FUEL • • • • • • • • • SECTION 2

CONTENTS

GENERAL DESCRIPTION

The fuel system consists of the fuel tank, fuel lines, fuel pump, carburetor, air cleaner and the accelerator pedal and linkage. Fuel is drawn from the fuel tank through the fuel lines to the inlet side of the fuel pump into the sediment bowl. The fuel is then pumped from the sediment bowl to the carburetor (Fig. 63).

The fuel tank is provided with a fuel gauge (tank unit) which controls the electrically operated fuel gauge in the instrument panel to indicate the amount of fuel in the tank. The fuel tank cap is provided with ventilation holes to avoid a vacuum build-up in the fuel tank.

Single diaphragm fuel pumps are used on both the four and six cylinder engines. However, dual diaphragm fuel and vacuum pumps are available as special equipment for either engine. The vacuum pump maintains a relatively constant vacuum to provide uniform operation of the windshield wiper motor.

A single throat downdraft type carburetor with a manually operated choke is used on both engines. While the external appearance of both the four and six cylinder carburetors is identical, the metering rod and jet, throttle valve shaft, pump diaphragm housing, etc. are different and cannot be interchanged.

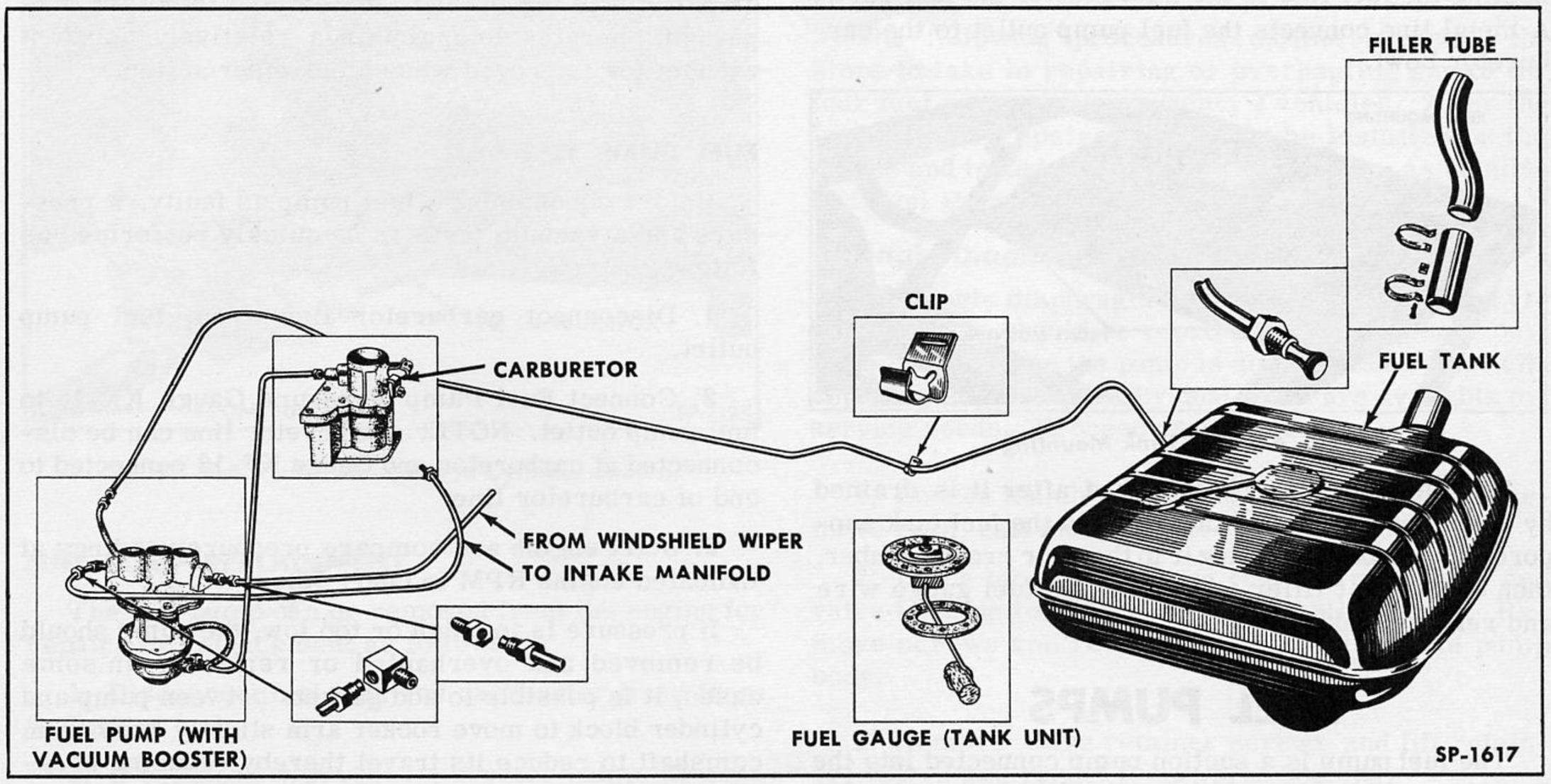

Fig. 63—Fuel System

An oil bath air cleaner is used on both four and six cylinder engines, however, some early four cylinder engines were equipped with an oil wetted type air cleaner.

MAINTENANCE

At regularly established intervals, remove, disassemble and clean the carburetor air cleaner according to instructions given in Section 17, "Lubrication."

Adjust the accelerator pedal linkage whenever operation of the pedal indicates need for adjustment. Adjust engine idle speed and fuel mixture at the carburetor whenever necessary to assure proper engine operation or whenever any changes have been made on the engine ignition system or cylinder compression as these items greatly affect carburetion. Adjustment of fuel pump should be checked and changed as necessary when fuel consumption is excessive or if engine cuts out at high speeds. These maintenance and adjustment operations are covered in detail under separate headings in this section. Section 1-A, "Engine Tune-Up" also details the adjustments and checks made on the fuel system during an engine tune-up.

FUEL TANKS AND LINES

A 13 gallon fuel tank is cushion mounted between the two crossmembers at the rear of the frame (Fig. 64).

The fuel line is routed from the bottom of the tank, along the right frame side rail, then across the rear of the front crossmember to a flexible fuel line connecting the fuel line to the inlet side of the fuel pump. A metal line connects the fuel pump outlet to the carburetor bowl.

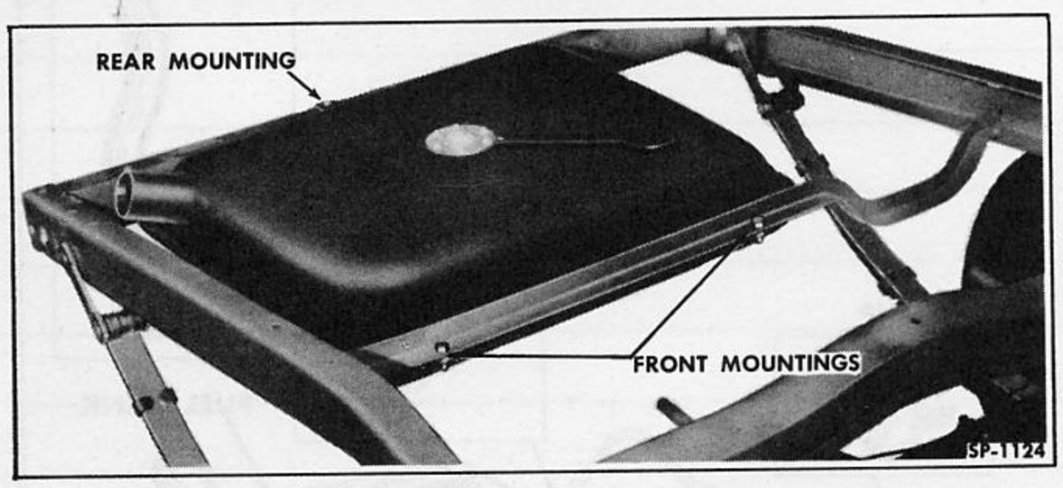

Fig. 64—Fuel Tank Mounting

The fuel tank can be removed after it is drained by removing two bolts attaching it to the fuel tank support and one bolt attaching it to the rear crossmember, then disconnect filler tube hose and fuel gauge wire and remove tank.

FUEL PUMPS

The fuel pump is a suction pump connected into the fuel line to pull gasoline from the fuel tank and pump it into the carburetor bowl to meet engine requirements at all speeds.

The fuel pump is attached to the left side of the engine, near the front. The fuel pump rocker arm extends into the cylinder block and rides against an eccentric cam on the front end of the camshaft. The other end of the rocker arm is pivoted in the fuel pump and attaches to a link which operates the fuel pump diaphragm.

When the engine is turning over, the rocker arm moves up and down and, in turn, moves the diaphragm in a pumping motion. When the diaphragm moves in one direction, it "sucks" fuel from the tank through the inlet check valve. When the diaphragm moves in the opposite direction, it causes the inlet check valve to close and forces fuel through an outlet check valve to the carburetor.

When the carburetor bowl is full, the carburetor float closes a needle valve to stop fuel flow into the carburetor. This action causes the pump to build up to a certain pressure and forces the diaphragm to take shorter strokes until it stops. When the carburetor float opens the needle valve, the diaphragm resumes its pumping action.

A fuel pump with an integral vacuum booster pump is available as special equipment on four or six cylinder engines. The fuel and vacuum pump contains two diaphragms operating off the same rocker arm. One diaphragm is for the fuel system and the other diaphragm operates to maintain a relatively constant vacuum for improved windshield wiper action.

FUEL PUMP TEST

Before condemning a fuel pump as faulty, a pressure and a vacuum test can be quickly performed as follows:

1. Disconnect carburetor line from fuel pump outlet.

2. Connect Fuel Pump Pressure Gauge KF-13 to fuel pump outlet. NOTE: Carburetor line can be disconnected at carburetor and Gauge KF-13 connected to end of carburetor line.

3. Start engine and compare pressure readings at indicated engine RPM in chart below.

If pressure is too high or too low, the pump should be removed and overhauled or replaced. In some cases, it is possible to add gaskets between pump and cylinder block to move rocker arm slightly away from camshaft to reduce its travel thereby reducing pressure. To increase pump pressure, remove gaskets.

