trolled as described above for each type system.

Solenoid controlled systems have switches which close at 150°F while others close at 98°F. Switches open approximately 12°F below closing temperatures (these are approximate temperatures).

Main Metering System (Fig. 6)

As the engine approaches cruising speed the increased air flow through the venturi creates vacuum (low pressure area) in the venturi of the carburetor. Near atmospheric pressure present in the bowl in the area above the fuel causes the fuel to flow to the lower pressure area created by the venturi and magnified by the booster venturi.

Fuel flows through the main jet into the main well; air enters through the main well air bleeds and into the main well through holes in the main well tube. The mixture of fuel and air being lighter than raw fuel responds faster to changes in venturi vacuum and is also more readly vaporized when discharged into the venturi.

The main discharge nozzle passage is a part of the booster venturi which is an integral part of the main body casting.

The main metering system is calibrated to deliver a lean mixture for best overall economy. When additional power is required a vacuum operated power system enriches the fuel-air mixture.

Power Enrichment System (Modulated Power Valve) (Fig. 7) (Model 2245)

During high speed (or low manifold vacuum) the carburetor must provide a mixture richer than is needed when the engine is running at cruising speed under no great power requirements. Added fuel for power operation is supplied by a vacuum modulated power enrichment system.

A vacuum passage in the throttle body transmits manifold vacuum to the vacuum piston chamber in the bowl cover. Under light throttle and light load conditions, there is sufficient vacuum acting on the vacuum piston to overcome the piston spring tension. When the throttle valves are opened to a 60° angle, vacuum that is acting on the piston is bled to atmosphere and manifold vacuum is closed off, which in turn insures proper mixture for this throttle opening. The vent port is right in line with the throttle shaft. The throttle shaft has a small hole drilled through it. When the throttle valve is opened to 60° the hole in the throttle shaft will line up with the port in the base of the carburetor and vent the piston vacuum chamber to atmosphere allowing the spring loaded piston to open the power valve.

As engine power demands are reduced, and the throttle valve begins to close, manifold vacuum increases. The increased vacuum acts on the vacuum

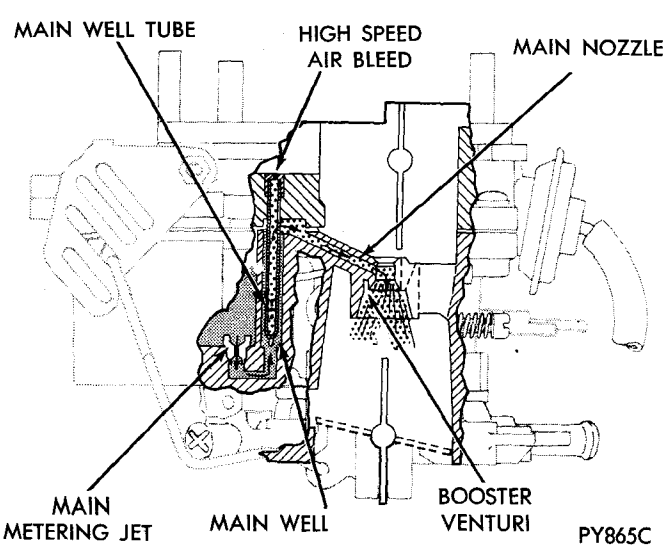


Fig. 6—Main Metering System

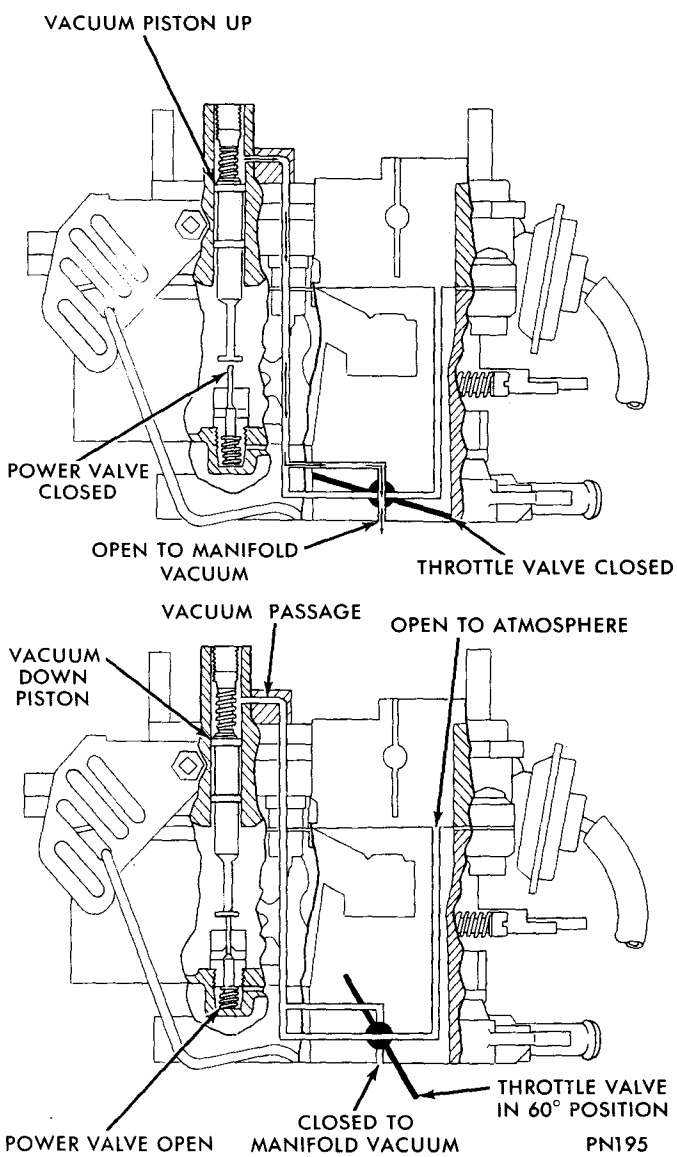


Fig. 7—Power Enrichment System (with Modulated Power Valve) Model 2245

piston, overcoming the tension of the piston spring. This closes the power valve and shuts off the added supply of fuel which is no longer required.

Power Enrichment System (Fig. 7 and 8)

The power enrichment system consists of a power valve installed in the center of the carburetor body between the main jets and a vacuum piston installed in the bowl cover. A vacuum passage leads from the top of the piston down to the manifold flange.

When manifold vacuum is high the vacuum piston is raised to the top of its cylinder and the spring on the piston stem is compressed.

When manifold vacuum drops to a predetermined level the spring overcomes the vacuum and pushes the piston stem down.

The piston stem in turn pushes the power valve needle down opening the power valve and permitting fuel to flow through the power valve through power valve channel restrictions and into the main well on either side of the power valve.

Accelerating Pump System (Fig. 9)

When the throttle valves are opened suddenly the air flow through the carburetor responds almost immediately. However, there is a brief time interval or lag before the fuel can overcome its inertia and maintain the desired fuel-air ratio.

The piston type accelerating pump system mechanically supplies the fuel necessary to overcome this deficiency for a short period of time.

Fuel enters the pump cylinder from the fuel bowl through a slot in the pump well above the normal position of the pump piston. When the engine is turned off, fuel vapors in the pump cylinder are vented through the area between the pump rod and pump plunger.

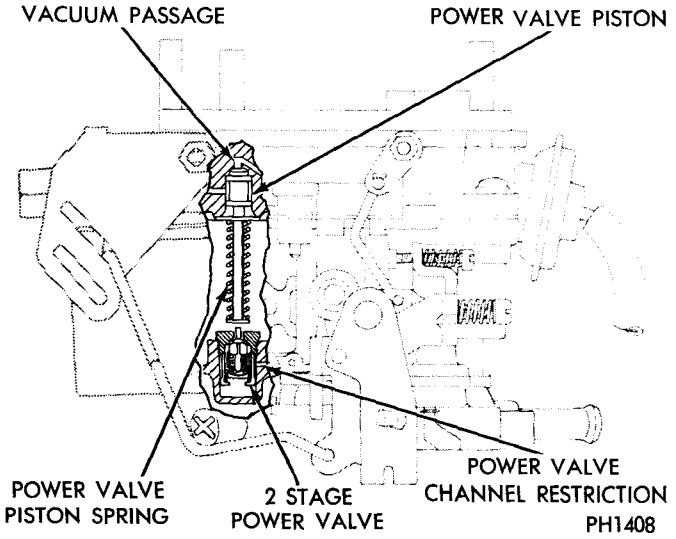


Fig. 8—Power Enrichment System (Model 2210)

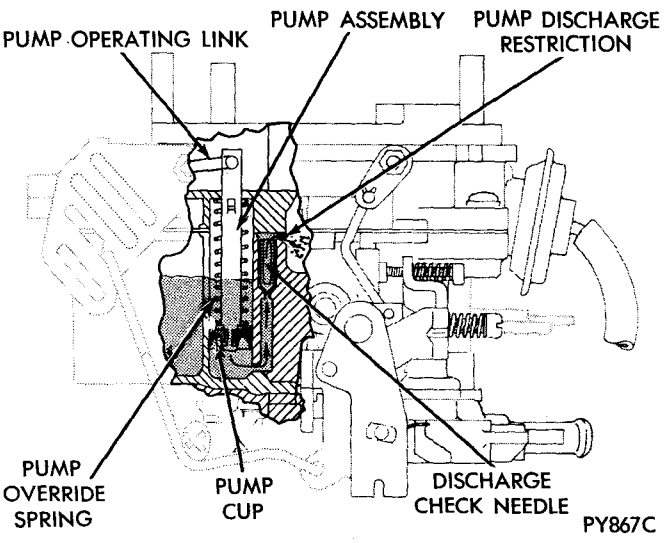


Fig. 9—Accelerator Pump System

As the throttle lever is moved the pump link operating through a system of levers and a pump override spring pushes the pump piston down. Fuel is forced through a passage around the pump discharge needle valve and out the pump discharge jets which are drilled in the main body.

Automatic Choke (Vacuum Kick) System (Fig. 10)

The automatic choke provides the richer fuel-air mixture required for starting and operating a cold engine. A bi-metal spring inside the choke housing, which is installed in a well in the intake manifold, holds the choke valve in the closed position.

When the engine starts, manifold vacuum is applied to the choke diaphragm through a rubber hose from the throttle body to the choke diaphragm assembly. The adjustment of the choke valve opening, when

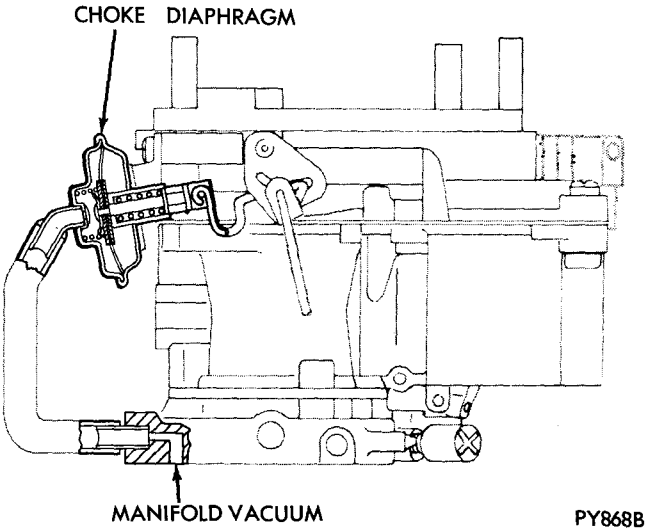


Fig. 10—Automatic Choke (Vacuum Kick) System

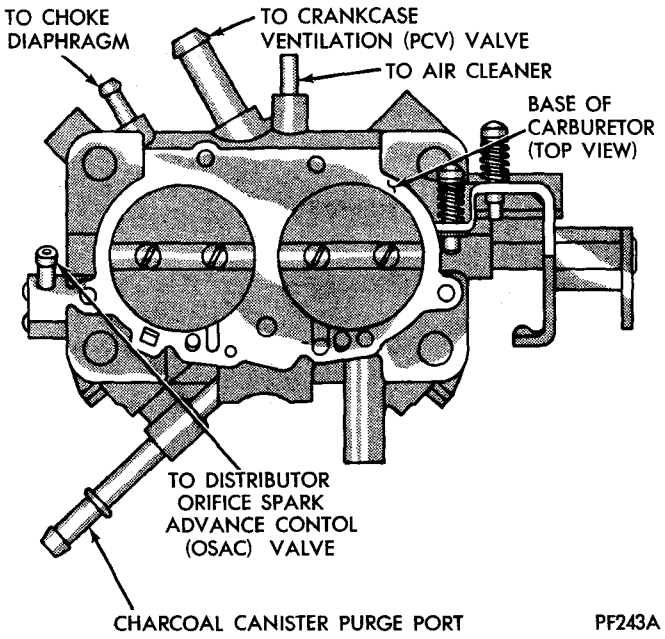


Fig. 11—Vacuum Port Identification—Model 2245

the engine starts and vacuum is applied to the choke diaphragm, is called vacuum kick.

Manifold vacuum alone is not strong enough to provide the proper degree of choke opening during the entire choking period. The impact of in rushing air past the offset choke valve provides the additional opening force.

As the engine warms up, manifold heat transmitted to the choke housing relaxes the bi-metal spring until it eventually permits the choke to open fully.

An electric heater assists engine heat to open the choke rapidly in summer temperatures.

Vacuum Port Identification

All model 2245 carburetors used on vehicles equipped with the exhaust gas recirculation system will have an additional vacuum port, as shown in Figure 1.

The exhaust gas recirculation (EGR) system is controlled by venturi vacuum and requires a port in the side of the carburetor above the throttle valve.

All vacuum hose connections on the carburetor should be inspected periodically. Any hardened or faulty hoses that may allow air leakage must be replaced (Fig. 11). See Emission Control Systems, Group 25 for proper hose routing.

SERVICE PROCEDURES

DISASSEMBLING CARBURETOR

(1) Place carburetor on repair stand to prevent damage to throttle valves and to provide a suitable base for working.

The air cleaner bolt is now threaded through the bowl cover into the main body of the carburetor. Be sure it is removed before disassembly.

(2) Remove idle enrichment diaphragm (Fig. 12).

(3) Remove nut and washer attaching accelerator pump rocker arm to accelerate pump shaft. Remove arm and washer from flats on pump shaft, then disengage accelerator pump rod from slot in arm and from hole in throttle lever. (Fig. 13).

(4) Remove nut and washer that attaches choke lever to choke shaft. Disengage fast idle connector rod from lever and fast idle cam. (Fig. 14).

(5) Remove choke vacuum diaphragm hose from throttle body tube fitting. Remove screws that attach choke diaphragm and mounting bracket to air horn.

(6) Remove choke diaphragm and at the same time, disengage choke operating link from slot in choke operating lever. (Fig. 15). Place choke unit to one side to be cleaned as a special item. **A liquid cleaner may damage diaphragm material.**

(7) If equipped remove "E" clip that retains bowl vent valve operating lever on stub shaft or air horn. Slide lever off shaft, being careful not to lose lever spring. (Note position of spring). (Fig. 16).

(8) Remove eight air horn attaching screws, then lift air horn straight up and away from main body. **Use extreme care when handling air horn to avoid bending or damage to main well tubes.** (Fig. 17).

