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TM 10-1133

MAINTENANCE MANUAL

CHEVROLET

CHEVROLET

PASSENGER CAR

Built for

UNITED STATES ARMY

MODEL AG

CONTRACT NUMBER
W-398-QM-10721

U. S. A. Registration Numbers
W-16954 — W-18032
W-18040 — W-18127
W-18812 — W-19263
And Contract
DA-W-398-2M-42

Chevrolet Motor Division
General Motors Sales Corporation
Detroit, Michigan

TM 10-1133

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WAR DEPARTMENT

Washington, October 1, 1941

TM10-1133, Maintenance Manual, Passenger Car, Chevrolet (Model BG) published by the Chevrolet Motor Division, General Motors Sales Corporation is furnished for the information and guidance of all concerned.

(AG 062.11 (4-26-41) PC (C), June 10, 1941.)

By order of the Secretary of War:

G. C. MARSHALL,
Chief of Staff

Official:

E. S. ADAMS,
Major General,
The Adjutant General

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TM 10-1133 MAINTENANCE MANUAL

CHEVROLET PASSENGER CARS MODEL BG

FOREWORD

This manual contains information covering the Operation, Maintenance and Repair of Chevrolet Passenger Cars.

For the convenience of the user it is arranged in sections. All information pertaining to a given unit will be found in the section devoted to that unit. The manual is written for the guidance of the operator and repair men who are responsible for the vehicle. Keep it handy and refer to it often.

