CARBURETOR GOVERNORS

ernor flywheel, Fig. 20. Depressing the foot accelerator advances the throttle lever to wide open position. This releases the internal driver (or flywheel), permitting the tension of the main spring to pull the throttle plate open.

With the throttle lever in wide open position, the flywheel will stop the throttle plate 13 degrees or more from a vertical position, Fig. 21. If the plate were allowed to reach a full vertical position, it would offer no resistance to the velocity of air passing through. (Throttle plate angle will differ with different models or types of engines.)

When engine revolutions approach the predetermined governor speed, the increased velocity of air striking the inclined throttle plate has enough force to overcome the tension of the main spring. This causes the throttle plate to be forced toward the closed position, leaving only enough throttle opening to pass a sufficient volume of fuel mixture to maintain the governed speed, Fig. 22.

If engine revolutions are reduced by a heavier load on the engine, the force of the air striking the throttle plate is likewise reduced. Under these conditions the tension of the main spring automatically opens the throttle wide to compensate for the heavier load.

At governor speed under light loads, the force exerted by the air velocity increases as the throttle plate nears the closed position. The restriction of the closing plate causes a marked increase in manifold vacuum. Both forces tend to close the throttle plate and under these conditions, the main spring is aided by the compensating spring to oppose the multiple force exerted by air velocity and increase in vacuum.

As the throttle plate approaches the closed position, the flywheel position changes to allow the compensating spring to contact the "pivot point" on the flywheel, Fig. 21. The tension of the compensating spring against the flywheel tends to force it toward the open position, Fig. 22. Pressure of this spring steadies the throttle plate, eliminating any surging to higher or lower engine speeds.

ADJUSTMENTS

To change the governor speed, remove the seal wire and large seal plug, Fig. 23. Turn the main adjusting screw clockwise to increase governed speed or counter-clockwise to decrease it. If the governor does not show definite response to changes of one-quarter to one full turn of the adjusting screw, it indicates a defective governor.

If the governor "surges" or "hunts" to a higher or lower engine speed, remove the small seal plug and turn the compensating spring adjusting screw, Fig. 23, one-quarter turn counter-clockwise until the surge is overcome.

If the governor does not respond quickly enough when governed speed is approached and the action "lags" or is "flat," turn the compensating adjusting screw clockwise until the symptom is overcome. Do not turn adjustment more than ½ turn at a time without checking performance of the vehicle on the road.

FUEL PUMPS

AC FUEL PUMPS

Using Fig. 1 as an example, all AC mechanical fuel pumps operate as follows:

1. The cam on the engine camshaft forces the rocker arm outward which, through the linkage and pull rod, moves the diaphragm on its down stroke.
2. The downward movement of the diaphragm creates a vacuum in the fuel chamber of the pump which sucks fuel from the gasoline tank.
3. The diaphragm spring then pushes the diaphragm upward on a pressure stroke, which forces the contents of the fuel chamber into the carburetor bowl.
4. The flow of fuel from the pump is controlled by the carburetor float. The float opens and closes the float needle valve which builds up or reduces pressure in the pump fuel chamber. As pressure is built up in the fuel chamber, it prevents the diaphragm from taking a complete stroke, thus reducing fuel flow. As pressure reduces in the fuel chamber, it allows the diaphragm to take longer strokes, thus increasing fuel flow.

Fig. 2 shows a typical combination fuel and vacuum pump, the vacuum section being used as a booster for windshield wiper operation. The operation of the vacuum pump is as follows:

1. Rotation of the camshaft eccentric actuates the rocker arm. This pushes the vacuum diaphragm downward, expelling the air in the chamber through the discharge valve and into the intake manifold of the engine.
2. On the return stroke of the rocker arm, the diaphragm moves upward, creating a vacuum in the chamber which opens the inlet valve, drawing air from the windshield wiper.
3. When the windshield wiper is not being used, manifold vacuum holds the diaphragm downward against spring pressure so that the diaphragm does not make a complete stroke for every stroke of the rocker arm.
4. When manifold vacuum is greater than the vacuum created by the pump, the air will flow from the windshield wiper through both valves, and the operation of the wiper will be the same as if the vacuum pump were not installed.
5. When manifold vacuum is low, that is, when the engine is accelerating or operating at high speed, the vacuum created by the pump will be greater and will operate the wiper.