FUEL PUMP TEST SPECIFICATIONS

MODEL	FUEL PUMP	PRESSURE TEST	VACUUM TEST
4 cyl.	Standard	4-3/4 psi at 1800 RPM	10-1/2" Mercury Min. at 1800 RPM
4 cyl.	Vacuum Booster	2-1/2 to 3-3/4 psi at 1800 RPM	10-1/2" Mercury Min. at 1800 RPM
6 cyl.	Standard	3-1/2 to 5-1/4 psi at 500 RPM	10" Mercury Min. at 500 RPM
6 cyl.	Vacuum Booster	3-1/2 to 5-1/4 psi at 500 RPM	10" Mercury Min. at 500 RPM

4. Remove pressure gauge and leave pump outlet open. Disconnect fuel tank line from fuel pump inlet.

5. Connect Vacuum Gauge C-425 to fuel pump inlet.

6. Start engine and compare vacuum readings at indicated engine RPM in chart above. If vacuum reading is too low, fuel pump should be removed and overhauled or replaced.

7. If vehicle is equipped with a vacuum booster pump, the vacuum pump can be checked by disconnecting fuel pump to intake manifold tube, starting engine and turning windshield wipers on. If wipers do not operate, connect the vacuum pump to wiper motor tube to the intake manifold tube. If wipers still do not operate, wiper motor or tube is defective. If wipers will operate, then vacuum booster pump is defective and should be repaired.

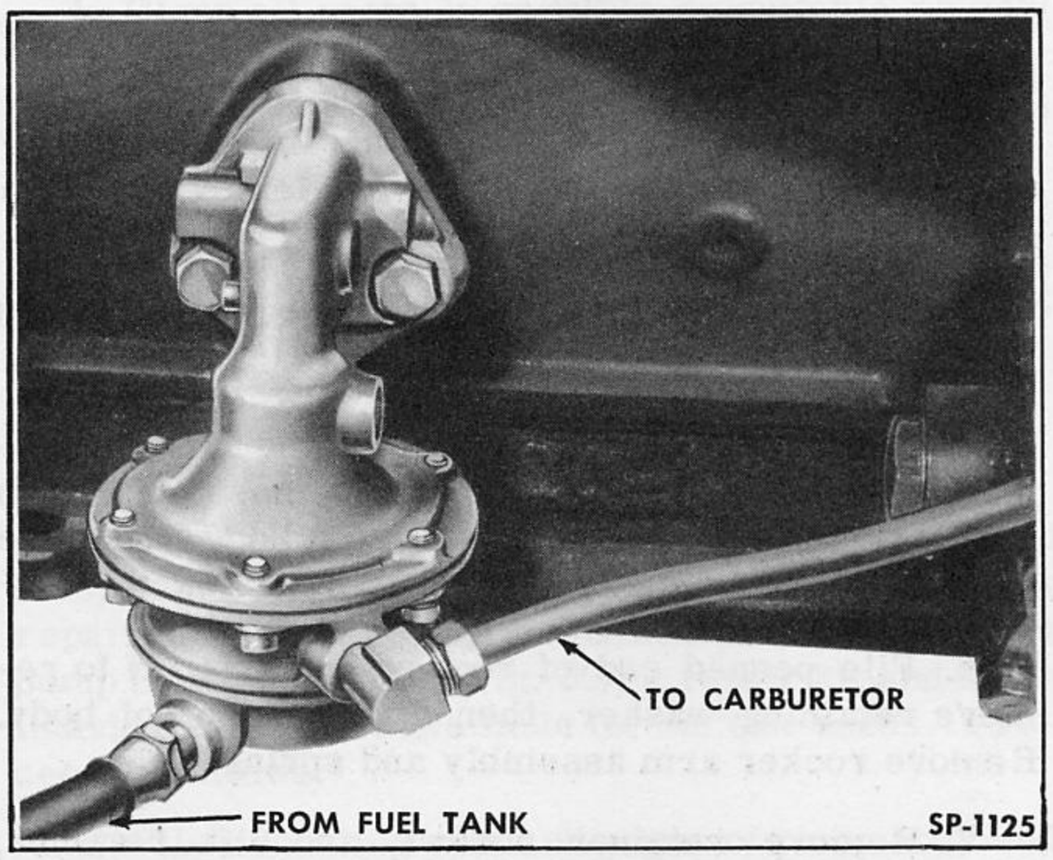

Fig. 65—Fuel Pump Mounting (6 Cylinder Shown)

FUEL PUMP REPLACEMENT

The fuel pump can be removed from the engine for repairs or replacement as follows:

1. Disconnect fuel tank and carburetor lines from fuel pump.

2. If equipped with vacuum booster pump, disconnect manifold and windshield wiper lines from fuel and vacuum pump.

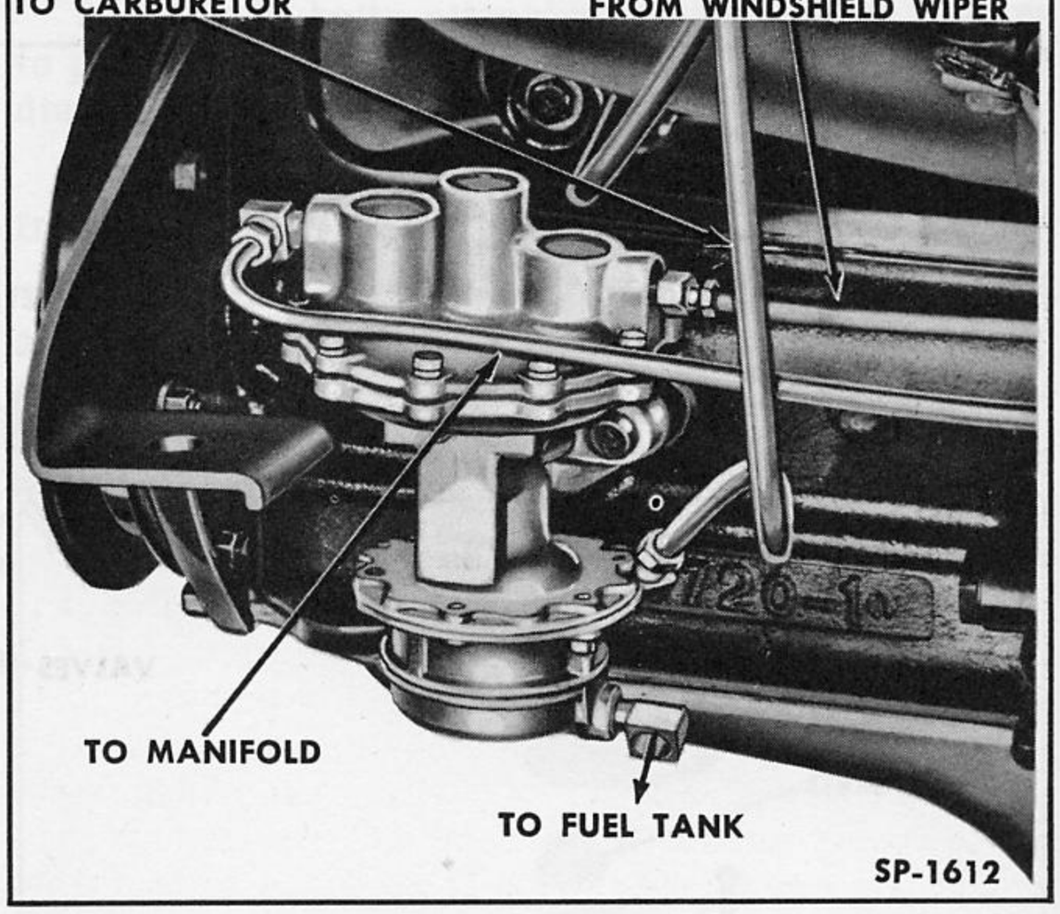

Fig. 66—Fuel and Vacuum Pump Mounting (6 Cylinder Shown)

3. Remove two bolts and lockwashers that attach fuel pump to engine block.

4. Remove fuel pump and gasket.

5. To install fuel pump, reverse the above procedure, making sure rocker arm rests on camshaft correctly.

FUEL PUMP REPAIR

The following procedures outline in detail the steps to take in repairing or overhauling any of the four fuel pumps used on Henry J vehicles. After the fuel pump is repaired, it should be installed on the engine and tested for pressure and vacuum as detailed in "Fuel Pump Test" in this section.

a. Single Diaphragm—Four Cylinder

The single diaphragm fuel pump used on four cylinder models should be repaired in the sequence outlined below. After the pump is disassembled (Fig. 67), repair kits and some individual parts are available for service needs. Proceed as follows:

1. Loosen thumb nut on strainer bowl bail and remove bowl, bail and gasket.

2. File a locating mark on edges of pump body and valve housing to aid when reassembling pump. Remove screws and remove valve housing from pump body.

