

Service Bulletin

JULY

1957

NO. 326

SOUTH BEND 27, INDIANA

SERVICING THE SCOTSMAN MODELS

CARBURETOR

The carburetor used in the Scotsman Models is the Carter Model BBRI-2724S (see Fig. 1). This carburetor employs five systems during the full range of operation.

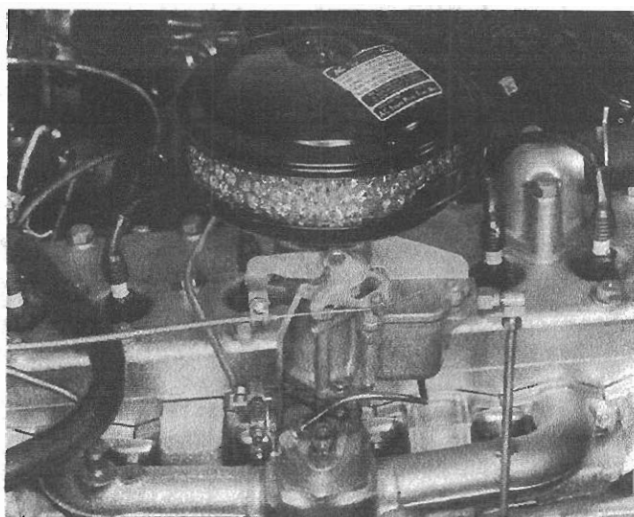


FIG. 1

Float System -- In the float system (see Fig. 2) gasoline enters the bowl (4) through the needle valve (2). The operation of the needle valve is controlled by the float (3) and the height of the fuel level in the bowl. The balance vent tube (1) allows atmospheric pressure to be equalized between the air intake and the fuel bowl.

Low Speed (Idle) System -- The idle or low speed system (see Fig. 3) completely controls the supply of fuel to the engine during idle and at speeds up to approximately 20 mph. (32.2 km). During the idle operation with a high vacuum, fuel is drawn from the bowl through the idle orifice tube (1) and then combines with the air drawn in from the air horn through the air bleed (6). The mixture then passes through the economizer (5) which tends to break it down into a finer vapor. The fuel-air mixture flows downward and out into the carburetor bore. The

idle mixture adjusting screw (3) varies the quantity of idle mixture entering the carbure-

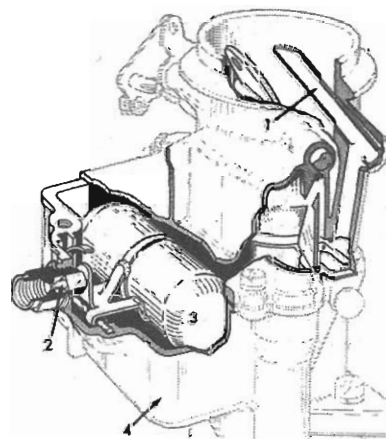


FIG. 2

- | | |
|----------------------|--------------|
| 1. BALANCE VENT TUBE | 3. FLOAT |
| 2. NEEDLE VALVE | 4. FUEL BOWL |

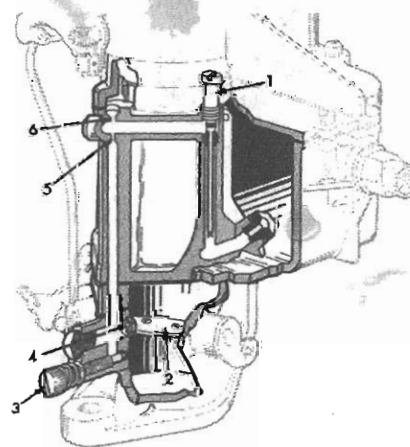


FIG. 3

- | | |
|--------------------------|---------------|
| 1. IDLE TUBE | 4. IDLE PORT |
| 2. THROTTLE VALVE | 5. ECONOMIZER |
| 3. IDLE ADJUSTMENT SCREW | 6. AIR BLEED |

tor bore which mixes with the air coming past the throttle valve (2). In this way, it varies the quality of the mixture finally entering the

engine. The idle port (4) is made in the form of a slot so that as the throttle is opened, it will not only allow more air to come past it but will also uncover more of the port allowing a greater quantity of mixture to enter the carburetor bore.

