

EXHAUST SYSTEM

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Description

Long life aluminized and stainless steel muffler components are used on all models. Mufflers on AC-1, AC-2 and AC-3 models are supported at the rear by double strap hangers. "L" type hangers are used to support the tail pipes on all models (Figs. 1, 2, 3 and 4).

Ball joint connections which allow more accurate

alignment of the exhaust system are located in the exhaust pipes forward of the mufflers on all models. (Figs. 1, 2, 3 and 4).

The exhaust manifolds on all engines incorporate a thermostatic heat control valve to direct the exhaust gases to a heat chamber beneath the carburetor mounting flange to help vaporize the fuel. The heat control valve is located in the right hand manifold (Figs. 6 and 7).

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
EXHAUST SYSTEM		
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 the manifold and cylinder block.	(a) Tighten the clamps at the leaking joints. (b) Replace the muffler assembly. (c) Replace the exhaust pipe. (d) Install a new gasket and tighten the exhaust pipe flange nuts to specifications. (e) Replace the manifold. (f) Tighten the manifold to cylinder block nuts to specifications.
LEAKING EXHAUST GASES	(a) Leaks at the pipe joints. (b) Damaged or improperly installed gaskets. (c) Restriction in muffler or tail pipe.	(a) Tighten the clamps at the leaking joints. (b) Replace gaskets as necessary. (c) Remove the restriction, if possible or replace as necessary.
ENGINE HARD TO WARM UP OR WILL NOT RETURN TO NORMAL IDLE	(a) Heat control valve frozen in the open position.	(a) Free up the manifold heat control valve solvent number, 1879318.
NOISE IN MANIFOLD	(a) Thermostat broken. (b) Weak or broken anti-rattle spring.	(a) Replace the thermostat. (b) Replace the spring.
MANIFOLD HEAT CONTROL VALVE RATTLE	(a) Thermostat broken. (b) Broken, weak or missing anti-rattle spring.	(a) Replace the thermostat. (b) Replace the spring.