(9) Disengage accelerator pump plunger from

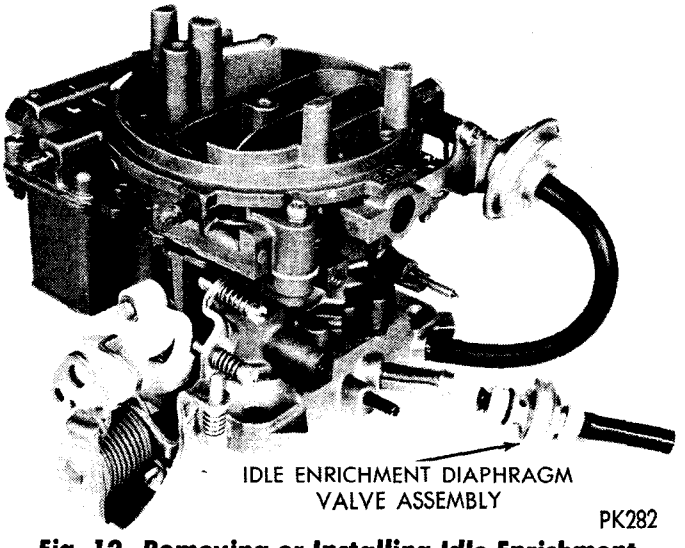


Fig. 12—Removing or Installing Idle Enrichment Diaphragm

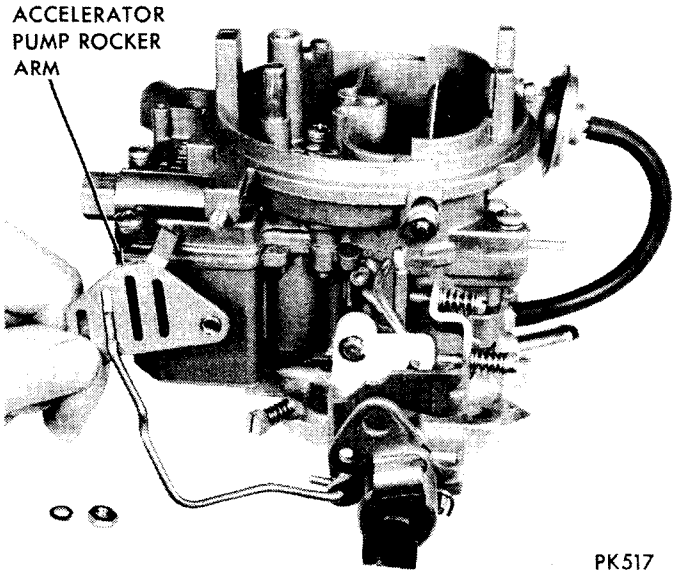


Fig. 13—Removing or Installing Accelerator Pump Rocker Arm

pump shaft by pushing **up** on bottom of plunger, then tilting slightly toward center, then slide off pump shaft. Slide plunger stem out of air horn and remove washer and compression spring. (Fig. 18).

(10) Slide accelerator pump shaft out of air horn (Fig. 19).

(11) Remove fuel inlet fitting and gasket from air horn.

(12) With air horn inverted, remove screw that attaches fuel baffle to air horn. (Fig. 20).

(13) Slide nylon float fulcrum pin out of air horn, then remove float. Invert air horn and drop out fuel inlet needle. Using a wide blade screw driver, remove fuel inlet needle valve seat and gasket. (Fig. 20).

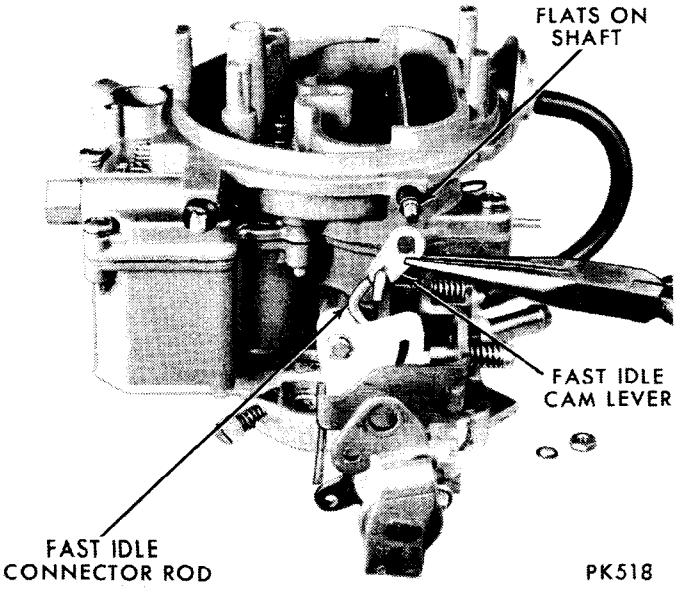


Fig. 14—Removing or Installing Fast Idle Connector Rod and Cam Lever

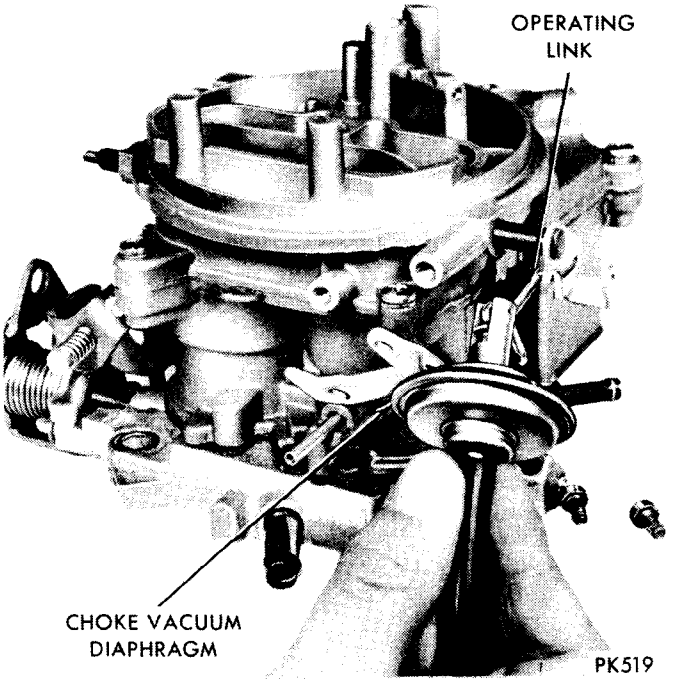


Fig. 15—Removing or Installing Choke Diaphragm

(14) Remove air horn gasket and discard.

(15) The vacuum piston assembly retaining ring is staked in position and care must be taken at removal. Remove staking with a suitable sharp tool then remove the vacuum piston from the bowl cover by depressing the piston and allowing it to snap up against the retaining ring (Fig. 21).

(16) **Do not attempt to remove main well tubes from air horn.** These tubes are a press fit in air horn, and will be damaged if removed. They can be cleaned in a solvent and blown dry with compressed air. If carburetor parts are cleaned in a basket, be sure other carburetor parts are not striking these tubes.

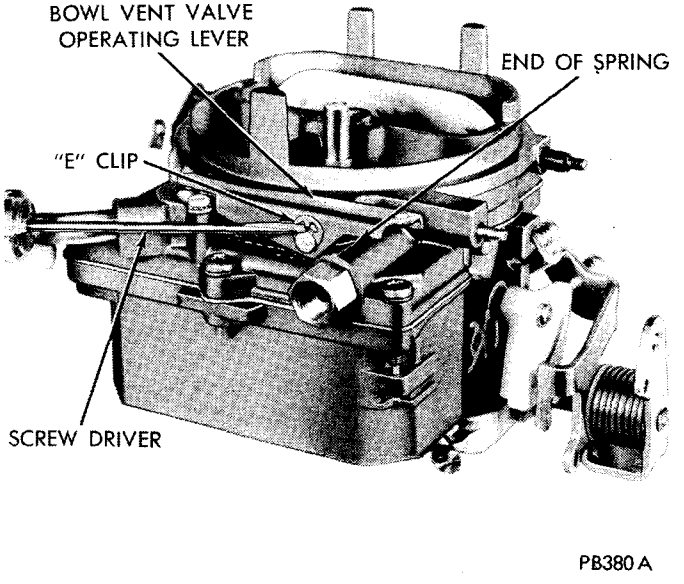


Fig. 16—Removing Bowl Vent Operating Lever

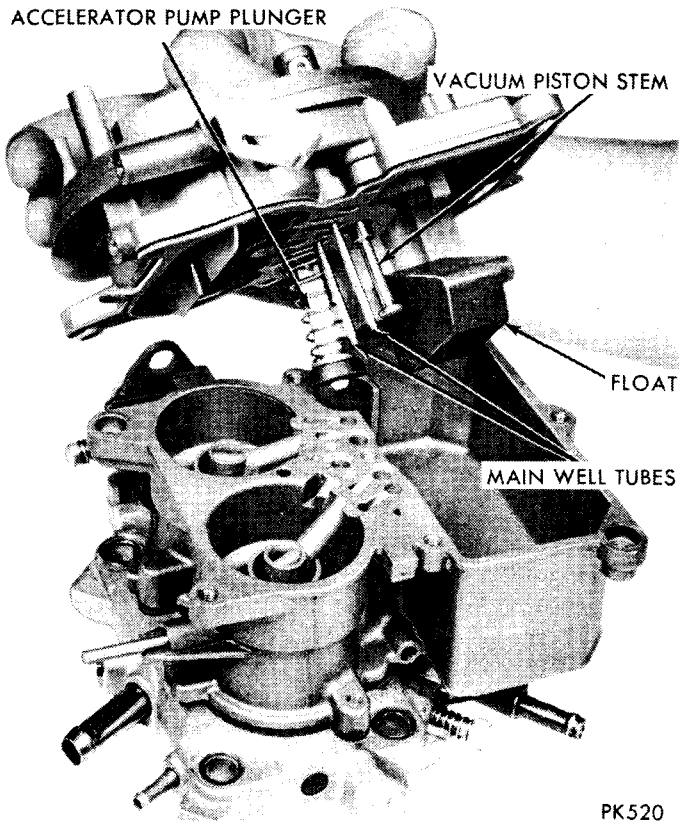


Fig. 17—Removing or Installing Air Horn

(17) Remove screws attaching bowl vent valve cover to fuel bowl. Lift off cover and remove vent valve, spring and seal. Remove seal from bottom of valve.

(18) Using Tool C-3748, remove main metering jets (Fig. 22).

(19) Remove power valve assembly (Fig. 23).

(20) Invert main body and drop out accelerator pump discharge check needle from discharge passage.

(21) Invert main body and remove throttle body to main body attaching screws. Separate bodies and gasket.

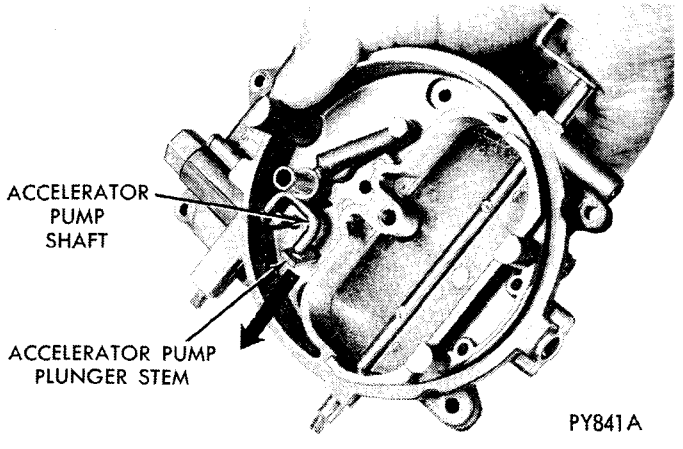


Fig. 18—Removing or Installing Accelerator Pump Plunger

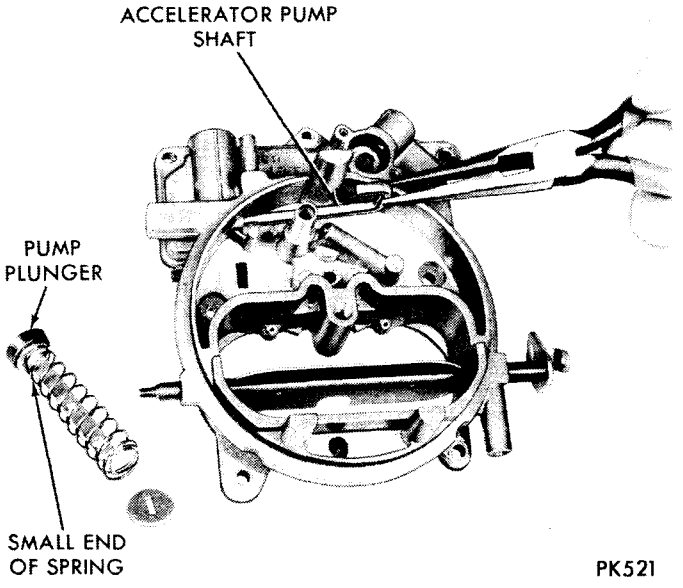


Fig. 19—Removing or Installing Accelerator Pump Shaft

(22) Remove fast idle cam retaining "E" clip, then slide fast idle cam off stub shaft. (Fig. 24).

(23) Turn idle limiter caps to stop. (Top on throttle side and bottom of stop on choke side). Remove idle limiter caps by prying off with suitable tool. (Be

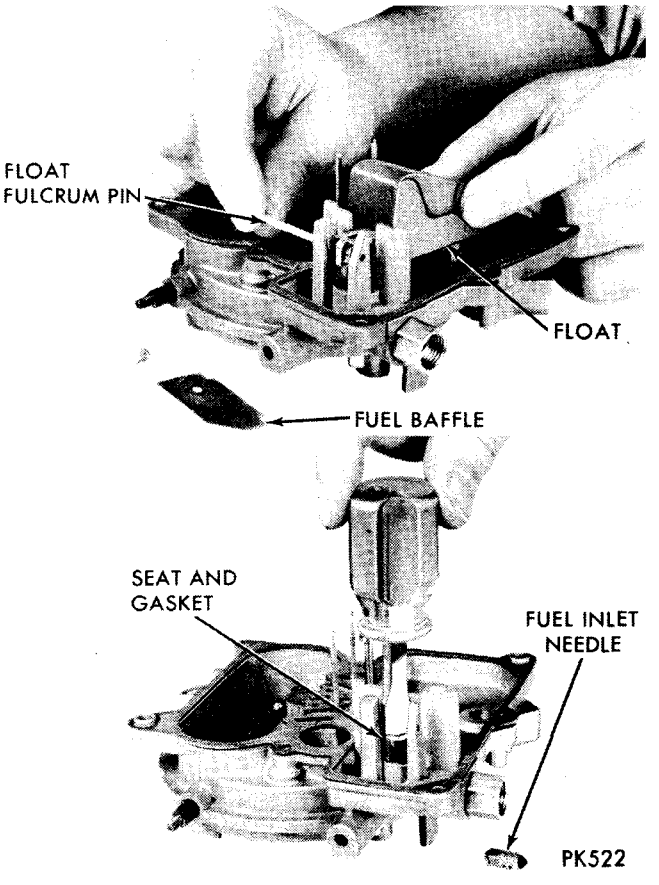


Fig. 20—Removing or Installing Float, Needle and Seat

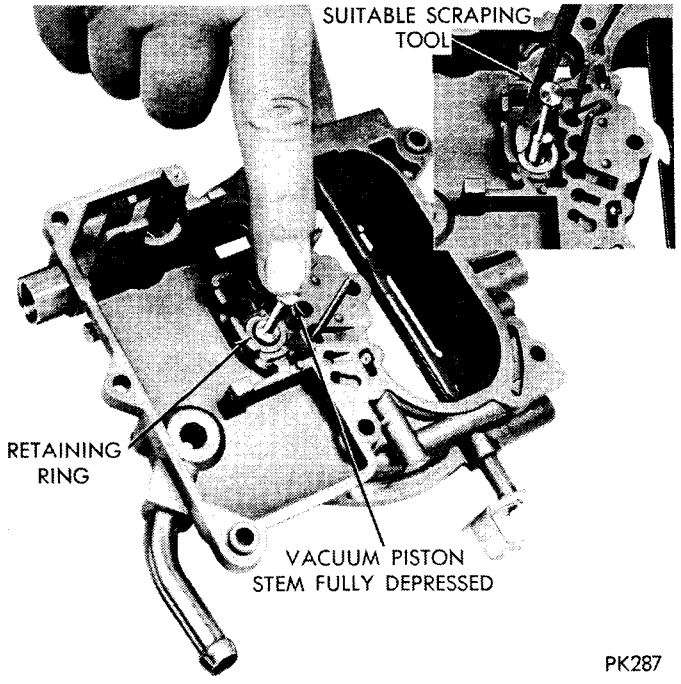


Fig. 21—Removing Vacuum Piston

careful not to bend screws.) Be sure and count number of turns to seat the screws, as the same number of turns (from the seat) must be maintained at installation. Remove screws and springs from throttle body.

