EXHAUST • • • • • • • SECTION 3

CONTENTS

GENERAL DESCRIPTION

The exhaust system, illustrated in Fig. 81, includes the exhaust manifold, exhaust pipe, muffler, tail pipe and necessary mounting parts.

The exhaust manifold is located on the left side of the engine. It is assembled to the intake manifold and they are installed as a unit to the cylinder block.

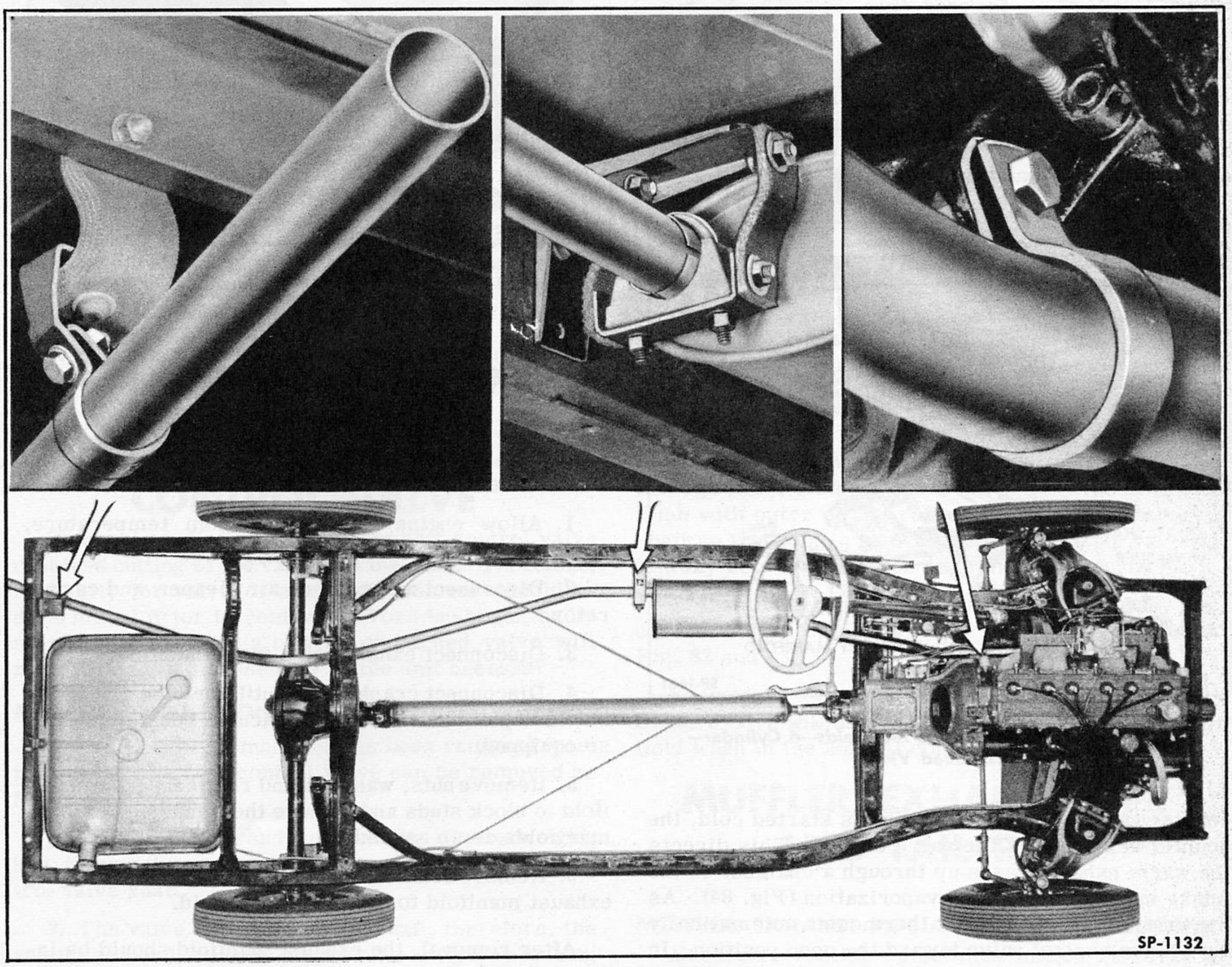