3. Remove valve retainer screws and lift retainer, valves and gasket from valve housing.

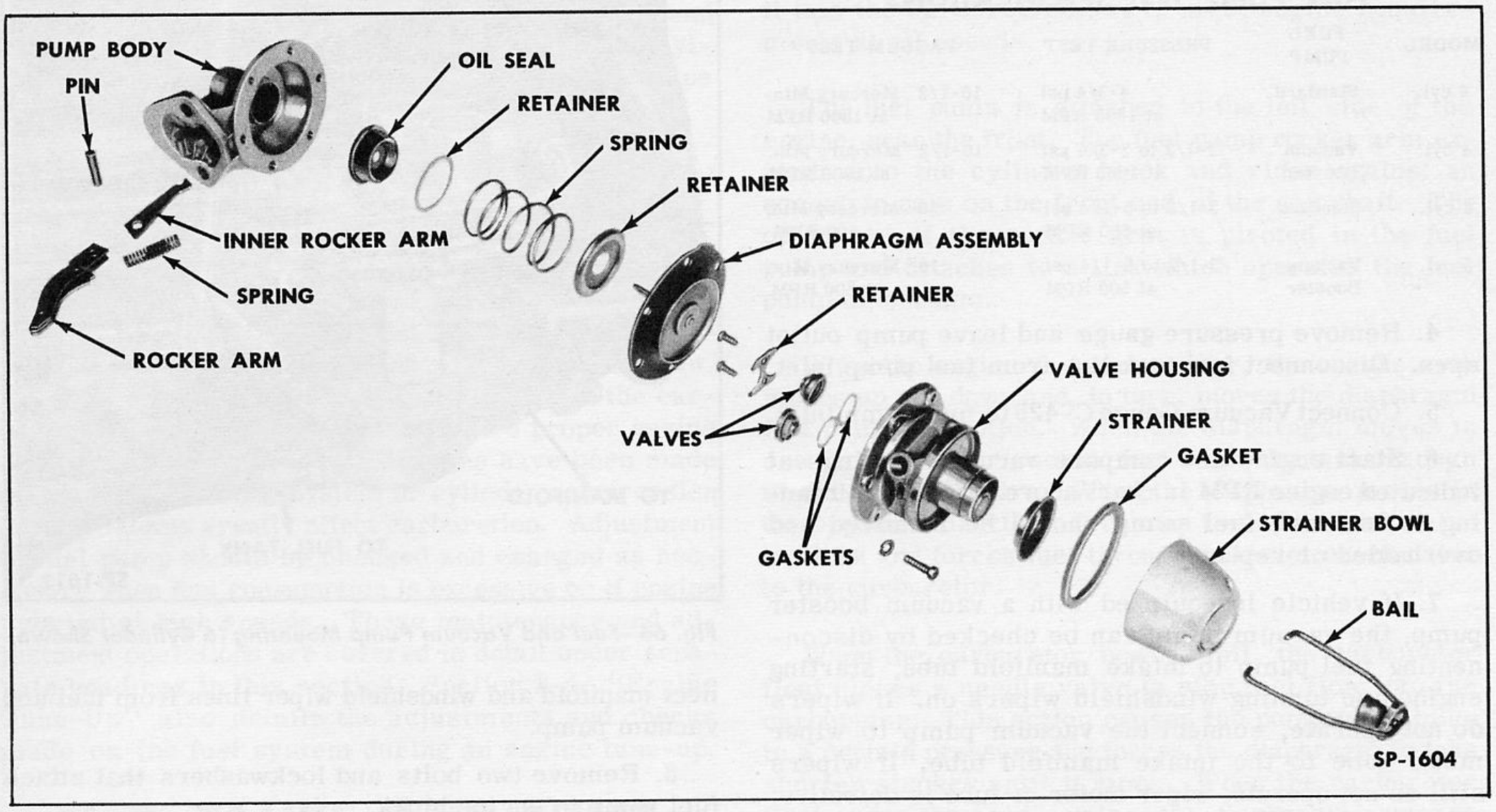

Fig. 67—Single Diaphragm Fuel Pump—4 Cylinder—Exploded View

4. Drive rocker arm pin out of pump body from side opposite stake marks. Lift out rocker arm and spring. Compress diaphragm and remove inner rocker arm, then lift out diaphragm, spring, retainers and oil seal from body.

5. Clean all parts in gasoline or suitable solvent and inspect for wear or damage. Select necessary parts or repair kit. If a repair kit is needed, use all parts in kit.

6. Assemble parts in reverse order of their removal. Place inlet valve in housing with the three legs pointing up away from valve seat and the outlet valve with the three legs pointing down. Line up file marks on pump body and valve housing. Alternately tighten housing to body bolts to prevent damage to diaphragm.

b. Double Diaphragm—Four Cylinder

A double diaphragm fuel and vacuum pump is available as special equipment on four cylinder models and should be repaired in the sequence outlined below. After the pump is disassembled, repair kits and some individual parts are available for service needs. Proceed as follows:

1. Loosen thumb nut on strainer bowl bail and remove bowl, bail and gasket.

2. File locating marks on edges of pump body, pump valve housing and vacuum valve housing to aid when reassembling pump. Remove screws and remove pump valve housing from pump body.

3. Remove vacuum valve housing from pump body by removing its attaching screws. Remove vacuum diaphragm spring and retainer.

4. Remove vacuum valve housing cover bolt and remove cover, gasket and screen.

5. Depress fuel pump diaphragm and tilt it to disengage from inner rocker arm, then remove diaphragm assembly, spring and retainer from body. Remove vacuum diaphragm assembly in same manner.

6. File peened end of rocker arm pin off to remove retaining washer, then drive pin out of body. Remove rocker arm assembly and spring.

7. Remove retainer screws and lift retainer, valves and gasket from both valve housings.

8. If oil seals in pump body need replacement, remove oil seal on vacuum side with Oil Seal Remover KF-66 or some other suitable tool, then drive out oil seal on fuel side with a drift. Install new oil seal using Oil Seal Installer KF-66.

9. Clean all parts in gasoline or suitable solvent and inspect for wear or damage. Select necessary parts or repair kit. If a repair kit is needed, use all parts in kit.

10. Assemble parts in reverse order of their removal. Place inlet valves in both housings with the three legs pointing up, away from valve seat and the outlet valves with legs pointing down into valve seat. Line up file marks on pump body and both valve housings. Alternately tighten housing to body bolts to prevent damage to diaphragm. When tightening vacuum valve housing bolts, operate the rocker arm with Fuel Pump Diaphragm Flexing Tool KF-65 to position vacuum diaphragm correctly.

c. Single Diaphragm—Six Cylinder

The single diaphragm fuel pump used on six cylinder models should be repaired in the sequence outlined below. After the pump is disassembled (Fig. 68), a repair kit and some individual parts are available for service needs. Proceed as follows:

1. File a locating mark on edges of valve housing and pump body to aid when reassembling fuel pump. Remove bolts attaching valve housing to pump body and remove valve housing.

2. Remove two screws in valve housing and remove housing cover. Remove strainer from housing.

3. Remove rocker arm return spring, plug, pin retainer, pin and rocker arm from pump body. Remove diaphragm assembly from pump body.

4. Clean all parts in gasoline or suitable solvent and inspect for wear or damage. Select necessary parts or repair kit. If a repair kit is needed, use all parts in kit.

5. Assemble parts in reverse order of their removal. Line up file marks on pump body and valve housing. Alternately tighten housing to body bolts to prevent damage to diaphragm.

d. Double Diaphragm—Six Cylinder

The double diaphragm fuel and vacuum pump used as special equipment on six cylinder models should be repaired in the sequence outlined below. After the pump is disassembled (Fig. 69), a repair kit and some individual parts are available for service needs. Proceed as follows:

1. File a locating mark on edges of pump body and pump valve housing to aid when reassembling pump. Also mark pump body and vacuum valve housing.

2. Remove bolts attaching pump valve housing to pump body and remove pump valve housing.

3. Remove two screws in pump valve housing and remove pump housing cover and strainer.

4. Remove rocker arm return spring, plug, pin retainer, pin and rocker arm from pump body. Remove pump diaphragm assembly.

5. Remove bolts attaching vacuum valve housing to pump body and remove vacuum assembly, vacuum diaphragm assembly and spring.

6. Remove vent plate, filter retainer and filter from pump body.

7. Clean all parts in gasoline or suitable solvent and inspect for wear or damage. Select necessary parts or repair kit. If a repair kit is needed, use all parts in kit.

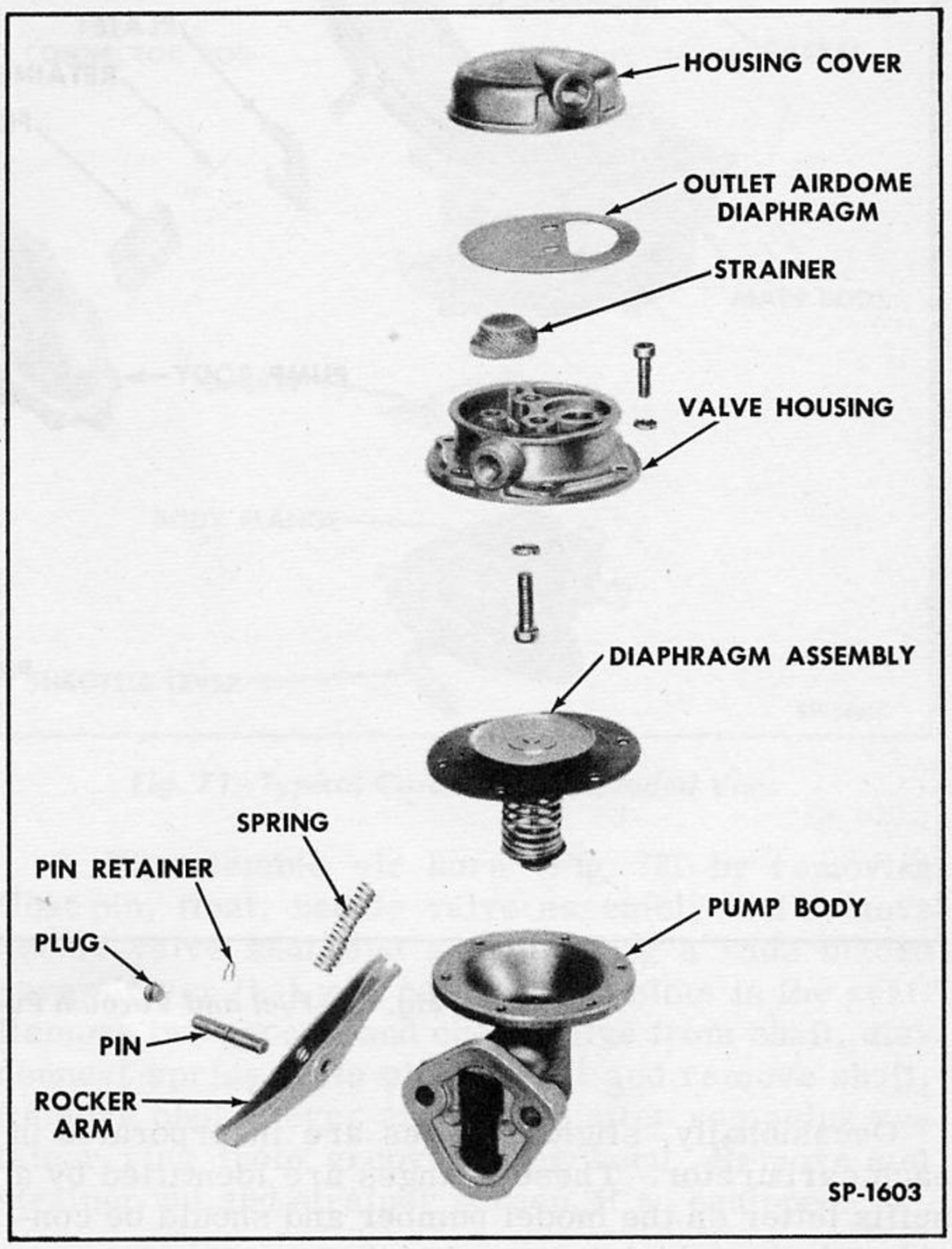

Fig. 68—Single Diaphragm Fuel Pump—6 Cylinder—Exploded View

8. Assemble parts in reverse order of their removal. Line up file marks on pump body, pump valve housing and vacuum valve housing. Alternately tighten housing to body bolts to prevent damage to diaphragm. When tightening vacuum valve housing bolts, operate the rocker arm with Fuel Pump Diaphragm Flexing Tool KF-65 to position vacuum diaphragm correctly.