The carburetor now has been disassembled into three sub-assemblies, the air horn, main body, throttle body and the components of each disassembled as far as necessary for cleaning and inspection.

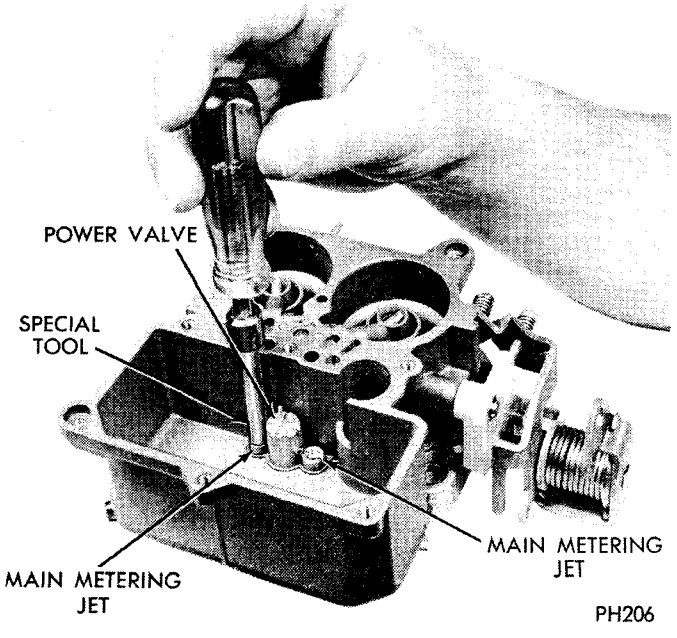


Fig. 22—Removing or Installing Main Metering Jets

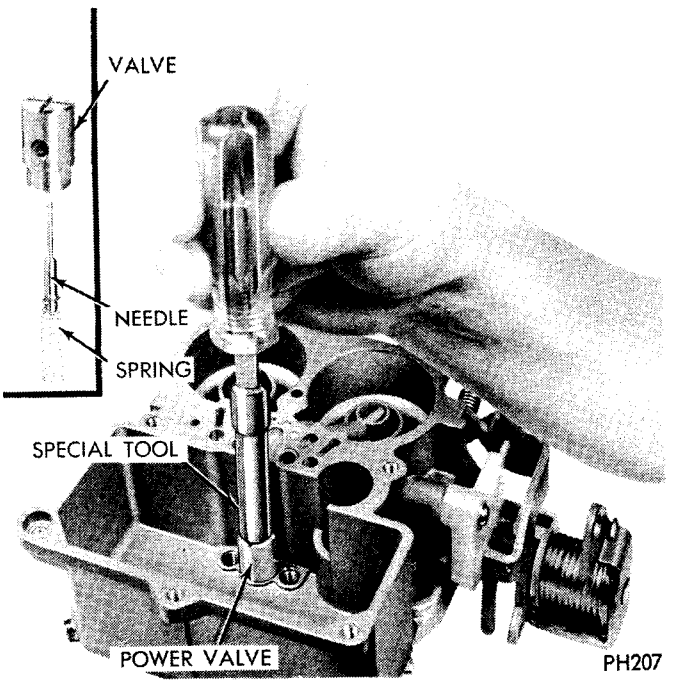


Fig. 23—Removing or Installing Power Valve—Model 2245

CLEANING CARBURETOR PARTS

Refer to General Information Section at front of Fuel System, for cleaning instructions.

INSPECTION AND REASSEMBLY

DO NOT clean any rubber or plastic parts in cleaning solvent because of possible damage.

Check for cracks, warpage, stripped screw threads, damaged or marred mating surfaces, on all major castings. The passages in the castings should be free of restrictions. Install new castings as required. Check float assembly for damage or any condition that would impair this item from further service. The choke and throttle valves should be replaced if the

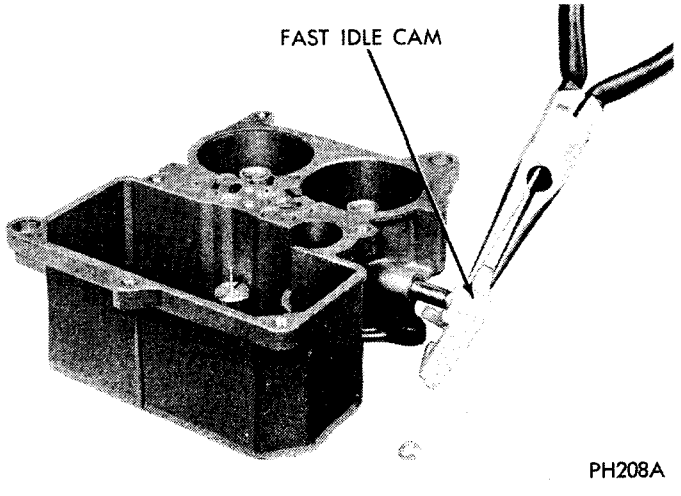


Fig. 24—Removing or Installing Fast Idle Cam

edges have been nicked or if the protective plating has been removed. Be sure that the choke and throttle shafts are not bent or scored. Replace any broken or distorted springs. Replace all screws and lockwashers that show signs of stripped threads or distortion.

Throttle Body

(1) Install idle mixture screws and springs in body. (The tapered portion must be straight and smooth. If the tapered portion is grooved or ridged, a new idle mixture screw should be installed to insure having correct idle mixture control.) **Do not use a screw driver.** Turn screws lightly against their seat with fingers. Back off the number of turns (from the seat) counted at disassembly. Install new plastic caps with tab against the maximum rich stop.

Main Body

(1) Install fast idle cam on main body stub shaft with steps toward fast idle adjusting screw. Install "E" clip to secure (Fig. 24).

(2) Invert main body and place a new gasket in position. Place throttle body on main body and align. Install attaching screws and tighten to 30 inch pounds.

(3) Install accelerator pump discharge check needle in discharge passage. (Fig. 25). Check accelerator pump, fuel inlet and discharge systems as follows:

(4) Pour clean gasoline into fuel bowl, approximately 1 inch deep. Slide accelerator pump plunger into cylinder. Raise plunger and press down lightly on plunger stem to expell all air from pump passage.

(5) Using a small clean brass rod, hold discharge check needle down on its seat. Again raise plunger and press downward. No fuel should be emitted from pump discharge passage. (Fig. 26).

If any fuel does emit from discharge passage, it indicates the presence of dirt or a damaged or worn check needle, or seat. Clean the passage again and retest as above. If leakage is still evident, attempt to form a new seat as follows:

(6) With discharge check needle installed, insert a piece of drill rod down on needle. Lightly tap drill rod with a hammer to form a new seat. Remove and discard old needle and install a new one. Retest as described previously. If service fix does not correct the condition, a new carburetor should be installed. Remove accelerator pump plunger, discharge check needle and fuel from main body.

(7) Install power valve, (Fig. 23). Tighten securely.

(8) Install main metering jets, using Tool C-3748 (Fig. 22). Tighten to 25 inch pounds.

(9) Install accelerator pump discharge check needle in pump discharge passage.

Air Horn

(1) Test freeness of choke mechanism in air horn. The choke shaft must float free to operate correctly. If choke sticks in bearing bores, or appears to be gummed from deposits in air horn, a thorough cleaning will be required.

(2) Install vacuum piston in its cylinder. Place retaining washer over piston stem and carefully seat in place with special tool C-4206 (Fig. 27). Lock in position by staking rim of cylinder (at least three places.) Do not over-stake. (Fig. 28). Compress piston to be sure no binding exists. If piston sticks or binds enough to hinder smooth operation, a new piston should be installed.

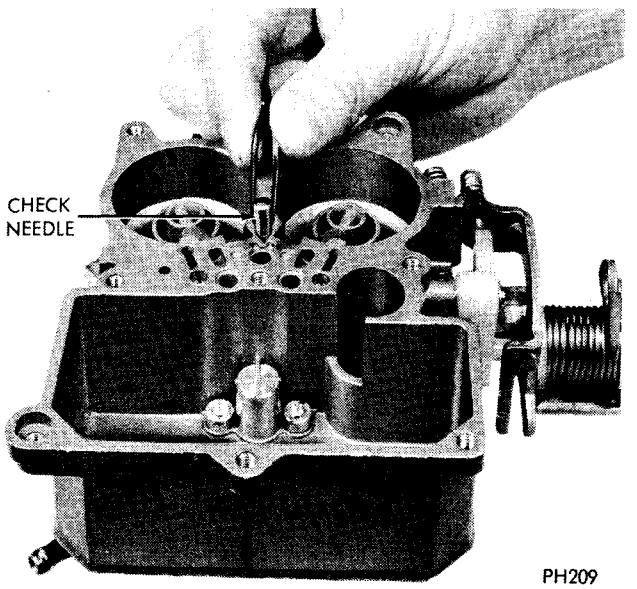


Fig. 25—Installing Accelerator Pump Discharge Check Needle

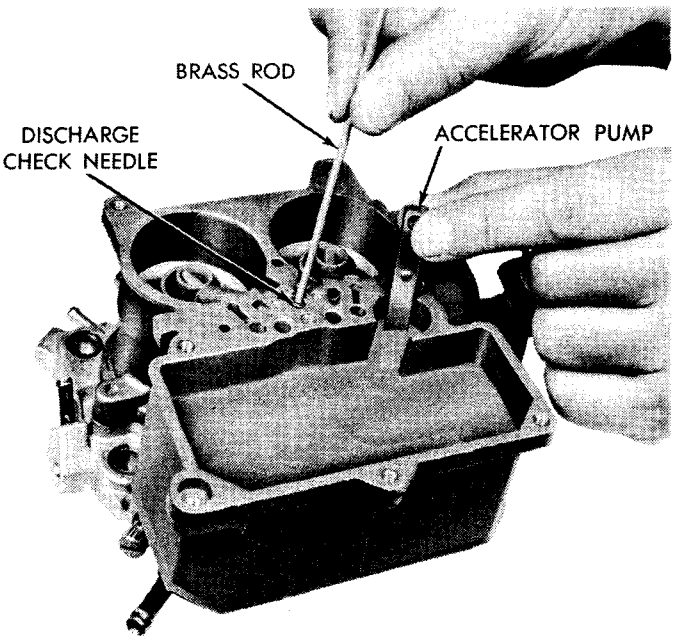


Fig. 26—Testing Accelerator Pump Discharge Check Needle

(3) Slide accelerator pump plunger compression spring over plunger stem, with small diameter toward plunger. Install washer and install pump shaft in air horn.

(4) As plunger is being installed in air horn, slightly tilt plunger to engage with plunger shaft.

(5) Install fuel inlet needle valve seat and gasket in air horn. Tighten securely, using a wide blade screwdriver. Install fuel inlet needle in seat.

(6) Install float in position, then slide delrin fulcrum pin through float hinge to retain float. Center fulcrum pin. **NOTE:** A nitrophyl float can be checked for fuel absorption by lightly squeezing between fingers. If wetness appears on surface or float feels heavy (check with known good float), replace the float assembly.

(7) Install fuel baffle on bosses with slots engaged in lugs. Install attaching screw and tighten securely.

Float

The carburetors are equipped with a viton tipped fuel inlet needle. The tip is flexible enough to make a good seal on the needle seat, and to give increased resistance to flooding. **Care should be taken to perform this operation accurately in order to secure best performance and fuel economy.**

(1) To correctly set float height when carburetor is being overhauled. Refer to carburetor adjustments for adjusting procedures.

Installing Air Horn

(1) Place a new gasket on air horn, then check to be sure main well tubes are straight. Lower air horn straight down on main body; guiding accelerator pump plunger into its cylinder. **Do not cut lip of plunger on sharp edge of cylinder.** Install attaching screws (long screw in center and rear corner on throttle lever side) and tighten to 25 inch pounds from center out.

(2) Install fuel inlet fitting and gasket in air horn and tighten securely.

(3) Engage hooked end of accelerator pump rod in throttle lever (hook end toward outside). Engage other end of rod in slot of pump rocker arm.

(4) Install washer and rocker arm on accelerator pump shaft with flats in alignment. Install attaching lockwasher and nut. Tighten securely.

(5) Install seal on bottom of vent valve. Slide plastic valve and seal into cover, with valve recess, mating with shoulder on underside of cover.

(6) Install bowl vent valve spring in position in opening in bowl, then install valve and cover over spring. Install attaching screws and tighten securely (Fig. 29).

(7) Install bowl vent valve lever on air horn, by first inserting spring into position in arm, with end of spring pointing toward fuel inlet fitting (Fig. 30). Slide assembly over stub shaft on air horn. Align spring and arm with stub shaft and end of spring over raised portion of fuel inlet fitting. Install "E" clip to secure. Vent valve should be in closed position.

(8) To install fast idle connector rod, engage plain end in slot of fast idle cam (from inside). Engage other end of rod in choke lever. With choke valve wide open, slide lever over choke shaft; (aligning

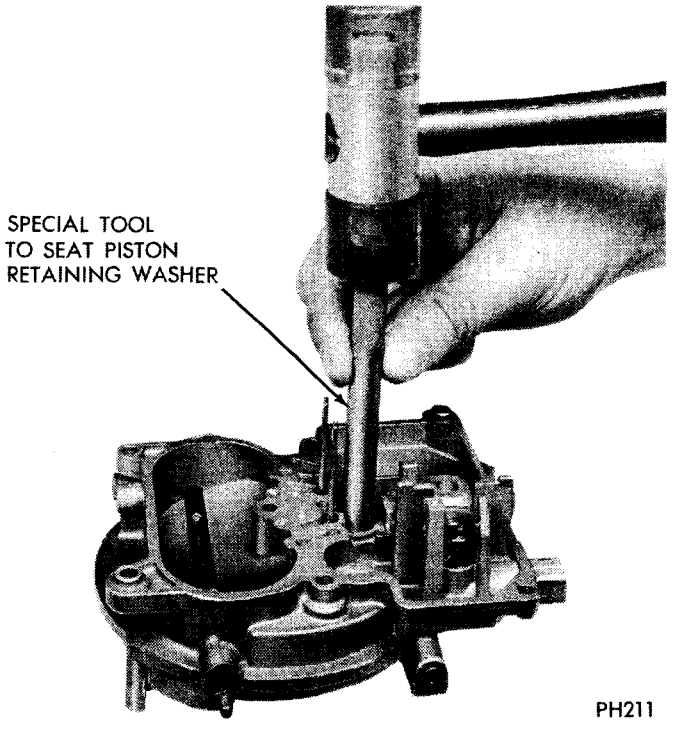


Fig. 27—Installing Vacuum Piston Retaining Washer

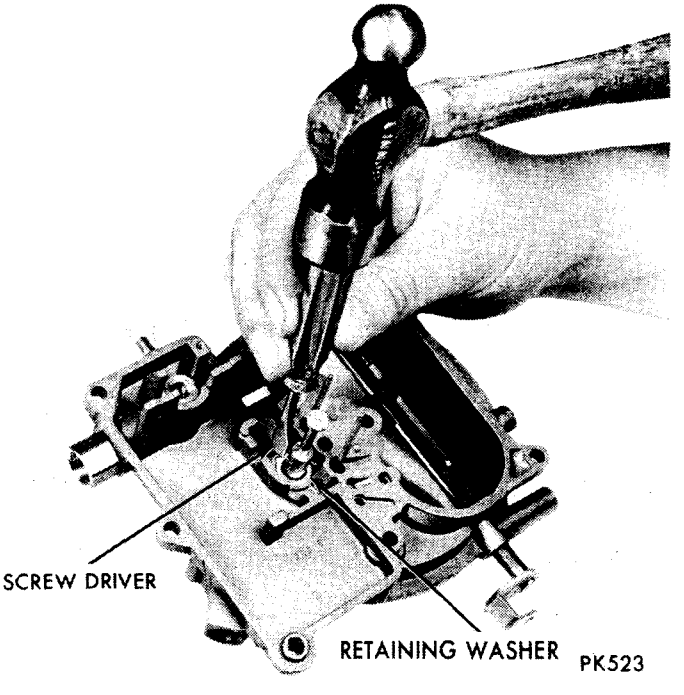


Fig. 28—Staking Vacuum Piston Retaining Washer in Bore

flats) and pointing directly to fast idle cam stub shaft. Install attaching lockwasher and nut. Tighten securely.

