EXHAUST • • • • • • • SECTION 3

CONTENTS

GENERAL DESCRIPTION

a. GENERAL. The exhaust system, illustrated in Figs. 149 and 150, includes the cast iron exhaust manifold, exhaust pipe, muffler, tail pipe and the necessary insulating and mounting parts.

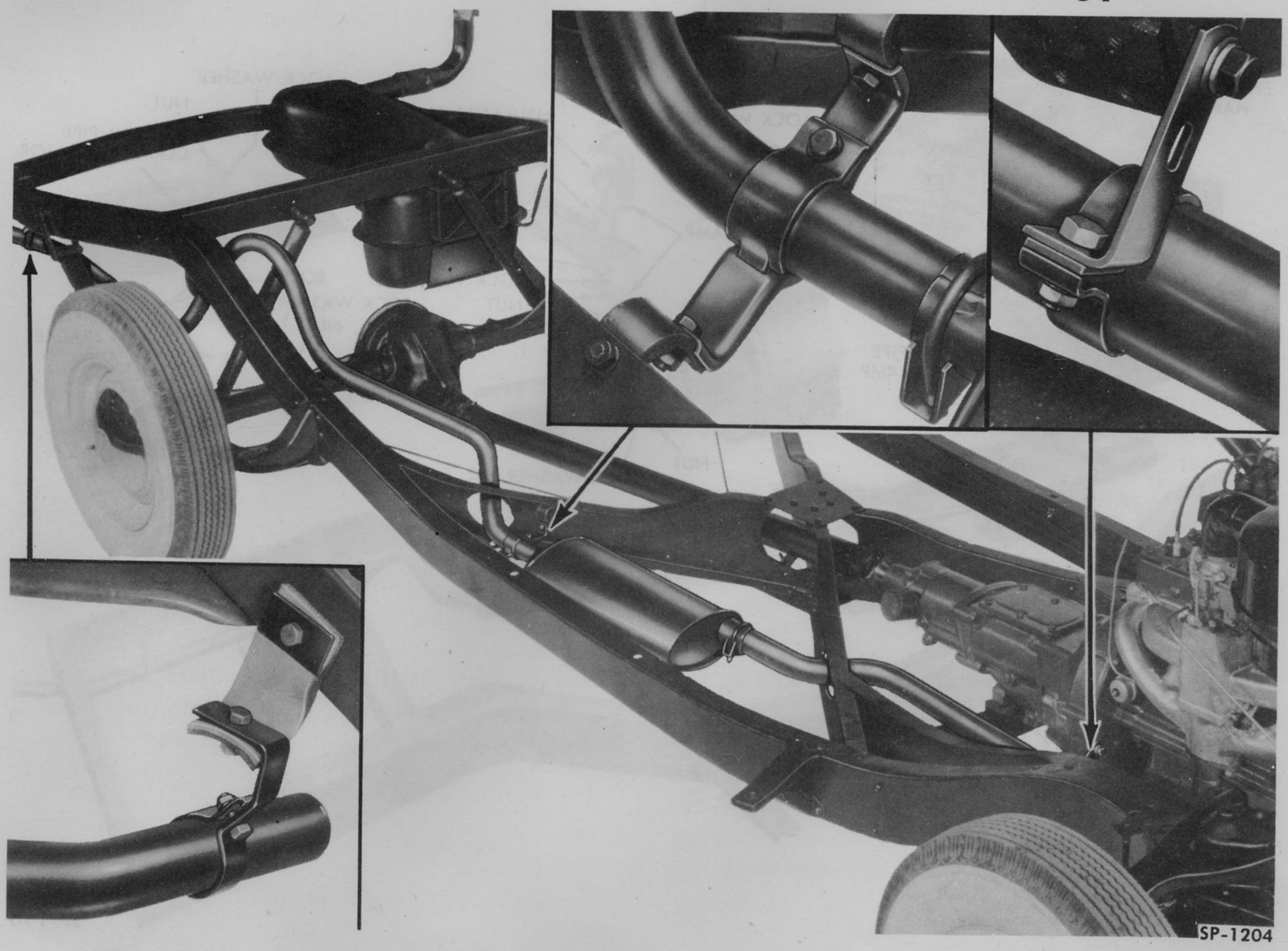

Fig. 149—Kaiser Exhaust System Installation

b. MUFFLER, EXHAUST PIPE AND TAIL PIPE. The manifold is on the right hand side of the engine. The exhaust pipe is attached to the manifold by a flange and gasket secured by two studs and self-locking nuts and is supported by a rigid bracket or hanger at the clutch housing. Clamps at the front and rear secure the exhaust pipe and tail pipe to the muffler.

The rear of the elliptical Kaiser muffler is connected to the tail pipe, which, as illustrated, is adequately supported by a transverse insulated bracket bolted to the frame side rail and crossmember which supports the insulated bracket. The support for the longer, cylindrical, Frazer muffler is combined with the tail pipe clamp. The Kaiser tail pipe rear support is bolted to the frame rear crossmember, that of the Frazer to the frame side rail.

c. EXHAUST AND INTAKE MANIFOLDS. The exhaust and intake manifolds are assembled as a unit before they are mounted on the cylinder block (Fig. 151). The manifold assembly is held against the cylinder block manifold gasket by 11 studs with washers and nuts. A gasket is used between the exhaust and intake manifold.

d. MANIFOLD HEAT CONTROL. When the cold engine is started, the heat control valve directs exhaust gases through a chamber (Fig. 152) surrounding a section of the intake manifold to aid fuel vaporization. As the engine warms up and too high a mixture temperature might reduce engine power, a bi-metallic element sensitive to exhaust manifold temperature (Fig. 151) moves the heat control valve automatically toward closed position. With manifold temperature below 70°F. the counterweight holds the valve open.