High Speed System -- As the throttle is opened and the speed increases from about 20 mph (32.2 km), the high speed system (see Fig. 4) gradually comes in and the low speed system tends to fade out, until at about 30 mph (48.3 km.) the high speed system is carrying the entire load. During the operation of the high-speed system, the velocity of the air flowing down through the carburetor creates a pressure less than atmospheric (a partial vacuum) at the diffuser hole (3). The difference in pressure between the bowl and the carburetor throat causes the fuel to flow from the bowl through the main metering jet (5). Air coming through the balance tube and the vent (1) is admitted through the air passage (2) into the main vent tube (4). This air mixes with the fuel in the space surrounding the tube so that a mixture of fuel and air is carried out of the diffuser hole (3). As the vacuum drops due to increased throttle opening, the vacuum can no longer hold the step-up piston (8) and the step-up rod (7). Spring pressure then raises the piston and opens the step-up jet (6). Thus allowing fuel to flow through the step-up jet in addition to that already flowing through the main metering jet.

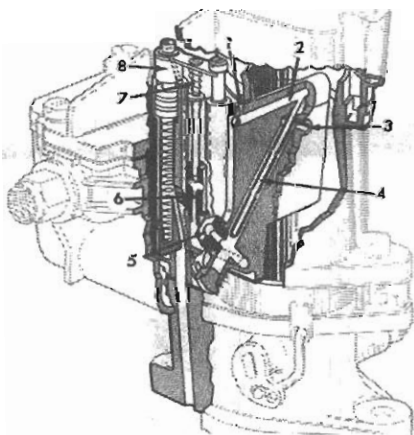


FIG. 4

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|-------------------|----------------------|
| 1. VENT | 5. MAIN METERING JET |
| 2. AIR PASSAGE | 6. STEP-UP JET |
| 3. DIFFUSER | 7. STEP-UP ROD |
| 4. MAIN VENT TUBE | 8. STEP-UP PISTON |

Accelerating (or Pump) System -- In the accelerating or pump system (see Fig. 5) as the accelerator is depressed, the pump plunger (6) is forced downward. This forces the fuel to leave the chamber, closes the inlet ball check (5), opens the outlet ball check (4) and discharges the fuel into the carburetor throat through the pump jet (3). As the accelerator

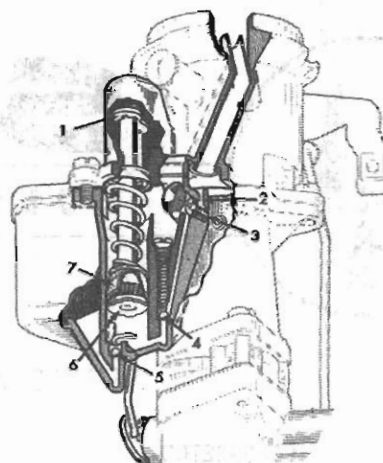


FIG. 5

- | | |
|-----------------------|---------------------|
| 1. PUMP LINK | 5. INLET BALL CHECK |
| 2. PUMP JET AIR BLEED | 6. PUMP PLUNGER |
| 3. PUMP JET | 7. PUMP LEATHER |
| 4. OUTLET BALL CHECK | |

is released to its original position, the plunger is pulled upward by the pump link (1), thus creating a partial vacuum, closing the outlet ball check and opening the inlet ball check, and drawing in a new charge of fuel.

The pump jet air bleed (2) releases the vacuum at the jet, thereby preventing the drawing of fuel through the pump jet during fixed speeds.

