

SECTION 6M

ENGINE FUEL

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ROCHESTER FUEL INJECTION

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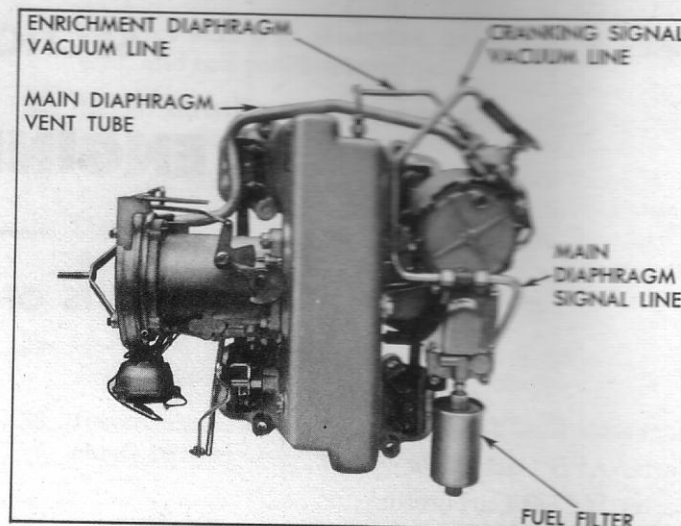
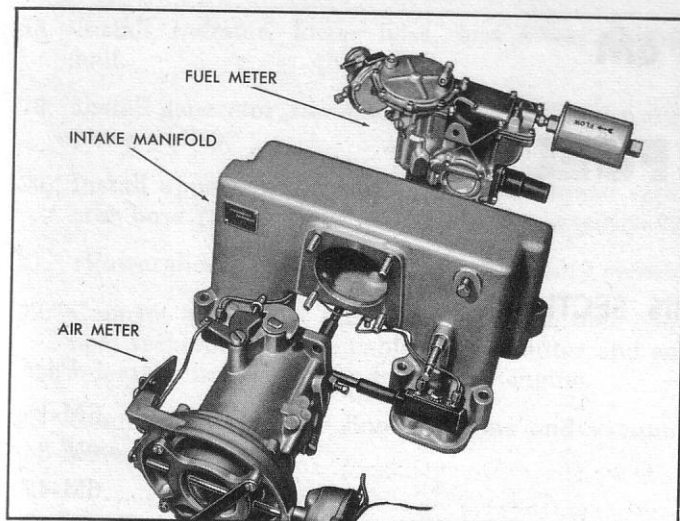


Fig. 1—Fuel Injection Assembly

GENERAL DESCRIPTION

The Chevrolet Fuel Injection System (fig. 1) has three basic components—(1) the AIR METER, which supplies a vacuum control signal to the fuel meter in response to engine load demand; (2) the FUEL METER, which interprets the vacuum control signal from the air meter and regulates the fuel flow to the nozzles accordingly; and (3) the INTAKE MANIFOLD, which provides the distribution system for the rammed air flow to the engine cylinders.

The following general description and operating principles apply to the latest type Fuel Injection Unit. Past model operating principles that are radically different are covered under Past Model Operating Principles.

AIR METER

The air meter consists of three main parts—the throttle valve, the cold enrichment valve and diffuser cone assembly and the air meter body (fig. 2).

The throttle valve controls the flow of air into the system and is connected mechanically to the accelerator pedal.

The diffuser cone is suspended in the bore of the air meter inlet. Its design provides a highly efficient, annular venturi between the air meter body and the cone (fig. 3). This type of venturi produces the minimum restriction to air flow that is a vital factor in engine breathing capacity.

The air meter body houses the foregoing components plus idle and main venturi signal systems.

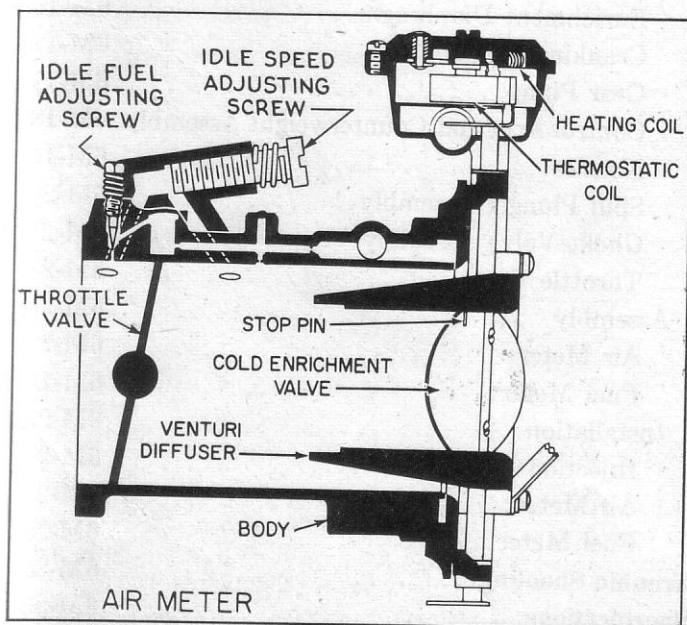


Fig. 2—Air Meter

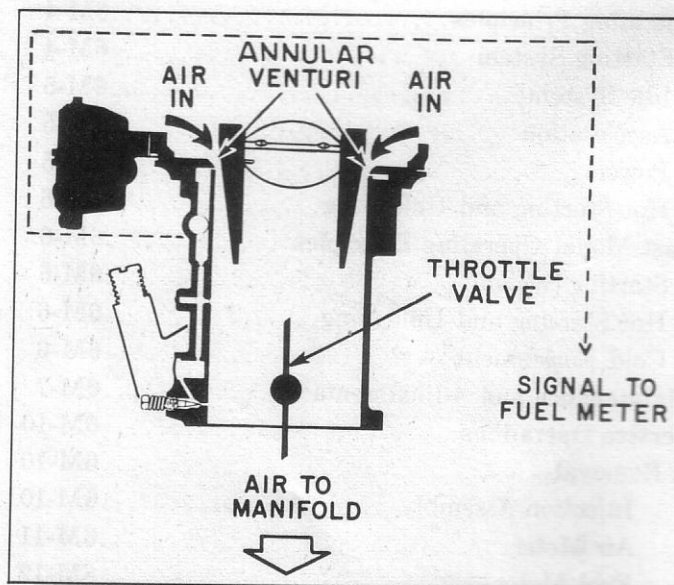


Fig. 3—Annular Venturi Location

MAIN VENTURI SIGNAL

Main venturi vacuum signals are generated at the venturi by air flowing past an annular opening formed between the air meter body and the machined piezometer ring. The signal is then transmitted thru a tube to the main control diaphragm in the fuel meter (fig. 4).

The venturi vacuum signal (except at idle speeds) will always be a direct measure of air flowing into the engine; therefore the signal can be used to automatically control fuel/air ratios to the engine cylinders.

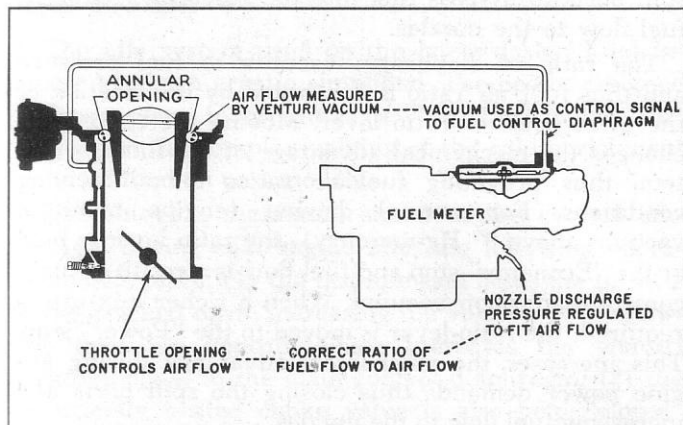


Fig. 4—Main Control Signal

IDLE AIR

Approximately 40% of the air requirements at idle enters the engine by way of the nozzle blocks from an air connection tapped into the air meter body (fig. 5). Part of the remaining 60% of idle air enters past the throttle valve which is preset against a fixed stop and part through the idle air by-pass passage that is controlled by the large idle speed adjusting screw. Turning this screw in reduces idle speed and turning the screw out increases idle speed.

FUEL METER

The fuel meter contains a float controlled fuel reservoir very similar to that used in conventional car-

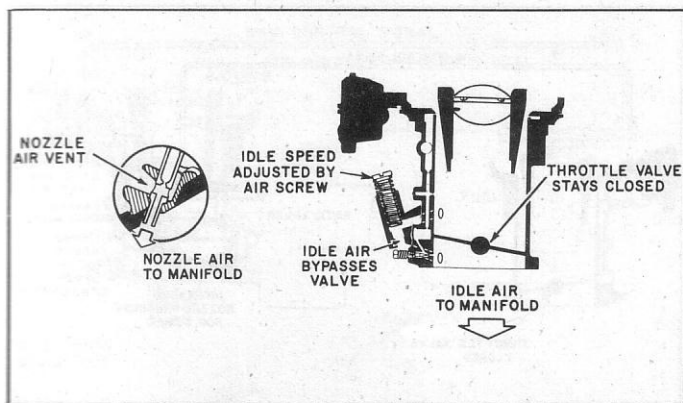


Fig. 5—Idle Air By-pass System

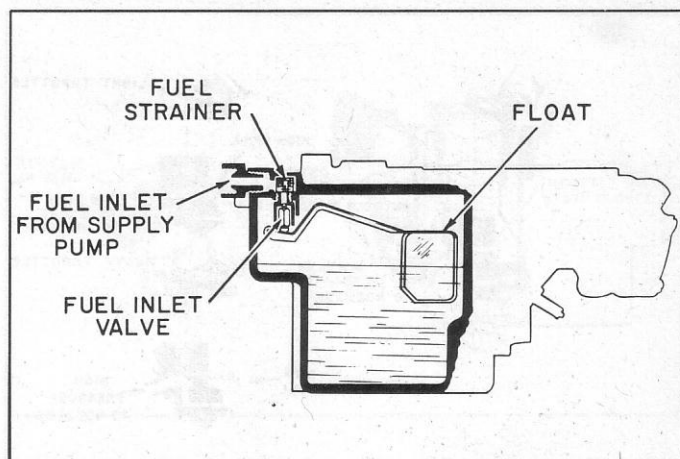


Fig. 6—Fuel Meter

buration (fig. 6). Fuel is supplied to the fuel meter by the existing engine fuel pump. Fuel enters the meter thru a 10 micron filter, passes thru the fuel inlet valve, and spills directly into the main reservoir of the fuel meter where the high pressure gear pump picks it up.

HIGH PRESSURE GEAR PUMP

The precision, high pressure, spur gear type pump is located in the lower part of the fuel meter main reservoir and is completely submerged at all times (fig. 7). The pump is powered by a flexible shaft driven by the distributor and rotates at $\frac{1}{2}$ engine speed. Nominal fuel pressures vary from near zero to 200 psi, depending on engine speed. Fuel supply not used by the engine is spilled back into the fuel meter by means of a fuel control system.

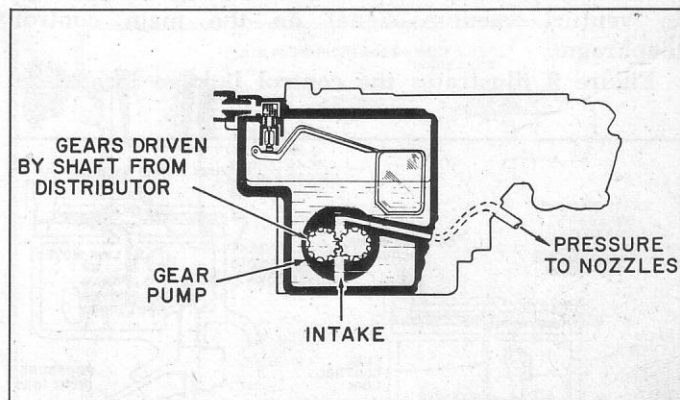


Fig. 7—Fuel Pump Location

FUEL CONTROL SYSTEM

Fuel pressure (flow) from the positive displacement gear pump must be regulated to provide the correct flow to the nozzles. The control of fuel flow in the Chevrolet Injection System is regulated by the amount of fuel spilled or bypassed away from the nozzle circuits. A three-piece valve is located in series between

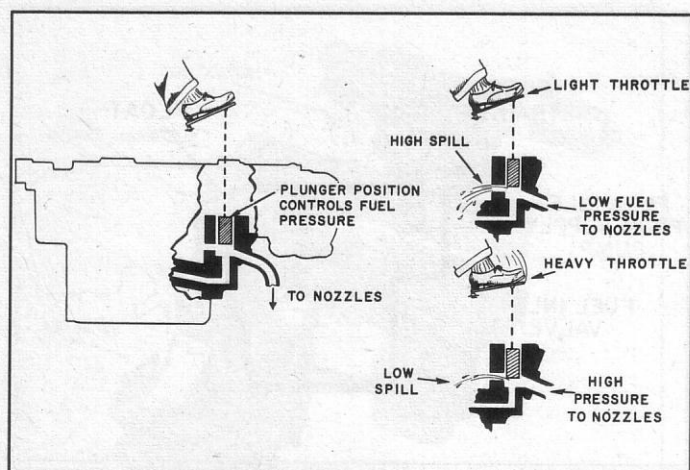


Fig. 8—Fuel Control System

the gear pump and the nozzles (fig. 8). When a high fuel flow is required, the spill plunger or disc is moved downward, closing off the spill ports to the fuel meter reservoir. This action prevents the fuel from by-passing the nozzle circuits and thus increases the fuel flow to the nozzles. Correspondingly, the spill plunger or disc must be raised to allow the spill ports to be exposed when a low fuel flow is required. This causes the main output of the gear pump to by-pass the nozzle circuits and re-enter the meter reservoir thru the now opened spill ports.

The accelerator pedal is not directly connected to the spill plunger. Fuel control is accomplished by a very precise linkage system. This linkage system is carefully counterbalanced so that the only forces acting on the system are fuel pressure and diaphragm vacuum. This precision balancing of the linkage makes the unit extremely sensitive to the slightest change in venturi vacuum signal on the main control diaphragm.

Figure 9 illustrates the control linkage located in

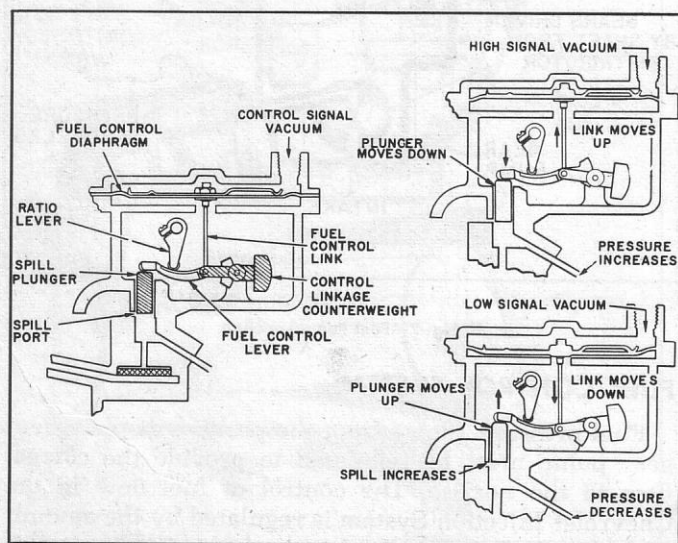


Fig. 9—Fuel Control Linkage

the fuel meter. One end of the fuel control lever rests directly on the spill plunger head and controls spill plunger or disc position. The other end of the control lever is connected by a link to the main control diaphragm. The control lever pivots on another lever called the ratio lever. When the diaphragm pulls the control lever upward, the roller end pushes the spill plunger or disc downward, closing off the spill ports and thus increasing fuel flow to the nozzles. When the diaphragm allows the control lever to fall, fuel pressure forces the spill plunger or disc upward and opens the spill ports to by-pass fuel into the reservoir, reducing fuel flow to the nozzles.

The ratio of diaphragm vacuum to fuel pressure and thus fuel/air ratio is controlled by the location of the pivot point or ratio lever. Moving the ratio lever changes the mechanical advantage of the linkage system, thus providing fuel/air ratios for all driving conditions. For normal driving (engine manifold vacuum above 8" Hg-mercury), the ratio lever is held at the "Economy" stop and fuel flow is a result of main control diaphragm vacuum. When a richer mixture is required, the ratio lever is moved to the "Power" stop. This increases the mechanical advantage during engine power demands thus closing the spill ports and increasing fuel flow to the nozzles.

OPERATING PRINCIPLES

STARTING SYSTEM

Cold engine starting conditions require extra fuel to compensate for poor fuel evaporation. Pumping the accelerator will not provide this fuel because there is no accelerator pump as in conventional carburetion. The accelerator should be depressed once and then released, allowing the throttle to be preset for starting by the fast idle cam. During cranking rpm, the signal generated at the idle needle and air meter venturi is very low and has to be boosted. This boost comes from a normally spring loaded open cranking signal valve located at the enrichment diaphragm housing (fig. 10). The open cranking signal valve al-

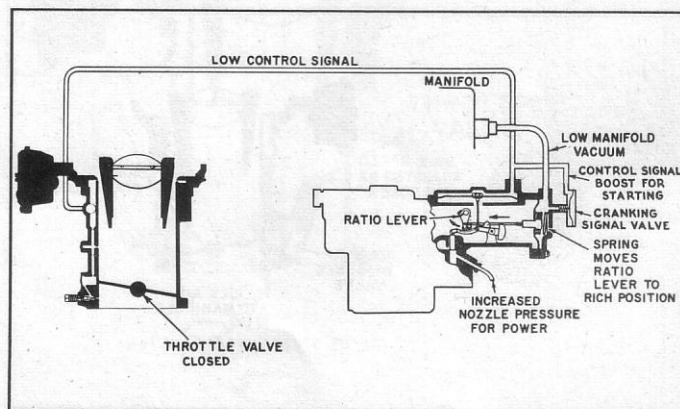


Fig. 10—Starting System

lows direct manifold **CRANKING VACUUM** to react on and lift the main control diaphragm closing the spill valve. In addition, the enrichment diaphragm is spring loaded to hold the ratio lever at the rich or "Power" stop (fig. 10), thus maximum fuel flow available at cranking speeds is directed to the nozzles. Immediately upon starting or when manifold vacuum reaches 1" Hg, the engine manifold vacuum overcomes the springs in the cranking signal valve and enrichment diaphragm, and the Fuel Injector operates on the normal idle system.

IDLE SYSTEM

The idle system used on the latest design Fuel Injector has been greatly simplified. The newly designed diffuser cone incorporates a "choking" valve that eliminates the complex valving of the cold enrichment system found on past models.

To achieve a maximum signal at the control diaphragm during cold engine idle, the following operations take place: (1) the fast idle cam holds the throttle valve cracked open, increasing the velocity of air flowing thru the venturi which increases the venturi vacuum signal to the main control diaphragm, (2) the electrically heated choke valve is also held "closed" during initial cold engine operation, forcing all air flow to pass thru the venturi. This makes it possible to obtain a usable venturi signal even at relatively low engine speeds, (3) the enrichment diaphragm is connected directly to manifold vacuum and moves the ratio lever to the "Economy" stop as soon as manifold vacuum overcomes the diaphragm spring. As the electric heating element relaxes the thermostat and allows the choke valve to open, less air passes thru the venturi, and the signal generated here drops. The idle signal system then becomes the more important signal.

Fuel control during warm-engine-idle, is accomplished thru the idle circuit signal acting on the main control diaphragm (fig. 11). The ratio lever is at the "Economy" stop. Air for combustion now enters as

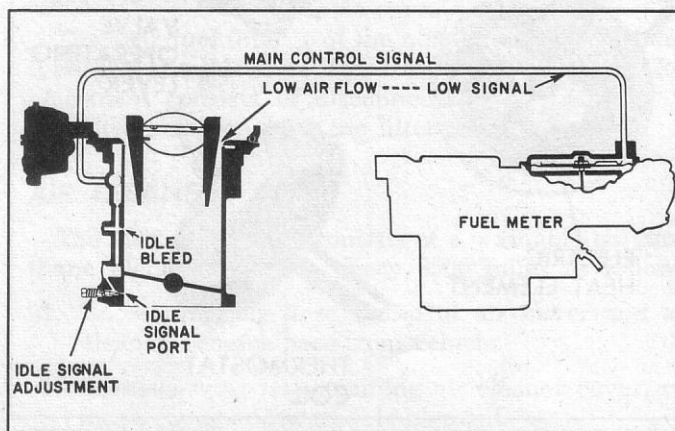


Fig. 11—Idle Signal System

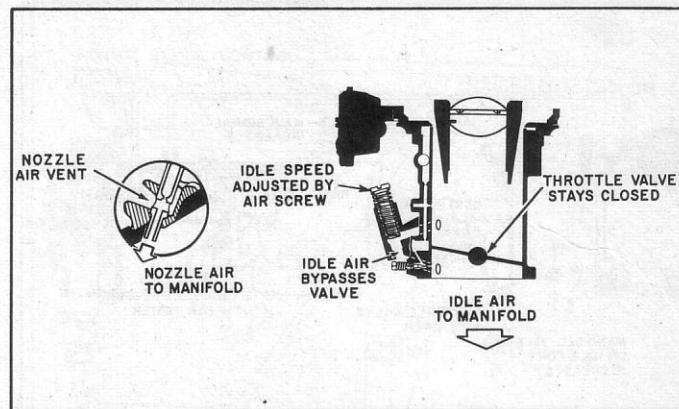


Fig. 12—Idle Air By-pass System

previously described thru the idle air by-pass circuit and the vented nozzle blocks (fig. 12).

ACCELERATION

At normal driving speeds, acceleration is instantaneous. As the throttle is opened, three operations take place to provide the necessary added fuel during acceleration (fig. 13): (1) opening the throttle valve causes an increase in air flow which increases the venturi signal at the main diaphragm, (2) the momentary reduction of manifold vacuum causes the ratio lever to move to the power stop, (3) the calibrated restriction in the main control signal circuit retains any signal left prior to the acceleration demands, thus adding to the total signal before it bleeds thru the restriction.

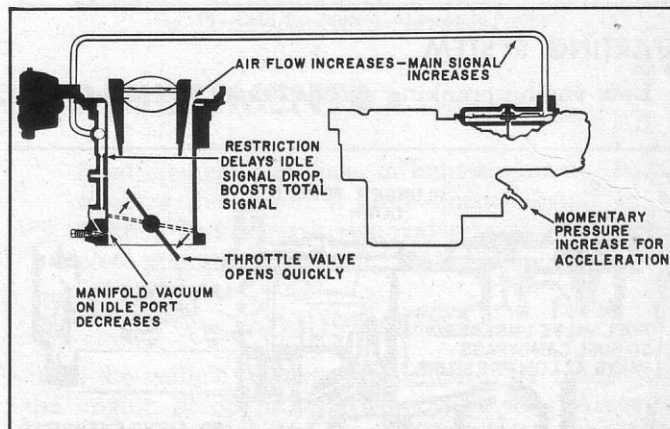


Fig. 13—Acceleration System

POWER

The fuel/air mixtures necessary during power demands are similar to acceleration demands. The quickly obtained wide-open-throttle causes a reduction in manifold vacuum and the ratio lever moves to the power stop. More important is the radically increased

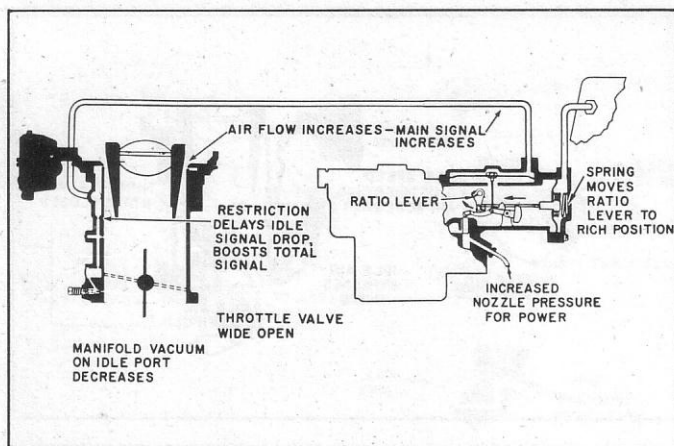


Fig. 14—Power System

air flow and hence venturi signal directed to the main diaphragm (fig. 14).

HOT STARTING AND UNLOADING

Hot starting and unloading operations definitely require no "extra" fuel. Since the electrically operated solenoid and micro switch are no longer used, the signal at the main control diaphragm must be reduced. For hot starting and unloading, the throttle valve should be held **WIDE OPEN** to prevent high manifold vacuum at the cranking signal valve. With the increased volume of air and reduced flow of fuel, the engine can then be started more easily.

PAST MODEL OPERATING PRINCIPLES

STARTING SYSTEM

Low engine cranking speeds create the same prob-

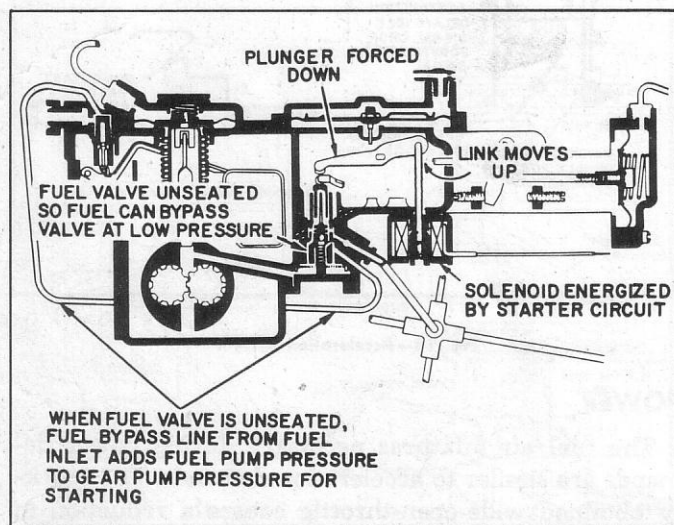


Fig. 15—Past Model Starting System

lem in past model Injection Units as is encountered in newer models. Whereas the cranking signal valve was incorporated to overcome this problem in newer models, the older models used a solenoid and linkage system (fig. 15). When the ignition switch was in the "start" position, the solenoid was actuated and the spill plunger was forced downward, thus diverting all fuel flow to the nozzles. In addition, a bypass port was exposed, allowing engine fuel pump pressure to be added to the fuel meter pump pressure. When the ignition switch was released to the "run" position, the solenoid released, allowing the Injection System to operate normally.

HOT STARTING AND UNLOADING

Hot starting and unloading of older model Injection Units is accomplished by opening the throttle valve $\frac{3}{4}$ or wider. This actuates a micro switch which in turn opens the electric circuit to the solenoid. The spill plunger will thus be allowed to spill fuel back into the fuel meter reservoir and the flooded condition can be overcome.

COLD ENRICHMENT

Smooth, cold engine warm-up is achieved on older

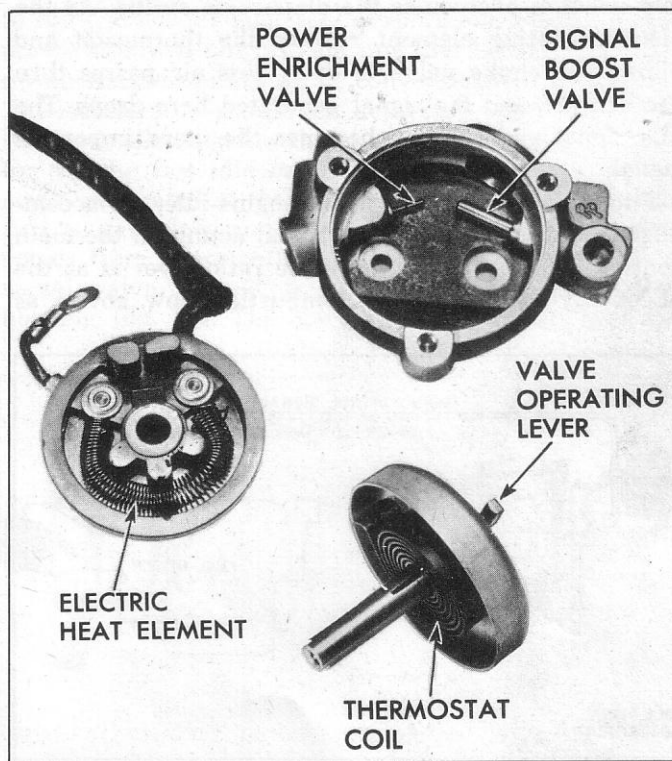


Fig. 16—Past Model Cold Enrichment Assembly

model Fuel Injection units by using two valves incorporated in a housing and operated by an electric coil (fig. 16). During cold engine idle, the signal boost valve, through a calibrated restriction, opens manifold vacuum to the main control diaphragm (fig. 17), thus "boosting" the signal here while it prevents manifold vacuum from reacting on the enrichment diaphragm and thus the ratio lever remains at the "power" stop. As the thermostatic spring becomes relaxed by the electric heating element, the signal boost valve becomes closed (fig. 18). Further relaxation of the spring opens the power enrichment valve and manifold vacuum is then directed to the enrichment diaphragm, forcing the ratio lever to the "economy" stop (fig. 19).

