

# COOLING SYSTEM

The water pump and fan assembly on all models is mounted on the front of the cylinder block. The water pumps have prelubricated shaft ball bearings and nonadjustable pump packings. Four-bladed fans are used on all models.

## SPECIFICATIONS

| ITEM                                      | 56G                         | 56B AND 56H                        | 56J                                |                                    |
|---|-----------------------------|------------------------------------|------------------------------------|------------------------------------|
| Capacity                                  | U. S. Quarts.....           | 11                                 | 17                                 | 25                                 |
|   | Imperial Quarts.....        | 9.2                                | 14.2                               | 20.8                               |
|   | Liters .....                | 10.4                               | 16.1                               | 23.7                               |
| Radiator core—make.....                   | McCord-Modine               | McCord-Modine                      | McCord-Modine                      |                                    |
|   | —type .....                 | {Cellular-Tubular<br>{Fin and Tube | {Cellular-Tubular<br>{Fin and Tube | {Cellular-Tubular<br>{Fin and Tube |
|   | —frontal area.....          | 443 sq. in.<br>(2858 sq. cm.)      | 443 sq. in.<br>(2858 sq. cm.)      | 443 sq. in.<br>(2858 sq. cm.)      |
| Radiator outlet hose—inside diameter..... | 1½" (38,1 mm.)              | 1¾" (44,5 mm.)                     | 1¾" (44,5 mm.)                     |                                    |
| —type .....                               | Molded Elbow                | Molded Elbow                       | Molded Elbow                       |                                    |
| Radiator inlet hose—inside diameter.....  | 1¼" (31,75 mm.)             | *                                  | 1½" (38,1 mm.)                     |                                    |
| —type .....                               | Molded Elbow                | Molded Elbow                       | Molded Elbow                       |                                    |
| Fan belt—length (outside).....            | 40¼" (102,2 cm.)            | 57" (144,8 cm.)                    | 56-11/16"<br>(144,1 cm.)           |                                    |
|   | —width (nominal).....       | .380" (9,652 mm.)                  | .380" (9,652 mm.)                  | .380" (9,652 mm.)                  |
|   | —angle of vee (pulley)..... | 36°                                | 36°                                | 36°                                |

\*1¼" (31,75 mm.) at engine outlet and 1½" (38,1 mm.) at radiator inlet.

## COOLING SYSTEM MAINTENANCE

### CHECKING COOLING SYSTEM

The coolant level should be checked when the engine is cold and, if necessary, only enough water added to bring the level to about 1½" below the top of the head tank. Do not overfill the radiator.

**CAUTION.**—Never remove the radiator cap quickly when the engine is hot. Sudden release of cooling system pressure may cause the coolant to boil, resulting in injury to persons or damage to car finish. When removing the pressure cap, turn the cap counterclockwise to stop. This will release built up pressure through overflow tube. Then press down and remove cap.

The cooling system is treated with a special compound in production which has sealer and rust inhibitor characteristics. The compound is put into the system in capsule form, dissolving and circulating throughout the entire system. It forms a protective coating to prevent small seepage leaks and rust. The addition of the compound may result in a slight discoloration of the coolant which is normal.

It is recommended that this compound be added to the system after each flushing or cleaning of the system. It is available from the Parts and Accessories Division.

### DRAINING THE SYSTEM

The radiator pet cock on all models is located on the right side at the front of the radiator and can be reached from below.

The cylinder block drain of the 56G models is located on the left side at the rear of the cylinder block behind the starter. The 56B, 56H, and 56J engines have two cylinder block drains, one plug on each side at the rear of the block.

To drain the system completely, open the pet cock at the radiator and disconnect both hoses of the Climatizer and one of the hoses of the defroster. On the 56G model, remove the pipe plug of the cylinder block; and on the 56B, 56H, and 56J models remove the cylinder block pipe plugs.

### FILLING THE SYSTEM

After the cooling system has been drained and the engine has been permitted to cool, the thermostat valve is closed. Although the thermostat is provided with a hole which acts as a vent when the system is refilled, the hole is very small to insure minimum water circulation through the radiator during the initial warm-up period. The cooling system should, therefore, be filled slowly.

If the system is filled too rapidly, the radiator upper tank will fill and a gurgling sound will be heard as the air escapes through the thermostat vent hole. Should this occur, continue to add fluid until the gurgling noise ceases, indicating that all the air has escaped. The engine should then be started and op-

erated until the thermostat opens and normal operating temperature is reached. If necessary, add sufficient fluid to bring the level in the radiator to just below the top of the filler tube.

Never add cold water to an overheated engine. The cold water will cause a sudden contraction of the heated metal, resulting in cracks or fractures of the cylinder head or block.

### FLUSHING THE SYSTEM

If a rust inhibitor is not used, it will be necessary to drain and flush the cooling system more frequently. The frequency of the flushing will depend on local water conditions.

A cleaning solution, such as that available through the Studebaker-Packard Parts and Accessories Division, should be used in connection with an approved radiator flusher. A radiator cleaner containing a strong caustic solution must not be used, as such a solution will have a detrimental effect on the cooling system.

### COOLING SYSTEM CORROSION

Lime and other minerals which are usually present in many kinds of water induce corrosion of metals. The common rust condition is a result of the chemical action of water, air, and iron. The formation of rust in the water jacket in heavy deposits will create local hot spots and will also be carried into the radiator

and clog the radiator tubes. Studebaker Cooling System Rust Inhibitor or Resistor or any other approved inhibitor added to the cooling system, will help protect the metal components of the entire cooling system. The advisability, however, of seasonal flushing of the system should not be disregarded.

