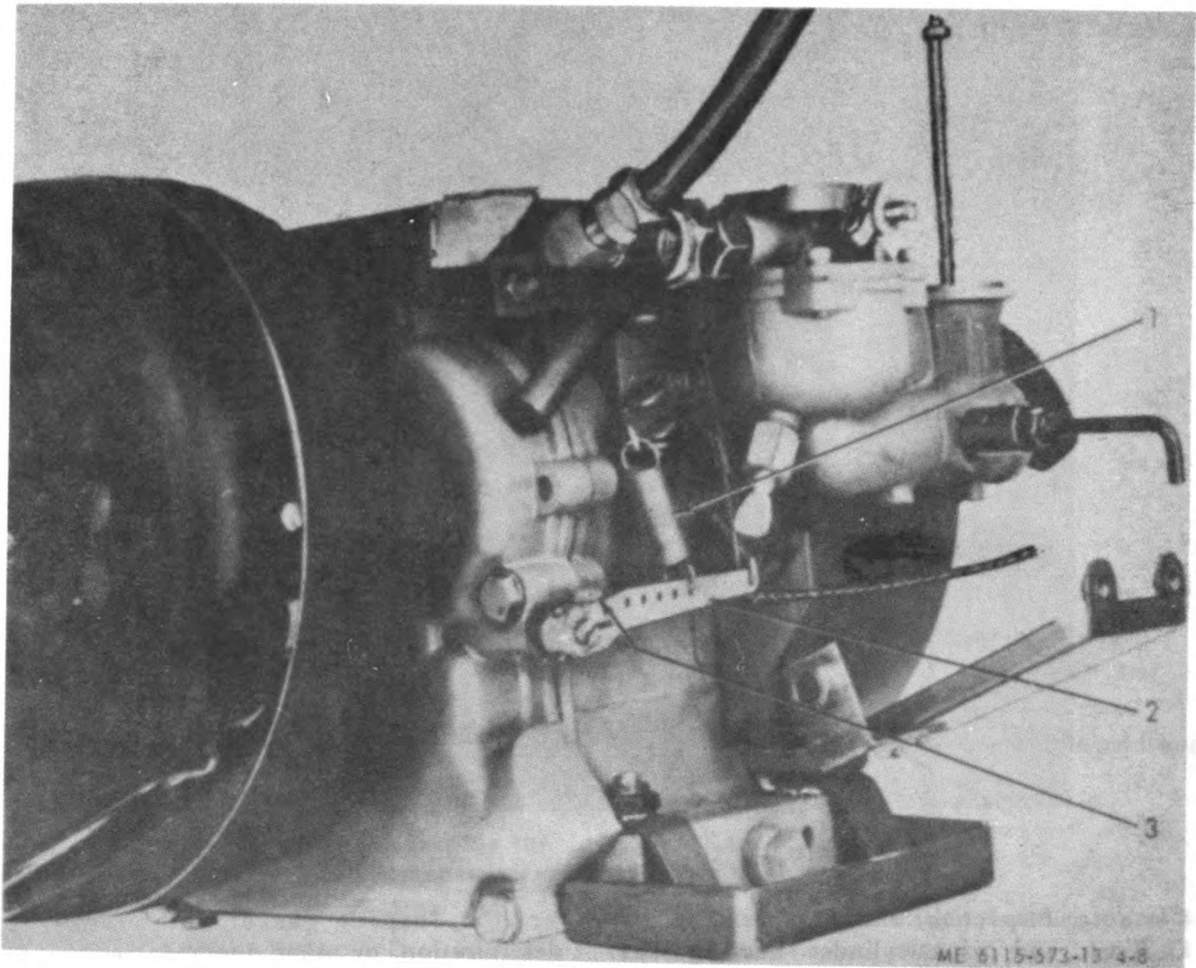
b. Loosen screw (3) holding governor lever (2) to governor shaft.

c. Turn lever counterclockwise until carburetor throttle is wide open.

d. Using a screwdriver, turn governor shaft counterclockwise as far as it will go.

e. Tighten screw holding governor lever to governor shaft.

f. Connect spring (1).



1 Governor tension spring

2 Governor lever

3 Screw

Figure 4-8. Governor control adjustment.

CHAPTER 5

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, SPECIAL TOOLS, AND EQUIPMENT

5-1. Special Tools and Equipment

No special tools and equipment are required by direct support personnel for maintenance of the generator sets.

5-2. Maintenance Repair Parts

Repair parts and equipment are listed and illustrated in the repair parts and special tools list covering direct support for this equipment.

Section II. TROUBLESHOOTING

5-3. General

a. This section contains troubleshooting information for locating and correcting most of the direct support troubles which may develop in the generator sets. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help you to determine probable causes and corrective actions to take. You should perform the tests/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or not corrected by listed corrective actions, notify your supervisor.

5-4. Troubleshooting

Refer to table 5-1 for troubleshooting procedures.

Table 5-1. TROUBLESHOOTING

| MALFUNCTION |
|--------------------|
| TEST OR INSPECTION |
| CORRECTIVE ACTION |

1. Engine Lacks Power
 - Step 1. Check for worn piston rings.
Replace rings (para 6-10).
 - Step 2. Check for worn cylinder.
Rebore cylinder (para 6-11).
 - Step 3. Check for dirty carburetor.
Clean carburetor (para 6-2).
2. Engine Speed Uneven
 - Step 1. Check for faulty engine governor.
Repair governor (para 6-9).
 - Step 2. Check for dirty carburetor.
Clean carburetor (para 6-2).
3. No Power Output
 - Step 1. Check for open generator leads.
Replace output leads.
 - Step 2. Check for burned out generator.
Replace generator (para 5-6).
 - Step 3. Check for faulty electrical assembly.
Repair electrical assembly (para 5-5).
4. Engine Fails to Start
 - Check for faulty ignition system.
Repair ignition system (para 6-4).
5. Excessive Smoke From Exhaust
 - Check for excessive oil consumption.
Replace rings (para 6-10).
6. Poor Engine Compression
 - Step 1. Check for worn or sticking piston rings.
Replace rings (para 6-10).

| MALFUNCTION | TEST OR INSPECTION | CORRECTIVE ACTION |
|---|--|---------------------------------|
| | Step 2. Check for sticking valves. | Replace valves (para 6-14). |
| 7. Generator Fails to Produce Rated Current | Step 1. Check for broken stator leads. | Replace broken wire (para 5-6). |
| | Step 2. Check for weak magnetism generator rotor. | Replace rotor (para 5-6). |
| | Step 3. Check for open or shorted stator windings. | Replace stator (para 5-6). |

Section III. REMOVAL AND INSTALLATION OF MAJOR COMPONENTS

5-5. Control Panel and Electrical Assembly

a. General.

(1) *PU-422B/U*. Figure 5-1 illustrates the parts located on the rear of the electrical subassembly. Figure 1-4 illustrates the parts locations and the wiring harness connections on the electrical subassembly. Foldout 2 is an electrical schematic diagram.

(2) *PU-532/PPS-4*. Figure 5-2 illustrates the parts located on the electrical subassembly. Foldout 1 illustrates the parts locations and the wiring harness connections on the electrical subassembly. Foldout 3 is an electrical schematic diagram.

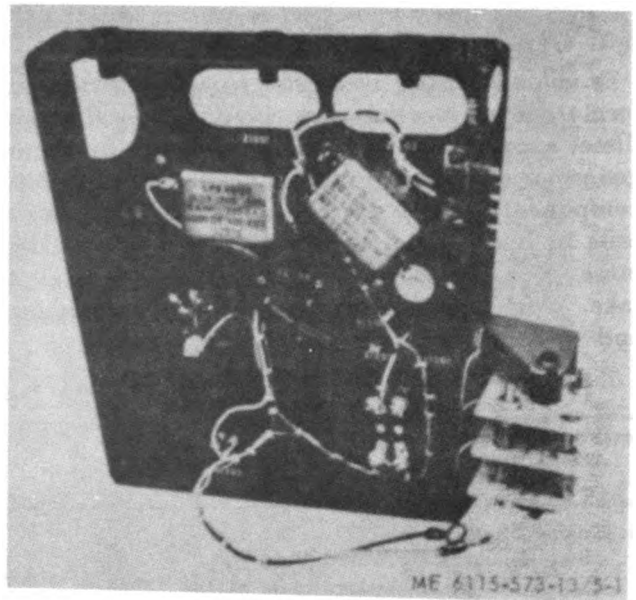
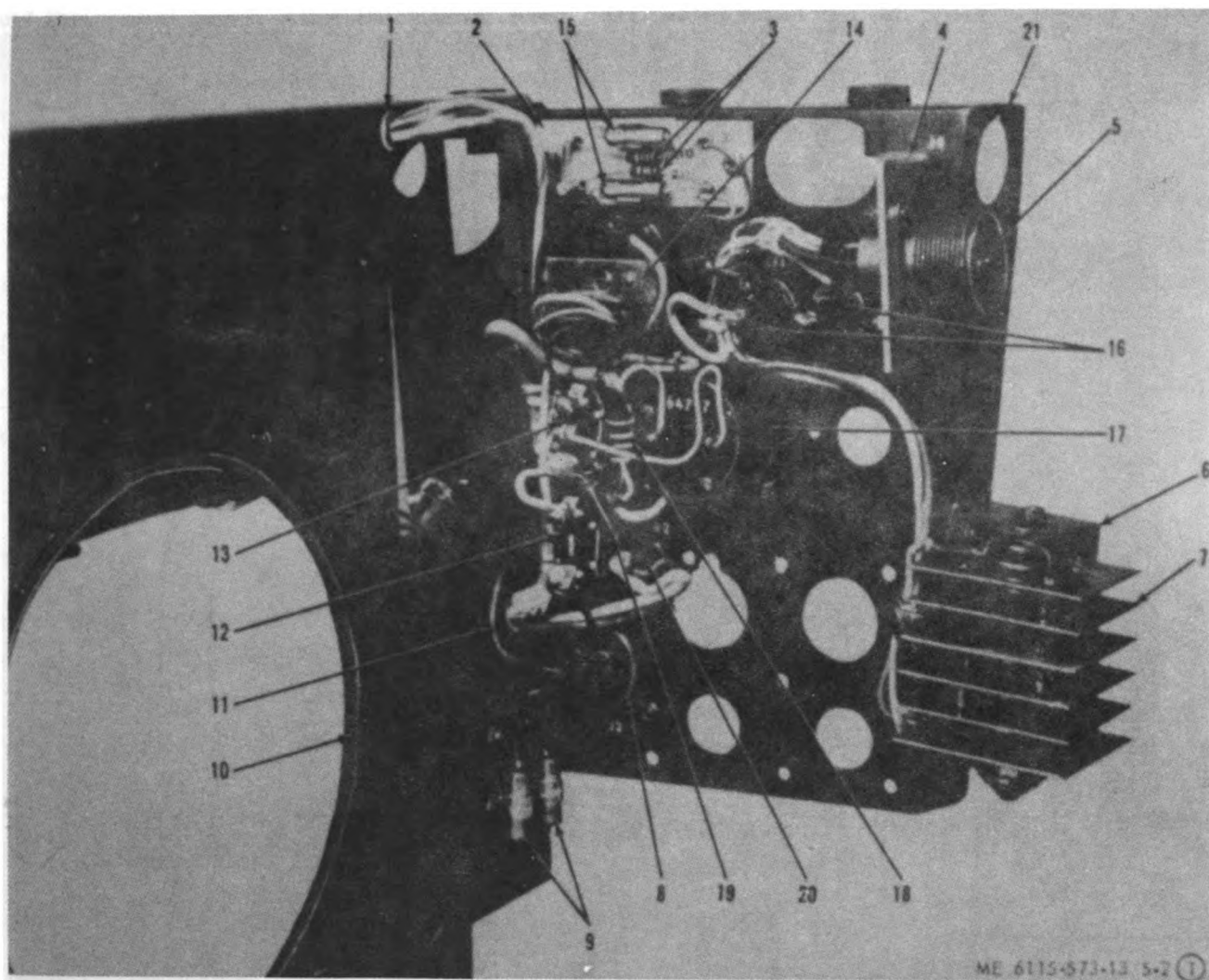
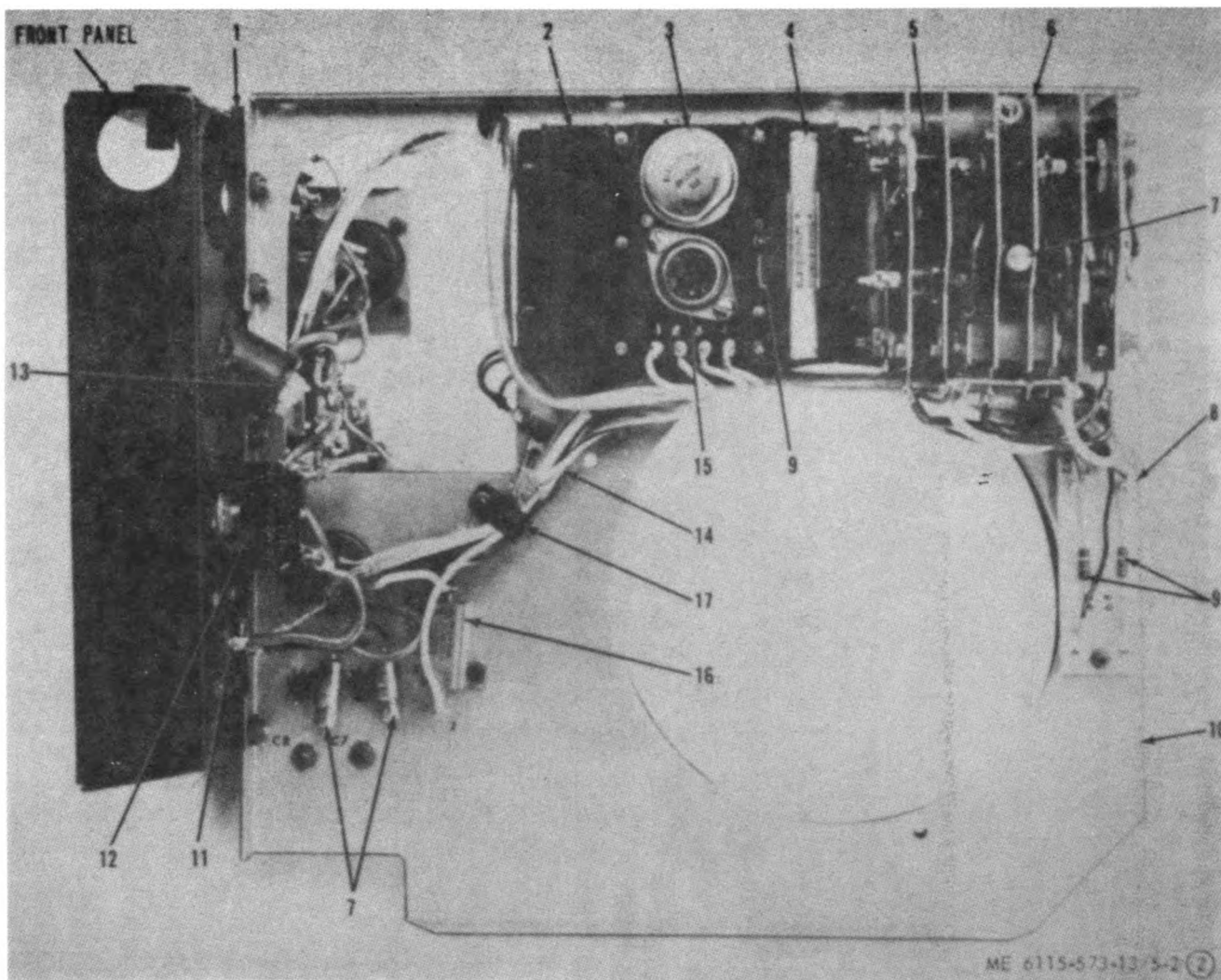


Figure 5-1. Components mounted at rear of control panel (*PU-422B/U*).



- | | |
|---|---|
| 1 Cable grommet | 12 Toggle switch (2 rqr) |
| 2 Terminal board No. 1 | 13 Volt-amp toggle switch |
| 3 Resistor, 5.6 + 10% megohm resistance, ½ watt power dissipation (2 rqr) | 14 Electrical connector |
| 4 Connector mounting bracket | 15 Capacitor, 0.1 uf, 400 volt, dc (2 rqr) |
| 5 Plug connector | 16 Fuseholder |
| 6 Rectifier bracket | 17 Ammeter |
| 7 Rectifier assembly | 18 Ammeter shunt |
| 8 Radar connector | 19 Resistor 49.9 megohms resistance, ½ watt power dissipation |
| 9 Capacitor, 0.01 uf, 100 volt, dc (2 rqr) | 20 Stud terminal (3 rqr) |
| 10 Gasket | 21 Control panel |
| 11 Wiring harness grommet | |

Figure 5-2. Components mounted at rear of control panel and on side panel (PU-532 / PPS-4) (sheet 1 of 2).