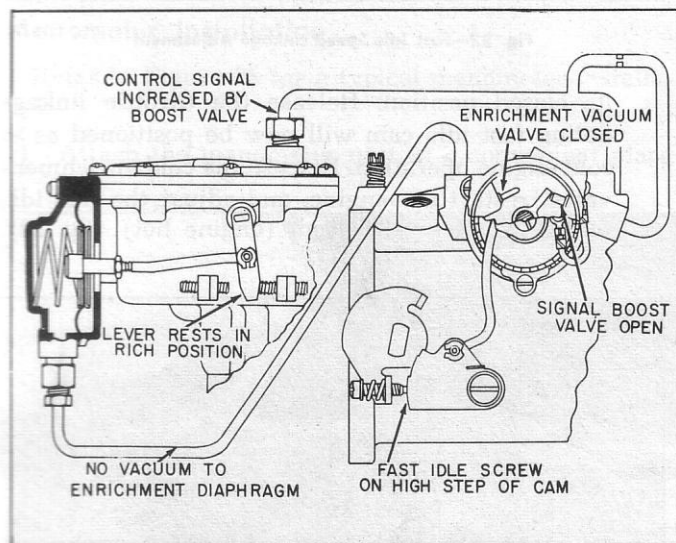


Fig. 17—Cold Enrichment—Starting Position

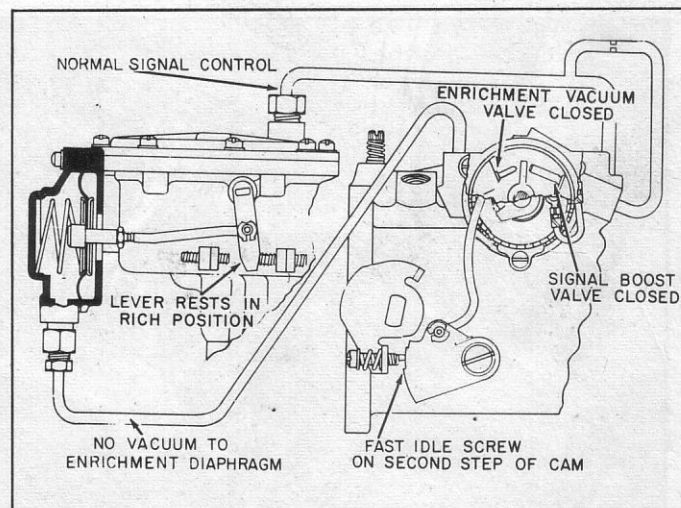


Fig. 18—Cold Enrichment—Mid Position

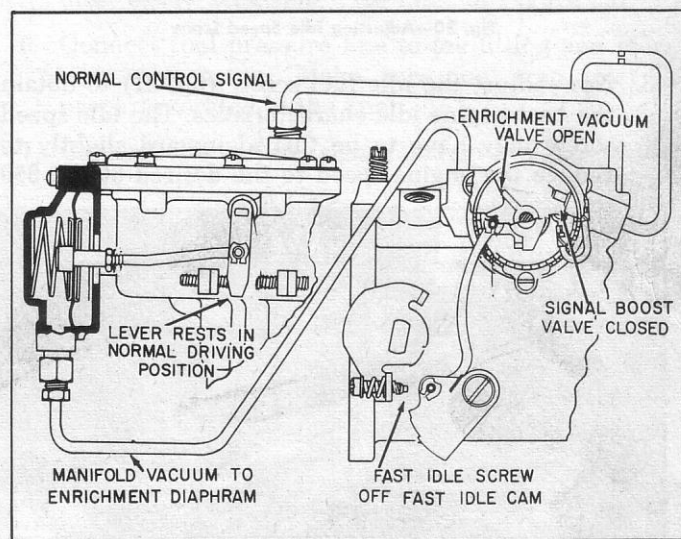


Fig. 19—Cold Enrichment—Operating Position

MAINTENANCE AND ADJUSTMENTS

MAINTENANCE

FUEL FILTER

The 1962 fuel filter is of the non-serviceable element type and should be replaced every 15,000 miles. Replacement consists of disconnecting the fuel line to the filter and removing the filter from the meter.

AIR CLEANER

The 1962 air cleaner consists of a washable polyurethane element. Service every 8000 miles as follows:

1. Loosen flexible hose clamp at air meter and air cleaner, remove hose from vehicle.
2. Remove wing nut retaining air cleaner cover, remove cover and washable element.
3. Wash element in solvent, squeeze excess solvent

from element and rinse in light engine oil. Again, squeeze excess oil from element, install in air cleaner and reverse removal procedures to complete operation.

ADJUSTMENTS

On-the-vehicle adjustments should be made with the engine at operating temperature. See Assembly Section for off-the-vehicle adjustments.

IDLE SPEED AND FUEL

1. Preset the idle speed and idle fuel adjusting screws $1\frac{1}{2}$ turns out from their fully closed position.
2. With the engine running, bring the idle speed up to approximate specifications by adjusting the idle speed screw (fig. 20). (See Specifications Section.)

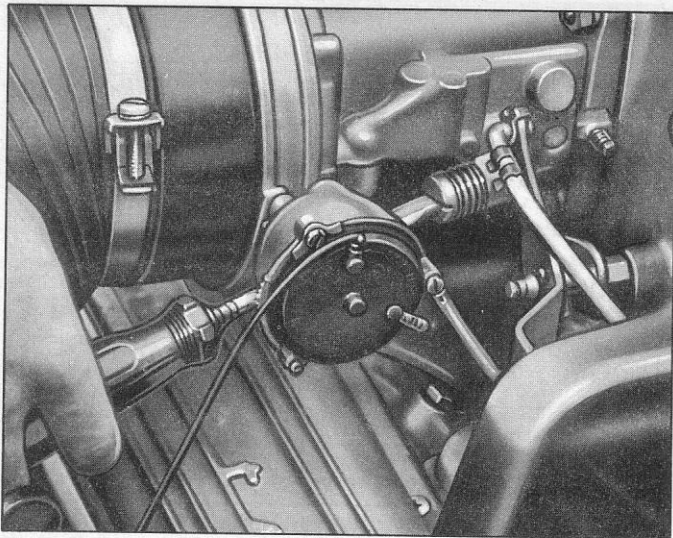


Fig. 20—Adjusting Idle Speed Screw

3. Now adjust the idle fuel screw (fig. 21) to obtain the best engine idle characteristics. The idle speed screw may have to be turned inward slightly to reduce the engine speed to the desired 800 to 850 rpm.

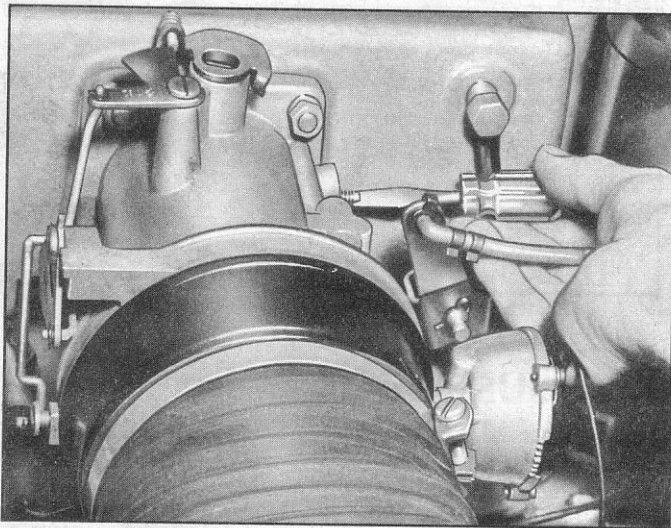


Fig. 21—Adjusting Idle Fuel Screw

NOTE: It is possible to develop a condition where the two idle adjusting screws become completely out of phase. Should this happen, purge the system or shut the engine off and repeat the entire above procedure.

FAST IDLE SPEED

1. Check the off position clearance between the fast idle cam and the adjusting screw. Bend the linkage to obtain clearance (fig. 22).
2. With the engine off, crack the throttle valve and manually position the cold enrichment valve to

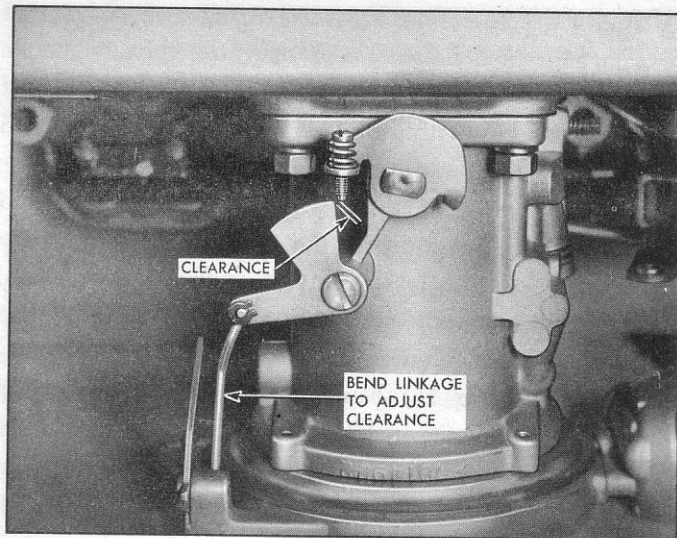


Fig. 22—Fast Idle Speed Linkage Adjustment

its closed position. Release the throttle linkage noting fast idle cam will now be positioned as in cold engine operation. Release the cold enrichment valve, restart the engine, and adjust the fast idle screw to obtain 1800 rpm (engine hot) (fig. 23).

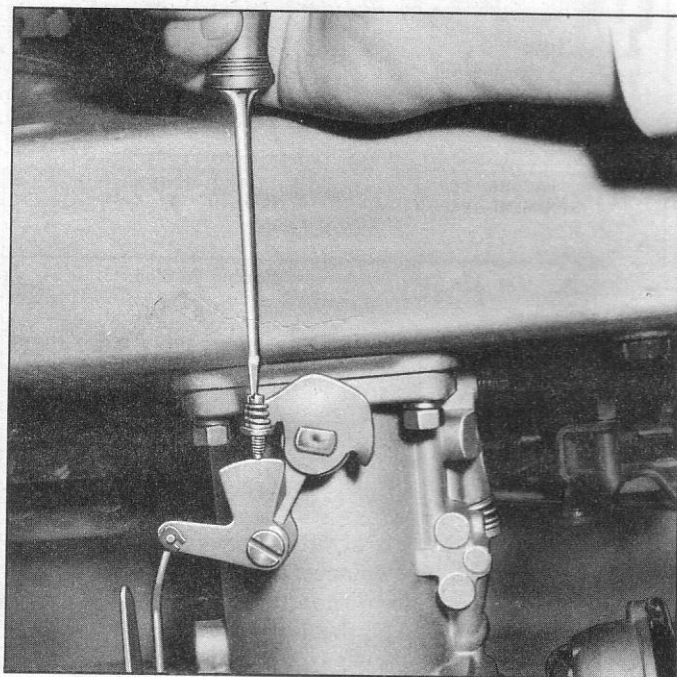


Fig. 23—Fast Idle Speed Screw Adjustment

COLD ENRICHMENT

The only cold enrichment adjustment needed on the 1962 type unit is to set the cold enrichment cover to 3 notches lean. Check also to see that the air meter adapter does not interfere with the valve linkage at the main diaphragm vent tube connection (fig. 24).

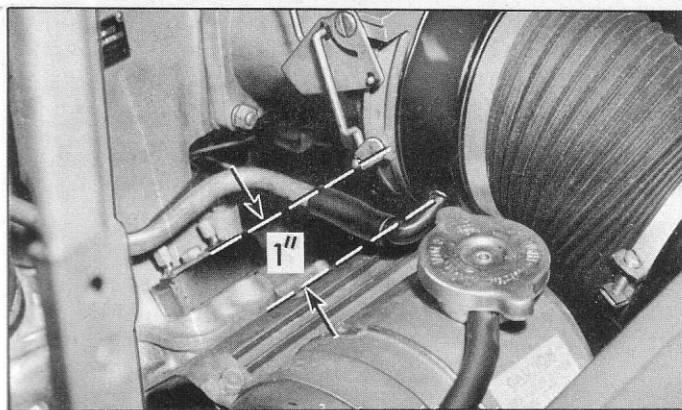


Fig. 24—Main Diaphragm Vent Tube Location

RATIO LEVER STOP SETTINGS

Manometer Installation

Refer to Figure 25 for a typical manometer installation.

1. Attach the manometer unit in a convenient place

on the vehicle. Use the two position bracket to obtain the most vertical position possible.

2. Level the unit by means of the leveling vial.
3. Open both water manometer valves. Check the water manometer to see if a zero reading can be obtained. Adjust to zero by means of the oil leveling screw.

NOTE: Add red oil (specific gravity 0.826) if a zero reading cannot be obtained. Back leveling screw out for this procedure.

4. Remove both hose adapters on the mercury (Hg) manometer and punch out the plug located in each adapter.
5. Install the tee fitting in the fuel nozzle circuit most easily accessible (see inset of Figure 25).
6. Connect fuel pressure line to tee fitting and mercury manometer. Make sure fuel trap inlet is properly located in the line.
7. Connect the venturi signal line with clamp to the

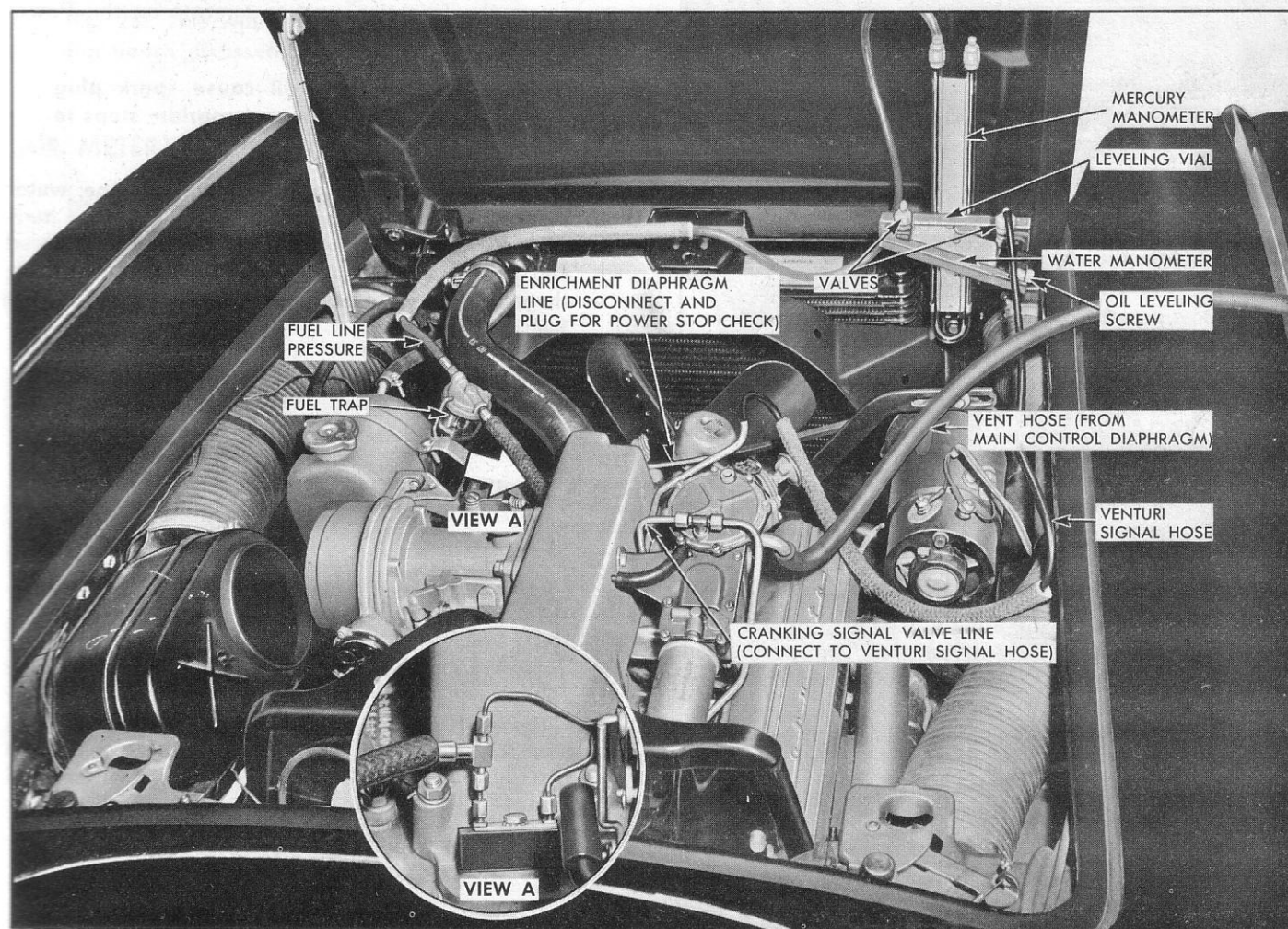


Fig. 25—Manometer Installation (Typical)

cranking signal valve line and the water manometer. Make sure the clamp is closed securely on this line during engine starting, otherwise high vacuum will cause the red oil to be lost.

8. Remove the main diaphragm vent tube and install the large rubber tube in its place.
9. Set mercury manometer at zero inches by sliding scale up or down. Check leveling vial again and adjust as necessary. Installation is now complete and ready for the Economy stop readings.

Economy Stop

With the instrument attached as outlined under Installation, proceed as follows:

NOTE: Check unit for physical defects before changing Economy or Power Stop Settings.

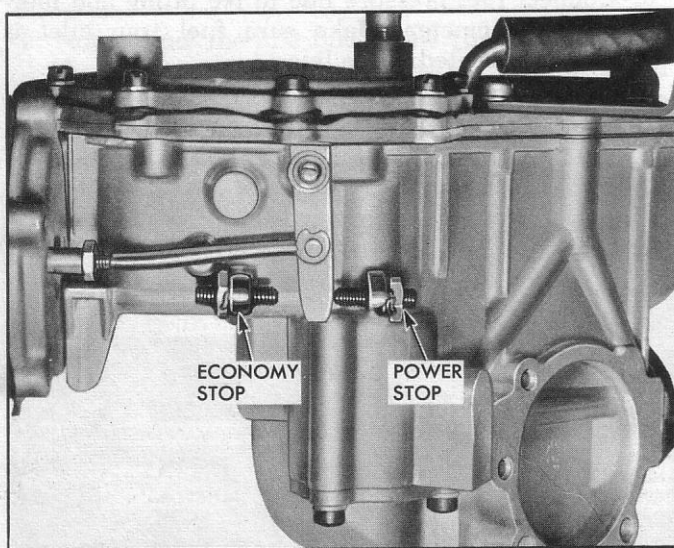


Fig. 26—Ratio Lever Stop Locations

1. Engine should be at operating temperature. Check to see that unit is operating on the economy stop (fig. 26).

NOTE: Some units will start hard with the cranking signal valve line disconnected. It may be necessary to reconnect this line during initial starting procedure.

2. Bring engine rpm up until a 0.5" signal is obtained on the water manometer. If desired, use the fast idle cam to hold this rpm. Take a reading on the mercury manometer and record. Return engine to a lower speed and repeat the above procedure. Record and average three readings for best results. This completes the steps necessary for the Economy stop reading. (See Specifications Section.)

Power Stop

The Power stop readings are obtained as follows:

1. Leave the manometer hooked up as in the Economy stop readings.
2. In addition, disconnect and plug the vacuum line going to the enrichment diaphragm. This will cause the Injection unit to operate on the Power stop entirely.

NOTE: This operation will cause spark plug fouling if prolonged. Take appropriate steps to correct this condition if present.

3. Bring engine up to a 0.5" signal on the water manometer and again take a reading on the mercury manometer and record. Lower engine speed and repeat above operation. Record and average three readings for best results. (See Specifications Section.)

NOTE: Be sure enrichment diaphragm is not bottoming in housing. (See Figure 48.)

SERVICE OPERATIONS

Servicing the Fuel Injection Air and Fuel Meter Assemblies can be accomplished without removing the intake manifold from the engine. Removal of the complete Injection Assembly need only be performed when complete overhaul or replacement becomes necessary.

REMOVAL

INJECTION ASSEMBLY

1. Disconnect washer vacuum line at manifold fitting, accelerator linkage at throttle bellcrank (fig. 27) electric choke lead wire, and bellcrank return spring.

2. Loosen clamp retaining flexible hose to air meter, slide hose from air meter adapter, leaving it connected at air cleaner.
3. Disconnect fuel line at fuel filter.
4. Disconnect drive cable coupling at distributor, slide cable into pump housing to disengage from distributor, pull cable clear of distributor and remove from vehicle.

NOTE: Use care to avoid losing fiber washer located at distributor end of drive cable.

5. Remove 8 manifold-to-engine adapter plate retaining nuts. Carefully remove Injection Assembly from vehicle.

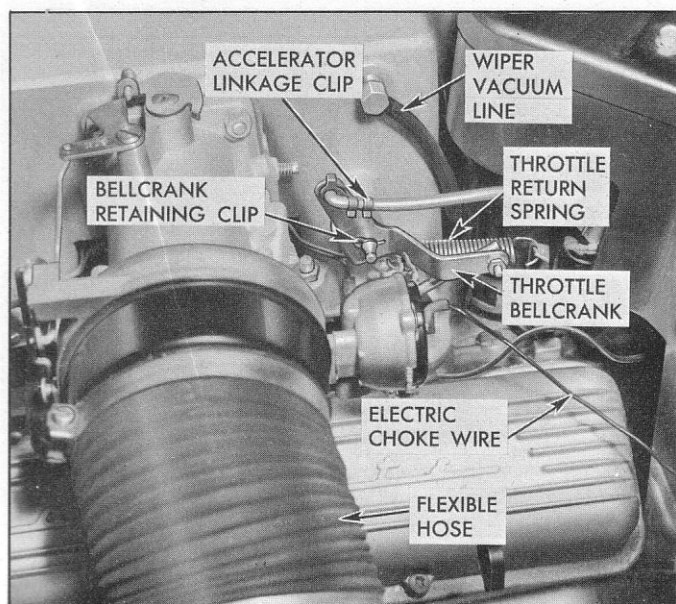


Fig. 27—Air Meter Connection Locations

NOTE: Install a $\frac{3}{8}$ " x 2" bolt and nut in each manifold outer mounting hole to form feet (fig. 28). This will prevent nozzle damage during bench disassembly.

AIR METER

NOTE: Should the intake manifold interior appear dirty after removing the air meter, it is recommended that the manifold be removed and cleaned.

1. Disconnect throttle return spring and accelerator linkage at throttle bellcrank (see fig. 27). Remove bellcrank retaining clip, slide bellcrank from pivot shaft, leaving it attached to the air meter.

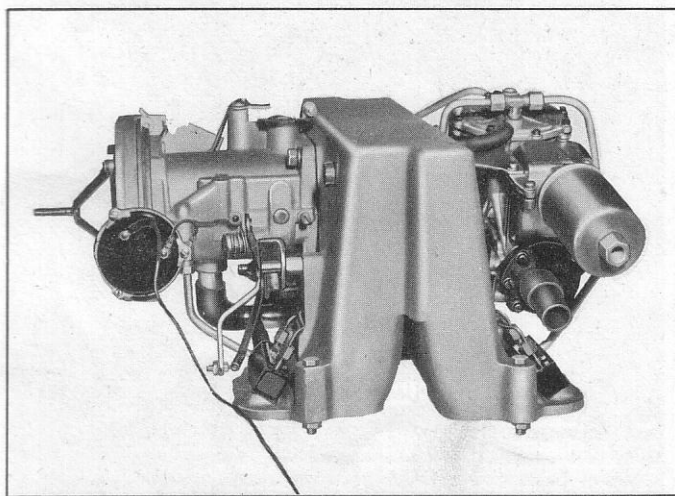


Fig. 28—Bench Disassembly Feet Installed

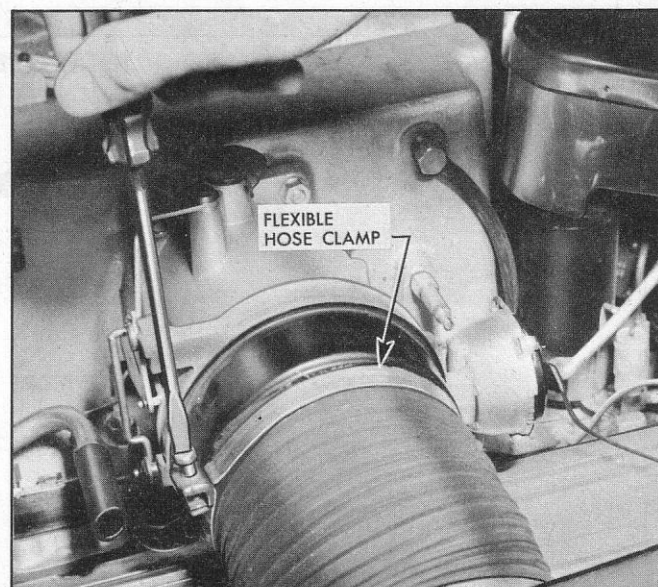


Fig. 29—Loosening Flexible Hose Clamp

2. Loosen clamp retaining air cleaner flexible hose to air meter (fig. 29), slide hose from adapter, leaving it attached to air cleaner. Disconnect main control diaphragm vent tube at adapter (fig. 30).
3. Disconnect electric choke lead wire.
4. Disconnect main control signal tube at both ends, lower it out of the way (fig. 31).
5. Remove 4 air meter-to-manifold retaining nuts and lockwashers. Carefully remove air meter from vehicle, simultaneously disconnecting rub-

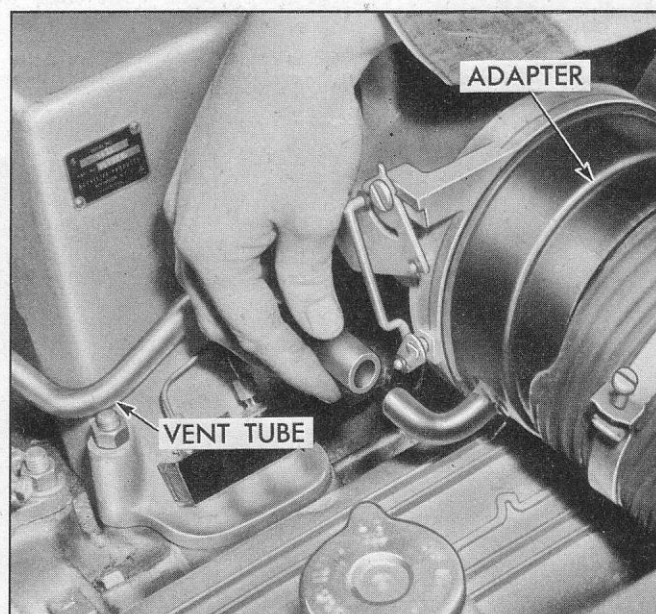


Fig. 30—Disconnecting Main Diaphragm Vent Tube

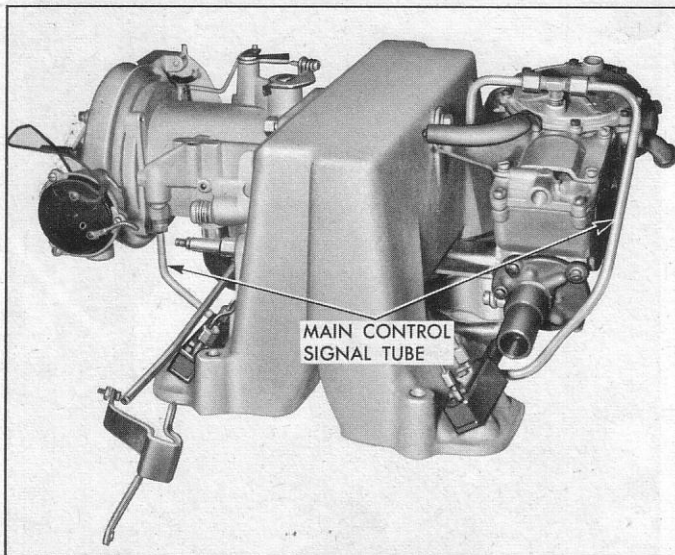


Fig. 31—Disconnecting Main Control Signal Tube

ber, nozzle balance tube elbow at air meter (fig. 32).

NOTE: Tip outer end of air meter upward to clear engine valve cover during removal.

FUEL METER

Refer to Figure 33 for fuel meter line locations.

1. Disconnect main control signal tube at diaphragm tee fitting.
2. Disconnect enrichment diaphragm tube at both ends, disengaging tube at manifold end first.
3. Disconnect main control diaphragm vent tube at both ends, rotate it clear of work area.

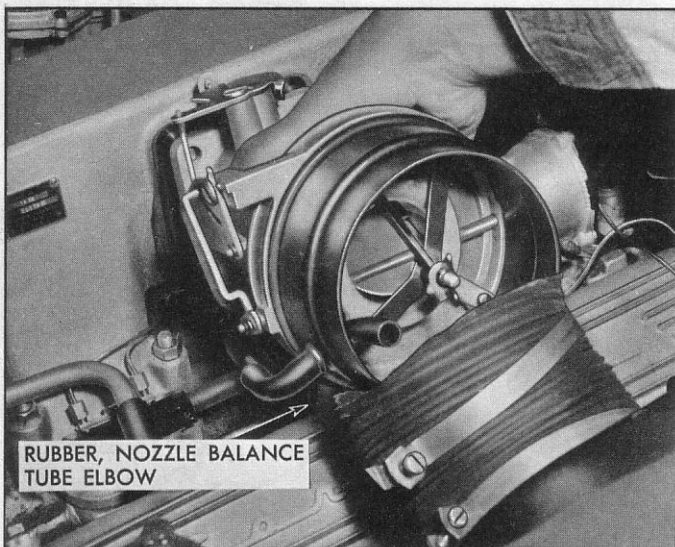


Fig. 32—Removing Air Meter

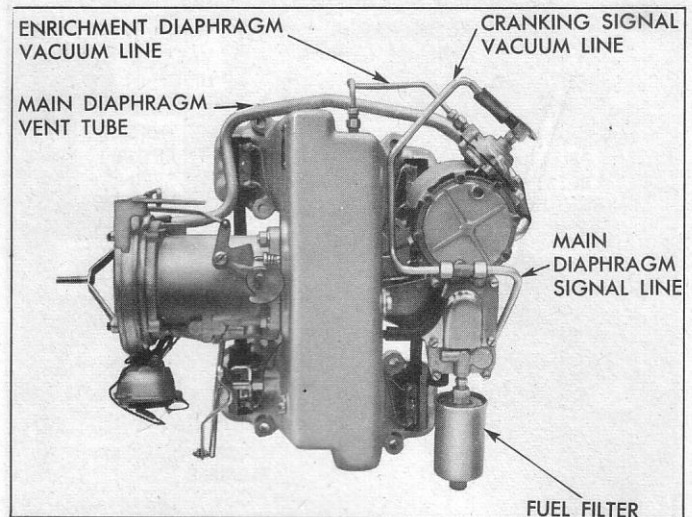


Fig. 33—Fuel Meter Line Locations

4. Disconnect and remove cranking signal valve tube to obtain meter removal clearance.
5. Loosen fuel pump-to-nozzle line fitting (fig. 34), but do not disengage line from meter at this time.
6. Disconnect fuel line at fuel filter, remove filter from meter.

NOTE: Filter removal at this time will facilitate installation procedures.

7. Disconnect drive cable as outlined in Step 2 of Injection Assembly Removal.
8. Disconnect main control signal tube at air meter.

NOTE: Remove throttle return spring to obtain working clearance.

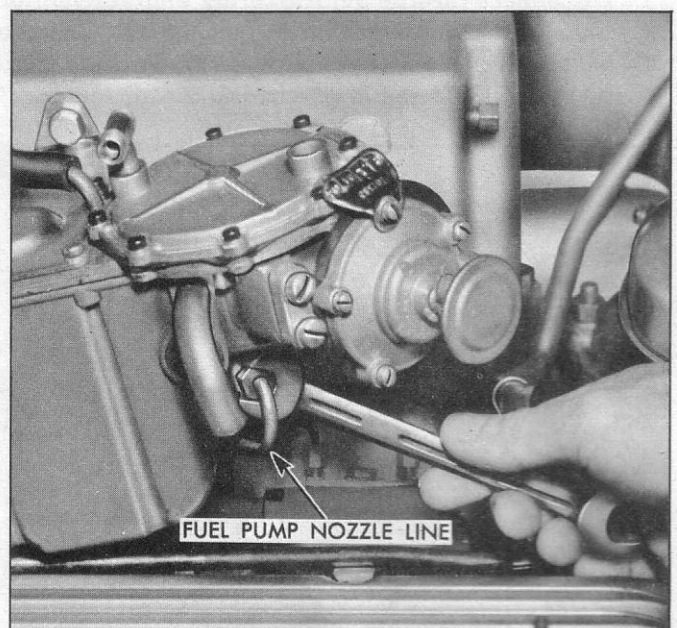


Fig. 34—Loosening Fuel Pump Nozzle Line Fitting

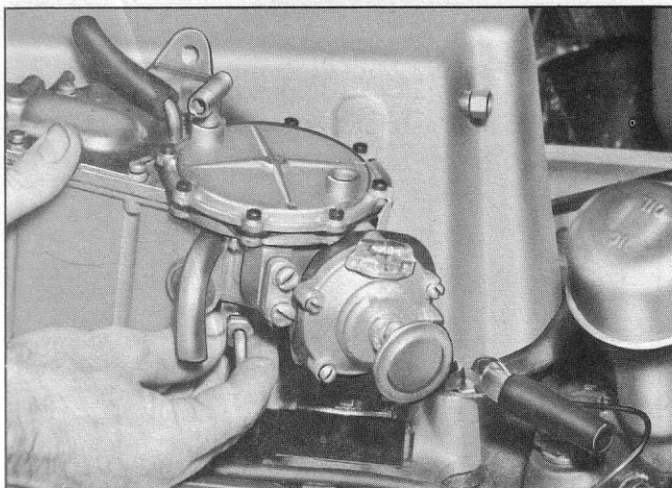


Fig. 35—Disengaging Fuel Nozzle Line

9. Remove the 2 lower fuel meter-to-support bracket retaining screws by passing a 10" screwdriver under the manifold to engage the screws. Screws can be retrieved after the meter has been removed.
10. Remove single, upper fuel meter bracket-to-manifold bolt, disconnect short vent tube from manifold to meter bowl and raise fuel meter to clear lower bracket.
11. Rotate the fuel meter clockwise slightly and disengage the fuel nozzle line loosened in Step 5 (fig. 35).