TROUBLE DIAGNOSIS — Fuel pump trouble is of only two kinds. Either the pump is supplying too little fuel, or too much. If the pump is supplying too little fuel, the engine will either not run at all, or it will cough or falter. If the pump is supplying too much fuel, gasoline will drip from the carburetor, or the engine will not run smoothly when idling. Too much fuel will also produce hard starting.

Fuel pumps may be tested with an analyzer which discloses fuel pump pressure and rate of flow, or it may be tested for pressure by connecting a gauge of the type shown in Fig. 3, the test being made while the engine is running. In the absence of this equipment, do not remove the pump from the engine until the following points have been checked.

If the engine is getting too little fuel, proceed as follows:

1. Be sure there is gasoline in the tank.
2. Disconnect the fuel line at the carburetor or at the pump, whichever is easier to reach. Then, with the ignition shut off, crank the engine with the starter. If gas spurts from the pump, the trouble is not in the pump, lines or tank.

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

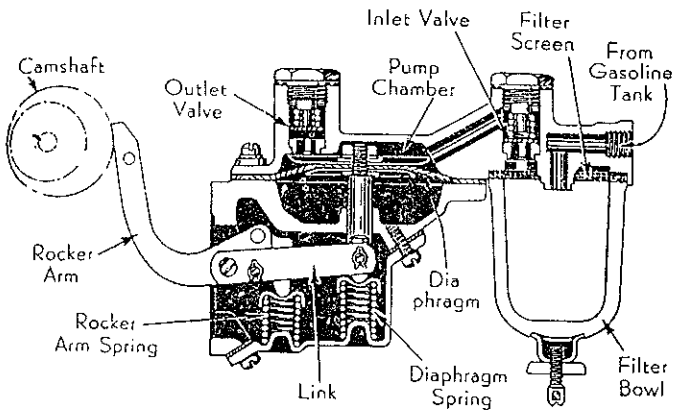

Fig. 1 Series B fuel pump. Design typical of series D

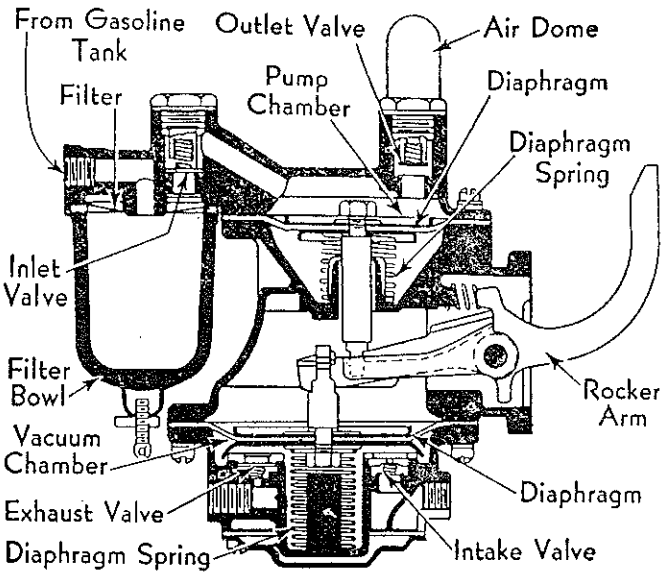

Fig. 2 Series AB fuel and vacuum pump. Design typical of series AD, AL, F, I and J

1. Look for leaky bowl gasket. If not sure, replace gasket.
2. Remove and clean the strainer or screen which is inside the bowl.
3. Look for loose fuel line connections. Check all the way back to the tank. Tighten all connections.
4. Blow out all lines to remove any restrictions.
5. Make sure all pump cover screws are tight, and see that external plugs over pump valves are tight.
6. Inspect flexible line (if used) for breaks or porous condition.