(9) Install idle enrichment valve.

Choke Vacuum Diaphragm

Inspect the diaphram vacuum fitting to be sure that the passage is not plugged with foreign material. Leak check the diaphragm to determine if it has internal leaks. To do this, first depress the diaphragm stem, then place a finger over the fitting to seal the opening. Release the stem. If the stem moves more than 1/16 inch in 10 (ten) seconds, the leakage is excessive and the assembly must be replaced.

Install choke diaphragm assembly on the air horn as follows:

(1) Engage free end of choke operating link in slot of choke lever.

(2) Install choke diaphragm and mounting bracket on air horn. Install attaching screws and tighten securely.

(3) Inspect rubber hose for cracks before placing it on correct carburetor fitting, after vacuum kick adjustment has been made.

Choke Vacuum Kick

The choke diaphragm adjustment controls the fuel delivery while the engine is running. It positions the choke valve within the air horn by action of the linkage between the choke shaft and the diaphragm. The diaphragm must be energized to measure the vacuum kick adjustment. Vacuum can be supplied by an auxiliary vacuum source.

Choke Unloader (Wide Open Kick)

The choke unloader is a mechanical device to partially open the choke valve at wide open throttle. It is used to eliminate choke enrichment during cranking of an engine. Engines which have flooded or stalled by excessive choke enrichment can be cleared by use of the unloader. Refer to carburetor adjustments for adjusting procedure.

Fast Idle Speed

Fast idle engine speed is used to overcome cold engine friction stalls, after cold starts and stalls because of carburetor icing. Set this adjustment after the vehicle odometer indicates over 500 miles to insure a normal engine friction level. Prepare engine by driving at least 5 miles. Refer to carburetor adjustments for adjusting procedure.

Vacuum Kick

The choke diaphragm adjustment controls the fuel delivery while the engine is running. It positions the choke valve within the air horn by action of the linkage between the choke shaft and the diaphragm. The diaphragm must be energized to measure the vacuum kick adjustment. Vacuum can be supplied by an auxiliary vacuum source.

Fast Idle Cam Position

This adjustment is important to assure that the speeds of each cam step occur at the proper time during engine warm-up.

Vacuum Throttle Positioner

Carburetor models 7697A and 7698A are equipped with a throttle positioner system which consists of an electronic speed switch, an electronically controlled vacuum solenoid valve and a vacuum actuated throttle positioner (Fig. 31).

The system's function is to prevent unburned hydrocarbons from entering the atmosphere through the vehicle's exhaust system when the engine is decelerated from a high RPM. The electronic speed

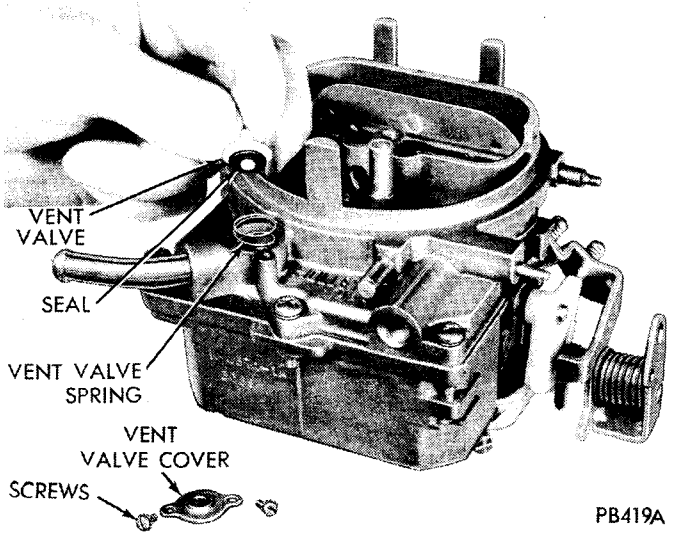


Fig. 29—Installing Vent Valve Seal and Cover

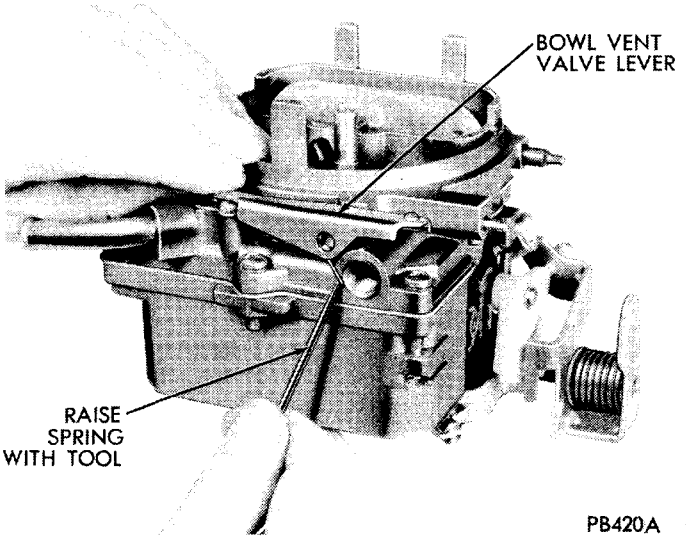


Fig. 30—Installing Bowl Vent Valve Lever and Spring

switch receives ignition pulses from the five ohm ballast resistor terminal connecting to the electronic ignition control unit. It then senses when the engine speed exceeds 2000 RPM and allows vacuum to energize the throttle positioner. When this positioner is energized, a throttle stop is provided which will inhibit the throttle from returning to the idle position. When the throttle is released, it will return to the new stop position (positioner energized) calibrated for a steady-state engine speed of 1750 RPM. As the engine is decelerating, the electronic speed switch senses when the engine speed drops below 2000 RPM and de-energizes the throttle positioner. This allows the throttle to return to the normal idle stop position and the engine will continue to decelerate to idle speed. This operation positions the throttle partially open (1750 RPM idle whenever the engine decelerates from a speed above 2000 RPM to a speed just below 2000 RPM. This provides sufficient air flow through the engine to adequately dilute the air-fuel mixture.

It is essential that the curb idle speed adjustment be made using **only** the curb idle speed screw on the carburetor. Curb idle speed adjustment **must not** be made using the adjustment for the vacuum throttle positioner. Improper adjustment of the throttle positioner may result in excessive curb idle speed.

At completion of all idle set or throttle positioner adjustments, engine must be cycled to a speed above 2500 RPM manually to check for proper idle return.

Diagnosis Procedure—Vacuum Throttle Positioner

(1) If vacuum throttle positioner does operate as described in Step 1 under adjustment, the faulty component can be diagnosed as described below.

(2) Check all wiring harness and hose connections in system.

(3) **Vacuum Actuator Test**—Apply vacuum from an external source to the actuator. If actuator does not operate, replace. If actuator operates, pinch off supply hose and observe actuator. If actuator remains in operating position for one minute or more, unit is satisfactory.

(4) **Vacuum Solenoid Test**—Apply vacuum from an external source to manifold supply hose connection on solenoid valve. Disconnect wiring harness from solenoid and ground one terminal of solenoid. Connect 12 volts to other terminal and observe vacuum actuator operation. If actuator does not cycle as 12 volts is applied, replace solenoid. If operation is normal, it will be necessary to replace the speed switch.

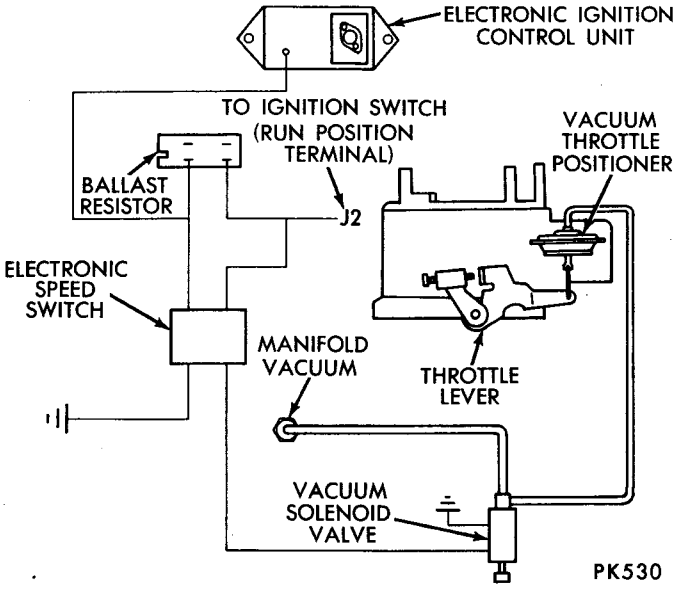
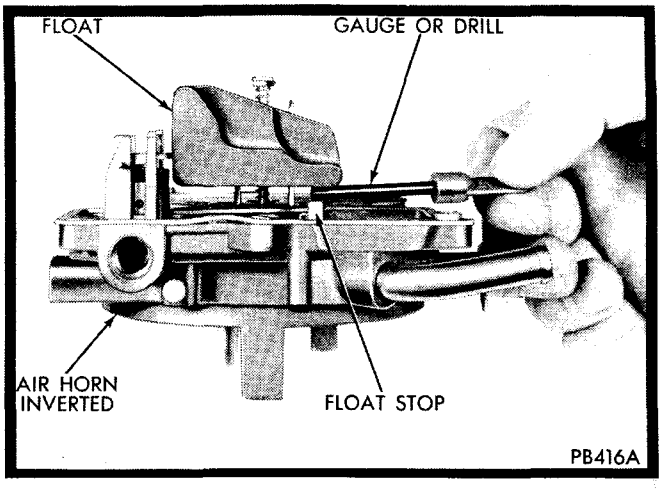


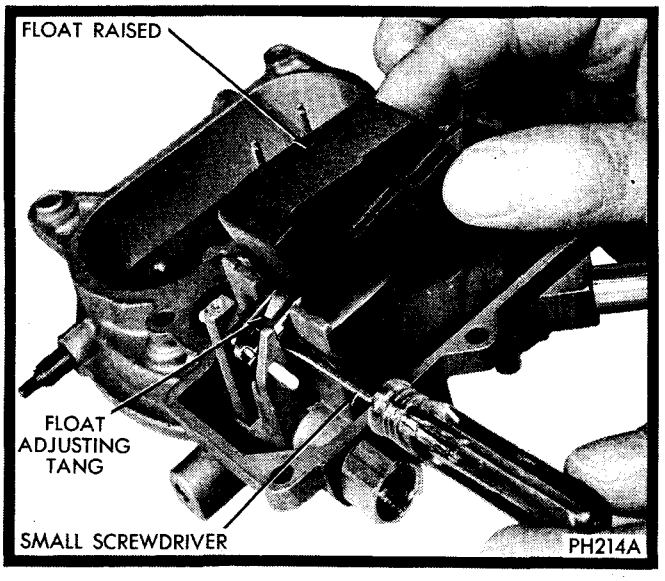
Fig. 31—Throttle Positioner System

HOLLEY 2245 CARBURETOR ADJUSTMENTS

1. FLOAT SETTING ADJUSTMENT

dry float setting between toe of float and float stop (± 1/32") 3/16"	R-6764A	R-7092A
	R-7870A	
	R-6886-1A	R-7697A
	R-7088A	R-7698A
	R-7091A	
	R-7871A	R-7103A





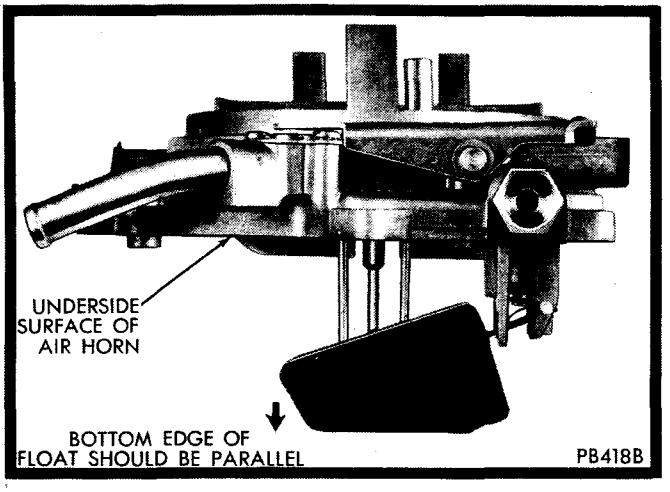
(1) Invert air horn so that weight of float only is forcing needle against seat.

(2) Measure the clearance between top of float and float stop. The clearance should be as shown in specifications. Be sure gauge is perfectly level when measuring.

If an adjustment is necessary, bend float adjusting tab toward or away from needle, using a narrow blade screwdriver, until correct clearance of setting has been obtained.

2. FLOAT DROP ADJUSTMENT

refer to illustration below	R-6764A	R-7092A
	R-7870A	
	R-6886-1A	R-7697A
	R-7088A	R-7698A
	R-7091A	
	R-7871A	R-7103A

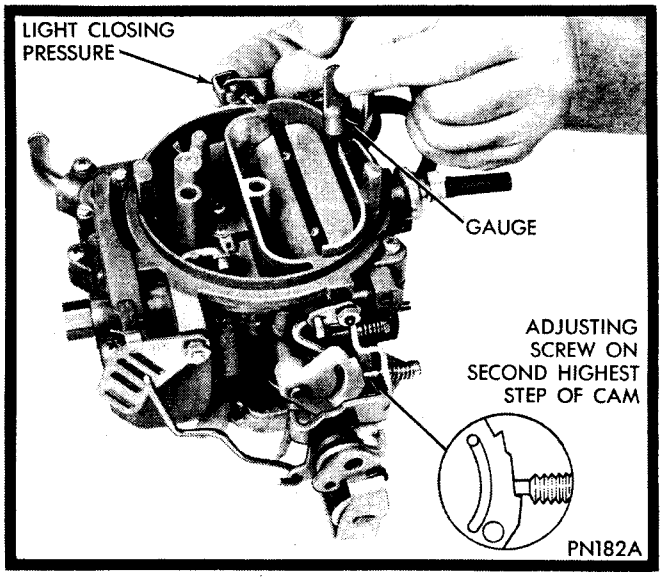


(1) Check float drop, by holding air horn in an upright position. The bottom edge of float should be parallel to underside surface of air horn. If an adjustment is necessary, bend tang on float arm until parallel surfaces have been obtained.

(2) Install fuel baffle to air horn.

3. FAST IDLE CAM POSITION ADJUSTMENT

.110" All



(1) With fast idle speed adjusting screw contacting second highest speed step on the fast idle cam, move choke valve toward closed position with light pressure on choke shaft lever.