- | | |
|--|--|
| 1 Gasket | 10 Baffle plate |
| 2 Heat radiator assembly | 11 Battery connector |
| 3 Transistor | 12 Battery toggle switch |
| 4 Capacitor, 150 uf, 50 volt, dc (2 qqr) | 13 Pass thru grommet |
| 5 Semiconductor device (6 qqr) | 14 Wiring harness |
| 6 Rectifier assembly | 15 Transistor |
| 7 Capacitor, 0.01 uf, 100 volt, dc (8 qqr) | 16 Resistor, 2 ohm resistance, 15 watt power dissipation |
| 8 Terminal board No. 2 | 17 Wiring harness clamp (3 qqr) |
| 9 Resistor, ½ watt power dissipation (4 qqr) | |

Figure 5-2. Components mounted at rear of control panel and on side panel (PU-532 / PPS-4) (sheet 2 of 2).

b. Control Panel and Side Panel Removal (PU-422B / U).

(1) With the engine stopped by means of the ENGINE switch placed in the OFF (down) position, allow sufficient time for the engine parts to cool to avoid burns.

(2) Pull ROPE STARTER outward from control panel about 1 foot and untie the knot in the rope which holds the handle.

CAUTION

Hold rope tightly so action of starter mechanism does not pull the rope into the starter housing.

(3) Tie a new knot in the rope behind the panel and retract the rope through the control panel so the knot stops at the opening in the recoil starter assembly. Make certain the knot is large enough to stop the rope from being pulled through the opening in the starter assembly.

(4) Loosen the nut that locks the choke lever to the carburetor choke control coupling (fig. 5-5) by holding the choke coupling with a pair of pliers and loosening the locknut with an adjustable wrench. Failure to hold the control coupling so it does not turn can damage the choke. Access to the locknut and coupling is obtained by reaching

behind the control panel. After the locknut has been loosened, disconnect the choke lever by turning choke lever on front control of control panel counterclockwise until it disengages from the carburetor coupling.

(5) Disconnect carb adj control by turning carb adj knob counterclockwise until it disengages from the packing nut on the carburetor (fig. 5-5).

(6) Disconnect yellow wire that runs from the engine switch by removing the screw from terminal board located at the generator end of the generator set (fig. 5-5).

(7) Disconnect black wire that runs from the engine switch by removing that screw in the engine block that retains wire (fig. 5-5).

(8) With reference to figures 5-3 and 5-4, remove the four screws (C) from the top baffle plate

(D) which secure the side panel to the top plate; the three screws (E) which secure the control panel (F) to the top baffle plate; the two screws (G) which secure the control panel to the engine bracket; and the four screws (M).

(9) Loosen the two screws (H) which secure the generator cable connector to the connector at the side of the control panel, and disconnect plug.

(10) Remove the two screws (J) securing the fuel line connector to the front panel, and three screws (9, fig. 4-5).

(11) Disconnect the speed adj control by turning the front panel knob counterclockwise until it disengages from the speed adjust link rod.

(12) Remove the control panel and side panel as an assembly from the unit.

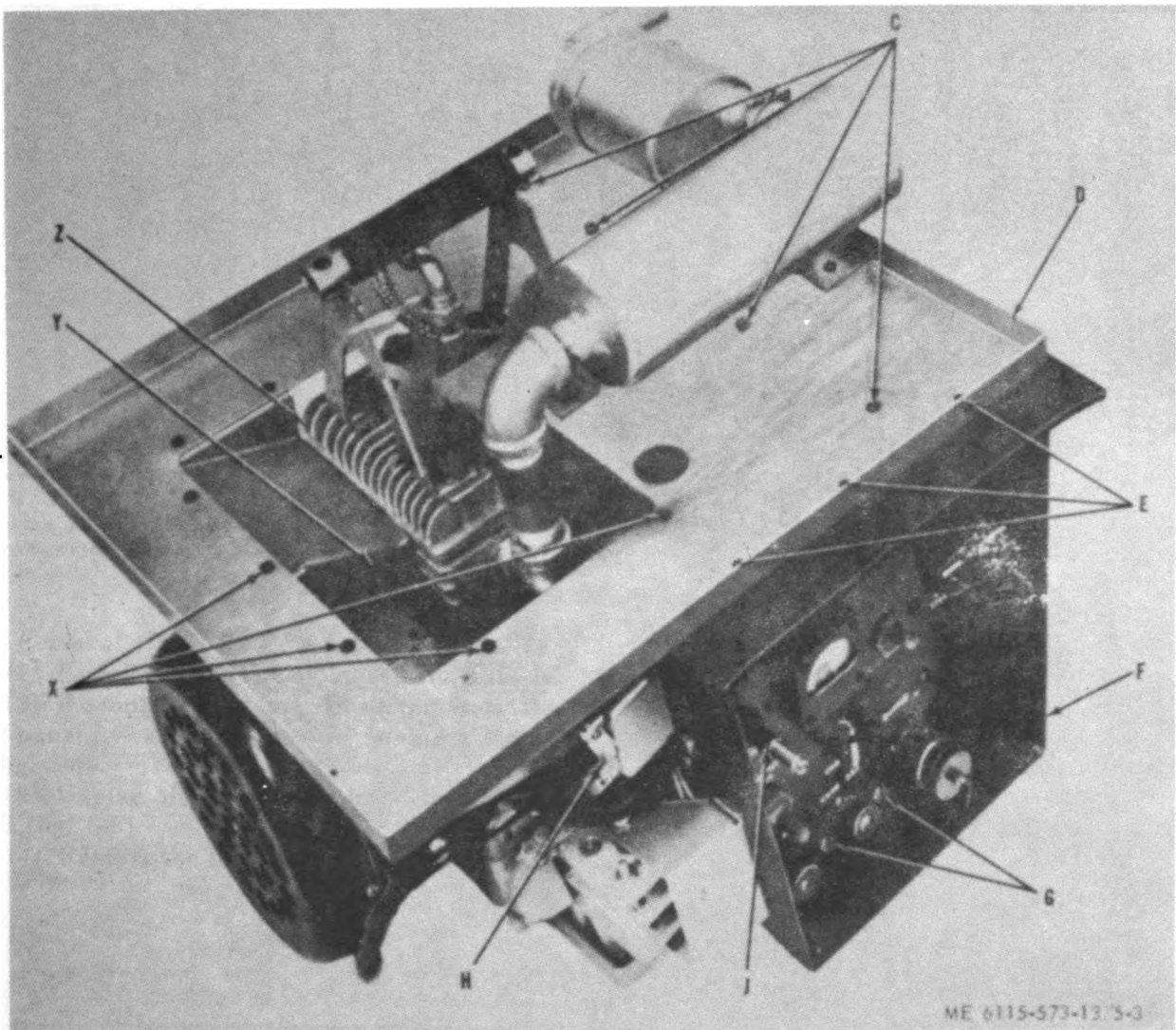


Figure 5-3. Control panel and side panel, removal and installation (PU-422B / U).

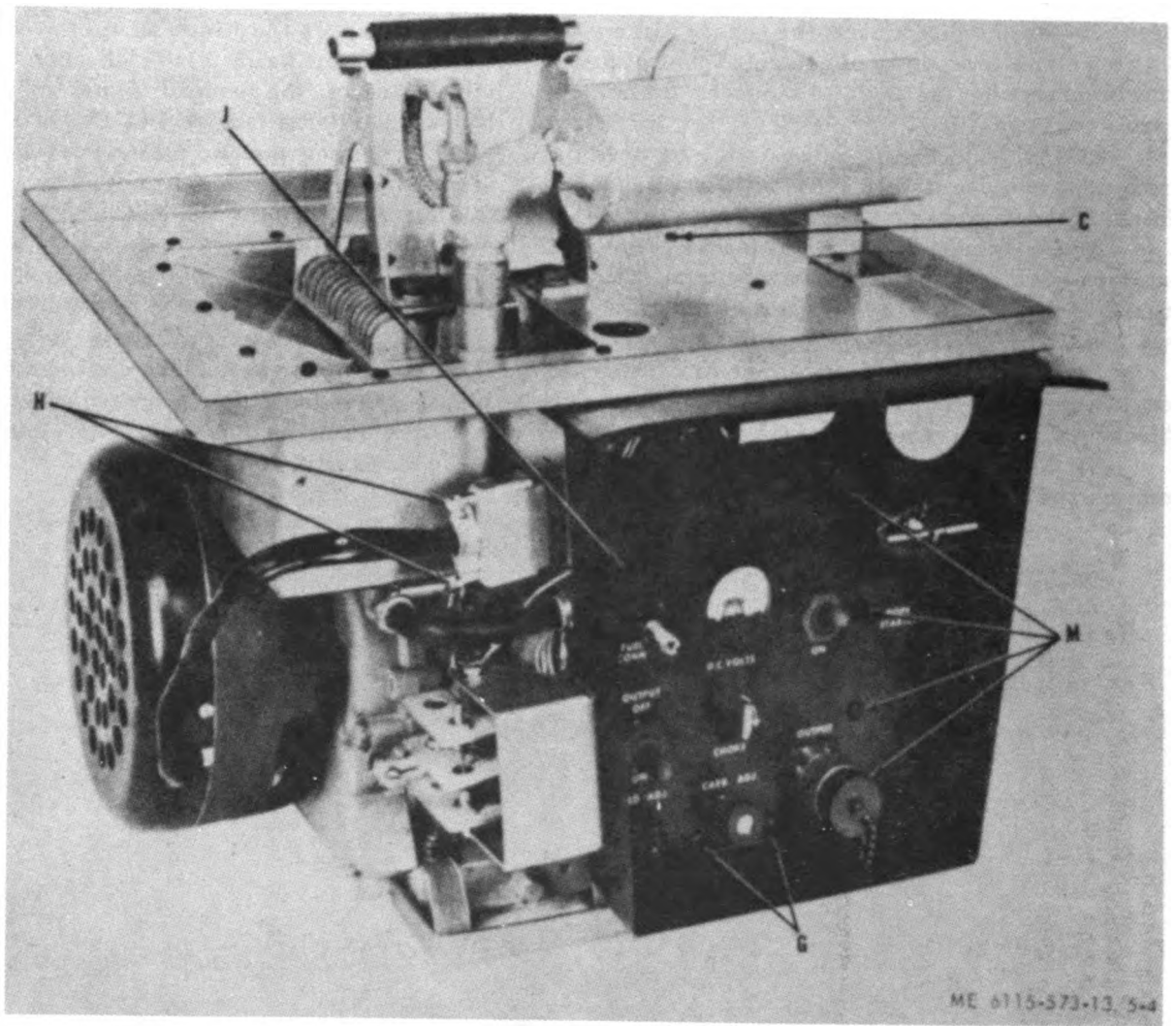
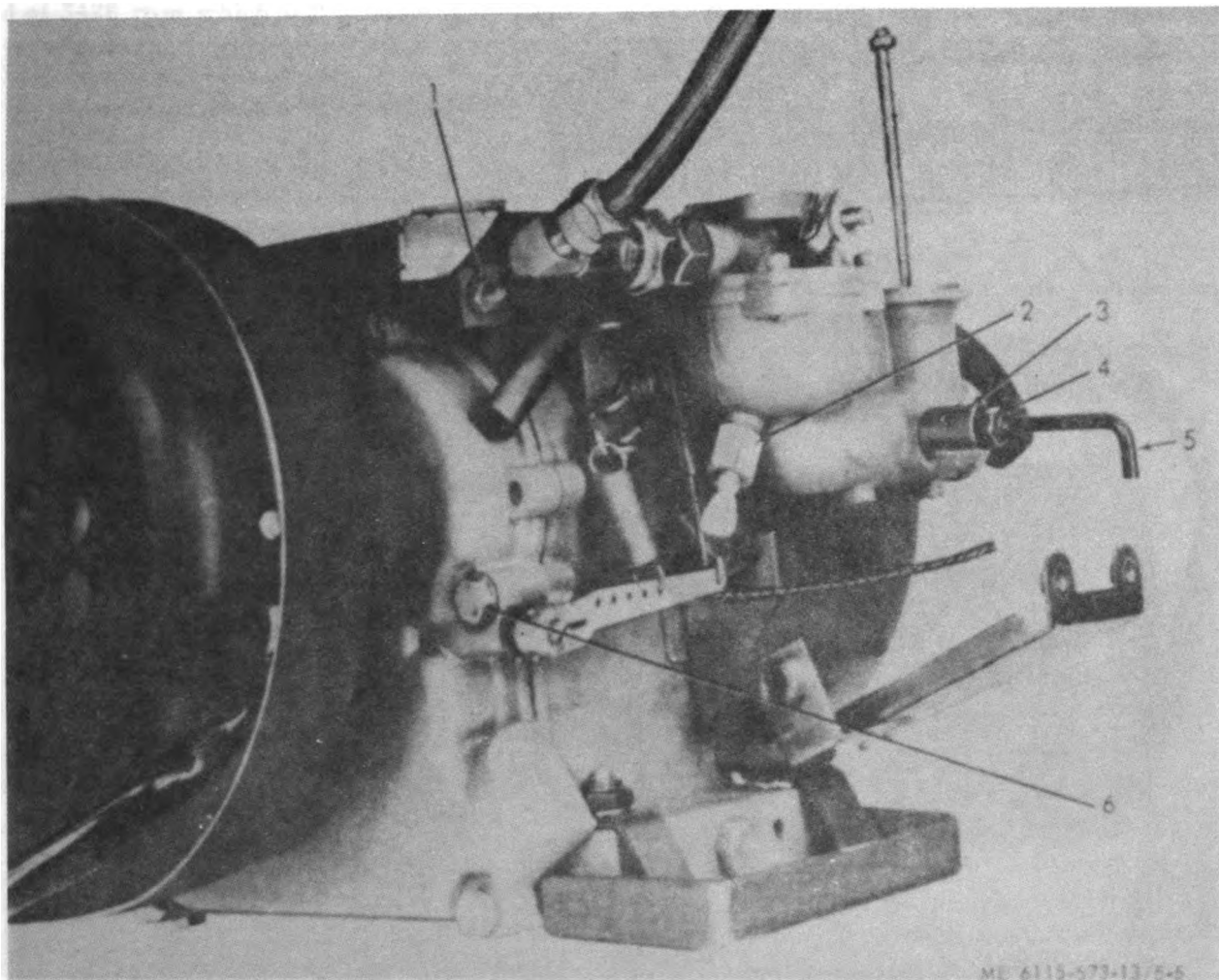


Figure 5-4. Control panel, removal and installation (PU-422 Q / U)



1 Screw (yellow wire from engine switch attaches here; PU-422B/U only)

2 Packing nut (for CARB ADJ needle valve)

3 Choke control coupling

4 Locknut

5 Choke lever

6 Grounding bolt (black wire from engine switch attaches here; PU-422B/U only)

Figure 5-5. PU-422B/U generator set with panels and air filter removed.

c. Removal (PU532/PPS-4 Only).

(1) Perform steps (1), (2), and (3) in *b* above.

(2) Disconnect the fuel connector from the front panel by removing the two retaining screws (L, fig. 5-6).

(3) Unplug the generator from the control panel (fig. 5-6)

(4) Remove the three screws (L) from the top

of the control panel and seven screws (L) which secure the control panel (fig. 5-6).

(5) Remove the four screws (C, fig. 5-3) securing side plate to the top of the engine.

(6) Remove the two screws which secure the side plate to the flywheel housing baffle.

(7) Remove the electrical assembly.