NOTE: Rubber "O" ring seal located at the fuel meter end of the line should be removed and discarded (fig. 36).

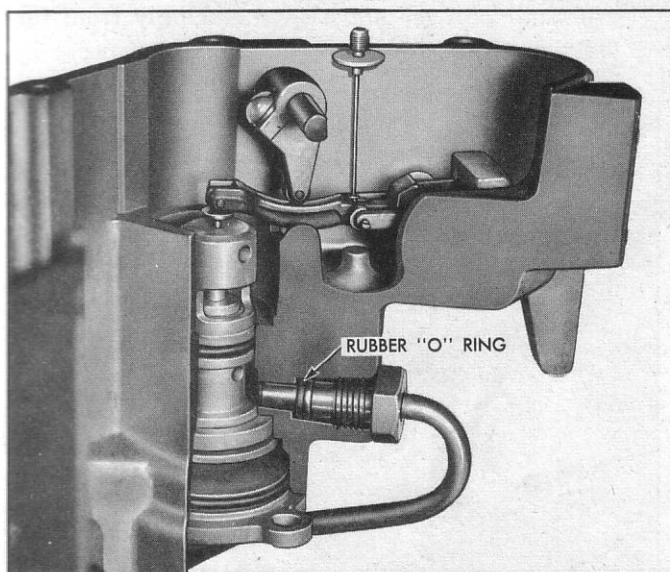


Fig. 36—Nozzle Line "O" Ring Position

DISASSEMBLY

AIR METER

1. Remove wing nut retaining air cleaner adapter to air meter, remove adapter.

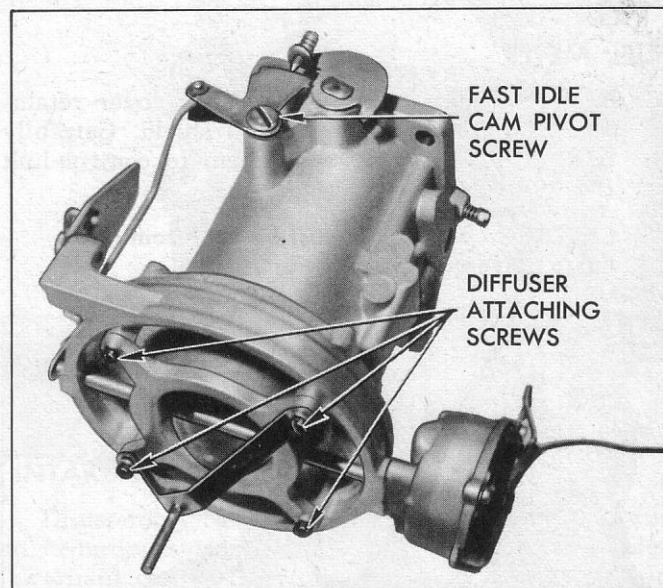


Fig. 37—Removing Diffuser Assembly

2. Remove 4 diffuser assembly screws, remove fast idle cam pivot screw (fig. 37), remove diffuser choke assembly and piezometer ring from air meter.

NOTE: See Repair Section for complete choke repair procedure.

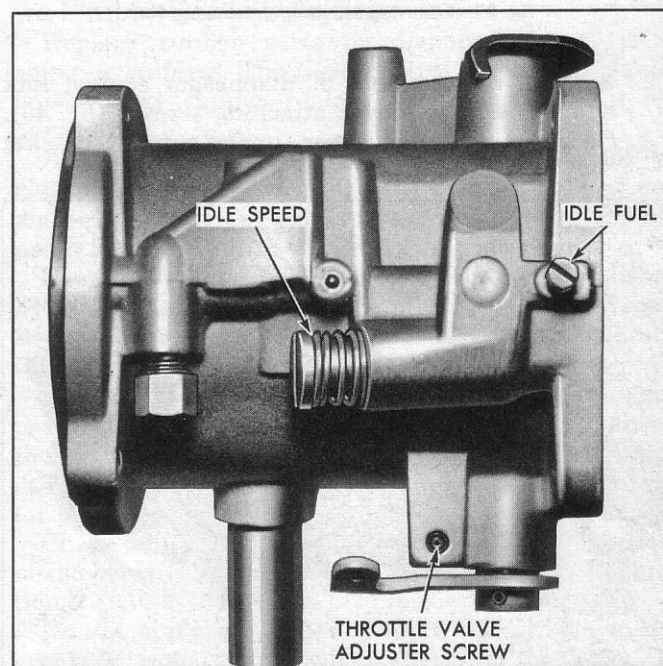


Fig. 38—Removing Idle Screws

3. Remove idle speed and idle fuel adjusting screws (fig. 38).
4. The throttle valve need not be removed from the air meter unless shaft binding exists (see appropriate Repair Section).

FUEL METER

1. Remove 8 main control diaphragm cover retaining screws, remove cover and shield. Carefully remove nut retaining diaphragm to control link (fig. 39), remove diaphragm.

CAUTION: Control link must be held from rotating to prevent control link damage.

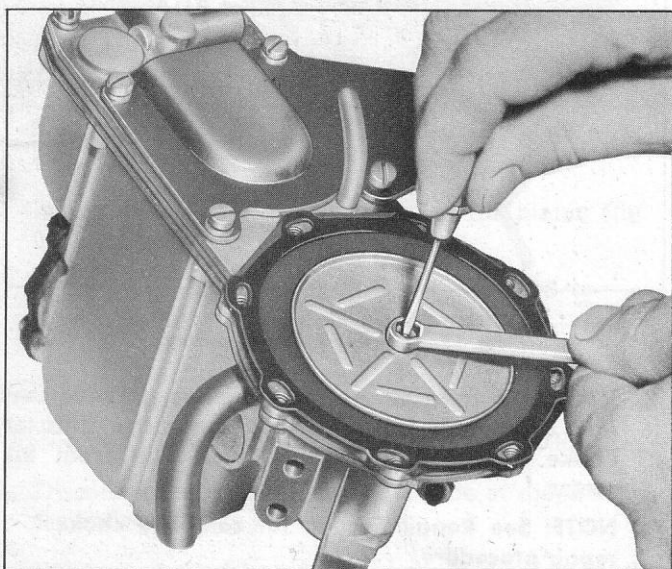


Fig. 39—Removing Diaphragm Retaining Nut

2. Remove nylon shield at diaphragm control link and 9 fuel bowl cover attaching screws (fig. 40). Carefully lift bowl cover, upper support bracket

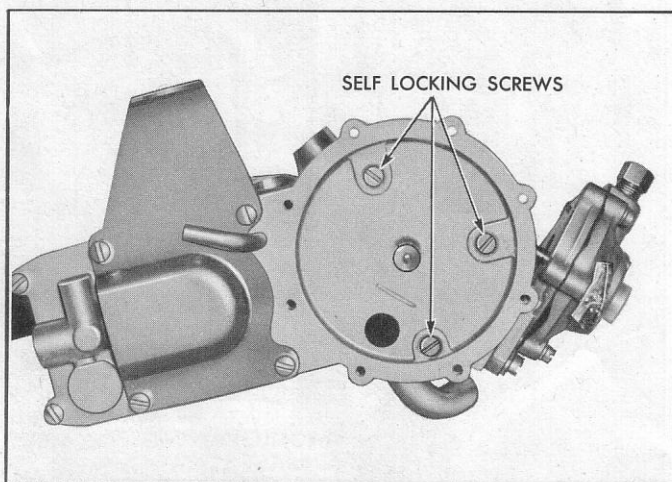


Fig. 40—Fuel Meter Cover Attaching Screws

and gasket from meter body.

CAUTION: Do not bend control link. Remove nylon shield by first starting link into slot, prying opposite side upward. Carefully turn shield over the link to complete removal (fig. 41).

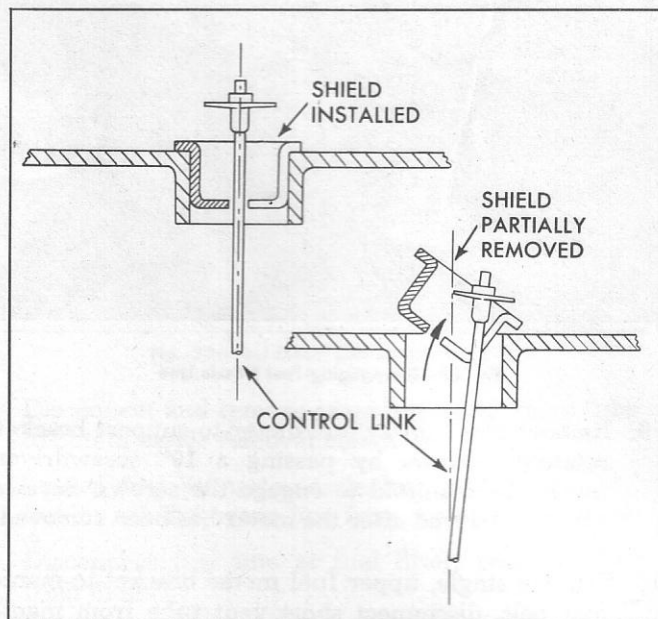


Fig. 41—Removing Nylon Splash Shield

3. Remove fuel pump and gasket.
4. Remove enrichment control rod clip at ratio lever, remove 2 enrichment housing attaching screws (fig. 42), remove enrichment housing and cranking signal valve from fuel meter.
5. Remove spill plunger cover and filter, carefully pull spill plunger and sleeve assembly from fuel meter bore (fig. 43).

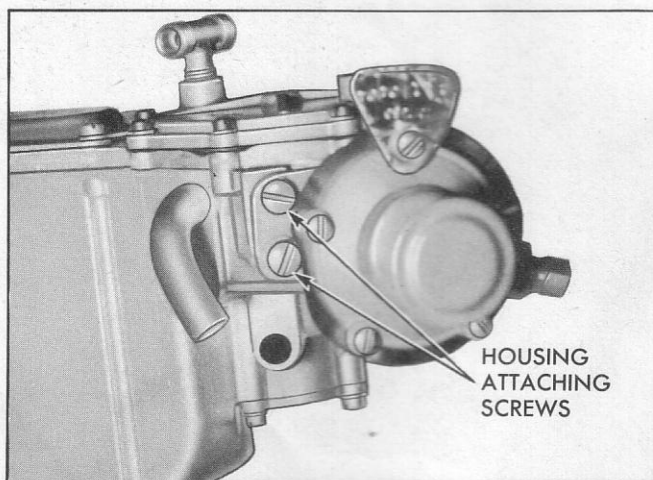


Fig. 42—Removing Enrichment Housing Attaching Screws

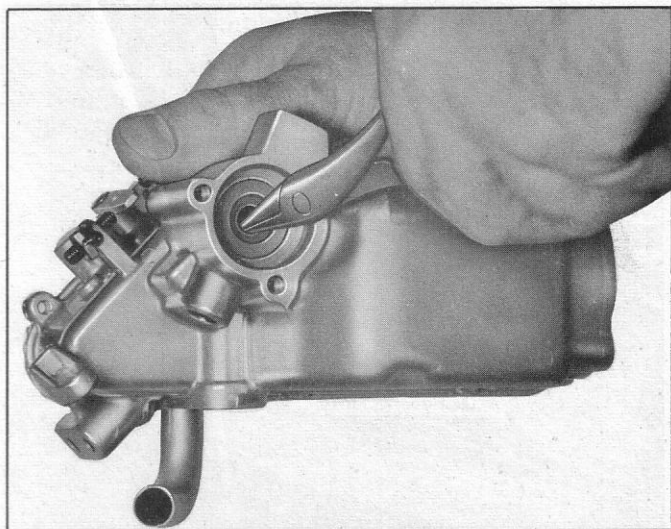


Fig. 43—Removing Spill Plunger Assembly

NOTE: Spill plunger retainer may pull out of sleeve—use a hooked wire to pull sleeve out should this occur.

6. Loosen screw retaining ratio lever in position, slide ratio lever and shaft from meter body (fig. 44).
7. Rotate control arm and counterweights on axle, press axle from meter body (fig. 45), remove control arm and counterweight assembly from fuel meter body.

NOTE: This procedure will also remove the lead sealing ball located on the outer end of the axle shaft.

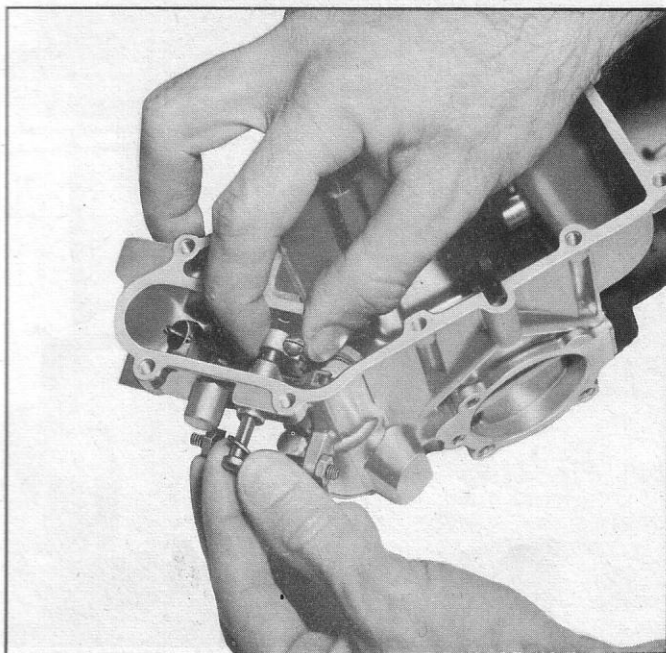


Fig. 44—Removing Ratio Lever From Fuel Meter

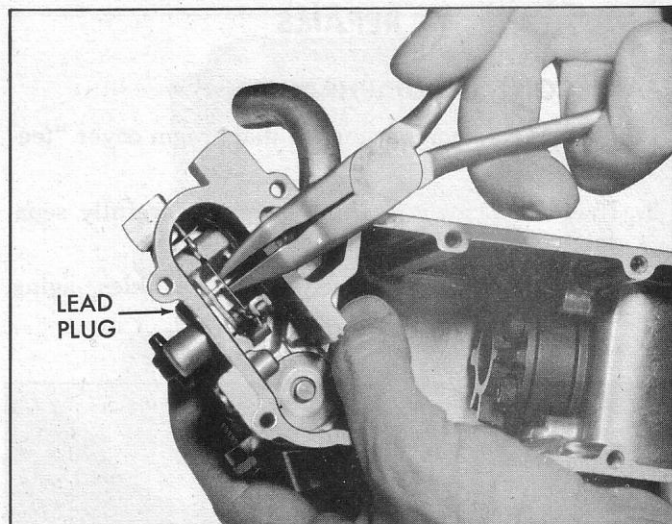


Fig. 45—Removing Control Arm Axle Shaft

INTAKE MANIFOLD

Disassembly of the intake manifold nozzle and fuel distribution system is necessary only when complete overhaul of the Injection Assembly is required. Individual nozzle service is covered under Repairs and can be accomplished with the unit mounted on the engine.

CLEANING AND INSPECTION

Wash all METAL parts in clean solvent and blow dry with compressed air. Strip the intake manifold to the bare casting when cleaning is required. Do not wash rubber parts or diaphragms.

Replace rubber parts or diaphragms that show aging or stiffness. The main control diaphragm should appear very supple, replace if this condition is not present.

Air meter calibrated restrictions should not be cleaned by passing wire thru the orifices. Solvent and air only should be used for this procedure. Do not use a wiping cloth to clean the air meter bore.

Nozzle servicing or cleaning can be accomplished by following the procedures outlined in the Repair Section. Again, do not pass wire thru the nozzle orifices, replace the nozzle assembly.

Inspect carefully all castings for cracks, plugged passages, plugged tubes and wear. Especially check the main control diaphragm linkage, axle shafts and castings for wear and cracks. Check valve mechanisms for binding conditions.

Check the integral siphon breaker ball for freedom of movement. Soak in solvent to correct sticky operation.

Do not apply a vacuum of more than 1" Hg to the cranking signal valve when checking for leaks. In most cases oral vacuum can be used successfully to determine leaking diaphragms.

REPAIRS

MAIN CONTROL DIAPHRAGM

1. Disconnect vacuum lines at diaphragm cover "tee" fitting.
2. Remove 8 cover retaining screws, carefully separate cover from diaphragm.
3. Check diaphragm for ruptures, wrinkles, aging, and free fall to verify diagnosis.

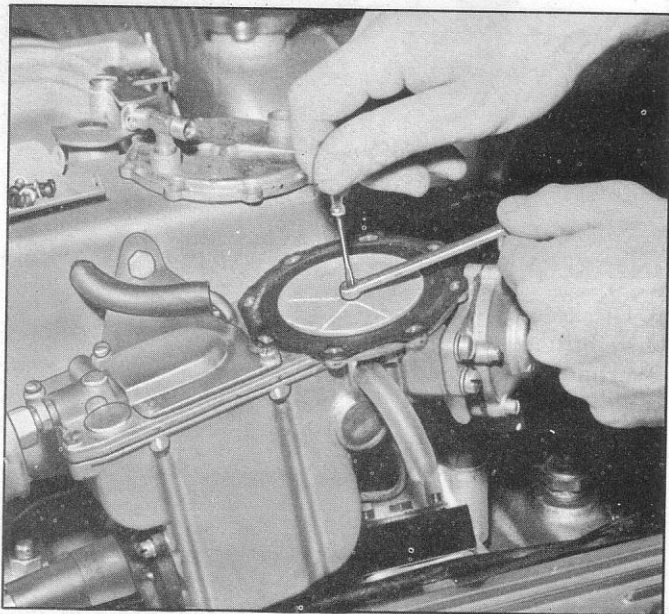


Fig. 46—Removing Main Diaphragm Retaining Nut

4. Remove nut retaining diaphragm to control link (fig. 46), remove diaphragm.

NOTE: Control link must be held from rotating otherwise damage to the linkage may occur.

5. Install new diaphragm and gasket on link and tighten retaining nut carefully.

CAUTION: Slots in diaphragm should align naturally with cover attaching screw holes located in the bowl cover. Repeat above step until this condition is achieved. Do not try to force the diaphragm holes to line up with the attaching screw holes. Some diaphragms appear drum tight when removed. This is a defective diaphragm. Do not duplicate this condition when installing a new diaphragm.

6. Reverse Steps 1 and 2 to complete operation.

NOTE: Calibration will not be affected by diaphragm replacement and need not be checked at this time.

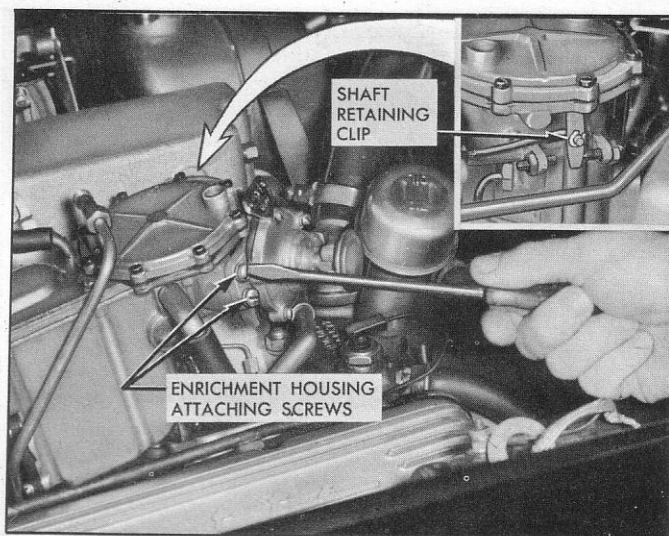


Fig. 47—Removing Enrichment Housing Attaching Screws

ENRICHMENT DIAPHRAGM

1. Remove ratio lever shield retaining screws, remove shield.
2. Remove vacuum lines from manifold and cranking signal valve.
3. Remove clip retaining shaft to ratio lever and two diaphragm housing retaining screws (fig. 47), remove enrichment diaphragm assembly.
4. Disassemble housing and replace diaphragm.

NOTE: Center new diaphragm in housing before cover is fully tightened.

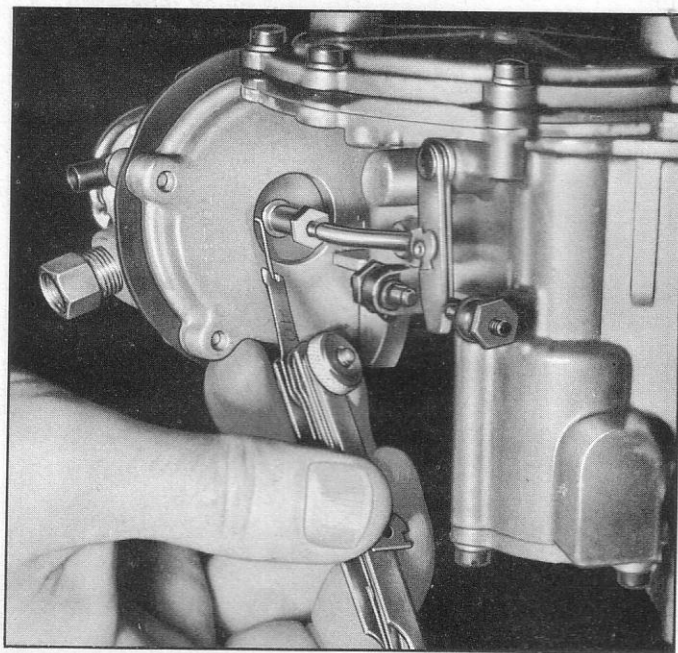


Fig. 48—Checking Enrichment Diaphragm Clearance

5. Reinstall assembly to fuel meter reversing Steps 1 thru 3.

NOTE: Check clearance between housing and diaphragm (fig. 48). This should be a minimum of .040" to prevent interference during power stop operation. Change the diaphragm shaft length to correct, being careful to hold the shaft while loosening the lock nut.

CRANKING SIGNAL VALVE

The non-serviceable cranking signal valve can be replaced by merely disconnecting the vacuum line and removing the valve (fig. 49).

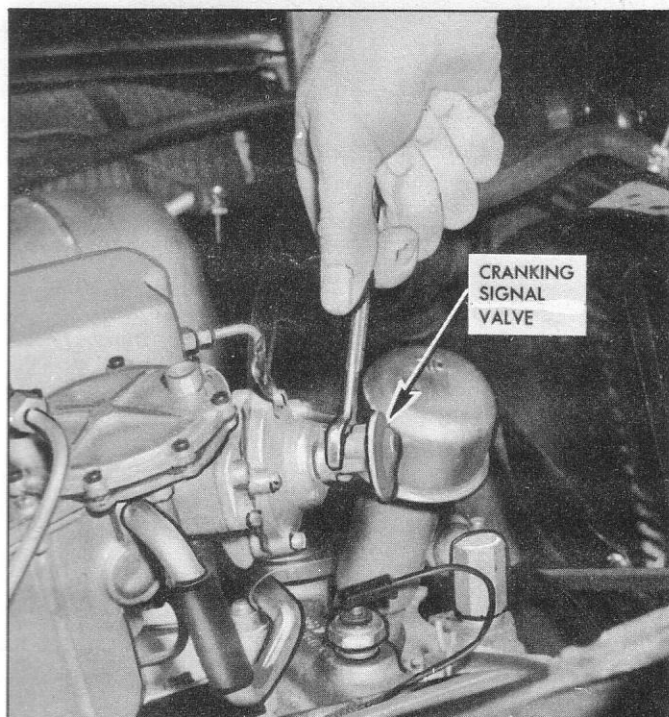


Fig. 49—Removing Cranking Signal Valve

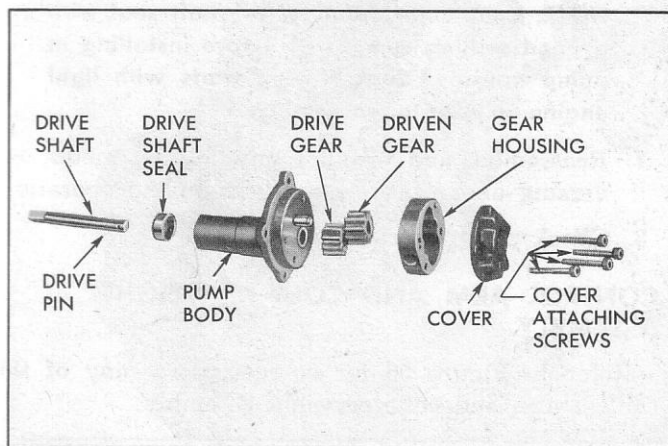


Fig. 50—Fuel Pump—Exploded View

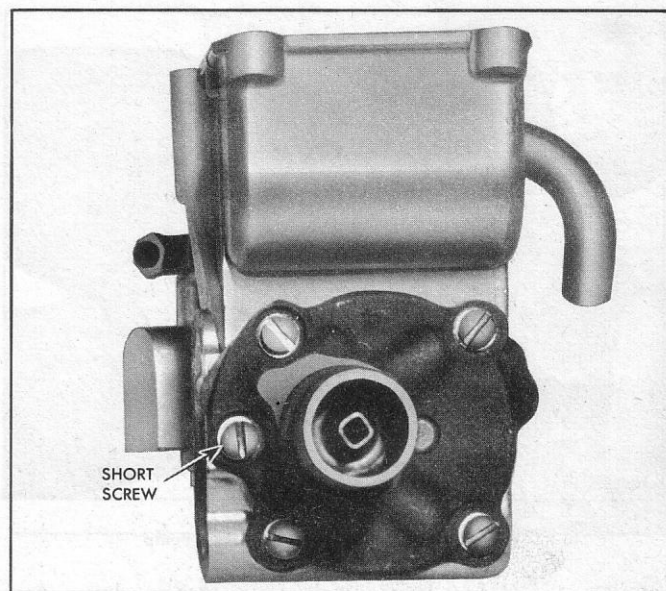


Fig. 51—Fuel Pump Short Screw Location

GEAR PUMP

Refer to Figure 50 for exploded view of gear pump. The gear pump may be serviced as follows:

1. Remove fuel meter (see Removal—Fuel Meter Section).
2. Remove 5 pump attaching screws, noting screw located at 9 o'clock is the shortest (fig. 51). Remove pump and gasket from fuel meter.
3. Scribe reassembly marks on pump housing, carefully noting that the intake port is located at the bottom of the pump (fig. 52). Remove sealing lead from cover attaching screws, remove screws and cover.

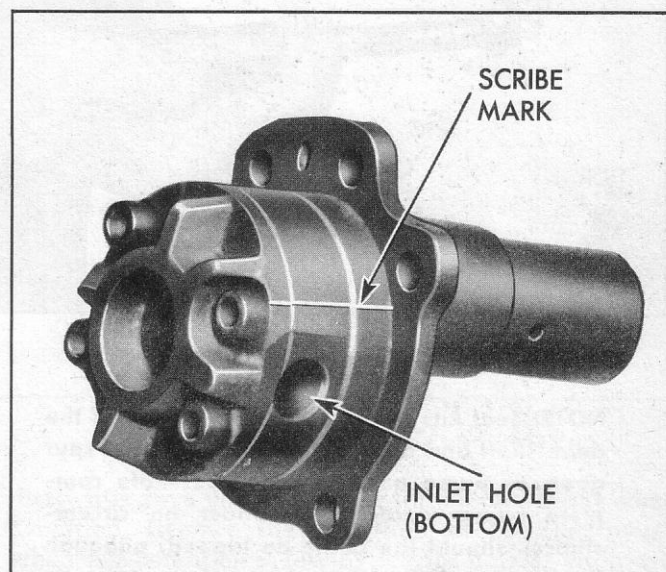


Fig. 52—Marking Reassembly Scribe Line

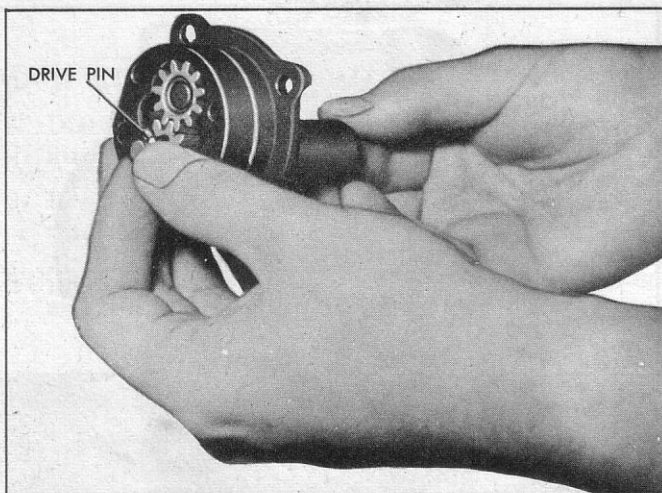


Fig. 53—Removing Drive Shaft From Pump

4. Finger press drive shaft from pump drive gear and housing (fig. 53).

CAUTION: Use care to avoid losing drive pin located in drive shaft.

5. Using a suitable puller or a $\frac{9}{16}$ " x 18 tap, remove drive shaft seal from pump housing (fig. 54).

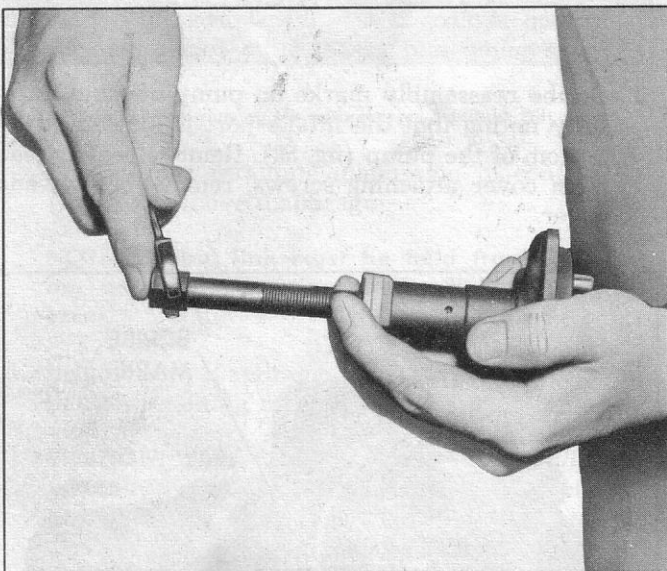


Fig. 54—Removing Drive Shaft Seal

NOTE: Seal kits are available for servicing the drive shaft and drive shaft seal. Damaged spur gears or pump housing will necessitate complete pump replacement. Under no circumstances should the gears be lapped, although the cover and body casting surfaces may be lapped.