CHEVROLET MOTOR DIVISION
General Motors Sales Corporation
DETROIT, MICHIGAN

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CHEVROLET 5-PASSENGER SEDAN

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Section 0

DRIVER INSTRUCTIONS

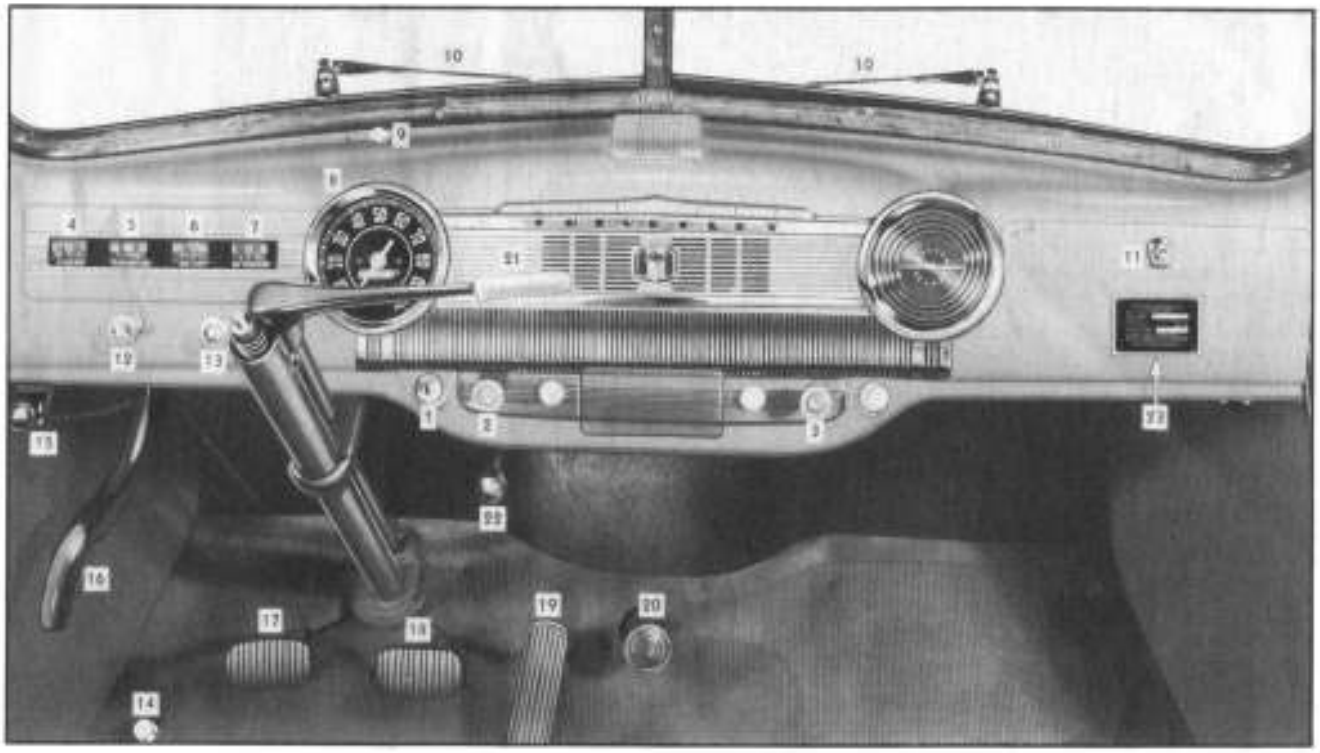

Fig. 1—Instrument Panel Showing Location of Instruments and Controls

1—Ignition Switch
2—Hand Throttle
3—Carburetor Choke
4—Fuel Gauge
5—Temperature Indicator
6—Ammeter
7—Oil Gauge
8—Speedometer
9—Windshield Wiper Switch
10—Windshield Wiper Blade
11—Glove Compartment Lock
12—Lighting Switch
13—Instrument Light Switch
14—Headlight Dimmer Switch
15—Hood Latch Control Button
16—Hand Brake Lever
17—Clutch Pedal
18—Brake Pedal
19—Accelerator
20—Starter Switch Pedal
21—Transmission Gearshift Lever
22—Ventilator Control Lever
23—Serial Number Plate

It is of definite importance that the driver of one of these vehicles be thoroughly familiar with the various controls and instruments and their proper use. Even the experienced driver should study the controls before attempting to start the engine or move the vehicle.

Figure 1 illustrates the controls and instruments; in the following paragraphs dealing with the purpose and use of the instruments and controls, we will refer to the key number of the instrument or control being discussed, so the reader may easily follow the instructions.

IGNITION SWITCH No. 1 is operated by turning the ignition switch key. Turning the key to the right turns on the ignition by closing the ignition primary circuit, while turning the key to the left turns off the ignition by opening the primary circuit.

HAND THROTTLE No. 2 is located on the instrument panel to the right of the ignition switch; pulling this button opens the throttle. This control may be used when starting or, if it is desired, to run the engine at a constant speed.

CARBURETOR CHOKE No. 3 is used when starting a cold engine. Pulling out this control button shuts off the air to the carburetor providing a rich mixture for starting. The choke button should be pushed in when the engine starts. If the engine is warm, the use of the choke is unnecessary.

FUEL GAUGE No. 4 registers the amount of fuel in the tank when the ignition switch is turned on. The dial has graduations for empty, half full and full.

TEMPERATURE INDICATOR No. 5 indicates the temperature of the liquid in the cooling system at all times. The driver should watch this instrument closely. A red band at the right of the dial is used to indicate excessive temperature. Whenever the indicator hand enters this band, the driver should immediately investigate the cause of the excessive temperature. Continuing to drive an overheated engine may cause permanent damage to its working parts.

AMMETER No. 6 is used to indicate whether the battery is being charged or discharged when the vehicle is in operation. If the ammeter shows discharge at all times, the cause should be investigated and corrected, otherwise the battery will be discharged.

OIL GAUGE No. 7 indicates the oil pressure. The dial has three divisions showing 0, 15 and 30. The driver should watch this instrument closely and, if the indicator hand drops to zero, the engin

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should be stopped immediately and the cause of oil pressure failure investigated and corrected before continuing to run the engine.

SPEEDOMETER No. 8 indicates the speed at which the vehicle is being driven. The odometer registers the total number of miles the vehicle has been driven.