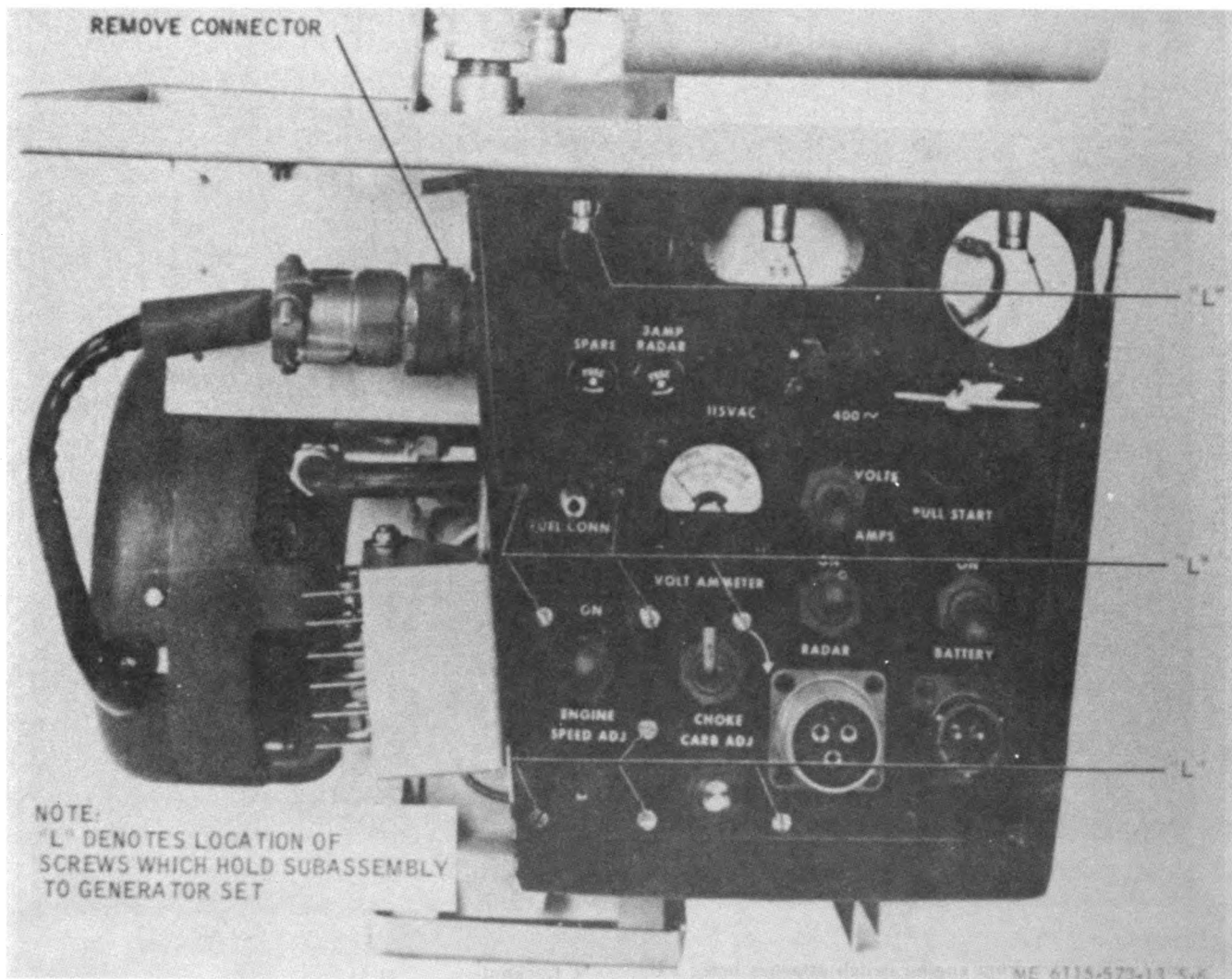


Figure 5-6. Electrical subassembly, removal and installation (PU-532 / PPS-4).

d. Cleaning, Inspection, and Replacemnt.

(1) Use a soft brush so as not to disturb the components and carefully brush any dirt from the front and rear of the control panel. Using an approved cleaning solvent and cloth, clean the side panel.

(2) Inspect control panel for loose connections, frayed wires, and damaged components. Refer any required service to direct support maintenance.

(3) Replace an unserviceable panel or electrical assembly with a serviceable like item.

e. Installation. Installation is the reverse of removal (b and c above).

NOTE

When assembling the choke lever in the PU-422B / U unit, thread the choke lever into the choke coupling only finger tight.

f. Checkout. Checkout of the electrical assembly will be performed by a qualified electronic technician according to best military practices.

5-6. Generator

a. General. The operator sets are described in paragraphs 1-7 and 1-9.

b. Checkout.

(1) Disconnect the generator connector from the electrical assembly (fig. 5-4 or 5-6).

(2) With a volt-ohmmeter, measure the resistance between the following pin members:

(a) PU-422B / U. A and B, A and D, C and B, C and D, E and B, E and D, and between each pin and generator frame. Resistance between any of these points shall not be less than 1 megohm. If not, replace stator winding.

(b) PU-532 / PPS-4. F and I, F and B, I and B, G and H, G and A, H and A, E and C, and between each pin and generator frame. Resistance between any of these points shall not be less than 1 megohm. If not, replace stator winding.

(3) With the generator connector still disconnected, start the engine and operate at a

speed of 3428 rpm which will produce a 400 cps output.

(4) With the volt-ohmmeter set for AC volts, measure the voltage between the following pins:

(a) *PU-422B/U*. Pins B and D. Meter should indicate approximately 129 vac. Measure the a-c voltage between pins A and C, A and E, and C and E. Meter should indicate approximately 25 vac. The difference between these voltages should not exceed 3 volts, otherwise, the stator winding should be repaired. If all voltage readings are low, replace the rotor.

(b) *PU-532/PPS-4*. Pins G and H, 35 V; G and A, 35 V; H and A, 35 V; F and I, 25.5 V; F and B, 25.5 V; I and B, 25.5 V, E and C, 125 V. If any of these voltages are more than 3 volts low, replace stator windings. If all the voltages are low, replace the rotor.

c. *Removal and Replacement (fig. 5-7 and 5-8).*

(1) Remove the generator cover by removing the two mounting screws.

(2) Remove the rotor by removing the nut, lockwasher, and flat washer.

(3) Install a rotor puller on the rotor end of the crankshaft. Tighten puller screw until rotor is unseated from shaft.

(4) Remove rotor and puller.

(5) Remove stator by loosening screws (fig. 5-8).

(6) Replace an unserviceable cover, rotor, or stator with a serviceable like item.

d. *Installation.* Installation is the reverse of removal.

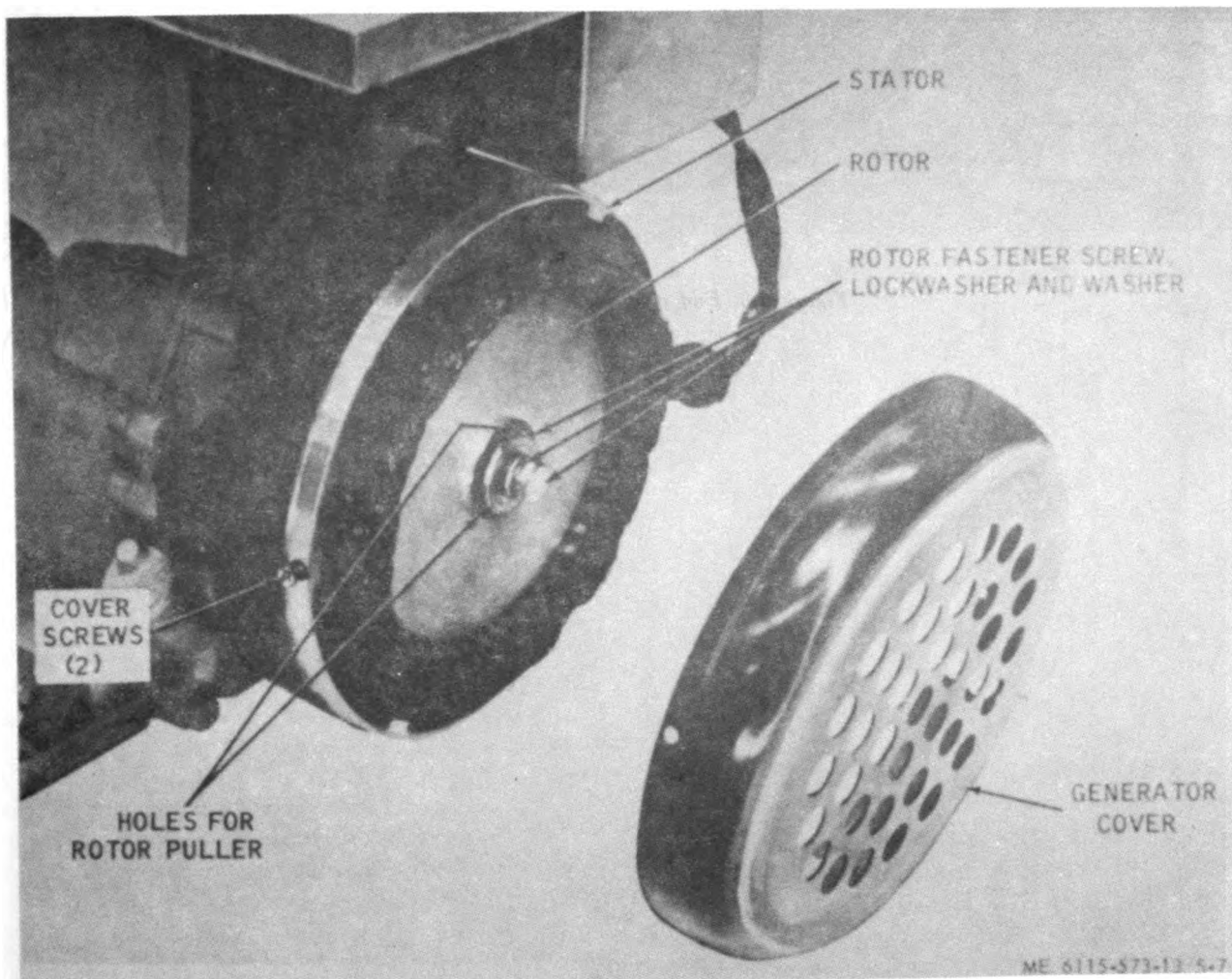


Figure 5-7. Generator, partially removed.

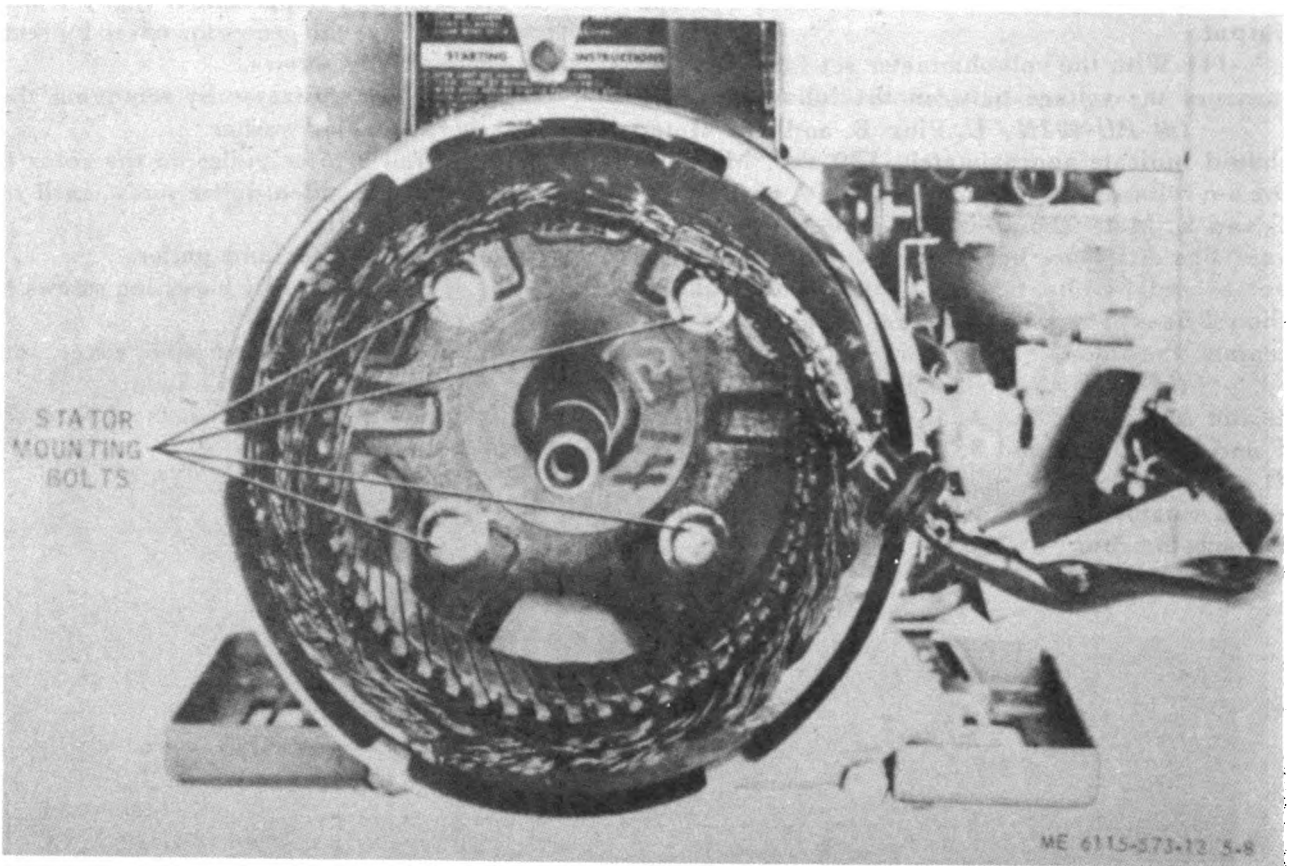


Figure 5-8. End view of generator, rotor removed.

CHAPTER 6

REPAIR OF ENGINE

Section I. ENGINE ACCESSORIES

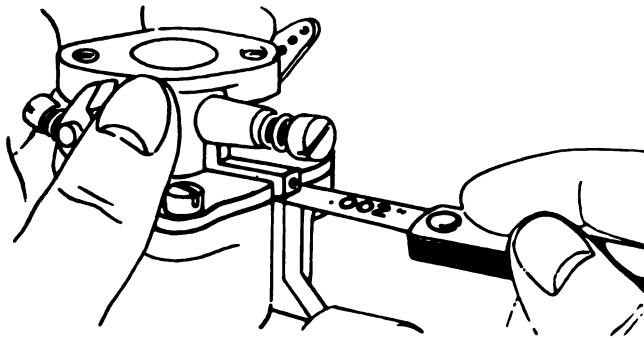
6-1. General

This section contains direct support maintenance instructions for the carburetor, recoil starter, and ignition system.

6-2. Carburetor

a. *Warping (fig. 6-1).*

- (1) Remove gaskets.
- (2) If a 0.002 inch feeler gage can be inserted between the upper and lower bodies at the air vent boss just below the idle valve, the upper body is warped and should be replaced.



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Figure 6-1. Checking carburetor body for warping.

b. *Carburetor and Exhaust Air Baffle Removal and Replacement.*

- (1) Remove the control and side panels (para 5-5).
- (2) Working from the top plate (D, fig. 5-3), remove the two head screws (fig. 6-2) located in the exhaust air baffle well. These screws hold the intake manifold, exhaust air baffle, and the carburetor together. As screws are removed, hold carburetor so it does not drop.

NOTE

Disconnect choke, speed adj. and carb adj controls from carburetor of the PU-532 / PPS-4 unit.

- (3) Remove carburetor completely by unhooking throttle linkage from governor arm.
- (4) Remove the four screws (X, fig. 5-3) securing the exhaust air baffle to the top baffle plate. Remove the screw holding the exhaust manifold air baffle to the cylinder head air baffle (2), and remove the exhaust manifold air baffle (fig. 6-2). Retain the upper and lower carburetor gaskets for reuse during installation.
- (5) Replace an unserviceable exhaust air baffle, gaskets, or carburetor with a serviceable like item.

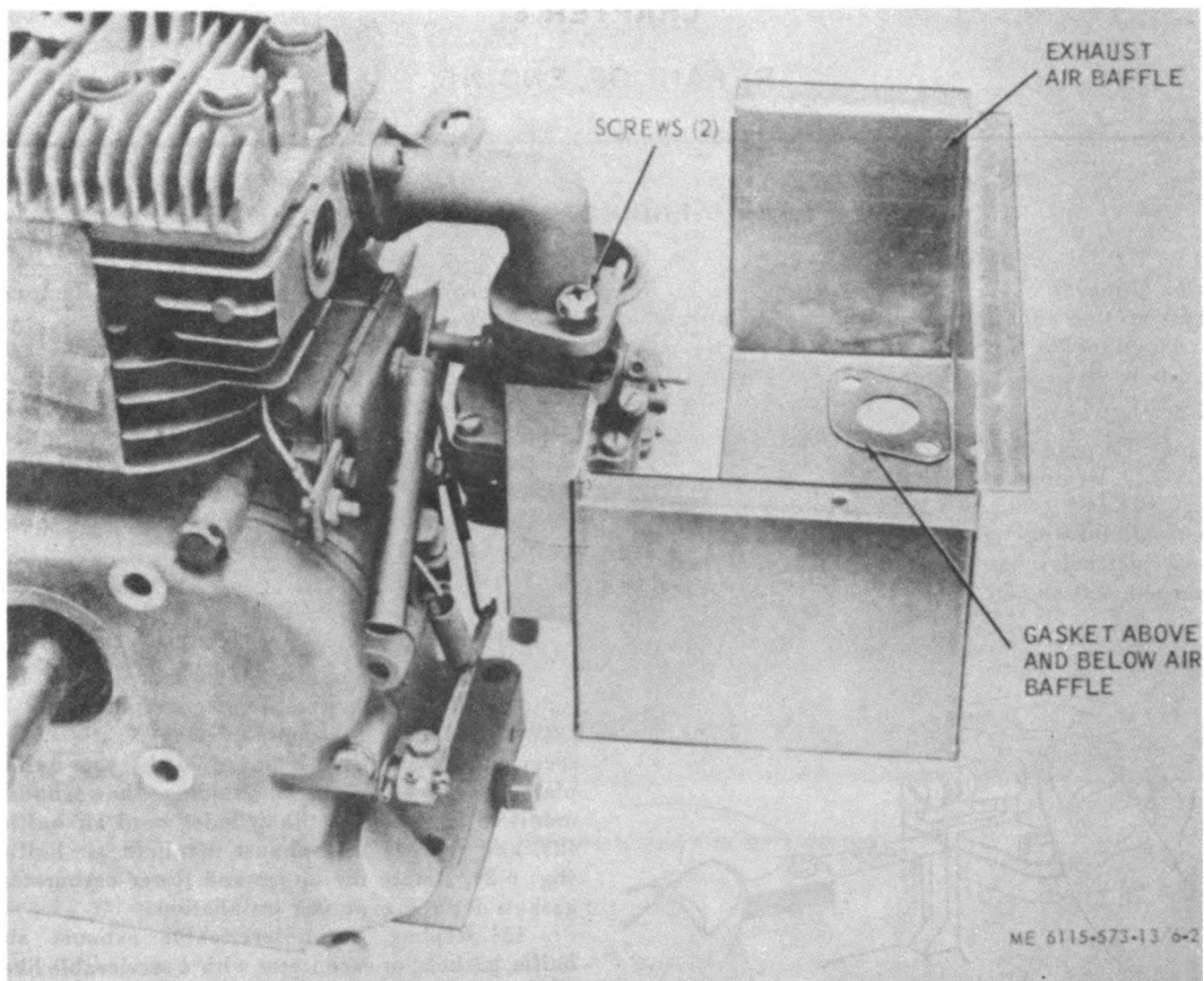


Figure 6-2. Carburetor and exhaust air baffle, removal and installation.

c. Installation. Installation is the reverse of removal.

d. Carburetor Disassembly (fig. 6-3).