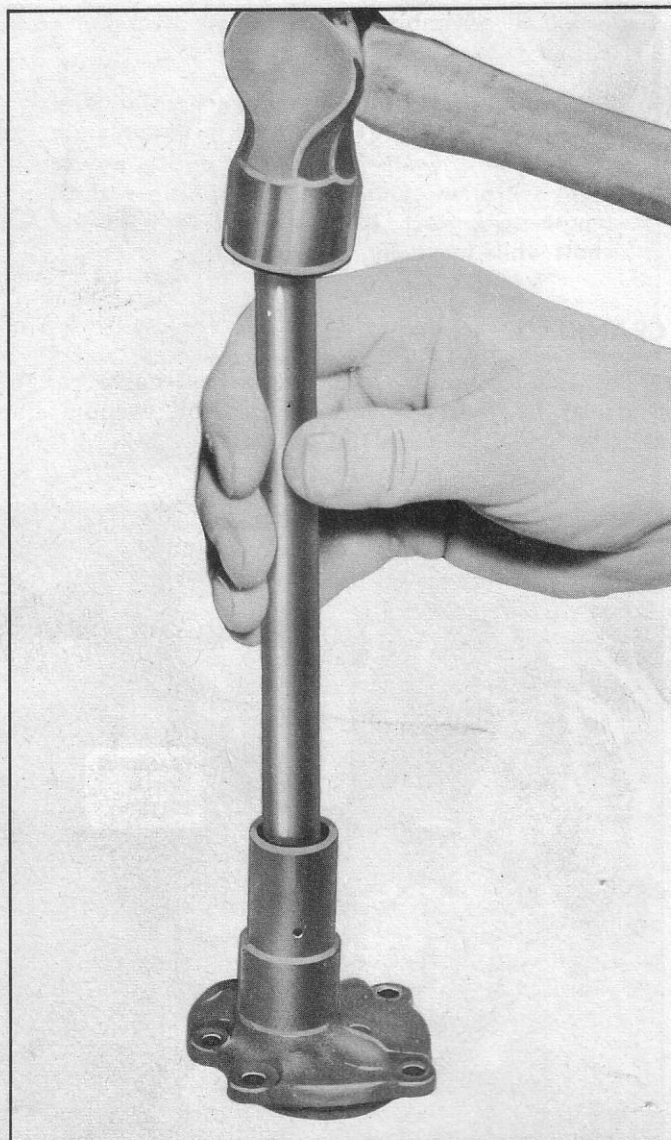


Fig. 55—Installing Drive Shaft Seal

6. Install new shaft seal using suitable diameter tool (fig. 55).

NOTE: Coat outer diameter of shaft seal with a good sealing compound before installing in pump housing. Coat moving parts with light engine oil prior to reassembly.

7. Reassemble and install pump in fuel meter, reversing above procedures to complete operation.
8. Check pump operation as final step.

CONTROL ARM AND COUNTERWEIGHT ASSEMBLY

Refer to Figure 56 for correct positioning of the control arm and counterweight assembly.

1. Remove fuel meter from vehicle (see appropriate Removal Section).

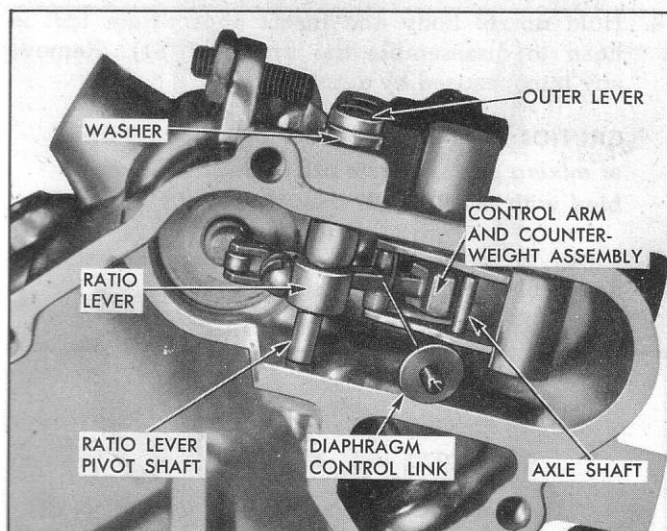


Fig. 56—Control Linkage Installation

2. Remove main diaphragm and meter bowl cover as outlined under Disassembly Procedures.
3. Remove enrichment diaphragm (see Repairs—Enrichment Diaphragm).
4. Loosen screw retaining ratio lever in position (fig. 57), slide ratio lever pivot shaft from meter body. Remove ratio lever.
5. Rotate control arm and counterweights on axle until axle shaft is exposed. Press axle from meter body using long nose pliers (fig. 58). Remove control arm and counterweight assembly from fuel meter body.

NOTE: This procedure will also remove the lead sealing ball located on the outer end of the axle shaft.

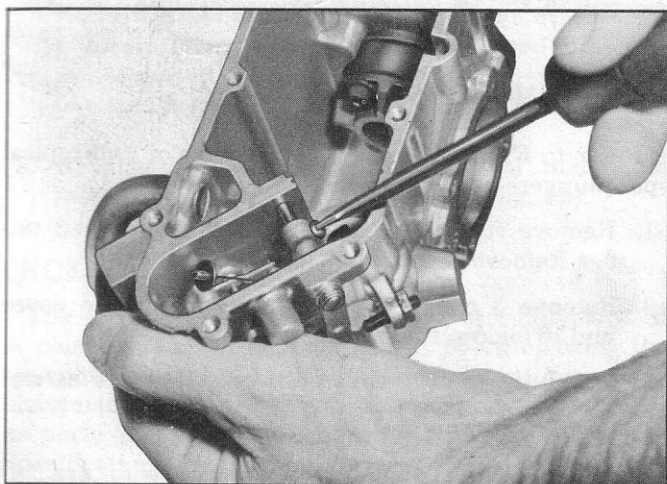


Fig. 57—Loosening Ratio Lever Retaining Screw

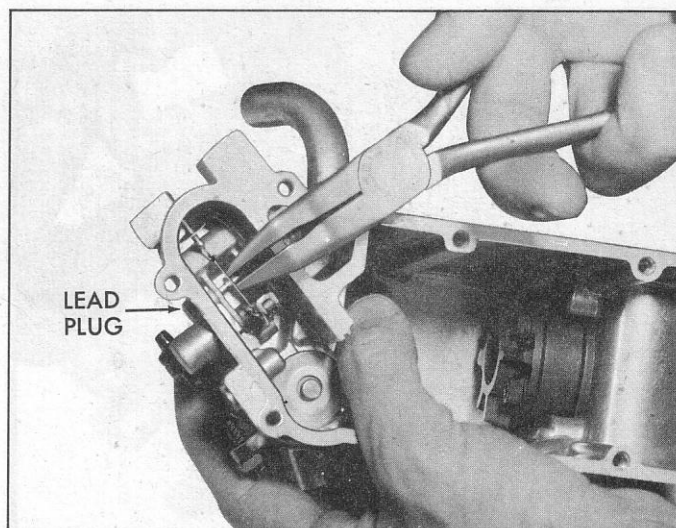


Fig. 58—Removing Control Arm Axle Shaft

6. Install new control arm and counterweight assembly in fuel meter. Be sure to use a new axle shaft. Check arm movement for correct operation.

NOTE: Axle shaft should bottom against fuel meter body. Install new lead sealing ball.

7. Reverse Steps 1 thru 3 to complete operation.

NOZZLES

Nozzles (fig. 59) may be disassembled for cleaning, using extreme care to insure correct reassembly. **DO NOT** use wire to clean orifices, **REPLACE THE NOZZLE**. If one nozzle is found to be exceptionally

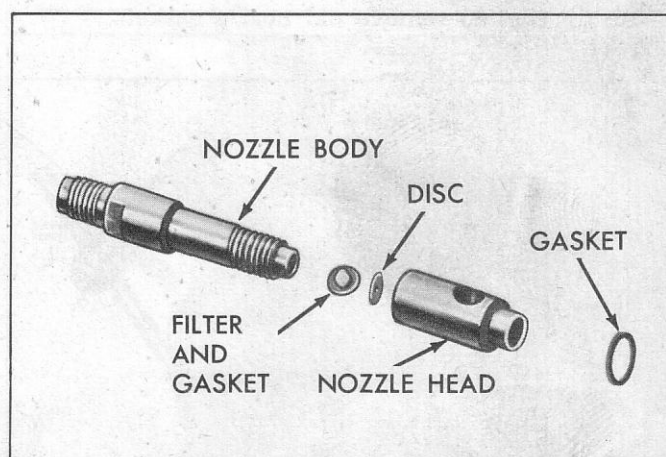


Fig. 59—Nozzle Assembly—Exploded View

dirty, it is very possible all the nozzles are in the same condition. Replace the fuel filter at the fuel meter when this condition is found. Service nozzles are available as complete assemblies only and should be replaced as follows:

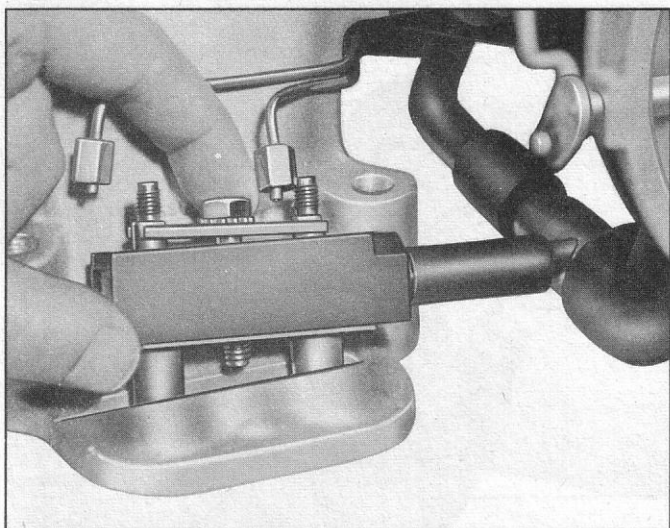


Fig. 60—Removing Nozzle Block Assembly

Production Nozzle Code	Use Replacement Nozzle	Part Number	Part Number
Q-11 or Q-12	Q12	7014856	7017124
R12 or R-13	R-13	7014857	7017125
S-13 or S-14	S-14	7014858	7017126

1. Disconnect and carefully raise fuel lines out of the way.

NOTE: Disconnect throttle bellcrank or fuel pump drive cable and place out of the way when servicing nozzles in those locations.

2. Remove nozzle block retaining screw, remove nozzles and nozzle block as an assembly (fig. 60).
3. Remove individual nozzles from nozzle block using care to remove old nozzle gaskets.

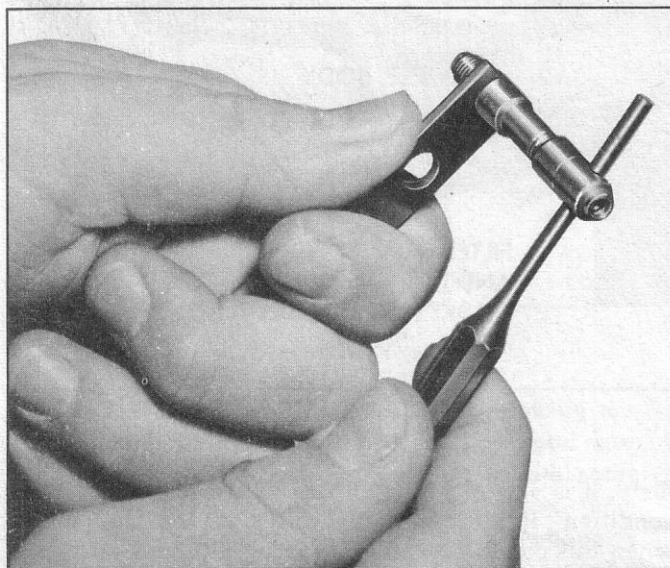


Fig. 61—Disassembling Nozzle

4. Hold nozzle body and insert appropriate tool in head to disassemble the unit (fig. 61). Remove any burrs caused by disassembly.

CAUTION: Use care to avoid damaging, losing or mixing parts. Nozzle orifice discs are assembled with the **BRIGHT** side toward the engine.

5. Clean or replace nozzle assemblies, reinstall in nozzle block with new gaskets.

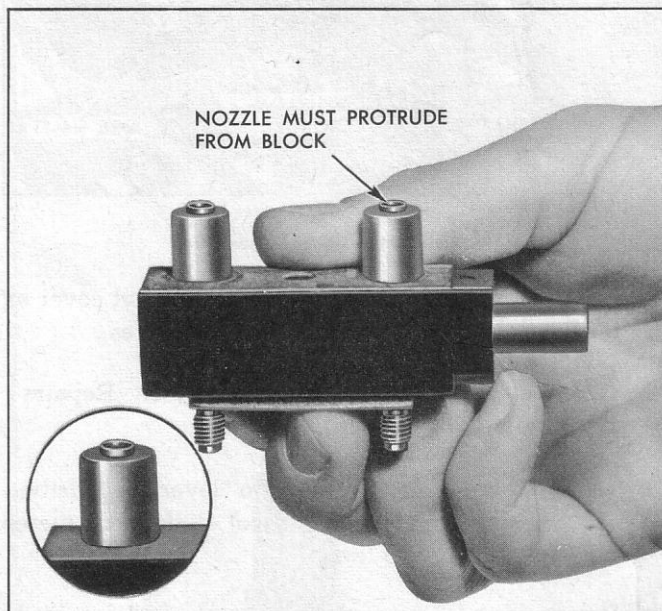


Fig. 62—Correct Nozzle Installation

CAUTION: Use care to insure nozzle gaskets remain in position during reinstallation procedure. Check to see that nozzles enter nozzle shields correctly (fig. 62).

6. Reverse Steps 1 and 2 to complete operation. Check vehicle performance.

SPILL PLUNGER ASSEMBLY

Refer to Figure 63 for exploded view of two typical spill plungers used in service.

1. Remove fuel meter from vehicle as outlined under Removal Section.
2. Remove 3 cover retaining screws, remove cover and 10 micron fuel filter.
3. Carefully remove spill plunger and sleeve assembly (fig. 64).

NOTE: Use a hook-shaped heavy wire engaged in the lower spill holes of the sleeve for old style sleeves.

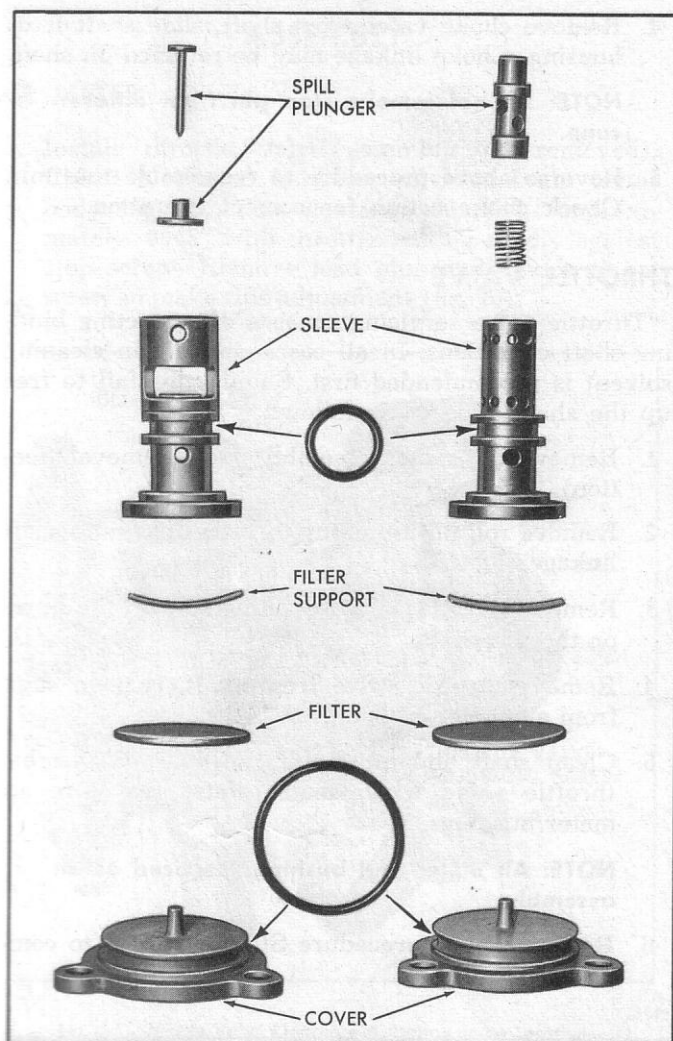


Fig. 63—Typical Spill Plungers—Exploded Views

4. Using fuel as a lubricant, check valve action for sticking, clean or replace valve and sleeve assembly where necessary.

NOTE: Current design valve and sleeve assemblies are interchangeable with past model assemblies and require no fuel meter alterations (die cast fuel meters only).

5. Reverse removal procedure, Steps 1 thru 3, to install valve and sleeve assembly (fig. 65).

CHOKE VALVE ASSEMBLY

The electric choke coil and cover assembly is held in place by 3 retaining screws (fig. 66). Replacing the assembly consists of merely removing these screws and disconnecting the lead wire. The new cover should be properly indexed to the housing when installed (see Specifications, Section 14).

Complete disassembly of the choke valve assembly is as follows:

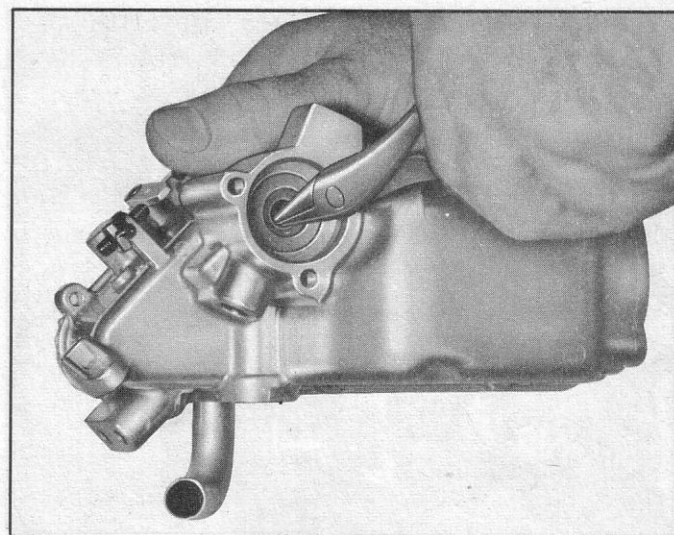


Fig. 64—Removing Spill Plunger Assembly

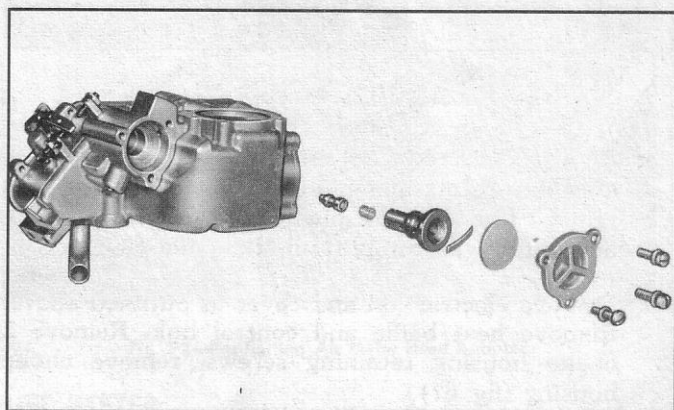


Fig. 65—Installing Spill Plunger Assembly

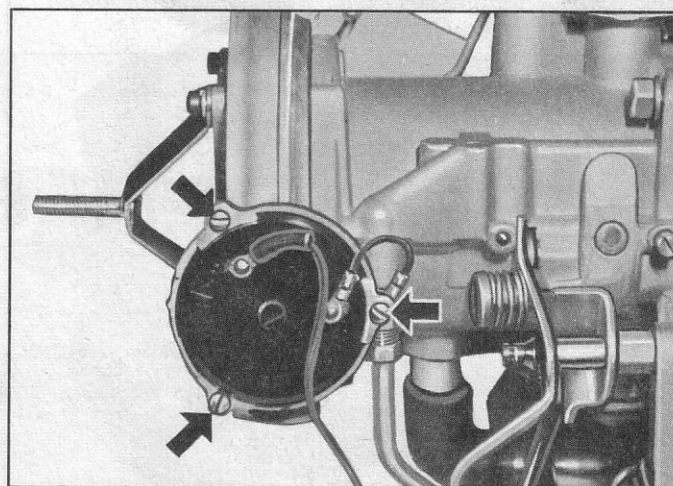


Fig. 66—Removing "Choke" Coil and Cover Assembly

1. Loosen air cleaner flexible hose clamps, slide hose from air meter adapter and cleaner, remove adapter.

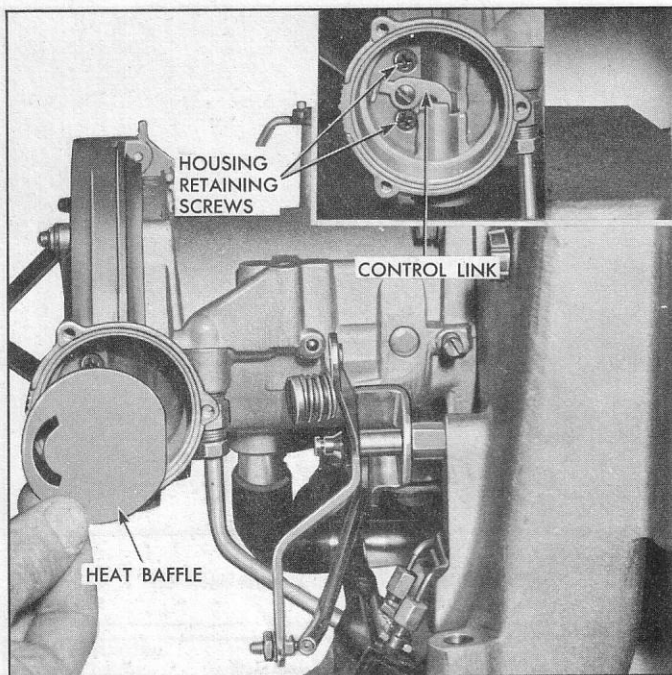


Fig. 67—Removing Heat Baffle and Control Link

2. Remove 4 screws retaining choke and diffuser assembly to air meter, disconnect lead wire, and remove fast idle cam pivot screw. Remove choke and diffuser assembly from air meter.
3. Remove electric coil and cover as outlined above. Remove heat baffle and control link. Remove 2 choke housing retaining screws, remove choke housing (fig. 67).

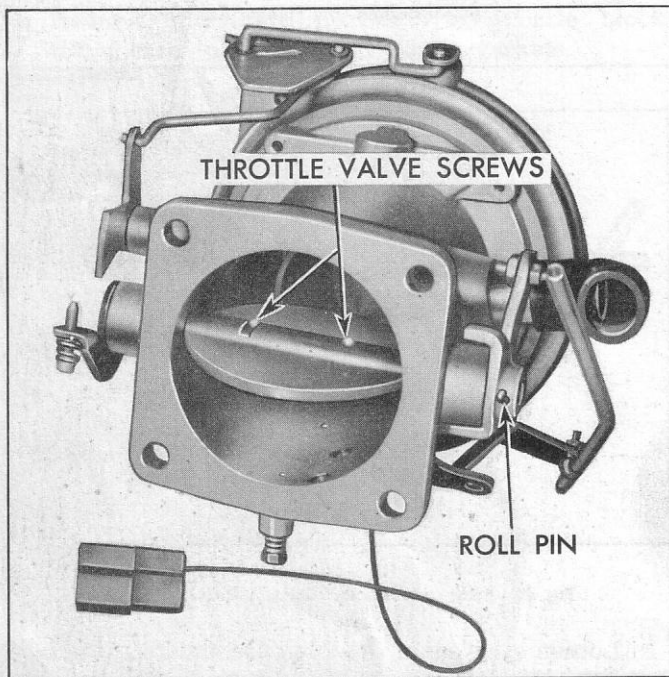


Fig. 68—Removing Throttle Shaft and Valve

4. Remove choke valve from shaft, slide shaft from housing. Choke linkage may be retained on shaft.

NOTE: Do not remove stop pin from diffuser cone.

5. Reverse above procedure to reassemble the unit. Check choke action for correct operation.

THROTTLE VALVE

Throttle valve servicing consists of correcting binding shaft conditions. In all cases, soaking in cleaning solvent is recommended first. Should this fail to free up the shaft, proceed as follows:

1. Remove air meter assembly (see Removal Section).
2. Remove roll pin retaining throttle linkage to shaft linkage (fig. 68).
3. Remove throttle valve retaining screws, file burrs on throttle shaft.
4. Remove throttle valve from shaft, remove shaft from air meter housing.
5. Clean shaft and air meter bushings, reassemble throttle valve when shaft rotates freely in air meter bushings.

NOTE: Air meter and bushings serviced as an assembly.

6. Reverse above procedure Steps 1 thru 4 to complete operation.

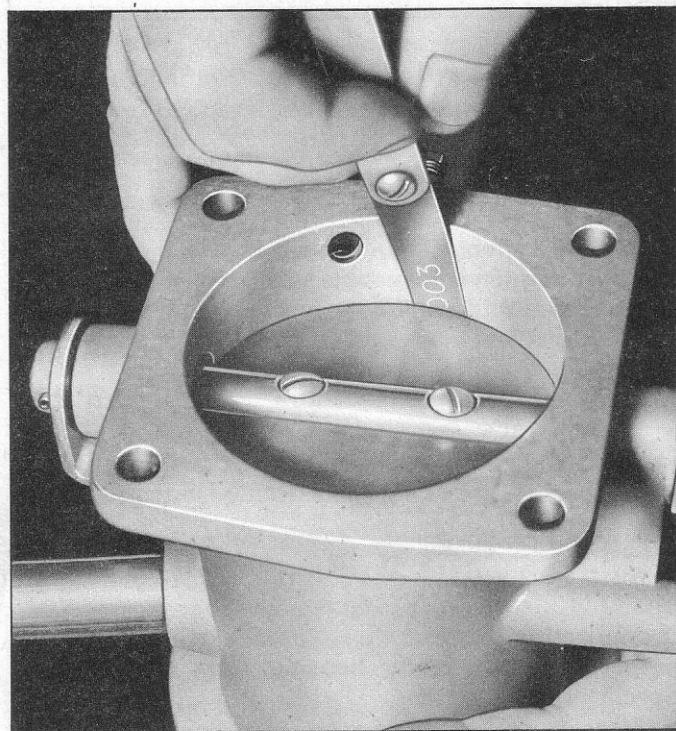


Fig. 69—Checking Throttle Valve to Body Clearance

ASSEMBLY

AIR METER

1. Install throttle valve assembly (if removed). Check clearance between valve and air meter body (fig. 69). This clearance should be approximately .0045" with throttle resting solidly against stop screw. Remove lead plug and hex head set screw to make this adjustment (fig. 70).

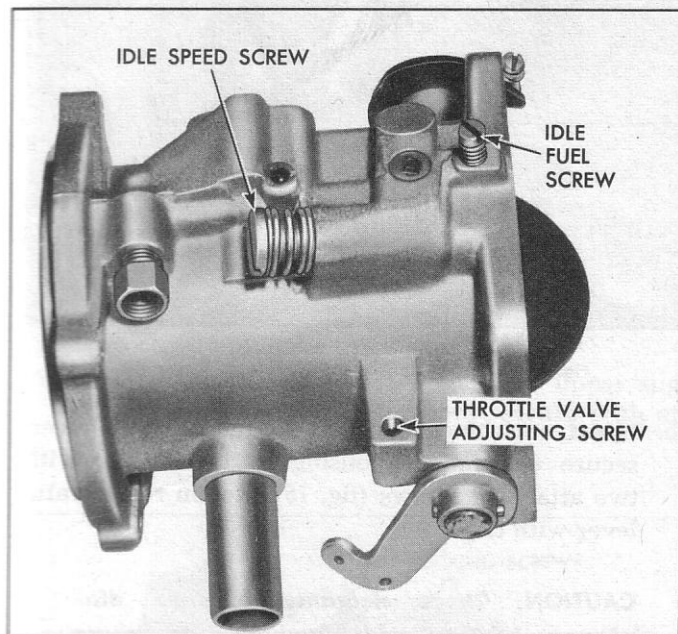


Fig. 70—Throttle Valve Clearance Adjusting Screw Location

CAUTION: Change this setting only if a poor or no-idle condition can be traced to improper clearance.

2. Install idle speed and idle fuel adjusting screws. Pre-set each screw $1\frac{1}{2}$ turns out from bottom.

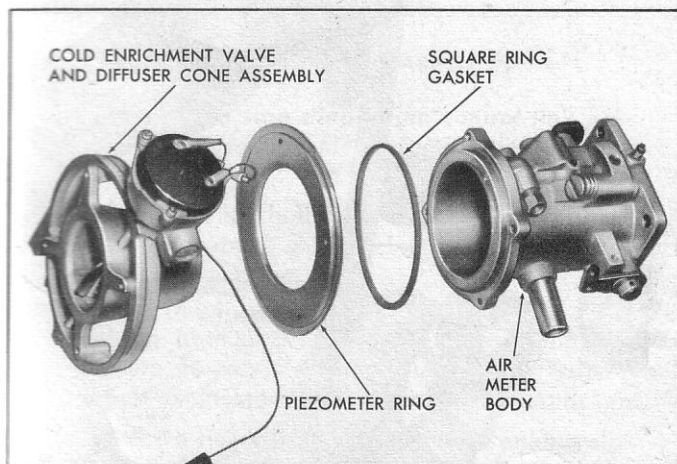


Fig. 71—Air Meter Assembly

NOTE: Replace idle fuel screw if valve end of screw appears damaged.

3. Position gasket, piezometer ring and diffuser assembly on air meter, install attaching screws (fig. 71). Install fast idle cam pivot screw and linkage.

NOTE: Piezometer ring and air cleaner hose adapter retaining bracket can be installed without reference to original position.

4. Attach air cleaner flexible hose adapter to air meter with retaining wing nut. Position adapter so that vent tube is approximately 1" below choke valve linkage (fig. 72).