WINDSHIELD WIPER SWITCH No. 9 is used to turn the windshield wiper on or off. Moving the switch to the right turns the wiper on. The speed of the wiper may be controlled by positioning the switch between the on and off position.

WINDSHIELD WIPER BLADE No. 10 is used in inclement weather to keep the windshield clean and thereby provide clear vision for the driver.

GLOVE COMPARTMENT LOCK No. 11. Pressing downward on the glove compartment lock cylinder opens the glove compartment door. The glove compartment may be locked with the key supplied with the vehicle.

LIGHTING SWITCH No. 12 controls the lighting circuits. When lighting switch is pulled out to the first position, it turns on the blackout parking lamps and tail lamp and, in addition, this position permits turning on the blackout lamps when the brakes are applied. To turn on the regular headlights depress the blackout button on top of the switch and pull the control button out to the second position. In this position, circuits are established to the regular tail and stop lights.

When the lighting switch button is pulled out to the third position it closes the circuits to the service stop light during daylight driving.

INSTRUMENT LIGHT SWITCH No. 13 is used to turn on the instrument lights when the lighting switch is in the headlight bright position. **NOTE—These lights will not operate with the lighting switch in the blackout position.**

HEADLIGHT DIMMER SWITCH No. 14 is a foot switch used to select the headlight beam (upper or lower) desired after the headlights are turned on, by depressing the switch button with the foot. Always use the lower beam when passing approaching vehicles. This is an important highway safety rule observed by all good drivers.

HOOD LATCH CONTROL BUTTON No. 15. Pulling out on the control button releases the hood latch which allows the hood to raise approximately one inch, providing sufficient opening to enable the driver to release the safety catch located under the forepart of the hood by pulling the catch forward.

HAND BRAKE LEVER No. 16 operates the brakes on the rear wheels mechanically. Whenever the vehicle is parked, the lever should be pulled toward the rear as far as possible. Before moving the vehicle, lever should be in released position.

CLUTCH PEDAL No. 17 is used to disengage the engine from the transmission when shifting gears. The clutch pedal should never be engaged quickly when the vehicle is in gear. Driving with foot on pedal will cause wear of clutch facings and throwout bearing. There should be one to one and a quarter inches of free travel of the clutch pedal before the clutch starts to disengage.

BRAKE PEDAL No. 18. Pressing down on the brake pedal applies the hydraulic brakes at all four wheels. Avoid driving with foot on brake pedal, as brakes will be partially applied and cause rapid wear of lining.

ACCELERATOR No. 19 is used in driving to control the speed of the engine.

STARTER SWITCH PEDAL No. 20. Pressing down on pedal with foot engages the starter and flywheel gears and also closes the starter switch, completing the electrical circuit between battery and starter. Rotation of the starter armature through the gears cranks the engine. When the engine starts, foot should be removed from pedal immediately.

TRANSMISSION GEARSHIFT LEVER No. 21 is used to select various gear ratios provided in the transmission. There are three speeds forward and one reverse. The illustration, Fig. 2, shows the gearshift lever positions for the various speeds.

VENTILATOR CONTROL LEVER No. 22 is used to open and close the cowl ventilator.

SERIAL NUMBER PLATE No. 23. This plate gives the serial number of the car and other pertinent data for identifying the vehicle.

OPERATING INSTRUCTIONS

Each day the following inspections should be made before starting the vehicle:

1. Check the oil level on the dip stick. If oil is down to the low mark, add oil.
2. Check the water in the radiator, and fill if necessary. Check hose connections for leaks. Check fan belt for looseness.
3. Note condition of tires and see that they are properly inflated.