Most of the permanent or alcohol base antifreeze compounds contain a satisfactory rust inhibitor. When one of these solutions is used, additional rust inhibitor is unnecessary.

### ANTIFREEZE SOLUTIONS

Either the alcohol base or the ethylene glycol base antifreeze may be used. Both will effectively protect the cooling system, but precautions must be taken when using the alcohol base antifreeze. The alcohol base antifreeze, because of its low boiling point, is subject to loss by evaporation. Therefore, the solution must be tested frequently and a sufficient quantity should be added to compensate for any loss. If the alcohol base solution is spilled on a painted surface, it must be washed off with water immediately or the finish may be damaged.

The amount of antifreeze to be used in the cooling system should be determined according to the recommendations of the antifreeze manufacturer.

Salt and petroleum base antifreeze solutions should not be used. Salt has a rapid corrosive effect on metals and petroleum deteriorates the rubber hoses.

## WATER PUMP AND FAN BELT

### FAN BELT

The fan belt should be kept in correct adjustment. Excessive tension will result in placing undue strain on the water pump and generator bearings. A belt that is too loose will slip and affect the operation of the water pump and generator.

#### Adjustment—56G Model

The fan belt tension should be adjusted so there is from  $\frac{3}{8}$ " to  $\frac{1}{2}$ " (9,5 mm. to 12,7 mm.) movement

of the belt. To adjust the belt tension (see Fig. 1), loosen the generator adjusting arm lock bolt nut and the two lower support bolts, and pry the generator outward. When the correct belt tension is obtained, tighten the two lower support bolts and the adjusting arm lock bolt nut, and recheck the belt adjustment.

#### Adjustment—56B, 56H, and 56J Models

There are two methods of adjusting the fan belt tension. These are: (1) using Fan Belt Adjusting Tool J-4672 or (2) using a spring scale.

To adjust the belt tension using the tool, first loosen the generator-to-mounting bracket bolts and the adjusting arm screw. Place the tool over the head of the front mounting bolt and rotate the tool until the arm of the tool contacts the edge of the generator end plate. Then using a torque wrench, turn the tool counterclockwise until a 20 to 25 ft-lbs (0,23 to 0,28 kg-m) torque is indicated on the wrench scale. While holding the wrench at the proper torque, tighten the adjusting arm screw securely. Remove the tool and tighten the generator-to-mounting bracket bolts.

If the tool is not available, use a spring scale to adjust the belt tension. Hook the scale to the belt midway between the generator and fan pulleys. Then adjust the tension on the belt so that a pull of 14 pounds (6,35 kg.) on the scale will lift the belt  $\frac{1}{2}$ " (12,7 mm.) as shown in Fig. 2.

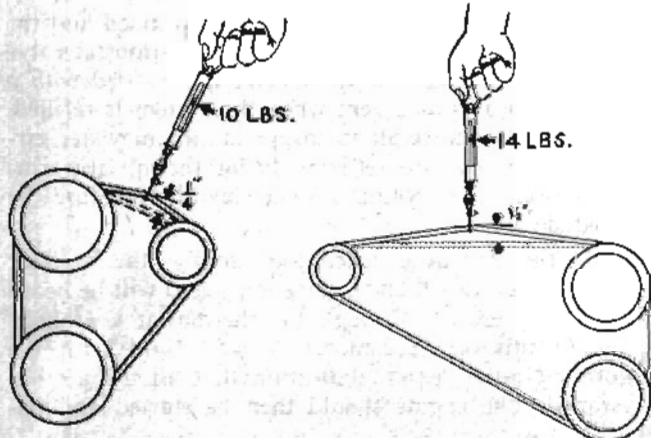


FIG. 1

FIG. 2



**WATER PUMP ASSEMBLY****Removal—56G Model**

Drain the cooling system completely as outlined under Draining the System. On the C models, remove the fan shroud as outlined under Fan Shroud—Removal. Loosen the generator, push it inward to relieve the tension on the fan belt, and remove the fan belt. Remove the fan-to-hub cap screws and remove the fan blades and pulley. Disconnect the Climatizer hose, if so equipped, and the generator adjusting arm. Disconnect the radiator outlet hose and complete the removal of the assembly by removing the mounting cap screws.

**Disassembly—56G Model**

The bearing lock ring (3, Fig. 3) must be removed before the pump (4) can be disassembled. Place the pump in an arbor press and remove the shaft, bearing, and hub assembly by pressing the arbor (1) through the impeller (2) and out through the front of the housing. Then press the shaft out of the hub.

**Servicing—56G Model**

Inspect the parts for damage or wear. If the thrust seal surface in the housing has become rough, it should be refaced with a water pump facing tool. In reassembling the pump, always use a new seal assembly and impeller.

**Reassembly—56G Model**

In reassembly, a new fan hub is used to insure a tight fit on the shaft. Press the fan hub on the shaft so it is flush with the end of the shaft. Insert the shaft in the housing and install the bearing lock ring. Then install the new seal assembly in the impeller and press the impeller on the shaft. There should be .015" to .031" (0.38 mm. to 0.79 mm.) clearance between the impeller (2, Fig. 4) and the housing (1). Rotate the shaft when checking the clearance.

**Installation—56G Model**

Using new gaskets, install the water pump assembly on the engine. Position the fan and pulley on the hub and install the retaining cap screws. Install the fan belt and adjust to the proper tension. On the C models, install the shroud as outlined under Fan

Shroud—Installation. Connect the Climatizer hose, if so equipped, and radiator outlet hose. Fill the cooling system and check the pump operation.