CARBURETORS

A single throat downdraft carburetor is used on all Henry J vehicles. The carburetors on the four cylinder and the six cylinder engines are the same basic type, however, the carburetor models differ.

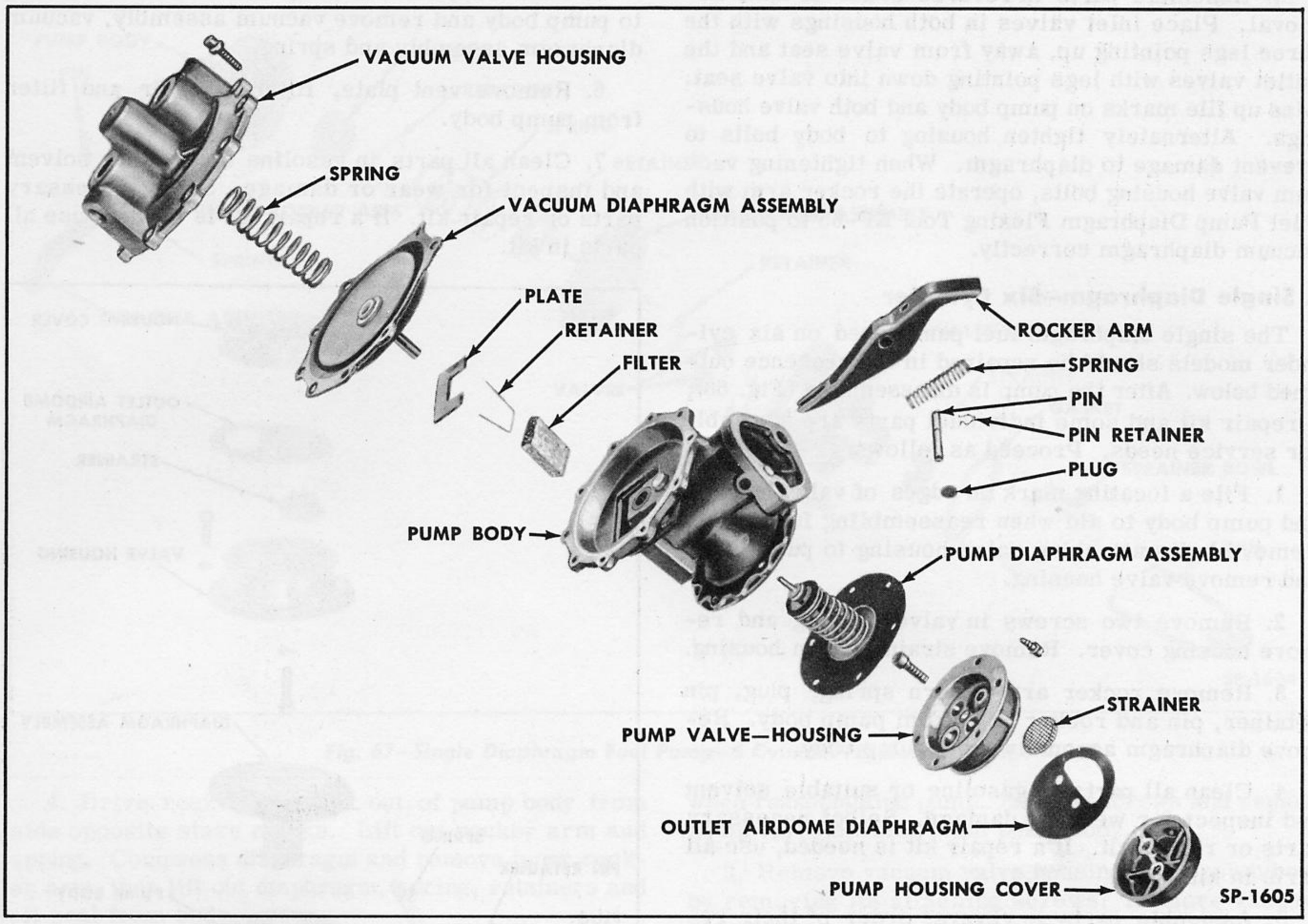

Fig. 69—Fuel and Vacuum Pump—6 Cylinder—Exploded View

Occasionally, slight changes are incorporated in each carburetor. These changes are identified by a suffix letter on the model number and should be considered when obtaining repair kits or parts.

The procedures outlined in this section can be used for repairing and adjusting any of the carburetors used on Henry J's. Only slight departures from the procedure may be necessary, depending on the carburetor model being repaired.

The carburetor is designed to supply the fuel needs of the engine under all conditions. To do this, it is necessary to have a carburetor with separate "circuits" to meet each of the conditions the engine may be subjected to. These circuits can be distinguished as follows:

1. The FLOAT CIRCUIT is merely a float operated valve that controls fuel flow into the carburetor bowl and attempts to maintain fuel level at a predetermined height.

2. The IDLE OR LOW-SPEED CIRCUIT is the means by which the engine obtains fuel when the throttle valve closes off the main air passage (air horn). The idle system is actually a by-pass around the throttle valve that allows fuel from the bowl to be "sucked" in to the intake manifold.

3. The HIGH-SPEED CIRCUIT is in operation when the throttle opens and air is passing through the air horn, past the end of a nozzle from the fuel bowl. This air flow will, in effect, suck fuel out of the nozzle and take it into the intake manifold. A metering rod is connected by linkage to the throttle valve. Both the metering rod and throttle valve are used to control the high speed circuit.

4. The PUMP-CIRCUIT is used for fast acceleration. When the foot throttle is suddenly depressed, a small mechanical pump in the carburetor is also depressed, forcing a small extra charge of fuel into the air stream until the fuel has time to start coming out of the high speed nozzle.

5. The STARTING CIRCUIT consists of a choke valve located in the air horn above the fuel jets. When the choke valve closes, a very rich mixture is supplied to the engine. This mixture will ignite much easier than the normal, leaner mixtures.

CARBURETOR REPLACEMENT

The carburetor can be removed from the engine for repairs or replacement as follows:

1. Remove air cleaner.

2. Disconnect choke cable and accelerator linkage at carburetor.

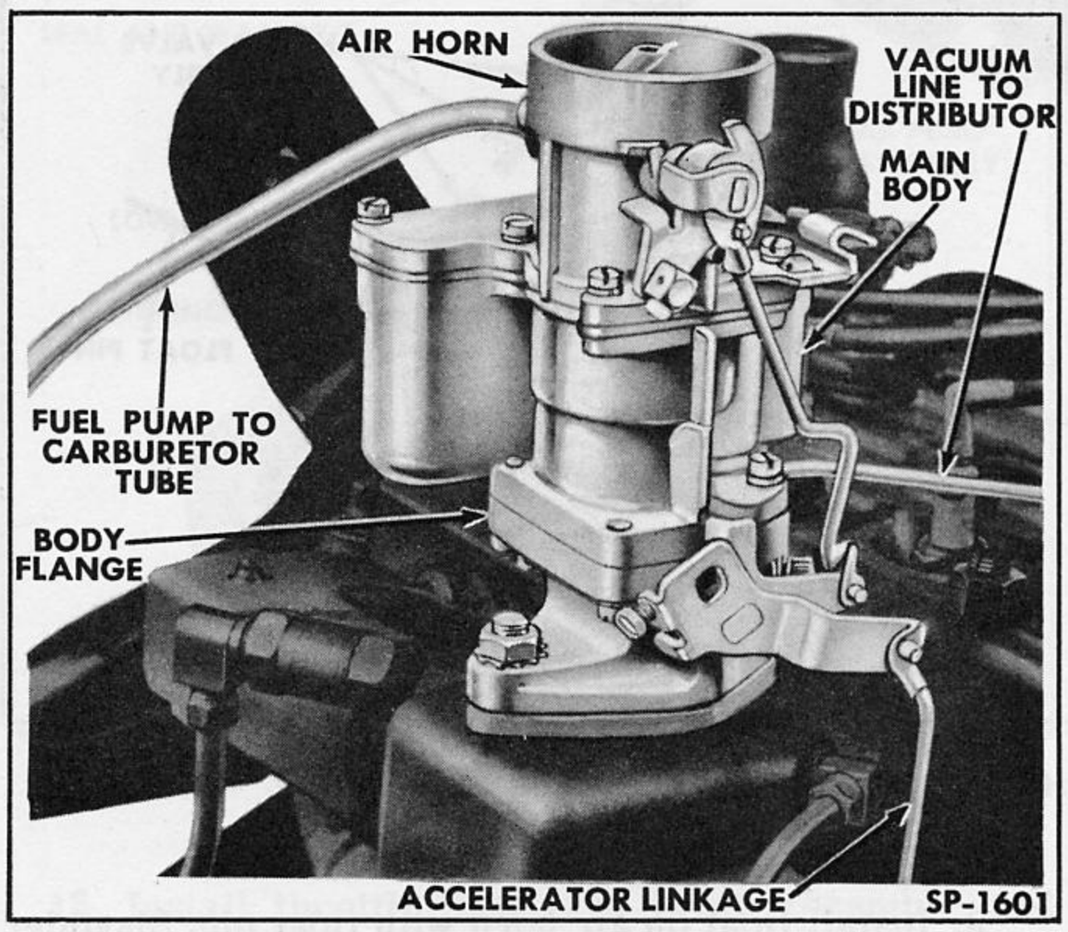

Fig. 70—Typical Carburetor Installation

3. Disconnect fuel and vacuum lines from carburetor.

4. Remove carburetor to intake manifold nuts and washers and remove carburetor and gasket. Clean mounting surfaces of carburetor and manifold, being careful not to drop dirt into manifold.

5. To install, reverse this procedure.

CARBURETOR REPAIR

The carburetor can be disassembled and repaired after it has been removed from the engine. It is recommended that a carburetor repair kit be used when rebuilding a carburetor. Proper tools (such as Carburetor Overhaul Kits KF-40 and KF-141) are helpful in overhauling the carburetor. Proceed as follows:

1. Disconnect fast idle connector rod and remove screws attaching air horn to carburetor main body (Fig. 71). Remove air horn assembly and gasket. Choke tube clamp is removed with one of the air horn attaching screws.