SERVICE PROCEDURES

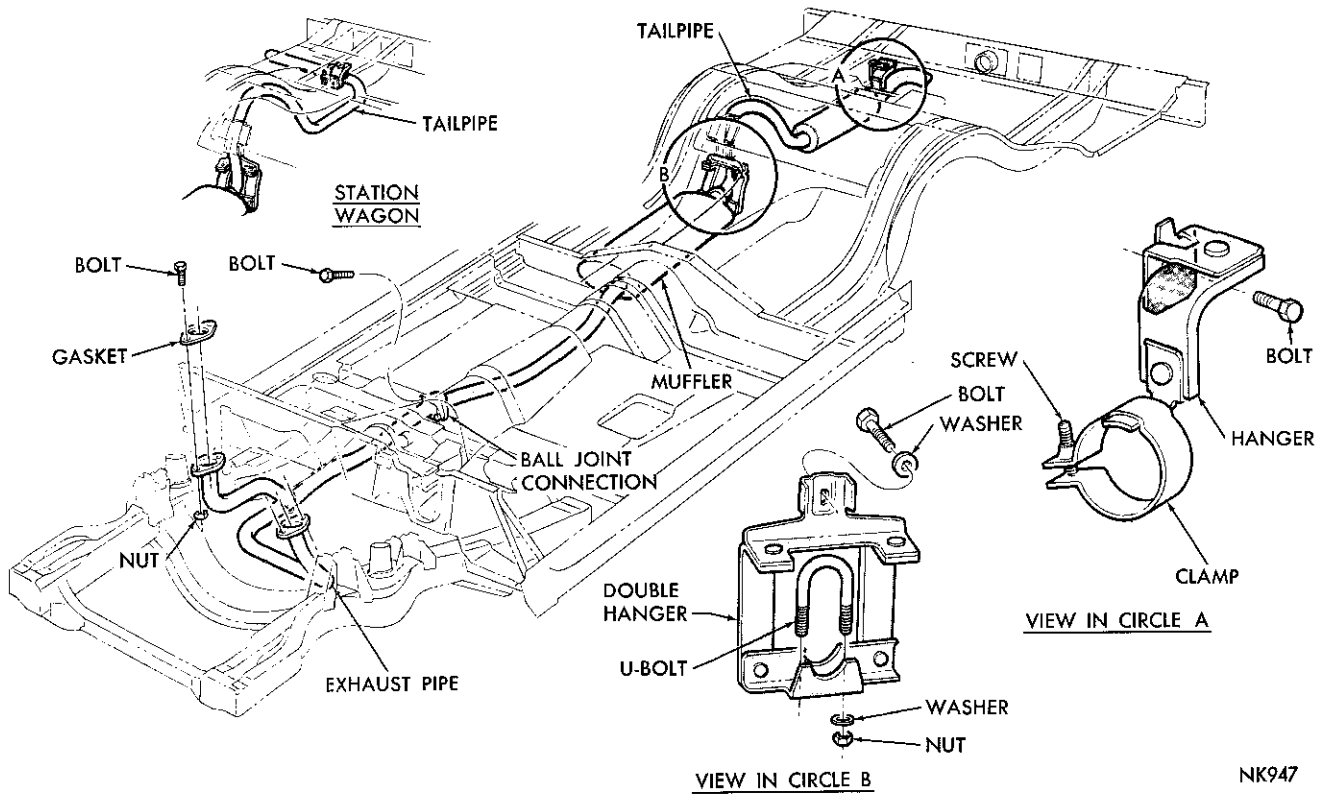
EXHAUST PIPES, MUFFLERS, TAIL PIPES

Removal

(1) Raise the vehicle on a hoist and lubricate the

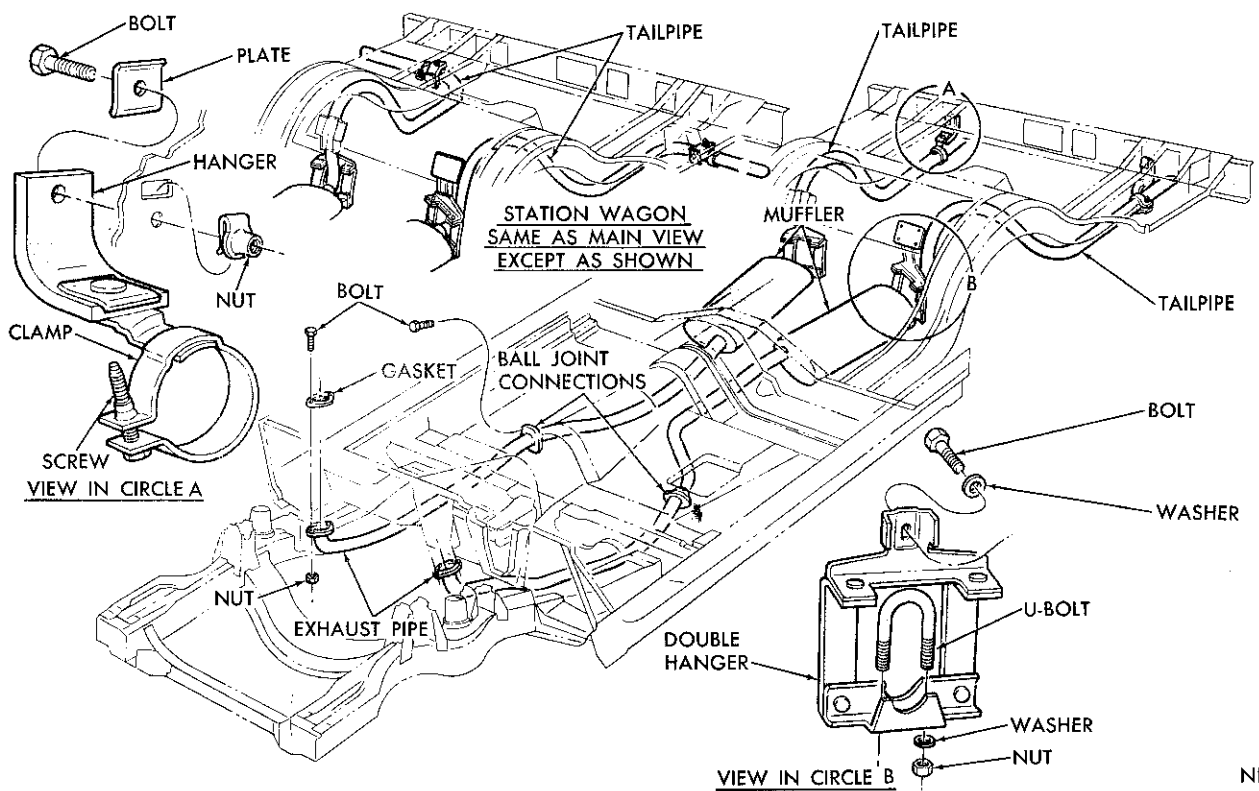
clamp nuts and bolts with penetrating oil to loosen the rust and dirt.