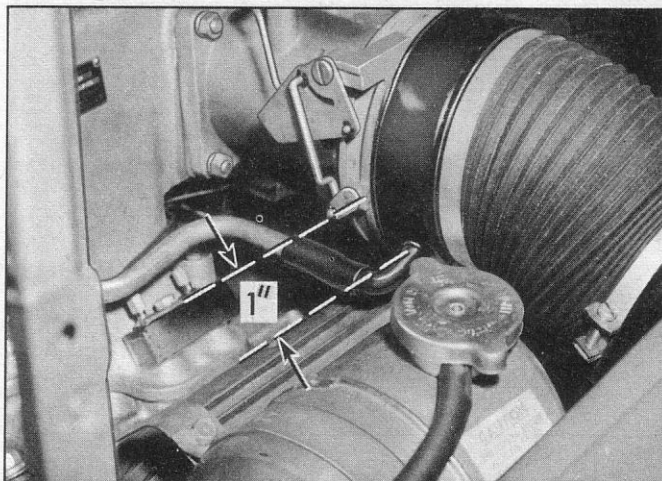


Fig. 72—Positioning Air Meter Hose Adapter

FUEL METER

1. Install spill plunger and sleeve assembly in fuel meter bore. Position filter support, filter and cover in place, retain with 3 attaching screws.

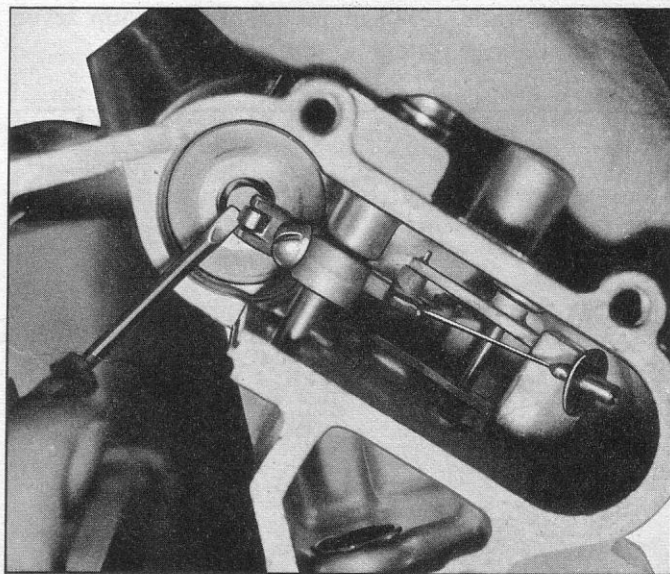


Fig. 73—Checking Spill Plunger Movement

NOTE: Plunger should be free on spring loaded assemblies. Check by lightly tapping plunger while assembly is held in operating position (fig. 73) (plunger should be lubricated with fuel during this test).

2. Install fuel pump and new gasket, secure with 5 attaching screws.

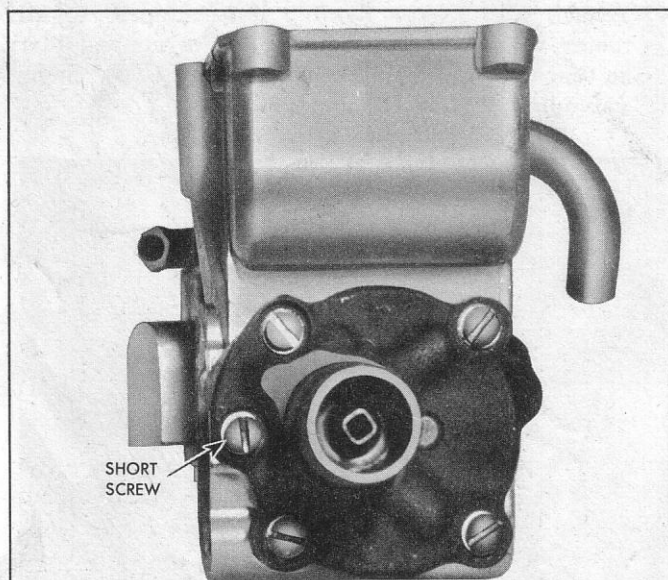


Fig. 74—Fuel Pump Short Screw Location

NOTE: Short screw is located at 9 o'clock (fig. 74). Verify by inspecting depth of screw holes in meter body.

3. Position Control Arm and Counterweight Assembly in meter, install axle shaft and lead sealing plug.
4. Position ratio lever in meter, install ratio lever shaft, tighten retaining screw securely.

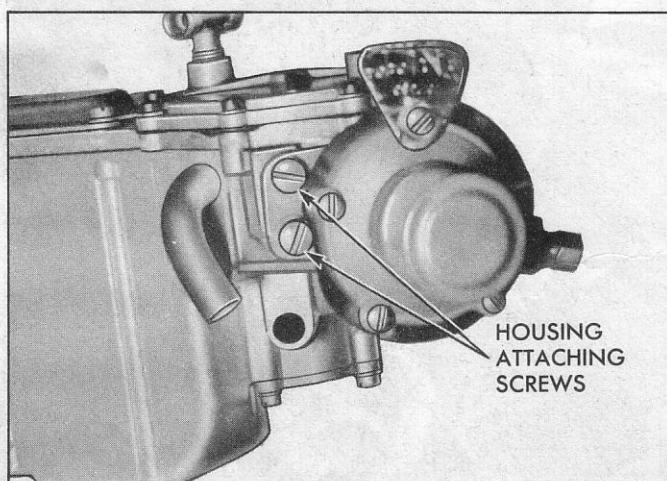


Fig. 75—Installing Enrichment Housing

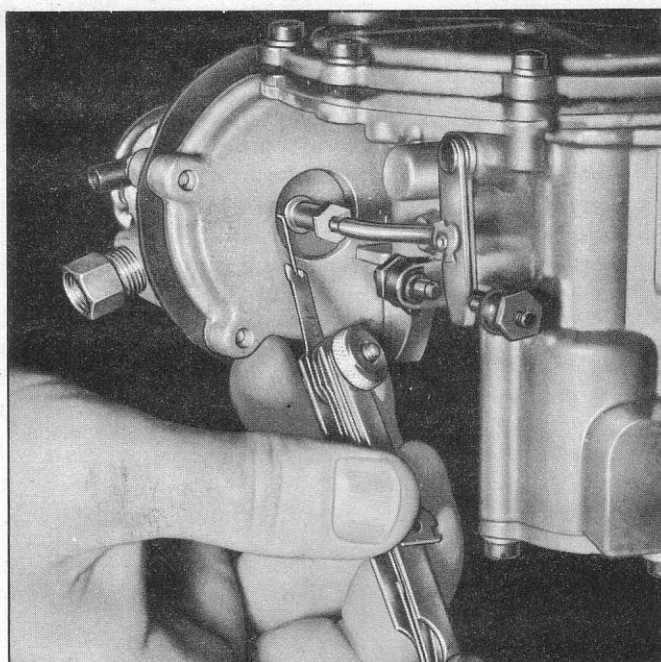


Fig. 76—Checking Enrichment Diaphragm Clearance

5. Insert enrichment diaphragm rod in ratio lever, secure enrichment housing to fuel meter with two attaching screws (fig. 75). Retain rod to ratio lever with clip.

CAUTION: Check clearance between diaphragm housing and diaphragm to insure ratio lever travel to power position will not be interrupted (fig. 76).

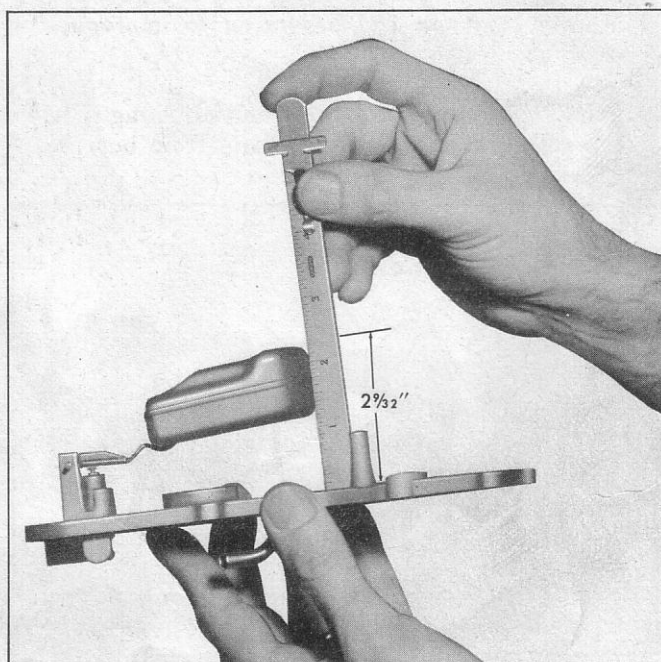


Fig. 77—Checking Float Level

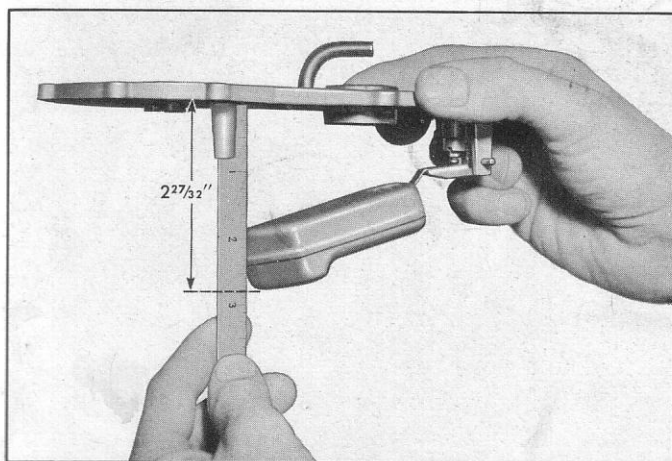


Fig. 78—Checking Float Drop

6. Check fuel reservoir float settings before positioning cover to fuel meter body. Float level (fig. 77) should be $2\frac{9}{32}$ inches while float drop (fig. 78) should be $2\frac{27}{32}$ inches. Bend float arms or tang respectively to make these adjustments.
7. Position fuel bowl gasket, cover and upper support bracket on fuel meter body, secure with attaching screws (fig. 79).

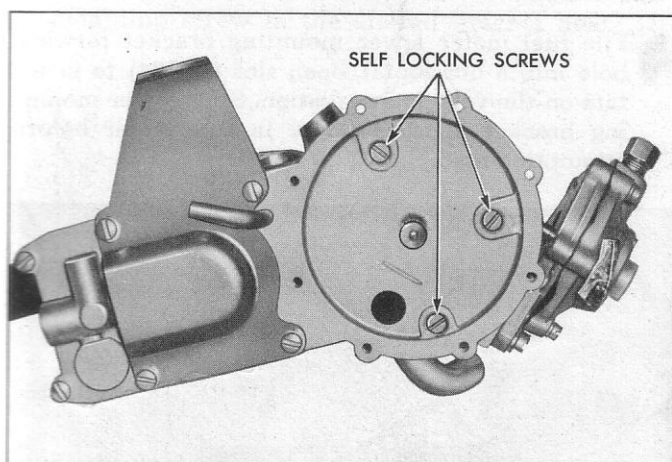


Fig. 79—Fuel Bowl Cover and Bracket Installed

CAUTION: Be sure diaphragm control link protrudes thru cover hole before securing cover to meter.

8. Install nylon shield at diaphragm control link. Start link into shield slot and carefully work shield into position.
9. Install diaphragm on control link (fig. 80). See caution note under Step 5 of Main Control Diaphragm Repair Section. Check to be sure small gasket is located under center of diaphragm.

NOTE: Do not install fuel filter or cranking signal tube until fuel meter is installed on the manifold.

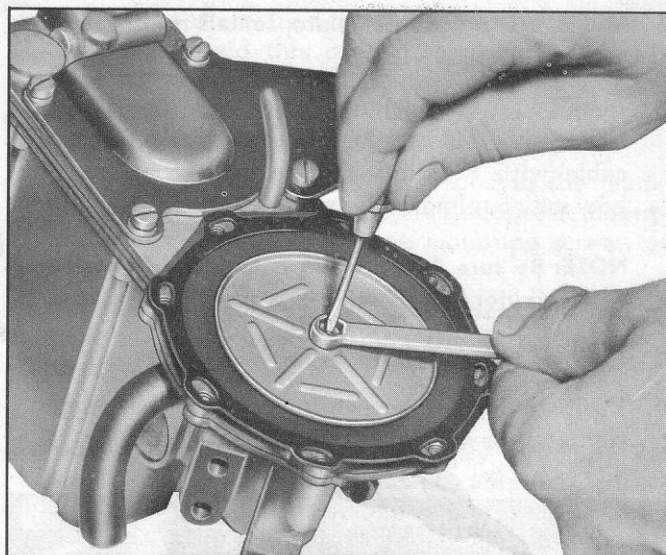


Fig. 80—Installing Diaphragm on Control Link

INSTALLATION

INJECTION ASSEMBLY

It is recommended that a fuel nozzle spray pattern check be made when a major overhaul involving complete nozzle cleaning is made. Use a suitable drive (air wrench, electric hand drill, etc.) to operate the gear pump while applying oral vacuum at the main control diaphragm to insure all fuel will pass into the nozzle circuit. The nozzle spray pattern should be such that each bank of nozzles appear as a single spray when viewed from the end of the Injection Assembly (fig. 81).

1. Remove bolts and nuts forming feet used during disassembly. Carefully position Injection Assem-

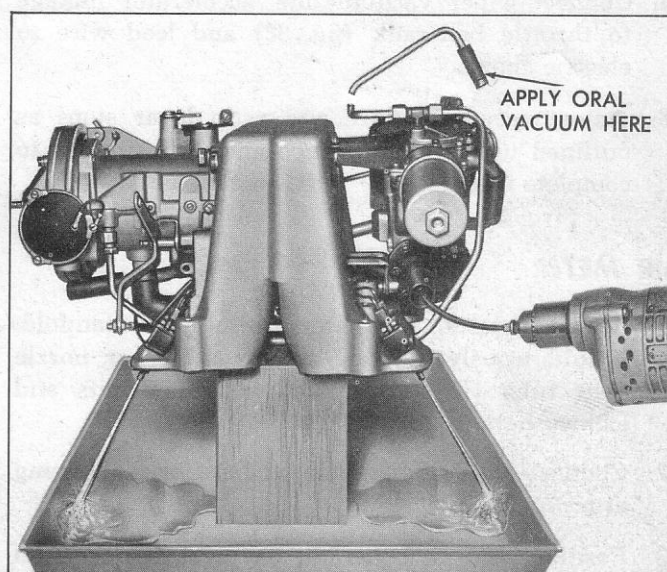


Fig. 81—Checking Fuel Nozzle Spray Pattern

bly on engine adapter plate. Install retaining nuts, torque to 15-20 ft. lbs.

2. Install fuel meter pump drive cable and housing. Slide cable and housing into gear pump first, align cable with distributor drive gear, connect cable housing coupling to distributor.

NOTE: Be sure fiber washer is correctly located at distributor end of drive cable.

3. Connect fuel line to fuel filter.
4. Position flexible hose to air meter hose adapter, tighten hose clamp securely.

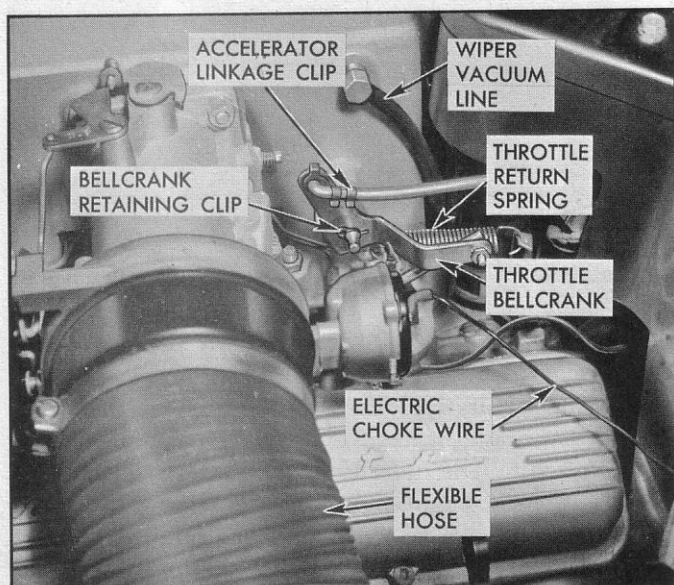


Fig. 82—Installing Fuel Injection Assembly

5. Connect wiper vacuum line, accelerator linkage to throttle bellcrank (fig. 82) and lead wire to electric choke.
6. Adjust speed, mixture and ratio lever stops as outlined under Maintenance and Adjustments to complete installation.

AIR METER

1. Carefully install air meter assembly to manifold, simultaneously aligning rubber elbow at nozzle vent tube (fig. 83). Install retaining nuts and lockwashers.
2. Connect main signal tube at both ends, starting at air meter first.
3. Position throttle bellcrank on pivot shaft, retain with clip. Install return spring and accelerator linkage.

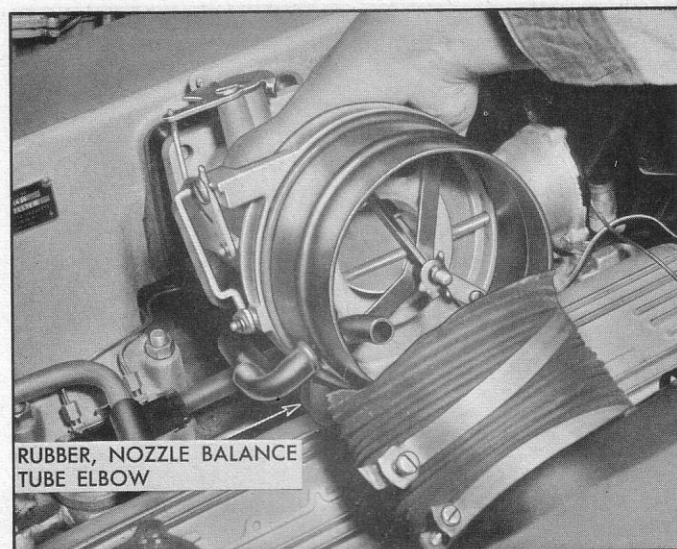


Fig. 83—Installing Air Meter Assembly

4. Connect electric choke lead wire.
5. Position flexible hose on air meter adapter and tighten hose clamp to complete installation procedure.

FUEL METER

1. File fuel meter lower mounting bracket forward hole into a horizontal, open slot (fig. 84) to facilitate on-the-vehicle installation. Start lower mounting bracket forward screw in fuel meter before attempting installation.

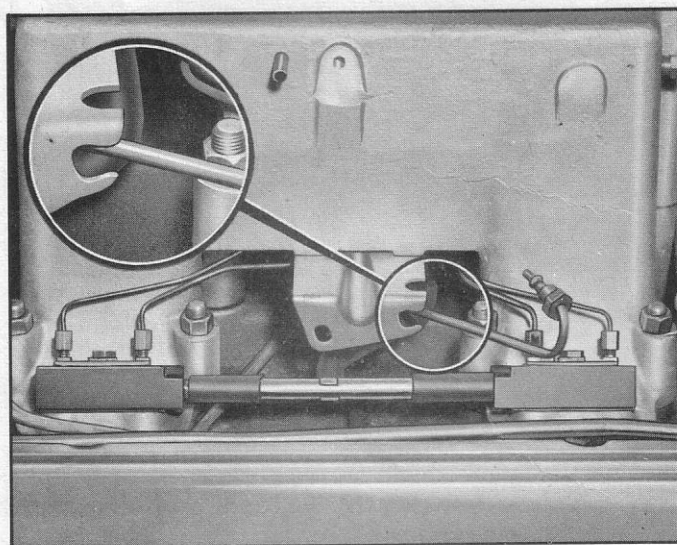


Fig. 84—Altering Lower Fuel Meter Bracket

2. Install a new "O" ring on the nozzle fuel distribution line, position fuel meter so that the distribution line will enter the fuel meter with no interference. Carefully insert the line into the meter, finger tighten the retaining nut (fig. 85).

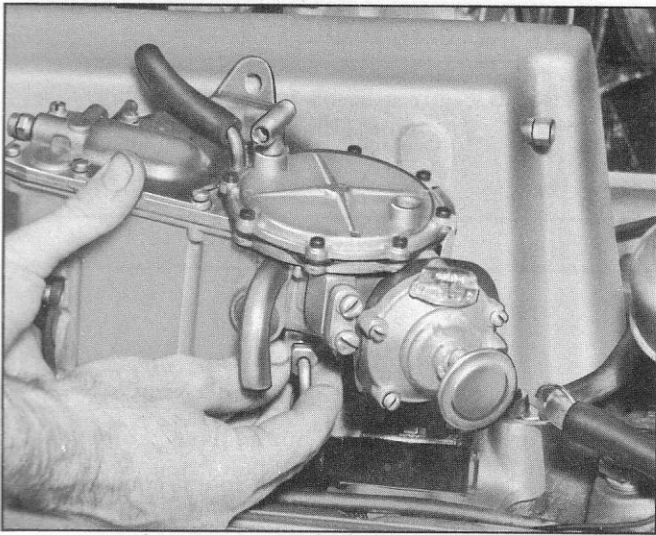


Fig. 85—Installing Nozzle Line in Meter

NOTE: Install the "O" ring absolutely dry to prevent the ring from rolling over the shoulder on the nozzle distribution line. Slight bending upward of the fuel meter end of the distributor line will facilitate entrance into the fuel meter.

3. Now engage the previously started forward mounting screw in the altered bracket hole.

4. Install the rearward screw in the lower mounting bracket. To aid this procedure, position the 10" screwdriver under the manifold prior to starting this screw. Use the screwdriver to help start the screw if a screwholder is not available.
5. Engage the short rubber vent tube to the manifold stud and install the upper fuel meter mounting screw. Tighten the three mounting screws at this time.
6. Position and connect the enrichment diaphragm tube at both ends, engaging the diaphragm end first.
7. Install the cranking signal line.
8. Lubricate the drive cable lightly prior to installation. Engage pump end of cable first, pushing cable and housing into the pump as far as it will go. Then engage distributor end and secure with coupling.

NOTE: Be sure fiber washer is located at distributor end of drive cable.

9. Install fuel filter and fuel line to meter.
10. Connect main diaphragm signal tube, starting at air meter end first. Connect throttle return spring to bellcrank.
11. Check installation for fuel leaks to complete procedure.

TROUBLE SHOOTING

The possibility of air or vacuum leaks, faulty ignition system, or low engine compression should be considered before condemning the Fuel Injection Sys-

tem. Refer to Figures 86-88 for typical schematics of Fuel Injection Systems (1957 thru 1962).

CONDITIONS	CHECKS
FAILS TO START (Ignition System OK) <ol style="list-style-type: none"> 1. No fuel to fuel meter 2. No fuel at nozzles (check more than one nozzle) 3. No vacuum signal at main control diaphragm 	Check fuel tank supply or engine fuel pump. Check for broken fuel meter pump drive cable. Check for leaking or ruptured main control diaphragm, defective cranking signal valve, or broken main control diaphragm linkage.
DIFFICULT STARTING (Operation Normal After Engine Warms Up) <ol style="list-style-type: none"> 1. Improper cold starting procedure 2. Improper hot starting or unloading procedure 3. No vacuum boost at disconnected signal line 	Preset fast idle cam by depressing accelerator pedal once, then releasing pedal until engine starts. Check fast idle cam setting (see Maintenance and Adjustments). Check for defective cranking signal valve or enrichment solenoid (older models). Check for choke valve stuck open (1962 Injection). Use $\frac{3}{4}$ or wide open throttle position to aid in overcoming hot starting problems. Check for defective cranking signal valve or micro-switch (where applicable). Check for defective cranking signal valve or cold enrichment housing. Check for vacuum leaks at main control diaphragm or signal line.
NO IDLE (High Speed Operation OK) <ol style="list-style-type: none"> 1. Idle adjusting screws out of phase 2. Idle speed too low—distributor advance incorrect 3. Idle fuel screw turned all the way out 4. Idle fuel screw turned all the way in 	Use procedure outlined under Maintenance Section. See Specifications Section. Check air meter throttle valve-to-bore clearance (see Assembly Section). Check for dirty air meter passages, vacuum or air leaks, or defective main diaphragm (aged, wrinkled). Check nozzle vent tubes and nozzles for plugged condition. Check nozzle-to-insulator gaskets for defects (broken missing, improperly located).

CONDITIONS (Continued)

CHECKS (Continued)

NO IDLE (Continued)

5. No idle boost signal

Check for defective cranking signal valve or signal boost valve (older models).

Check for plugged main control diaphragm vent tube.

Check for sticking spill-plunger.

Check for main diaphragm shrinkage.

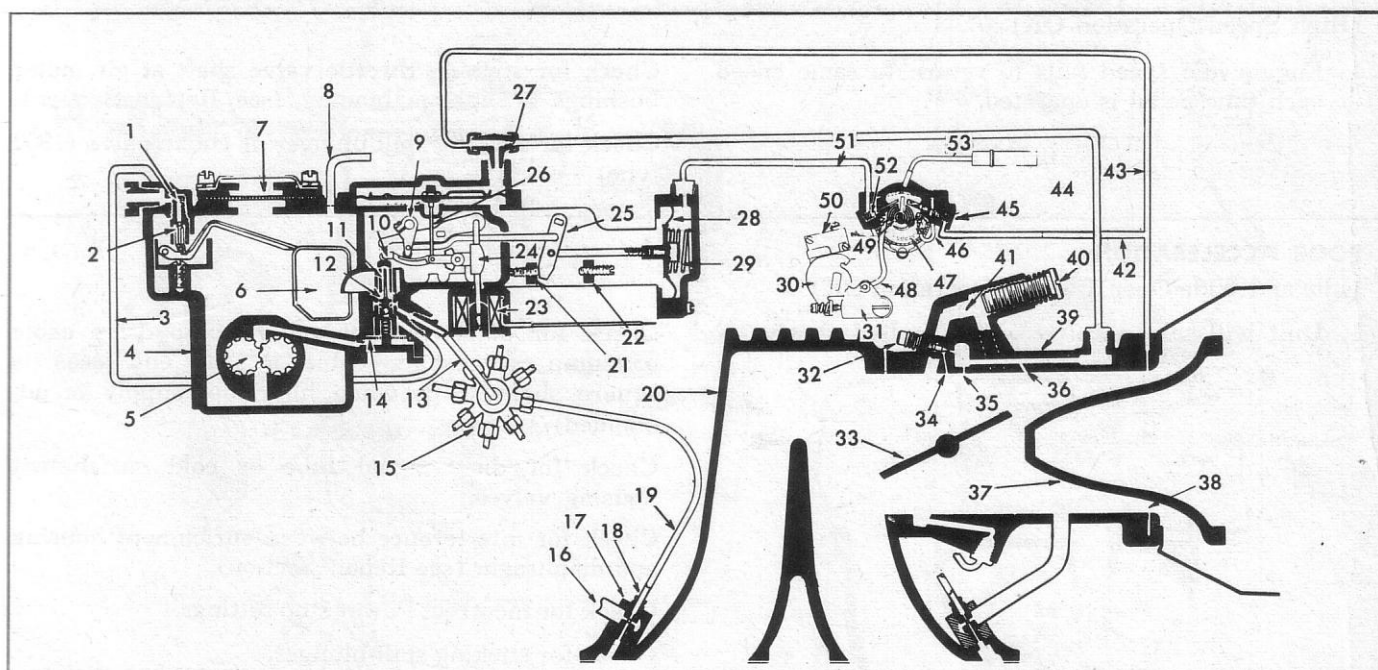


Fig. 86—Schematic Diagram (Typical 1957-58)

- | | | | |
|---|-------------------------------------|--|--------------------------------------|
| 1. Fuel Inlet and Strainer | 14. Pump Outlet Strainer | 28. Enrichment Diaphragm | 41. Idle Air By Pass |
| 2. Float Needle and Seat | 15. Fuel Distributor | 29. Enrichment Diaphragm Spring | 42. Idle Vacuum Signal Line |
| 3. Starting By Pass Fuel Line | 16. Nozzle Air Duct | 30. Throttle Shaft Cam Lever | 43. Main Control Signal Line |
| 4. Fuel Meter Casting | 17. Nozzle Block | 31. Fast Idle Cam | 44. Boost Signal Line |
| 5. Fuel Meter Fuel Pump | 18. Fuel Nozzle | 32. Idle Fuel Signal Adjustment Needle | 45. Boost Valve |
| 6. Float | 19. Nozzle Fuel Line | 33. Throttle Valve | 46. Heat Element Ground Wire |
| 7. External Bowl Vent Screen | 20. Intake Manifold Casting | 34. Idle Signal Port | 47. Electric Heat Element |
| 8. Bowl-to-Manifold Vent | 21. Rich (Power) Stop | 35. Off-Idle Signal Port | 48. Cold Enrichment-to-Fast Idle Rod |
| 9. Ratio Lever | 22. Lean (Economy) Stop | 36. Idle Signal Bleed | 49. Thermostatic Coil |
| 10. Fuel Control Lever | 23. Starting Solenoid | 37. Diffuser Cone | 50. Starting Cut-Off Switch |
| 11. Spill Plunger | 24. Diaphragm Linkage Counterweight | 38. Venturi | 51. Enrichment Vacuum Signal Line |
| 12. Anti-Percolation Valve and Spring | 25. Enrichment Lever | 39. Air Meter Casting | 52. Enrichment Vacuum Signal Valve |
| 13. Fuel Meter-to-Distributor Fuel Line | 26. Main Control Diaphragm Link | 40. Idle Air (Speed) Adjustment Screw | 53. Hot Wire from Battery |
| | 27. Restriction Tee | | |

CONDITIONS (Continued)	CHECKS (Continued)
<p>ROUGH IDLE (High Speed Operation OK)</p> <ol style="list-style-type: none"> 1. Idle adjusting screws out of phase 2. Excessive fuel at idle (exhausting black vapors) 	<p>Use procedure outlined under Maintenance Section.</p> <p>Purge system by accelerating a few times to clear manifold.</p> <p>Check for defective cranking signal valve or defective cold enrichment housing operation (older models).</p> <p>Check nozzle vent tubes and nozzles for plugged condition.</p> <p>Check main diaphragm vent tube for plugged condition.</p> <p>Check engine valve lash settings.</p>
<p>ERRATIC IDLE SPEEDS (High Speed Operation OK)</p> <ol style="list-style-type: none"> 1. Engine idle speed fails to return to same speed each time pedal is operated. 	<p>Check for sticking throttle valve shaft at air meter bushings or linkage binding (see Repair Section).</p> <p>Check for sticking spill plunger or choke valve (1962 type).</p>
<p>POOR ACCELERATION (Idle and Wide Open Throttle Operation OK)</p> <ol style="list-style-type: none"> 1. Unit will take throttle when applied slowly. 	<p>Check for defective fuel meter pump drive cable or pump drive shaft (cable or shaft end loses its square shape, slips when high fuel supply is demanded).</p> <p>Check for dirty signal tube or cold enrichment housing valves.</p> <p>Check for interference between enrichment housing and diaphragm (see Repair Section).</p> <p>Check for incorrect Power stop settings.</p> <p>Check for sticking spill-plunger.</p>
<p>POOR PERFORMANCE</p> <ol style="list-style-type: none"> 1. Hesitation or flat spot. 2. Surging (at steady engine speed). 	<p>Check for defective main control diaphragm or vacuum leaks.</p> <p>Check for faulty spill plunger operation.</p> <p>Check for incorrect Economy Stop setting (see Maintenance Section).</p> <p>Check for plugged nozzles or nozzle vent tubes.</p> <p>Check for incorrect Economy stop setting.</p> <p>Check for faulty integral siphon breaker operation.</p> <p>Check for plugged main control diaphragm vent tube.</p>

CONDITIONS (Continued)

CHECKS (Continued)

POOR PERFORMANCE (Continued)

3. Excessive fuel consumption.

Check for defective cranking signal valve or cold enrichment housing valve sticking.