Starting the Engine

1. Transmission gearshift lever must be in neutral position. See Fig. 2.
2. Pull out hand throttle about $\frac{3}{8}$ inch. This is not necessary if engine is warm.
3. Pull out choke button to obtain proper fuel and air mixture for starting. If the engine is warm, choking will be unnecessary.
4. Insert key in ignition switch and turn switch to "On" position.
5. Step on starter pedal to crank the engine. Release pedal as soon as engine starts.
6. Push in on choke button and adjust hand throttle to obtain even idling. When engine is cold, it should be run several minutes before attempting to move the vehicle.

Starting the Vehicle

1. Push clutch pedal downward to disengage the clutch.
2. Move transmission gearshift lever into first speed position. See shifting diagram, Fig. 2.
3. Release the hand brake lever.
4. Step down on accelerator pedal to speed up the engine. Release clutch pedal slowly and push accelerator pedal down as necessary to pick up the load and prevent stalling the engine as the car starts to move.

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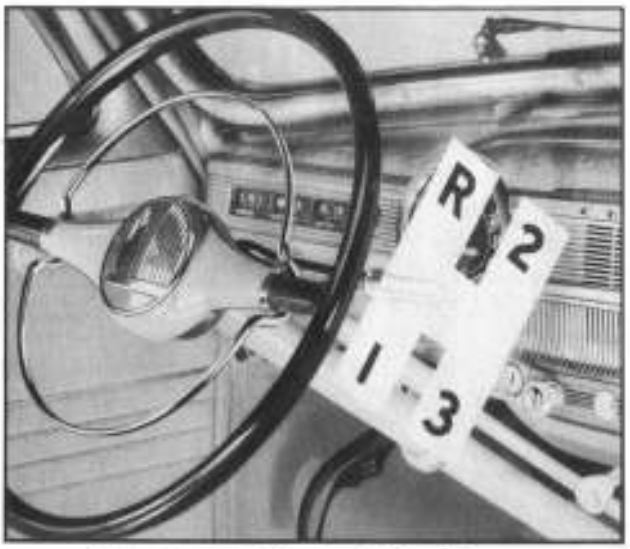

Fig. 2—Transmission Gearshifting Diagram

5. As car speed increases, release accelerator pedal, depress clutch pedal, move gearshift lever to neutral and then to the next higher speed. Step down on accelerator and release clutch as explained above. Repeat this operation until transmission is in high gear.

Shifting to Lower Speed in Transmission

The transmission should always be shifted to the next lower speed before engine begins to labor or before vehicle speed is reduced appreciably. With synchro-mesh transmission the shift into second speed is accomplished as follows:

1. Depress the clutch pedal quickly, maintaining the same pressure on accelerator. Move gearshift lever from high to second and engage the clutch.
2. To shift from second to low speed, depress the clutch pedal quickly, maintaining the same pressure on accelerator. Move gearshift lever to neutral and at the same instant engage the clutch. Again depress the clutch pedal and move gearshift lever to low speed position. Engage the clutch slowly and at the same time accelerate the engine speed to synchronize it with that of the vehicle.

Shifting into Reverse

Before attempting to shift into reverse, the car must be brought to a complete stop to prevent damage to the gears.

1. Push clutch pedal downward to disengage clutch.
2. Move gearshift lever to reverse position. Engage clutch slowly and push down on accelerator pedal as necessary to pick up the load and prevent stalling the engine as the vehicle starts to move.

Stopping the Vehicle

1. Remove foot from accelerator pedal and apply brakes by pressing down on brake foot pedal.
2. When speed of vehicle has been reduced to idling speed of engine, disengage clutch and move transmission gearshift lever into neutral position.
3. When vehicle has come to a complete stop, release clutch pedal and apply hand brake.

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GENERAL LUBRICATION

Lubrication of an automobile is important to prevent damage to moving parts due to friction, heat or foreign material. As all moving parts are not subjected to the same type of operating conditions the lubricant to be used is that which most nearly meets the requirements of the part involved. In some places excessive heat or cold is the problem to overcome, in others it is extreme pressure, water, sand or grit. The type of operating surface must also be taken into consideration as certain parts rotate or oscillate on bronze bushings, roller bearings, ball bearings or cast iron bearings. Each of the above conditions or constructions make necessary the application of a specialized lubricant.

