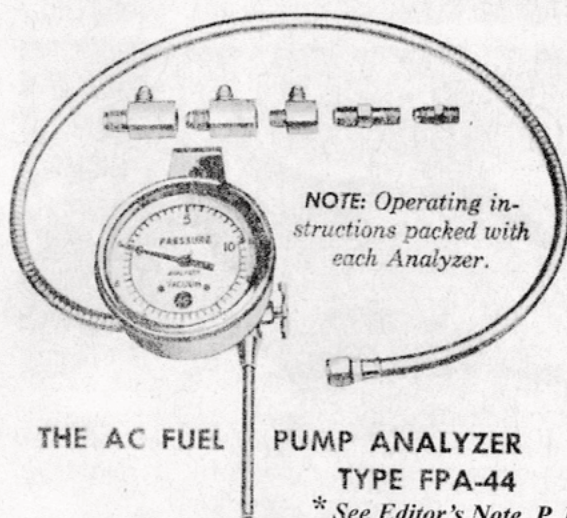


TESTING THE FUEL PUMP ON THE ENGINE

The AC Fuel Pump Analyzer FPA-44 enables the user to determine whether the fuel pump is operating within correct pressure limits and with sufficient fuel delivery for the engine's requirements, without removing the pump from the engine.



** See Editor's Note, P. 1*
Pressure below minimum indicates wear on internal parts of the pump, such as diaphragm, diaphragm spring, pull rod, link, rocker arm, and valves. It may also indicate gum or dirt on valve seats.

If the analyzer registers under pressure or over pressure, the pump should be removed for thorough check of internal parts which may require replacement of parts, or replacement of entire pump. See page 21 for chart of popular pump pressure limits.

By using a suitable pint measure and specifications furnished with the AC Fuel Pump Analyzer, it can be determined whether the fuel flow is adequate for the engine. For the average passenger car, $\frac{3}{4}$ to a full pint should flow in one minute.

If the pump does not deliver a pint in the time specified, it should be removed from the engine for overhaul, or replacement, as it may indicate any of the following conditions:

- Weak diaphragm spring
- Worn rocker arm
- Worn links

- Worn pull rod
- Leaks at diaphragm
- Leaks at strainer bowl
- Worn valves or valve seats

Analyzer Type FPA-44 can also be used for testing the vacuum section of combination pumps to determine if vacuum is sufficient to operate the windshield wiper.

HOW TO DIAGNOSE FUEL PUMP TROUBLE

Fuel pump trouble is of only two kinds. Either the pump is supplying too little gas or, in rare cases, too much.

If the pump is supplying too little gas, the engine either will not run at all, or it will cough and falter.

If the pump is supplying too much gas, you will be able to see gasoline dripping from the carburetor, or the engine will not run smoothly when idling. Engines are usually hard to start when getting too much gas.

LOCATING THE TROUBLE

**ALWAYS CHECK WHILE THE PUMP IS
INSTALLED ON THE ENGINE.**

Don't take it off to check it.

NOTE: A more accurate check of fuel pump operation may be obtained with an analyzer as previously described.

NOT GETTING ENOUGH GAS

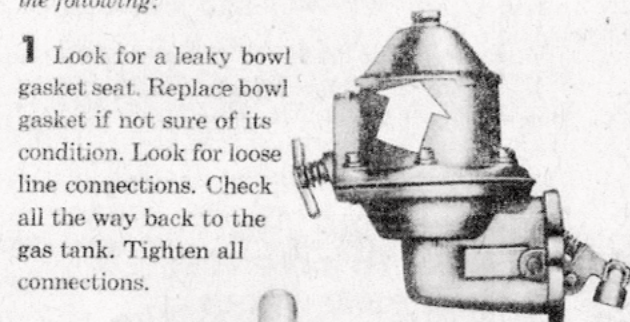
If the engine is getting too little gas, the trouble may be in the pump, the fuel line, or the gas tank. First, be sure that there is gas in the tank.

Disconnect the pump to carburetor line at the pump, or at the carburetor, whichever is easier to reach. Then, turn the engine over a few times, using the starting motor. It is best to turn off the ignition switch.