Fig. 81—Exhaust System

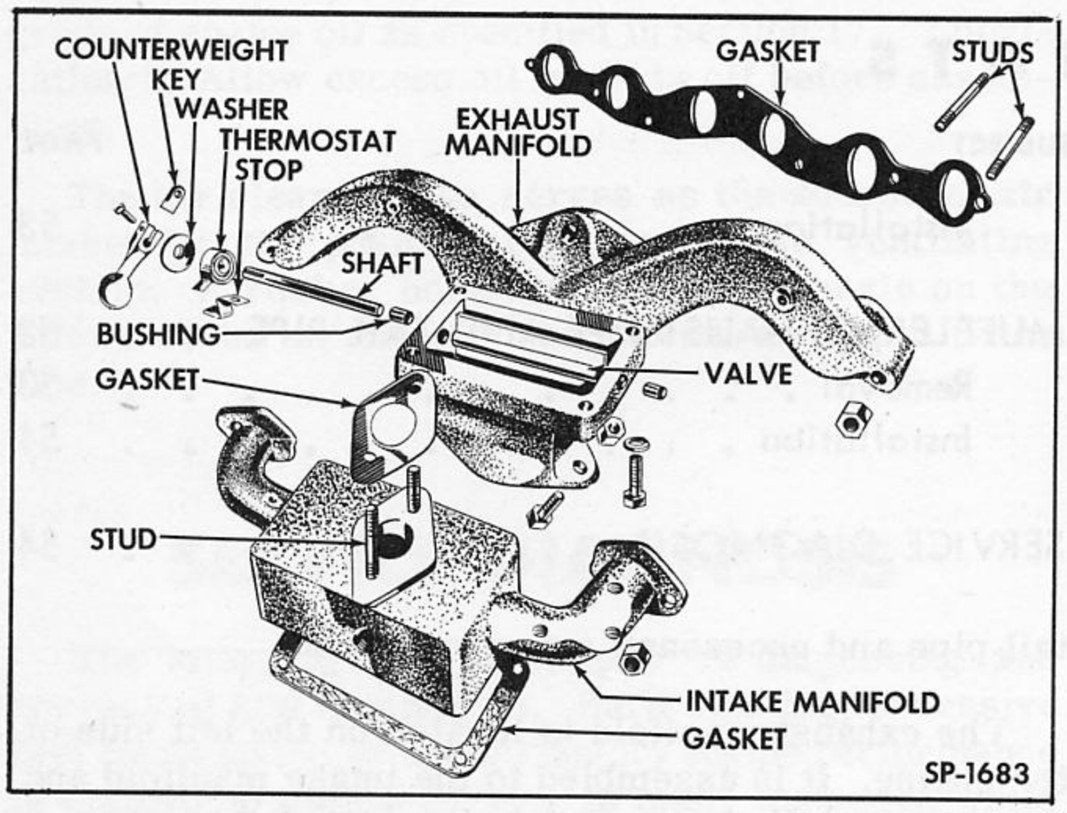

Fig. 82—Exhaust and Intake Manifolds—4 Cylinder—Exploded View

An automatic heat control valve is located in the exhaust manifold to aid in fuel vaporization during engine ''warm-up'' period by heating a section of the intake manifold. The manifold heat control valve is actuated by a bi-metallic thermostat spring and a