Check for open electric choke coil (unit remains on Power stop).

Check driving habits.

Check for fuel leaks or faulty integral siphon breaker operation.

Check for incorrect spark plug heat range or fouled plugs.

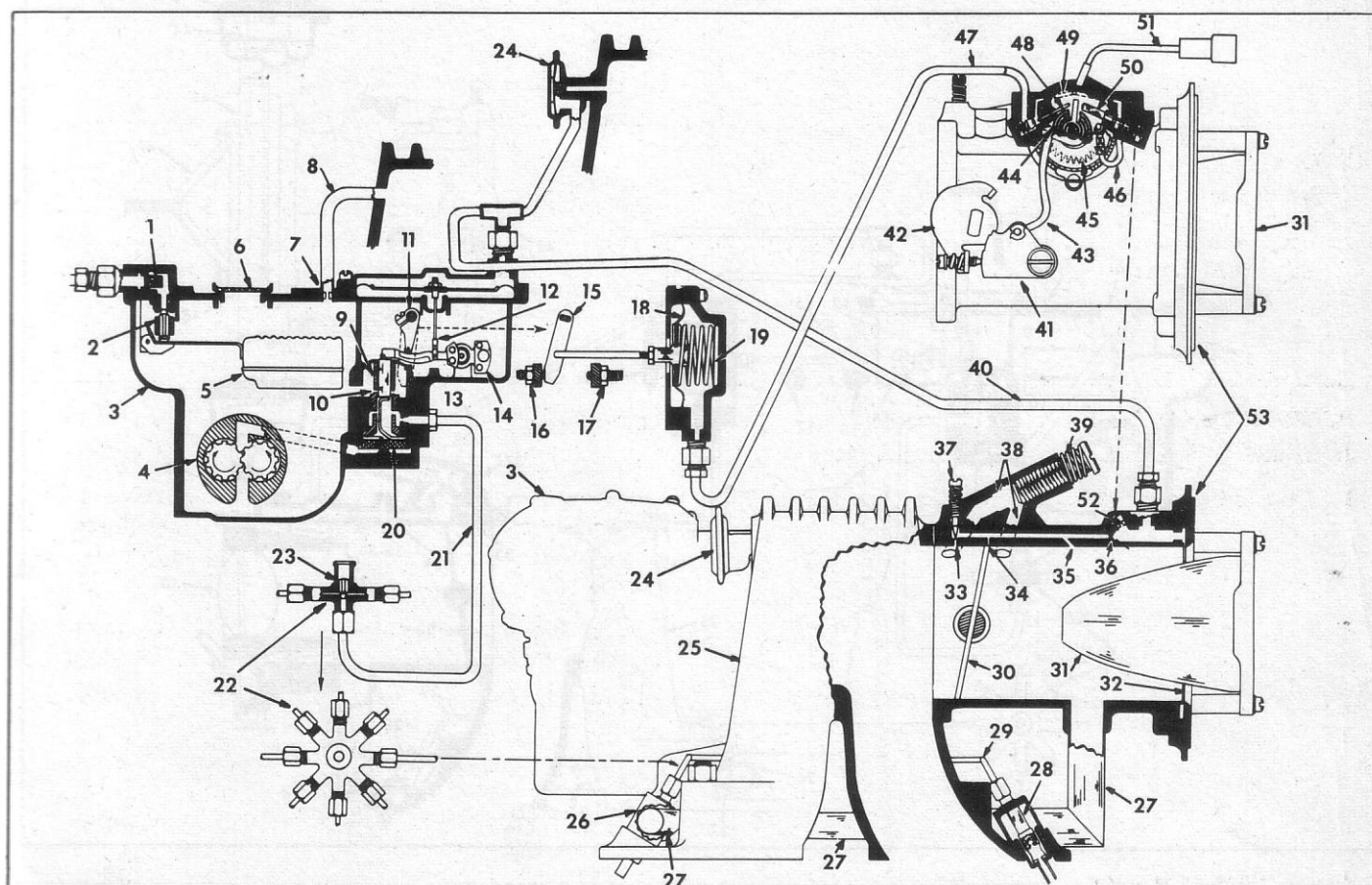


Fig. 87—Schematic Diagram (Typical 1958-1961)

- | | | | |
|--------------------------------------|---|--|--|
| 1. Fuel Inlet Strainer | 15. Enrichment Lever | 29. Nozzle Fuel Line | 42. Throttle Shaft Cam Lever |
| 2. Float Needle and Seat | 16. Rich (Power) Stop | 30. Throttle Valve | 43. Cold Enrichment-to-Fast Idle Rod |
| 3. Fuel Meter Casting | 17. Lean (Economy) Stop | 31. Diffuser Cone | 44. Thermostatic Coil |
| 4. Fuel Meter Fuel Pump | 18. Enrichment Diaphragm | 32. Venturi | 45. Electric Heat Element |
| 5. Float | 19. Enrichment Diaphragm Spring | 33. Idle Signal Port | 46. Heat Element Ground Wire |
| 6. External Bowl Vent Screen | 20. Pump Outlet Strainer | 34. Off-Idle Signal Port | 47. Enrichment Vacuum Signal Line |
| 7. Bowl-to-Manifold Vent Restriction | 21. Fuel Meter-to-Distributor Fuel Line | 35. Idle Signal Bleed | 48. Enrichment Vacuum Signal Valve |
| 8. Bowl-to-Manifold Vent | 22. Fuel Distributor | 36. Idle Signal Restriction | 49. Manifold Vacuum Supply to Cold Enrichment Valves |
| 9. Spill Plunger | 23. Fuel Distributor Check Valve | 37. Idle Fuel Signal Adjustment Needle | 50. Boost Signal Valve |
| 10. Spill Ports | 24. Cranking Signal Valve | 38. Idle Air By Pass | 51. Hot Wire to Generator |
| 11. Ratio Lever | 25. Intake Manifold Casting | 39. Idle Air (Speed Adjusting Screw | 52. Boost Signal Line Restriction |
| 12. Main Control Diaphragm Link | 26. Nozzle Block | 40. Main Control Signal Line | 53. Air Meter |
| 13. Fuel Control Lever | 27. Nozzle Air Duct | 41. Fast Idle Cam | |
| 14. Diaphragm Linkage Counterweight | 28. Fuel Nozzle | | |

CONDITIONS (Continued)

CHECKS (Continued)

POOR PERFORMANCE (Continued)

4. Wide Open Throttle—Engine Missing.

Check fuel meter pump drive cable and drive shaft for "out of square" condition.

Check engine fuel pump—should have approximately 3 lbs. pressure at 4000 rpm.

Check for dirty air cleaner or fuel filter.

Check for defective spark plugs.

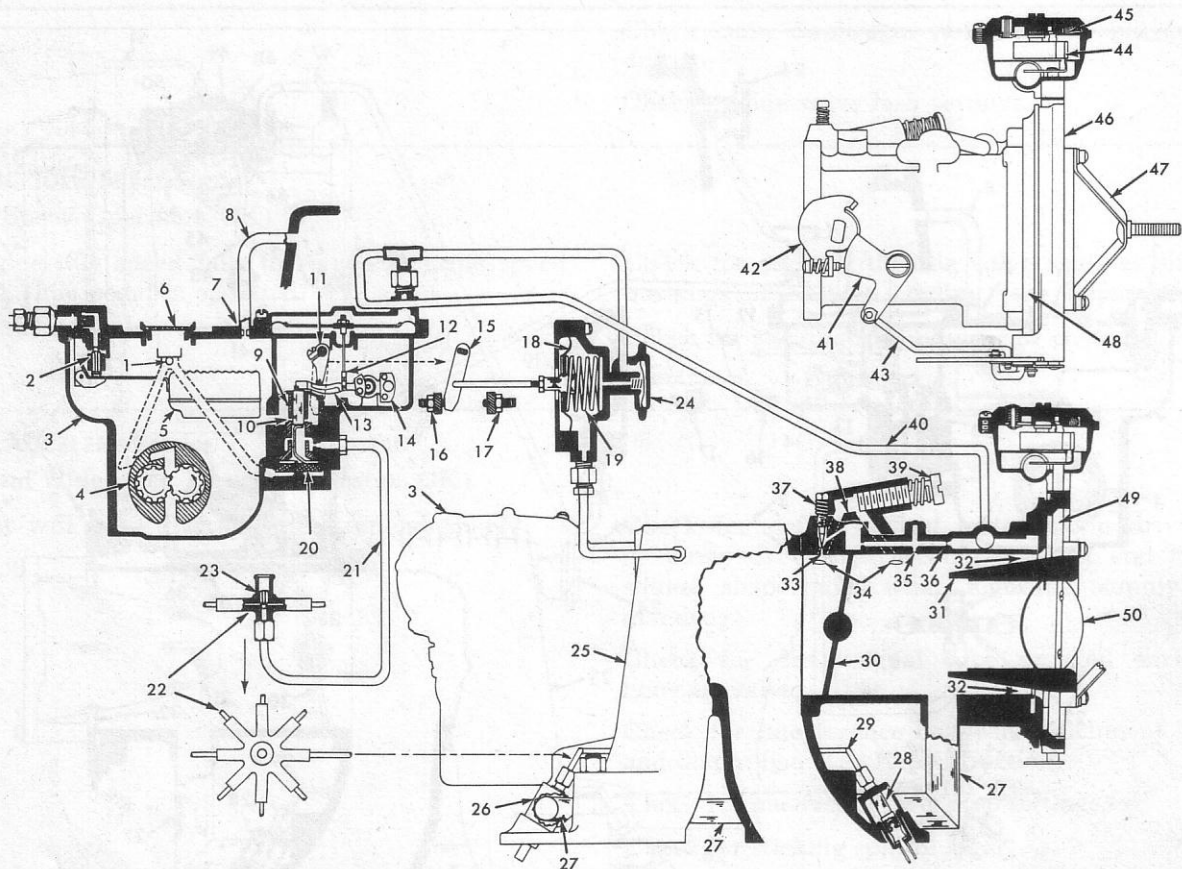


Fig. 88—Schematic Diagram (Typical 1962)

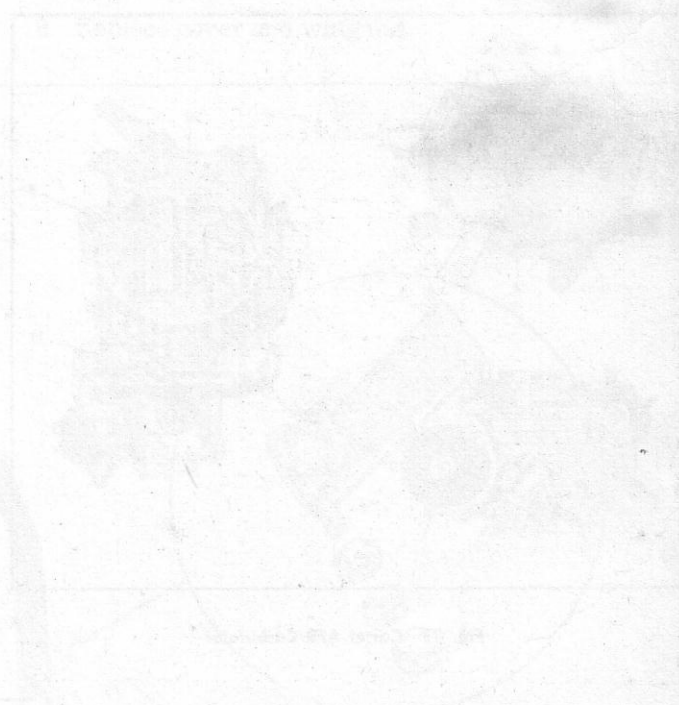
- | | | | |
|--------------------------------------|---|--|---------------------------------------|
| 1. Integral Siphon Breaker | 14. Diaphragm linkage Counterweight | 26. Nozzle Block | 39. Idle Air Speed Adjusting Screw |
| 2. Float Needle and Seat | 15. Enrichment Lever | 27. Nozzle Air Duct | 40. Main Control Signal Line |
| 3. Fuel Meter Casting | 16. Rich (Power) Stop | 28. Fuel Nozzle | 41. Fast Idle Cam |
| 4. Fuel Meter Fuel Pump | 17. Lean (Economy) Stop | 29. Nozzle Fuel Line | 42. Throttle Shaft Cam Lever |
| 5. Float | 18. Enrichment Diaphragm | 30. Throttle Valve | 43. Cold Enrichment-to-Fast Idle Link |
| 6. External Bowl Vent Screen | 19. Enrichment Diaphragm Spring | 31. Diffuser Cone | 44. Thermostatic Coil |
| 7. Bowl-to-Manifold Vent Restriction | 20. Pump Outlet Strainer | 32. Venturi | 45. Electric Heat Element |
| 8. Bowl-to-Manifold Vent | 21. Fuel Meter-to-Distributor Fuel Line | 33. Idle Signal Port | 46. Cold Enrichment Assy. |
| 9. Spill Plunger | 22. Fuel Distributor | 34. By Pass Ports | 47. Air Cleaner Hose Adapter Bracket |
| 10. Spill Ports | 23. Fuel Distributor Check Valve | 35. Idle Signal Bleed | 48. Piezometer Ring |
| 11. Ratio Lever | 24. Cranking Signal Valve | 36. Idle Signal Restriction | 49. Cold Enrichment Valve Shaft |
| 12. Main Control Diaphragm Link | 25. Intake Manifold Casting | 37. Idle Fuel Signal Adjustment Needle | 50. Cold Enrichment Valve |
| 13. Fuel Control Lever | | 38. Idle Air By Pass | |

SPECIFICATIONS

Refer to Specifications—Section 14.

SPECIAL TOOLS

Refer to page 6M-50.



MAINTENANCE AND ADJUSTMENTS

FUEL SYSTEM CLEANING

1. Remove the fuel filter and clean it with a clean cloth. If the filter is dirty, replace it with a new one.

2. Clean the fuel lines and injectors with a clean cloth. If the lines or injectors are dirty, clean them with a clean cloth.

3. Clean the fuel tank and vent. Remove the fuel tank cap and clean the inside of the tank with a clean cloth. Clean the vent with a clean cloth.

CARTER AFB CARBURETOR

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GENERAL DESCRIPTION

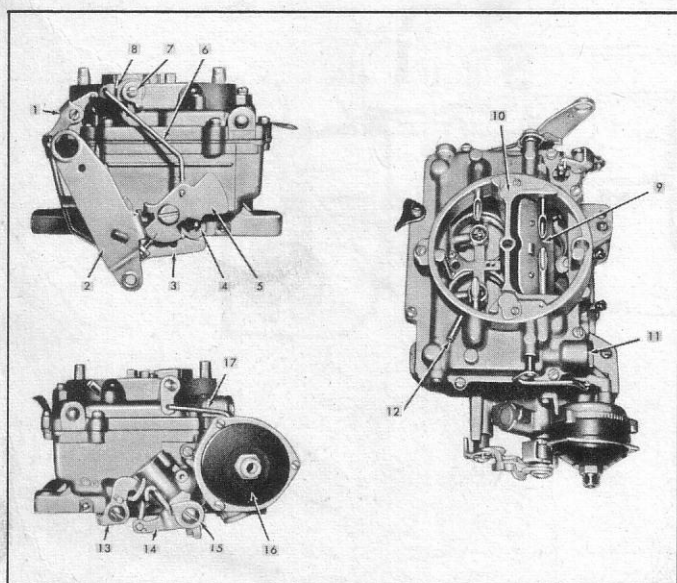


Fig. 89—Carter AFB Carburetor

The Carter AFB (Aluminum Four-Barrel) Carburetor (fig. 89) is used as a high performance option on the 327 cubic inch engine. The carburetor is a 4-barrel downdraft type which provides the advantages of a dual 2-barrel installation in one compact unit. It is used in conjunction with a dual exhaust system.

A clean air system to the automatic choke housing minimizes any tendency toward sticking parts due to dirt.

Clean air is drawn from an adapter tube in the carburetor air horn through a tube to the manifold choke heat tube, then through another tube to choke housing cover.

- | | |
|-------------------------------------|--|
| 1. Pump Lever | 10. Piston Cover Plate |
| 2. Primary Throttle Shaft Lever | 11. Fuel Inlet Fitting |
| 3. Secondary Throttle Lockout Lever | 12. Choke Clean Air Pickup Tube |
| 4. Secondary Throttle Shaft Lever | 13. Secondary Throttle Shaft Dog Lever |
| 5. Fast Idle Cam | 14. Secondary Throttle Trip Lever |
| 6. Fast Idle Rod | 15. Primary Throttle Shaft Lever |
| 7. Choke Shaft Outer Lever | 16. Choke Coil & Housing Cover |
| 8. Choke Shaft Kick Lever | 17. Intermediate Choke Rod |
| 9. Choke Valve | |

MAINTENANCE AND ADJUSTMENTS

FUEL FILTER (fig. 90)

The fuel filter used with AFB Carburetors is a separate glass bowl unit installed between carburetor inlet and fuel line to carburetor.

1. Remove the glass bowl and paper filter element.
2. Replace paper filter element.
3. Reinstall with new gasket.

POLYURETHANE ELEMENT AIR CLEANER

1. Remove cover wing nut, cover and filter element.
2. Visibly check the element for tears or rips and replace if necessary.
3. Clean all accumulated dirt and grime from air cleaner body and cover. Discard air horn to air cleaner gasket.
4. Remove support screen from element and wash element in kerosene or mineral spirits; then squeeze out excess solvent.

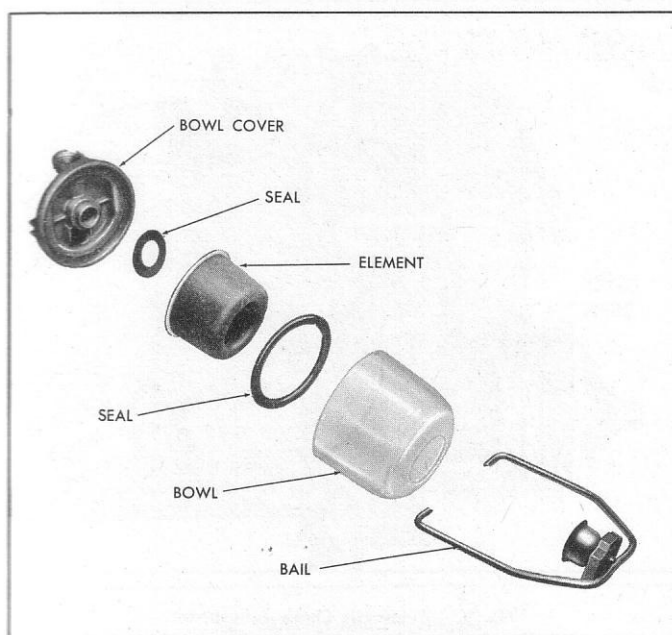


Fig. 90—Fuel Filter Assembly

NOTE: Never use a hot degreaser or any solvent containing acetone or similar solvent.

5. Dip element into light engine oil and squeeze out excess oil.

NOTE: Never shake, swing or wring the element to remove excess oil or solvent as this may tear the polyurethane material. Instead, "squeeze" the excess from the element.

6. Replace element onto screen support.
7. Using a new gasket, replace air cleaner body over carburetor air horn.
8. Replace the element in the air cleaner. Care must be taken that the lower lip of the element is properly placed in the assembly and that the filter material is not folded or creased in any manner that would cause an imperfect seal. Take the same precautions when replacing the cover that the upper lip of the element is in proper position.
9. Replace cover and wing nut.

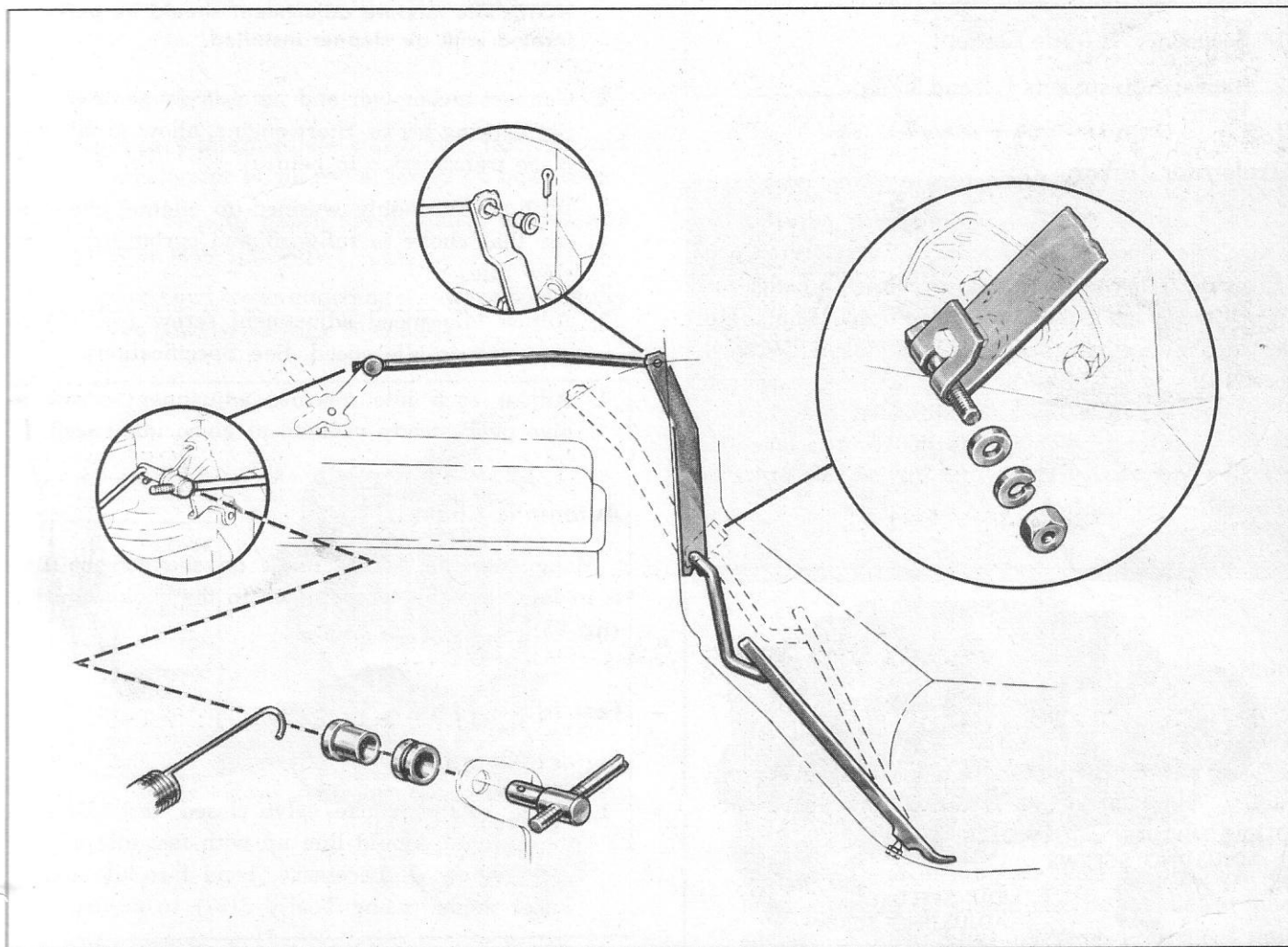


Fig. 91—Accelerator Linkage

ADJUSTMENTS ON THE CAR

All adjustments listed below can be done without removing the carburetor from the engine. They should be performed in the following sequence:

1. Accelerator Linkage
2. Idle Speed and Mixture
3. Automatic Choke
4. Fast Idle

If trouble cannot be corrected with the above adjustments, continue with the following adjustments:

5. Float
6. Intermediate Choke Rod
7. Accelerator Pump
8. Unloader
9. Closing Shoe
10. Secondary Throttle Opening
11. Secondary Throttle Lockout
12. Repeat Adjustments 1, 2 and 3

Accelerator Linkage

The length of the throttle linkage is adjustable to assure wide-open throttle with full accelerator pedal depression. To check, depress accelerator pedal fully and check to see if throttle is wide open. If not, adjust threaded swivel at throttle lever to suit. With the accelerator pedal fully depressed and the carburetor throttle valve fully open the threaded swivel should be adjusted for free entry into the throttle lever (fig. 91). The swivel should then be turned two full turns to lengthen the control rod.

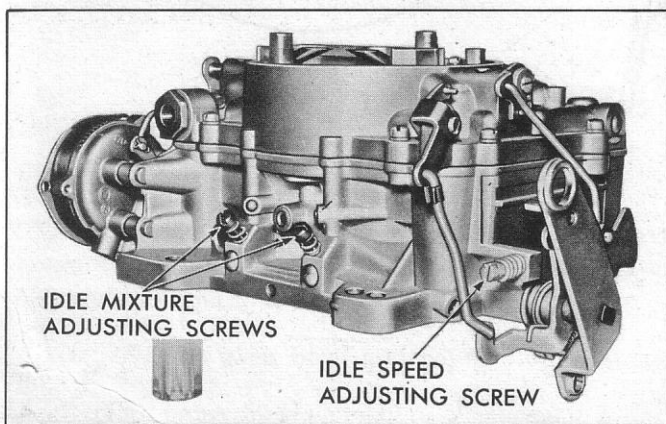


Fig. 92—Idle Speed and Mixture Adjustment Screws

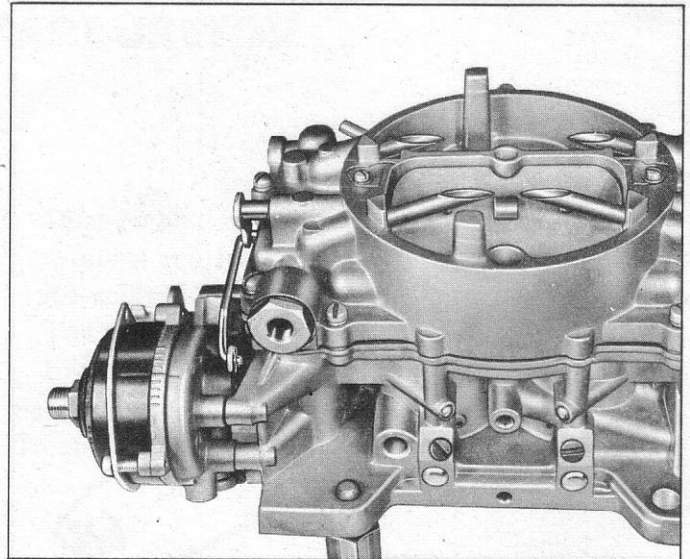


Fig. 93—Automatic Choke Adjustment

Idle Speed and Mixture

NOTE: Idle mixture adjustment should be performed with air cleaner installed.

1. Connect tachometer and vacuum gauge to engine. Set parking brake. Start engine, allow to idle and place transmission in neutral.
2. With a thoroughly warmed-up engine, check to see that choke is fully off and carburetor is on slow idle.
3. Adjust idle speed adjustment screw (fig. 92) to give proper idle speed. See Specifications.
4. Adjust each idle mixture adjustment screw to give peak steady vacuum at given idle speed.

Automatic Choke

Make sure the scribe mark on the coil housing is in line with the center notch in the choke housing (fig. 93).

Fast Idle

(Refer to figure 94)

1. While holding choke valve closed, fast idle cam index mark should line up with fast idle adjustment screw. If necessary, bend fast idle rod at lower angle (using Tool J-5197) to adjust.
2. Start engine and attach tachometer. With fast idle screw on index of cam, adjust fast idle

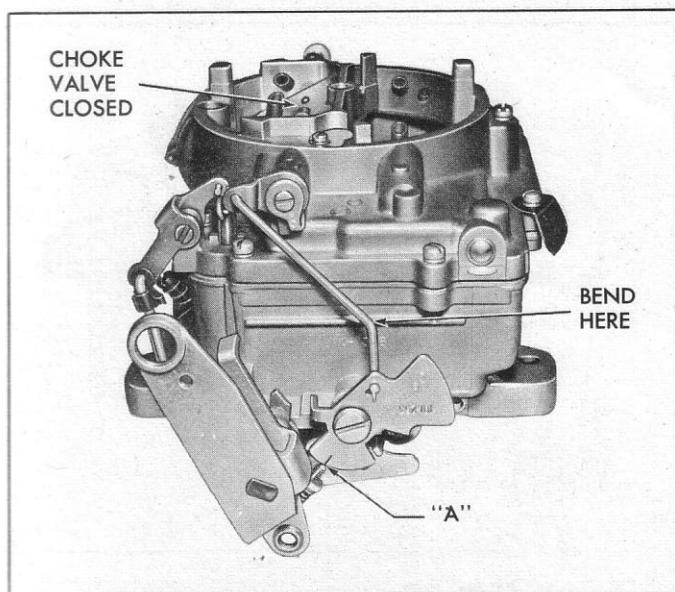


Fig. 94—Fast Idle Adjustment

screw to obtain approximately 1750 rpm with warm engine.

Float

1. Remove air cleaner.
2. Disconnect intermediate choke rod, fast idle rod and accelerator pump rod at levers on bowl cover.
3. Remove step-up piston cover plates, pistons and metering rods (fig. 95).
4. Remove bowl cover attaching screws and carefully remove bowl cover (figs. 96 and 97).