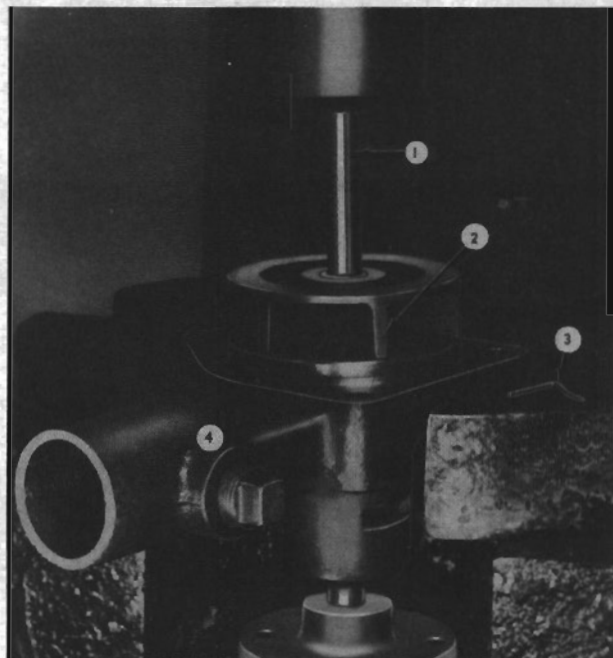


FIG. 3

1. Arbor  
2. Impeller

3. Lock ring  
4. Housing

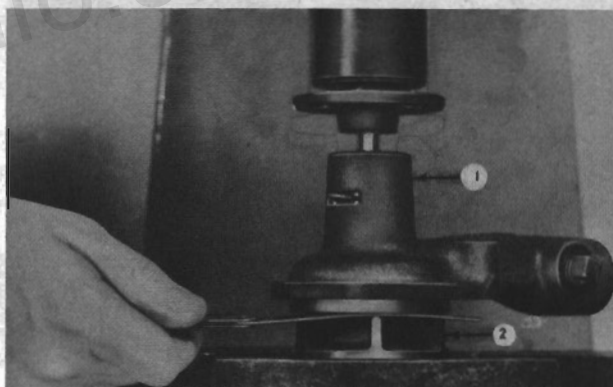


FIG. 4

1. Pump body

2. Impeller

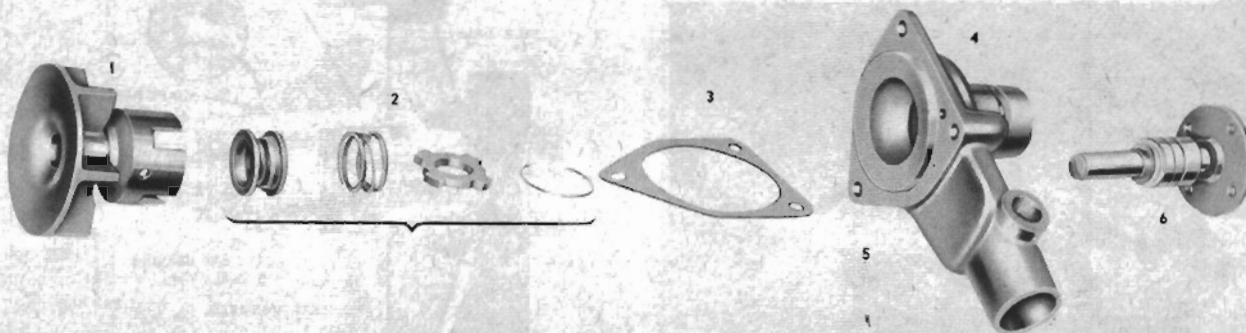


FIG. 5

1. Impeller  
2. Seal assembly

3. Gasket

4. Pump body

5. Lock ring

6. Fan hub, shaft and bearing assembly

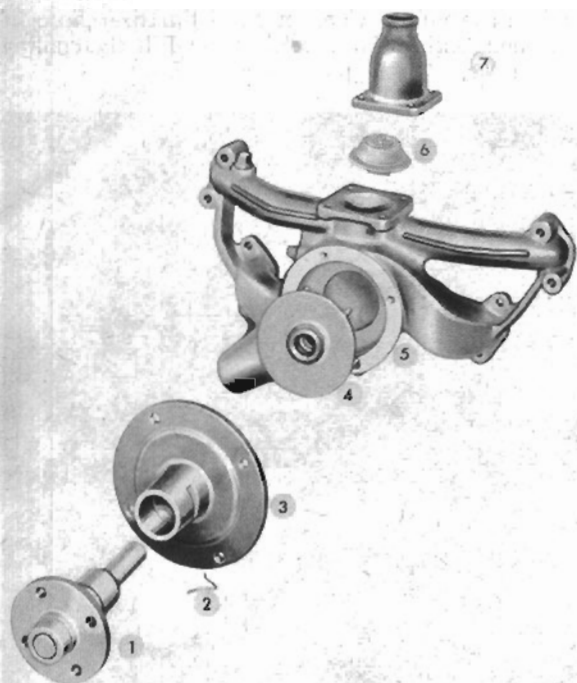


FIG. 6

- |  |                               |
|--|-------------------------------|
| 1. Fan hub, shaft and bearing assembly | 4. Impeller and seal assembly |
| 2. Lock ring                           | 5. Pump manifold              |
| 3. Cover                               | 6. Thermostat                 |
|  | 7. Water outlet housing       |