(2) Insert specified gauge (see Specifications) between top of choke valve and wall of air horn. An adjustment will be necessary if a slight drag is not obtained as gauge is being removed.

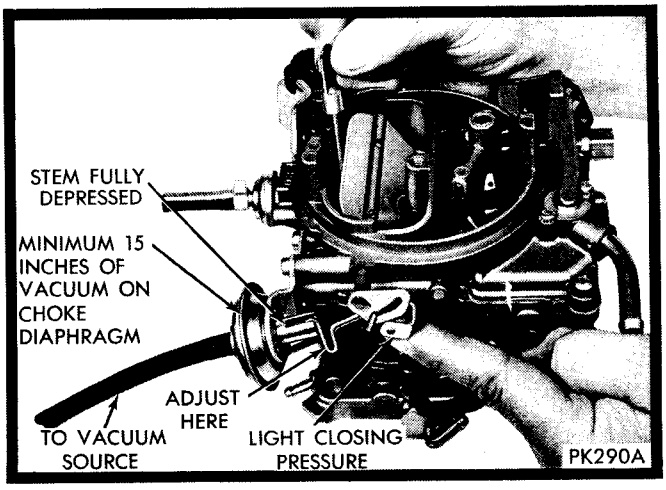
(3) If an adjustment is necessary, bend fast idle connector rod at angle until correct valve opening has been obtained.

4. CHOKE VACUUM KICK ADJUSTMENT

.90" R-7870A

.130" R-7871A

.150" All (except R-7870A and R-7871A



(1) Using an auxiliary vacuum source, disconnect vacuum hose from carburetor and connect it to hose from vacuum supply, with a small length of tube to act as a fitting. Removal of hose from diaphragm may require forces which can damage the system. Apply a vacuum of 15 or more inches of mercury.

(2) Insert specified gauge (refer to Specifications) between top of choke valve and wall of air horn.

Apply sufficient closing pressure on lever to which choke rod attaches to provide a minimum choke valve opening, without distortion of diaphragm link. Note that the cylindrical stem of diaphragm will extend as internal spring is compressed. This spring must be fully compressed for proper measurement of vacuum kick adjustment.

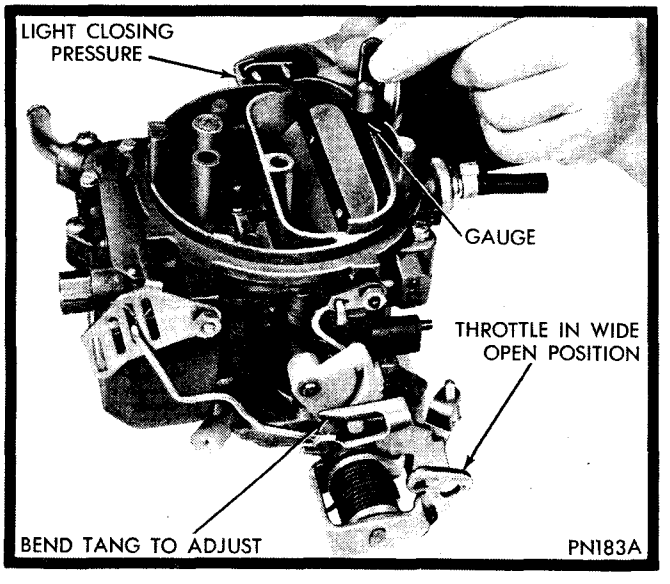
(3) Adjustment is necessary if slight drag is not obtained when removing the gauge. Shorten or lengthen diaphragm link to obtain correct choke valve opening. Length changes should be made by carefully opening or closing the U-bend provided in the link. Improper bending causes contact between the U-section and the diaphragm assembly. **Do not apply twisting or bending force to diaphragm.**

(4) Make following check. With vacuum applied to diaphragm, the **choke valve should move freely** between open and adjusted positions. If movement is not free, examine linkage for misalignment or interferences caused by bending operation. Repeat adjustment if necessary to provide proper link operation.

(5) Reinstall vacuum hose on correct carburetor fitting.

5. CHOKE UNLOADER ADJUSTMENT (WIDE OPEN KICK)

.170" All



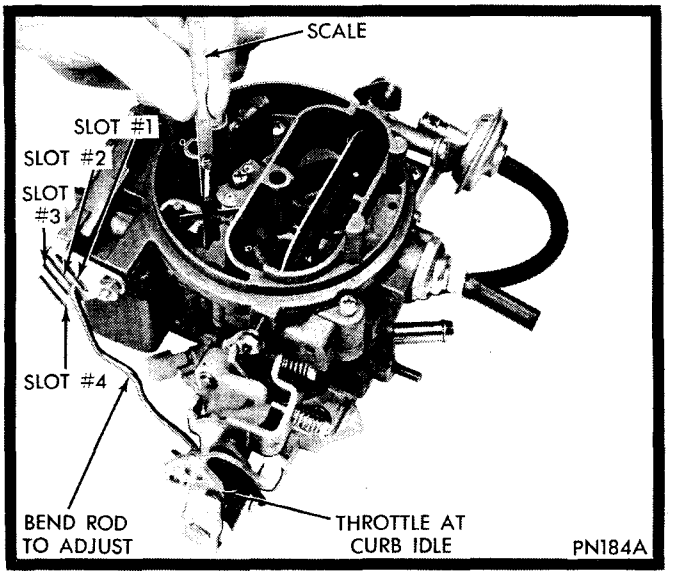
(1) Hold throttle valves in wide open position. Insert specified gauge (see Specifications) between upper edge of choke valve and inner wall of air horn.

(2) With a finger slightly pressing against choke lever, a slight drag should be felt as gauge is being withdrawn. If an adjustment is necessary, bend unloader tang on throttle lever until correct opening has been obtained.

6. ACCELERATOR PUMP STROKE MEASUREMENT (AT IDLE)

SLOT #1 R-7870A, R-6886A, R-7697A, R-7088A, R-7871A, R-7092A

SLOT #2 R-6764A, R-7103A, R-7698A, R-7091A



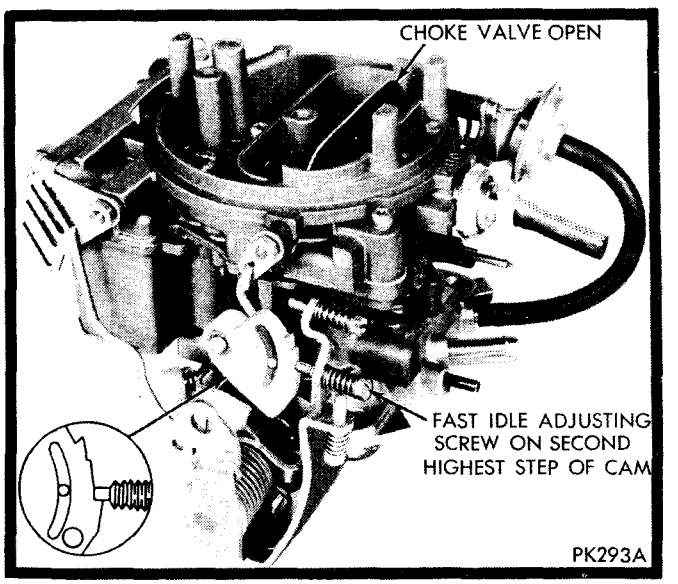
(1) Be sure pump connector rod is in the proper slot of the accelerator pump arm (refer to specifications).

(2) Use a scale to measure travel (drop) of the accelerator pump plunger between curb idle and wide open throttle, or between closed throttle and wide open throttle. Both dimensions are listed in the specifications. Closed throttle is obtained by backing off the curb idle screw and moving the fast idle cam to open choke position.

(3) To adjust pump travel, bend pump operating rod in the proper area until correct setting has been obtained.

7. FAST IDLE SPEED ADJUSTMENT

1600 RPM	R-6886-1A	1600 RPM	R-7871A
	R-7697A		R-7091A
	R-7103A		R-7092A
	R-7088A	1700 RPM	R-6764A
	R-7698A		
		1800 RPM	R-7870A



(1) Remove the air cleaner and disconnect vacuum hoses from the carburetor that lead to the heated air control and OSAC valve. If not equipped with OSAC valve, disconnect the hose that leads directly to the distributor (eliminates vacuum advance) disconnect EGR hose and cap all vacuum ports at the carburetor.

(2) With engine off, transmission in NEUTRAL and parking brake set, open throttle and close choke.

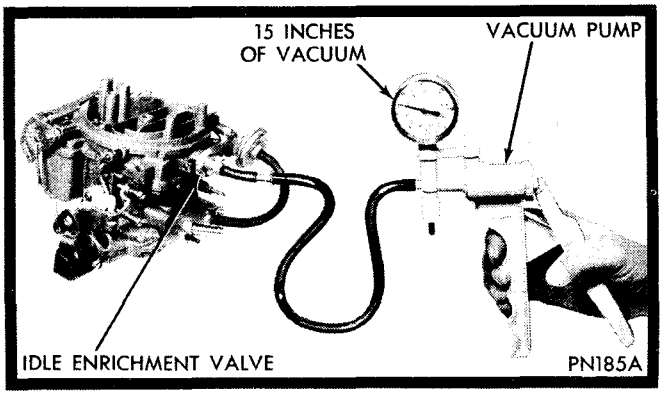
(3) Close throttle to place fast idle speed screw on highest speed step.

(4) Move fast idle cam until screw drops to second highest speed step.

(5) Start engine and determine stabilized speed. Turn fast idle speed screw to secure speed listed in specifications. Reposition speed screw on cam after each speed adjustment to provide correct throttle closing torque.

8. IDLE ENRICHMENT VALVE

refer to illustration below



(1) Warm engine to normal operating temperatures.

(2) Remove air cleaner but DO NOT cap any vacuum fittings opened by hose removal (leakage needed for test).

(3) Disconnect hose to idle enrichment system diaphragm at plastic connector (connector must be removed from carburetor hose because it is a filtered bleed which will interfere with test).

(4) Start engine and place fast idle speed screw on slowest speed step of fast idle cam.

(5) Connect 3 or 4 feet of hose to the enrichment diaphragm hose with suitable connector.

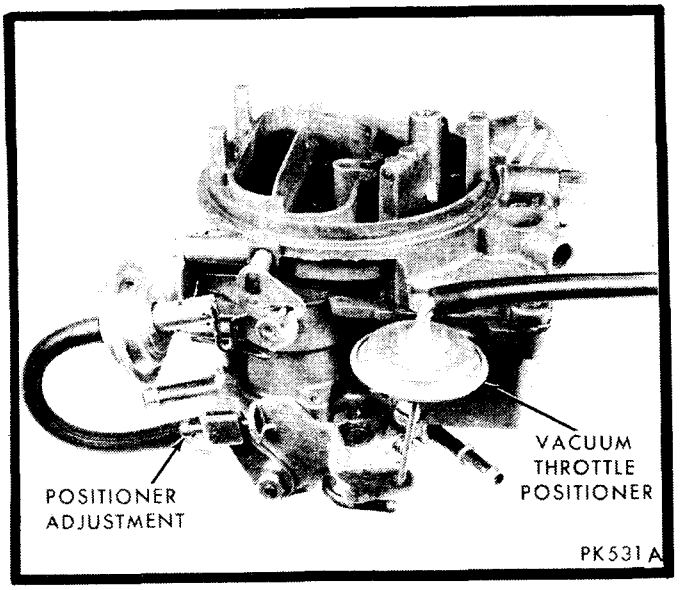
(6) Apply vacuum to other end of hose (use auxiliary vacuum source) and listen for engine speed change. If speed can be controlled by vacuum, the diaphragm and air valve are operating satisfactory. If speed can not be controlled proceed to next step.

(7) Place finger or other plug over air inlet passage and listen for engine speed change. If speed can be controlled, the diaphragm is leaking or the air valve is stuck open. If speed can not be controlled, the air valve is stuck closed. In either case, clean the air valve and repeat step 6. If speed control is still absent, replace the diaphragm.

9. VACUUM THROTTLE POSITIONER ADJUSTMENT

2500 RPM

R-7697A
R-7698A



(1) Start engine and allow to idle in Neutral, then accelerate engine to a speed above 2000 RPM and verify that vacuum positioner unit operates and can withstand a hand applied load in the opearting position. If operation is not proper, determine cause of failure before proceeding, using diagnosis procedure.

(2) If unit operates properly as described above, adjust to operate at specified speed using the following procedure.

(3) Accelerate engine manually to the RPM shown above.

(4) Adjust positioner screw using standard or special driver as required until screw just contacts throttle lever.

(5) Release throttle, then slowly adjust positioner to decrease engine speed until a sudden drop in speed occurs (over 1000 RPM). At this point, continue adjusting vacuum positioner in decreasing direction 1/4 additional turn and tighten lock nut. Accelerate engine manually to approximately 2500 RPM and release throttle, engine should return to normal idle. This completes the adjustment.

SETTING PROCEDURES

er to
edures
low

e all adjustments with engine fully warmed

e transmission in neutral and set parking

llights off and air conditioning compressor
ing.
ove hose at distributor and plug hose.
k timing (refer to Emission Control Label in
partment).
st mixture setting (refer to Emission Con-
n engine compartment).

a new vehicle (under 300 miles) idle speed
uld be reduced 75 RPM for both propane
peed and curb idle speed.

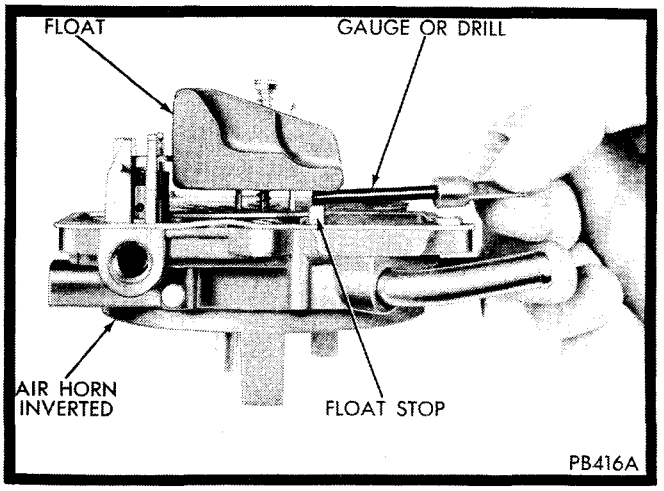


Fig. 3—Checking Float Setting

(9) Check float drop by holding air horn in an upright position. The bottom edge of the float should be parallel to the underside of air horn. If an adjustment is necessary, bend tang on float arm until parallel surfaces have been obtained (Fig. 4).

(10) Lower air horn straight down on carburetor, guiding accelerator pump plunger into its cylinder. Install eight attaching screws (long screw in center and rear corner on throttle lever side) and tighten to 25 inch-pounds starting from the center and working to the outside.

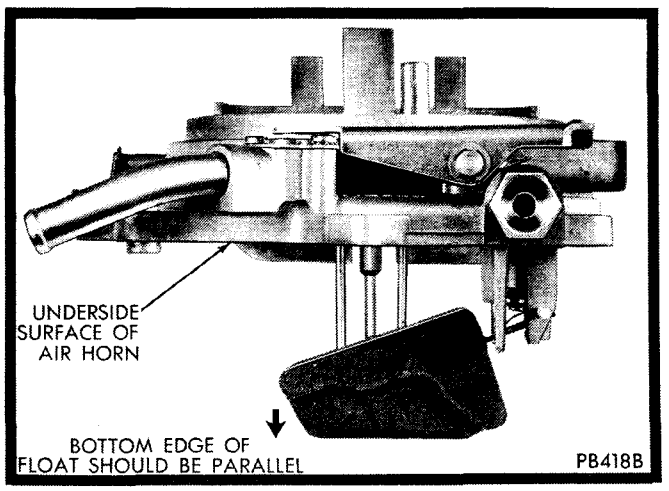


Fig. 4—Checking Float Drop

(11) Install choke lever, fast idle connector rod, nut and washer to choke shaft and tighten (Fig. 1).