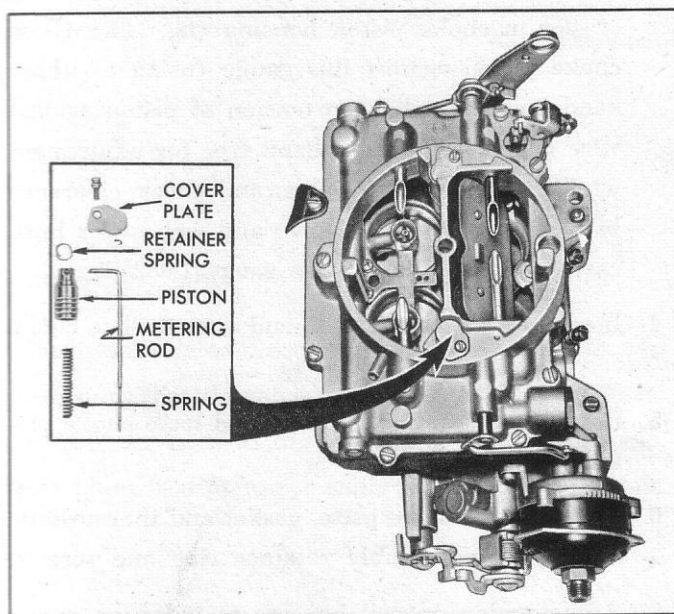


Fig. 95—Metering Rod Removal

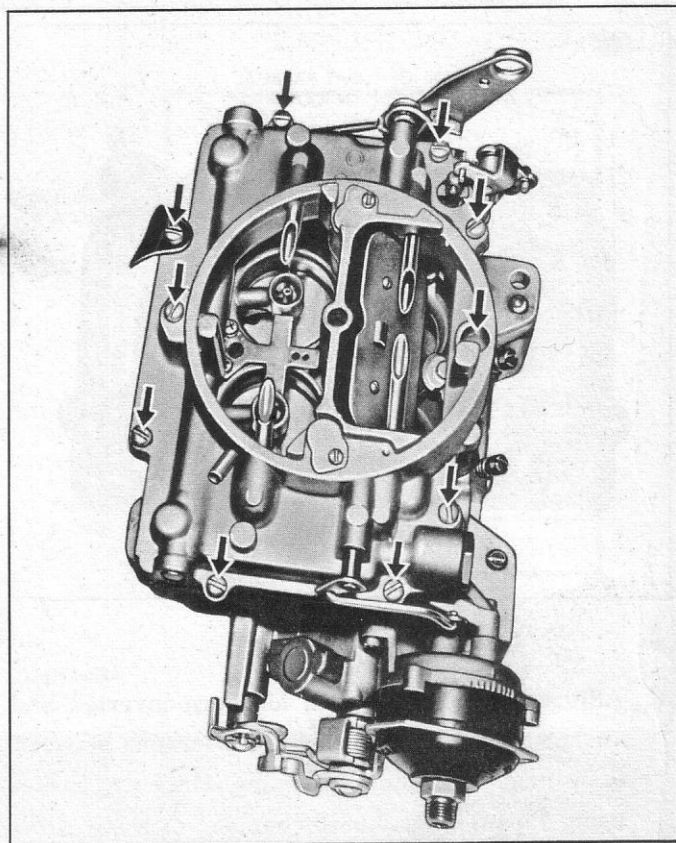


Fig. 96—Bowl Cover Attaching Screws

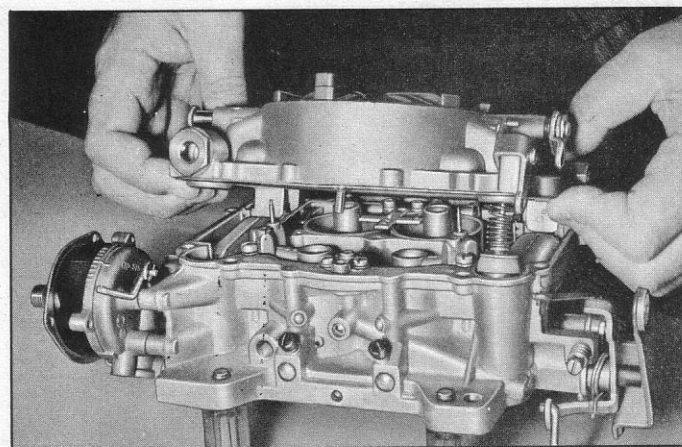


Fig. 97—Removing Bowl Cover

5. Align Float. Sight down side of float to determine if side is parallel with outer edge of air horn. If adjustment is necessary, bend float lever by applying pressure to end of float with fingers while supporting float lever with thumb (fig. 98).

Remove any excess clearance between arms of float lever and lugs on air horn by bending float lever arms. Arms should also be parallel to inner surface of lugs. After aligning, each float must operate freely.

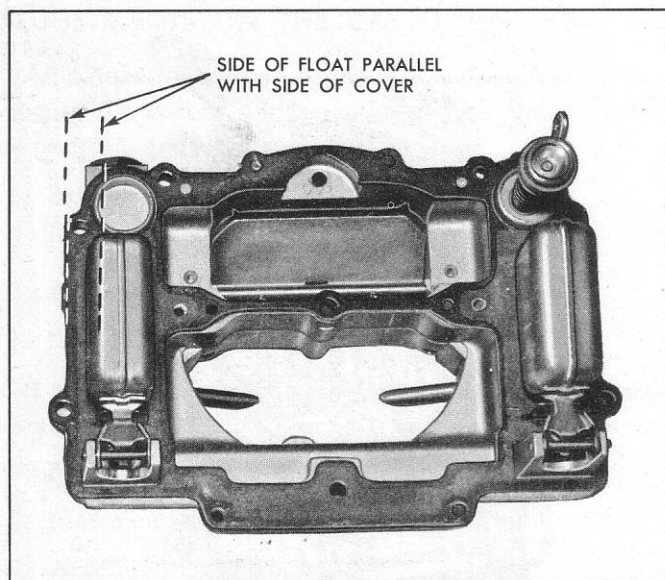


Fig. 98—Aligning Floats

6. Adjust Float Level. With air horn inverted and air horn gasket in place, check clearance between each float (at outer end) and air horn gasket using Float Gauge J-9550 chain set or a $\frac{5}{16}$ " drill (fig. 99). To adjust, bend float lever. After any adjustment, recheck float alignment.

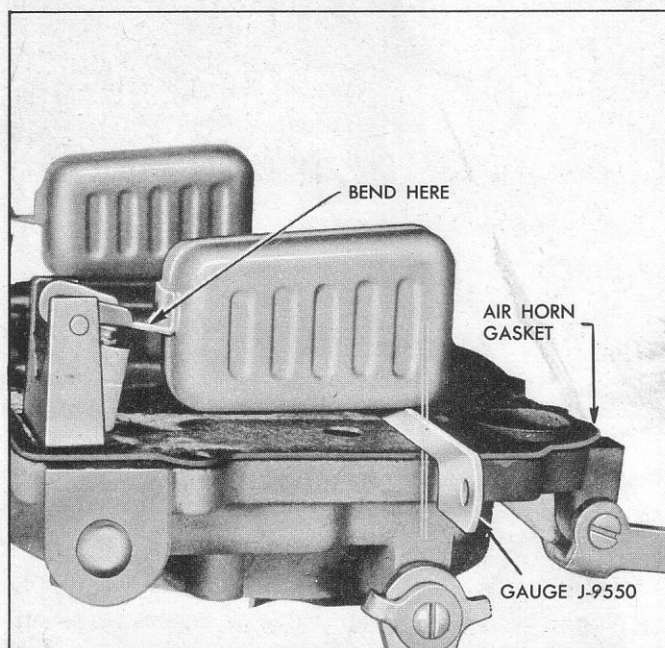


Fig. 99—Adjusting Float Level

7. Adjust Float Drop. With air horn held in upright position, measure vertical distance from air horn gasket to outer end of each float using a scale.

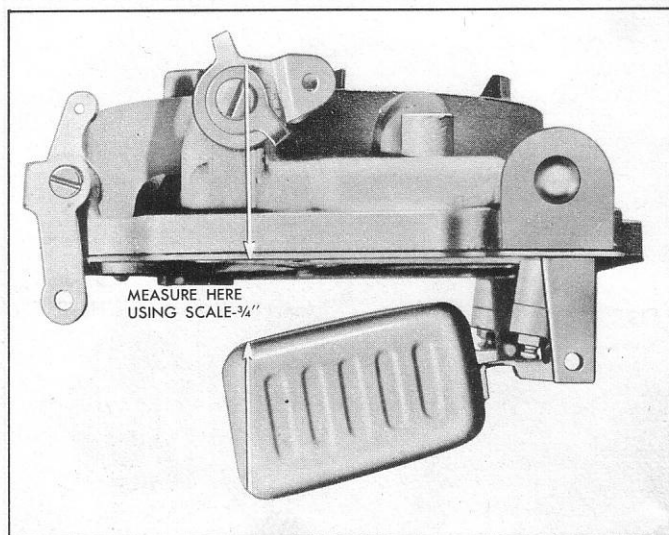


Fig. 100—Adjusting Float Drop

Bend float arm tang as required to obtain $\frac{3}{4}$ " measurement (fig. 100).

8. Reverse Steps 1, 2, 3 and 4 to reassemble.

Intermediate Choke Rod

1. Remove three choke coil housing screws and remove retainer ring and choke coil housing assembly.
2. Remove coil housing gasket and baffle plate.
3. Open choke valve and insert .026" wire gauge, J-9550 between bottom of slot in piston and top of slot in choke piston housing (fig. 101). Close choke piston against this gauge (using a rubber band doubled will keep tension of piston against wire gauge leaving one hand free for adjustment while gauging choke valve, and check clearance between top of choke valve and web of air horn casting, using J-9550 wire gauge (.0825").
4. If adjustment is required bend intermediate choke rod using Bending Tool J-4552.
5. Remove gauges and rubber band from choke piston lever.
6. Install choke baffle plate, gasket and thermostatic coil housing assembly retainer ring and screws.
7. Adjust index on coil housing to index on choke housing.

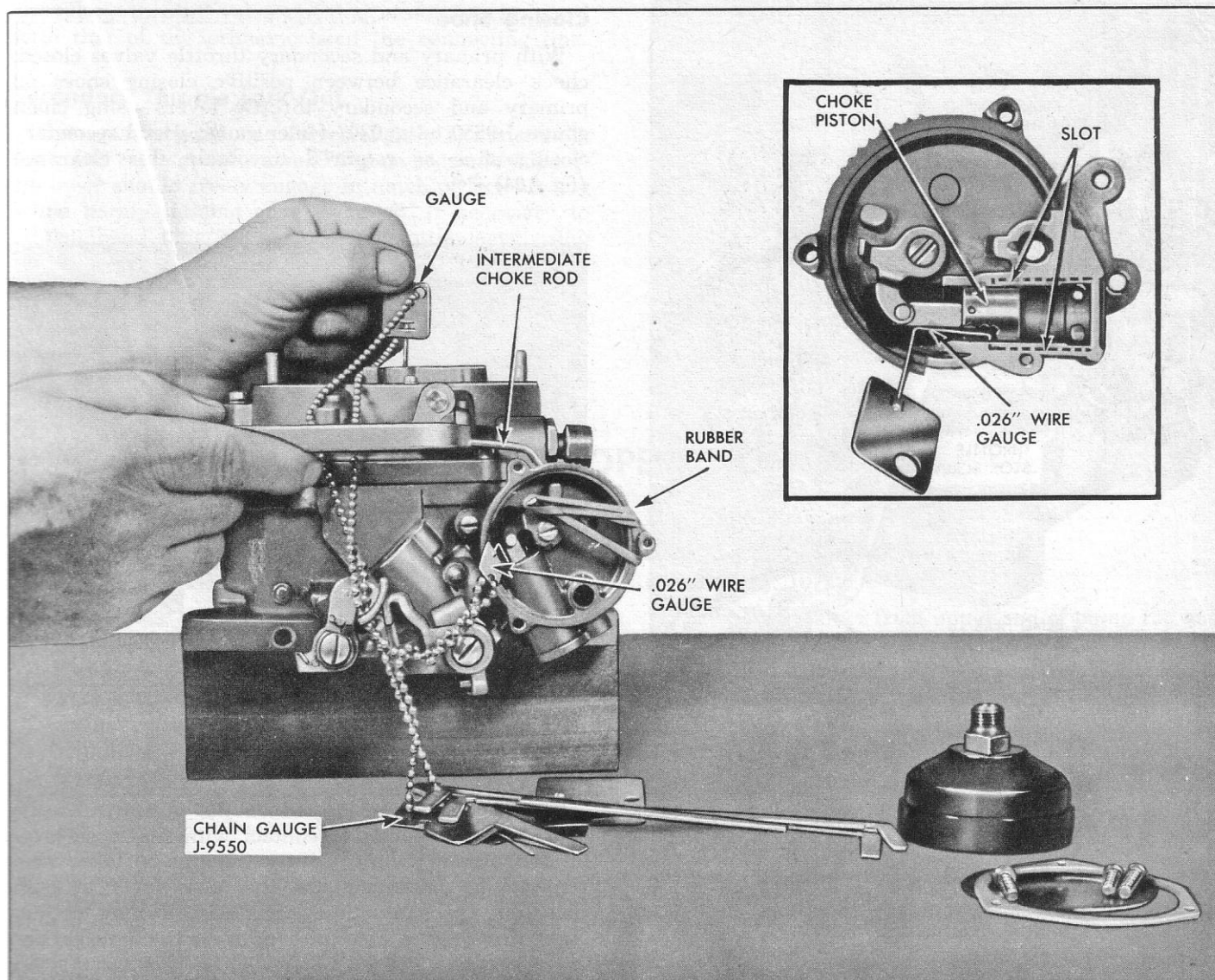


Fig. 101—Intermediate Choke Rod Adjustment

Accelerator Pump

Push fast idle cam aside and back out throttle stop screw until throttle valves seat in throttle bores. Measure from air horn to top of plunger shaft with scale. Bend pump rod at lower angle as required to obtain

$\frac{1}{2}$ " measurement using Tool J-4552 (fig. 102). Turn throttle stop screw in (from fully closed throttle position $\frac{1}{2}$ turn which should provide an initial idle adjustment.

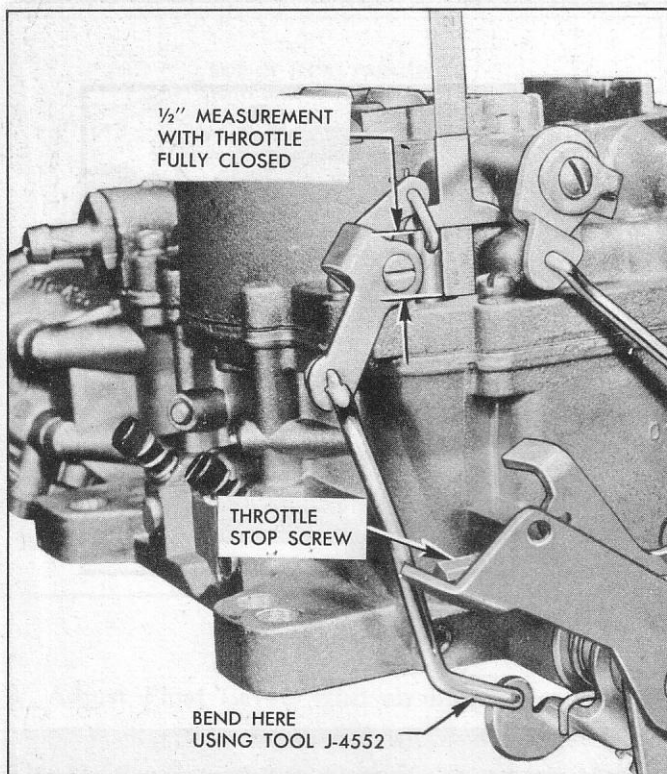


Fig. 102—Pump Adjustment

Unloader

Hold throttle wide open and check clearance between upper edge of choke valve and inner wall of air horn using a $\frac{3}{16}$ " drill. Bend unloader tang on throttle shaft lever as required to obtain clearance (fig. 103).

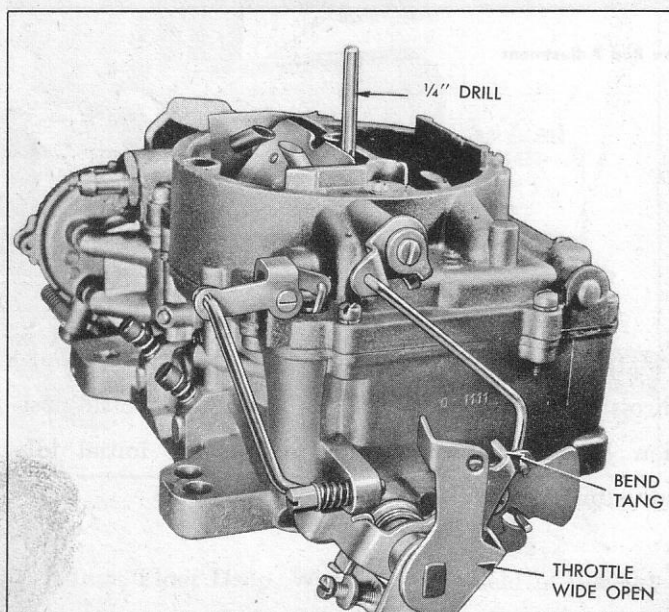


Fig. 103—Unloader Adjustment

Closing Shoe

With primary and secondary throttle valves closed, check clearance between positive closing shoes on primary and secondary throttle levers using chain gauge J-9550 or a .020" feeler gauge. Bend secondary closing shoe as required to obtain this clearance (fig. 104).

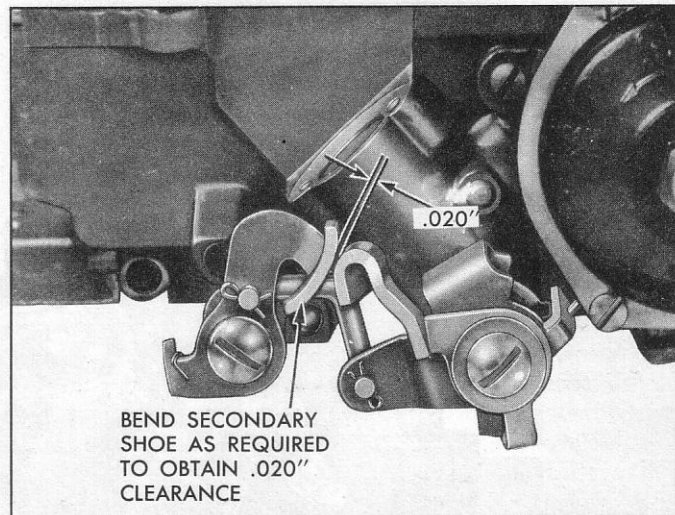


Fig. 104—Closing Shoe Adjustment

Secondary Throttle Opening

The pick-up lever located on the primary throttle shaft has two points of contact with the loose lever on the primary shaft. Caution should be taken that the pick-up lever contacts the loose lever at both points at the same time (fig. 105). If they do not make this contact, bend pick-up lever to obtain proper engagement.

The primary and secondary throttle valve must come to the wide open position simultaneously. If the

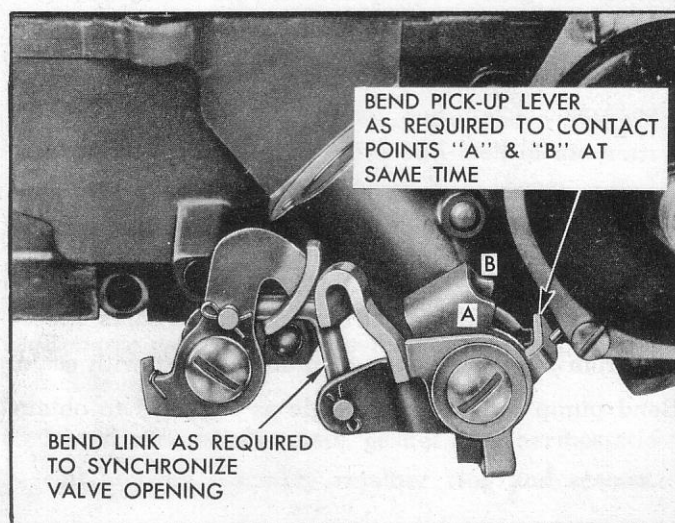


Fig. 105—Secondary Throttle Opening Adjustment

secondary throttle valve opening is not synchronized with that of the primary, bend the connecting link.

Secondary Throttle Lock-Out

Open primary throttle valves slightly and manually open and close choke valve. Tang on secondary throttle lever should freely engage in notch of lockout dog while barely missing edge of notch. If necessary to adjust, bend tang on secondary throttle lever using Tool J-6058-A (fig. 106).

Additional Adjustments

If additional adjustments are necessary, repeat accelerator linkage, idle speed and mixture, automatic choke and fast idle adjustments.

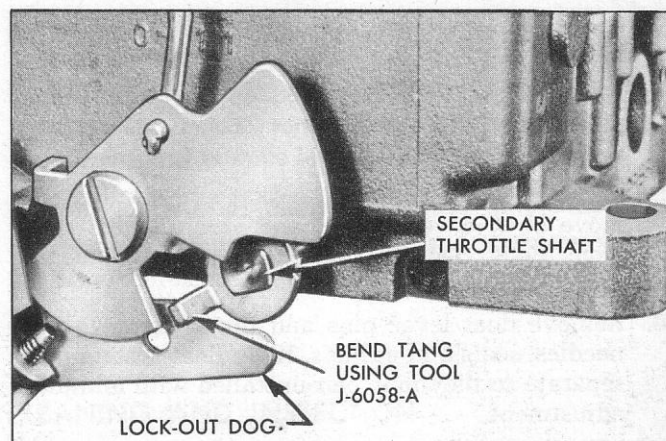


Fig. 106—Secondary Throttle Lock-Out Adjustment

SERVICE OPERATIONS

REMOVAL

1. Remove air cleaner, gasket and stud.
2. Disconnect vacuum, fuel and choke pipes at carburetor. On models equipped with positive ventilation, disconnect ventilation hose at valve on carburetor base.
3. Disconnect accelerator rod and throttle return spring at carburetor.
4. Remove mounting nuts and lift carburetor from manifold.

DISASSEMBLY

Bowl Cover Components

(Refer to Fig. 107)

1. Remove retainer from upper end of pump rod and disconnect pump rod from arm.
2. Remove hairpin clip from upper end of intermediate choke rod and disconnect rod.
3. Remove screw from end of choke shaft and remove outer lever and washer. Then remove inner

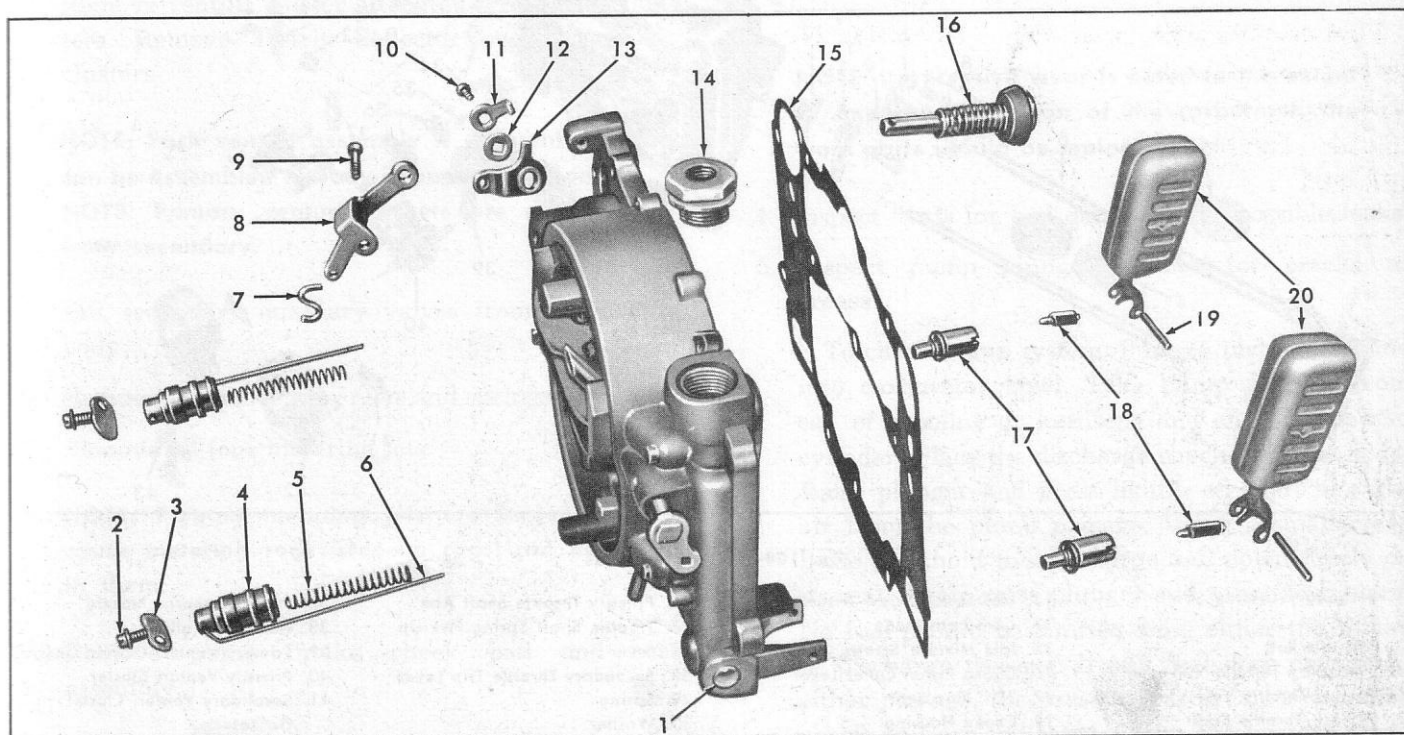


Fig. 107—Bowl Cover Components

- | | | | | |
|------------------------|---------------------------|-----------------------------|---------------------------|-----------------------|
| 1. Bowl Cover Assembly | 6. Metering Rod | 11. Choke Shaft Outer Lever | 16. Pump Plunger Assembly | 21. Choke Valve |
| 2. Screw | 7. Pump Link | 12. Washer (Spacer) | 17. Float Needle Seat | 22. Choke Valve Shaft |
| 3. Piston Cover Plate | 8. Pump Lever | 13. Choke Shaft Kick Lever | 18. Float Needle | |
| 4. Power Piston | 9. Pump Lever Pivot Screw | 14. Fuel Inlet Fitting | 19. Float Hinge | |
| 5. Spring | 10. Screw | 15. Cover Gasket | 20. Float | |

lever and fast idle rod from carburetor as an assembly.

4. Remove screws holding two step-up position cover plates to air horn and remove cover, piston, step-up rod and spring (fig. 95).
5. Remove fuel inlet fitting, gasket and strainer. Remove bowl cover screws and carefully lift cover from Body Section (fig. 97) to avoid damaging floats or pump plunger.
6. Remove float lever pins and floats. Remove float needles, seats and gaskets. Keep float system parts separate so they may be reinstalled with minimum adjustment.

7. Remove pump plunger lever screw and lever. Remove "S" link and plunger. Remove cover gasket.

Ordinarily the carburetor bowl covers are disassembled as far as is necessary during an overhaul procedure. The choke valve and shaft (or shafts) should not be removed unless shaft is binding or valve is damaged. If either condition exists, disassemble as follows:

8. File choke valve screws (staked ends) level with shaft to avoid damaging threads in shaft; then remove the screws and choke valve. Slide shaft from cover.

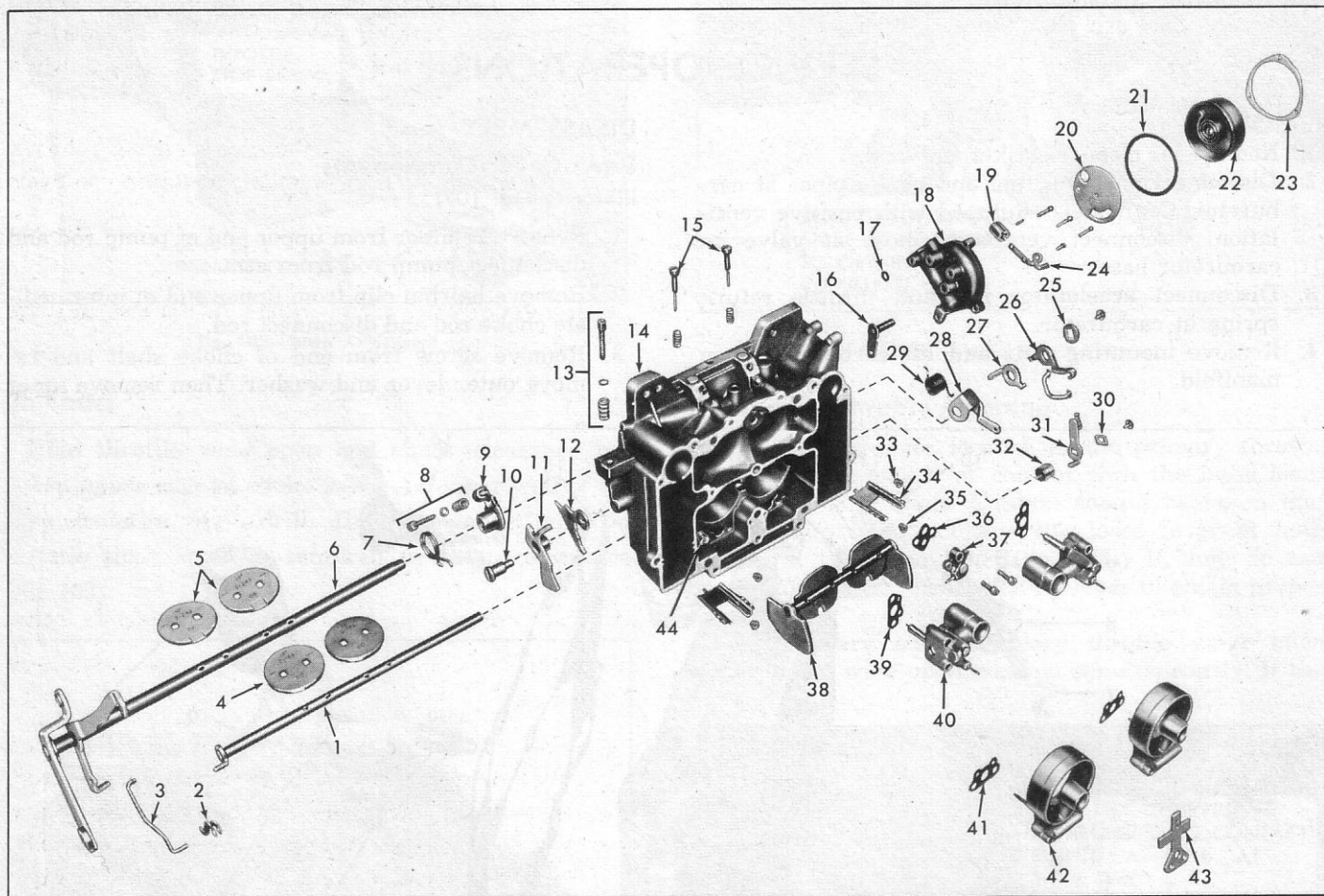


Fig. 108—Body Components

- | | | | |
|--------------------------------------|----------------------------------|---|---|
| 1. Secondary Throttle Shaft | 13. Idle Speed Screw Assembly | 26. Primary Throttle Shaft Arm | 37. Pump Discharge Nozzle. |
| 2. Clip | 14. Carburetor Body | 27. Throttle Shaft Spring Pick-Up Lever | 38. Auxiliary Valves |
| 3. Fast Idle Rod | 15. Idle Mixture Screws | 28. Secondary Throttle Trip Lever | 39. Primary Venturi Cluster Gasket |
| 4. Secondary Throttle Valves | 16. Choke Piston Outer Lever | 29. Spring | 40. Primary Venturi Cluster |
| 5. Primary Throttle Valves | 17. "O" Ring Seal | 30. Washer | 41. Secondary Venturi Cluster Gasket |
| 6. Primary Throttle Shaft | 18. Choke Housing | 31. Secondary Throttle Shaft Dog Lever | 42. Secondary Venturi Cluster |
| 7. Primary Throttle Shaft Spring | 19. Choke Piston | 32. Spring | 43. Secondary Venturi T-Strip Deflector |
| 8. Fast Idle Screw Assembly | 20. Choke Baffle Plate | 33. Primary Metering Jet | 44. Pump Inlet Ball and Check Valve |
| 9. Fast Idle Screw Plate | 21. Gasket | 34. Fuel Splash Shield | |
| 10. Screw | 22. Choke Coil and Housing Cover | 35. Secondary Metering Jet | |
| 11. Fast Idle Cam | 23. Retainer Ring | 36. Pump Discharge Nozzle Gasket | |
| 12. Secondary Throttle Lockout Lever | 24. Choke Piston Inner Lever | | |
| | 25. Washer | | |

Body Components

(Refer to Fig. 108)

1. Remove accelerator pump lower spring.
2. Check the fuel in the bowl for contamination by dirt, gum or other foreign matter, then empty fuel from bowl.