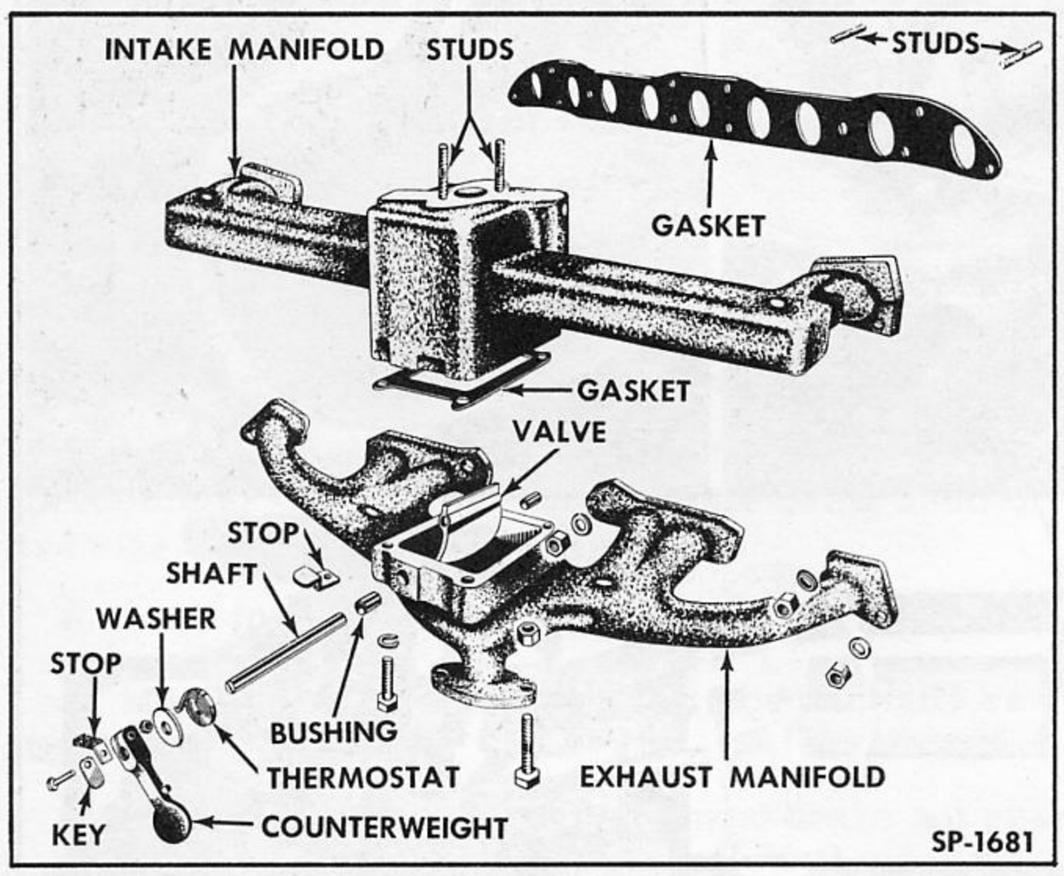

Fig. 83—Exhaust and Intake Manifolds—6 Cylinder—Exploded View

counterweight. When the engine is started cold, the counterweight holds the valve closed. This directs the warm exhaust gases up through a chamber in the intake manifold to aid fuel vaporization (Fig. 84). As the engine warms up, the thermostat automatically swings the control valve toward the open position. In the open position, the valve allows exhaust gases to go directly out through the exhaust pipe.

The exhaust pipe is attached to the bottom of the exhaust manifold and is supported by a hanger at the clutch housing. It extends down to the muffler which is located along the left side rail of the frame.

The oval shaped perforated tube type muffler is mounted in such a way that it is well protected by the frame side rail and does not affect road clearance of the vehicle. A hanger and clamp supports the rear end of the muffler and the front end of the tail pipe. Another hanger at the rear end of the frame supports the rear end of the tail pipe. Both the muffler and tail pipe supports are insulated by heavy straps to reduce noise and vibration.