If correction of the above items fail to

7. If pump to engine gasket is too thick, pump pressure will be too low.

restore the pump to operating condition, it should be removed for replacement or overhaul.

If the engine is getting too much fuel, the trouble is more than likely caused by one of the following: (a) defective automatic choke, (b) excessive use of hand choke, (c) punctured carburetor float, (d) defective carburetor needle valve, (e) loosely connected fuel line or loose carburetor assembly screws, (f) improper carburetor adjustment, (g) if pump to engine gasket is too thin, pump pressure will be too high.

If none of the above items is the cause of flooding or poor gasoline mileage, then the pump needs overhauling.

VACUUM PUMP TROUBLES—If the windshield wiper is slow acting at high speed, it indicates an inoperative vacuum pump. Check the lines to the wiper. If the trouble is not in the lines, disassemble the vacuum pump and examine the valves and diaphragm.

If vacuum pump operation is noisy, it generally indicates either a worn or improperly installed oil seal or a worn vacuum pump link and rocker arm pin.

High gasoline pressure and noise indicates that the fuel pump is striking the vacuum pump diaphragm. This can be corrected by replacing the rocker arm pin and vacuum pump link.

If the vacuum pump diaphragm is punctured, oil is drawn from the crankcase, causing high oil consumption and ignition miss due to fouled plugs. A small hole in the diaphragm, when first encountered, may be indicated by a partial miss on the two cylinders adjacent to the spot where the vacuum line taps into the manifold. This condition may be checked by the action of the windshield wiper upon acceleration, or by disconnecting the line on the manifold side of the vacuum pump to inspect for oil leakage.

Noisy operation or failure of the diaphragm may also indicate that it is either too taut, or too slack, which will be evident if the diaphragm is wrinkled.

SERVICE PROCEDURE—A good working knowledge of the three pumps described in the following paragraphs will furnish a good background for servicing all AC fuel and vacuum pumps.

Models B and R are representative of what is known as "single pumps"—which means that they pump nothing but fuel. The AJ pump, known as a "combination fuel and vacuum pump", not only pumps fuel but it also creates a vacuum which helps keep the windshield wiper operating.

Fig. 4 is an exploded view of Model B, while Fig. 5 is that of Model AJ.

Do not attempt to overhaul fuel pumps unless you have a set of special tools designed for the purpose. If your equipment is not adequate, install a new or rebuilt pump, the latter being available on an exchange basis.

Most pumps are identified by stamping the last four digits of the part number on the edge of the mounting flange. To identify the pump, convert these digits to the factory number by referring to the following key:

(152)1000 to (152)3999
(559)4000 to (559)4999

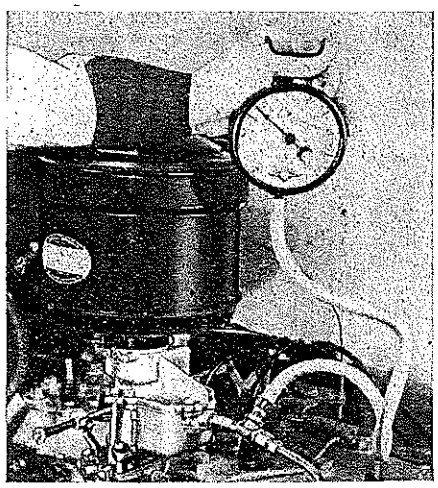

Fig. 3 Testing fuel pump pressure

(85)5000 to (85)6999
(153)7000 to (153)9999

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

SERVICE NOTE—B series pump repair procedure can also be used as a guide for series D and O. And insofar as the body section is concerned, it may also be used as a reference in servicing S, AC, AG and AR pumps, while the cover section is typical of series P, W, Y and AK.

R series pump repair procedure may be used as a guide in servicing E, G, T, AF, AH, AT, AU and AW pumps. It may also be used in servicing the body on series P, W, Y and AK, and the cover on S, AC, AG and AR pumps.

Use the AJ instructions as a guide in repairing all combination pumps.

PUMP REMOVAL—Disconnect the fuel line between the carburetor and pump, and the line between the pump and gasoline tank. If it is a combination pump,