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



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Fig. 1—Exhaust System—Single (AC-1, AC-2, AC-3)



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Fig. 2—Exhaust System—Dual (AC-2, AC-3)

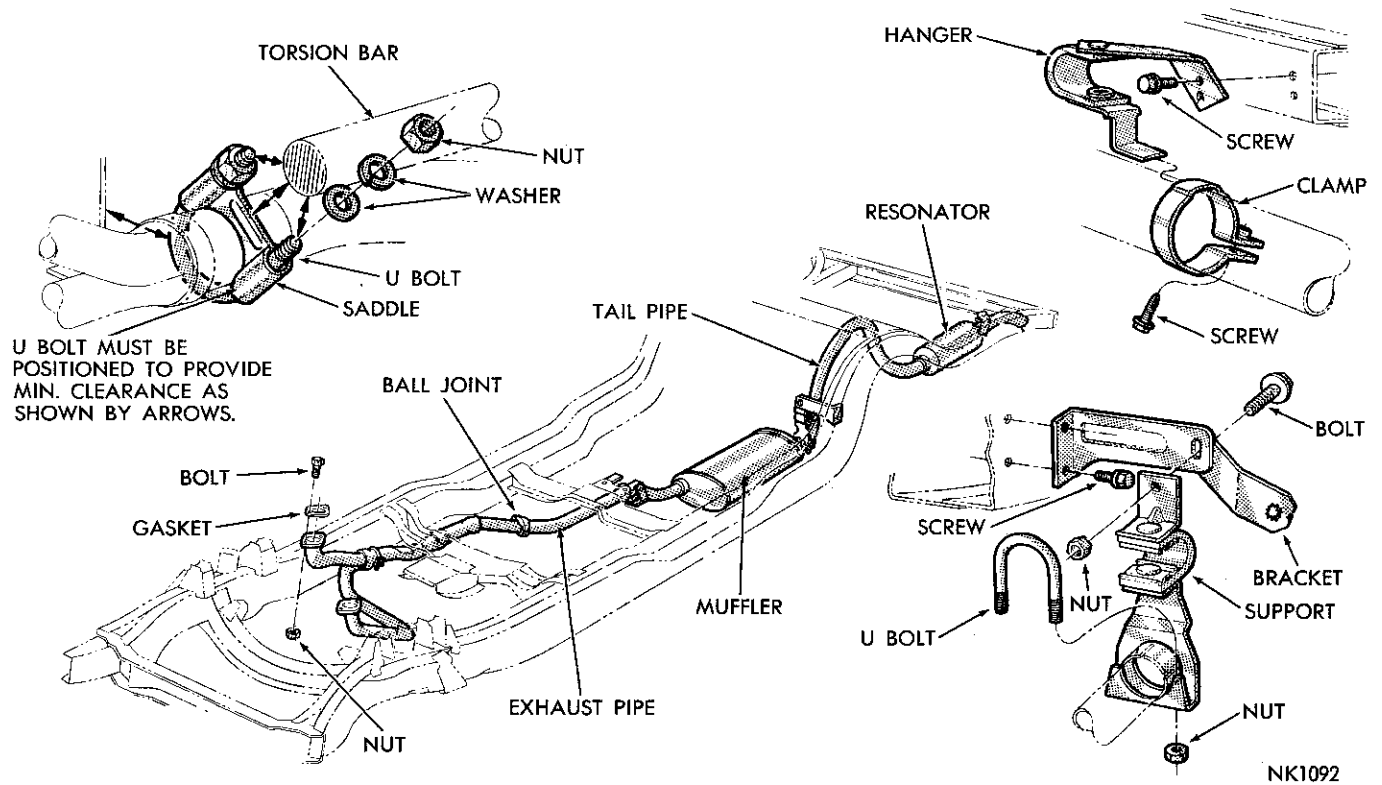


Fig. 3—Exhaust System—Single (AY-1 Sedan)

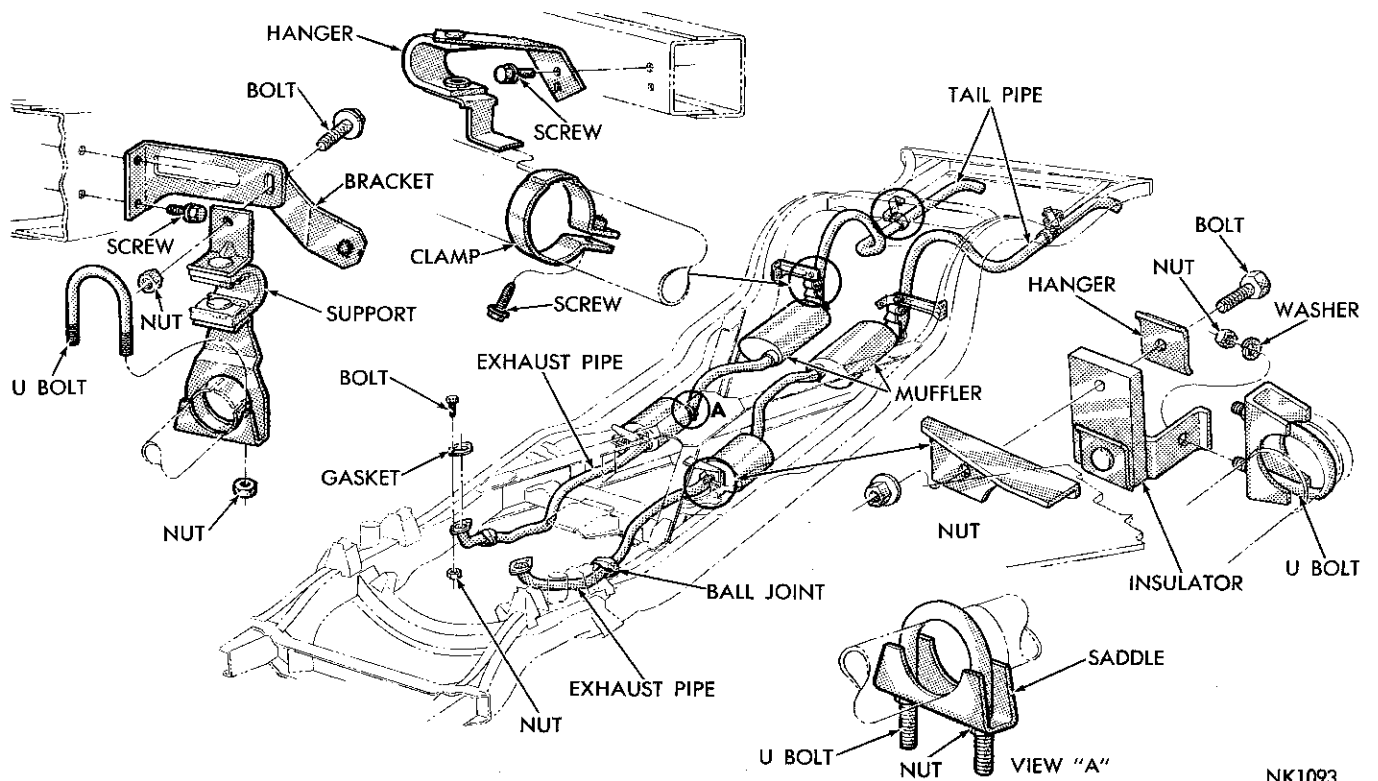


Fig. 4—Exhaust System—Dual (AY-1 Convertible Models)