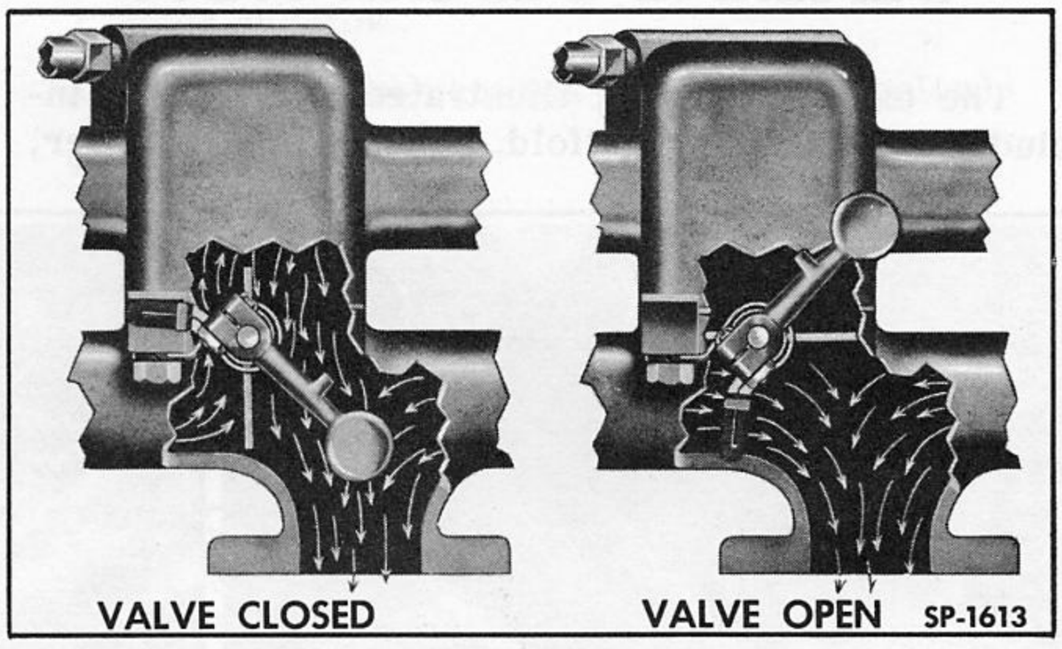

Fig. 84—Operation of Manifold Heat Control Valve (6 Cylinder Shown)

EXHAUST MANIFOLD

EXHAUST MANIFOLD REMOVAL AND INSPECTION

Remove the exhaust manifold as follows:

1. Allow engine to cool to room temperature, otherwise warpage of the manifold may result.

2. Disconnect and remove air cleaner and carburetor.

3. Disconnect exhaust pipe from manifold.

4. Disconnect crankcase ventilator tube and windshield wiper vacuum tube (or vacuum booster tubes if so equipped).

5. Remove nuts, washers and retainers from manifold to block studs and remove the intake and exhaust manifolds as an assembly.

6. Remove four bolts and washers that attach the exhaust manifold to the intake manifold.

After removal, the exhaust manifold should be inspected for cracks or distortion. If either condition is evident, the manifold should be replaced.

If any of the manifold to block studs are damaged or stripped, they should be replaced also.

Examine the manifold heat control valve. It must operate freely without bind or excessive end-play. When the manifolds are cold, the thermostat spring must permit the counterweight to hold the valve in the closed position to direct hot exhaust gases upward to the intake manifold heating chambers.

EXHAUST MANIFOLD INSTALLATION

Always use new gaskets when installing manifolds. Have all mating surfaces clean and smooth and check all attaching studs, replacing any that are damaged.

Proceed as follows:

1. Using a new gasket, install the exhaust manifold to the intake manifold with four bolts and washers. Tighten bolts to 12 - 15 foot-pounds torque on four cylinder engines and 15 - 20 foot-pounds on six cylinder engines.

2. Place manifolds on cylinder block, using a new manifold gasket, and install retainers or washers and nuts loosely on the studs. Starting at center and working outward, tighten all nuts to 31 - 35 foot-pounds torque.

3. Connect exhaust pipe to manifold. Use new gasket if necessary.

4. Install carburetor to intake manifold, using new gasket, and connect carburetor throttle linkage, fuel line, vacuum tubes and air cleaner.

5. Connect crankcase ventilator tube and vacuum tube to manifolds.

MANIFOLD HEAT CONTROL VALVE

Removal or disassembly of the heat control valve requires cutting of the valve and the shaft. Therefore, necessity for valve or shaft replacement should be determined prior to removal. Worn bushings, badly misaligned shaft or a broken or burned valve will make complete disassembly of the unit necessary.

MANIFOLD HEAT CONTROL VALVE REMOVAL

After the exhaust manifold has been removed from the engine, the heat control valve can be removed as follows:

1. Loosen screw and remove the counterweight, key, thermostat washer and thermostat from heat control valve shaft.

2. The valve is welded to the shaft, therefore, the valve and shaft must be cut with an acetylene cutting torch at two places and the pieces removed.

