

Group 11

EXHAUST SYSTEM

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TIGHTENING REFERENCE

	Foot-Pounds
Ball Joint Screw	20
Exhaust Manifold Nuts	30
Exhaust Pipe Flange Nut	40
Exhaust Pipe Support Clamp Bolts	10
Converter Housing Bracket Screw	15

SERVICE DIAGNOSIS

1. EXCESSIVE EXHAUST NOISE

- a. Leaks at the pipe joints.
- b. Burned or blown out muffler.
- c. Burned or rusted out exhaust pipe.
- d. Exhaust pipe leaking at the manifold flange.
- e. Exhaust manifold cracked or broken.
- f. Leak between manifold and cylinder block.

2. LEAKING EXHAUST GASES

- a. Same as paragraph 1a through f.
- b. Damaged or improperly installed gaskets.
- c. Restriction in muffler or tail pipe.

3. ENGINE HARD TO WARM UP OR WILL NOT RETURN TO IDLE

- a. Heat control valve frozen in open position.

2 — EXHAUST SYSTEM

4. NOISE IN MANIFOLD

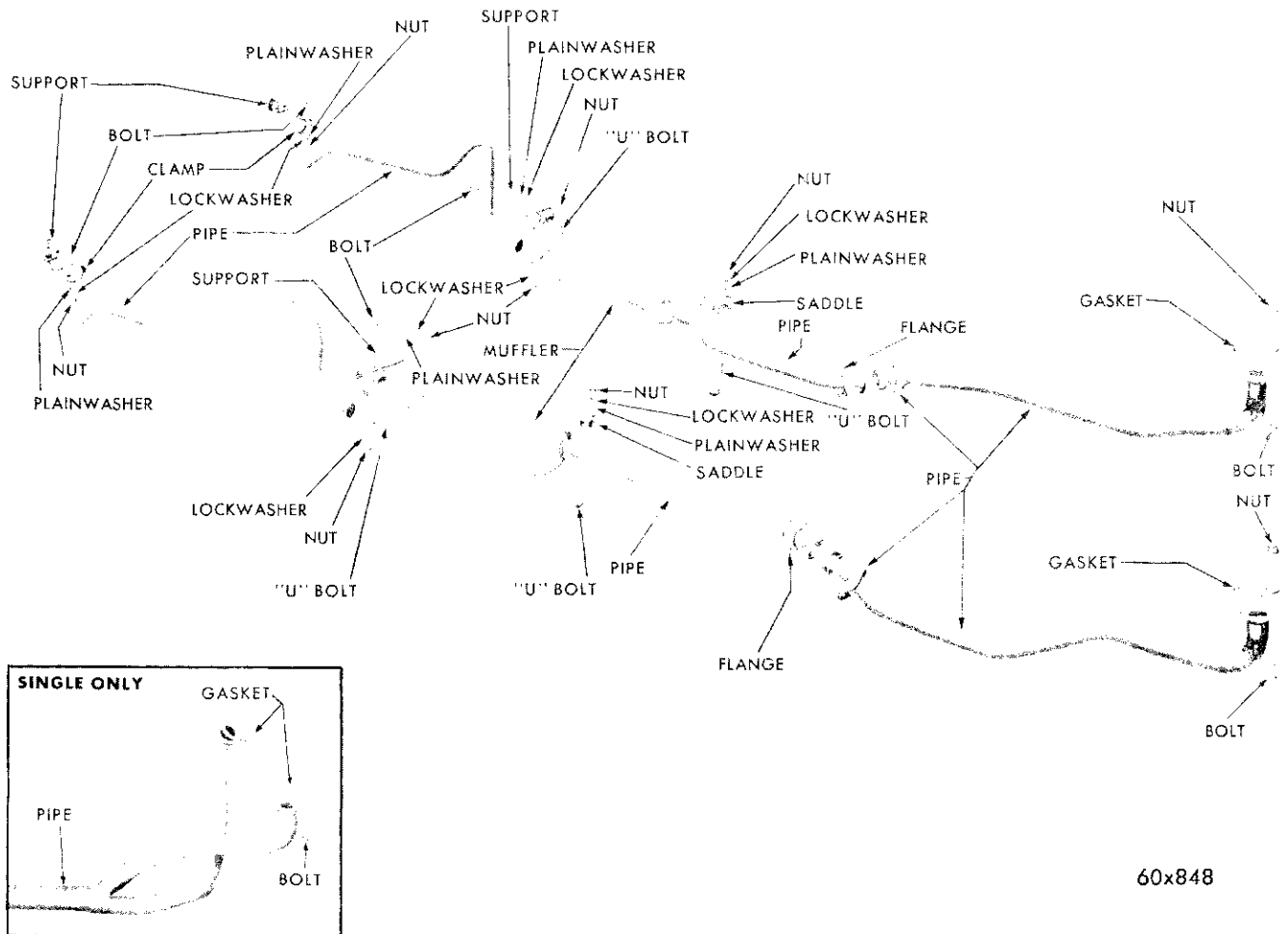
- Thermostatic spring broken.
- Weak or broken anti-rattle spring.
- Heat control valve shaft loose in body.