Choke System -- The manually-operated choke system (see Fig. 6) is used only in starting and during the warmup of the engine. The choke breather valve (1) allows sufficient air to enter to provide the proper mixture when the choke valve is fully closed. The fast idle cam (3) is connected to the choke shaft so that



FIG. 6

- | | |
|-------------------------|------------------|
| 1. CHOKE BREATHER VALVE | 3. FAST IDLE CAM |
| 2. CHOKE VALVE | |

the throttle valve is forced open slightly when the choke valve (2) is closed.

DISASSEMBLY

Remove the air horn and bowl cover assembly (3, Fig. 7) with gasket (11). Remove the float lever pin retainer (5) and lift out the float (7) float lever pin (6). Remove the float needle (9) and needle seat (10). Remove the hairpin clip from the pump operating link (35) and remove the link. Then lift out the pump plunger (22), lifter link (17) and spring (21) as an assembly. Using Retainer Ring Removing Tool J-1306, remove the retainer ring (25) and then the inlet ball check (23).

To disassemble the pump plunger (22) from the lifter link (17), compress the pump spring (21) to a point below the notch on the plunger shaft and turn the lifter link 1/4 turn.

Remove the rivet plug (27) from the pump jet passage and remove the pump jet assembly (26).

KEY TO PARTS IN FIG. 7

1. CHOKE BRACKET ASSEMBLY
2. CHOKE VALVE AND SHAFT
3. AIR HORN
4. AIR HORN SCREWS
5. FLOAT LEVER PIN RETAINER
6. FLOAT LEVER PIN
7. FLOAT
8. FLOAT NEEDLE SEAT GASKET
9. FLOAT NEEDLE
10. FLOAT NEEDLE SEAT
11. AIR HORN GASKET
12. IDLE TUBE AND PLUG ASSEMBLY
13. STEP-UP PISTON, PLATE AND ROD ASSEMBLY
14. STEP-UP PISTON SPRING
15. STEP-UP JET AND GASKET ASSEMBLY
16. STEP-UP PISTON GASKET
17. PUMP LIFTER LINK
18. PUMP CHECK PLUG
19. PUMP SPRING RETAINER
20. PUMP CHECK SPRING
21. PUMP SPRING
22. PUMP PLUNGER AND ROD ASSEMBLY
23. PUMP CYLINDER INLET BALL
24. PUMP CHECK OUTLET BALL
25. RETAINER
26. PUMP JET ASSEMBLY
27. RIVET PLUG
28. MAIN BODY
29. THROTTLE BODY SCREW
30. MAIN METERING JET AND GASKET ASSEMBLY
31. FLANGE GASKET
32. INSULATOR
33. FLANGE GASKET
34. THROTTLE SHAFT ASSEMBLY
35. PUMP OPERATING LINK
36. IDLE ADJUSTING SCREW
37. THROTTLE BODY