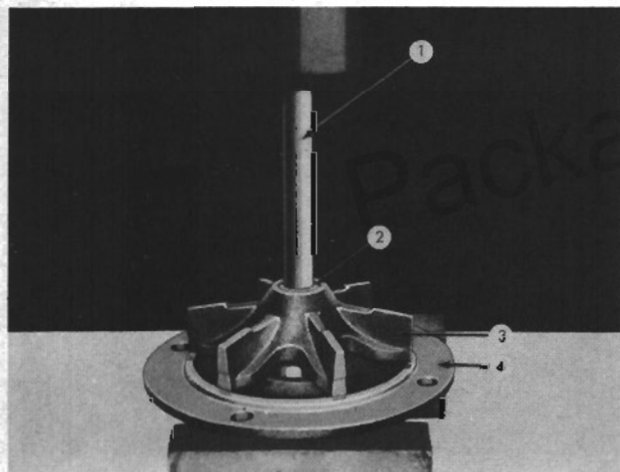


FIG. 7

- |          |             |
|----------|-------------|
| 1. Arbor | 3. Impeller |
| 2. Shaft | 4. Cover    |

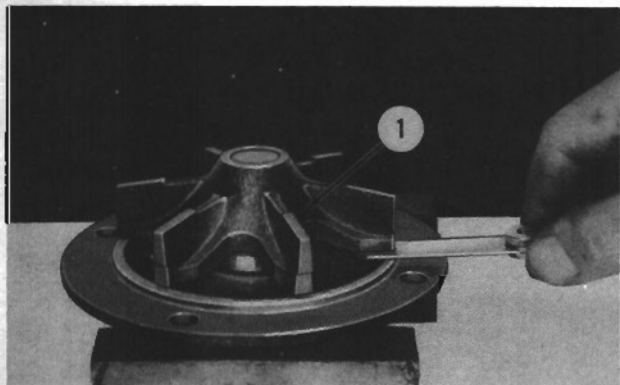


FIG. 8

- |             |
|-------------|
| 1. Impeller |
|-------------|

### Removal—56B and 56H Models

Drain the cooling system completely as outlined under Draining the System. Loosen the generator, push it inward to relieve the tension on the fan belt, and remove the belt. Remove the fan-to-hub screws and remove the fan and pulley. On the C and K models, remove the shroud as outlined under Fan Shroud—Removal.

Remove the four cap screws which retain the pump cover to the water pump manifold (5, Fig. 6); this permits removal of the pump assembly from the manifold.

### Disassembly—56B and 56H Models

Remove the bearing lock ring (2). Place the assembly in the arbor press and press the hub, shaft, and bearing assembly (2, Fig. 7) out of the impeller (3) and cover (4). Then press the shaft and bearing assembly out of the hub.

### Servicing—56B and 56H Models

Inspect the parts for damage or wear. If the thrust seal surface in the housing has become rough, it should be refaced with a water pump facing tool.

### Reassembly—56B and 56H Models

In reassembly, a new fan hub should be used to insure a tight fit on the shaft. Press the fan hub on the shaft so it is flush with the end of the shaft. Insert the shaft in the housing and install the bearing lock ring. Then install a new seal assembly in the impeller and press the impeller on the shaft so that the impeller is flush with the end of the shaft. The clearance between the impeller (1, Fig. 8) and cover must not exceed .090" (2,286 mm.).

### Installation—56B and 56H Models

Position the assembly on the manifold, aligning the holes of the cover and the manifold. Place new copper gaskets on the cover retaining screws and install the screws securely.

On the C and K models, install the shroud as outlined under Fan Shroud—Installation. Align the fan pulley and fan with the hub and install the four retaining screws. Install the fan belt and adjust to the proper tension. Fill the cooling system and check the operation of the pump.

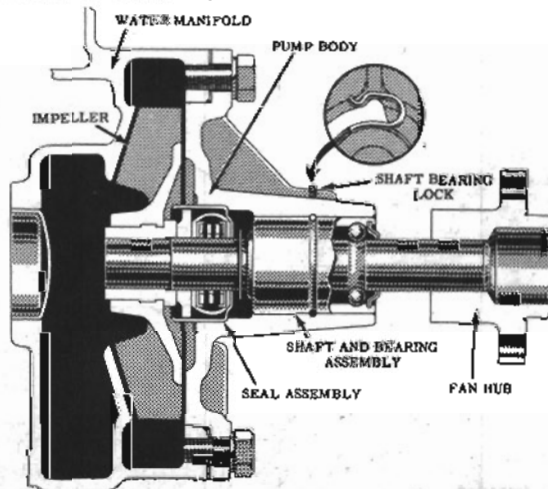


FIG. 9



**Removal—56J Model**

Drain the cooling system. Loosen the generator, push it inward to relieve the tension on the fan belt, and remove the belt. Remove the fan-to-hub screws and remove the fan and pulley.

Remove the cap screws which retain the pump body to the pump manifold; this permits removal of the pump assembly from the manifold (see Fig. 10).

The pump assembly is serviced as an assembly.

**Installation—56J Model**

Place a new gasket on the pump body flange. Before installing the pump, make sure the by-pass hole in the manifold is open. Position the pump on the manifold and install the retaining screws. Copper washers should be used at each of the screws to prevent leakage.

Install the fan belt, fan, and pulley, and adjust the fan belt tension.