5. MANIFOLD HEAT CONTROL VALVE RATTLE

a. Check for broken thermostatic spring and make necessary correction.

b. Check for weak or broken anti-rattle spring and make necessary repairs.

c. Check shaft for looseness in body and correct as necessary.



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Fig. 1—Exhaust System PS1, PS3, PC1

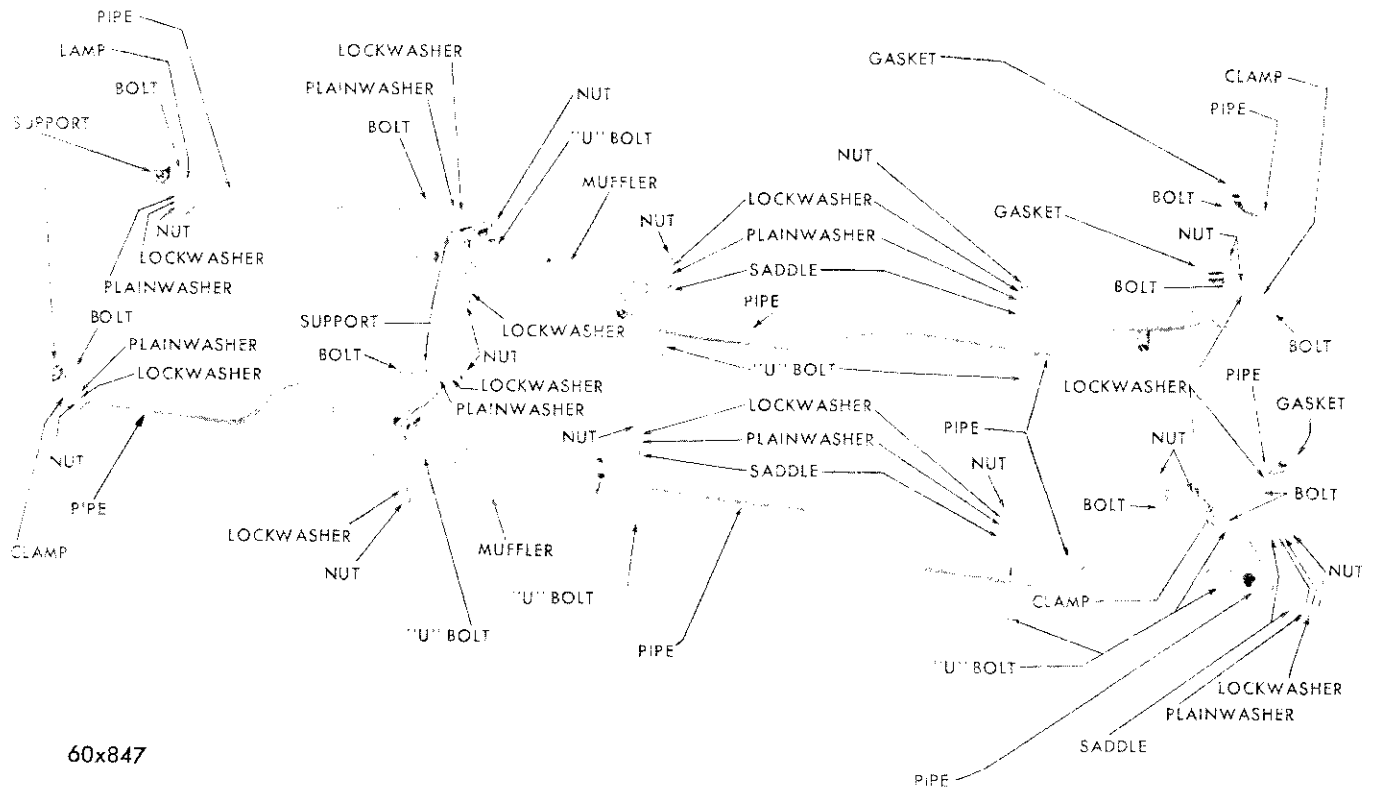


Fig. 2—Exhaust System Ram Manifold