3. Carefully drive shaft bushings out of the manifold.

MANIFOLD HEAT CONTROL VALVE INSTALLATION

Install the heat control valve as follows:

1. Press new shaft bushings into manifold until the space between the inner ends of the bushings is 2.176 inches on six cylinder engines and 1.875 inches on four cylinder engines (see Fig. 85). The bushings should extend approximately equal distances inside the inner surfaces of the exhaust manifold.

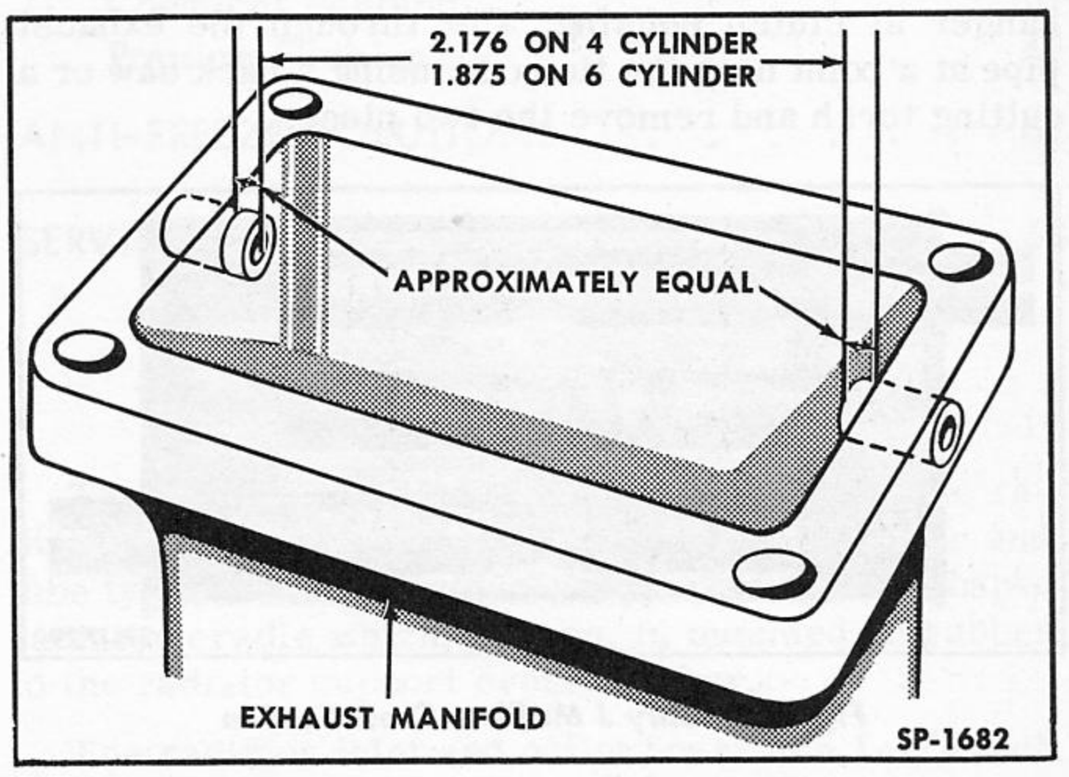

Fig. 85—Heat Control Valve Shaft Bushing Installation

2. Line ream the bushings to .315 - .317 inch inside diameter. Use a new shaft to check alignment of the bushings.

3. Hold the valve in the manifold and insert shaft through manifold and valve until end without slot is flush with outer end of rear bushing. Weld valve to shaft so that slot in shaft is horizontal when valve is midway between full open and full closed position.

4. Install thermostat, thermostat washer, key and counterweight on slotted end of shaft as shown in Fig. 82 and 83.

5. Operate the valve manually to check for bind. Be sure valve will direct gases up into the intake manifold when in the normal cold position.

MUFFLER, EXHAUST PIPE AND TAIL PIPE

MUFFLER, EXHAUST PIPE AND TAIL PIPE REMOVAL

Excessive rusting sometimes makes removal of clamps, bolts and nuts difficult when removing parts

of the exhaust system. Rust removal followed by applications of penetrating oil may help. In extreme cases, some of the attaching parts may have to be replaced. The procedure to remove the muffler and both pipes is as follows:

1. Remove tail pipe by loosening clamps at muffler and at rear frame crossmember. If necessary, support muffler during this operation.

