1970-72 MECHANICAL FUEL PUMPS

DESCRIPTION

Mechanical fuel pumps are either component or sealed unit design and some incorporate a vacuum pump (for vacuum operated windshield wipers). All fuel pumps are diaphragm operated single action pumps, actuated by a rod and/or rocker arm engaging an eccentric on the engine camshaft. On combination fuel/vacuum pumps, the vacuum pump is piston type and actuated by the same rod and/or rocker arm as the fuel pump.

OPERATION

FUEL PUMP

Fuel tank to pump suction stroke is positively actuated by a rocker arm or rod pulling the diaphragm down to create a vacuum in the pump chamber. *NOTE – Diaphragm will be pushed on rod actuated pumps.* Delivery of fuel to carburetor is spring operated (spring controls fuel pressure) and functions only when fuel is required. With carburetor inlet valve closed, fuel in pump diaphragm chamber holds spring compressed at end of suction stroke (rocker arm or rod continues to operate, but free movement of linkage allows diaphragm to remain stationary). Some fuel pumps incorporate a pulsator diaphragm and chamber which acts as a shock absorber and evens out fuel pressure and delivery (pulsator diaphragm is compressed during delivery stroke, and expands during the subsequent suction stroke).

VACUUM PUMP

Vacuum pump is connected "in line" between windshield wiper and intake manifold for booster action. Pump operates in same manner as fuel pump with suction stroke positively actuated and exhaust stroke spring actuated. When manifold vacuum is higher than vacuum created by pump, piston remains at end of suction stroke with spring compressed and without pump action (valves remain open for free flow of air through pump).

TROUBLE SHOOTING

Insufficient fuel or no fuel delivery may not be due to a defective fuel pump, but the diagnosis could indicate a faulty fuel pump. Perform the following checks on the fuel supply system before testing, replacing or overhauling the pump.

1) Insufficient fuel supply.
2) Restricted fuel filter(s).
3) Leaks in fuel lines or fittings.
4) Dented, pinched or kinked fuel lines.
5) Collapsed flexible fuel hose.
6) Water and/or dirt in fuel supply.
7) Dirt or restriction in fuel tank.
8) Push rod worn.
9) Vent in tank restricted (will also cause collapsed tank).
10) Incorrect fuel pump installed.
11) Frozen or vapor locked fuel lines.
12) Defective fuel pump.

TESTING FUEL PUMP

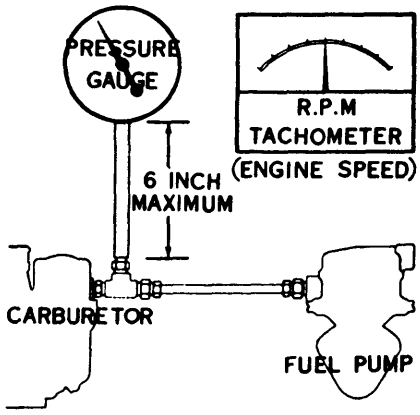
Before making pressure and volume tests, fuel system should be checked for restricted fuel filter(s). If any doubt exists as to the condition of the filter(s), they should be replaced. If fuel filter(s) are OK, make fuel pump pressure and volume tests. If test indicate fuel pump is operating properly, an ignition system defect should be suspected.

PRESSURE TEST

For specifications see "FUEL PUMP PRESSURE AND VOLUME" in appropriate TUNE-UP story.

Some pumps have an internal bleed which lets pressure drop to zero with engine off.

Connect pressure gauge in fuel line at carburetor using a "T" fitting so carburetor will be supplied with fuel. Hose to gauge should have a second "T" and a valve, for venting and capacity test. Crank or run engine at specified RPM and open vent valve to release air in pump. Close vent and read pressure.

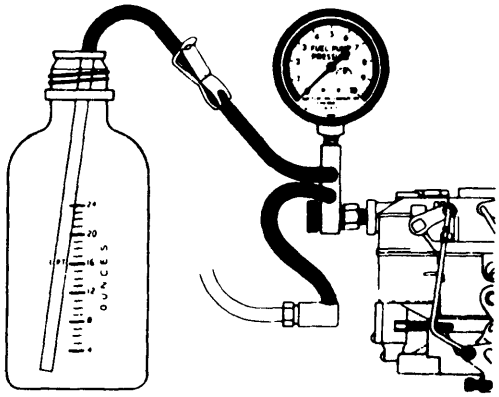


CHECKING FUEL PUMP PRESSURE

VOLUME (CAPACITY) TEST

For Specifications see "FUEL PUMP PRESSURE AND VOLUME" in appropriate TUNE-UP story.