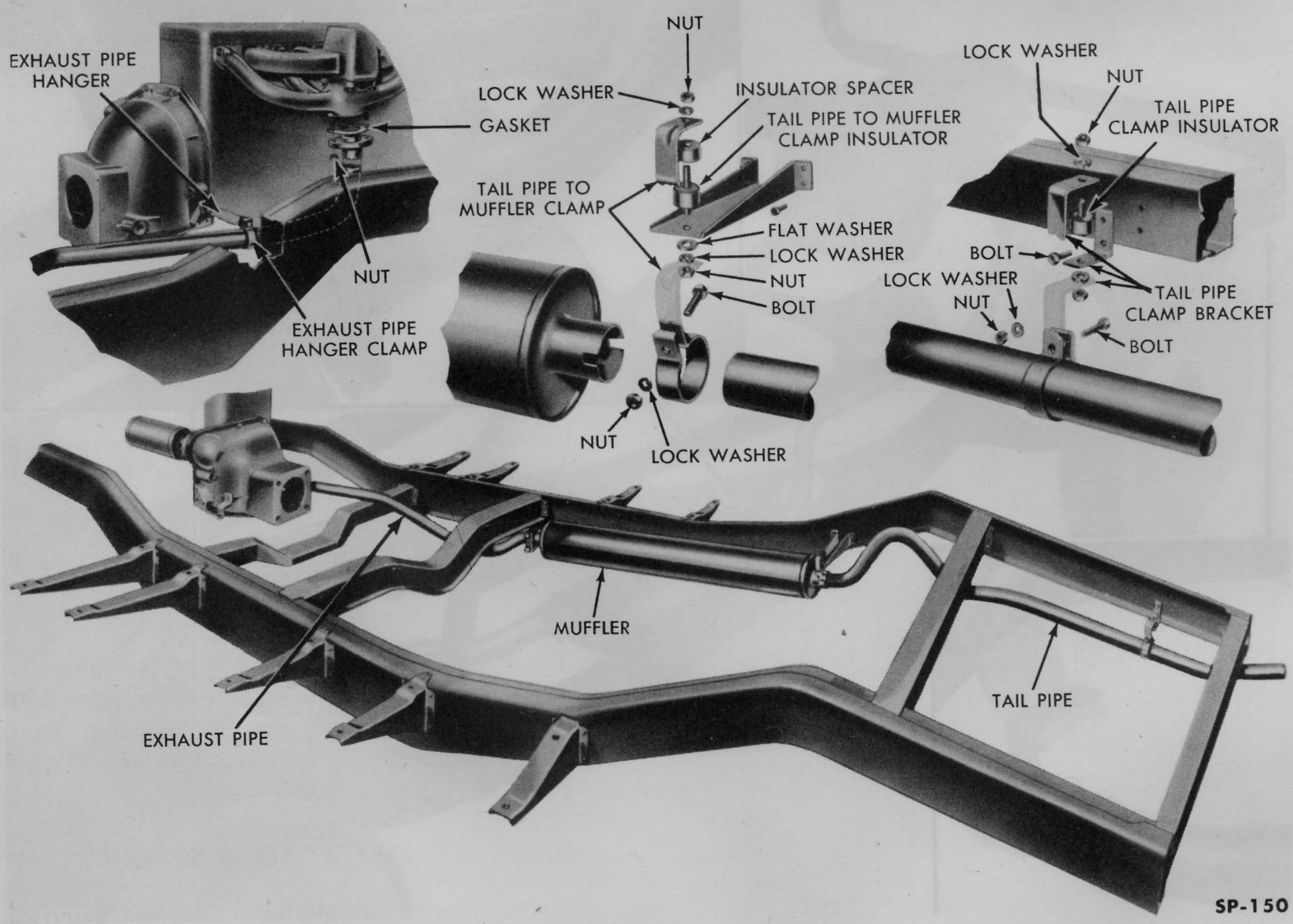

Fig. 150—Frazer Exhaust System Installation

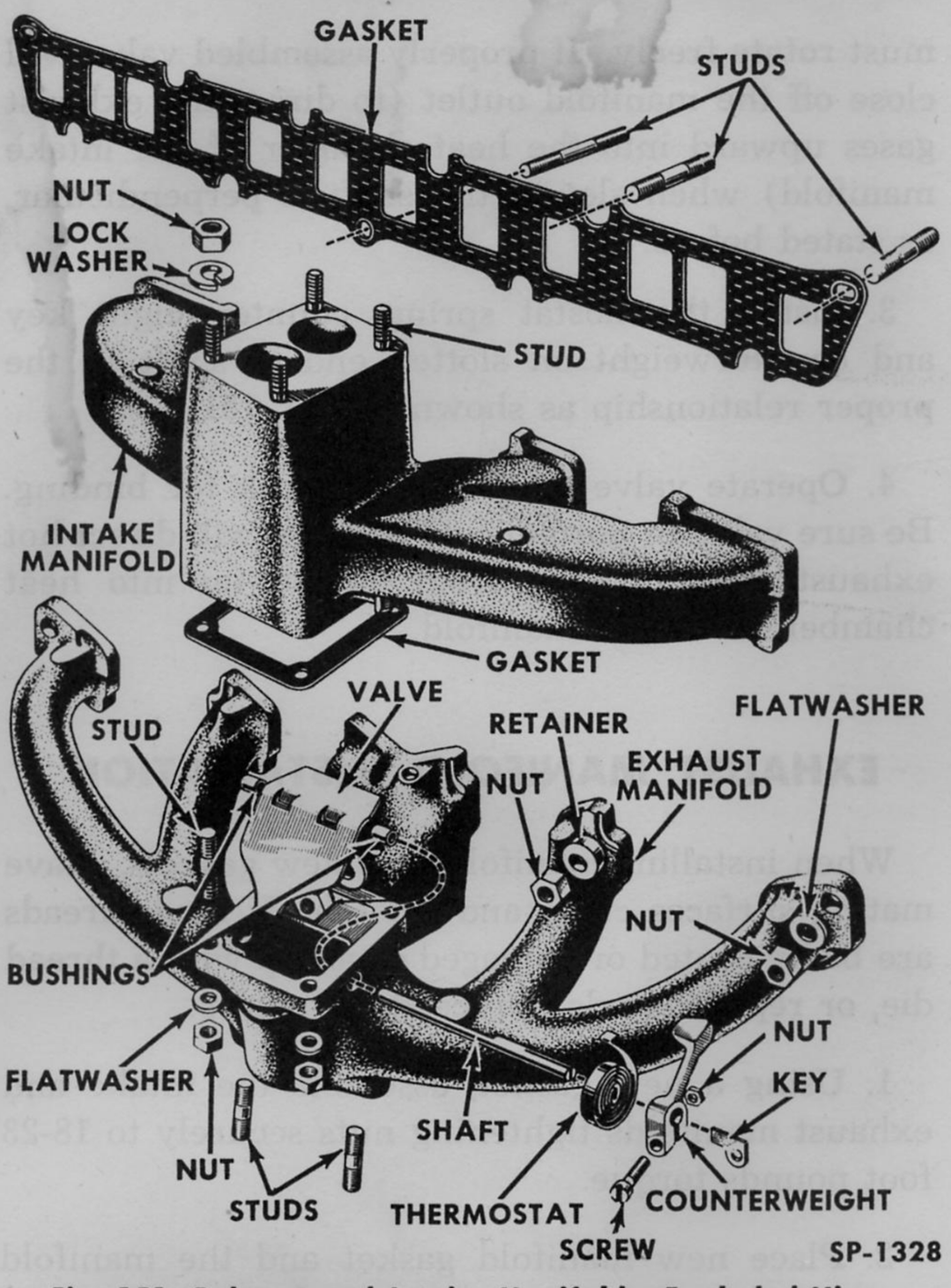

Fig. 151—Exhaust and Intake Manifolds—Exploded View

MUFFLER, EXHAUST PIPE AND TAIL PIPE REMOVAL

Excessive rusting sometimes makes removal of clamps, bolts and nuts difficult. Rust removal followed by applications of penetrating oil may help. In extreme cases careful application of heat, a hack saw, or application of sufficient torque to twist off badly rusted bolts may be found expedient. The procedure to remove the muffler and both pipes is as follows:

1. Loosen pipe clamps at front and rear ends of muffler and hanger at clutch housing.

2. Remove exhaust pipe to manifold flange nuts and free exhaust pipe from the manifold. Discard flange gasket.

3. At clutch housing, remove front hanger clamp nut, bolt and lock washer. Work rear end of exhaust pipe free from muffler inlet and remove pipe, at same time supporting front end of muffler.

4. Loosen muffler tail pipe clamp and remove muffler by working outlet end free from the tail pipe.

5. Remove nuts and lock washers attaching the tail pipe hanger clamps. Remove the tail pipe, pulling the front end free from support or hanger clamp.

6. Remove clamps from exhaust pipe, muffler and tail pipe. Then remove exhaust pipe and tail pipe hangers from clutch housing and frame and disassemble or remove mountings, if parts require replacement.