Lubricants are much cheaper than repair bills and should be applied regularly to secure a maximum of useful service. Consequently, it is of equal importance that not only the proper grade of lubricant be used but that it be applied in accordance with a definite schedule.

The chart at the end of this section should be referred to for instructions on the mileage of application and the grade and quantity of lubricant required for all parts of the automobile. A more detailed account of certain phases of lubrication is given in the following paragraphs.

ENGINE

Oil Gauge

When starting a cold engine, it will be noted that the oil gauge on the instrument panel will register a high oil pressure. As the engine warms up, the pressure will drop until it reaches a point where changes to higher speeds will raise the pressure very little, if at all.

If the oil pressure registers abnormally high after the engine is thoroughly warmed up, an inspection should be made to ascertain if the oil lines and passages are "plugged."

Lubrication

First 500 Miles

Proper selection of the oil to be used will add much to the performance, reliability, economy and long life of an engine.

It is important that the recommended light oils be used in the engine during the "breaking-in" period as they assure ease of starting the engine; prompt flow of a sufficient quantity of oil to the bearings; less friction between moving parts; less wear of moving parts, etc.

The crankcase of the engine, as delivered from the factory, is filled with 10-W oil. This should be left in during the first 500 miles and then the crankcase should be drained (while hot) and refilled to the proper level.

After 500 Miles

After the first 500 miles the crankcase oil should be selected to give the best performance for the climatic and driving conditions under which the car is being operated.

Climatic Conditions

During the colder months of the year, an oil which will permit easy starting at the lowest atmospheric temperature likely to be encountered should be used.

When the crankcase is drained and refilled, the crankcase oil should be selected not on the basis of the existing temperature at the time of the change, but on the lowest temperature anticipated for the period during which the oil is to be used.

If oil is selected for existing temperatures, starting trouble may be encountered due to slower cranking speeds caused by too heavy an oil.

The viscosity grade of crankcase oil will, therefore, depend upon the climatic conditions under which the car is operated.

Fall — Winter — Spring

The viscosity grade best suited for use in the engine at the various temperatures is given under reference Note 5 at the end of this section. Use the grade indicated for the lowest temperature expected. Always use the lighter grade oil when in doubt.

10-W oil plus 10% kerosene is recommended only for those territories where the temperature falls below 10 degrees below zero for protracted periods.

Summer

The use of 20-W or SAE 20 oils during the summer months will permit better all around performance than will the heavier body oils, with no appreciable increase in oil consumption.

If SAE 20 or 20-W oil is not available, SAE 30 oil may be used if it is expected that the average prevailing daylight temperature will consistently be above 90° F.

Maintaining Oil Level

The Oil Gauge Rod (Fig. 1) is marked "Full" or "Add Oil." These notations have broad arrows pointing to the level lines.

The oil level should be maintained between the two lines; neither going above the "Full" line nor under the "Add Oil" line.

Check the oil level frequently and add oil when necessary. Always be sure the crankcase is full before starting on a long drive.

Fig. 1—Oil Gauge Rod

When to Change Crankcase Oil

Some oils have been greatly improved, driving conditions have changed, and improvements in engines, such as the crankcase ventilating system, have greatly lengthened the life of good lubricating oils. However, to insure continuation of best per-

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formance, low maintenance cost and long engine life, it is necessary to change the crankcase oil whenever it becomes contaminated with harmful foreign materials. Under normal driving conditions draining the crankcase and replacing with fresh oil every 2000 or 3000 miles is recommended. Under the adverse driving conditions described in the following paragraphs, it may become necessary to drain the crankcase oil more frequently.

Driving over dusty roads or through dust storms introduces abrasive material into the engine. Carburetor Air Cleaners decrease the amount of dust that may enter the crankcase. The frequency of draining depends upon severity of dust conditions and no definite draining periods can be recommended.