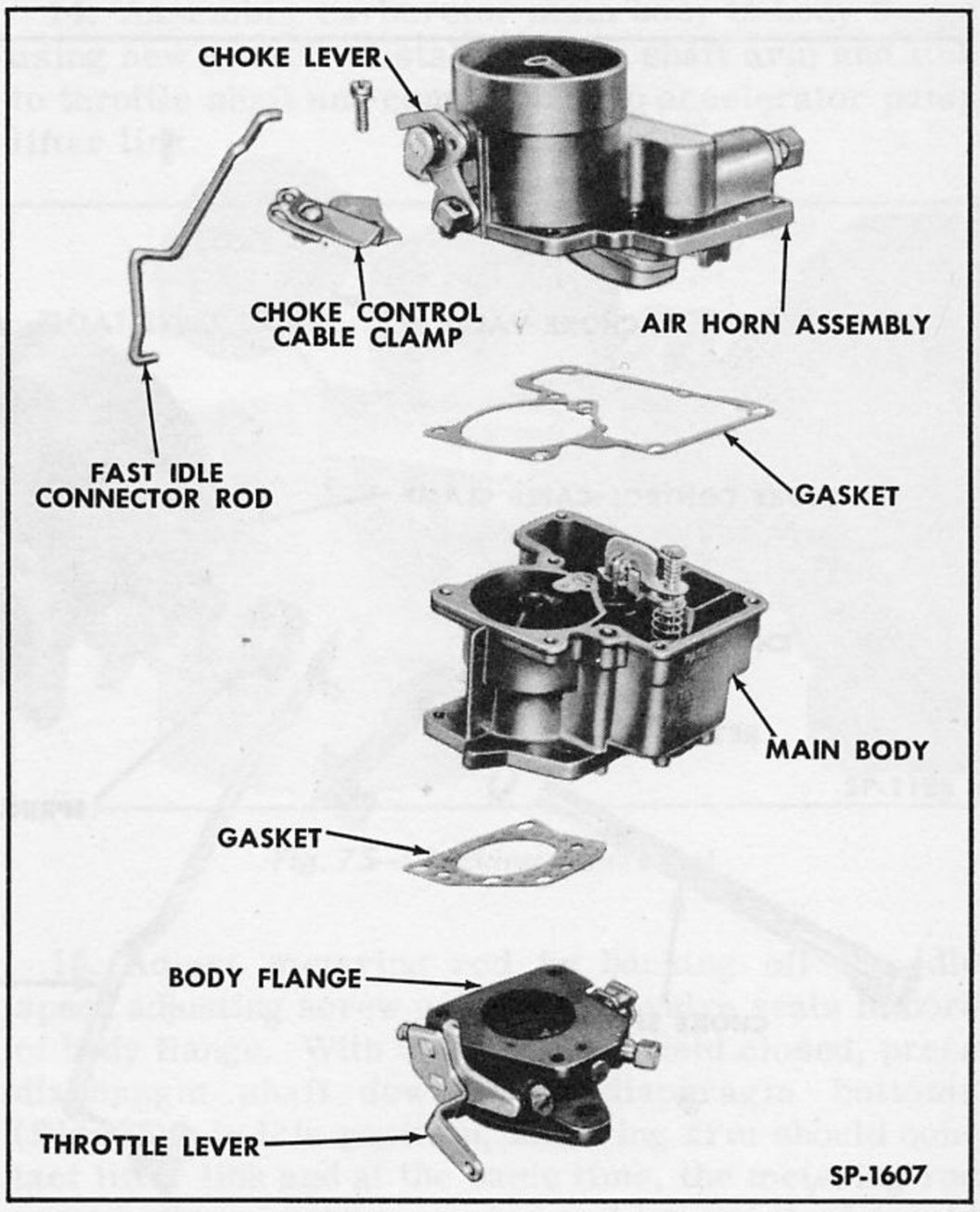

Fig. 71—Typical Carburetor—Exploded View

2. Disassemble air horn (Fig. 72) by removing float pin, float, needle valve assembly and remove needle valve seat and gasket using a wide bladed screwdriver that will contact both slots in the seat. Remove two screws and choke valve from shaft, disconnect spring from choke shaft and remove shaft. Remove choke lever and spring after removing retainer ring from groove in air horn. Remove fuel strainer nut and strainer screen, if so equipped.

3. Turn carburetor main body upside down, allowing pump check valve to drop out. Remove throttle shaft arm and link from throttle shaft. Remove upper spring retainer on pump shaft and remove spring, metering rod assembly, pump lifter link and baffle plate (if so equipped) from carburetor bowl (Fig. 73).

Remove four pump diaphragm housing attaching screws and remove pump assembly from bowl. Remove metering rod jet and low speed jet from carburetor bowl with a proper size screwdriver.

4. Remove carburetor main body from body flange by removing attaching screws.

5. To disassemble body flange (Fig. 74), remove two screws and throttle valve from shaft and remove

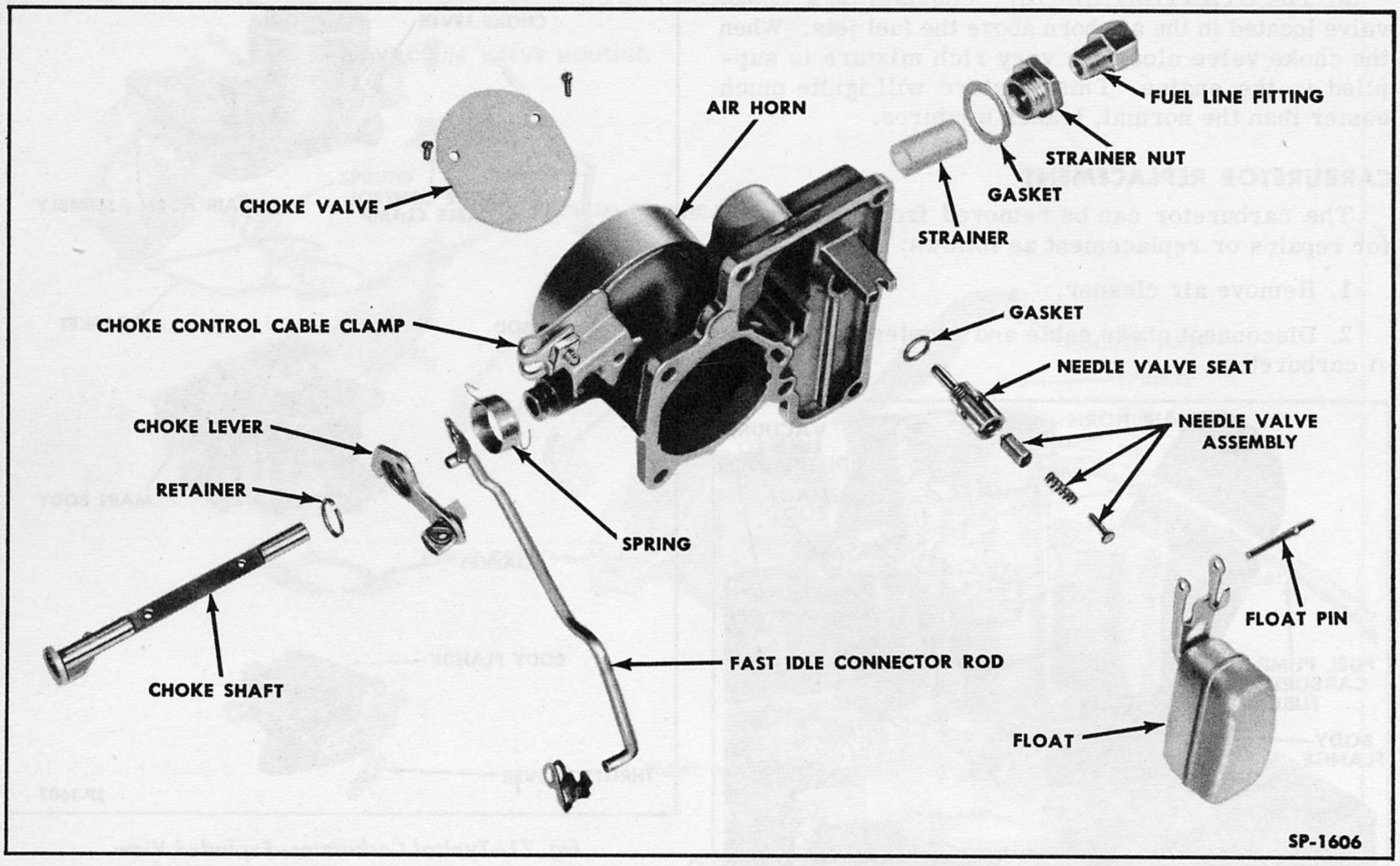

Fig. 72—Carburetor Air Horn—Exploded View

shaft and throttle lever. Remove idle mixture adjusting screw and spring and vacuum line fitting.

6. Clean all parts thoroughly with a suitable cleaning solvent that will dissolve carbon, varnish and gum. Blow out all passages with compressed air. Scrape all gasket surfaces clean. Tap a new idle port rivet plug into the body flange with a hammer. Check all parts for cracks, wear or damage.

7. Position choke lever spring and lever in place on air horn, then install retaining ring. Insert choke shaft in air horn and position choke valve in place on shaft with letter "C" facing upward. Install choke valve screws. Hold choke valve in closed position to seat valve in air horn while tightening screws. Upset ends of screws after tightening to lock them in place.

8. Install needle valve seat and gasket in air horn with a screwdriver that is wide enough to contact both slots to prevent damage to seat. Place needle valve assembly in seat. Install fuel strainer, nut and gasket to air horn assembly.

9. Install float on air horn with float pin. Shoulder of pin should be on side nearest carburetor wall. Obtain a piece of stock that is 9/32 inch thick for use as a float level gauge. Hold air horn assembly upside down (float on top) and check distance between float and gasket surface of air horn as shown in Fig. 75. Float should just contact gauge. If not, adjust float level by bending tip on float — do not bend float arm.

10. Install metering rod jet and low speed jet in main body with a wide bladed screwdriver. Install pump check valve in main body.

11. Install accelerating pump diaphragm assembly and housing in main body with four attaching screws. Install lower spring and retainer to diaphragm shaft. Install pump lifter link with seal and washer (if so equipped) in place on link. Position metering rod assembly on diaphragm shaft with metering rod in jet. Install upper spring and retainer.

12. Install idle mixture adjusting screw and spring to body flange. Turn screw in carefully until it seats, then back off 1-1/2 turns. Install distributor vacuum line fitting.