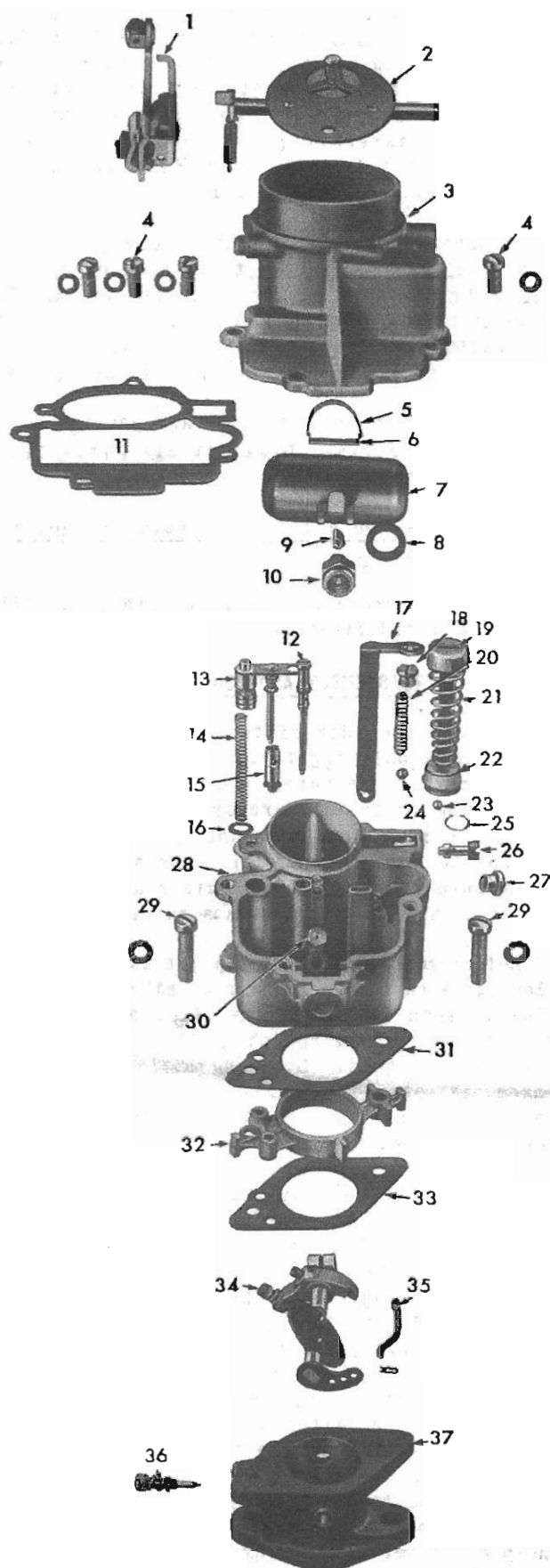


FIG. 7

Then remove the pump check plug (18), spring (20), and ball (24). Remove the idle tube (12) and the step-up piston, plate and rod assembly (13). Then remove the step-up piston spring (14) and gasket (16). Remove the step-up jet and gasket assembly (15). Remove the main metering jet and gasket assembly (30) using a 5/16" socket. Do not use pliers.

Remove the carburetor main body (28) from the flange (37). Remove the insulator spacer (32) and gaskets (31 and 33). Remove the nozzle passage bleed plug from the underneath side of the carburetor body. Remove the idle mixture adjusting screw and spring (36) from the flange.

Thoroughly clean all parts and passages and inspect all parts. Blow out all parts with compressed air.

CAUTION -- Do not dip the pump plunger in cleaning solvent.

When, reassembling the carburetor, use all new gaskets and rivet plugs.

REASSEMBLY AND ADJUSTMENTS

Install the idle mixture screw and spring (36). Seat only lightly. Back off the screw approximately one turn. Install the passage bleed plug in the carburetor body (28). Then place the insulator (32) and gaskets (31 and 33) on the body flange (37). Install the body being sure the gaskets and screws are properly aligned. Tighten the screws securely.

Before installing the pump jet assembly (26) blow out with compressed air to make sure it is clean. Then install a new rivet plug. Wipe off the pump discharge check ball (24) in the palm of your hand. Drop the ball in the discharge jet passage and install the spring (20) and screw plug (18). Seat the plug securely but do not tighten excessively.

Install the pump cylinder inlet ball (23) and the retainer ring (25). Use Retainer Ring Installing Tool J-1407. Install the pump plunger assembly (22) (to prevent damaging the leather packing, turn the plunger as it is being pushed into the cylinder). Install the pump spring (21), the small end of the spring is placed at the packing end of the plunger. Place the spring retainer (19) over the rod. Install the pump lifter link (17); push down on the link and at the same time pull up on the pump plunger shaft, turning it a 1/4 turn to engage it in the notch in the lifter link. Install one end of the pump operating link (35) in the pump lifter link and the other in the center hole of the throttle shaft arm and lock with the hairpin clip.