- (1) Remove carburetor as directed in *b* above.
- (2) Use a ½ inch wrench and loosen needle packing nut. Screw out the packing nut and needle valve together.
- (3) Use a thin, blunt screwdriver to remove the nozzle. This nozzle projects into a recess in the upper body and must be removed before the upper body is separated from the lower body.
- (4) Remove the four screws holding the upper and lower bodies.

- (5) Remove the idle valve.
- (6) Remove pin which holds the float in place.
- (7) Remove the float and float needle valve. Check the float for leakage. If float contains gasoline, replace.
- (8) A wide, heavy screwdriver should be used to remove the float needle seat. Pull venturi out of lower body.
- (9) To remove throttle shaft, use a thin punch to drive out the pin which holds the throttle stop to the shaft, then pull out the shaft. If the shaft and bushings are worn, replace.

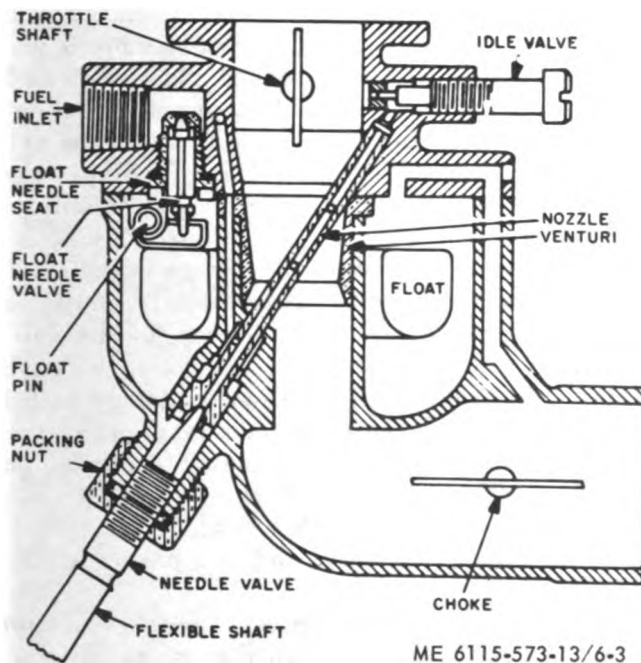


Figure 6-3. Carburetor, cutaway view.

e. Cleaning, Inspection, and Replacement.

(1) Clean all parts with an approved cleaning solvent; dry thoroughly.

(2) Inspect main adjustment screw and needle of inlet needle and seat assembly for a worn or damaged seating surface; the seating surfaces should come to a smooth, sharp point with no ridges around point. Inspect main adjustment screw for distortion and for damaged threads. Replace damaged parts.

(3) Inspect carburetor body for cracks and for worn or damaged threads. Check the fit of the throttle shaft and choke shaft in their ports in the body. The shafts should fit without perceptible side play. Repair slightly damaged threads with a thread tap. Replace the body if the threads are badly damaged, if it is cracked, or if the bearing surfaces of the throttle or choke shafts are worn.

(4) Inspect throttle and choke shafts for cracks, distortion, loose levers, and for wear of the bearing surfaces; replace if damaged.

(5) Inspect float levers and float lever pins for distortion, wear, or cracks; replace if damaged.

(6) Inspect the seat of inlet needle and seat assembly and of the main nozzle for damage or scoring of the seating surfaces; replace if damaged.

(7) Inspect all other parts for cracks, breaks, distortion, worn or damaged threads, or other damage; replace parts when necessary.

f. Repair and Assembly.

(1) Use new gaskets and new parts where necessary.

(2) Screw inlet seat with gasket securely in place and drop float valve needle into seat.

(3) Place body gasket on upper body and assemble float.

(4) Invert upper body to check the float level. The float should be parallel to the body mounting surface. If not, bend tang on float until they are parallel (fig. 6-4). Assemble venturi and gasket to lower body and to the air baffle (fig. 6-2).

(5) Be sure the holes in the gaskets and body are aligned.

(6) Fasten upper and lower bodies together with four mounting screws (fig. 6-5).

(7) Screw in nozzle with narrow, blunt screwdriver, being careful that the nozzle tip enters the recess in the upper body. Tighten nozzle securely.

(8) Screw in needle valve on the end of the flexible shaft until it just touches the seat, then turn it back about 1½ turns. Do not tighten pack nut excessively.

(9) Screw in idle valve until it just touches the seat, then turn it back about ¾ turn.

NOTE

The above needle and idle valve settings are approximately correct. Final adjustment should be made when the engine is running.

(10) Install carburetor on engine as directed in c above.

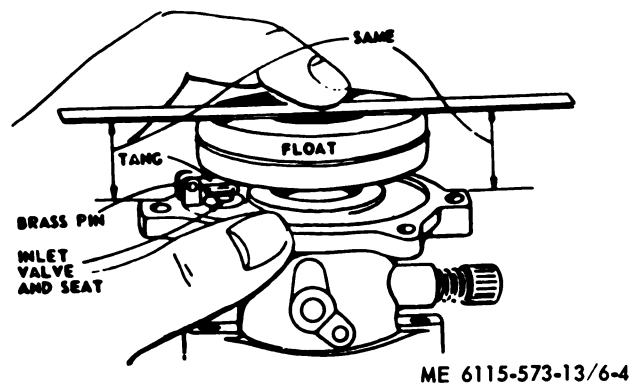
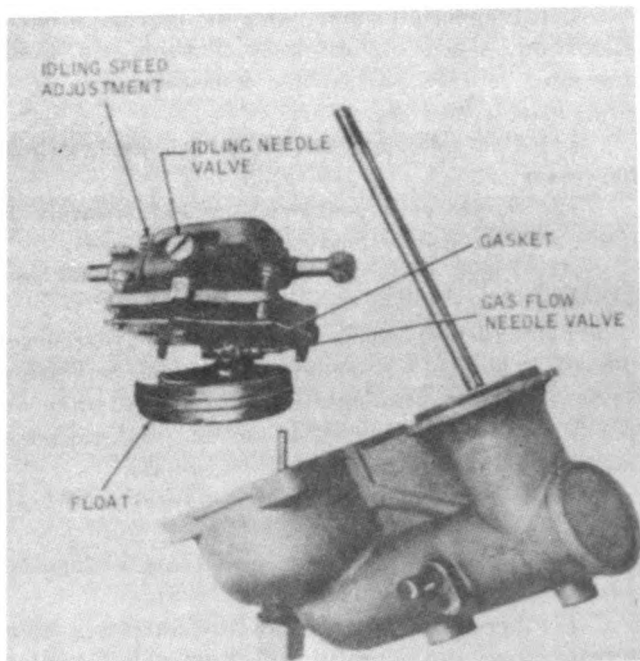


Figure 6-4. Checking carburetor float level.



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Figure 6-5. Carburetor, partially exploded view.

6-3. Recoil Starter and Blower Housing Assembly

a. *General.* The recoil starter (fig. 6-6) is

mounted on the fan housing directly in front of the flywheel. It consists of a driving assembly and a pawl cup assembly. The driving assembly is made up of a pulley with an extended square hub and a nylon rope which, when pulled, imparts rotation to the pulley. A spring in the pulley rewinds the nylon rope after it is pulled and released. The pawl cup assembly consists of a cup with four steel balls held inside the cup and a shaft. The assembly bolts to the flywheel. When the starter rope is pulled, the balls engage the square hub of the drive pulley and transfer the rotation of the pulley to the cup and to the flywheel to start the engine. When the engine starts, the rotation imparted to the cup and balls by turning flywheel throws the balls out of engagement with the hub of the pulley by centrifugal force. This prevents the engine from turning the pulley.

b. *Removal and Replacement.*

- (1) Remove control and side panels (para 5-5).
- (2) Remove the three screws (fig. 6-6) securing the fan housing to the engine.
- (3) Loosen the two head bolts (fig. 4-3) so blower housing can be lifted up to clear the raised "dimple" for the high tension spark plug wire.
- (4) Remove starter and blower housing.
- (5) Replace an unserviceable starter and fan housing assembly, or starter rope handle, with a serviceable like item.

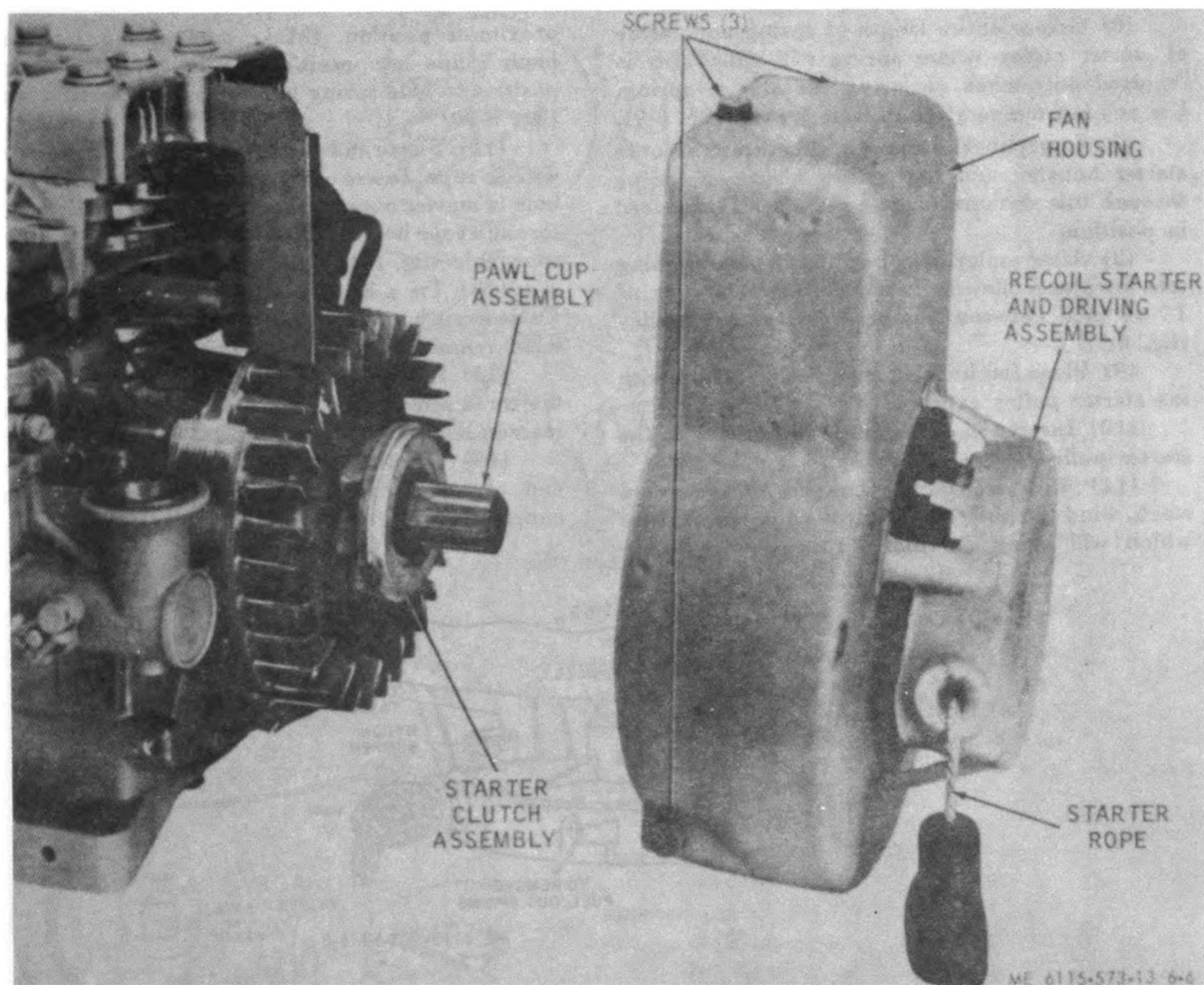


Figure 6-6. Starter and blower housing assembly, removal and installation.

c. **Installation.** Installation is the reverse of removal. Install starter rope handle as shown in figure 6-7.

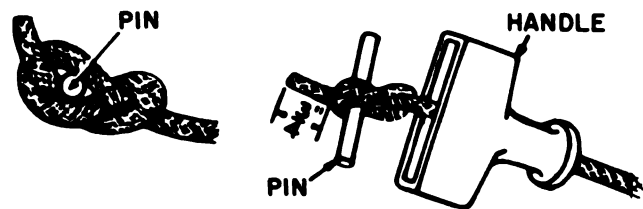


Figure 6-7. Starter rope handle replacement.

d. **Starter Spring and Starter Rope Replacement.**

- (1) Remove starter and fan housing (b above).
- (2) Grasp outer retaining hook of spring and pull through slot in housing as far as possible (fig. 6-8).
- (3) Bend up tangs which hold starter pulley or starter housing and remove pulley and spring. If bumpers on tangs are worn, reverse or replace (fig. 6-8).
- (4) Untie remaining knot in starter rope and remove rope from hole in pulley.
- (5) Hook end of new spring to starter pulley (fig. 6-8).

(6) Grease entire length of spring and inside of starter pulley where spring will rub. This is required only when replacing the starter spring. Use any low temperature silicone grease. (fig. 6-9).

(7) Insert hooked end of spring through slot in starter housing and pull entire length of spring through this slot until starter pulley can be placed in position.

(8) After pulley is in position, bend retaining tabs in place allowing a maximum clearance of $1/64$ inch between bumpers and starter pulley (fig. 6-9).

(9) Place fan housing in a vise or clamp with the starter pulley exposed.

(10) Insert a $3/4$ inch square wood stock in the starter pulley.

(11) With a wrench clamped to the wood stock, wind the pulley $13\frac{1}{4}$ turns counterclockwise which will bring the pulley rope hole into ap-

proximate position. (Make sure spring retaining hook snaps into position.) Hold wrench in this position to hold spring tension while inserting rope (fig. 6-10).

(12) Pierce end of rope with a stiff wire. Hook wire to rope. Insert other end of wire through rope hole in starter housing, between pulley flanges and through rope hole in pulley, and draw rope through rope hole (fig. 6-11).

(13) Tie a knot in both ends of starter rope. Untie wrench and allow tension on starter spring to wind remaining rope onto starter pulley.

(14) Replace starter housing on engine with the three screws (fig. 6-6). Complete generator set reassembly.

(15) Carefully remove knot on starter housing end of rope, thread the rope through the front panel, and tie on the pull-start handle (fig. 6-7).

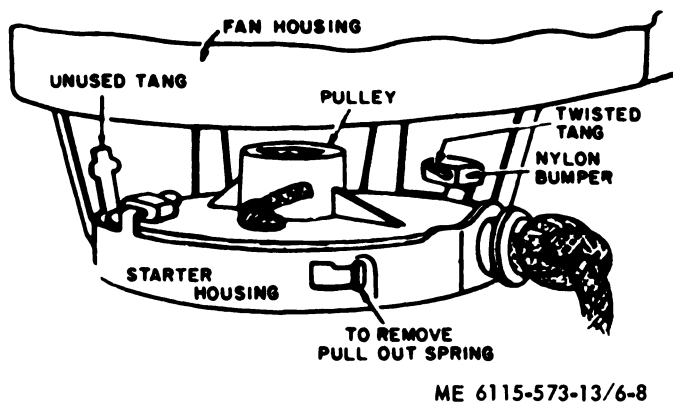


Figure 6-8. Details of rewind starter assembly.