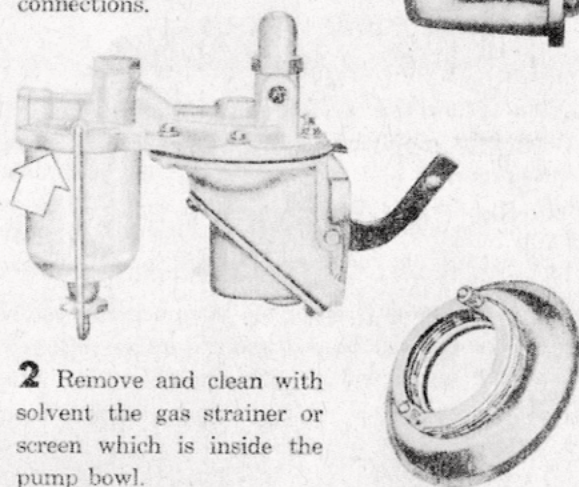
If gas spurts from the pump, or the open end of the line, the pump, gasoline, and tank are OK.

If no gas flows at all, or if only a little gas flows, do the following:

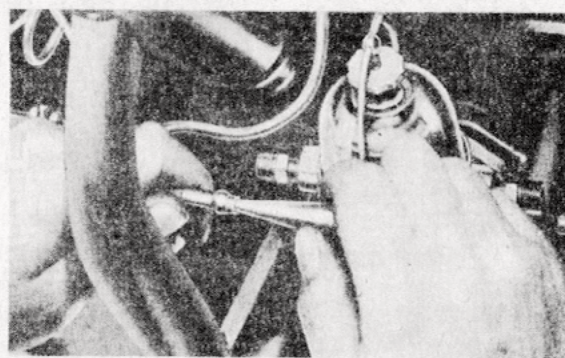
1 Look for a leaky bowl gasket seat. Replace bowl gasket if not sure of its condition. Look for loose line connections. Check all the way back to the gas tank. Tighten all connections.



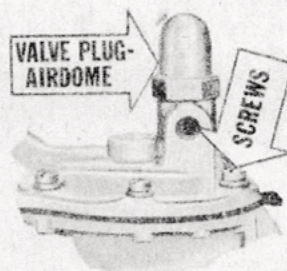
2 Remove and clean with solvent the gas strainer or screen which is inside the pump bowl.



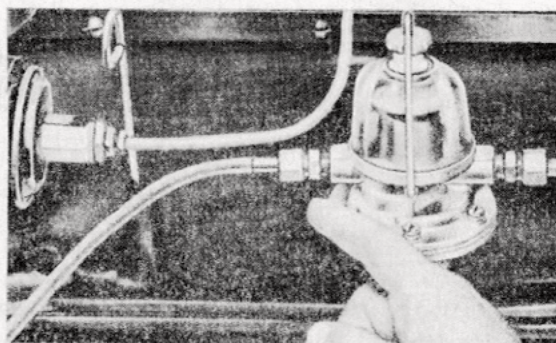
3 Look for a clogged fuel line. Blow out with compressed air.



4 Make sure that all cover screws on the pump are tight and that the external plugs over pump valves are tight.



5 Inspect the flexible fuel line for age (deterioration), leaks, chafing, burns, kinks, checks or cracks.



If correction of the above 5 items does not place the pump in operating condition, it should be removed for replacement or overhaul.

GETTING TOO MUCH GAS

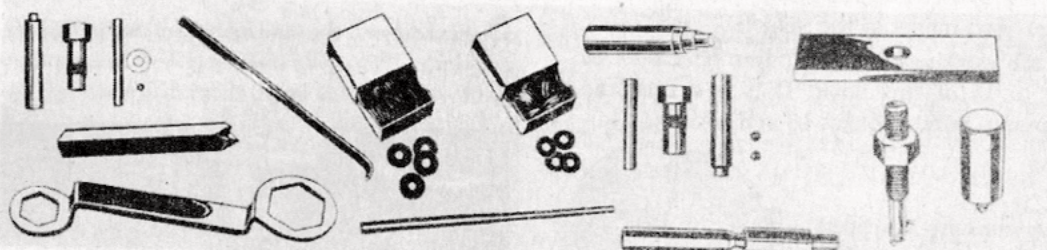
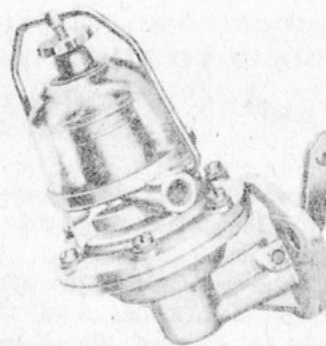
More often than not, an oversupply of gasoline is caused by trouble somewhere *besides* in the fuel pump. So first check the following:

- 1** Defective automatic choke
- 2** Excessive use of hand choke
- 3** Punctured carburetor float
- 4** Defective carburetor needle valve
- 5** Loosely connected fuel line, or loose carburetor assembly screws
- 6** Improper carburetor adjustment

If none of these six points is the cause of flooding or poor gasoline mileage, then a new pump is needed or the old one needs an overhaul.