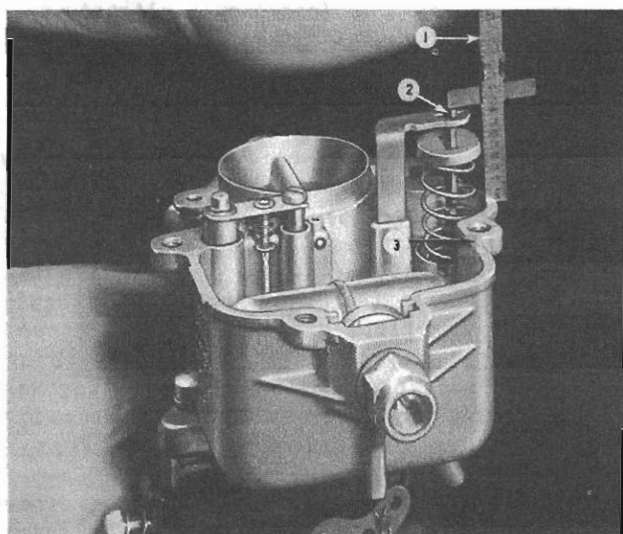


FIG. 8

- 1. SCALE
- 2. PUMP PLUNGER SHAFT
- 3. GASKET SURFACE OF BODY

To check the accelerating pump travel, first back off the throttle speed screw and close the throttle. Then measure the distance from the gasket surface of the body to the top of the plunger shaft (2, Fig. 8). Open the throttle wide making sure the plunger (2, Fig. 9) is at the bottom of the cylinder and measure the distance again. There should be 1/2" (12.7 mm.) difference in the measurements. To obtain the specified measurement, bend the horizontal portion of the pump lifter link up or down as required.

Install the main metering jet and gasket assembly, using a 5/16" socket. **CAUTION** -- Do not tighten excessively. Install the step-up

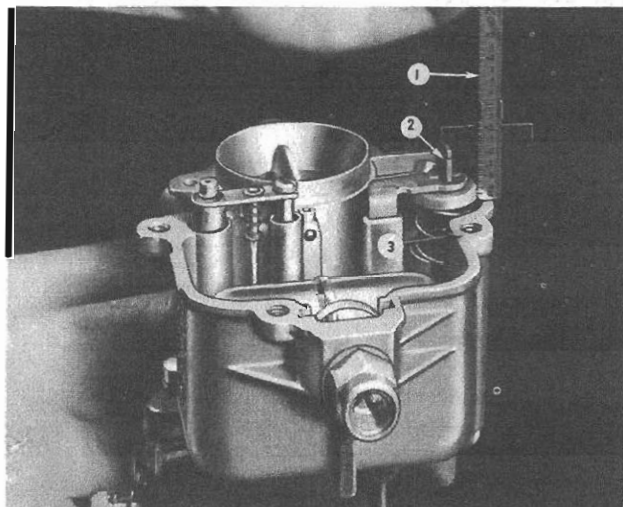


FIG. 9

- 1. SCALE
- 2. PUMP PLUNGER SHAFT
- 3. GASKET SURFACE OF BODY

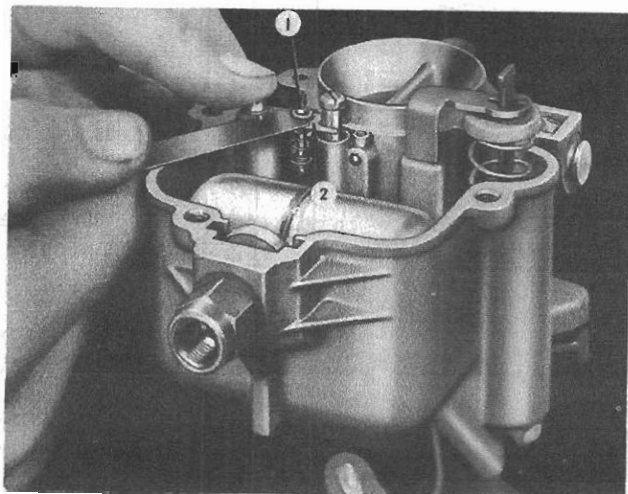


FIG. 10

1. ROD HEAD 2. STEP-UP PLATE

jet and gasket assembly (15). Install the step-up piston gasket (16) and spring (14). Install the step-up piston plate and rod assembly and the idle tube assembly. Hold the piston plate assembly down when seating the idle tube. There should be a .010" (0,254 mm.) clearance between the step-up plate (2, Fig. 10) and the rod head (1). Using Vacuum Piston Wrench Tool KMO-269-S5 (1, Fig. 11), bend the step-up plate (2) in either direction as required to obtain the correct clearance.