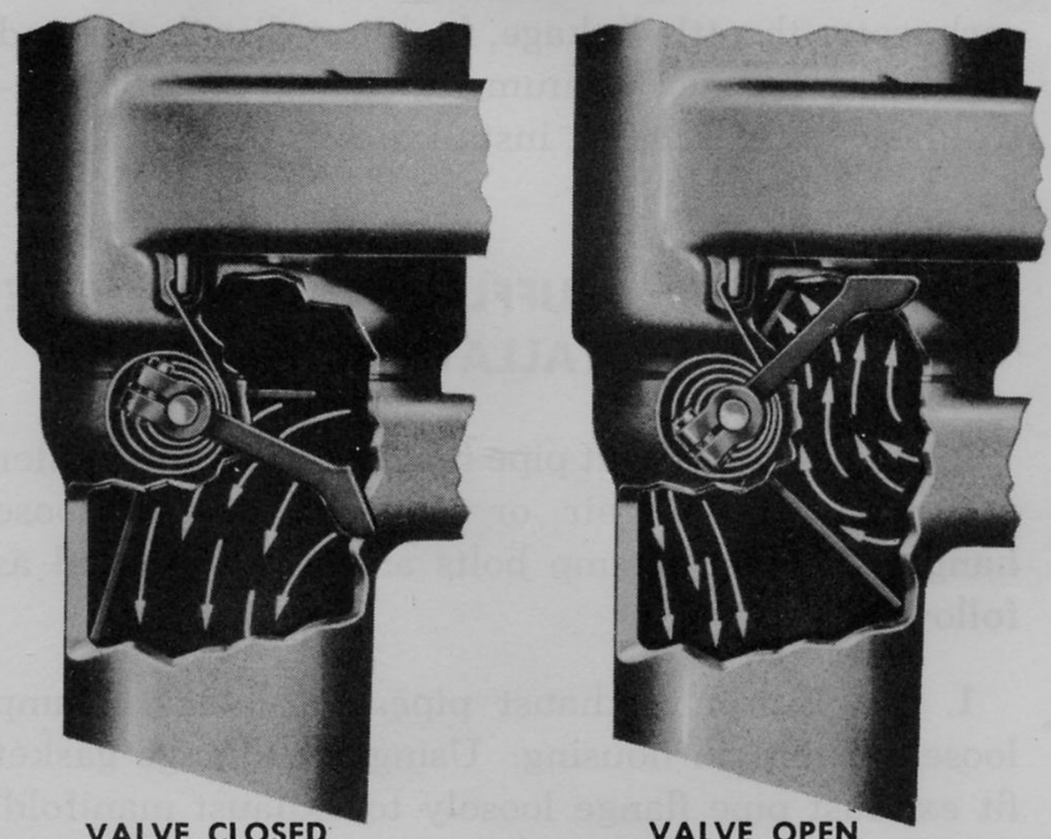

Fig. 152—Intake Manifold Heat Control Operation

EXHAUST MANIFOLD REMOVAL

To remove the manifolds, proceed as follows:

1. Disconnect carburetor throttle linkage, fuel lines (to distributor and to fuel pump vacuum booster) and climatic control heat tube. Remove air cleaner and carburetor.

2. Remove manifold stud nuts, washers and retainers and lift off intake and exhaust manifolds as an assembly. Discard manifold to engine gasket.

3. Remove four nuts and washers attaching the intake manifold to exhaust manifold and lift off intake manifold and gasket, exposing exhaust manifold heat chamber and heat control valve. Discard gasket.

EXHAUST MANIFOLD INSPECTION

Inspect exhaust manifold for cracks and distortion and replace if either condition is evident. Recondi-

tion or replace stripped or damaged cylinder block manifold studs.

Examine climatic control heat tube in manifold. It must be tight and inside of tube must be clear.

Inspect manifold heat control valve. It must operate freely, without binding or excessive play. The thermostat spring must hold valve in position (open) to direct hot exhaust gases to intake manifold heat chamber when manifolds are cold. If these parts are in good servicable condition no further disassembly is necessary.

HEAT CONTROL VALVE OVERHAUL

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

a. DISASSEMBLY. Proceed as follows:

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

2. The valve is welded to the shaft. Therefore, to remove, cut the shaft and valve with an acetylene cutting torch at two points and remove the three pieces.

3. Drive the shaft bushings out of the manifold.

b. ASSEMBLY AND ADJUSTMENT. When assembling install new bushings, valve and shaft. The shaft and valve must be installed in the manifold and then arc-welded together. Proceed as follows:

1. Press new shaft bushings into manifold until outer end is flush with outside of the manifold and line ream the bushings to .3115–.3125 inch inside diameter. Use a new shaft to check the alignment of the bushings.