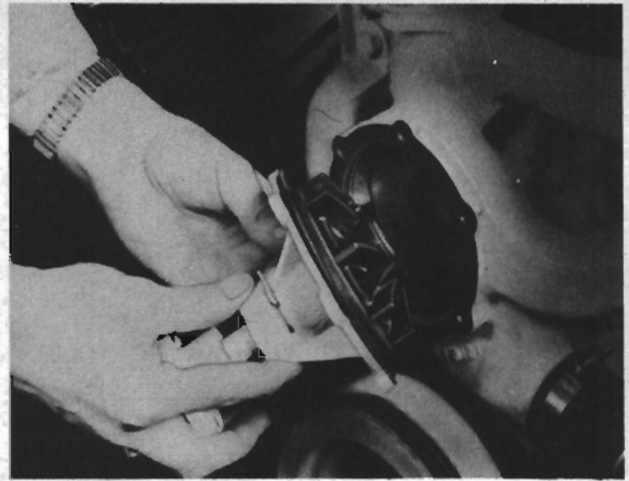


FIG. 10

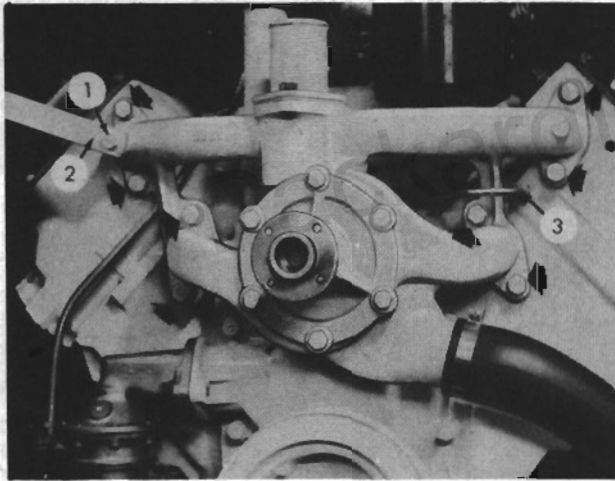
**WATER PUMP MANIFOLD**

FIG. 11

- 1. Cap screw
- 2. Generator adjusting arm

- 3. Oil filter pipe

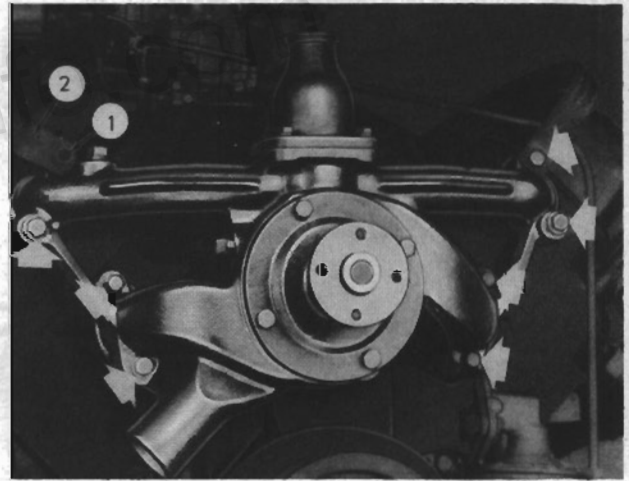


FIG. 12

- 1. Top stud

- 2. Generator adjusting arm

**Removal—56B, 56H, and 56J Models**

The water pump manifold assures even distribution of coolant between the water jackets of the two cylinder banks. Before removing the manifold, remove the four cap screws and remove the fan belt pulley and fan blade assembly. It is not necessary to remove the water pump.

Remove both radiator hoses (and both Climatizer hoses, if so equipped).

Remove the four cap screws which hold the water outlet to the water manifold, and remove the outlet, gasket, and thermostat. On the 56J model, disconnect the oil filter pipe (3, Fig. 11).

Remove the generator adjusting arm (2, Fig. 11, or 12) from the cap screw or top stud (1). Remove the cap screws, indicated by arrows in Figs. 11 and 12, and the stud (1, Fig. 12) on the 56B and 56H models. Remove the manifold.

Remove the water pump assembly as described under Water Pump Assembly—Removal.