(12) Install accelerator pump rocker arm, nut and washer to accelerator pump shaft and tighten (Fig. 1).

(13) Connect choke assembly.

(14) Connect vacuum kick, idle enrichment diaphragm and bowl vent hoses.

(15) Install air cleaner bolt that is threaded through bowl cover into main body of carburetor.

(16) Install air cleaner assembly and gasket.

(17) Check idle speed with tachometer. If adjustment is necessary refer to Emission Control Information Label in engine compartment for proper procedure and specifications.

HOLLEY 2300G SERIES CARBURETOR

INDEX

	Page
Carburetor Adjustments	74
Accelerator Pump	74
Fast Idle Speed	75
Float Setting	74
Fuel Level in Bowl (On Vehicle)	77
Positive Throttle Return Spring	72
Cleaning and Inspection	71
Disassembling Carburetor	68
Fuel Bowl	70
Governor Housing	71
Main Body	70
Main Metering Body	71
Throttle Body	69
Throttle Operating Housing	71
General Information	62
Reassembling Carburetor Fuel Bowl	71
Governor Housing	72
Main Metering Body	73
Throttle Body	72
Throttle Operating Housing	72
Servicing Carburetor	67
Specifications	127

CARBURETOR APPLICATION

Requirement	Transmission	Engine	BBLS	Carburetor	Model
Fed. Can.	Man. Auto.	361 Cu. In.	Dual	Holley	R-7137A
		361-4 Cu. In.	Dual	Holley	R-6769-1A

GENERAL INFORMATION

The Holley two barrel carburetor Series 2300G (Figs. 1, 2, 3) features a low silhouette design that provides for easy servicing and adjusting. Each barrel has its own venturi, idle system, main metering system, booster venturi and throttle valve. The same fuel inlet and air inlet supplies both barrels.

The metering body contains the fuel metering passages for the basic systems.

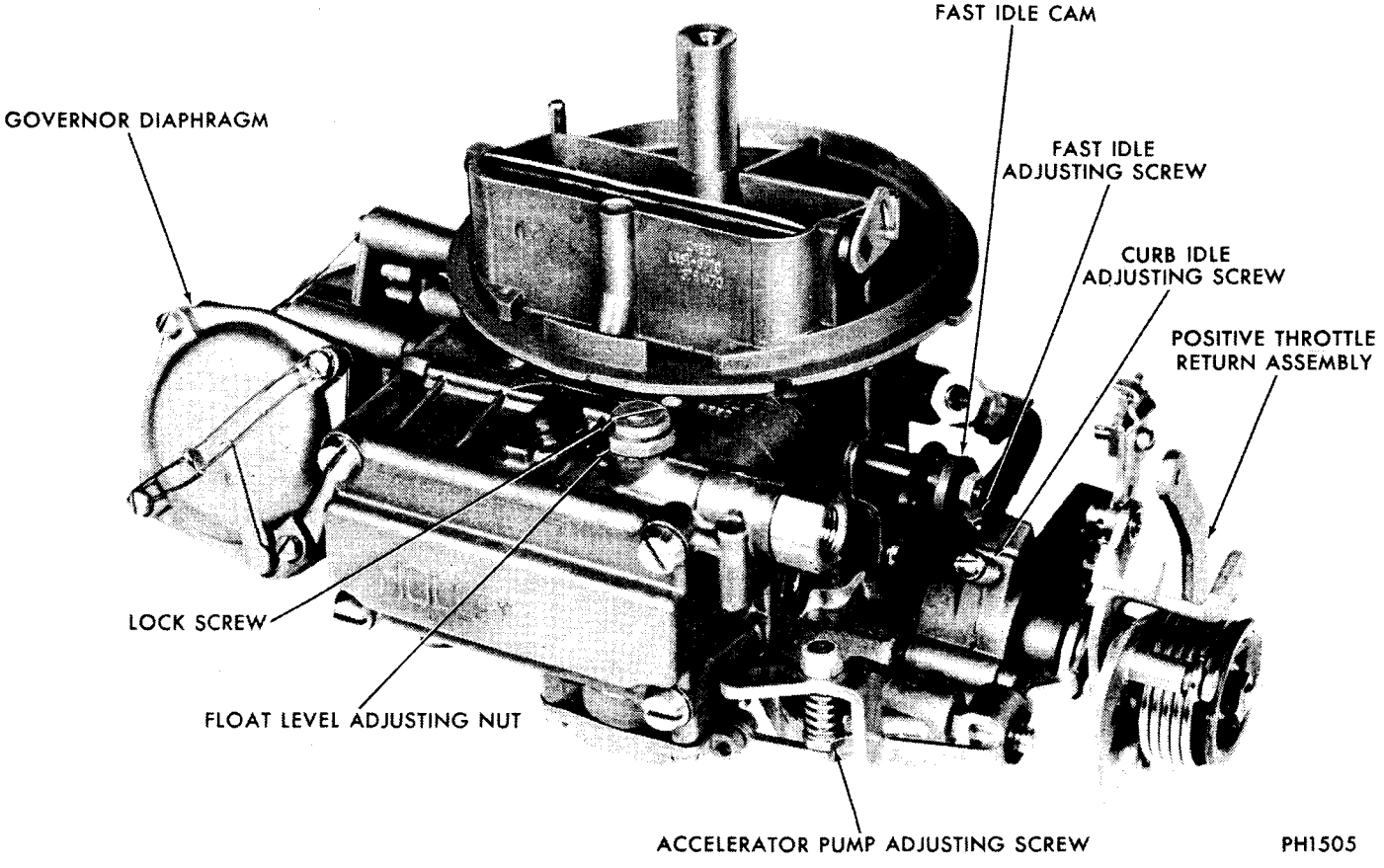


Fig. 1—Carburetor Assembly 2300G. Series (Front View)

The carburetor is equipped with a diaphragm type, cam operated accelerating pump located in bottom of the fuel bowl. The pump functions when the pump lever is activated by a cam on the throttle lever assembly. An override spring on the pump lever adjusting screw allows a prolonged discharge of fuel for smooth acceleration.

The supply of fuel necessary for high speed or full power operation is delivered by a fully automatic power enrichment system. Manifold vacuum on the power valve diaphragm actuates the power enrichment system.

A manual operated choke is used on the carburetors. The carburetor is equipped with the centrifugal-vacuum type governor to accurately control engine speed where governing is required.

Major Sub-assemblies

There are four major sub-assemblies of the carburetor. The main body assembly, the fuel bowl, the metering body assembly and the throttle body assembly. The centrifugal-vacuum type governor is attached to the throttle body.

The die cast fuel bowl and metering body assemblies contain the fuel chamber, fuel inlet needle valve, accelerating pump, main jets, and fuel metering passages. The die cast throttle body assembly contains the throttle valves, throttle linkage, and various fuel and vacuum passages.

Operation

The carburetor uses the four basic systems required for efficient carburetion. These four systems are: The Idle System which provides a rich mixture for smooth idle and low speed performance; the Accelerating Pump System which provides additional fuel during acceleration; The Main Metering System which provides an economical mixture for normal cruising conditions; and the Power Enrichment System which provides a richer mixture when high power output is desired.

Supplementing the four systems are—The Fuel Inlet System which constantly supplies fuel to each basic system; and the Choke System which temporarily enriches the fuel mixture to aid in starting and running a cold engine. The difference in air pressure (vacuum) within the carburetor provides the force for proper discharge of fuel for the various engine speed and load conditions.

Fuel Inlet System (Fig. 4)

All fuel first enters the fuel bowl which stores fuel for the four basic metering systems. The fuel enters the fuel bowl through a screen ahead of the fuel inlet valve or needle and seat assembly. The amount of fuel

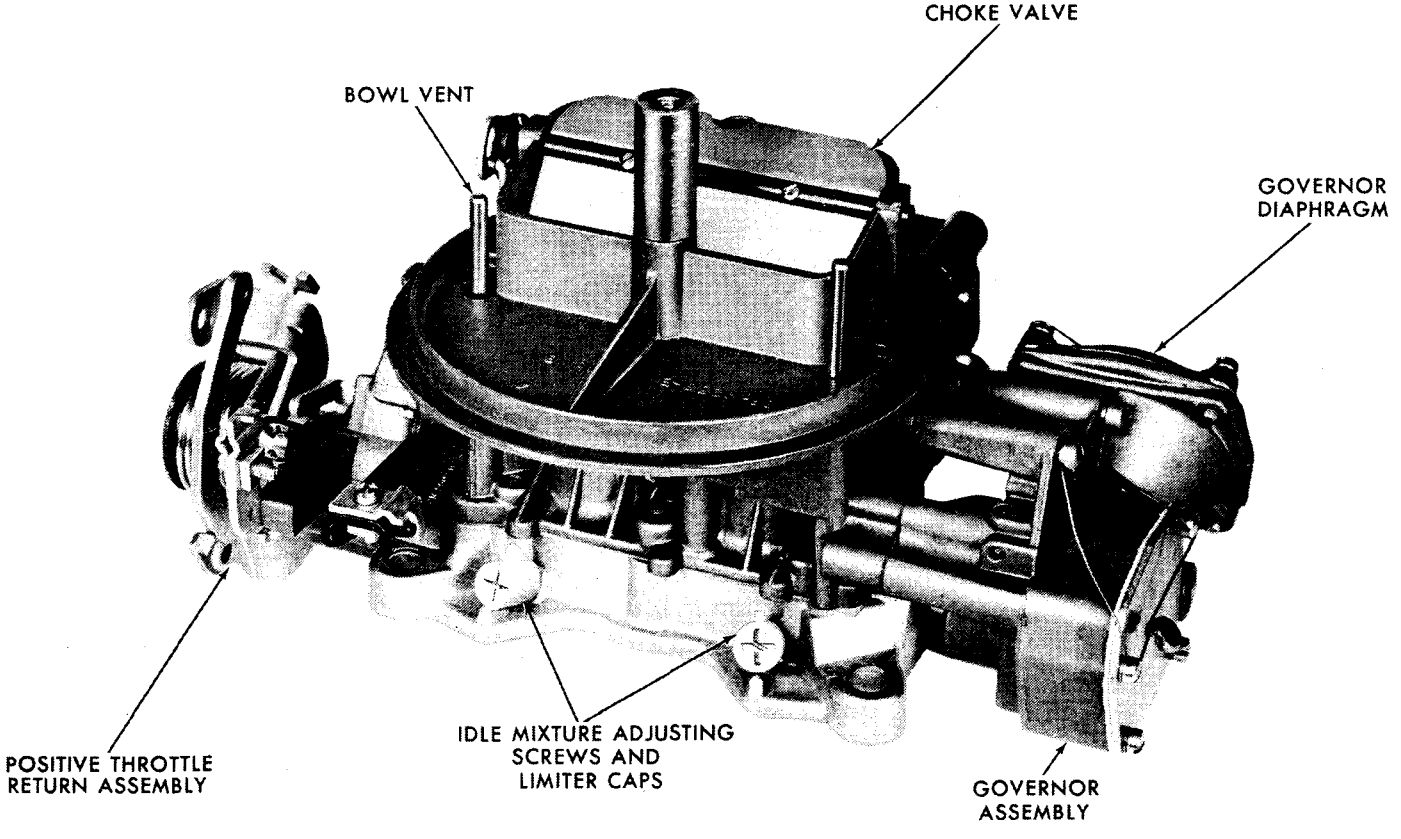


Fig. 2—Carburetor Assembly 2300G. Series (Rear View)

entering the fuel bowl is determined by the space between the movable needle and its seat and also by the pressure from the fuel pump.

Movement of the needle in relation to the seat is controlled by the float and hinge assembly which rises and falls with the fuel level. As the fuel level drops, the float drops, opening the needle valve to allow fuel to enter the float chamber. When the fuel reaches a specified level, the float moves the needle valve to a position where it restricts the flow of fuel, admitting only enough to replace that being used. Any slight change in the fuel level causes a corresponding movement of the float, opening or closing the fuel inlet needle valve to immediately restore or hold the proper fuel level. The fuel inlet system must constantly maintain the specified level of fuel as the basic fuel metering systems are calibrated to deliver the proper mixture only when the fuel is at this level.

Choke

The choke permits a richer fuel-air mixture required for starting and operating a cold engine. Most of the vaporized fuel condenses to a liquid upon contact with the cold surfaces of intake manifold. In this liquid form it burns too slowly and incompletely in the cylinders and will cause stalling and loss of power. The choke valve can be manually closed during the cranking period and partially open during warm up, inducing manifold vacuum below the choke plate. This greater vacuum causes both main metering system and idle system to discharge fuel into the manifold.

Idle System (Fig. 5)

At idle and low speeds, the air flow through the carburetor is not strong enough to draw fuel through the venturi for the main metering system. Intake manifold vacuum is high because of the greater restriction to the air flow by the nearly closed throttle valves. This high manifold vacuum is used to provide the pressure differential to operate the idle system.

The carburetor utilizes two identical idle systems, one for each bore. Since, the two passages function identically, only one side will be considered in this explanation.

At idle, the normal air pressure in the float chamber causes the fuel to flow through the idle system to the greatly reduced pressure area below the throttle valve. Fuel flows from the float chamber through the main jet then into the small angular but horizontal passage that leads across to a vertical passage.