- (3) Disconnect the ball joints in the exhaust pipes.
- (4) Disconnect the exhaust pipe at the exhaust manifolds and remove the exhaust pipe.
- (5) Remove the muffler, extension pipe and the tail pipe assembly.

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

Installation

- (1) Connect the exhaust pipes to the manifolds, using new gaskets. Tighten the nuts to 40 foot-pounds.
- (2) Adjust the hanger heights for proper alignment.
- (3) Tighten "U" bolt nuts to 100 inch-pounds.
- (4) Tighten support clamp screws to 95 inch-pounds.
- (5) Align system at ball joints and tighten flange bolts to 20 foot-pounds. The inner surfaces of the flanges should be parallel to each other and perpendicular to the pipe axis.
- (6) Adjust the converter housing bracket, so that it is flat against the converter housing and in the proper contact with the pipe tab. Tighten screw to 15 foot-pounds.

INTAKE MANIFOLD

NOTE: Refer to the "Engine" Group 9 for removal and installation of the intake manifold.

With the manifold removed clean and inspect it as follows:

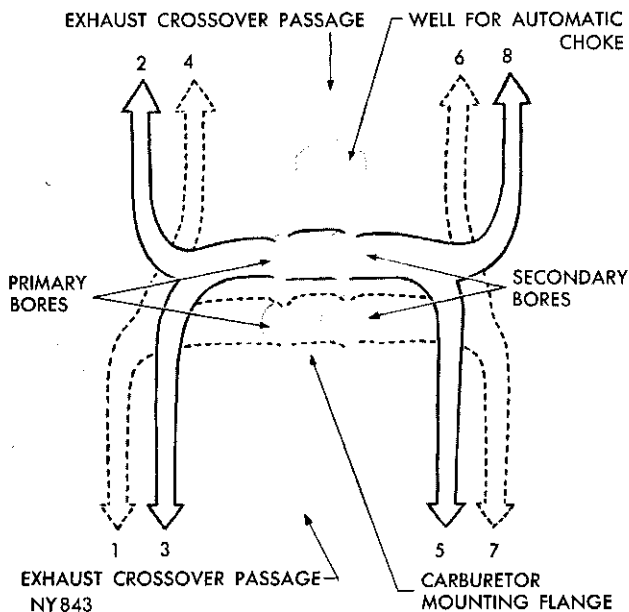


Fig. 5—Intake Manifold

- (1) Clean the manifold in solvent. Blow dry with compressed air.
- (2) Inspect the exhaust crossover passage and pressure test for leakage into any of the intake passages (Fig. 5).
- (3) Inspect the mating surfaces for parallelism.
- (4) Use new gaskets when installing the manifold.

EXHAUST MANIFOLD

Removal

- (1) Disconnect the spark plug cables from the spark plugs.
- (2) Remove the alternator from the right cylinder head.
- (3) Disconnect the exhaust pipes at the exhaust manifold flanges.
- (4) Remove the nuts that hold the exhaust manifolds to the cylinder heads.
- (5) Slide the manifolds off the studs and away from the cylinder heads.
- (6) Clean the exhaust manifolds in solvent. Blow dry with compressed air.
- (7) Inspect the manifolds for cracks and distortion.

Installation

NOTE: If studs came out with the nuts, install new studs, applying sealer on the coarse thread ends. If this precaution is not taken, water leaks may develop at the studs.