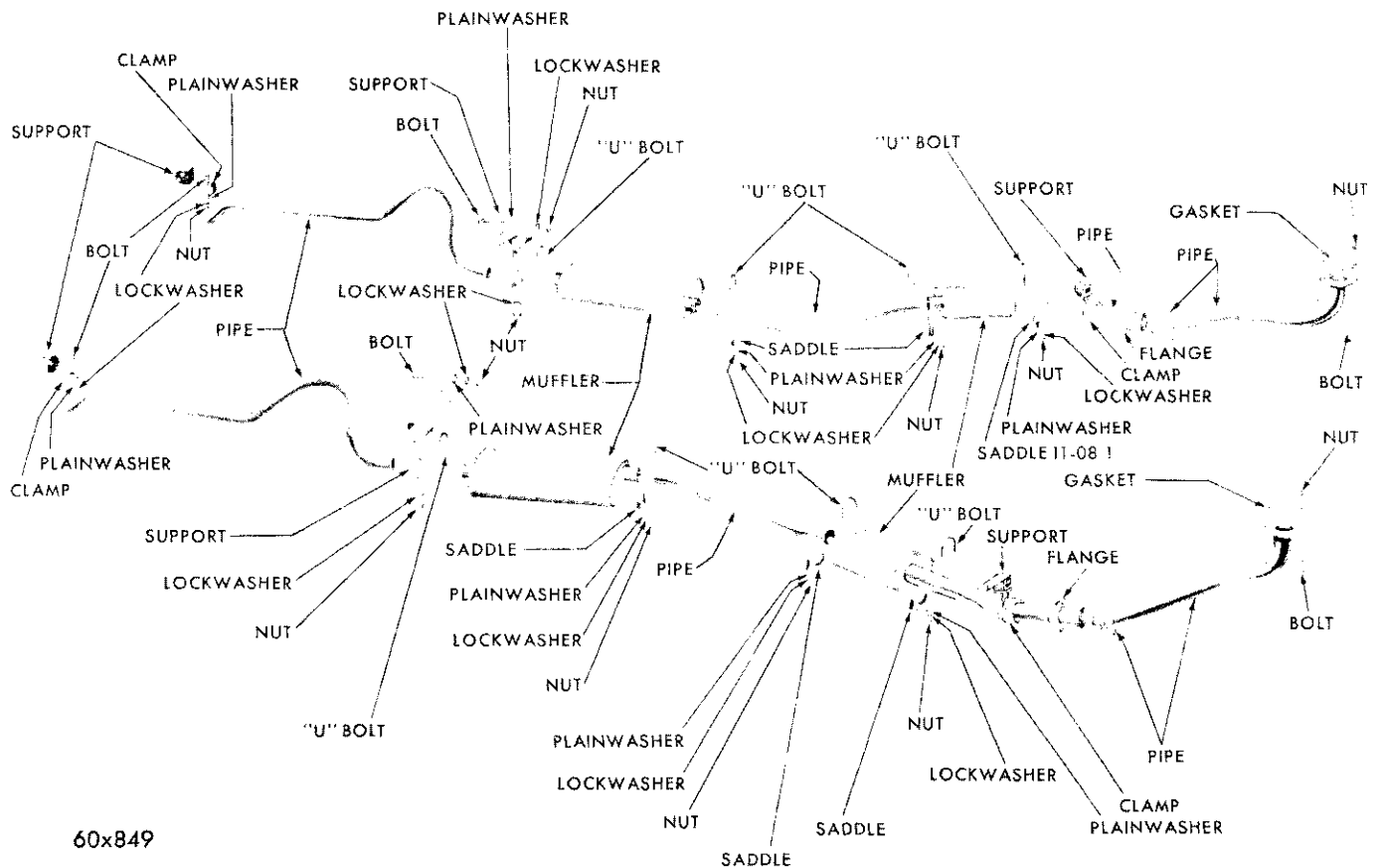


Fig. 3—Exhaust System PC2, PC3

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Longer life aluminized exhaust components are used on all models. The exhaust system is suspended by loop type hangers through the propeller shaft tunnel offering greater protection against road damage. Ball joints which allow more accurate alignment of the exhaust system are located ahead of the mufflers. (Figs. 1, 2, 3, and 4.)