Use same "T" fitting and vent valve line as for Pressure Test. Crank or run engine at specified RPM with hose from vent valve placed in a one pint or quart container. Open vent valve and note time required to obtain specified amount of fuel.



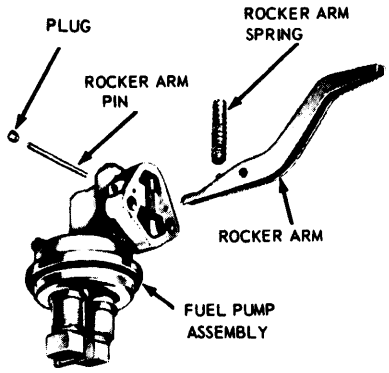
CHECKING FUEL PUMP VOLUME

1970-72 MECHANICAL FUEL PUMPS (Cont.)

VACUUM TEST

Disconnect fuel inlet line at fuel pump and connect vacuum gauge to pump inlet fitting. Disconnect pump outlet line, to ensure pump operation at full capacity. Crank or run engine at 500 RPM and note gauge reading and reaction. Vacuum should be 10" Hg. at 500 RPM and gauge needle should remain steady. *NOTE — Blow-back or immediate drop when pump is stopped indicates inlet valve is not seating (except on internal bleed-off type pumps).*

Incorrect fuel pressure and low volume (capacity or flow rate) will affect engine performance. Low pressure will cause a lean mixture and fuel starvation at high speeds. Excessive pressure will cause high fuel consumption and carburetor flooding. If fuel pump pressure, volume (capacity), or vacuum, is not within specification, and no other defect in fuel supply system is apparent, overhaul or replace fuel pump as required.



SEALED FUEL PUMP (TYPICAL)

TESTING VACUUM PUMP

VACUUM TEST

CAUTION — Do not plug pump outlet line, this line must be open whenever pump is operated.

First check operation of windshield wiper motor and lines by disconnecting inlet and outlet lines at pump and connecting these lines together (to bypass pump). Operate engine at speeds up to 1000 RPM. Wiper should operate at full speed. *NOTE — A dry windshield will slow down action of wipers.*

To check vacuum pump, disconnect pump outlet line at intake manifold and plug manifold fitting. Disconnect pump inlet line and connect a vacuum gauge at pump inlet fitting. Operate engine at 500 to 1000 RPM and note gauge reading. Vacuum should be approximately 14" to 19" Hg.

HIGH OIL CONSUMPTION

NOTE — Piston type vacuum pumps require some oil for piston and cylinder wall lubrication and oil traces do not indicate a defective pump. Sudden increase in oil consumption may indicate a defective pump.

To test for excessive oil consumption, install a 2" glass bown type fuel filter (with filter element removed) in vacuum pump outlet line. An accumulation of 1/4" of oil in the bowl after 25 miles of operation indicates a defective pump.

OVERHAUL

SEALED FUEL PUMPS

Sealed fuel pumps can not be overhauled. If rocker arm, fulcrum pin or spring become damaged, they can be replaced by removing the fulcrum pin, rocker arm spring. Install new part or parts and stake or plug new pin in place.