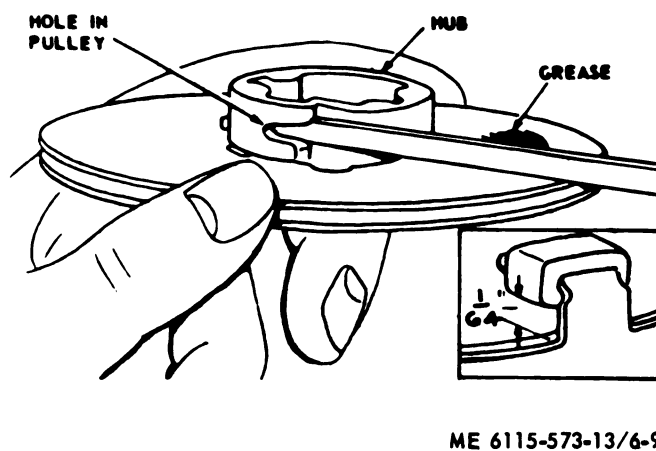
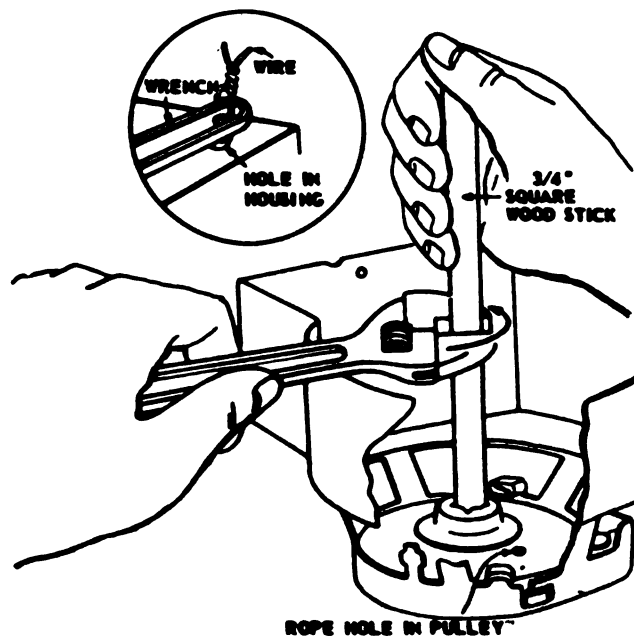
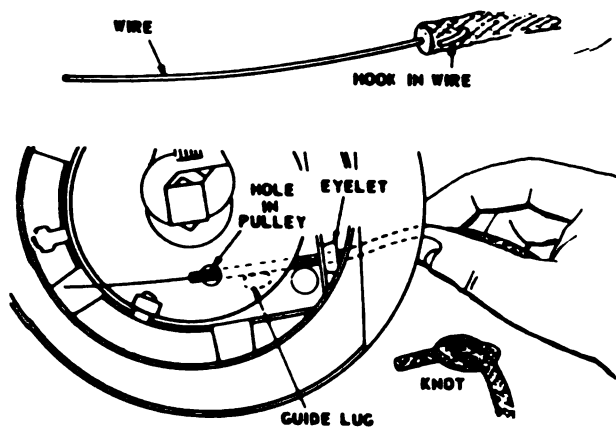


Figure 6-9. Assembly starter recoil spring.



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Figure 6-10. Winding recoil spring.



ME 6115-573-13/6-11

Figure 6-11. Starter rope installation.

e. Starter Clutch Assembly and Flywheel.

(1) **Removal** (fig. 6-12 and 6-13).

(a) Remove starter and fan housing (b above).

(b) Insert a wedge between the fins on the flywheel so that the flywheel will not turn.

(c) Turn the starter clutch assembly counterclockwise to remove.

(d) Remove cup washer from shaft.

(e) Remove flywheel with wheel puller; two holes are provided for insertion of wheel puller bolts into flywheel (fig. 6-13).

(f) Remove flywheel key.

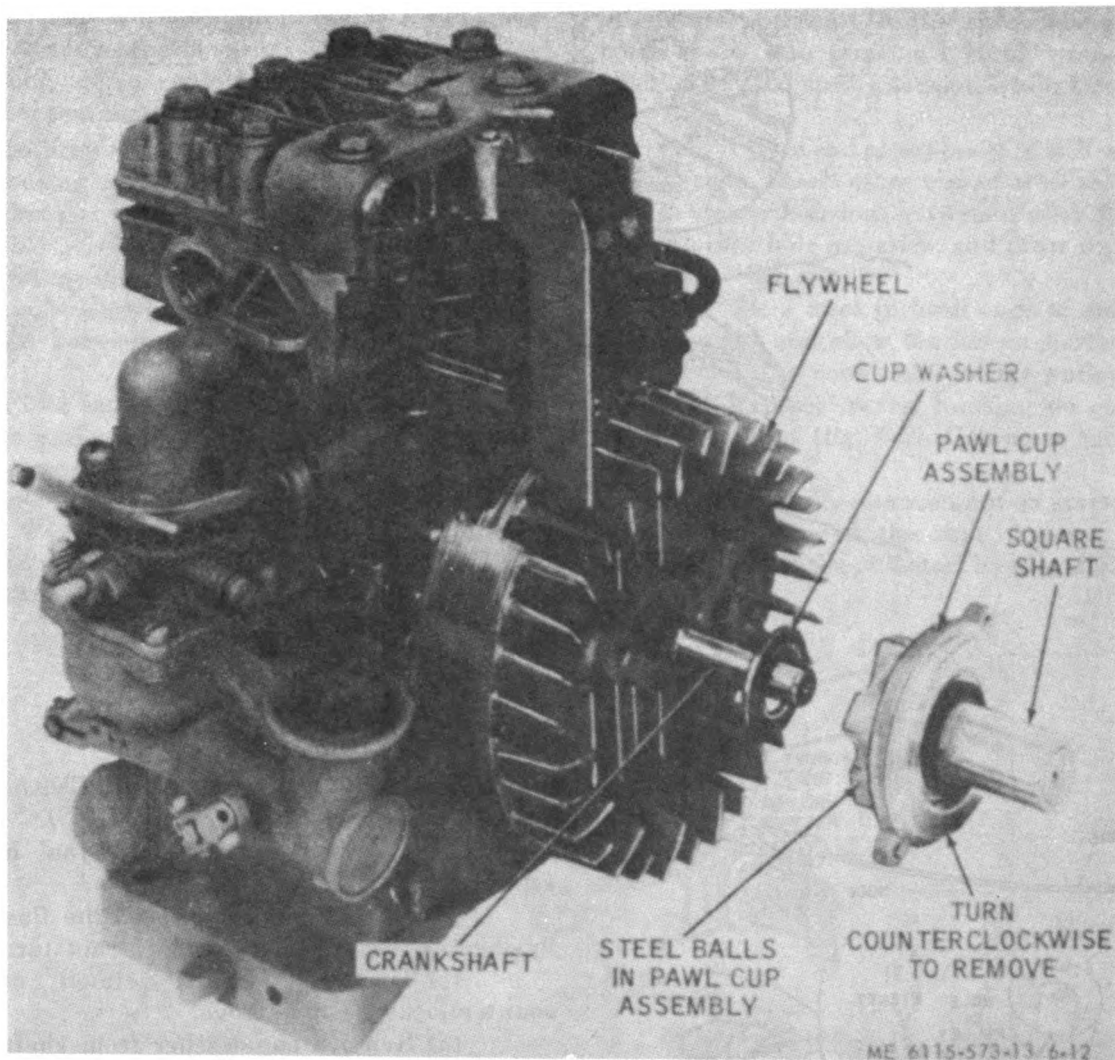


Figure 6-12. Starter clutch assembly removed.

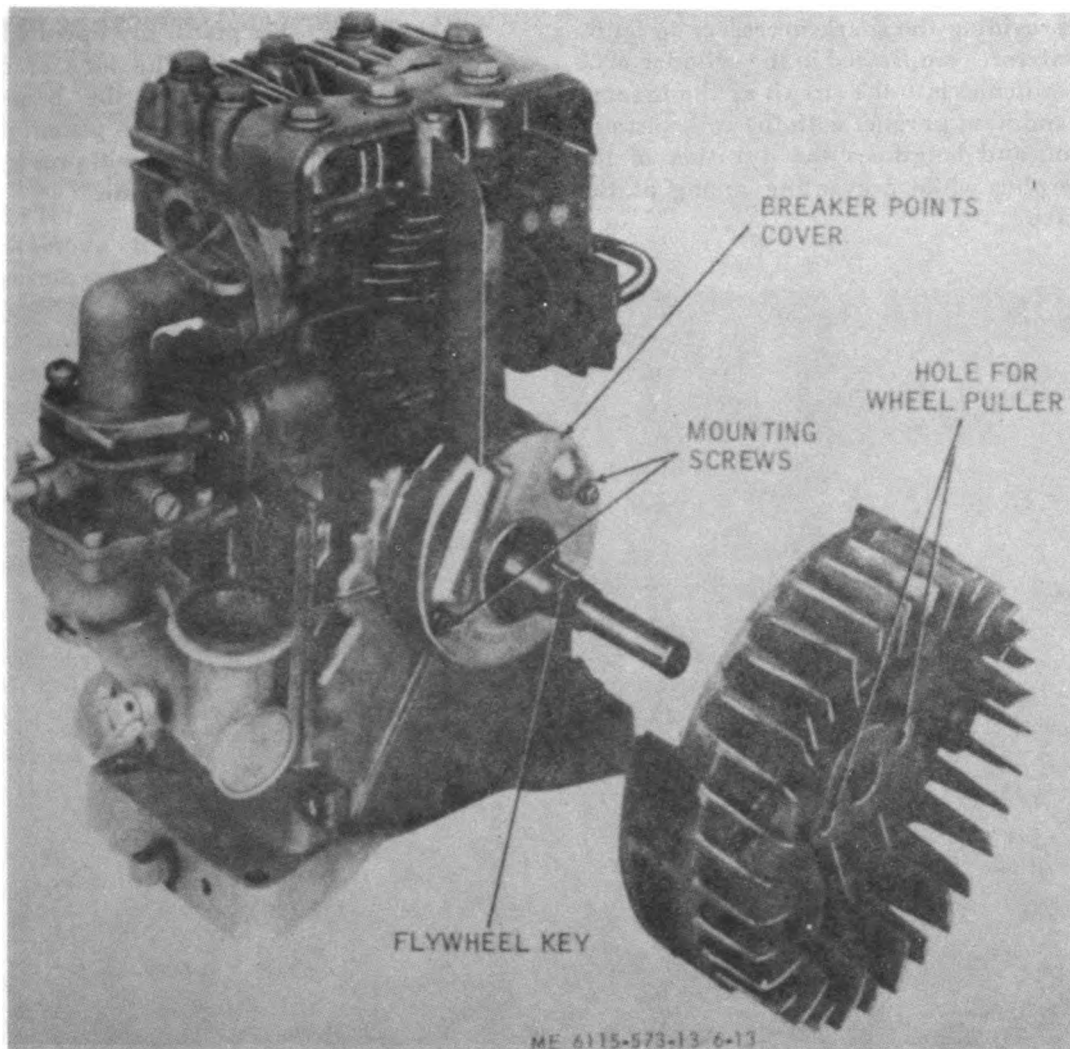


Figure 6-13. Flywheel removed.

(2) Cleaning, Inspection, and Replacement.

(a) Clean clutch assembly and flywheel with an approved solvent and dry thoroughly.

(b) Inspect starter clutch for cracks, worn or damaged steel balls, or other damage.

(c) Inspect flywheel key. If damaged, replace key. Replace an unserviceable clutch assembly with a serviceable like item.

(d) Inspect flywheel for cracked or broken fins and for distorted or scored mounting hole. Replace an unserviceable flywheel with a serviceable like item.

(e) Remove burrs or dirt from engine crankshaft and keyway.

(3) Installation.

(a) Position flywheel on crankshaft so that keyway aligns with key. Insert key into keyway of crankshaft. Tap flywheel onto crankshaft with soft hammer until it is firmly seated on tapered shaft (fig. 6-13).

(b) Install cup washer and starter clutch assembly on crankshaft (fig. 6-12).

(c) Position blower housing on engine and secure with three screws (fig. 6-6).

6-4. Ignition System

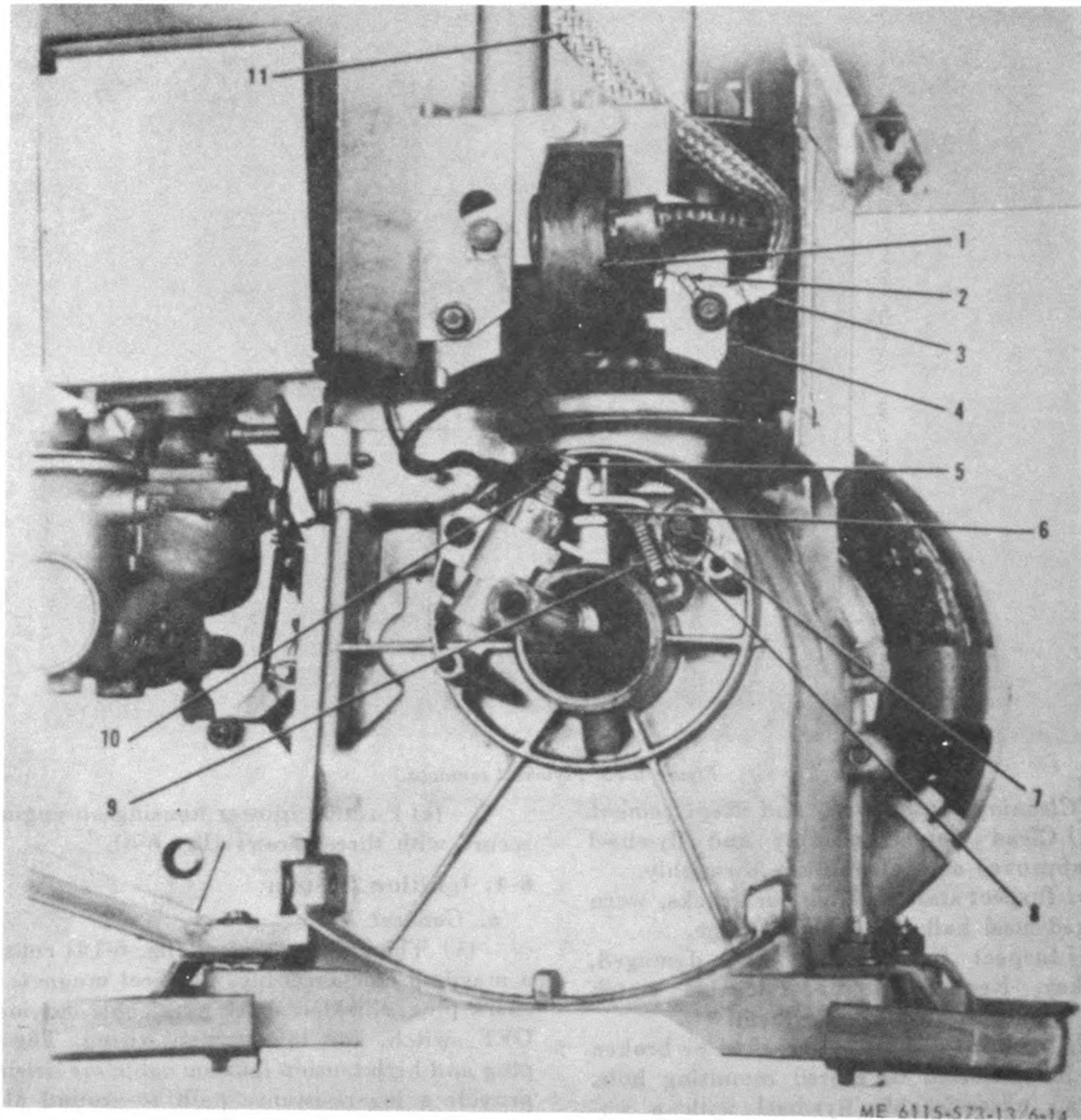
a. General.

(1) The ignition system (fig. 6-14) consists of a magneto coil assembly, flywheel magnet, shield spark plug, shielded spark plug cable, engine ON-OFF switch, and low tension wiring. The spark plug and high tension ignition cable are shielded to provide a low-resistance path to ground of stray currents produced by the ignition system, thus preventing radio interference (fig. 4-3).