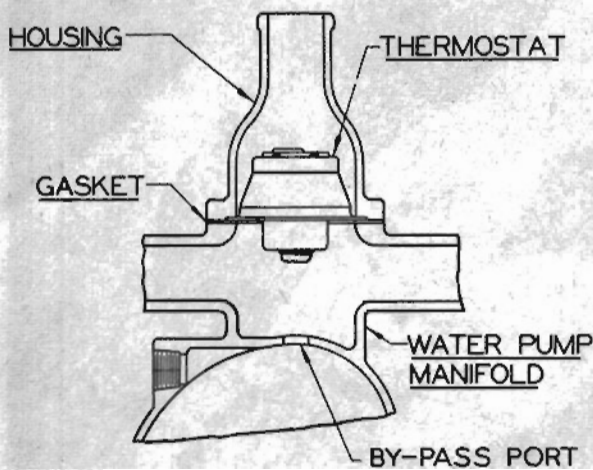


FIG. 13

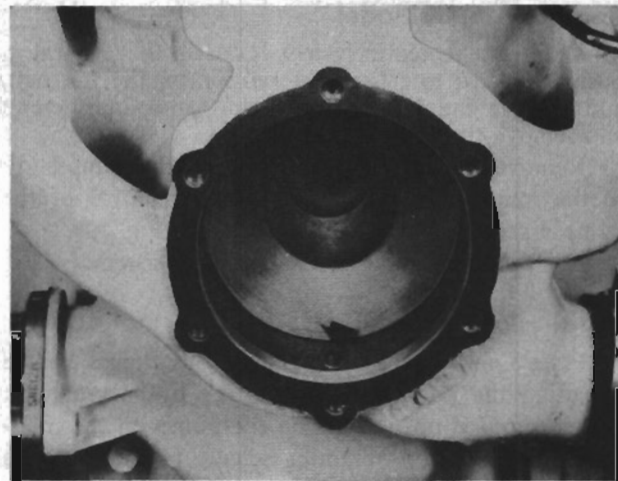


FIG. 14

### Inspection and Installation— 56B, 56H, and 56J Models

Examine the water manifold by-pass port (Fig. 13-56B and 56H models, Fig. 14-56J models), and clean out if necessary. Make sure that there are no deposits or other obstructions in the manifold. It should be possible to pass a  $\frac{5}{8}$ " (15.9 mm.) steel ball or marble completely through the manifold in either direction. Examine the cylinder block for obstructions or deposits where the water manifold attaches, and clean out if necessary.

Install the water pump assembly as described under the Water Pump Assembly—Installation, using a new gasket.

Position the water pump manifold assembly at the front of the engine, use all new gaskets, and install the retaining cap screws. Install the stud in the 56B and 56H models. Install the generator adjusting arm on the stud, but do not tighten the nut. Install the thermostat, new gasket, water outlet housing, and four retaining cap screws. Install the radiator hoses and oil cooler on 56J models equipped with the automatic transmission. Install Climatizer hoses, if so equipped. On the 56J models, connect the oil filter pipe. Align the fan pulley and fan blade assembly with the fan hub, and install and tighten the four retaining cap screws. Install the fan belt and adjust to the proper tension. Fill the cooling system and check for leaks with the engine running.

## HEAT INDICATOR—ENGINE UNIT

### Testing—All Models

The cylinder head unit (see Figs. 15, 16, and 17) is connected to the instrument panel (dash) unit by a single wire. To test the heat indicator system, first check the wiring for loose connections, broken wires,

or ground. Connect a panel unit which is known to be correct, to the cylinder head unit and provide a good ground for the unit. Run the engine and check the temperature. If the test unit operates satisfactorily, it indicates that the panel unit of the car is at fault. If the readings of the test unit are not satisfactory, the cylinder head unit is at fault and must be replaced.

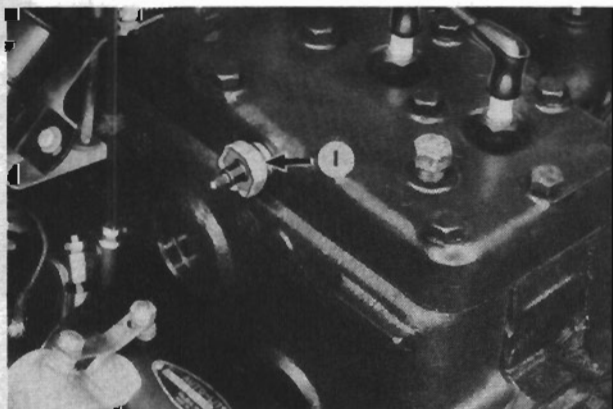


FIG. 15  
1. Cylinder head unit

### Removal and Installation—All Models

The heat indicator engine unit of the 56G model is located on the left side of the cylinder head. On 56B, 56H, and 56J models, it is located at the rear of the left bank cylinder head in the water passage cover plate.

To remove the unit, first drain the cooling system. Then disconnect the wire at the unit. On the 56G model, unscrew the unit from the cylinder head. On 56B, 56H, and 56J models, remove the unit and mounting plate as an assembly.

To install on 56G models, screw the unit into the head securely; and on all other models install the mounting. Connect the wire to the unit terminal.



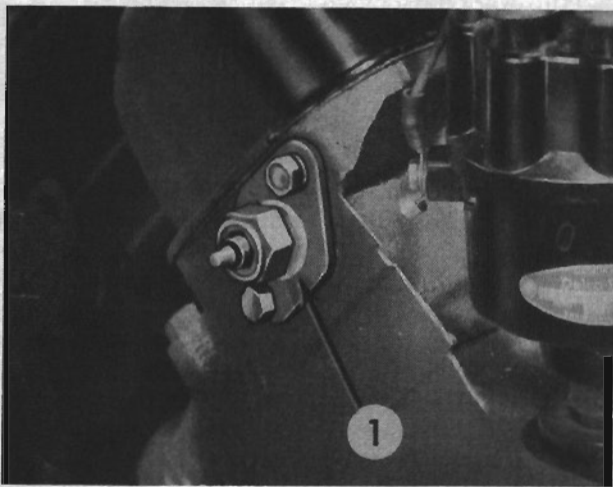


FIG. 16  
1. Cylinder head unit

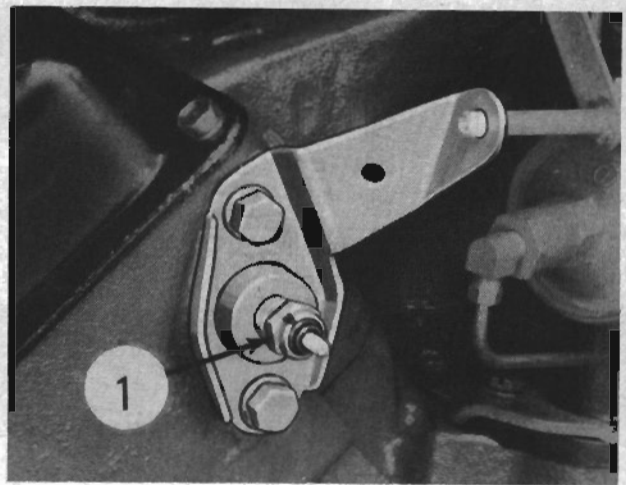


FIG. 17  
1. Cylinder head unit

## THERMOSTAT

### Testing—All Models

The thermostat used in the cooling system regulates the water flow through the radiator to maintain correct coolant temperature. When the water in the cylinder block approaches the temperature of efficient engine operation, the thermostat valve will open slightly to permit a flow of water through the radiator. As the water temperature increases, the valve opens a corresponding amount. When the valve is in its wide-open position, there is no restriction to water flow.