Install the float needle seat and gasket assembly and float needle. Then, install the float and float lever pin. To check the float level, hold the lip (4, Fig. 12) of the float (2) against the float needle (3) making sure the float pin is pushed down as far as it will go. Place the Float Level Gage KMO-733 (1) across the rim of the float bowl and over the center of the float and check the float position. The float setting should be $5/64" \pm 1/64"$ (1,98 mm. $\pm 0,397$ mm.). To obtain setting, bend the vertical lip (1, Fig. 13) of the float (2) using the Vacuum Piston Wrench Tool KMO-269-S5 (3).

Install the float lever pin retainer, making sure the ends are against the float pin.

Install a new bowl cover gasket. Connect the fast idle link rod. Place the air horn and bowl cover assembly over the main body and install the screws securely. Install a new carburetor-to-manifold gasket of the correct type.

Install the carburetor. Check the choke and throttle for full operation and adjust the idle speed. The idle speed of the engine should be set at 550-600 rpm.

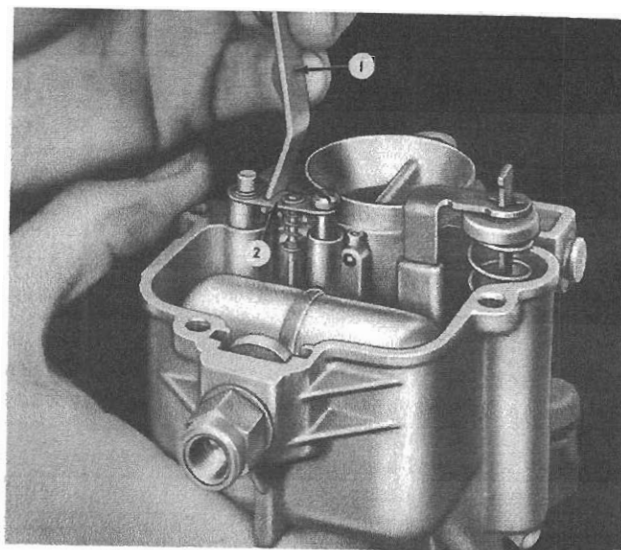


FIG. 11

1. VACUUM PISTON WRENCH KMO-269-S5
2. STEP-UP PLATE

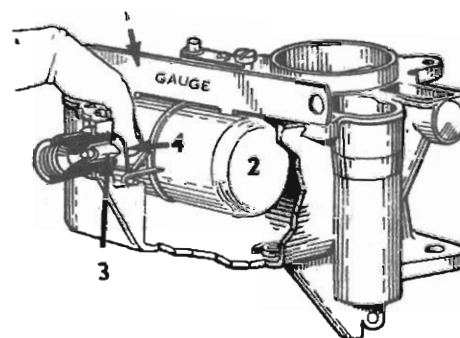


FIG. 12

1. FLOAT LEVEL GAGE KMO-733
2. FLOAT
3. FLOAT NEEDLE
4. FLOAT LIP

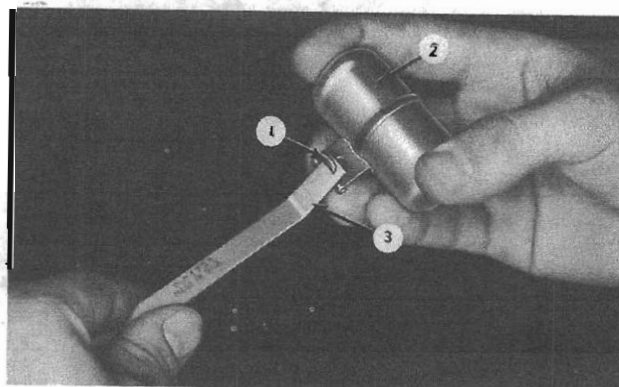


FIG. 13

1. FLOAT LIP
2. FLOAT
3. VACUUM PISTON WRENCH KMO-269-S5

CARBURETOR METERING JETS

Metering jets are available in several sizes to provide the proper fuel-air ratio at different altitudes. The jet size is stamped on the jet.