(2) The magneto coil assembly is secured directly above the flywheel. As the flywheel rotates, the magnetic field on the magnet imbedded in the flywheel, cuts across the magneto coil, gradually inducing a high current in the coil. The flow is through the closed breaker points. This current is broken as the breaker points of the magneto open, and a high voltage is thus induced in the secondary winding of the coil and discharged through the

spark plug, providing the spark necessary to ignite the fuel-air mixture compressed in the cylinder. The capacitor is switched into the circuit as the breaker points open and it, in parallel with the coil, sustains the oscillation and lengthens the duration of the spark in the plug while preventing arcing at the breaker points.

(3) The breaker points are operated by a cam on the engine crankshaft. The lobe of the cam is positioned so that it opens the breaker points slightly before top-dead-center piston position to ignite the fuel at the time that will provide the most efficient operation of the engine.



- 1 Magneto coil
- 2 Coil ground wire
- 3 Spark plug shield ground
- 4 Magneto armature post
- 5 Movable breaker point
- 6 Plunger
- 7 Pivot post
- 8 Ground braid
- 9 Breaker point spring
- 10 Fixed breaker point (p/o capacitor)
- 11 Shielded ignition cable

Figure 6-14. View of ignition system.

b. Access to Ignition Components.

(1) Remove starter mechanism and fan housing (para 6-3). If additional access is required, remove appropriate housings (para 4-17, 5-5, and 6-2).

(2) Remove the starter pawl cup and flywheel (para 6-3 e).

(3) Remove the two screws holding the breaker points cover and remove the cover (fig. 6-13).

c. Inspection and Repair.

(1) Check magnetic attraction of magnets cast into internal diameter of flywheel. A rough check to determine if magnets are powerful enough can be made by holding a screwdriver loosely by the end of the handle and allowing the blade to dangle within 1 inch of magnets. The magnets should attract the blade from a 1-inch distance. Replace flywheel if damaged or if it has lost its magnetic attraction.

NOTE

Magnets are mounted on one side only of the flywheel. The other side contains steel counterweights which are not magnetized.

(2) Check condition of breaker plunger; replace if badly worn.

(3) Check condition of magneto breaker points. If they are badly burned or pitted, replace breaker points and capacitor as directed in steps (4) through (12) below.

(4) Unsolder ground strap from movable breaker point arm.

(5) Remove mounting screw and spring that secure breaker point assembly; lift breaker point arm from pivot post (fig. 6-14).

(6) Remove capacitor clamp and capacitor.

(7) Solder ground strap from pivot post onto replacement breaker point arm. Position and secure new breaker point arm on pivot post.

(8) Position capacitor and secure loosely with capacitor clamp.

(9) Connect electrical leads.

(10) Apply a few drops of oil to breaker point plunger.

(11) Install pawl cup assembly on crankshaft to permit shaft to be rotated. Rotate crankshaft

manually until breaker points are opened to widest gap.

(12) Check breaker point gap with feeler gage. Gap should be 0.020 inch. If point is not correct, loosen capacitor clamp mounting screw and, with a screwdriver, adjust position of capacitor to get required gap. Tighten clamp mounting capacitor screw and turn crankshaft one revolution to recheck adjustment. Readjust if necessary.

(13) Remove magneto armature coil by removing screw at end of shielded ignition cable (11, fig. 6-14) and disconnecting cable from spark plug. Disconnect primary wire from fixed breaker point on capacitor. Remove the two mounting bolts and remove armature and coil.

(14) Wipe coil assembly with clean, dry cloth.

(15) Inspect coil assembly for damaged lead, cracked insulation, exposed windings, or any other damage. Install armature coil in reverse order of removal. Replace with new armature coil if necessary.

(16) Check all electrical leads for shorting or grounding to engine. Check for broken connections to engine switch on control panel.

d. Assembly and Adjustment.

(1) Remove pawl cup from crankshaft if installed for turning crankshaft.

(2) Replace breaker points cover and retaining screws. Apply a sealer around wire leads to stop dust and dirt.

(3) Position flywheel for correct keyway alignment. Insert key into keyway. Tap flywheel into position with a soft hammer.

(4) Install cup washer with concave side toward engine. Secure with screws.

(5) Install clutch assembly onto crankshaft (para 6-3 e).

(6) Adjust the air gap between the armature coil pole pieces and the flywheel to within 0.006 to 0.010 inch by loosening screws and shifting position. Tighten screws when adjustment is complete.

(7) Install all remaining components in reverse order of disassembly.

Section II. ENGINE COMPONENTS

6-5. General

The engine used with the generator is a conventional four-stroke cycle, air-cooled engine. The information contained in this section is arranged in a logical sequence of disassembly, repair, and assembly of the engine.

6-6. Preliminary Disassembly of Engine

a. Drain oil (fig. 3-1).

b. Remove gasoline can and fuel line (para 4-3).

c. Remove all housing assembly air baffles and muffler assembly (para 4-16, 4-17, 5-5, and 6-2).

d. Remove air filter (para 4-20).

e. Remove starter and fan housing assembly (para 6-3).

f. Remove pawl cup and flywheel (para 6-3 e).

g. Remove spark plug and shielded ignition cable (para 4-19 and 6-4 c).

h. Remove generator (para 5-6).

6-7. Valves and Valve Springs Disassembly

a. Remove valve cover and crankcase breather (fig. 6-15).

b. Compress valve springs with spring compressor, Briggs and Stratton Tool No. 19063.

c. Raise valve spring collars and lift out locking pins (fig. 6-16).

d. Remove compressor and spring.

e. Lift out valves. Retain springs, collars, and locking pins for reassembly.

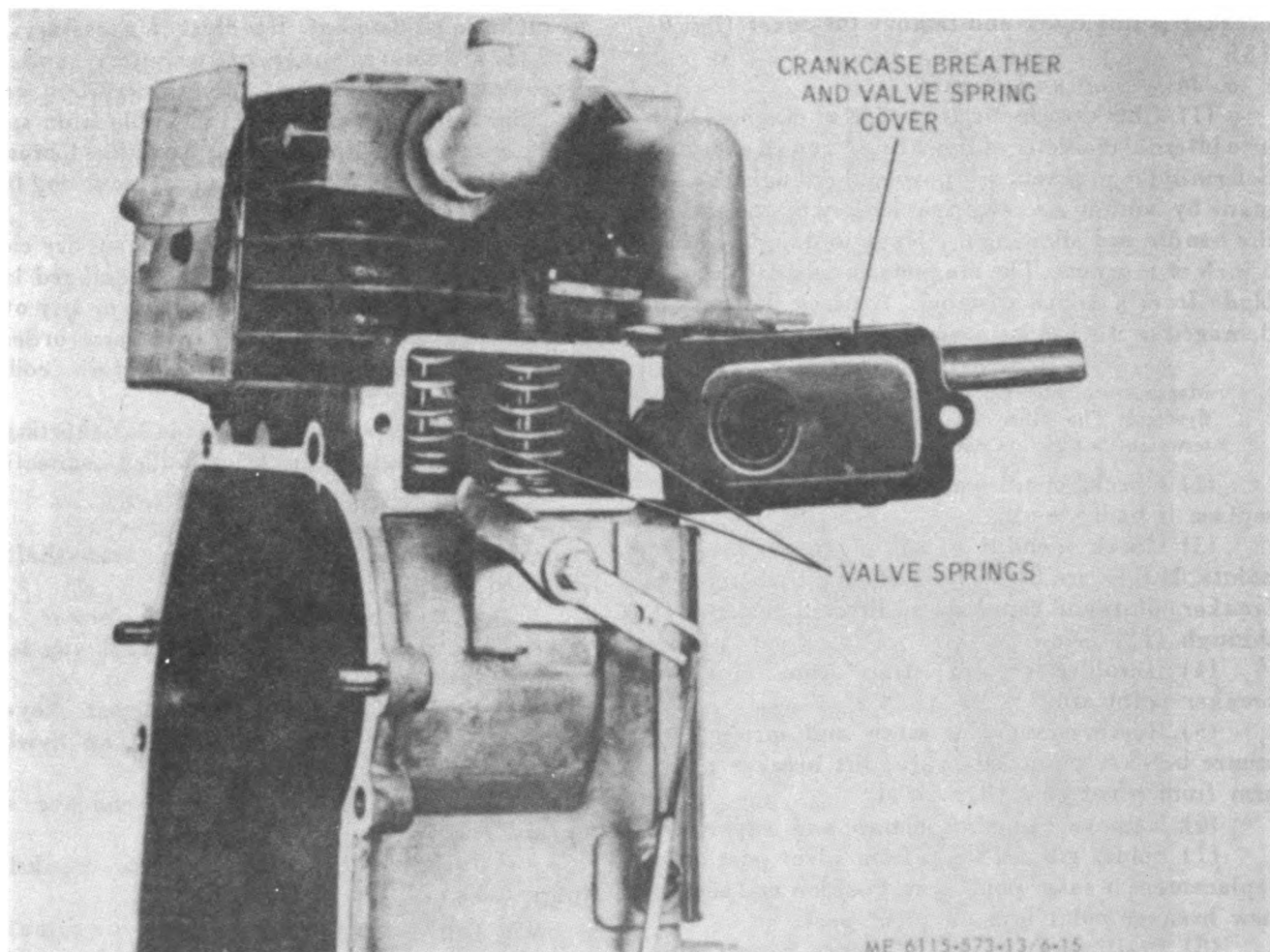


Figure 6-15. Partial disassembly of engine showing access to valve springs.

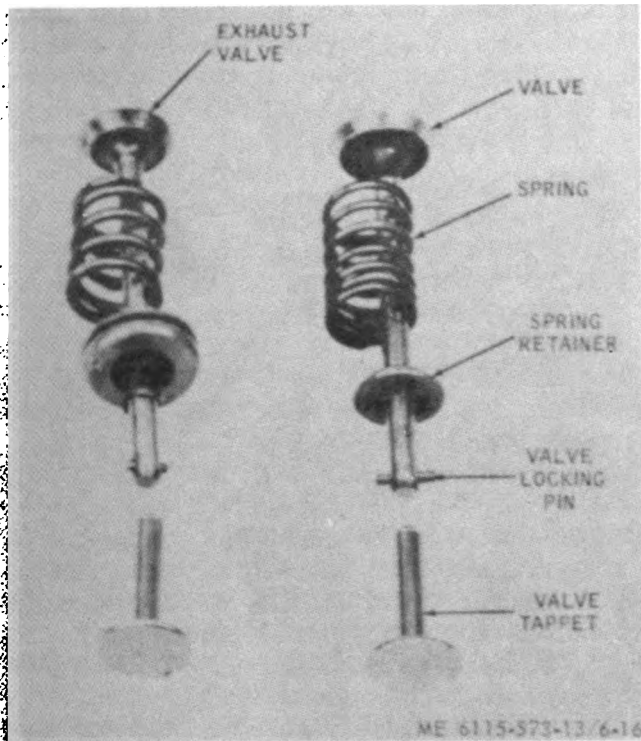


Figure 6-16. Relationship of valves and springs to cam tappets.

6-8. Check of Crankshaft End Play (fig. 6-17)

The end play of the crankshaft should be between 0.002 to 0.008 inch. The best method to check this is to clamp a dial indicator on the crankshaft with the pointer against the cylinder. Moving the crankshaft in and out will show the end play on the indicator. If no dial indicator is available, a clamp or pulley can be fastened to the crankshaft and feeler gages can be used to measure the distance from the pulley to the cylinder with the crankshaft pushed toward the cylinder and pulled away. The difference in distance is the end play. If the end play is greater than 0.008 inch, it indicates excessive main bearing wear.

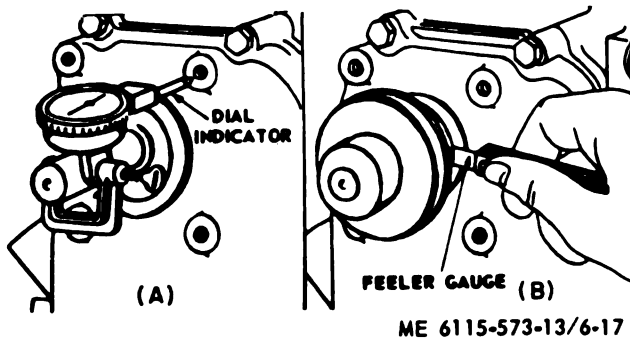


Figure 6-17. Checking crankshaft end play.

6-9. Mechanical Governor

a. Disassembly and Repair.

NOTE

This is a very skillful operation, and should be performed only when absolutely necessary.

(1) The governor is located inside the crankcase cover and the cover must be removed (fig. 6-18). Before doing this, make sure all burrs and rough spots are removed from extruding crankcase surfaces. To remove cover, remove six bolts and pull cover outward.

(2) Loosen the screw on the governor level and pull lever from governor shaft (fig. 6-19).

(3) Loosen the two governor housing mounting screws to remove governor housing. As the housing is lifted, the governor gear will slip off the shaft. Do not allow gear to drop and be damaged. During disassembly, inspect and repair governor assembly as necessary to insure that governor weights are securely fastened.

(4) Retain the steel thrust washer (fig. 6-19) on the shaft between the gear and the gear housing; this washer will be used when assembling the governor.

(5) To remove the governor lever shaft, pull out with a pair of pliers or drive out with a thin punch the roll pin in the outside end of the governor lever shaft. Remove the washer (fig. 6-19).

(6) With a screwdriver, turn the governor lever shaft clockwise, from the outside end, to unscrew the governor crank follower from the shaft. This is a left-hand thread. Hold governor crank follower and pull out the shaft.

(7) Replace unserviceable parts with serviceable like items.

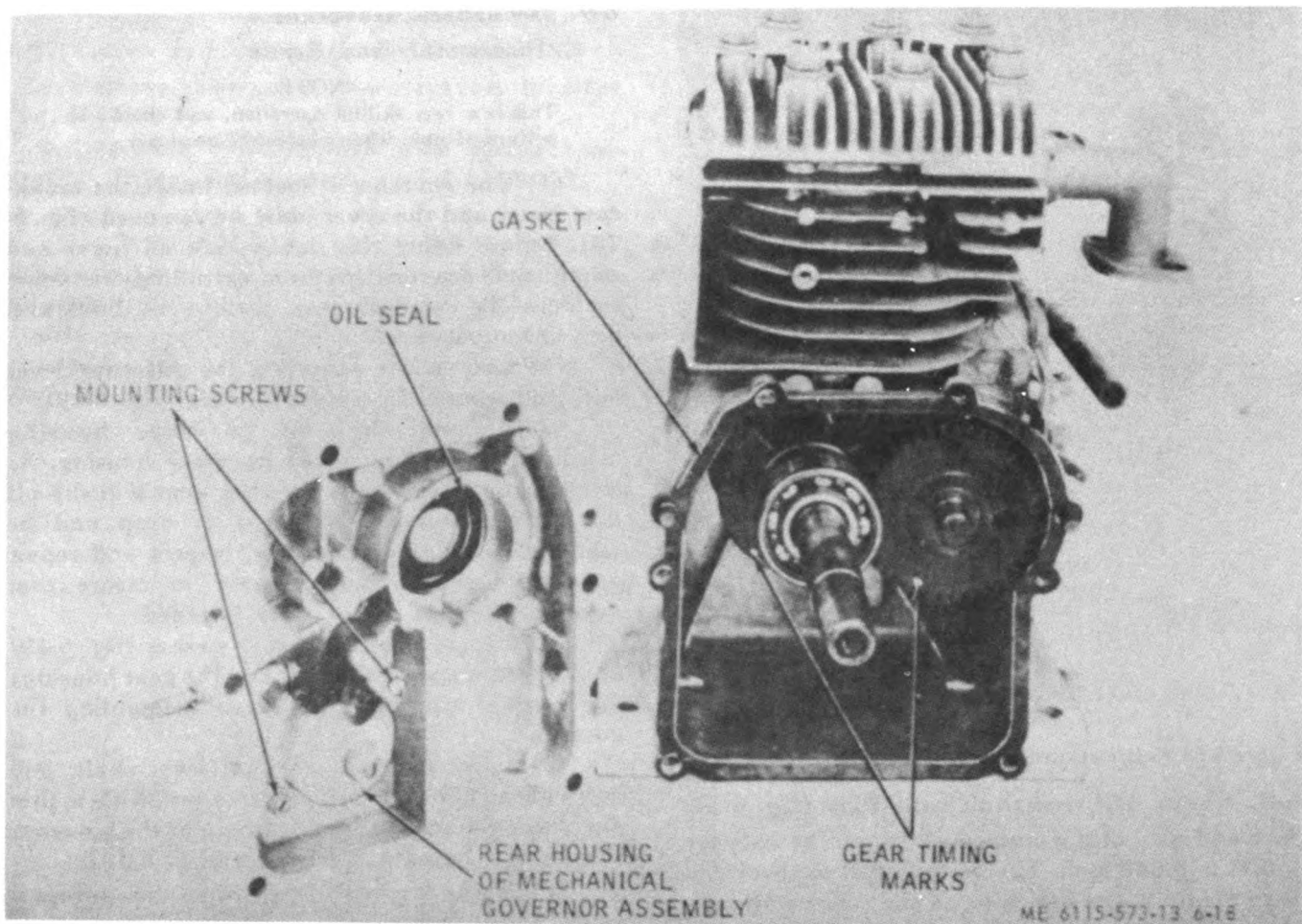


Figure 6-18. Engine body with crankcase cover removed.