If the thermostat is believed to function improperly, it should be removed from the engine and its operation checked. Suspend the thermostat in a pan of water, heat the water, and, with an accurate thermometer, check the temperature of the water when the thermostat begins to open. The temperature at which the valve is wide open need not be checked because this will be correct if the start-to-open temperature is correct. A 170°F. (76°C.) thermostat is installed in production in all models. 160°F. (71°C.) and 180°F. (82°C.) thermostats are available through the Parts Department if cooler or hotter operating temperatures are required because of climatic conditions. The 170° thermostat should start to open between 167°F. (75°C.) and 172°F. (77°C.); the 160° between 157°F. (69°C.) and 162°F. (72°C.) and the 180° between 177°F. (80°C.) and 182°F. (83°C.)

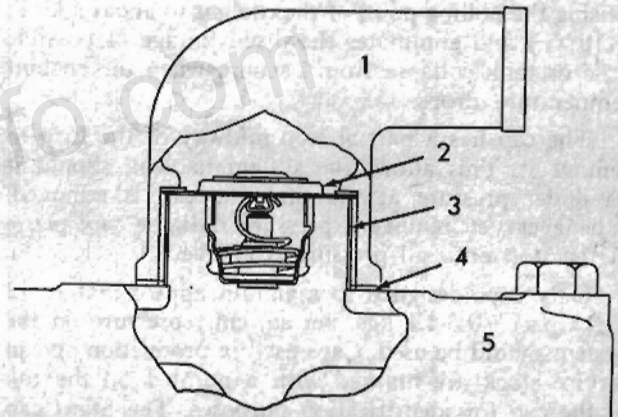


FIG. 18

|                 |                   |
|-----------------|-------------------|
| 1. Water outlet | 4. Gasket         |
| 2. Thermostat   | 5. Cylinder block |
| 3. Spacer tube  |                   |

When installing a thermostat, place the spring end downward. See Fig. 18. An error in this respect will render the thermostat inoperative and cause severe overheating.

## RADIATOR CORE, CAP, AND SHROUD

### RADIATOR CAP

An atmospheric vented, pressure-type radiator cap is used on all models. The pressure range of this cap is 12 to 15 p.s.i. (0.8-1.1 kgs. per sq. cm.). The atmospheric vented cap differs from the pressure cap formerly used in that it does not cause the cooling system

to be sealed at all times; instead, the cap seals or closes the system only when pressures within the system begin to exceed normal atmospheric pressure. The system remains sealed as heat (pressure) increases until the pressure in the system is from 12 to 15 p.s.i. above normal atmospheric pressure, at which time

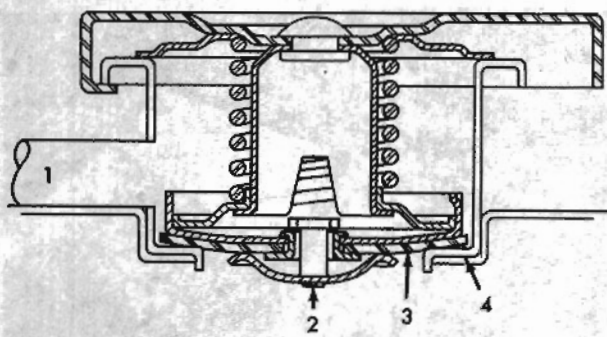


FIG. 19

1. Overflow pipe  
2. Vacuum valve

3. Seal  
4. Filler tube

the pressure seal (3, Fig. 19) in the cap opens and pressure is relieved through the overflow pipe.

On the other hand, while pressure is above normal atmospheric pressure, if the temperature of the coolant falls, the atmospheric vent (2) will open as the coolant pressure reaches normal atmosphere and no vacuum is created in the system.

This type of pressure cap has the advantage of raising the boiling point of the coolant to about 230°F. (110°C.) and eliminates the disadvantage of possible hose or tank collapse from vacuum when the coolant temperature drops.

The cap has a partial stop midway of the turn to remove it. This allows the system to vent, should it be under pressure at the time the cap is removed. Whenever you remove a pressure radiator cap, pause at the stop until all pressure is relieved.

Only caps designed to maintain approximately 12 to 15 p.s.i. (0.8-1.1 kgs. per sq. cm.) pressure on the system should be used. Caps used in production and in service stock are marked with a number on the top of the cap for identification purposes. The Stant cap is marked "S.M.Co." and has a large numeral "14"

embossed on the top; the AC cap has the numerals "698/13#" stamped into the top.

## FAN SHROUD

### Removal—C and K Models

Drain the coolant from the radiator and remove the radiator inlet hose. Remove the wiring junction block from the fan shroud. Pry open the wiring harness clips and move the harness out of the way. Remove the four fan-to-hub screws and remove the fan blades. Remove the four cap screws holding the shroud to the radiator core support and remove the fan shroud.

Align the fan shroud to the radiator core support and install the retaining screws. Install the fan blades. Place the wiring harness in the clips and bend the clips to hold it securely. Install the junction block and horn relay. Install the radiator inlet hose and fill the radiator.