6. INTAKE MANIFOLD (Fig. 5)

Refer to Engine Group 9 for removal and installation of intake manifold.

7. EXHAUST MANIFOLD

a. Removal

(1) Disconnect spark plug cables at spark plugs.

(2) Remove generator from right exhaust manifold.

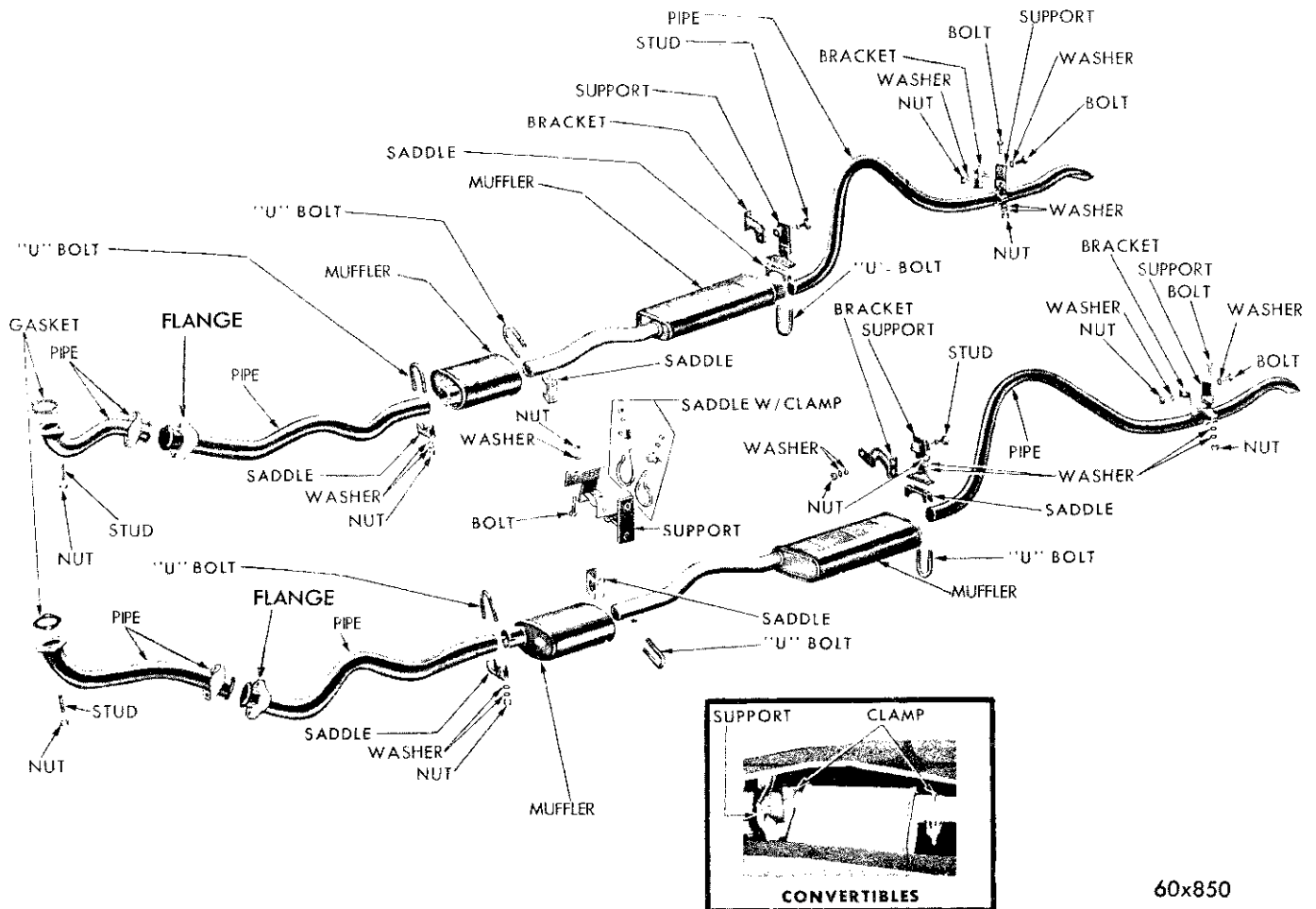
(3) Disconnect exhaust pipes at exhaust manifold flanges.