CARBURETOR AIR CLEANER

The air cleaner used is of the oil-wetted type, but does not have a silencer feature. (See Fig. 1).

To service the cleaner, remove the element and wash in solvent. Then apply a light coating of heavy engine oil and reassemble. Servicing intervals should be determined by the operating conditions. Under severe dust conditions it may be necessary to service the unit daily.

HEATER AND DEFROSTER

A recirculating type heater mounted on the dash is standard equipment. A Climatizer as used on other models may be installed but it is not a factory-installed option.

The heater and defroster operate as a single unit with one blower motor. The amount of air and the direction of flow are controlled by the positioning of the three doors provided in the heater housing. The amount of air to the defroster is dependent on the degree of opening of the doors. Maximum defroster air is obtained by closing all three doors.

The heater motor is protected by a SFE-14 fuse which is located on the switch.

A screw-type valve located at the rear of the engine cylinder head (see Fig. 14) provides a shut-off to prevent hot water circulation through the heater when heater operation is not

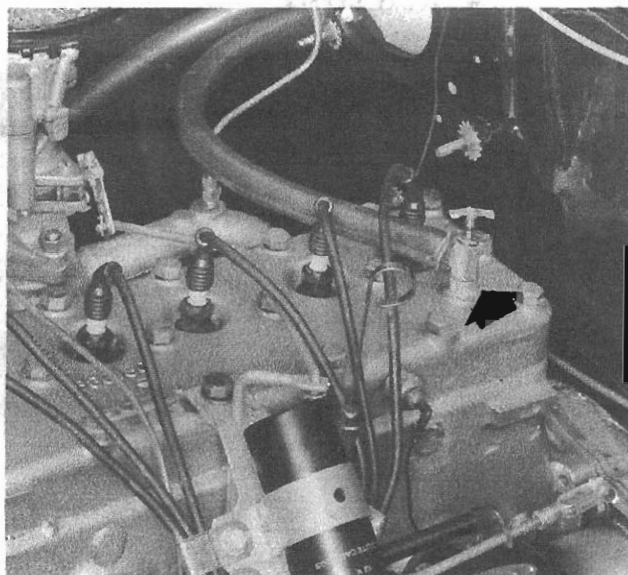


FIG. 14

required.

HEATER CORE REMOVAL

To remove the core it is not necessary to remove the complete heater assembly from the car. Drain the cooling system. Disconnect the hoses from the core nipples. Remove the housing front cover. See Fig. 15. Then, pull the core rearward out of the housing.

HEATER MOTOR REMOVAL

Disconnect the motor wire from the switch. Remove the core. Then, remove the heater fan by loosening the set screw and slipping the fan off the shaft. Remove the heater motor stud nuts (the ground wire is connected to one of the studs) and slip the motor off the mounting bracket and out of the housing.

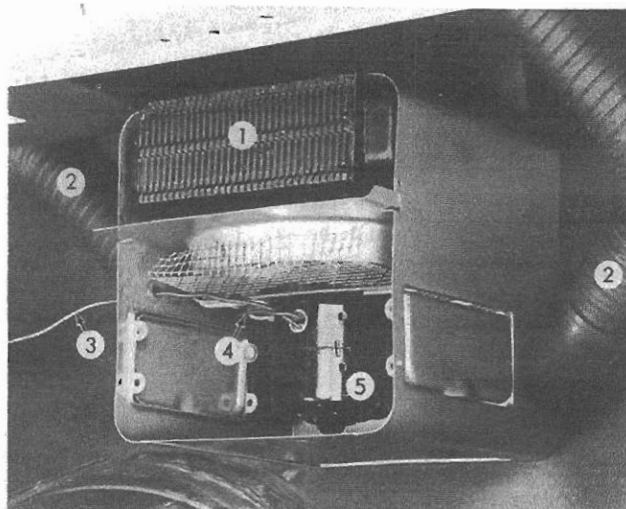


FIG. 15

- | | |
|-------------------------|----------------------|
| 1. HEATER CORE | 4. MOTOR GROUND WIRE |
| 2. DEFROSTER HOSES | 5. HEATER MOTOR |
| 3. MOTOR-TO-SWITCH WIRE | |