The fuel flows up this vertical passage, (idle well) past the idle feed restriction and then it is mixed with air coming in from the idle air bleed. This fuel-air mixture flows through a short horizontal passage and then down another vertical passage. At the bot-

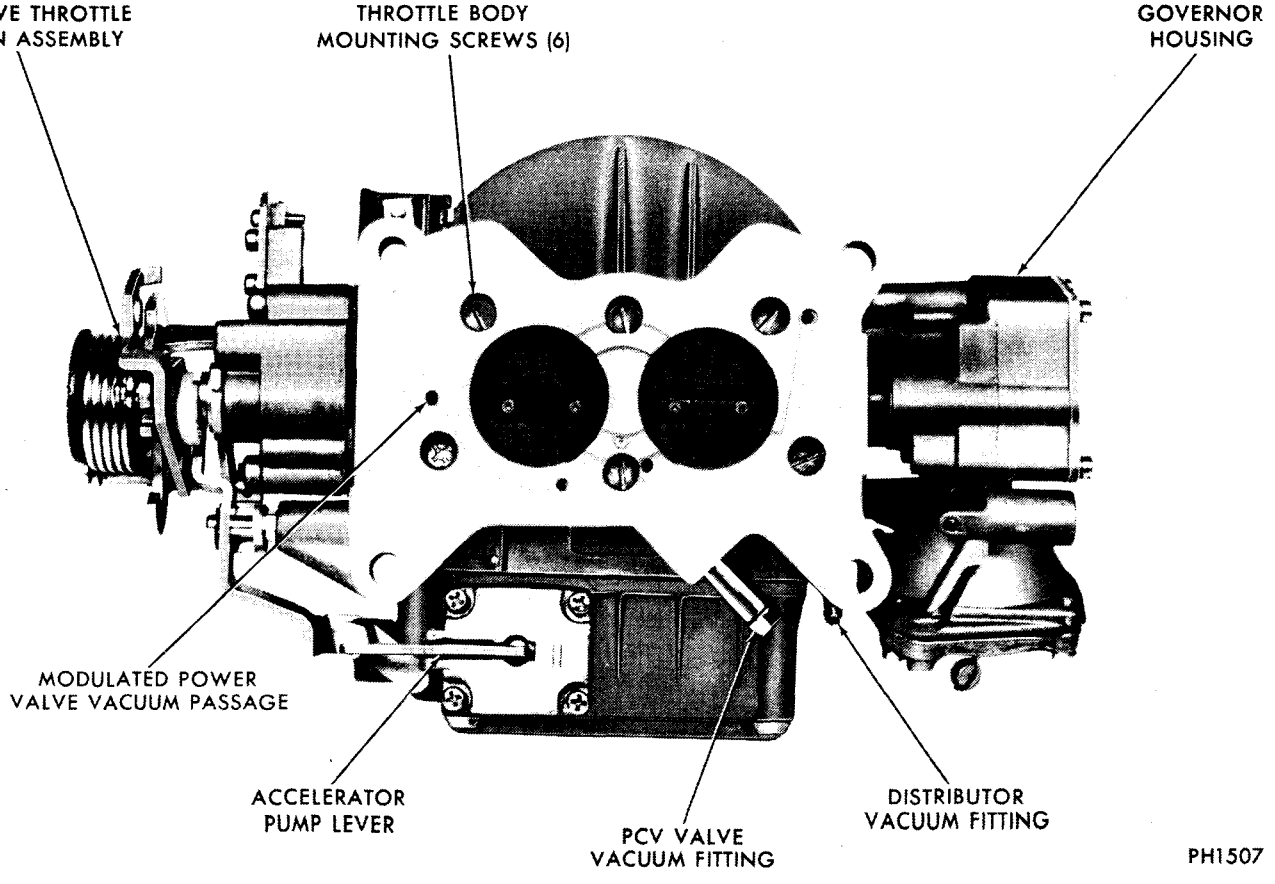


Fig. 3—Carburetor Assembly 2300G. Series (Bottom View)

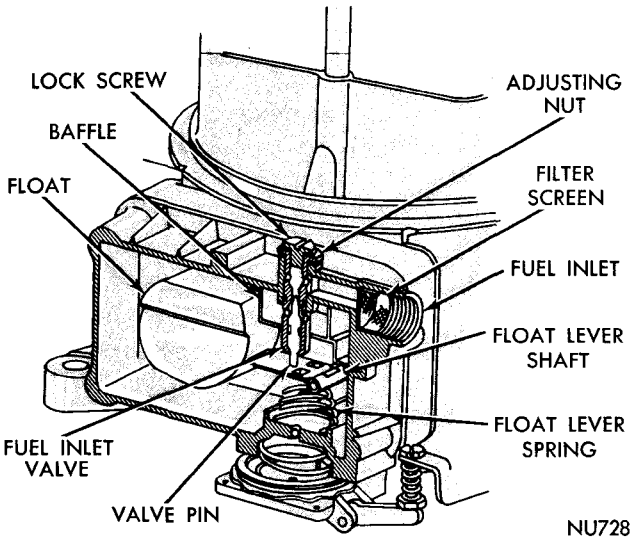


Fig. 4—Fuel Inlet System

tom of this vertical passage the fuel-air mixture branches in two directions, one through the idle discharge passage and the other to the idle transfer passage.

The fuel in the idle discharge passage flows through a short passage, down another passage in the main body and into the throttle bore below the throttle valve.

During off-idle operation when the throttle valve is moved slightly, the fuel flows through the idle transfer passage from the metering body into the throttle body passage. As the idle transfer slot is exposed to manifold vacuum, fuel is discharged into the throttle bore.

As the throttle valve is opened still wider and engine speed increases, the air flow through the carburetor is also increased. This creates an increased vacuum in the venturi to bring the main metering system into operation. The flow from the idle system tapers off as the main metering system begins discharging fuel. The two systems are engineered to provide smooth gradual transition from idle to cruising speeds.

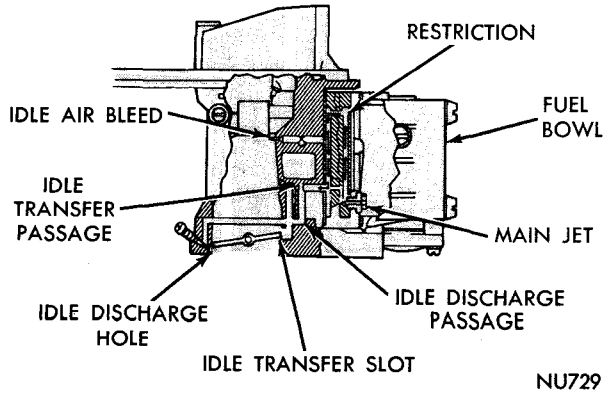


Fig. 5—Idle System

Accelerating Pump System (Fig. 6)

As the throttle opening is increased, the air flow through the carburetor responds almost immediately. The fuel, however, is heavier than air and there is a brief interval before the fuel flow responds. It is during this interval that the accelerating pump operates, supplying fuel until the other metering systems can provide the proper mixture.

The accelerating pump is located in the bottom of the fuel bowl. The pump begins to function when the pump operating lever is actuated by throttle movement. When the throttle is opened the pump linkage, actuated by a cam on the throttle shaft lever, forces the pump diaphragm up. As the diaphragm moves up, the pressure forces the pump inlet check ball on its seat preventing fuel from flowing back into the float chamber. The fuel flows from the short horizontal passage in the fuel bowl into the long diagonal passage in the metering body. The fuel passes into the main body and then in the pump discharge chamber. The pressure of the fuel causes the discharge needle to raise and fuel is discharged into the venturi.

As the throttle is moved toward the closed position, the linkage returns to its original position and the diaphragm spring forces the diaphragm down. As the diaphragm returns to its original position the pump inlet check ball is moved off its seat and the diaphragm chamber is filled with fuel from the bowl.

Main Metering System (Fig. 7)

When the engine is running, it draws air through the carburetor venturi and booster venturi. The air passing through the throat of a venturi, creates a low pressure called a vacuum. The strength of this low pressure is determined primarily by the velocity of the air flowing through the throat of the venturi. This, in turn, is regulated by the speed and power output of the engine. The difference, between the pressure in the booster venturi and the normal air pressure in the float chamber, causes fuel to flow through the main metering system.

At cruising speed, fuel flows from the float

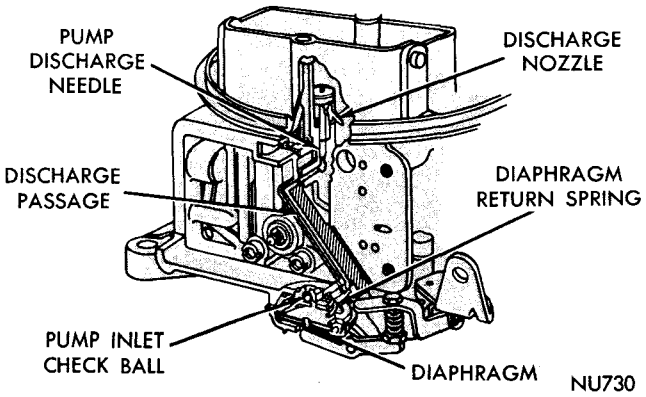


Fig. 6—Accelerating Pump System

chamber through the main jet, which measures or meters fuel flow, into the bottom of the main well. The fuel moves up the main well past the main well air bleed hole in the side of the well. Filtered air, enters through the air bleed in the main body and then into the main metering body by interconnecting passages. This mixture of fuel and air, being lighter than raw fuel, responds faster to any change in venturi vacuum and vaporizes more readily when discharged into the air stream of the venturi. The mixture of fuel and air moves up the main metering passage and passes into the short horizontal passage leading to the main body, then through the horizontal channel of the discharge nozzle.

This fuel is discharged into the booster venturi and then in the air stream of the carburetor venturi.

The throttle valve controls the amount of fuel-air mixture admitted to the intake manifold, regulating the speed and power output of the engine in accordance with accelerator pedal movement.

Power Enrichment System (Modulated Power Valve) (Fig. 8)

During high speed (or low manifold vacuum) the carburetor must provide a mixture richer than is needed when the engine is running at cruising speed under no great power requirements. Added fuel for power operation is supplied by a modulated power enrichment system.

A vacuum passage in the throttle body transmits manifold vacuum to the power valve chamber in the main body. Under light throttle and light load conditions, there is sufficient vacuum acting on the power valve to keep it closed. When the throttle valves are opened to a 55° angle, vacuum that is acting on the power valve is bled to atmosphere, which in turn insures proper mixtures for this throttle opening. The vent port is right in line with the throttle shaft. The throttle shaft has a small hole drilled through it. When the throttle valves are opened to 55° the hole in the throttle shaft will line up with the port in the base of the carburetor and vent the power valve vacuum chamber to atmosphere allowing the spring loaded power valve to open.

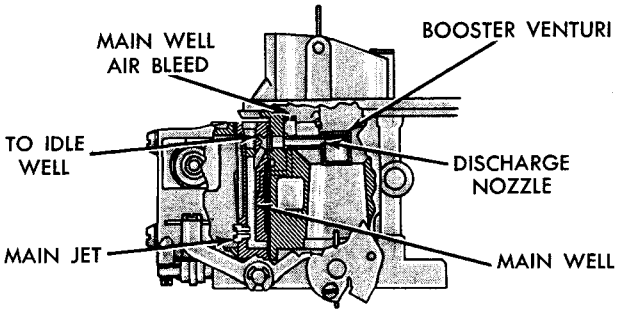


Fig. 7—Main Metering System

As engine power demands are reduced, and the throttle valves begin to close, manifold vacuum increases. The increased vacuum acts on the diaphragm, overcoming the tension of the power valve spring. This closes the power valve and shuts off the added supply of fuel which is no longer required.

Spark Advance (Fig. 9)

The carburetor is teamed with the distributor to effect spark timing that will satisfy all engine speed and load conditions.

The spark must be advanced as the engine speed is increased since a definite time is required for the fuel-air mixture to burn and reach its maximum pressure at the right time for highest efficiency of the engine cycle. Because the fuel-air mixture induced into the intake manifold at light loads is not as dense as that during high load operation, it burns more slowly, hence the spark under these conditions must also be advanced.

Governor (Fig. 10)

A centrifugal vacuum-operated engine speed governor is incorporated in this carburetor model as a positive means of controlling engine speed. The governor contains a throttle actuating mechanism attached to the throttle shaft of the carburetor. The throttle actuating mechanism consists of a diaphragm assembly, governor spring, and governor lever assembly.

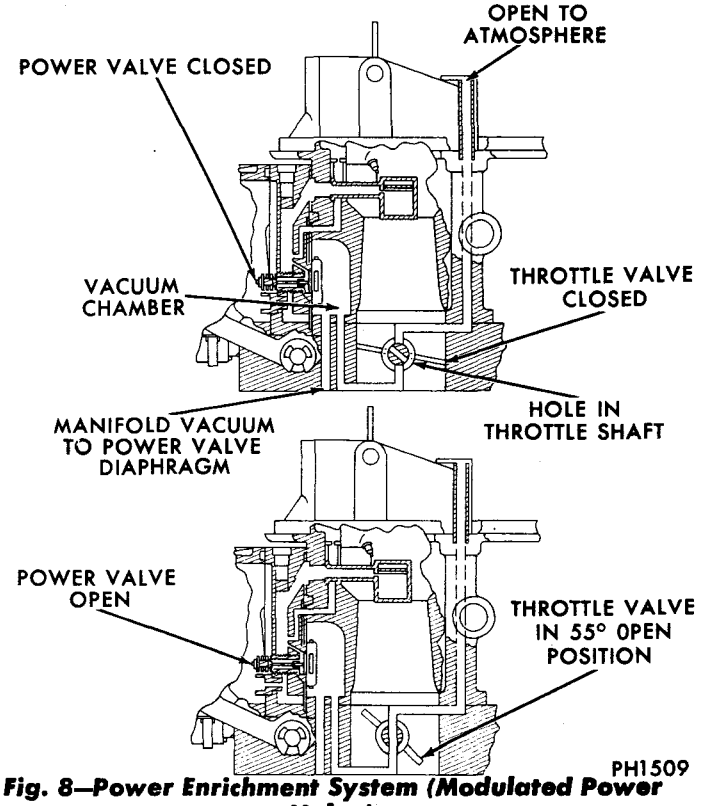


Fig. 8—Power Enrichment System (Modulated Power Valve)

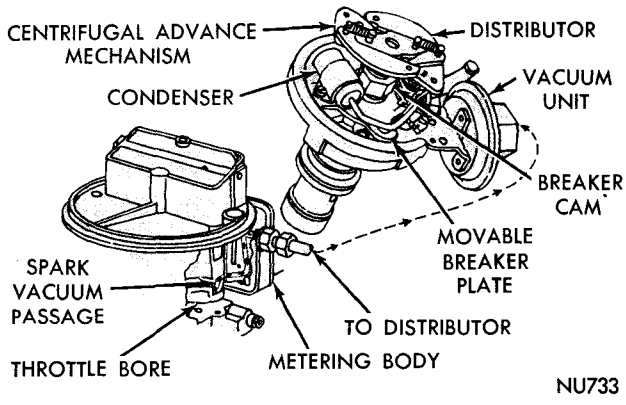


Fig. 9—Spark Advance

Governor speed adjustments are made at the distributor.

Below governing speeds, the operator, through a simple clutch arrangement on the throttle body of the carburetor, controls the throttle valves in the usual manner. When governing speed is reached, a combination of venturi and manifold vacuum acts on the governor diaphragm to close the throttle valves. Two calibrated by-pass jets in the vacuum passages meters the vacuum from the venturi and the manifold to provide the correct balance for proper operation of the governor. At speeds below governing rpm, this vacuum is weakened by air bleeding through the governor valve in the governor spinner so that no premature governing action will occur. Filtered air from the carburetor air cleaner enters the governor system through a passage in the main body and then into the governor vent tube. The air flows through an air line to housing section of distributor enclosing governor rotor. A combination of low pressure from the venturi and manifold transmitted through the governor system passages, draws the air past the governor valve and through another air line to the throttle actuating unit on the carburetor. In the controlling unit, centrifugal force acting on the rotor, which has kept pace with engine speed, overcomes the tension of the valve spring and tends to close the governor valve when

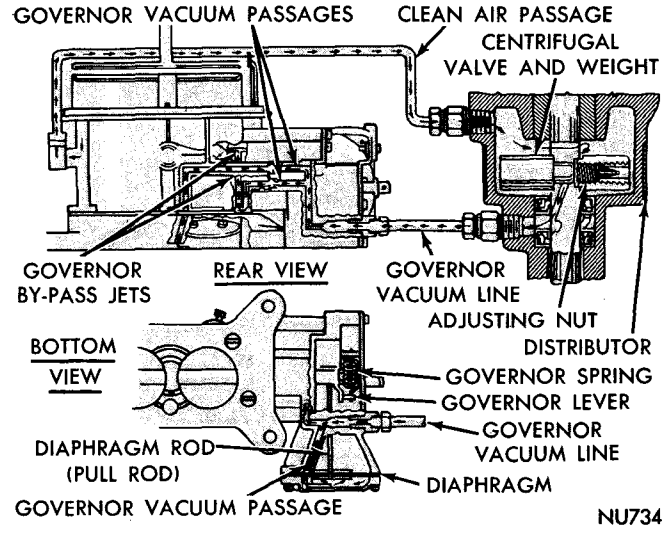


Fig. 10—Governor System

governing speed is reached. This greatly restricts the amount of air bleeding through to the diaphragm on the carburetor, thus allowing the combined venturi and manifold pressure differential to operate the diaphragm. As the pressure differential across the diaphragm increases, the diaphragm moves the governor lever against the tension of the governor spring to close the throttle valves. The governed engine speed is held for constant load by centrifugal force on the valve balanced against the tension of the valve spring. Any slight change in engine speed due to load restriction will cause the governor valve to react immediately, either increasing or decreasing the amount of air bleeding through the governor valve orifice. A change in the amount of air bleed will, in turn, cause an instant response from the diaphragm to increase or decrease the throttle valve opening. When the accelerator is released, control is taken from the governor by the external throttle lever and the return spring in the accelerator pedal linkage closes the throttle valves to bring the engine to any desired lower speed.