(4) Remove nuts that hold exhaust manifolds to cylinder heads.

(5) Slide manifolds off studs and away from cylinder heads.

(6) Clean exhaust manifolds in solvent. Blow dry with compressed air.

(7) Inspect manifolds for cracks and distortion.



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Fig. 4—Exhaust System PY1

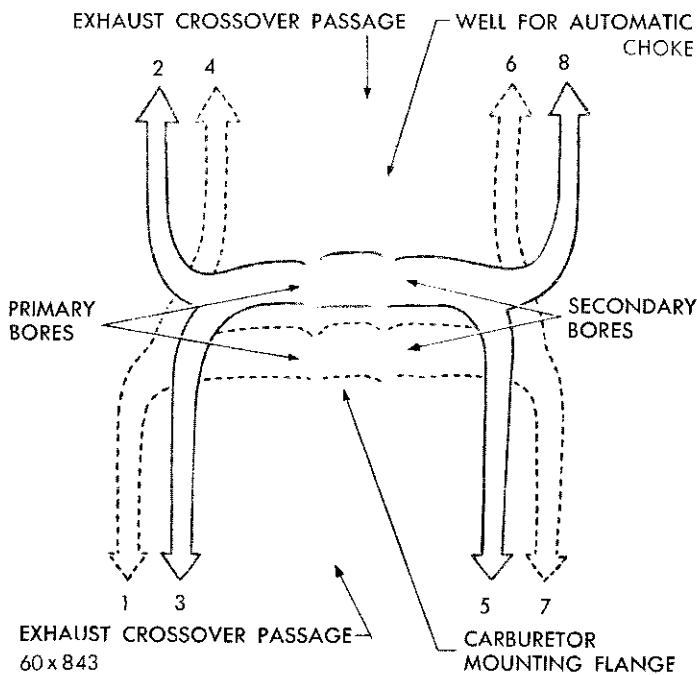


Fig. 5—Intake Manifold

b. Installation

(1) Place exhaust manifolds on studs on cylinder heads and install nuts. Tighten to 30 foot-pounds torque.

(2) Connect exhaust pipes at exhaust manifolds. Tighten nuts to 40 foot-pounds torque.

(3) Install generator on right exhaust manifold and adjust belt tension.

(4) Connect spark plug cables to spark plugs.

8. MANIFOLD HEAT CONTROL VALVE

The purpose of the manifold heat control valve is to direct hot exhaust gas to a heat chamber in the intake manifold and pre-heat the fuel and air mixture, thus the fuel is vaporized to a greater degree before entering into the combustion chambers, providing faster warm up of cold engines.

When a cold engine is started the thermostatic coil exerts enough tension to keep the valve closed. Thus, exhaust gases from the right exhaust manifold pass through the exhaust crossover branch in the intake manifold and into the left exhaust manifold.

When the spring heats up, it loses tension and the valve opens, permitting exhaust gas from the right exhaust manifold to pass directly to the exhaust pipe.

9. EXHAUST PIPES, MUFFLERS, TAIL PIPES

a. Removal

(1) Raise vehicle on hoist and lubricate clamp

nuts and bolts with penetrating oil to loosen rust and dirt.

(2) Remove clamps from exhaust pipes, mufflers and tail pipes.

(3) Disconnect exhaust pipe at exhaust manifold and remove exhaust pipe.

(4) Remove muffler, extension pipe and tail pipe assembly.

NOTE: If only muffler is to be replaced, cut extension at muffler with a hack saw. It is unnecessary to remove the exhaust pipe. The replacement muffler is installed using clamp at the front of muffler.

b. Installation

(1) Connect exhaust pipes to exhaust manifolds. Tighten nut to 40 foot-pounds torque.

(2) Adjust hanger heights for proper alignment.

(3) Tighten all slip joints to 10 foot-pounds torque. Work from the rear to the front of car.

(4) Tighten all support clamps to 10 foot-pounds torque when installing mufflers.

(5) Tighten ball joint flange bolts to 20 foot-pounds torque. Inner surfaces of flanges should be parallel to each other and perpendicular to the pipe axis.

(6) On cars equipped with single exhaust system, proceed as follows:

(7) Adjust converter housing bracket, so that it is flat against converter housing and in proper contact with the pipe tab. Tighten screws to 15 foot-pounds torque.