Short runs in cold weather, such as city driving, do not permit thorough warming up of the engine and water may accumulate in the crankcase from condensation of moisture produced by the burning of the fuel. Water in the crankcase may freeze and interfere with proper oil circulation. It also promotes rusting and may cause clogging of oil screens and passages. Under normal driving conditions this water is removed by the crankcase ventilator. But if water accumulates it should be removed by draining the crankcase as frequently as may be required.

It is always advisable to let the engine reach normal operating temperature before draining the crankcase. The benefit of draining is, to a large extent, lost if the crankcase is drained when the engine is cold as some of the suspended foreign material will cling to the sides of the oil pan and will not drain out readily with the slower moving oil.

Crankcase Dilution

Probably the most serious phase of engine oil deterioration is that of crankcase dilution, which is the thinning of the oil by fuel vapors leaking by the pistons and rings and mixing with the oil.

Leakage of fuel, or fuel vapors, into the oil pan occurs mostly during the "warming-up" period, when the fuel is not thoroughly vaporized and burned.

Automatic Control

The Chevrolet engine is equipped with automatic devices which aid greatly in minimizing the danger of crankcase dilution.

Rapid warming up of the engine is aided by the thermostatic water temperature control, which automatically prevents circulation of the water in the cooling system until it reaches a predetermined temperature.

Thermostatic heat control on the exhaust manifold, during the "warming-up" period, automatically directs the hot exhaust gases against the center of the intake manifold, greatly aiding the proper vaporization of the fuel.

The down-draft carburetor is an aid to easy starting, thereby minimizing the use of the choke. Sparing use of the choke reduces danger of raw, or unvaporized fuel entering the combustion chamber and leaking into the oil reservoir.

An efficient crankcase ventilating system drives off fuel vapors and aids in the evaporization of the raw fuel and water which may find its way into the oil reservoir.

Control by the Operator

Ordinarily the above automatic control devices will minimize, or eliminate, the danger of crankcase dilution.

However, there are abnormal conditions of service when the operator must aid in the control of crankcase dilution.

Short runs in cold weather, such as city driving, do not permit the thorough warming up of the engine nor the efficient operation of automatic control devices. It is recommended that the oil be changed more often when the car is subject to this type of operation.

Poor mechanical condition of the engine, such as scored cylinders, poor ring fit, "sloppy" or loose pistons, faulty valves, poor ignition, will increase crankcase dilution. Keep the car in good mechanical condition.

Poor fuels which contain portions hard to ignite and slow to burn will increase crankcase dilution. Use good fuel.

Water in Crankcase

Serious lubrication troubles may result in cold weather by an accumulation of water in the oil pan. This condition is, as a rule, little understood by the car operator. To demonstrate the chief cause of water in the oil pan, hold a piece of cold metal near the end of the exhaust pipe of the engine and note the rapid condensation and collection of drops of water on it. The exhaust gases are charged with water vapor and the moment these gases strike a cold surface, they will condense, forming drops of water.

A slight amount of these gases pass the pistons and rings, even under the most favorable conditions, and cause the formation of water in the oil pan, in a greater or less degree, until the engine becomes warm. When the engine becomes thoroughly warm, the crankcase will no longer act as a condenser and all of these gases will pass out through the crankcase ventilator system.

Short runs in cold weather, such as city driving, will aggravate this condensing action.

Corrosion

Practically all present-day engine fuel contains a small amount of sulphur which, in the state in which it is found, is harmless; but this sulphur on burning, forms certain gases, a small portion of which is likely to leak past the pistons and rings and reacting with water, when present in the crankcase, form very corrosive acids. The more sulphur in the fuel, the greater the danger from this type of corrosion. This is a condition which we cannot wholly avoid, but it may be reduced to a minimum by proper care of the engine.

As long as the gases and the internal walls of the crankcase are hot enough to keep water vapor from