- (1) Place the exhaust manifolds on the studs on the cylinder heads and install the nuts. Tighten to 30 foot-pounds torque.
- (2) Connect the exhaust pipes at the exhaust manifolds. Tighten the nuts to 40 foot-pounds torque.
- (3) Install the alternator on the right cylinder head and adjust the belt tension.
- (4) Connect the spark plug cables to the spark plugs.

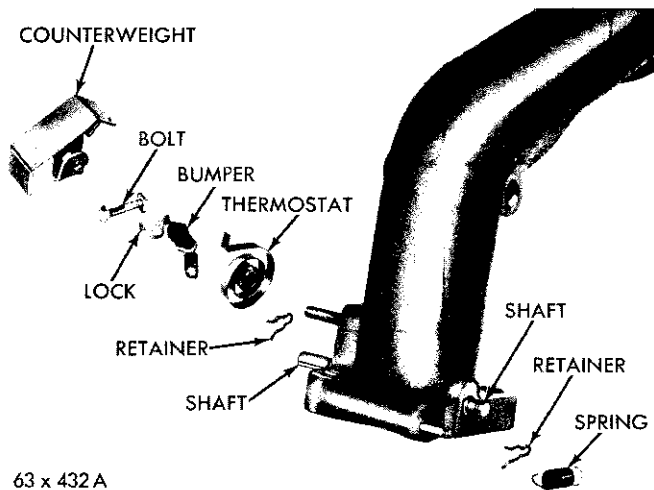
Manifold Heat Control Valve

Inspect the operation of the manifold heat control valve and apply Heat Control Valve Solvent, Part No. 1879318 to both ends of the valve shaft every six months.

With the engine idling, accelerate the engine and release quickly. The counterweight should respond by moving clockwise approximately 1/2 inch and return to its normal position.

Removal (All Models)

- (1) Loosen the counterweight clamp bolt (Figs. 6 and 7) and remove the counterweight, lock and stop from the end of the shaft, exposing the thermostat.
- (2) Unhook the thermostat from the pin and remove by sliding out of the valve shaft slot.
- (3) If the valve shaft is frozen in the manifold, ap-



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Fig. 6—Manifold Heat Control Valve—Rear Outlet Manifold

ply manifold heat control valve solvent, Part No. 1879318, and allow to stand several minutes. Loosen by rotating the shaft back and forth until the shaft turns easily.

Installation Rear Outlet Manifold (383, 413 Cu. In Engines)

(1) Position shaft in extreme counterclockwise position (Fig. 6).

(2) Place a new thermostat in the shaft slot with the outer end of the thermostat facing downward on the right side. Wrap outer end of the thermostat clockwise and engage under the stop pin (Fig. 6).

(3) Place the counterweight on the shaft with the shield in the upper position and insert the lock in the shaft slot (Fig. 6).

(4) Center the counterweight on the shaft and turn the valve counterclockwise until the bumper passes the stop pin.

(5) Press the counterweight on the shaft until it is seated. Tighten the clamp bolt to 50 inch-pounds, using Torque Wrench C-3380.