WINDSHIELD WIPERS

The windshield wipers are vacuum operated and are controlled by a slide-type control. Move the knob to the left to operate the wipers. Full left position gives maximum speed. Intermediate positions regulate the speed of the wipers.

Servicing instructions are the same as outlined in the 1956 Studebaker Passenger Car Shop Manual.

RADIO OR CLOCK GRILLE PANEL

If a radio or clock are to be installed, a grille panel must also be installed.

REAR QUARTER WINDOW - 2-DOOR SEDAN MODELS

The rear quarter windows of the 2-door sedan models are stationary.

Removal -- To remove the rear quarter window glass, first remove the seat cushion and seat back. Remove the garnish moulding. To remove the trim panel; remove the screw at the upper front corner, the drive nail at the upper rear corner and unsnap the clips at the front edge of the panel. Remove the two screws (3, Fig. 16) which retain the support block at the bottom edge of the glass. Hold the glass in position while removing the support block. Carefully lower the glass until it rests on the stops at the bottom of the channels. Remove the window run (1) and the outer weather seal (2) from the opening. Lift the glass and as it approaches the top of the opening tilt the top of the glass inward. Continue to lift and remove it from the body.

Installation -- From the inside of the car, slip the plastic water shield into the opening and start the glass into the opening. Lower the glass carefully to the bottom of the channels. Reglue the headlining if pulled loose during removal of the run. Install the window run and outer weather seal. Slip the glass up into position and install the support block. Check the water shield to make certain that it is hanging down in position. Then install the trim panel. Install the garnish moulding. Install the seat back and seat cushion.

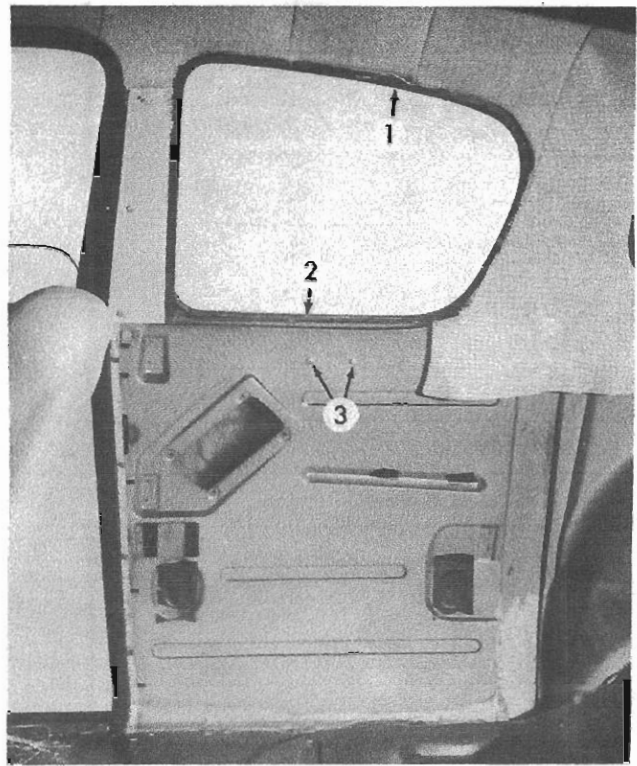


FIG. 16

1. WINDOW RUN
2. OUTER WEATHER SEAL
3. SUPPORT BLOCK SCREWS

NOTES

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STUDEBAKER-PACKARD CORPORATION

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