2. Remove muffler by loosening exhaust pipe to muffler clamp.

3. Remove exhaust pipe by removing exhaust pipe to manifold bolts (or nuts) and loosening exhaust pipe hanger at clutch housing. Cut through the exhaust pipe at a point near the tie rods, using a hack saw or a cutting torch and remove the two pieces.

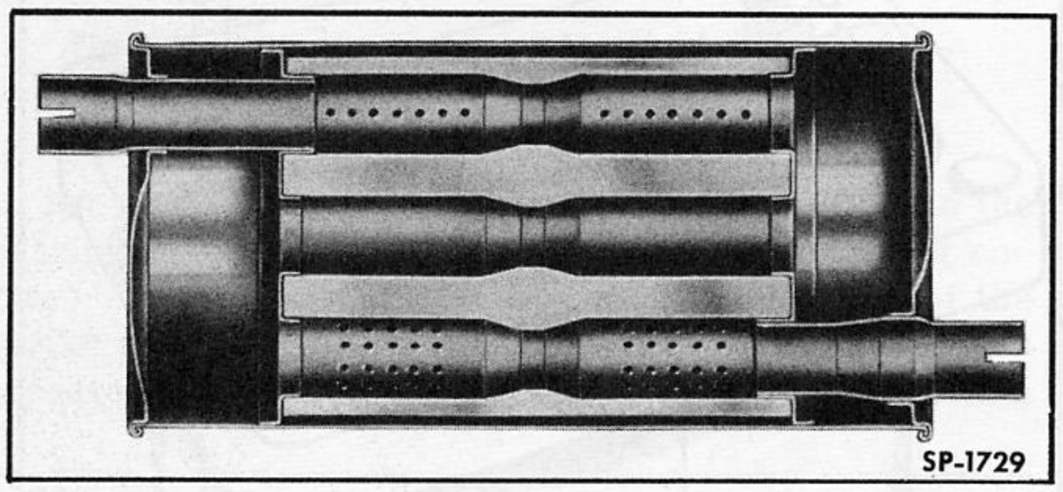

Fig. 86—Henry J Muffler—Cross Section

MUFFLER, EXHAUST PIPE AND TAIL PIPE INSTALLATION

When installing the exhaust system, it may be somewhat easier to install all parts loosely, line them up correctly, and then tighten all attaching bolts or nuts. Proceed as follows:

1. Cut new exhaust pipe in two sections with a hack saw at a point 29-1/2 inches from the muffler end of the pipe.

2. Hold both sections in place on the vehicle with rear section in hanger on clutch housing and install a sleeve and clamps (Service Part Kit No. 214242) to join the two sections of exhaust pipe. Loosely attach exhaust pipe to manifold.

3. Place exhaust pipe to muffler clamp on exhaust pipe and slide muffler onto exhaust pipe. NOTE: Muffler will fit only one way as the inlet hole is larger than the outlet hole.

4. Insert the tail pipe into rear hanger, then slide it into the muffler.

5. Make sure all parts align and are not contacting other parts of the underbody. Also make sure both pipes are inserted into the muffler fittings beyond ends of slots. Tighten all attaching bolts or nuts.

SERVICE DIAGNOSIS

The exhaust system normally provides long, trouble-free service. However, the system should be checked periodically to be sure it is functioning properly. The following trouble symptoms will be helpful in determining causes of troubles in the exhaust system:

ODOR

When odor is evident, check for:

1. Cracked exhaust manifold or leaking gasket.

2. Loose exhaust pipe to manifold connection.

3. Blown or burned out exhaust pipe or muffler.

NOISE

When noise is evident, check for:

1. Blown or burned out exhaust pipe or muffler.

2. Loose exhaust pipe to manifold connection or blown gasket.

3. Loose exhaust manifold or blown gasket.

4. Tail pipe or exhaust pipe not inserted far enough into muffler.

MISCELLANEOUS

In addition to the above symptoms, high fuel consumption, pre-ignition or spark knock, overheating, and hard starting when the engine is warm are indications of a restricted muffler, exhaust or tail pipe, or of the heat control valve being stuck in the closed position.

If the warm-up period is excessively long or if excessive spitting and sluggishness are encountered when the engine is cold, the heat control valve may be stuck in the open position.