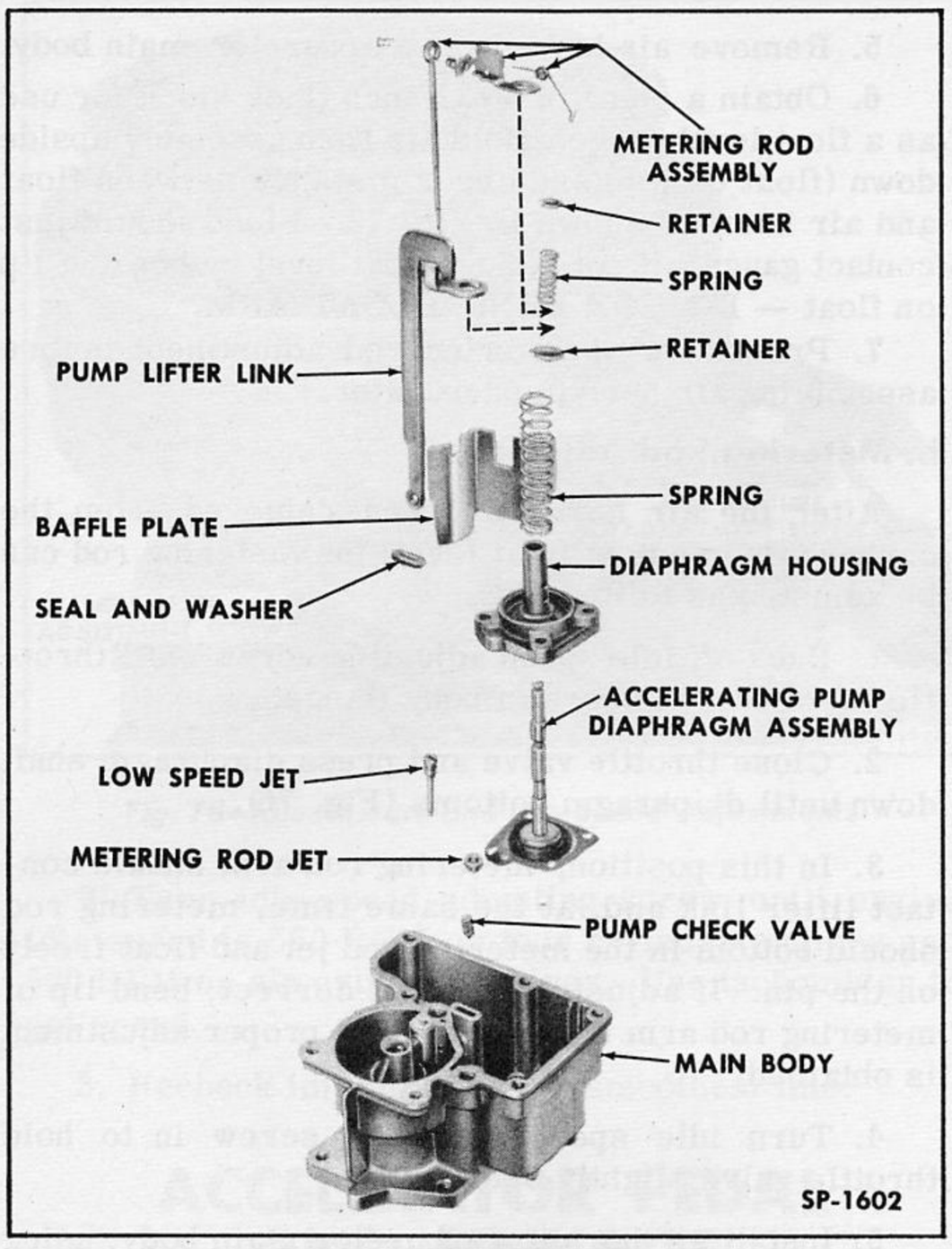

Fig. 73—Carburetor Main Body—Exploded View

13. Install throttle shaft and lever assembly and fast idle arm to body flange. Install throttle valve to shaft with two screws, but do not tighten. Valve must be positioned so letter "C" faces downward. Center valve by holding it firmly in a closed position and tighten attaching screws.

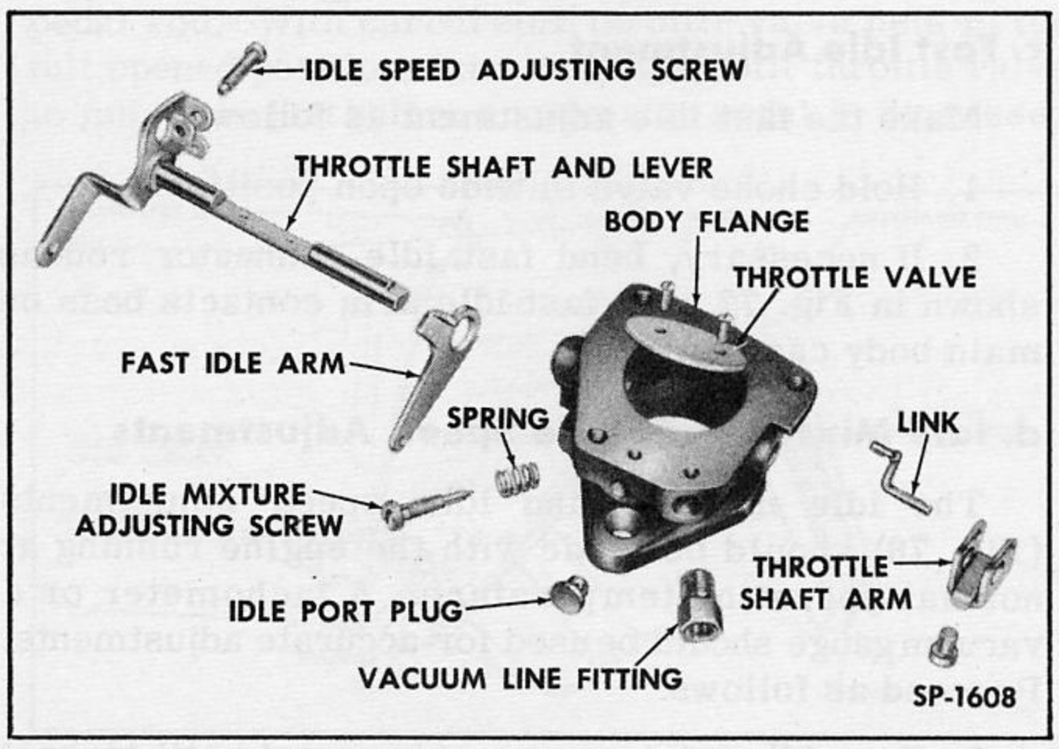

Fig. 74—Carburetor Body Flange—Exploded View

14. Assemble carburetor main body to body flange using new gasket. Install throttle shaft arm and link to throttle shaft and connect link to accelerator pump lifter link.

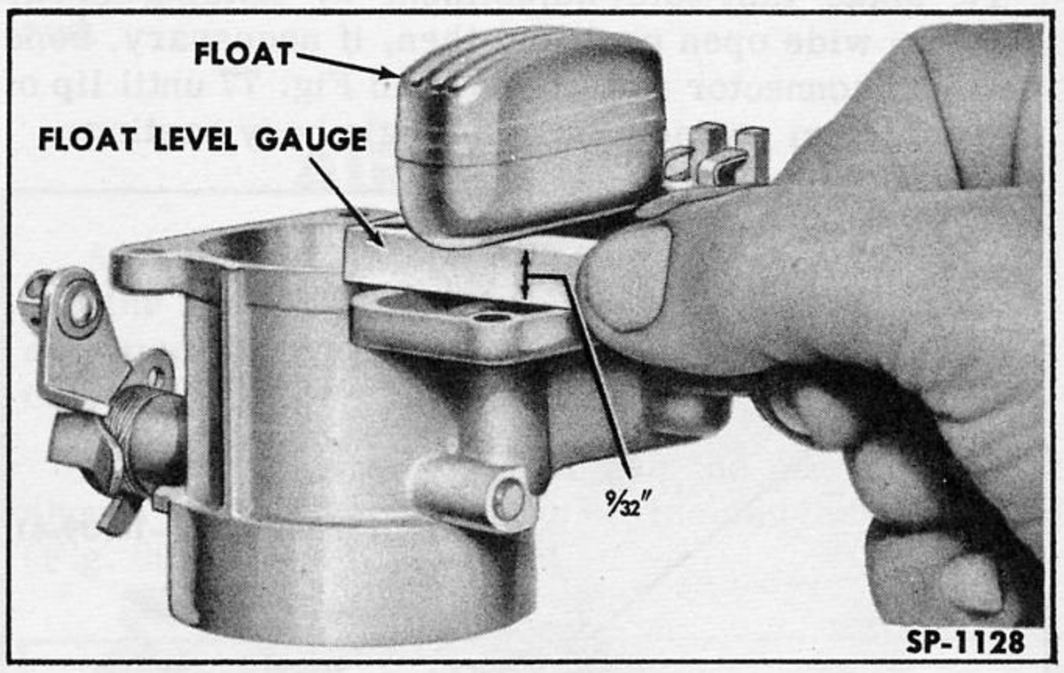

Fig. 75—Checking Float Level

15. Adjust metering rod by backing off the idle speed adjusting screw until throttle valve seats in bore of body flange. With throttle valve held closed, press diaphragm shaft down until diaphragm bottoms (Fig. 76). In this position, metering arm should contact lifter link and at the same time, the metering rod must bottom in the metering rod jet and float freely on the pin.

Adjust by bending lip of metering rod arm up or down until correct adjustment is obtained.