10. TESTING MANIFOLD HEAT CONTROL VALVE

Inspect operation of heat control valve every 1,000 miles and apply manifold heat control valve solvent Part No. 1879318 to both ends of valve shaft. With

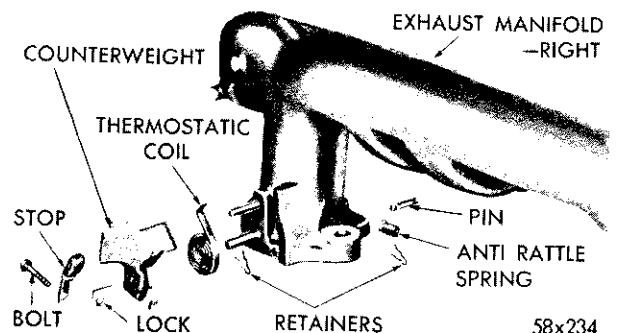


Fig. 6—Manifold Heat Control Valve

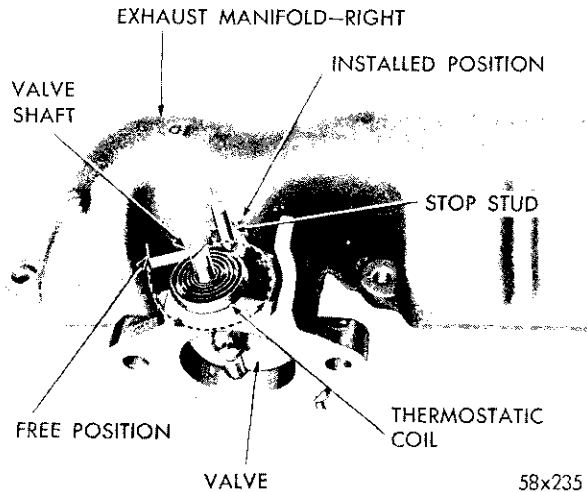


Fig. 7—Positioning Coil

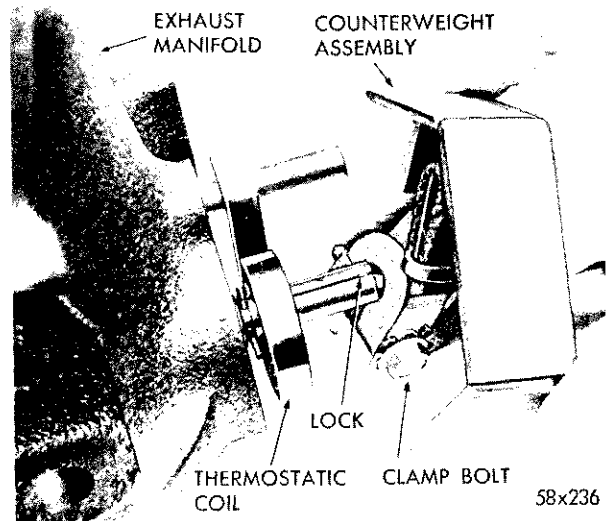


Fig. 8—Installing Counterweight

engine idling (car standing) accelerate engine and release quickly. The counterweight should respond by moving clockwise approximately $\frac{1}{2}$ inch and return to its normal position. The heat control valve can be disassembled and repaired as follows:

a. Disassembly (Fig. 6)

(1) Loosen retaining nut and remove counterweight, lock and stop from end of shaft, exposing the thermostatic coil.

(2) Unhook coil from pin and remove by prying out of valve shaft slot.

(3) If valve shaft is frozen in manifold, apply manifold heat control valve solvent, Part No. 1879318, and allow to stand several minutes. Loosen by rotating shaft back and forth until shaft turns easily.

b. Assembly

(1) Position valve shaft in extreme counterclockwise position.

(2) Place the new coil in position over shaft slot,

with outer end tongue of coil in lower right-hand position, as shown in Figure 7. Press inner end of coil into slot of shaft and seat firmly.

(3) Move outer end tongue around and hook under pin, as shown in Figure 7.

(4) Place counterweight over shaft (with weight in upward position) and insert lock in shaft slot, as shown in Figure 8. Center counterweight on shaft and turn assembly clockwise until stop passes the pin. Press counterweight on shaft until seated, install stop and tighten nut securely with Tool T109-173. Test valve for proper operation.

NOTE: If the composition on stop is worn, replace with a new stop.

c. Servicing

Check the manifold heat control valve for proper operation during lubrication and engine tune-up and apply Manifold Heat Control Valve Solvent Part No. 1879318 to both ends of valve shaft. See Lubrication, Group 0.