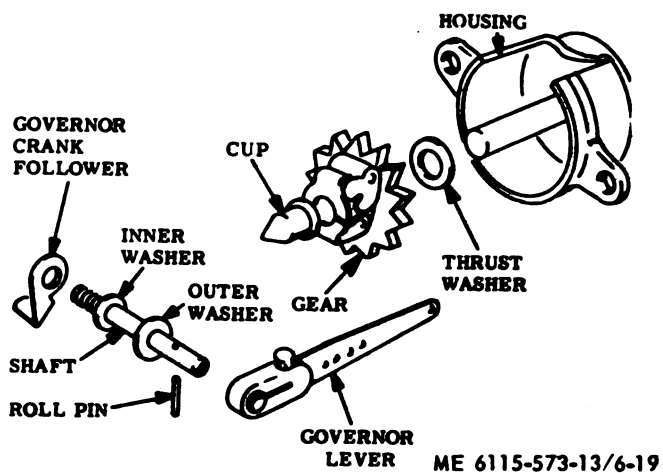


Figure 6-19. Mechanical governor parts.

b. Assembly.

(1) Push governor lever shaft into crankcase cover, with the threaded end in.

(2) Assemble the small washer on the inner end of the shaft, then screw the shaft into the governor crank follower by turning the shaft

counterclockwise. This is a left-hand thread. Tighten securely.

(3) Turn the shaft and follower so that follower points toward the bottom of the crankcase cover.

(4) Place the washer on the outside end of the

shaft and insert roll pin into governor shaft opening. Roll pin should just go through the shaft so the pin protrudes from only one side of the shaft.

(5) Place the thrust washer and then the governor gear on the shaft in the gear housing.

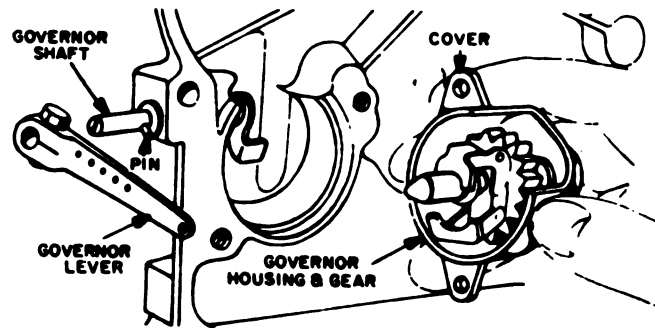
(6) Hold crankcase cover in a vertical (normal) position and then assemble the housing with gear in position so that the point of the steel cup on the gear rest against the crank follower.

(7) Tighten housing in place with two mounting screws (fig. 6-20).

(8) Assemble the governor lever on the governor shaft with lever pointing downward at about a 30-degree angle.

(9) Complete all remaining mechanical and electrical assembly.

(10) Adjust governor (para 4-24).



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Figure 6-20. Assembling mechanical governor.

6-10. Piston and Connecting Rod

a. Removal.

(1) Make sure all carbon is removed from piston top and top end of cylinder block, as previously outlined.

(2) Loosen cap screws to remove rod cap (fig. 6-21).

(3) Push rod and piston assembly out of cylinder.

(3) Check the remaining space in the groove with a feeler gage. If a 0.005 gage can be inserted in this space, piston is excessively worn and should be replaced.

d. *Piston Pin Inspection.* Replace pin that is worn to a size of 0.48876 or smaller, or is more than 0.0005 inch out-of-round.

e. *Connecting Rod Replacement.*

(1) If the crankpin bearing hole in the rod is scored or worn to a size of 0.875 inch or larger, replace rod.

(2) If the piston pin bearing hole is scored or worn to a size of 0.49125 or larger, replace rod.

6-11. Cylinder Wall Inspection

After piston has been removed, inspect cylinder wall for scoring or cracks. Within an inside micrometer, check bore size at approximately center of piston ring travel area. Normal maximum cylinder size is 2.3125. If bore size is more than 0.003 oversize or more than 0.0015 inch out-of-round, cylinder must be rebored for a larger piston in order to restore engine to maximum efficiency.

6-12. Crankshaft Inspection

After removing crankshaft, inspect condition of journals and crankpin. If journals are worn to a size smaller than 0.8725 and the crankpin is worn to a size smaller than 0.8670, it is recommended that the crankshaft be replaced.

6-13. Cleaning Engine Parts

After the engine is disassembled and checked, clean all parts with an approved solvent and dry thoroughly.

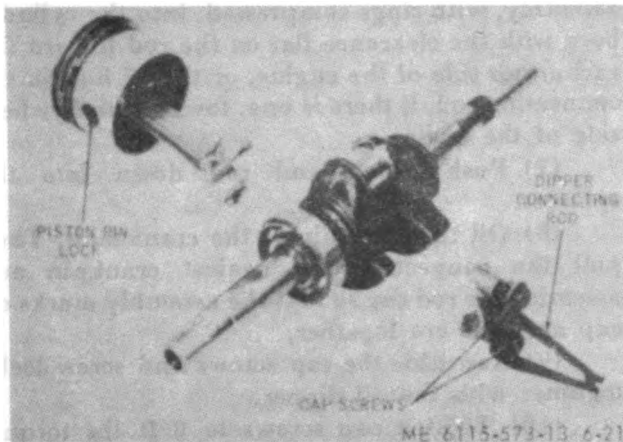


Figure 6-21. Piston, connecting rod, and crankshaft.

b. Disassembly.

(1) Remove piston pin lock with thin-nosed pliers.

(2) Push pin out of piston.

(3) Remove piston rings.

c. Piston Cleaning and Inspection.

(1) Clean carbon from top ring groove.

(2) Place a new ring in top groove.

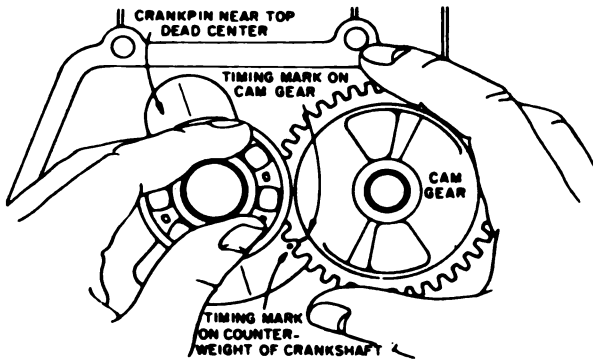
6-14. Valve Refacing

The valves can be refaced in any standard approved valve refacer and the valve seats reground with a valve seat grinder. Grinding angle is 45 degrees on all models. After grinding and facing, the valves and seats should be lightly lapped with grinding compound. Be sure to thoroughly clean the parts after grinding and lapping.

6-15. Tappet, Crankshaft, and Cam Gear Reassembly

a. Insert tappets, crankshaft, and cam gear in this order.

b. When inserting the cam gear, turn crankshaft and cam gear so the timing marks on the gears or counterweights are aligned (fig. 6-22).



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Figure 6-22. Alining timing marks.

6-16. Assembling Connecting Rod and Piston

a. Piston Pin.

(1) Place a pin lock in the groove at one side of the piston.

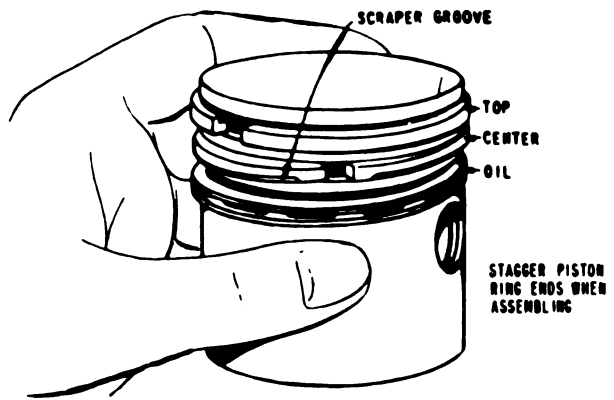
NOTE

The piston pin is a push-fit in both piston and connecting rod. One end of the piston pin is flat while the other end is recessed.

(2) From the opposite side of the piston, insert piston pin (flat end first) into piston and push all the way through the piston and connecting rod until the pin stops against the pin lock.

(3) Assemble a pin lock in the remaining pin lock groove.

b. **Piston Rings.** There are three different rings to a piston: (1) top ring, (2) center compression or scraper ring, and (3) oil ring. The various rings and the proper position of each are shown in figure 6-23. Note especially the center compression ring. The scraper groove should always be down toward the piston skirt. Be sure the oil return holes are clean and the carbon is removed from all ring grooves before installing rings.



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Figure 6-23. Position of piston rings

c. Installation.

(1) If a new connecting rod is used, place in a vice to loosen the cap screws. This will prevent twisting the rod.

(2) Oil the rings and piston skirt, then compress rings with ring compressor.

(3) Place the piston into ring compressor so that the square drive hole in the compressor is toward the piston skirt.

(4) Turn piston and compressor upside down on the bench and push downward so that piston head and edge of compressor band are even while tightening the compressor.

(5) Draw the compressor up tight to fully compress the rings, then loosen the compressor very slightly.

(6) Place the connecting rod and piston assembly, with rings compressed, into the cylinder bore with the clearance flat on the rod toward the carburetor side of the engine, or the oil hole in the connecting rod, if there is one, toward the flywheel side of the engine.

(7) Push piston and rod down into the cylinder.

(8) Oil the crankpin of the crankshaft. Then pull the connecting rod against crankpin and assemble the rod cap so that the assembly marks on cap and rod are together.

(9) Assemble the cap screws and screw locks together with the oil dipper.

(10) Tighten cap screws to 8 ft.-lbs torque.

(11) Rotate the crankshaft two complete revolutions to be sure rod is correctly installed. If the rod strikes the cam, the rod has been assembled with the clearance flat on the wrong side or the engine is out of time. If the crankshaft operates freely, bend the connecting rod screw locks against the screw heads.

6-17. Generator Set Final Assembly

Reverse the order of disassembly to assemble the generator set.

APPENDIX A

REFERENCES

A-1. Fire Protection

TB 5-4200-200-10

Hand Portable Fire Extinguishers Approved for Army Users

A-2. Lubrication

C9100-IL

Identification List for Fuels, Lubricants, Oils and Waxes

A-3. Radio Suppression

TM 11-483

Radio Interference Suppression

A-4. Maintenance

TB 750-651

Use of Antifreeze Solutions and Cleaning Compounds in Engine Cooling Systems

TM 38-750

The Army Maintenance Management System (TAMMS)

TM 5-6115-573-23P

Organizational and Direct Support Maintenance Repair Parts and Special Tools List.

A-5. Shipment and Storage

TB 740-97-2

Preservation of USAMEC Mechanical Equipment for Shipment and Storage

TB 740-90-1

Administrative Storage of Equipment

A-6. Destruction to Prevent Enemy Use

TB 750-244-3

Procedures for Destruction of Equipment to Prevent Enemy Use

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. General

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the identified end item or component will be consistent with the assigned maintenance functions.

c. Section III. Not applicable.

d. Section IV contains supplemental instructions or explanatory notes required for a particular maintenance function.

B-2. Explanation of Columns in Section II

a. *Group Number, Column (1).* The assembly group number is a numerical group assigned to each assembly. The assembly groups are listed on the MAC in disassembly sequence beginning with the first assembly removed in a top down disassembly sequence.

b. *Functional Group, Column (2).* This column contains a brief description of the components of each assembly group.

c. *Maintenance Functions, Column (3).* This column lists the various maintenance functions (A through K). The upper case letter placed in the appropriate column indicates the lowest maintenance level authorized to perform these functions. The active repair time required to perform the maintenance function is included directly below the symbol identifying the category of maintenance. The symbol designations for the various maintenance levels are as follows:

- C—Operator or crew
- O—Organizational maintenance
- F—Direct support maintenance
- H—General support maintenance
- D—Depot maintenance

The maintenance functions are defined as follows:

A—Inspect. To determine serviceability of an item by comparing its physical, mechanical, and electrical characteristics with established standards.

B—Test. To verify serviceability and to detect electrical or mechanical failure by use of test equipment.

C—Service. To clean, to preserve, to charge, and to add fuel, lubricants, cooling agents, and air. (If it is desired that elements, such as painting and lubricating, be defined separately, they may be so listed.)

D—Adjust. To rectify to the extent necessary to bring into proper operating range.

E—Align. To adjust specified variable elements of an item to bring to optimum performance.

F—Calibrate. To determine the corrections to be made in the readings of instruments or test equipment used in precise measurement. Consists of the comparison 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 with the certified standard.

G—Install. To set up for use in an operational environment such as an emplacement, site, or vehicle.

H—Replace. To replace unserviceable items with serviceable like items.

I—Repair. Those maintenance operations necessary to restore an item to serviceable condition through correction of material damage or a specific failure. Repair may be accomplished at each level of maintenance.

J—Overhaul. Normally, the highest degree of maintenance performed by the Army in order to minimize time work is in process consistent with quality and economy of operation. It consists of that maintenance necessary to restore an item to completely serviceable condition as prescribed by maintenance standards in technical publications for each item of equipment. Overhaul normally does not return an item to like new, zero mileage, or zero hour condition.

K—Rebuild. The highest degree of materiel maintenance. It consists of restoring equipment as nearly as possible to new condition in accordance with original manufacturing standards. Rebuild is performed only when required by operational considerations or other paramount factors and then only at the depot maintenance level. Rebuild reduces to zero the hours or miles the equipment, or component thereof, has been in use.

d. *Tools and Equipment, Column (4).* This column is provided for referencing by code the special tools and test equipment (sec. III), required to perform the maintenance functions (Sec. II).

e. *Remarks, Column (5).* This column is provided for referencing by code the remarks (sec. IV) pertinent to the maintenance functions.

B-3. Explanation of Columns in Section IV

a. *Reference Code.* This column consists of two

letters separated by a dash (entered from col. (5) of Section II). The first letter references alpha sequence in column (5) and the second letter references a maintenance function, column (3), A through K.

b. *Remarks.* This column lists information pertinent to the maintenance function to be performed (as indicated in sec. II).