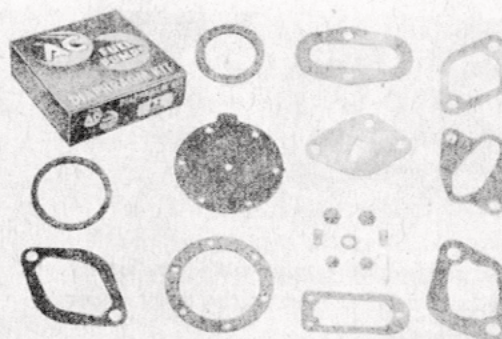
WHAT TO DO WITH A PUMP THAT NEEDS REPAIRING

1 You can install a new *AC Fuel Pump* which will give the customer "new car" pump performance for only a little more money than the cost of the most simple repair job.



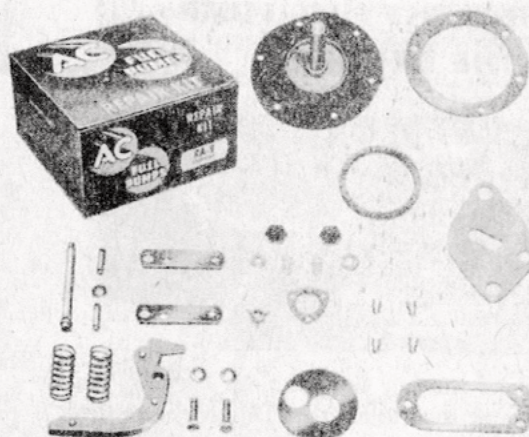
2 These tools are used to repair fuel pumps. Their purpose and use is explained in the section entitled "Special Fuel Pump Tools" (Pages 19 and 20).

3 **DIAPHRAGM KITS** . . . If a new AC Fuel Pump is not available, then an emergency repair can be made with an AC Diaphragm Kit. Emergency service on nearly all fuel pumps is possible with a stock of only a few kits. For repairs on fuel pumps only, see pages 12 to 15. For repairs on fuel and vacuum pumps, see pages 16 and 17.



Typical Diaphragm Kit

4 **REPAIR KITS** . . . If the trouble is more extensive than the diaphragm, and a new AC Fuel Pump is not available, you can give the pump a complete overhaul. Kit numbers prefixed with "RA" contain rocker arms, while those prefixed with "R" do not contain rocker arms.



Typical Repair Kit

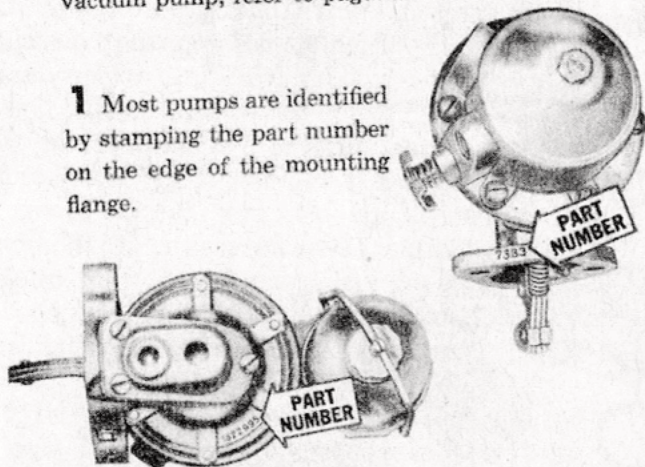
HOW TO OVERHAUL PUMPS COMPLETELY

If a new pump is not available, and your tool equipment is adequate, it is possible for you to do an overhaul job.

All the parts needed (except body and cover castings) are available in AC "RA" or "R" Kits carried by your AC Wholesaler. When ordering, give your AC Wholesaler the pump number, or the make, year, and model of the vehicle.