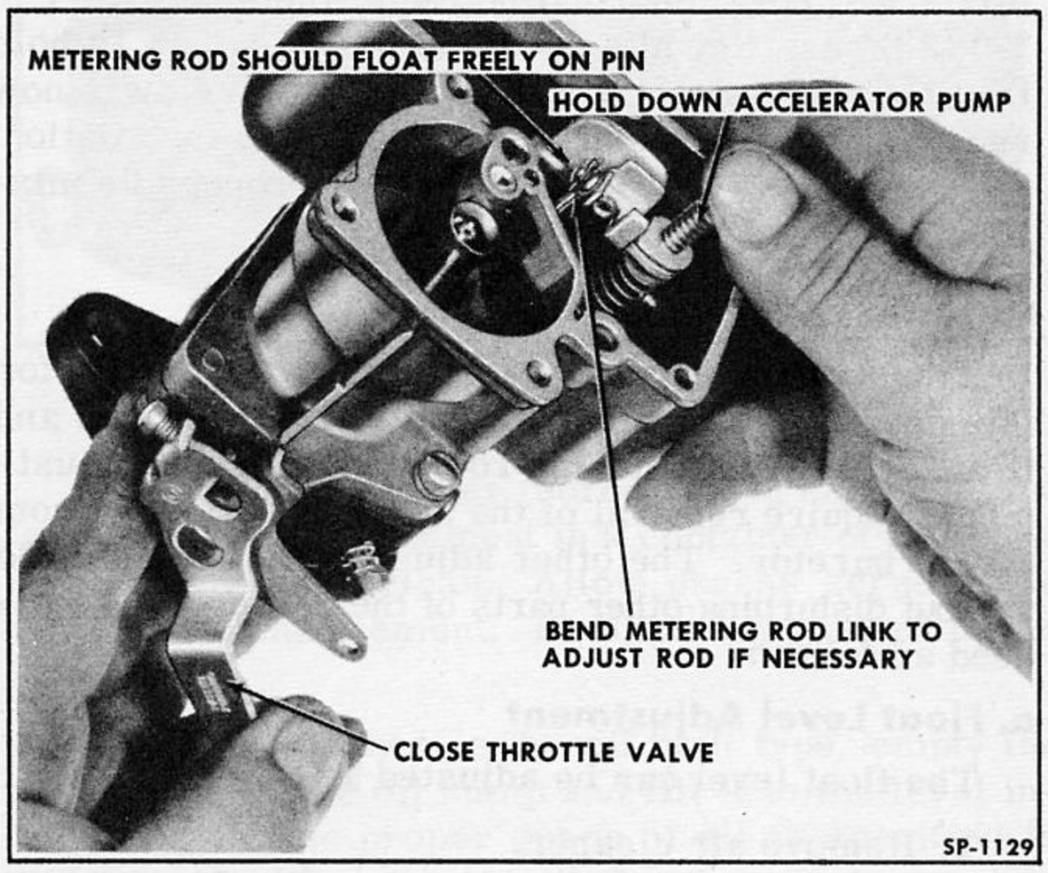

Fig. 76—Checking Metering Rod Adjustment

16. Install air horn on carburetor main body, using new gasket. Install fast idle connector rod between

choke lever and fast idle arm on throttle shaft. Install choke control cable clamp under air horn to main body attaching screw.

17. Make fast idle adjustment by holding choke valve in wide open position, then, if necessary, bend fast idle connector rod as shown in Fig. 77 until lip of fast idle arm contacts boss on main body casting.

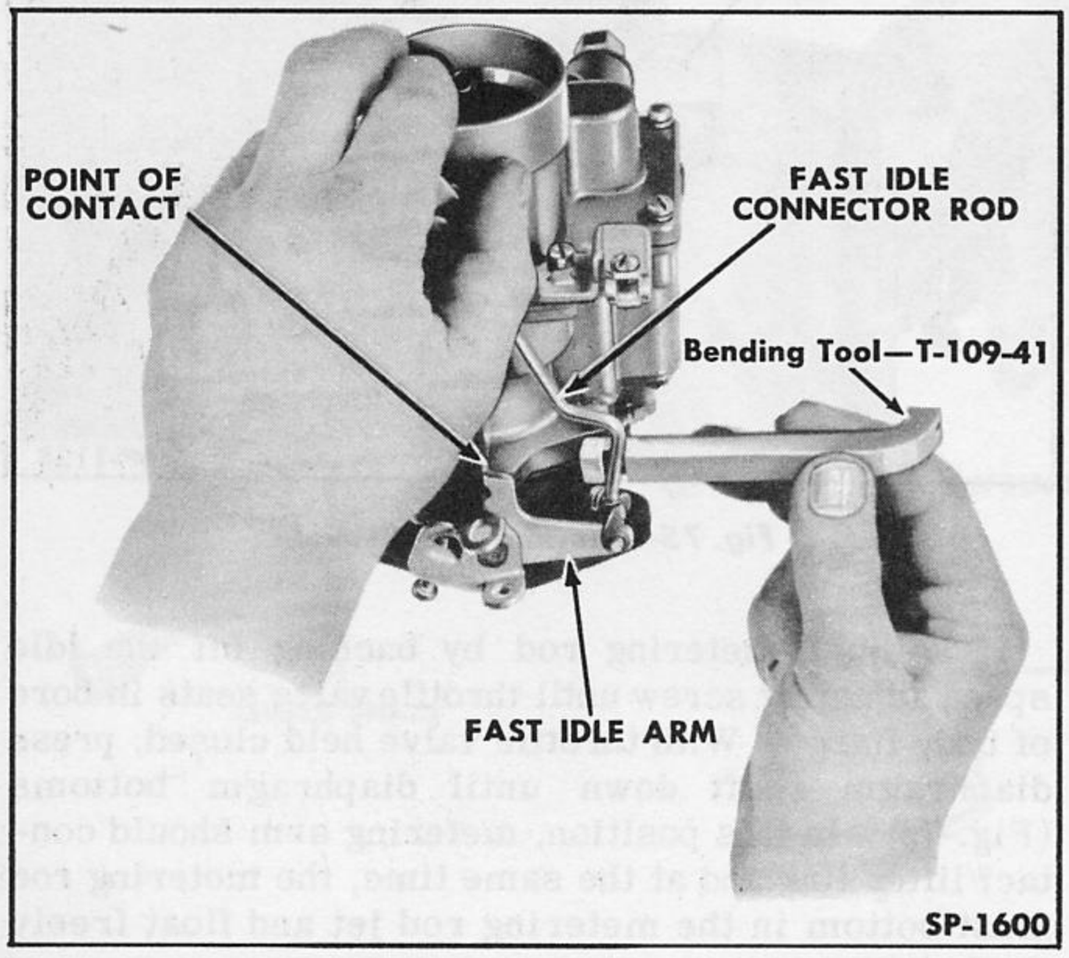

Fig. 77—Fast Idle Adjustment

18. Check idle mixture adjustment by turning idle mixture screw in until it bottoms, then back off 1 to 1-1/2 turns. Set idle speed adjusting screw to hold throttle valve slightly open. The carburetor is now ready for installation on the engine. After installation, the carburetor should be adjusted for proper idle mixture and idle speed as detailed below.

CARBURETOR ADJUSTMENTS

Adjustments can be made on the carburetor for idle speed, idle mixture, fast idle, metering rod and float level. The metering rod and float level adjustments require removal of the air horn assembly from the carburetor. The other adjustments can be made without disturbing other parts of the carburetor. Proceed as follows:

a. Float Level Adjustment

The float level can be adjusted as follows:

1. Remove air cleaner.
2. Disconnect choke cable and accelerator linkage at carburetor.
3. Disconnect fuel and vacuum lines from caruretor.
4. Disconnect fast idle connector rod from choke lever.
5. Remove air horn from carburetor main body.
6. Obtain a piece of 9/32 inch thick stock for use as a float level gauge. Hold air horn assembly upside down (float on top) and check distance between float and air horn as shown in Fig. 75. Float should just contact gauge. If not, adjust float level by bending lip on float — DO NOT BEND FLOAT ARM.
7. Proceed with metering rod adjustment before assembling air horn to carburetor.

b. Metering Rod Adjustment

After the air horn has been removed from the carburetor to adjust float level, the metering rod can be adjusted as follows:

1. Back off idle speed adjusting screw until throttle valve seats in bore of body flange.

2. Close throttle valve and press diaphragm shaft down until diaphragm bottoms (Fig. 76).

3. In this position, metering rod arm should contact lifter link and, at the same time, metering rod should bottom in the metering rod jet and float freely on the pin. If adjustment is not correct, bend lip of metering rod arm up or down until proper adjustment is obtained.

4. Turn idle speed adjusting screw in to hold throttle valve slightly open.

5. Install air horn to carburetor main body, using new gasket.

6. Connect fast idle connector to choke lever.

7. Install choke control cable clamp under air horn attaching screw and connect choke cable to clamp and to choke lever. Connect accelerator linkage to throttle lever.

8. Connect fuel and vacuum lines to carburetor and install air cleaner.

c. Fast Idle Adjustment

Make the fast idle adjustment as follows:

1. Hold choke valve in wide open position.

2. If necessary, bend fast idle connector rod as shown in Fig. 77 until fast idle arm contacts boss on main body casting.

d. Idle Mixture and Idle Speed Adjustments

The idle mixture and idle speed adjustments (Fig. 78) should be made with the engine running at normal operating temperature. A tachometer or a vacuum gauge should be used for accurate adjustments. Proceed as follows:

1. Turn idle mixture screw in or out until highest idle speed or vacuum reading is obtained.

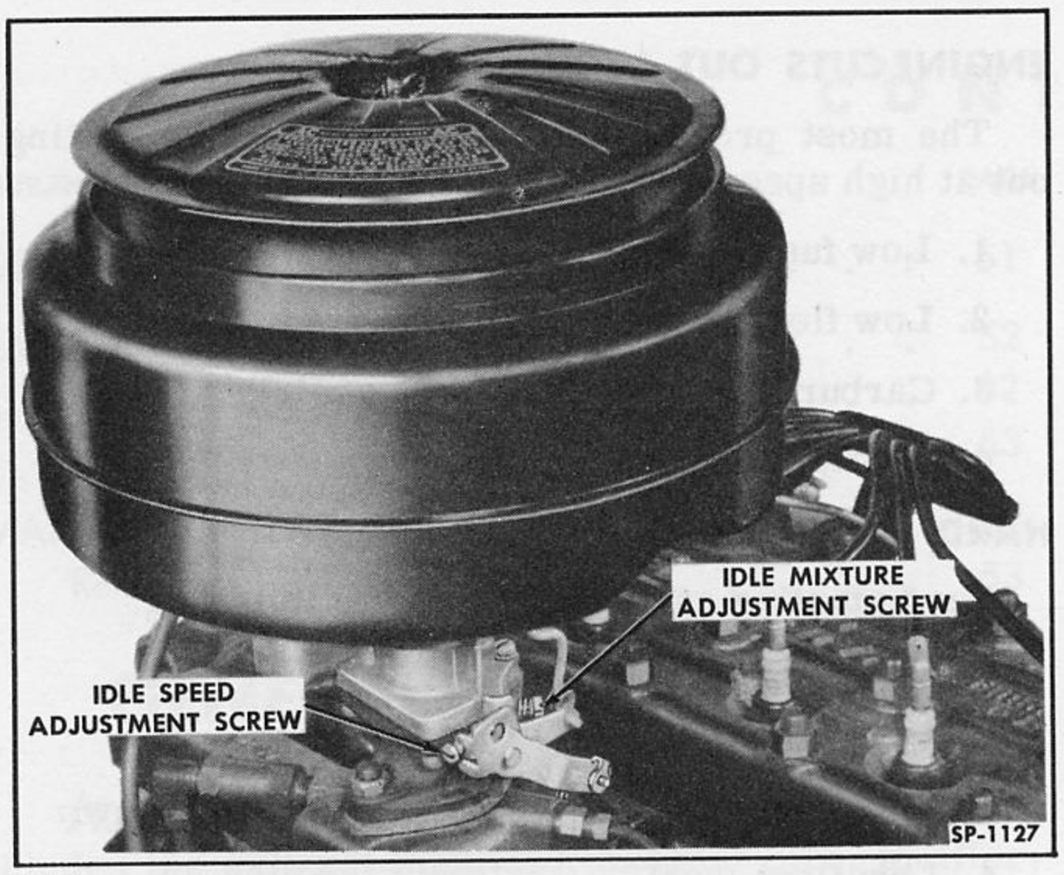

Fig. 78—Idle Mixture and Idle Speed Adjustments

2. Turn idle speed adjusting screw until engine idle speed is 550 RPM on four cylinder engines and 500 RPM on six cylinder engines. Use tachometer to set speed.