Section II. MAINTENANCE ALLOCATION CHART

| (1) Group No. | (2) Functional group | (3) Maintenance functions | | | | | | | | | | (4) Tools and equipment | (5) Remarks | | | | | |
|------------------|--|------------------------------|------|---------|--------|-------|-----------|---------|---------|--------|----------|----------------------------|----------------|---------|--|--|--|-----|
| | | A | B | C | D | E | F | G | H | I | J | | | K | | | | |
| | | Inspect | Test | Service | Adjust | Align | Calibrate | Install | Replace | Repair | Overhaul | | | Rebuild | | | | |
| 01 | HOUSING, COVERS, CARRYING CASE, AND ACCESSORY ITEMS | | | | | | | | | | | | | | | | | |
| | Can, Fuel | C | | C | | | | O | O | O | | | | | | | | A-C |
| | 0.1 | 0.1 | | 0.1 | | | | 0.1 | 0.1 | 0.5 | | | | | | | | |
| | Hose Assembly, Fuel Line | C | | | | | | | O | | | | | | | | | |
| | 0.1 | 0.1 | | | | | | | 0.1 | | | | | | | | | |
| | Valve, Fuel | | | | | | | | | O | | | | | | | | |
| 02 | Cover, Carrying Case | C | | | | | | | C | F | | | | | | | | |
| | 0.1 | 0.1 | | | | | | | 0.1 | 1.0 | | | | | | | | |
| | Carrying Case | C | | | | | | | C | F | | | | | | | | |
| | 0.1 | 0.1 | | | | | | | 0.1 | 2.0 | | | | | | | | |
| | Plate, Instruction | | | | | | | | O | | | | | | | | | |
| | 0.1 | | | | | | | | 0.1 | | | | | | | | | |
| 02 | EXHAUST AND COOLING SYSTEM | | | | | | | | | | | | | | | | | |
| | Muffler and Pipe Fittings | | | | | | | | O | | | | | | | | | |
| | 0.5 | | | | | | | | 0.5 | | | | | | | | | |
| 03 | Cowling, Deflectors, Air Shroud and Air Baffle | | | | | | | | O | | | | | | | | | |
| | 0.5 | | | | | | | | 0.5 | | | | | | | | | |
| | Lifting Straps | | | | | | | | O | | | | | | | | | |
| | 0.1 | | | | | | | | 0.1 | | | | | | | | | |
| | CONTROL PANEL HOUSING AND CUBICLES | | | | | | | | | | | | | | | | | |
| | Panel, Control | | | | | | | | F | | | | | | | | | |
| | 2.0 | | | | | | | | 2.0 | | | | | | | | | |
| | Meters | | | | | | | | F | | | | | | | | | |
| | 1.0 | | | | | | | | 1.0 | | | | | | | | | |
| | Wiring | | | | | | | | F | | | | | | | | | |
| 2.0 | | | | | | | | 2.0 | | | | | | | | | | |
| 03 | Holder, Fuse | | | | | | | | F | | | | | | | | | |
| | 0.1 | | | | | | | | 0.1 | | | | | | | | | |
| | Fuse | | | | | | | | C | | | | | | | | | |
| | 0.1 | | | | | | | | 0.1 | | | | | | | | | |
| | Switches | | | | | | | | F | | | | | | | | | |
| | 0.2 | | | | | | | | 0.2 | | | | | | | | | |
| | Diodes | | F | | | | | | F | | | | | | | | | |
| | 0.1 | | 0.1 | | | | | | 0.1 | | | | | | | | | |
| | Transistors | | F | | | | | | F | | | | | | | | | |
| | 0.1 | | 0.1 | | | | | | 0.1 | | | | | | | | | |
| 03 | Resistors | | F | | | | | | F | | | | | | | | | |
| | 0.1 | | 0.1 | | | | | | 0.1 | | | | | | | | | |
| | Rectifier Assembly | | F | | | | | | F | F | | | | | | | | |
| | 0.5 | | 0.5 | | | | | | 0.5 | | | | | | | | | |
| | Capacitors | | F | | | | | | F | | | | | | | | | |
| | 0.1 | | 0.1 | | | | | | 0.1 | | | | | | | | | |

Section II. MAINTENANCE ALLOCATION CHART—Continued

| (1) Group No. | (2) Functional group | (3) Maintenance functions | | | | | | | | | | (4) Tools and equipment | (5) Remarks | | | | |
|------------------|--|------------------------------|------|---------|--------|-------|-----------|---------|---------|--------|----------|----------------------------|----------------|---------|--|--|-----|
| | | A | B | C | D | E | F | G | H | I | J | | | K | | | |
| | | Inspect | Test | Service | Adjust | Align | Calibrate | Install | Replace | Repair | Overhaul | | | Rebuild | | | |
| 03 | CONTROL PANEL HOUSING AND CUBICLES—Continued | | | | | | | | | | | | | | | | |
| | Terminal Board | | | | | | | | F | | | | | | | | |
| | Receptacle | | | | | | | | 1.0 | | | | | | | | |
| | | | | | | | | | F | | | | | | | | |
| | | | | | | | | | 0.2 | | | | | | | | |
| 04 | ELECTRIC MOTORS AND GENERATORS | | | | | | | | | | | | | | | | |
| | Generator Assembly | C | | | | | | | F | F | | | | | | | |
| | Lead Assembly | 0.1 | | | | | | | 1.0 | 4.0 | | | | | | | |
| | Rotor Assembly | | | | | | | | F | | | | | | | | B-I |
| | Stator Assembly | | | | | | | | 1.0 | | | | | | | | |
| | | | | | | | | | F | | | | | | | | |
| | | | | | | | | | 2.0 | | | | | | | | |
| 05 | ENGINE AND ACCESSORIES | | | | | | | | | | | | | | | | |
| | Engine, Gasoline | C | O | C | | | | | F | O | F | | | | | | |
| | Head, Cylinder | 0.2 | 0.2 | 0.2 | | | | | 1.5 | 2.0 | 8.0 | | | | | | |
| | Gasket | | | | | | | | O | | | | | | | | |
| | Crankshaft and Gear | | | | | | | | 0.5 | | | | | | | | |
| | Bearing, Crankshaft | | | | | | | | O | | | | | | | | |
| | Seals, Oil | | | | | | | | 0.5 | | | | | | | | |
| | Flywheel | | | | | | | | F | | | | | | | | |
| | Piston and Pin Assembly | | | | | | | | 2.0 | | | | | | | | |
| | Rings, Piston | | | | | | | | F | | | | | | | | |
| | Rod Assembly, Connecting | | | | | | | | 2.0 | | | | | | | | |
| | Valves, Exhaust and Intake | | | | | | | | F | F | | | | | | | C-I |
| | Insert, Valve | | | | | | | | 2.0 | 2.0 | | | | | | | |
| | Tappet, Valve | | | | | | | | F | | | | | | | | D-I |
| | Camshaft and Gear | | | | F | | | | 2.5 | 2.5 | | | | | | | |
| | Cover, Valve and Engine Breather | | | | 0.2 | | | | F | | | | | | | | |
| | Plug, Oil Filler and Level | | | | | | | | 4.0 | | | | | | | | |
| | Manifold Intake | | | | | | | | F | | | | | | | | |
| | Starter Assembly, Recoil | | | | | | | | 0.2 | | | | | | | | |
| | Carburetor Assembly and Exhaust Air Baffle | | | | O | | | | F | F | | | | | | | |
| | Air Filter | | | | 0.2 | | | | 1.0 | 1.0 | | | | | | | |
| | | | | | | | | | | O | | | | | | | |
| | | | | | | | | | | 0.2 | | | | | | | |

Section II. MAINTENANCE ALLOCATION CHART—Continued

| (1) Group No. | (2) Functional group | (3) Maintenance functions | | | | | | | | | | (4) Tools and equipment | (5) Remarks | |
|------------------|--------------------------------------|------------------------------|------|----------|----------|-------|-----------|----------|----------|--------|----------|----------------------------|----------------|-----------|
| | | A | B | C | D | E | F | G | H | I | J | | | K |
| | | Inspect | Test | Service | Adjust | Align | Calibrate | Install | Replace | Repair | Overhaul | | | Rebuild |
| 05 | ENGINE AND ACCESSORIES— Continued | | | | | | | | | | | | | |
| | Fuel Strainer | | | O 0.1 | | | | O 0.1 | O 0.2 | | | | | E-C |
| | Choke Control | | | | | | | F 0.2 | | | | | | |
| | Throttle Control | | | | | | | F 0.2 | | | | | | |
| | Governor Assembly | | | | | | | F 2.0 | F 3.0 | | | | | |
| | Governor Control | | | | O 0.2 | | | F 1.0 | | | | | | |

Section IV. REMARKS

| Reference Code | Remarks |
|----------------|---|
| A-C | Clean fuel strainer in fuel tank. |
| B-I | Replace receptacle. |
| C-I | Grind and reface. |
| D-I | Grind and reface. |
| E-C | Clean fuel filter in fuel line, in back of control panel. |

APPENDIX C

BASIC ISSUE ITEMS LIST AND ITEMS TROOP INSTALLED OR AUTHORIZED

Section I. INTRODUCTION

C-1. Scope

This appendix list items required by the operator for operation of the generator sets.

C-2. General

This list is divided into the following sections:

a. Basic Issue Items List—Section II. Not applicable.

b. Items Troop Installed or Authorized List—Section III. A list of items in alphabetical sequence, which at the discretion of the unit commander may accompany the generator sets. These items are NOT subject to turn-in with the generator sets when evacuated.

C-3. Explanation of Columns

The following provides an explanation of columns in the tabular list of Basic Issue Items Lists, Section II, and Items Troop Installed or Authorized, Section III.

a. Source, Maintenance, and Recoverability Code(s) (SMR).

(1) Source code, indicates the source for the listed item.

Source codes are:

| <i>Code</i> | <i>Explanation</i> |
|-------------|--|
| P | Repair parts, special tools and test equipment supplied from GSA / DSA or Army supply system and authorized for use at indicated maintenance levels. |
| P2 | Repair parts, special tools and test equipment which are procured and stocked for insurance purposes because the combat or military essentiality of the end item dictates that a minimum quantity be available in the supply system. |

(2) Maintenance code, indicates the lowest level of maintenance authorized to install the listed item. The maintenance level code is:

| <i>Code</i> | <i>Explanation</i> |
|-------------|--------------------|
| C | Crew / Operator |

(3) Recoverability Code, indicates whether unserviceable items should be returned for recovery or salvage. Items not coded are non-recoverable. Recoverability codes are:

| <i>Code</i> | <i>Explanation</i> |
|-------------|---|
| R | Applied to repair parts (assemblies and components), special tools and test equipment which are considered economically repairable at direct and general support maintenance levels. |
| S | Repair parts, special tools, test equipment and assemblies which are economically repairable at DSU and GSU activities and which normally are furnished by supply on an exchange basis. |

b. Federal Stock Number. This column indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Description. This column indicates the Federal item name and any additional description of the item required.

d. Unit of Measure (U/M). A two character alphabetic abbreviation indicating the amount or quantity of the item upon which the allowances are based, e.g., ft, ea, pr, etc.

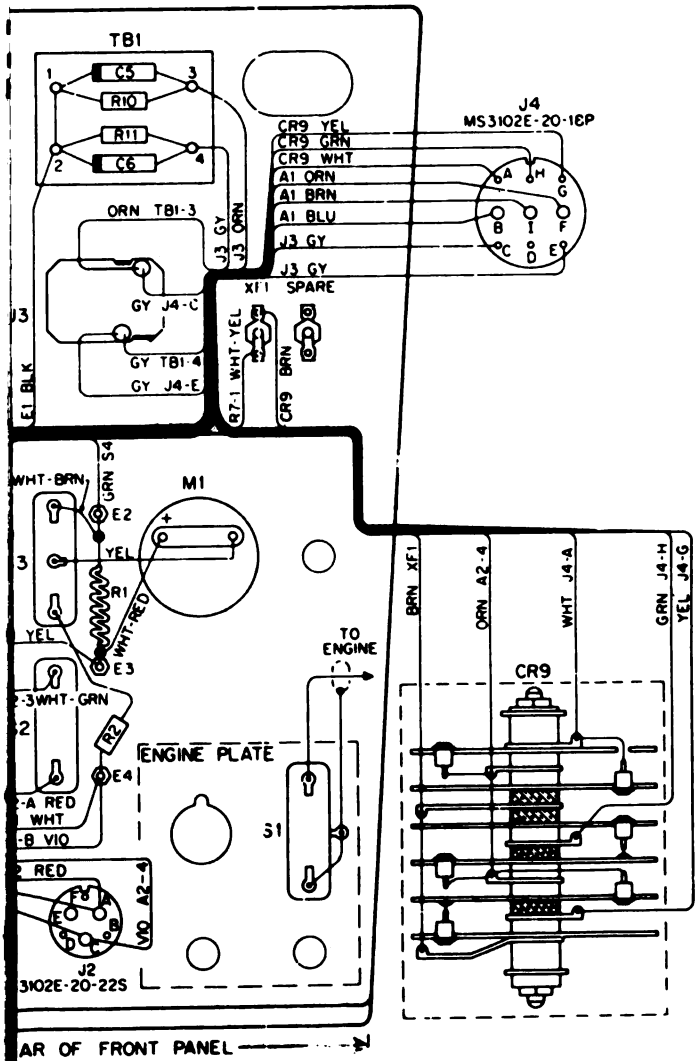
e. Quantity Furnished With Equipment (BIIL only). This column indicates the quantity of an item furnished with the equipment.

f. Quantity Authorized (Items Troop Installed or Authorized Only). This column indicates the quantity of the item authorized to be used with the equipment.

g. Illustration (BIIL Only). This column is divided as follows:

(1) *Figure number.* Indicates the figure number of the illustration in which the item is shown.

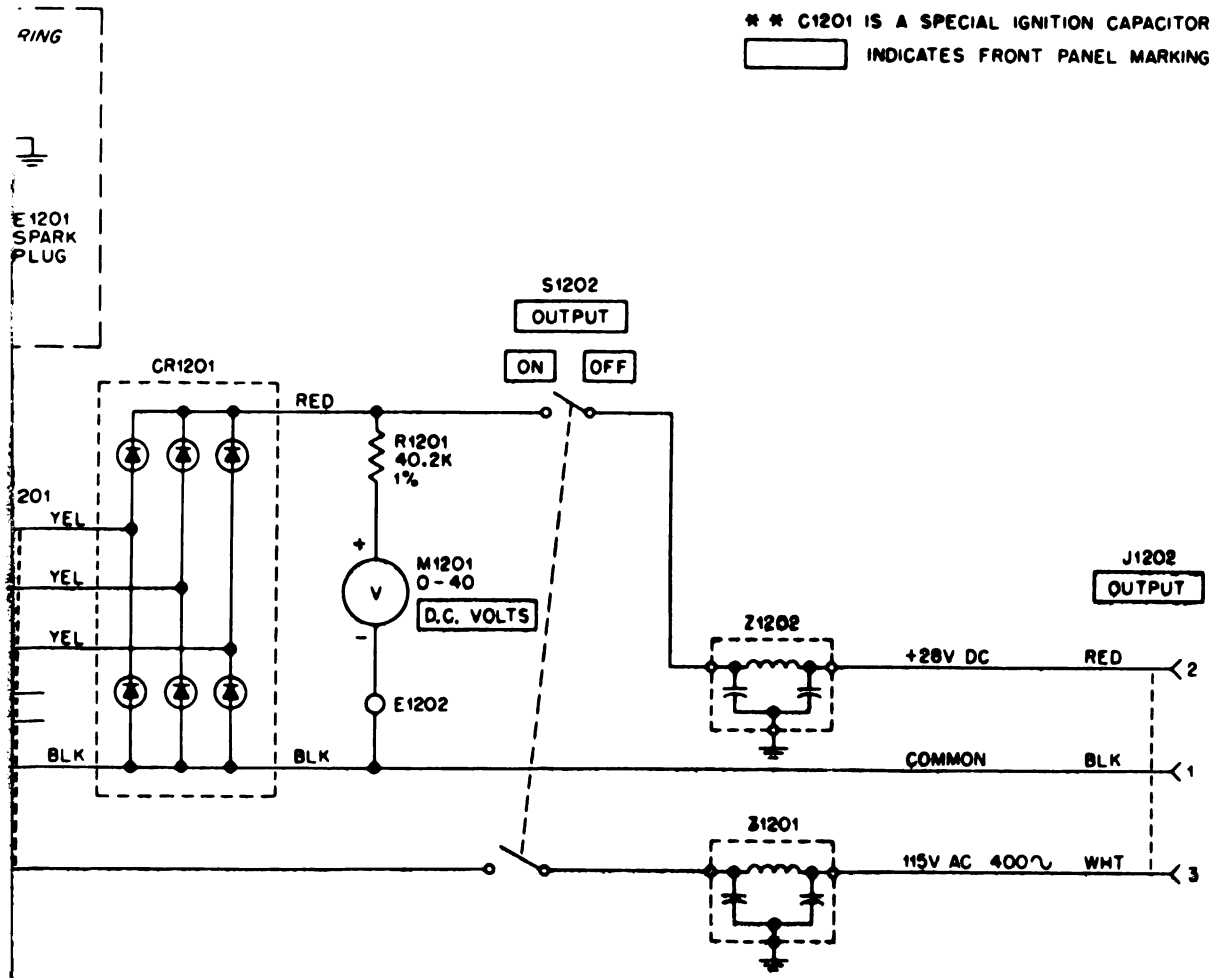
(2) *Item number.* Indicates the callout number used to reference the item in the illustration.



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g diagram (PU-532 / PPS-4)

FO-1



** C1201 IS A SPECIAL IGNITION CAPACITOR
 [] INDICATES FRONT PANEL MARKING



| | | |
|----------|-------|----------------------------------|
| acitor | J1202 | Connector, output |
| sembly | M1201 | Voltmeter |
| andoff | P1201 | Connector, generator |
| acts | R1201 | Resistor, 40.2-kilohm resistance |
| agnet | S1201 | Switch, engine on-off |
| enerator | S1202 | Switch, output on-off |
| | Z1201 | Filter, dc output |
| | Z1202 | Filter, ac output |

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Foldout 2. Schematic wiring diagram (PU-422B/U)

Stud terminal
Stud terminal
Battery connector
Radar connector
Connector, 115 v-ac, 400 cycles
Plug connector
Ammeter
Transistor
Transistor
Ammeter shunt
Resistor, 49.9 K-ohm $\pm 1\%$ resistance
Resistor, 470 $\pm 10\%$ ohms resistance
Resistor, 1200 $\pm 10\%$ ohms resistance
Resistor, 5.6 $\pm 10\%$ megohms resistance
Resistor, 5.6 $\pm 10\%$ megohms resistance
Resistor, 2-ohm resistance, 15-watt
Resistor, 5.6 $\pm 10\%$ megohms resistance
Resistor, 5.6 $\pm 10\%$ megohms resistance
Resistor, 5.6 $\pm 10\%$ megohms resistance
Resistor, 5.6 $\pm 10\%$ megohms resistance
Ignition switch, single pole, single throw
Radar switch, single pole, single throw
Meter switch, single pole, double throw
Battery switch, double pole, single throw
Terminal board No. 1
Terminal board No. 2
Fuseholder

ME 6115-573-13/FO-3

g diagram (PU-532 / PPS-4)

FO-3