## RADIATOR CORE

### Removal—All Models

Drain the cooling system, disconnect the battery, and tie up the hood. Remove the horn relay and the head lamp junction block screws, and free the wires across the top of the shroud from the clips. On 56B, 56H, and 56J models, remove the gasoline pipe clip screw. If the car has power steering, free the upper hose from the hose support. Remove the fan blades assembly. Disconnect the upper and lower hoses from the radiator. Remove the screws and remove the core.

### Installation—All Models

Install and connect the core and the shroud. Connect the lower and upper hoses to the radiator. Install the fan blades assembly and adjust fan belt tension. Fasten wires, junction block, and horn relay securely. On 56B, 56H, and 56J models, install the gasoline pipe clip screw. Fill the cooling system. Connect the battery, start engine, and inspect for leaks.

## DIAGNOSIS

### EXCESSIVE ENGINE TEMPERATURE

#### CAUSES

1. Poor water circulation.
  - a) Slipping fan belt.
  - b) Engine block or cylinder head passages clogged or restricted.
  - c) Radiator core clogged.
  - d) Head gasket or water pump gasket improperly installed.
  - e) Water hoses deteriorated or collapsed.
  - f) Thermostat defective or upside down.
  - g) Pump impeller loose on shaft.
  - h) Insufficient coolant in the system.
2. Poor air circulation.
  - a) Slipping fan belt.
  - b) Radiator core or grille damaged or obstructed.
  - c) Fan shroud removed (C and K models).
  - d) Fan blades bent.
3. Improper engine operation.
  - a) Ignition timing too late or too early.
  - b) Spark modifier stuck.
  - c) Any condition causing preignition.
  - d) Excessive engine friction, due to tight bearings or pistons, improper grade of oil, etc.
4. Engine overloaded.
  - a) Slipping clutch.
  - b) Dragging brakes.



- c) Tight wheel bearings.
- d) Abnormal friction in drive components.
- 5. Heat indicator not reading correctly.
- 6. Heavy paint, grease, or dirt on radiator core.
- 7. Use of certain types of antifreeze in warm weather.
- 8. Oil in water.

### WATER LOSS FROM COOLING SYSTEM

#### CAUSES

1. External leaks at radiator, hoses, Climatizer, drain plugs, water pump, freeze plugs, etc.
2. Internal leaks in engine (cracked block, porous casting, loose gasket, etc.), or water pump.
3. Combustion gases leaking into cooling system because of loose head bolts or faulty gasket.
4. No thermostat in system.
5. Losses through overflow pipe, due to overfilling, overheating, surging because of air domes in accessories or hoses, etc.
6. Air leaks into system at radiator cap, hoses, or cooling system gaskets.
7. Excessive pressures due to pressure cap sticking.
8. Improper filler cap.

### WATER PUMP NOISES

#### DESCRIPTION

Water pump noises are rare and are often difficult to locate. A noisy water pump, however, can generally be detected by the use of a sounding rod against the water pump body or by removing the fan belt temporarily. Water pump noises are usually indicated by a bump, squeal, or scraping noise.

#### CAUSES

1. Pulley loose on pump shaft.
2. Pump impeller loose on pump shaft.
3. Excessive end play of pump shaft.
4. Impeller blades rubbing water pump housing.
5. Impeller broken.
6. Dry or damaged fan shaft bearing.

### FAN NOISES

#### DESCRIPTION

Fan noises due to the condition of the fan belt are usually apparent by a squeak or squeal in the forward part of the engine when the engine is idling or

when the engine is rapidly accelerated.

Fan noises have various characteristics but can generally be located when the engine is idling. Paragraphs a), b), and d) under Cause No. 1 will be indicated by a continuous squeak or squeal, while paragraph a) under Cause No. 2 will cause an intermittent thud. Paragraph c) under Cause No. 2 will cause a light metallic rattle at low speed with an uneven engine idle. The fan blades striking the radiator, or fan belt will cause a decided scraping sound. Paragraphs f), g), and h) under Cause No. 2 will generally cause a whir or hum at the higher engine speeds.

#### CAUSES

1. Fan belt noises.
  - a) Belt adjusted too tight (squeak).
  - b) Belt adjusted too loose (squeak on acceleration).
  - c) Grease, rust, or foreign matter on fan belt or pulleys.
  - d) Incorrect type or make of fan belt.
  - e) Fan belt badly worn or burned.
  - f) Misalignment of fan belt pulleys.
2. Fan noises.
  - a) Excessive water pump shaft end play.
  - b) Fan blades loose on hub.
  - c) Crankshaft, generator, or fan pulleys cracked or distorted.
  - d) Fan hub loose and turning on shaft.
  - e) Fan blades striking fan belt or radiator.
  - f) Unbalanced fan blade assembly.
  - g) Uneven pitch of fan blades.
  - h) Bent or distorted fan blades.

### PREMATURE FAN BELT BREAKAGE OR RAPID WEAR

#### CAUSES

1. Tight adjustment causing abnormal stretch.
2. Loose adjustment causing excessive slippage.
3. Use of incorrect type belt.
4. Oil on belt causing deterioration.
5. Misalignment of belt pulleys.
6. Belt striking or rubbing on fan blades.
7. Excessive friction in water pump or generator causing overload on belt.
8. Broken or rough fan pulley flanges.

## SERVICE BULLETIN REFERENCE

| NUMBER | PAGE | SUBJECT |
|--------|------|---------|
|        |      |         |
|        |      |         |
|        |      |         |
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