NOTE: A magnet swept around the bottom of the bowl while fuel is still present will pick up iron oxide dust or metal particles which have a tendency to cause leakage at needle seats.

3. Remove choke housing cover retainer, cover, cover gasket, and baffle plate.
4. Remove choke housing mounting screws and housing. Remove "O" ring seal from vacuum opening of housing mounting boss.
5. Remove choke piston lever screw and remove piston and two levers.
6. Remove pump cluster attaching screws, pump cluster and gasket. Remove pump discharge needle.
7. Remove venturi cluster attaching screws and clusters. Remove T-strip deflector over secondary clusters.

NOTE: Each venturi assembly is different and can be assembled to body in one location only.

NOTE: Primary venturi gaskets are different from secondary.

8. Lift secondary auxiliary valves from carburetor body.
9. Remove idle mixture screws and springs.
10. Remove all four metering jets.

NOTE: Primary metering jets are larger because metering rods (step-up rods) are used in them.

11. Remove pump intake check ball and seat assembly.

NOTE: For normal cleaning and inspection, it is not necessary to disassemble the carburetor body any further. However, if throttle valves or linkage are worn or damaged, complete disassembly as follows:

12. Remove fast idle cam screw and cam.
13. Remove primary to secondary connecting link. Remove primary and secondary throttle dog lever screws and remove levers, and springs.
14. File off staked ends of throttle valve attaching screws and remove screws and throttle valves from bores. Slide throttle shafts from carburetor body.

CLEANING AND INSPECTION

The most frequent causes of carburetor malfunction are gum, dirt, carbon, and water. For this reason, carefully clean and inspect all parts and castings while the carburetor is being serviced.

1. a. Wash all parts in carburetor cleaning solution except coil housing assembly and pump plunger.
b. Choke coil housing assembly should be cleaned in gasoline.
2. Inspect holes in all operating levers and castings for excessive wear.
3. Inspect bearing surfaces of all shafts for excessive wear.

NOTE: If excessive wear is noted to the extent of improper operation of the carburetor, the worn parts should be replaced.

4. Inspect floats for bad dents and/or possible leaks.
5. Inspect pump plunger leather for cracks or creases.

To check pump system: Pour ½ inch of gasoline into carburetor bowl. Take pump plunger from can of gasoline or kerosene and slide into pump cylinder. Place the discharge check ball into body. Raise plunger and press lightly on shaft to expel air from the pump passage. Using a small clean brass rod, hold the discharge ball down firmly on its seat. Again raise plunger and press downward. No fuel should be emitted from either the intake or discharge passage. If any fuel does emit from either passage, the presence of dirt or a damaged check ball are indicated. Clean the passage again and repeat the test. If leakage is still present, replace the check valve.

6. If choke piston sticks in cylinder, remove welch plug in bottom of housing for inspection of cylinder.

der and air slots. If carbon or dirt is present, remove carbon from cylinder with sandpaper (DO NOT USE EMERY CLOTH) and clean slots. Carefully install new welch plug. Be certain welch plug seat is carefully cleaned before installing new plug.

NOTE: Removal of the welch plug to clean the choke piston housing should be done only if the choke piston does not move freely in its cylinder.

7. Inspect float needles and seat for burrs and ridges. If present, replace both the needle and seat; never replace either alone.
8. Inspect metering rods and jets. If either are bent, burred, or distorted, replace both rod and jet.
9. Inspect edges of primary and secondary throttle valves for gouges and other deformations. If these or any other conditions exist which would prevent full seating, replace the faulty valve.
10. Check pump plunger return spring and vacuum piston spring for weakness and distortion.
11. Inspect all mating surfaces of choke housing, bowl cover, carburetor body, and throttle flange for burrs, gouges, or other surface irregularities. All surfaces must be smooth to prevent leaks.

ASSEMBLY ADJUSTMENT

During assembly of carburetor, use all new gaskets and any additional new parts found to be necessary during inspection. Calibrated parts must be as specified for carburetor CODE number which is stamped in red on mounting flange at rear center, or on identification tag.

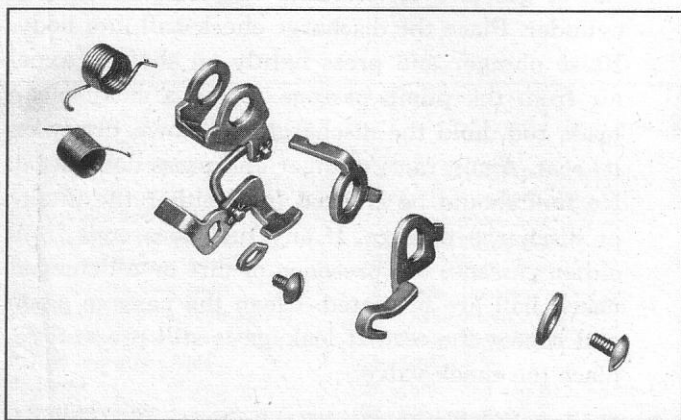


Fig. 109—Throttle Shaft Levers

Carburetor Body

1. Install primary and secondary throttle shafts.
2. Install primary throttle shaft dog levers and spring (fig. 109).
3. Install secondary throttle shaft dog lever and spring. Wind spring one turn (fig. 110).

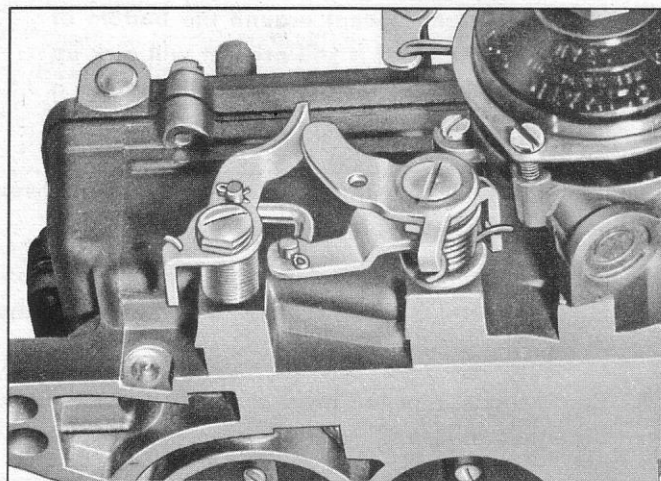


Fig. 110—Throttle Shaft Levers—Installed

4. Install throttle valves in shafts with part number identification toward bottom of flange and secure with new screws (fig. 111).

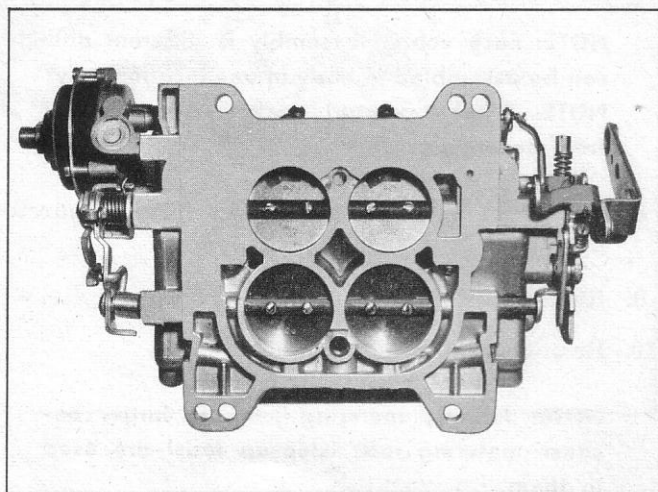


Fig. 111—Throttle Valve Position

5. Install pump intake check ball and ball seat assembly with a new gasket (fig. 112). Install primary and secondary metering jets and tighten securely.

NOTE: The primary jets are the two having the larger orifices.

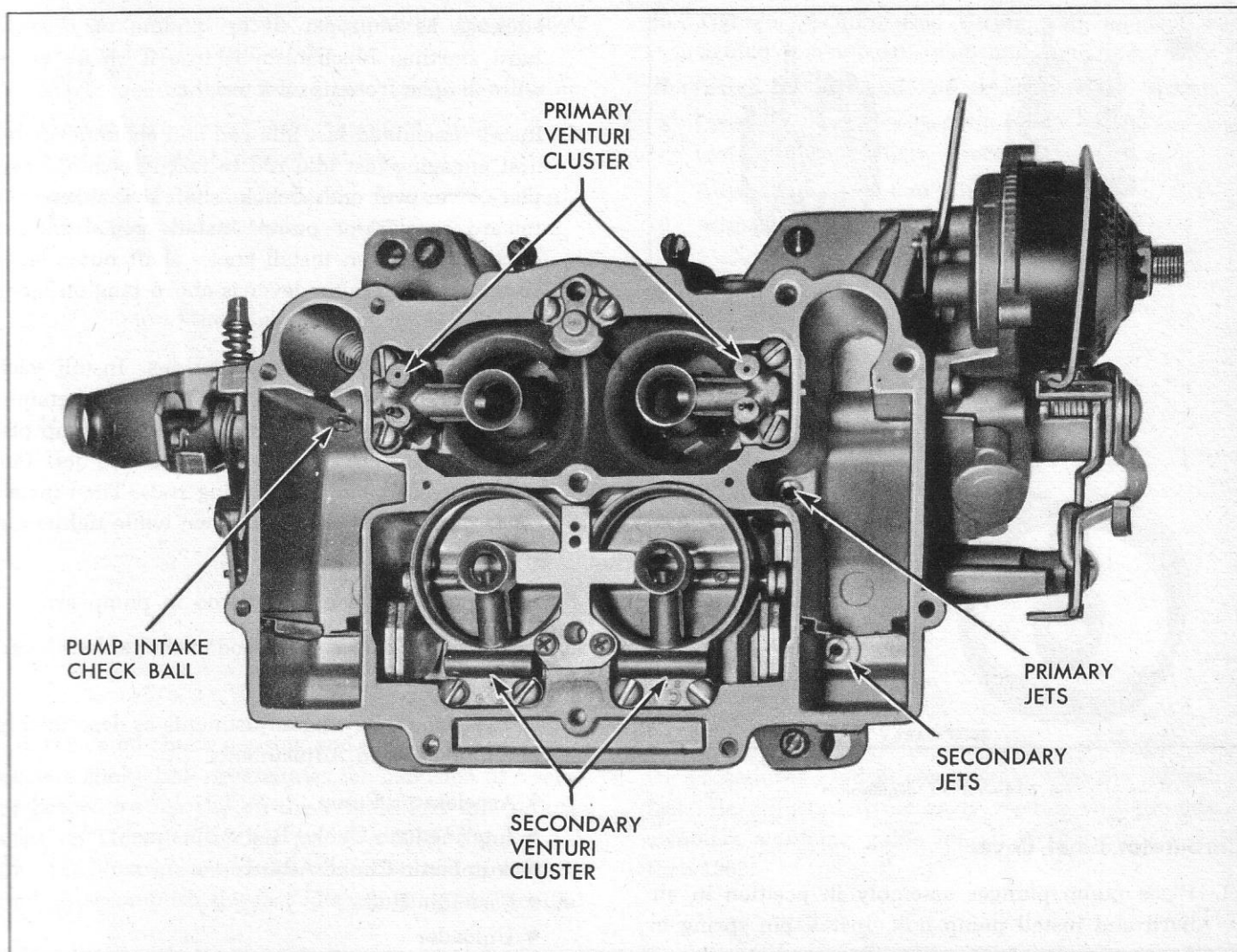


Fig. 112—Body Components

6. Install pump discharge check needle point down. Install pump jet housing and gasket.
7. Install auxiliary valve assembly with screw heads down (fig. 113). Then install secondary and primary venturi assemblies, using new gaskets (fig. 114).

NOTE: If a primary venturi assembly does not fit in place, flush with top of main body, it belongs on the other side.

8. Install the mixture adjustment screws. Seat lightly and back out $1\frac{1}{2}$ turns, which will provide an average initial adjustment.
9. Install choke piston housing shaft, lever and rod assembly in piston housing with lever and rod pointing away from heat pipe connector. Install small round rubber gasket in housing recess, then install piston housing on main body using three

screws. Install choke piston, pin link, and lever assembly in piston housing. Install piston lever on flats of shaft in such a way that inner and outer levers are pointing in same general direction. Then install special washer and screw.

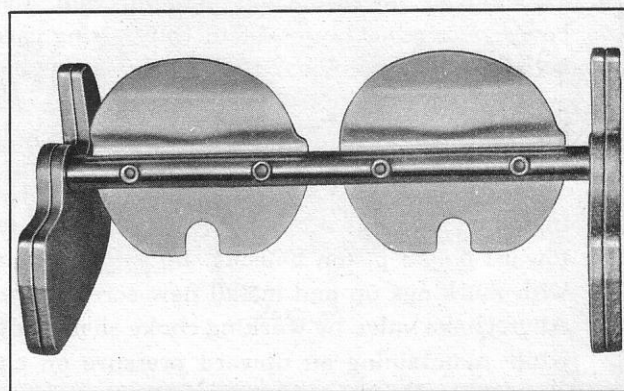


Fig. 113—Auxiliary Valve Assembly

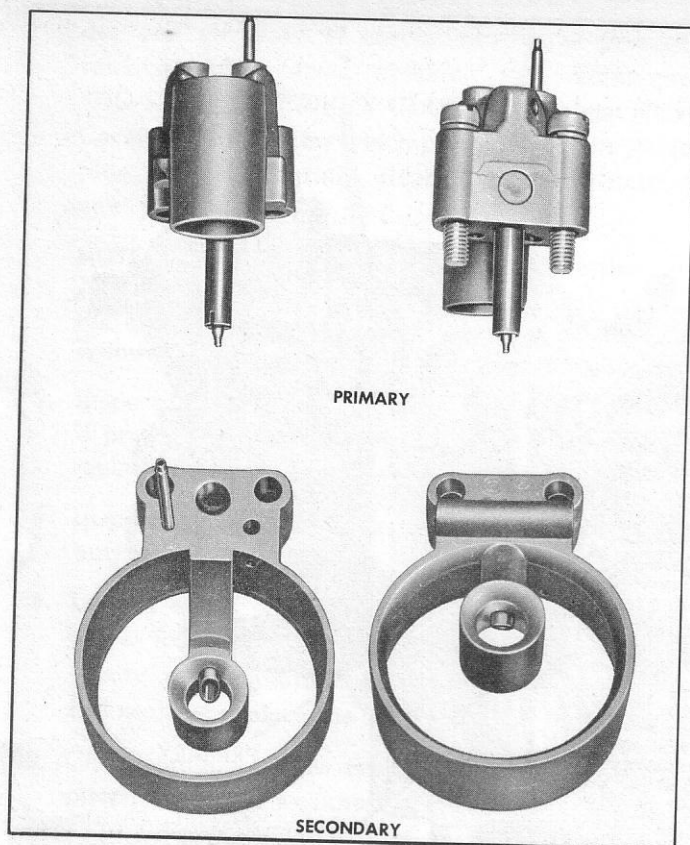


Fig. 114—Venturi Identification

Carburetor Bowl Cover

1. Place pump plunger assembly in position in air horn and install pump link. Install pin spring in upper end of link. Invert air horn and install new air horn gasket.
2. Install float needle seats and gaskets. Install float needles, floats, and lever pins, making sure they are installed in original locations.
3. Perform float adjustments as outlined under "Maintenance and Adjustments."
4. Place lower pump spring in pump well. Install bowl cover assembly on main body, using care to avoid distortion of floats. Install bowl cover screws and tighten evenly. (Two longer screws go in middle holes.) Install fuel inlet strainer in fuel inlet and install inlet in air horn.
5. Install choke shaft in air horn with attached lever toward choke piston housing. Install choke valve with markings up and install new screws loosely. Align choke valve by working choke shaft endwise while maintaining an upward pressure on choke shaft lever. Tighten and stake choke valve screws. Check for uniform clearance and freedom from

sticking, as improper fit or binding may cause hard starting. Mechanism is free if choke valve will fall open from its own weight.

6. Install assembled fast idle rod and choke lever by first engaging fast idle rod in fast idle cam. Then place lever over end of choke shaft so that it points toward accelerator pump. Install special washer on shaft and then install choke shaft outer lever so that tang on outer lever is above tang on inner lever when choke valve is open.
7. Install two step-up piston springs. Install each assembled step-up piston, rod and rod retainer spring. Carefully push down on each step-up piston and rod until rod enters metering jet. Use care to avoid bending metering rods. Then install cover plates, holding plates down while tightening screws.
8. Install upper end of pump rod in pump arm.
9. Install upper end of choke rod in choke shaft lever, using pin spring on rod.
10. Perform the following adjustments as described in Maintenance and Adjustments.
 - Accelerator Pump
 - Intermediate Choke Rod Adjustment
 - Automatic Choke Adjustment
 - Fast Idle Rod
 - Unloader
 - Closing Shoe
 - Secondary Throttle Opening
 - Secondary Throttle Lockout

TEST BEFORE INSTALLATION ON ENGINE

It is good shop practice to fill the carburetor bowl before installing the carburetor. This reduces the strain on the starting motor and battery and reduces the possibility of backfiring while attempting to start the engine. A fuel pump clamped to the bench, a small supply of fuel and the necessary fittings enable the carburetor to be filled and the operation of the float and intake needle and seat to be checked. Operate the throttle several times and check the discharge from the pump jets before installing the carburetor.

INSTALLATION

1. Be certain throttle flange and intake manifold gasket surfaces are clean.

2. Install new carburetor to manifold gasket over manifold carburetor studs.
3. Start vacuum line fitting into carburetor fitting.
4. Lower carburetor onto manifold studs, choke housing to right side of vehicle.
5. Install and tighten securely four nuts, using a short open end wrench.
6. Tighten vacuum line fitting and connect and tighten choke heat tube, and fuel line.
7. Install throttle rod and throttle return spring.
8. Install air cleaner gasket, stud, air cleaner and two wing nuts. Tighten securely.
9. Adjust idle speed and mixture.
10. Adjust fast idle.

SPECIFICATIONS

Refer to Specifications—Section 14.

SPECIAL TOOLS

Refer to page 6M-50

CARTER WCFB CARBURETOR

A relocated choke housing and addition of an intermediate choke link necessitates the inclusion of a service procedure for the off-the-vehicle fast idle adjustment on Corvette models prior to 1958. Figures 115 thru 117 illustrate the choke relocation and procedures used to accomplish the fast idle adjustment. The 1961

Passenger Car Shop Manual WCFB Carburetor service procedures used in conjunction with the following fast idle adjustment for early models will provide a complete servicing guide for all WCFB models—1955 thru 1962.

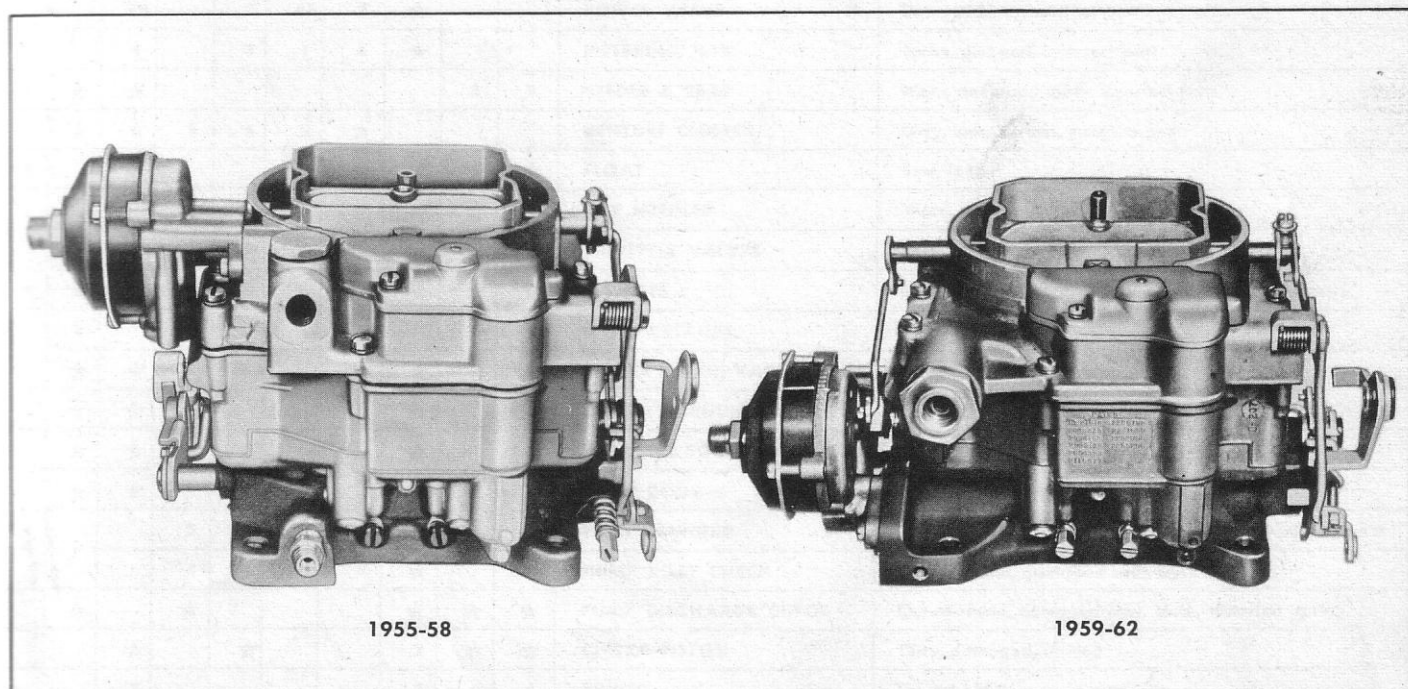


Fig. 115—WCFB Carburetor Comparison

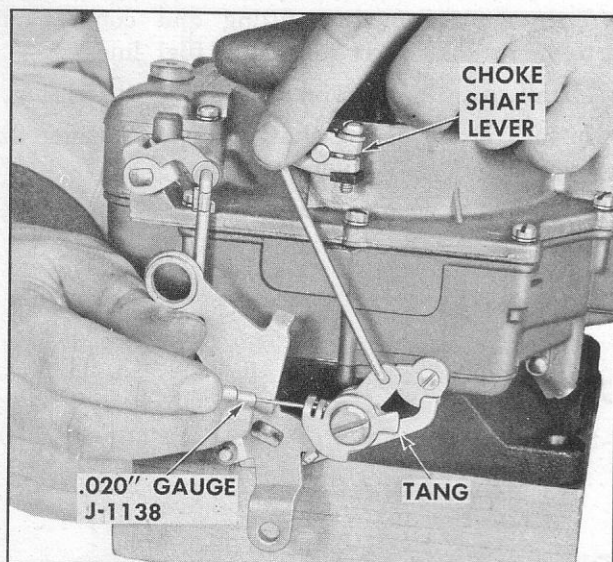


Fig. 116—Correcting Choke Linkage for Fast Idle Adjustment

FAST IDLE ADJUSTMENT (OFF ENGINE)

1. Loosen choke lever clamp screw on choke shaft (fig. 116).
2. Insert .020 Tool J-1388 between lip of fast idle cam and boss of throttle flange.
3. Holding choke valve tightly closed, pull choke shaft lever upward as illustrated to eliminate all

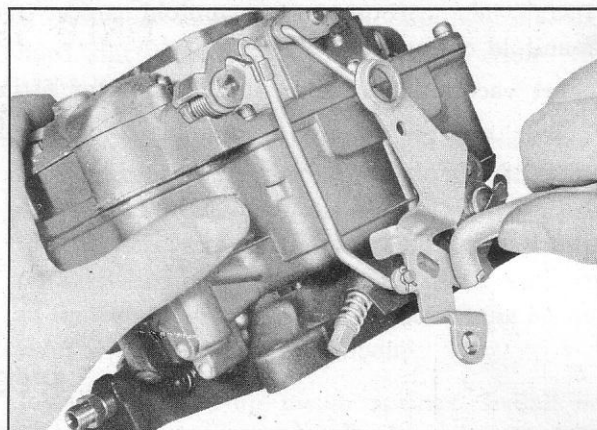


Fig. 117—Setting Fast Idle Adjusting Tang

slack from linkage and tighten screw in choke lever clamp.

4. Invert carburetor and place fast idle tang on high step of fast idle cam.
5. Holding choke valve tightly closed, bend fast idle adjusting tang until there is .015" on synchromesh models and .018" on automatic models (Tool J-657) opening between throttle valve and bore of carburetor side opposite idle port (fig. 117).

NOTE: Fast idle adjusting tang must be on high step of cam while making this adjustment.

TROUBLE SHOOTING CHART

CARTER AFB CARBURETOR

COMPLAINT										CHECK POINTS*	WHAT TO LOOK FOR
FLOODING	ROUGH IDLE	ECONOMY	HESITATION	ACCELERATION FLATNESS	SURGE	LOW TOP SPEED OR POWER	COLD OPERATION	STALLING	HARD HOT STARTING		
	1	★		★			★	1	★	IDLE ADJUSTMENT	Correct speed and mixture
2		3		★	3	3		4	★	FLOAT ADJUSTMENT	Use correct gauge
			1	★			★			PUMP ROD ADJUSTMENT	Use correct dimension, throttle valves closed
		★					1a	★	1	AUTOMATIC CHOKE ADJ.	Set to latest specification
							1b	★		CHOKE ROD ADJUSTMENT	Use correct gauge, fast idle screw on 2nd step of cam, next to high step
							1c		2	UNLOADER ADJUSTMENT	Use correct gauge, throttle valves wide open; check to see that throttle linkage allows wide open position on car
							1d	★		FAST IDLE ADJUSTMENT	Set with warm engine, use tachometer, set to information specification
							1e	★		SECONDARY LOCKOUT ADJ.	Proper clearance so cam is free to move with throttle valves closed
							1f	★		SECONDARY CONTOUR ADJ.	Proper clearance so throttle valves are free to move with choke open
		2a		1	1a	1	★			POWER PISTON	Dirty, distorted, sticking, incorrect part
		2b		2	4b	2	★			POWER VALVE	Dirty, sticking, incorrect part
		4		3	1	4	★			METERING JETS	Loose, plugged, incorrect part
1	★	★						3	3	NEEDLE & SEAT	Worn, damaged, dirty, incorrect part
	★	★	5	4	2	★				VENTURI CLUSTER	Dirty, loose screws, incorrect part
3		★			★			★	★	FLOAT	Bent, leaky
	3							★		IDLE NEEDLES	Worn, damaged
	4		★	★		★	★	★		THROTTLE VALVES	Sticking open or closed, damaged
4	★	★	★	★	★	★	★	★	★	GASKETS	Improper seal, hard or brittle material, loose screws
	2							★	★	IDLE PASSAGES	Dirty
	★	★				★	★			POWER PISTON VACUUM PAS.	Plugged or vacuum leaks
	★	★					3		★	CHOKE VACUUM PASSAGE	Plugged or vacuum leaks
	★	★		★			★			THROTTLE BODY HEAT PAS.	Plugged with carbon
	★	★								PUMP BODY	Crack or loose fit on plunge shaft
			3				★			PUMP PLUNGER	Hard or worn leather, distorted spring, stuck vent ball check
			4				★			PUMP INLET CHECK	Out-of-round, damaged seat, stuck
	★		★				★	★	★	PUMP DISCHARGE CHECK	Out-of-round, damaged seat, stuck, distorted spring
		★		★			2	★	★	CHOKE PISTON	Dirty, damaged, sticking
		1					4		4	DRIVER	Driving habits, correct procedures
		2								PUMP DISCHARGE JETS	Dirt, must be open

*Numbers under each complaint heading indicate order of probability of causes listed.

SPECIAL TOOLS

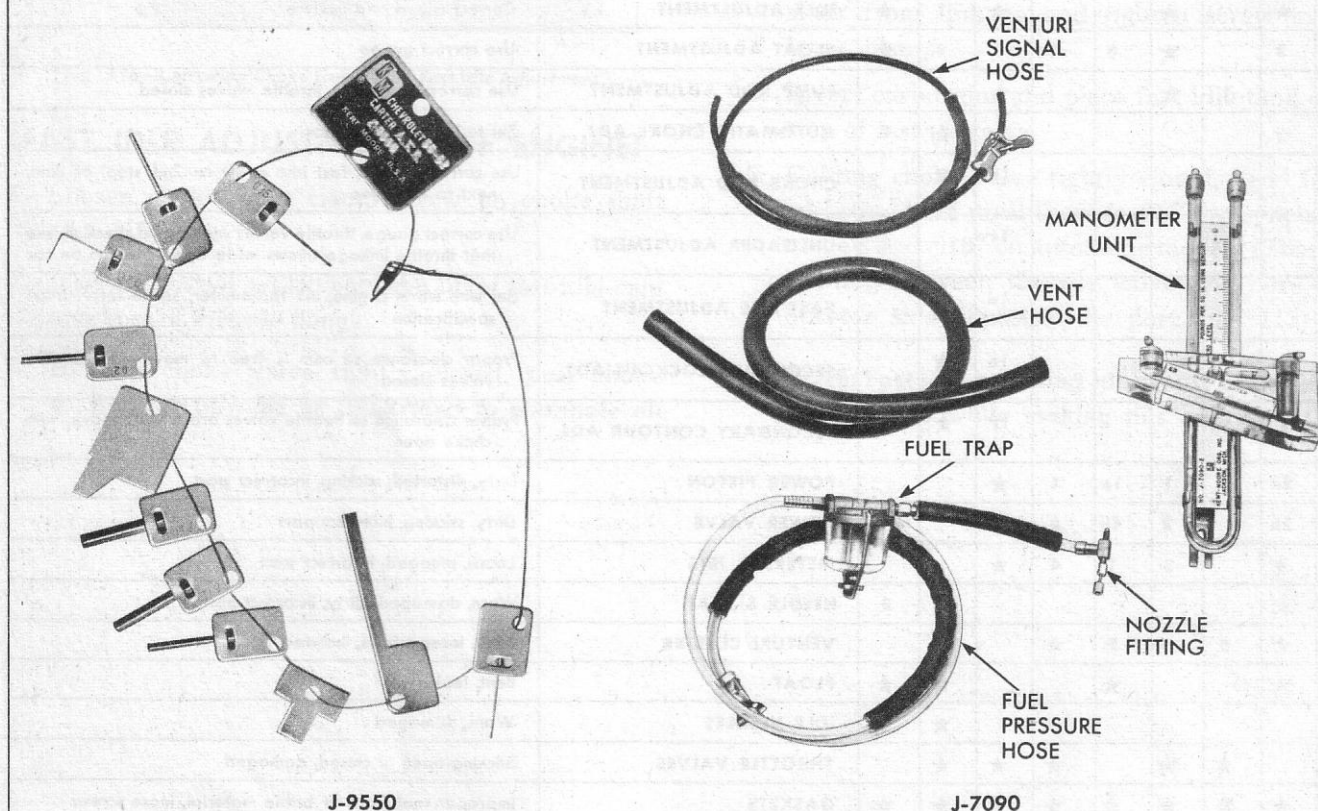


Fig. 118—Special Tools