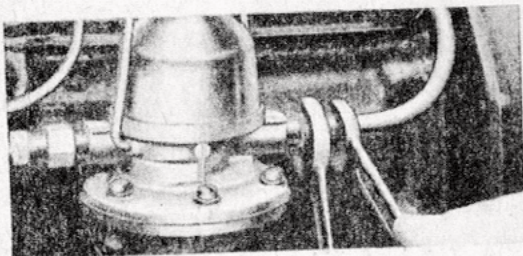
If you are working on a fuel pump only refer to pages 12 to 15 of this book. If it is a fuel and vacuum pump, refer to pages 16 and 17.

1 Most pumps are identified by stamping the part number on the edge of the mounting flange.

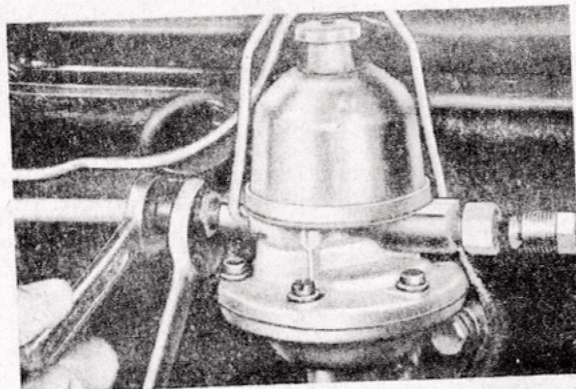


2 Some high production pumps are identified by the complete part number cast in the body under the diaphragm flange.

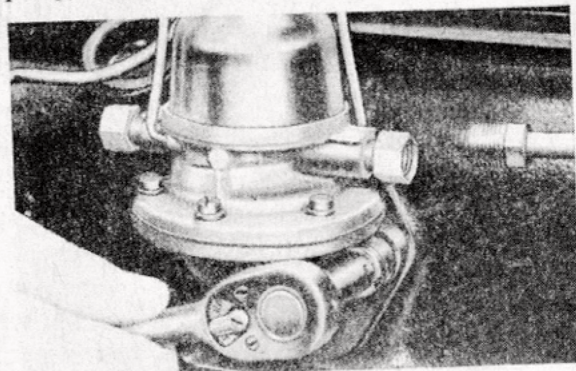
TAKING THE FUEL PUMP OFF THE ENGINE



1 Disconnect the fuel line (tubing) between the fuel pump and the carburetor. This is the outlet line.

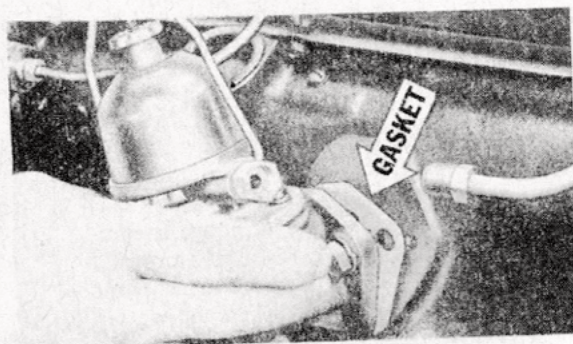


2 Disconnect the line between the pump and the gas tank. This is the inlet line. If it is a combination pump, disconnect both vacuum lines.



3 Remove the bolts and lock washers which hold pump to the engine.

NOTE: On some engines the pump is mounted to the engine with a thick gasket or spacer. On these engines the spacer must be re-used or the pump will be damaged.