3. Recheck idle mixture for smoothest idle.

ACCELERATOR PEDAL AND LINKAGE

Engine speed is controlled by a throttle valve in the carburetor which is operated by the accelerator pedal through linkage. Any or all parts of the accelerator pedal and linkage are easily replaced. The accelerator linkage is adjustable at the pedal rod (Fig. 79) by two nuts which control the position of the bell crank on the pedal rod.

To adjust the linkage, loosen two lock nuts on the pedal rod. With carburetor throttle valve held in the full opened position, turn lock nuts until throttle valve is fully open just before accelerator pedal is depressed enough to contact the floor mat, or if vehicle is equipped with overdrive, just before pedal contacts the kickdown switch. Tighten lock nuts. The pressure required to depress the accelerator can be varied by changing the location of the spring clip on the pedal rod.

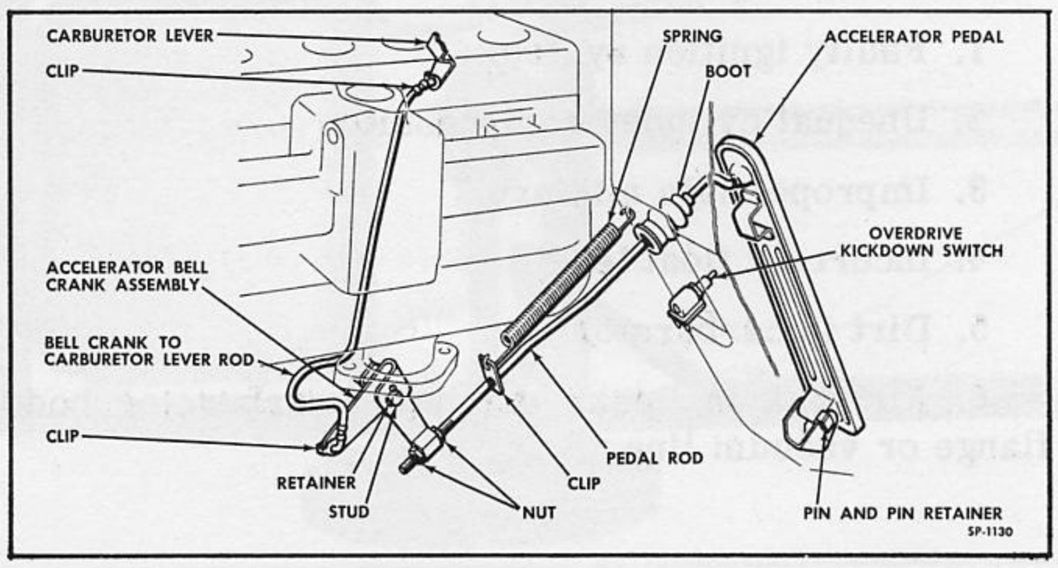

Fig. 79—Accelerator Pedal and Linkage

AIR CLEANER

An oil bath air cleaner is used on both the four and the six cylinder engines. Some early four cylinder models were equipped with an oil wetted air cleaner.

Before attempting to service the air cleaner, it should be removed from the engine and disassembled (Fig. 80).

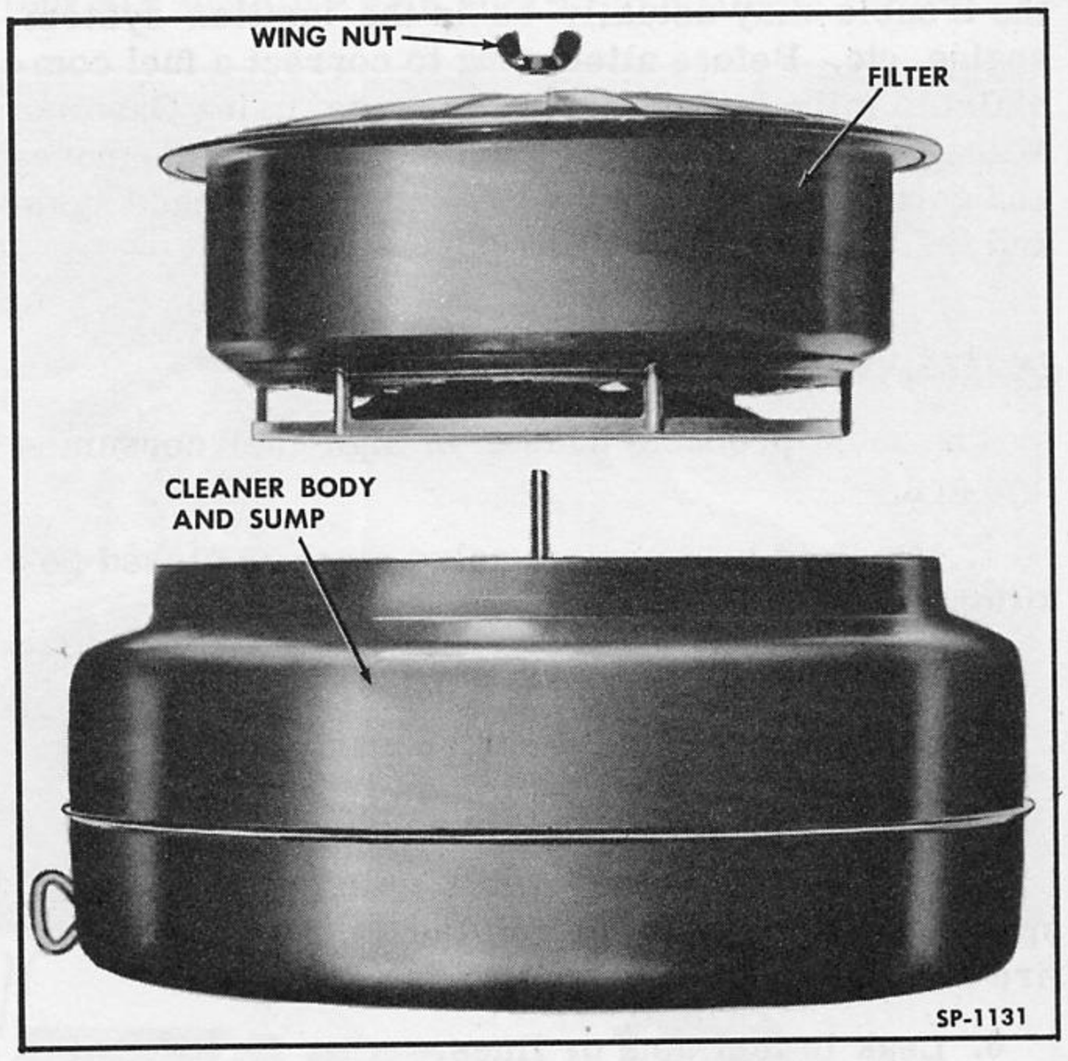

Fig. 80—Oil Bath Air Cleaner—Exploded View

Clean the air cleaner thoroughly in kerosene and wipe dry. Dip the element in a container of kerosene and agitate until clean. Allow excess kerosene to drain from the element. Replace any gasket that is damaged.

If the air cleaner is the oil bath type, empty the old oil, clean the oil sump and fill it to the level indicated with the proper grade of oil as specified in Section 17, "Lubrication." It is important not to overfill the oil sump. Assemble the air cleaner and install it on the engine.

If the air cleaner is the oil wetted type, the cleaner element must be re-wetted by dipping in the proper

grade of engine oil as specified in Section 17, "Lubrication". Allow excess oil to drain off before assembling.

The air cleaner also serves as the source of air intake for the positive type crankcase ventilating system. A rubber hose attaches to a nozzle on the bottom of the air cleaner and extends to the oil filler tube.

SERVICE DIAGNOSIS

The following will be helpful in diagnosing and correcting fuel complaints. Hard starting, excessive fuel consumption or unsatisfactory engine performance is blamed on the carburetor in many instances while the trouble may actually be in the ignition system, engine, etc. Before attempting to correct a fuel complaint, a mileage test should be made, using Gasoline Mileage Tester DD-425. After the trouble is diagnosed and corrected, the mileage test should be made again and the two tests compared.

EXCESSIVE FUEL CONSUMPTION

The most probable causes of high fuel consumption are:

1. Manifold heat control valve stuck in closed position.
2. Faulty ignition system.
3. Carburetor not adjusted properly.
4. Excessive operation of accelerator pedal.
5. Incorrect speedometer reading due to wrong speedometer pinion gear for the axle being used or tire size different than specified.
6. Leak in fuel tank or lines.
7. Muffler, tail pipe or exhaust pipe partially restricted.
8. Brakes adjusted too tight or hand brake not released.
9. Air cleaner restricting normal passage of air.
10. Tire pressure too low.
11. Excessive toe-in of front wheels.
12. Bad valves and worn piston rings.
13. Incorrect valve or ignition timing.

ENGINE CUTS OUT AT HIGH SPEED

The most probable causes of the engine cutting out at high speed are:

1. Low fuel pump pressure.
2. Low float level.
3. Carburetor jet or fuel lines restricted.
4. Faulty ignition system.

HARD STARTING

Hard starting can result from the following:

1. Faulty ignition system.
2. Poor gasoline.
3. Vapor lock (see causes of vapor lock below).
4. Low float level.
5. Dirt in carburetor.
6. Needle valve stuck shut.
7. Inoperative fuel pump.
8. Leaky carburetor.

VAPOR LOCK

Vapor lock is usually the result of excessive heat. Check for the following:

1. Check cooling system for proper engine cooling.
2. Check carburetor float level. Make sure float moves freely.
3. Faulty ignition system.
4. Not enough valve clearance.
5. Restricted exhaust system.
6. Manifold heat control valve stuck in open position.

ROUGH ENGINE

When the engine runs rough at idle speed, check for the following:

1. Faulty ignition system.
2. Unequal cylinder compression.
3. Improper idle mixture.
4. Incorrect float level.
5. Dirt in carburetor.
6. Air leak in intake manifold, carburetor body flange or vacuum line.