2. Center valve in manifold and insert shaft through manifold and valve until end without slot is flush with outer end of rear bushing. Rotate valve until lower end contacts inside of manifold on the engine side and rotate shaft so that slot in end of shaft is in a vertical position when manifold is installed. With parts in these relative positions, arc-weld valve to shaft. After welding, shaft and valve must rotate freely. If properly assembled valve will close off the manifold outlet (to direct the exhaust gases upward into the heat chamber of the intake manifold) when slot in the shaft is perpendicular, as stated before.

3. Install thermostat spring, counterweight key and counterweight on slotted end of shaft in the proper relationship as shown in Fig. 151.

4. Operate valve manually to check for binding. Be sure valve in normal cold position will direct hot exhaust gases coming from engine up into heat chamber of intake manifold.

EXHAUST MANIFOLD INSTALLATION

When installing manifolds use new gaskets. Have mating surfaces clean and smooth. If stud threads are badly coated or damaged clean up with a thread die, or replace studs. Proceed as follows:

1. Using a new gasket, assemble the intake and exhaust manifolds tightening nuts securely to 18-23 foot pounds torque.

2. Place new manifold gasket and the manifold carefully over studs against cylinder block. Place clamps or washers over studs and start stud nuts. Starting at center and working toward ends tighten nuts carefully. Torque to 30-35 foot pounds.

3. Using new carburetor to manifold gasket, install carburetor on intake manifold. Connect the carburetor throttle linkage, fuel line, distributor and fuel pump booster vacuum tubes and climatic control heat tube. Finally, install the air cleaner.

EXHAUST PIPE, MUFFLER AND TAIL PIPE INSTALLATION

Install front exhaust pipe first, followed by muffler and tail pipe. Repair or replace bent or loose hangers and bad clamp bolts and nuts. Proceed as follows:

1. Install front exhaust pipe. Fit hanger clamp loosely at clutch housing. Using new flange gasket fit exhaust pipe flange loosely to exhaust manifold. Start, but do not yet tighten, the special self-locking flange nuts.

2. Install the Kaiser tail pipe loosely in its 2 mounting brackets, but do not tighten clamps. Attach the Frazer tail pipe and muffler support clamp loosely. Slide tail pipe into muffler outlet and then slide exhaust pipe well into muffler inlet.

3. Align exhaust pipe, muffler and tail pipe. Make certain exhaust pipe and tail pipe are inserted in muffler inlet and outlet fittings well beyond ends of the slots in those fittings.

4. Start tightening with the exhaust pipe flange, drawing flange nuts to 25-30 foot pounds torque. Working toward the back tighten the hanger at the clutch housing, 10-15 foot pounds torque for the bolt to the housing and 5-10 for the clamp bolt nut. Tighten the clamp nuts at muffler inlet and muffler outlet to 5-10 foot pounds, after making certain that tail pipe clears frame, floor pan and other near-by parts. Tighten tail pipe clamps and supports, clamps to 5-10 foot pounds torque and support to frame bolts to 10-15 foot pounds.

CAUTION: If exhaust pipe or tail pipe is not inserted in its muffler inlet or outlet fitting beyond the end of the slot a whistling noise may result, and if a clamp is insufficiently or excessively tightened a hissing sound may be caused.

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.

a. ODOR. If odor of exhaust gas is noticeable check for:

1. Cracked exhaust manifold or leaking gasket.
2. Loose manifold to exhaust pipe connection.
3. Blown or burned out muffler or exhaust pipe.

b. NOISE If exhaust noise is excessive check for:

1. Blown or burned out muffler or exhaust pipe.
2. Loose exhaust manifold or blown gasket.
3. Loose manifold to exhaust pipe connection or blown gasket.

c. MISCELLANEOUS. In addition to the foregoing symptoms, high fuel consumption, pre-ignition or spark knock and overheating may also indicate one of two things at fault in the exhaust system—the muffler or exhaust pipes may be restricted or the heat control valve may not be operating properly.

SERVICE BULLETIN REFERENCE

KAISER-FRAZER SHOP MANUAL

SERVICE BULLETIN REFERENCE