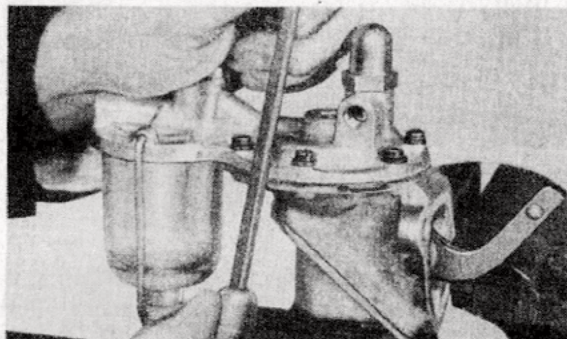


4 Remove pump, or pump and spacer (as described in No. 3), being sure to remove the gasket also.

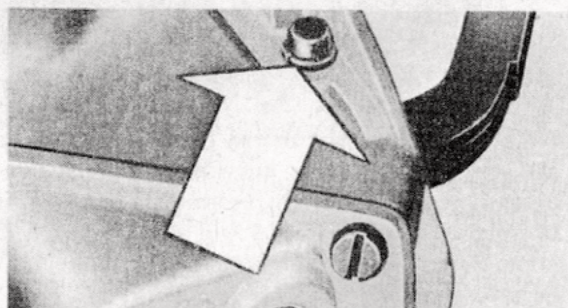
5 Clean the pump with gasoline, or any other commercial solvent, using a rag or brush.

HOW TO TAKE A FUEL PUMP APART

There are only a few precautions to be considered in the disassembly of pumps. Other than these precautions, fuel pumps can be taken apart in any convenient way.



1 Always file mark across the diaphragm flanges. These file marks will serve as a guide when reassembling to make certain that the inlet and outlet holes will match the position of the fuel line. If a heat shield stud is used, the file mark should be made at the stud position.



2 Fuel pumps with riveted diaphragm and pull rod assemblies usually have a tight fitting oil seal around the pull rod. On this type of pump, the oil seal can be ruined by tipping the diaphragm while unhooking from the link. The safest method to follow is to first remove the rocker arm pin, rocker arm, and link. The diaphragm assembly can then be lifted straight out, with no damage to the oil seal.

OIL SEAL REMOVAL AND REPLACEMENT

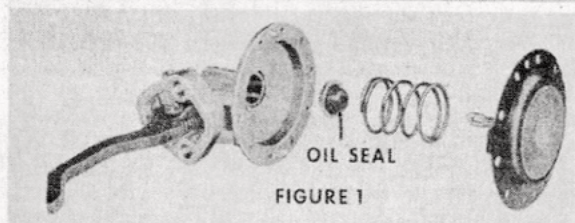


FIGURE 1

Oil seals (Fig. 1 & Fig. 2) are an integral part of the body. Both are highly important and efficient in preventing loss of crankcase oil.

Figure 1 shows exploded view of components of body assembly and sequence of oil seal and oil seal retainer installation.

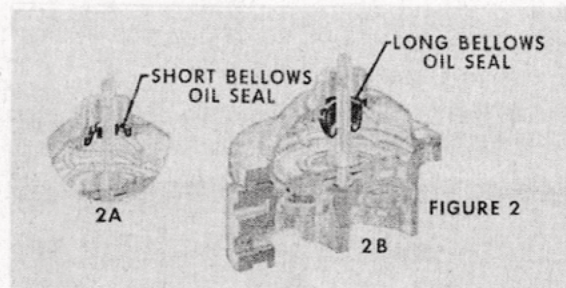
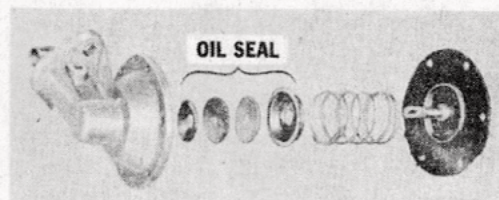


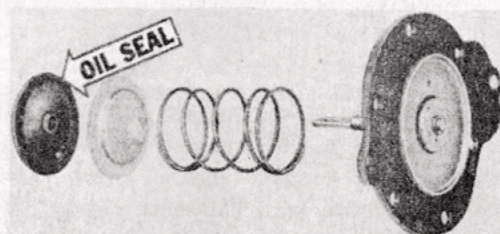
Figure 2 (insert 2A) is the short bellows design which permits a limited degree of pull rod travel at point of contact. The short seal is applicable to both fuel and vacuum sections.

Figure 2B is the long bellows oil seal where total pull rod travel is absorbed by bellows deflection. For fuel sections of combination pumps it must be used in conjunction with large diameter (1 1/4") diaphragm springs. There are no vacuum section limitations except for old type pumps where no provision was made to accommodate an integral seal.

Use oil seal removing and replacing tool PT-9 for service. Stake securely four (4) places. Assemble pull rod tang carefully through seal to avoid damaging bellows.