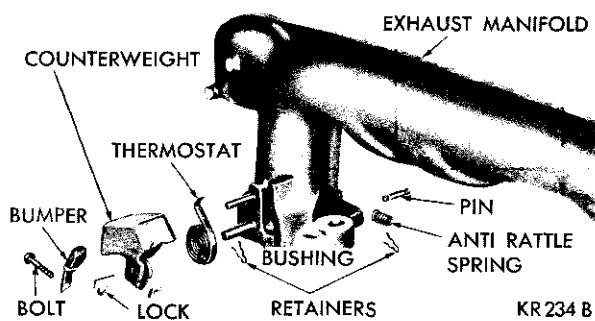


Fig. 7—Manifold Heat Control Valve—Center Outlet Manifold

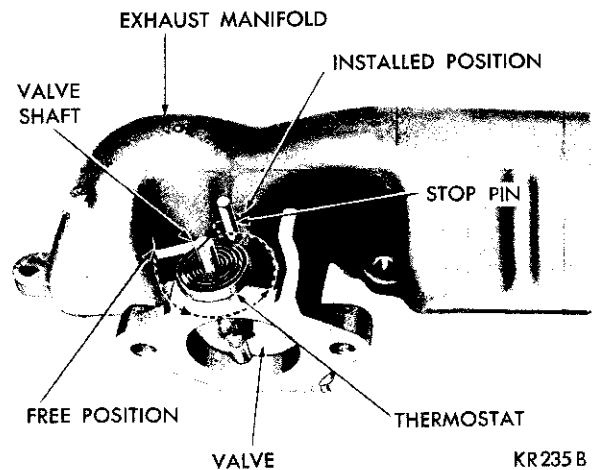


Fig. 8—Positioning the Thermostat

(6) Make sure that the anti-rattle spring on the opposite end of the shaft is in place. Test operation of the valve.

Installation—Center Outlet Manifold (383, 413 Cu. In. Engine)

(1) Position shaft in extreme counterclockwise position (Fig. 7).

(2) Place a new thermostat in the shaft slot with the outer end of the thermostat facing downward on the left side. Wrap the outer end of the thermostat counterclockwise and engage it under the stop pin (Fig. 8).

(3) Place the counterweight on the shaft with the shield in the upper position and insert the lock in the shaft slot.

(4) Center the counterweight on the shaft and turn the valve clockwise until the bumper passes the stop pin (Fig. 9).

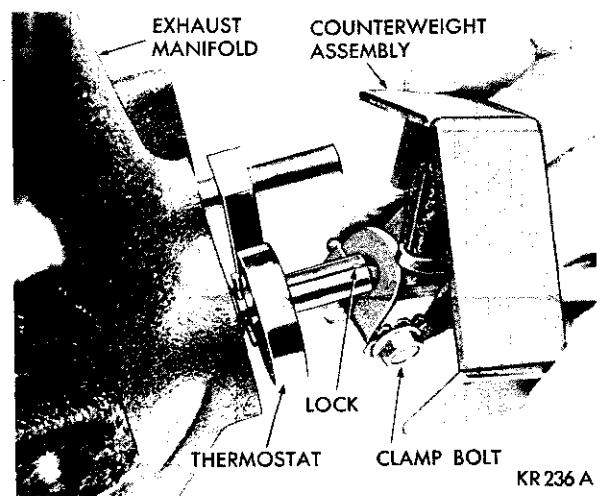


Fig. 9—Installing the Counterweight

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(5) Press the counterweight on the shaft until it is seated. Tighten clamp bolt to 50 inch-pounds, using Tool C-3380 Torque Wrench.

(6) Make sure the anti-rattle spring on the opposite end of the shaft is in place. Test operation of the valve.

MANIFOLD HEAT CONTROL VALVE REPLACEMENT

Removal

- (1) Remove the alternator.
- (2) Remove the exhaust pipe from the manifold.
- (3) Remove the exhaust manifold from the engine.
- (4) Remove the counterweight, thermostat, shaft, clips and anti-rattle spring.
- (5) Cut the valve plate off of the shaft.
- (6) Remove the shaft and press the bushings from the manifold.

Installation

- (1) Install the new bushings in the exhaust manifold.
- (2) Position the shaft into both bushings and check the shaft for freedom of turning. Should the shaft fail

to turn freely, it will be necessary to hone the bushings.

(3) Pull the shaft out far enough to position the valve plate on the shaft, then slide shaft into position in both bushings.

(4) Align the hole in the valve plate with the hole in the shaft and insert a drift into both holes to maintain correct positioning of the valve plate as it is being welded to the shaft.

(5) Remove the drift from the valve plate and shaft.

(6) Install the new anti-rattle spring, shaft clips, thermostat and counterweight assembly on the shaft.

(7) Install the manifold on the engine assembly.

(8) Using a new gasket, connect the exhaust pipe to the manifold.

(9) Install the alternator and adjust the belt tension.

(10) Start the engine and test the operation of the manifold heat control valve assembly.

Servicing

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