COMPONENT FUEL PUMPS

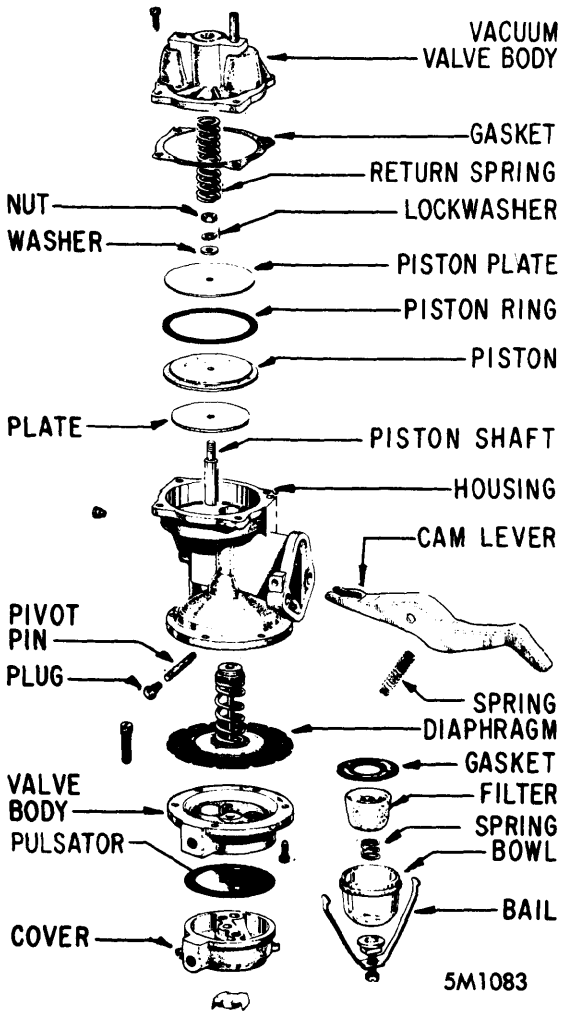
Disassembly — File a locating mark on pump cover, fuel and vacuum pump sections and pump body, for reassembly in same relative positions. Remove diaphragm screws while holding fuel and vacuum pump bodies firmly against pump body. *NOTE — Vacuum pump has a strong spring within cover and spring tension can be relieved by installing two longer screws in diametrically opposite diaphragm flange screw holes and turning these screws out evenly until pressure relieved* . On AC pumps, unhook fuel pump pull rod from rocker arm link by pressing down on diaphragm and tilting lower end of pull rod away from rocker arm, unhook vacuum pump pull rod by turning diaphragm assembly 90° while tilting lower end away from rocker arm link. On Carter pumps, it will be necessary to remove rocker arm pin and withdraw rocker arm from pump body to free the diaphragm pull rod (Piston type vacuum pump piston assembly can be withdrawn from cylinder by grasping piston nut and rotating piston while it is being pulled out). To remove valves and oil seals for replacement, remove staking and pry old valves and seal out *(CAUTION — On Carter pumps, valves are not replaceable and should not be removed).*

Reassembly — Reverse disassembly procedure and assemble parts in correct position as indicated by marks made before disassembly. Note the following:

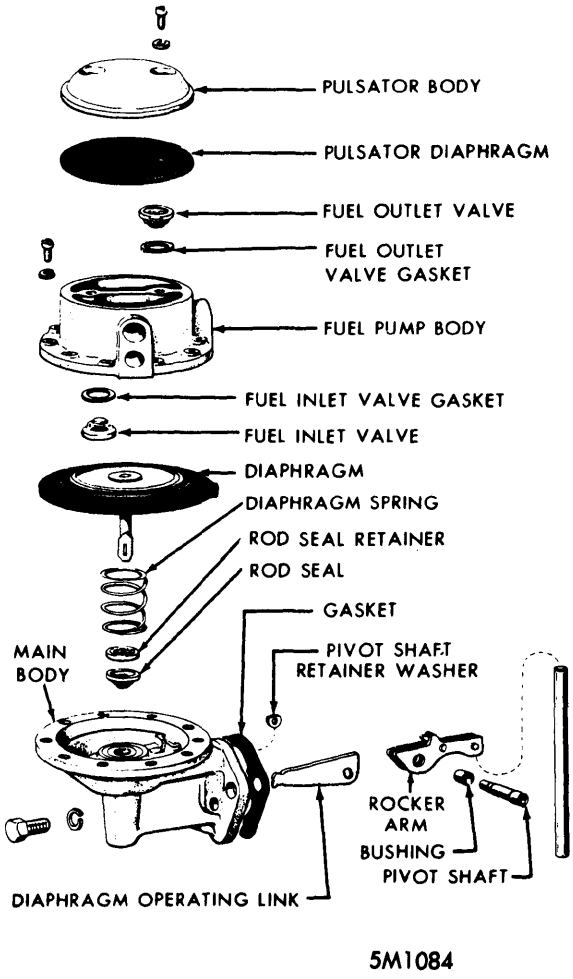
Fuel Pump Diaphragm Installation — Hold diaphragm flat and use aligning pins while installing fuel cover on pump body, install diaphragm screws snugly, then press on rocker arm to flex diaphragm to its full stroke and tighten all diaphragm screws securely before releasing rocker arm.

Vacuum Pump Piston Ring Installation — Do not disassemble piston to replace piston ring. Stretch new ring just enough to slip it over piston plate. When installing piston in cylinder, use thin feeler stock to work ring into cylinder.

1970-72 MECHANICAL FUEL PUMPS (Cont.)



FUEL & VACUUM PUMP (TYPICAL) (CARTER SHOWN)



FUEL PUMP (TYPICAL) (AC SHOWN)