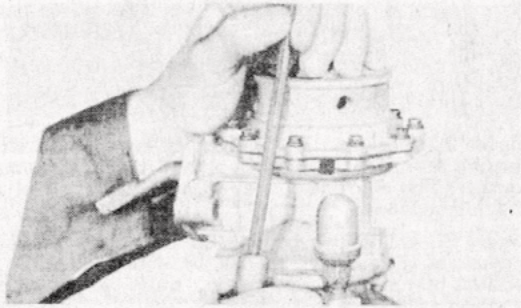
This oil seal is made up of a compression spring and two leather washers sandwiched between metal discs, the latter being keyed for locking over the pull rod flat. As a variant, you may find a cup-shaped rubber oil seal held in place by the diaphragm spring. No special tools are required for removal and replacement of these types of seals.



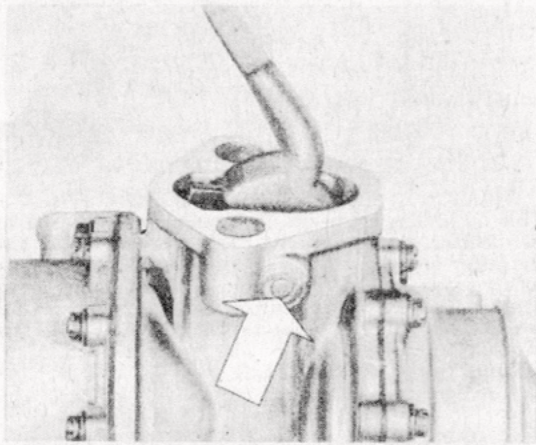
This oil seal is assembled to the diaphragm pull rod. Place spring over pull rod and compress with retainer, dish side down, until it can be locked over ears on pull rod by turning 90 degrees. Push oil seal on pull rod until center portion of seal is 1/4" below flat of pull rod. Install in pump as an assembly.

HOW TO TAKE A COMBINATION PUMP APART

SPECIAL WARNING: Before taking a combination pump apart, read the assembly instructions on pages 16 and 17. If you find your tool equipment is not adequate, don't try to do the job. Instead, order a new AC Fuel Pump from your AC Jobber.

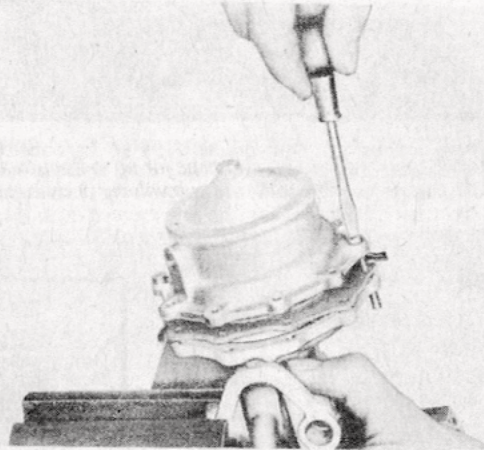


1 File mark across both fuel and vacuum diaphragm flanges so that you will have a guide for correct reassembly.



2 The fuel section diaphragm is usually sealed around the pull rod with a tight fitting oil seal. Tilting of the diaphragm to unhook from the link will damage this oil seal. The safest method to follow is to first remove the rocker arm pin, rocker arm, and link assembly. Diaphragm can then be lifted straight out with no damage to the oil seal.

3 Some vacuum sections of combination pumps have a very strong diaphragm spring. Because of this strong spring, it is safer to replace two opposite



vacuum section diaphragm flange screws with two longer screws, 10-32 x 1½". Then remove all the standard screws and alternately back off long screws until the spring pressure is no longer effective.

HOW TO PUT A FUEL PUMP TOGETHER

AC has built several hundred types of fuel pumps. But you do not need to know all of the details of every type in order to give reasonably good service to your customers. If you will teach yourself to know *three* types of pumps *thoroughly*, you should be able to handle nearly every fuel pump service job that comes to you.

On the following pages, we have given you a step-by-step story of how to put three types of fuel pumps back together again. These three types are fairly representative of all AC Fuel Pumps. Become thoroughly familiar with these three, and you should not find it too difficult to handle others.

Two of the three representative type pumps are what is known as "single pumps"—which means that they pump nothing but fuel (gasoline). The third type is known as a "combination fuel and vacuum pump." It pumps fuel for the engine. It also creates a vacuum which helps to keep the windshield wiper operating when the engine is working hard. Every fuel pump AC has ever built is either a "single" or a "combination" pump.