SERVICE PROCEDURES

SERVICING CARBURETOR

Dirt, dust, water and gummy deposits are some of the main causes for poor carburetor operation. However, proper cleaning and the installation of new parts, where required, will return the carburetor to its originally designed performance.

When overhauling the carburetor, several items of importance should be observed to assure a good job:

(1) All parts should be carefully cleaned in a suitable solvent, then inspected for damage and wear.

(2) Use air pressure **only** to clear the various orifices and channels.

(3) Replace questionable parts with **NEW** ones.

When checking parts removed from the carburetor, it is at times rather difficult to be sure they are satisfactory for further service. It is, therefore, recommended that in such cases, **NEW PARTS** be installed.

(4) Always use a complete repair kit when overhauling the carburetor. Using the code number stamped on the airhorn, adjacent to the fuel inlet, refer to the parts catalog and order the correct repair kit for the carburetor being worked on.

DISASSEMBLING CARBURETOR

To disassemble carburetor (Fig. 1), for cleaning or overhaul, proceed as follows:

(1) Place carburetor on repair stand C-3886 to prevent damage to the throttle valves and to provide a suitable base for working.

(2) Remove screws that attach fuel bowl and metering body to main body. Remove fuel bowl. (Fig. 2).

(3) Remove metering body and discard gasket. (Fig. 3).

(4) Remove governor seal wire, then remove gov-

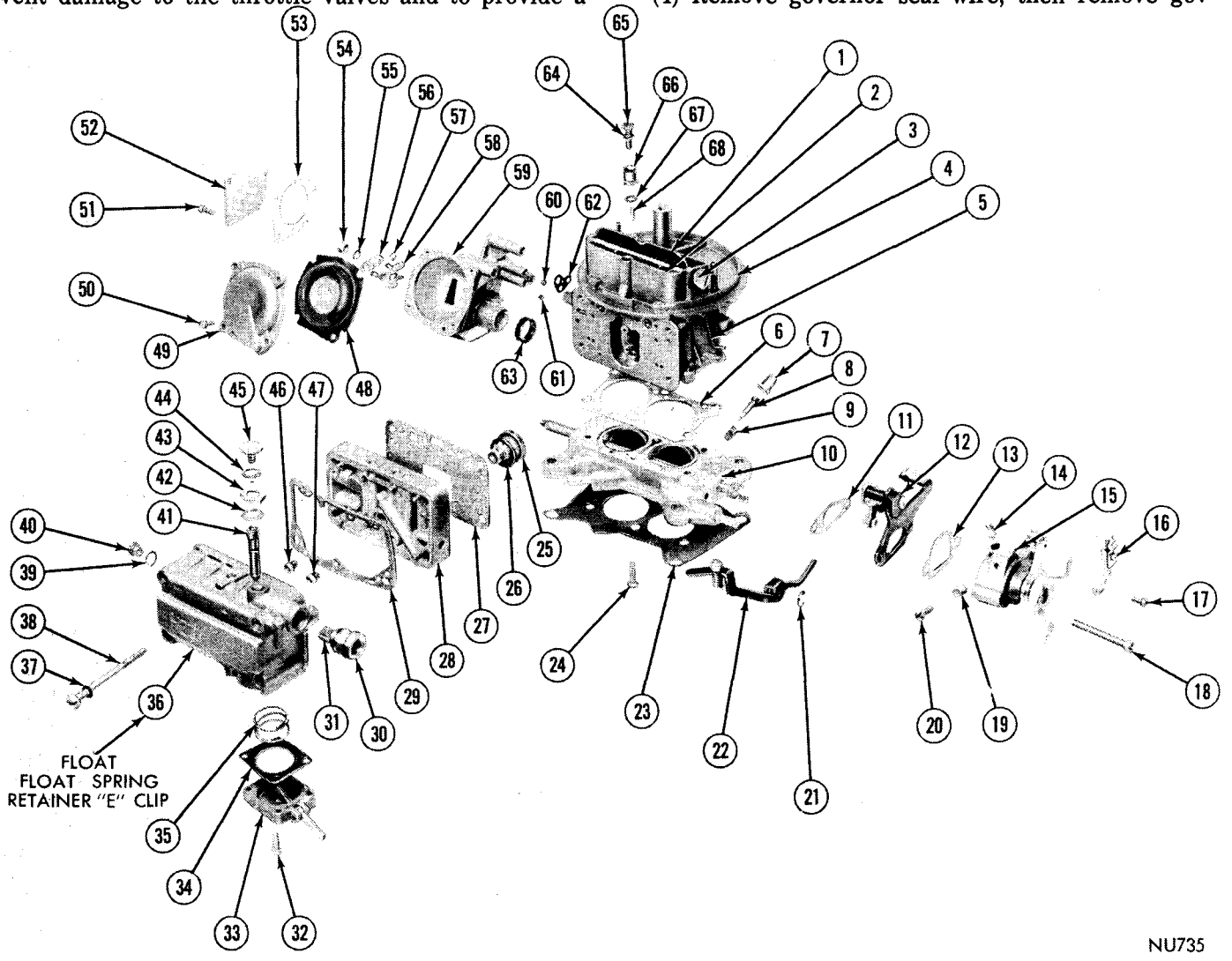


Fig. 1—Carburetor Assembly (Disassembled View)

LEGEND FOR FIGURE 1

1. Choke Valve
2. Choke Valve Screw (2)
3. Choke Rod Spring
4. Main Body
5. Choke Rod
6. Main Body Gasket
7. Idle Limiter Cap (2)
8. Idle Mixture Adjusting Screw (2)
9. Adjusting Screw Spring (2)
10. Throttle Body
11. Gasket Backing Plate
12. Backing Plate.
13. Gasket Control Housing
14. Fast Idle Adjusting Screw
15. Throttle Operating Housing
16. Throttle Cable Clamp and Bracket.
17. Bracket Attaching Screws (2)
18. Operating Housing Attaching Screw (2)
19. Curb Idle Adjusting Screw Spring
20. Curb Idle Adjusting Screw
21. "E" Clip Retainer Pump Lever
22. Pump Operating Lever
23. Carburetor Mounting Gasket
24. Throttle to Main Body Screw (6)
25. Power Valve
26. Power Valve Gasket
27. Metering Body/Main Body Gasket
28. Metering Body
29. Metering Body/Fuel Bowl Gasket
30. Fuel Inlet Fitting and Gasket
31. Fuel Inlet Screen
32. Cover Attaching Screw (4)
33. Accelerating Pump Cover
34. Accelerating Pump Diaphragm
35. Diaphragm Spring
36. Fuel Bowl: Float, Spring, Baffle, and Retainer (Not Shown)
37. Fuel Bowl Mounting Screw Seal (4)
38. Fuel Bowl Mounting Screw (4)
39. Sight Plug Gasket
40. Sight Plug
41. Inlet Needle Valve and Seal
42. Valve Seat Gasket
43. Valve Adjusting Nut
44. Adjusting Screw Gasket
45. Adjusting Screw
46. Metering Valve #63
47. Metering Valve #63
48. Governor Diaphragm
49. Diaphragm Cover
50. Cover Attaching Screws (4)
51. Governor Cover Attaching Screw (4)
52. Governor Cover
53. Governor Cover Gasket
54. Governor Lever Attaching Nut
55. Attaching Nut Lockwasher
56. Governor Spring
57. "E" Retainer Clip, Diaphragm Pull Rod
58. Governor Lever
59. Governor Housing
60. Governor By-Pass Jet #43
61. Governor By-Pass Jet #26
62. Governor Housing Gasket
63. Governor Housing Seal
64. Discharge Cluster Screw Gasket
65. Discharge Cluster Attaching Screw
66. Discharge Cluster
67. Cluster Gasket
68. Discharge Check Needle

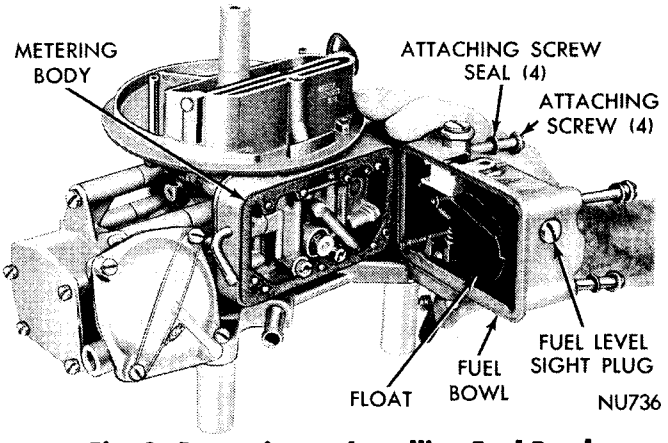


Fig. 2—Removing or Installing Fuel Bowl

ernor cover plate screws. Remove cover plate and gasket to expose governor mounting screw and governor lever nut (Fig. 4).

(5) Remove governor spring, then remove governor lever nut and washer. Slide governor lever off flats of throttle shaft. (Fig. 4). **DO NOT REMOVE SPRING POST**.

(6) Remove screws that attach governor body to main body, then slide governor body out and away from main body (Fig. 5). Discard gasket and governor body to throttle body seal.

Positive Throttle Return

(1) Straighten lock tab on throttle shaft nut (Fig. 6).

(2) Remove throttle shaft nut and slide lock washer, spring bushing (lining up the spring concentric with the shaft will aid in removing the spring bushing) and throttle shaft spacer off the throttle shaft.

(3) Coil spring counterclockwise and disengage hook from long spring anchor. (Noting the short straight section of coil spring).

(4) Remove notched retaining lever.

(5) Remove trip lever.

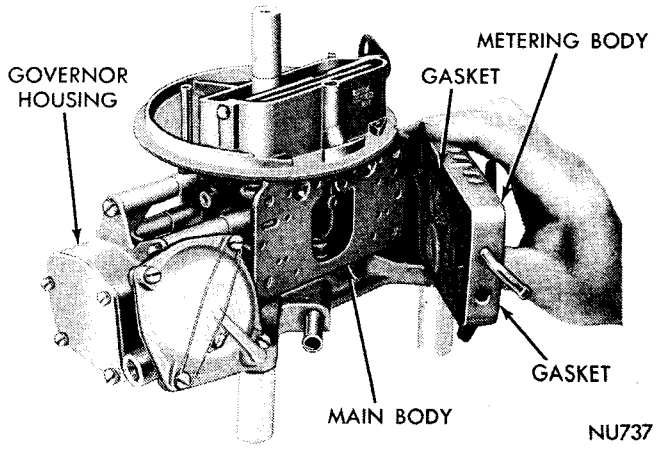


Fig. 3—Removing or Installing Metering Body

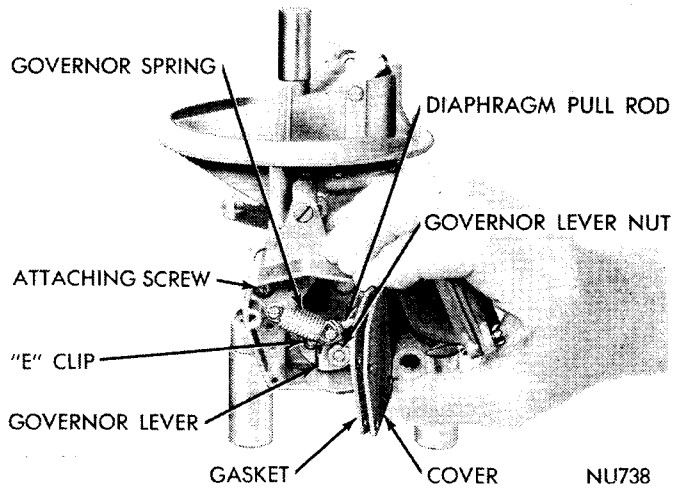


Fig. 4—Removing or Installing Governor Housing Cover

(6) Remove screws that attach throttle operating housing to throttle body. Disengage throttle shaft clutch from throttle lever dog. (Fig. 7). Slide throttle operating housing and lever out and away from throttle body. Discard gasket. Slide fast idle adjusting screw up and out of operating housing.

(7) Remove "E" clip and remove accelerating pump operating lever from pivot.

(8) Remove throttle back up plate and gasket from throttle body and at the same time, disengage choke rod from choke lever. (Fig. 8). Discard gasket.

(9) Invert carburetor, then remove screws that attach throttle body to main body. Separate bodies and discard gasket. (Fig. 1).

Throttle Body

In normal routine cleaning and overhaul of the carburetor, do not remove throttle valves unless they are nicked or damaged. If necessary to remove, proceed as follows:

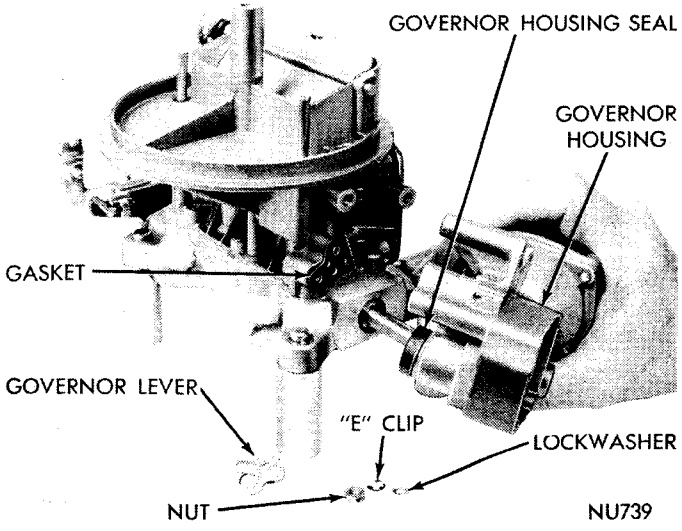


Fig. 5—Removing or Installing Governor

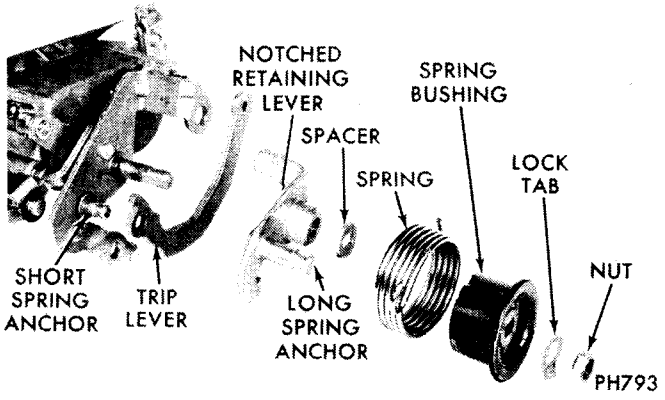


Fig. 6—Disassembling Positive Throttle Return Assembly

(1) Remove screws that hold throttle valves to throttle shaft. **(These screws are staked to prevent loosening and care is necessary to avoid breaking off in shaft. Remove staking with a file).**

(2) Slide damaged throttle valve/or valves out of bore. Notice the location of the throttle valve number in relation to throttle bore.

(3) Using a suitable tool, pry the plastic limiter caps off the two idle air mixture screws. (Be sure and count the number of turns to seat the screws, as the same number of turns from the seat must be maintained at installation). Remove screws and springs from throttle body. Discard plastic caps. (Fig. 9).

Main Body

(1) Remove pump discharge nozzle retaining screw, then lift out discharge nozzle. Remove gasket from nozzle (top and bottom) and discard. (Fig. 10).

(2) Invert main body and drop out pump discharge check needle from discharge passage. (Fig. 10).

The carburetor now has been disassembled into

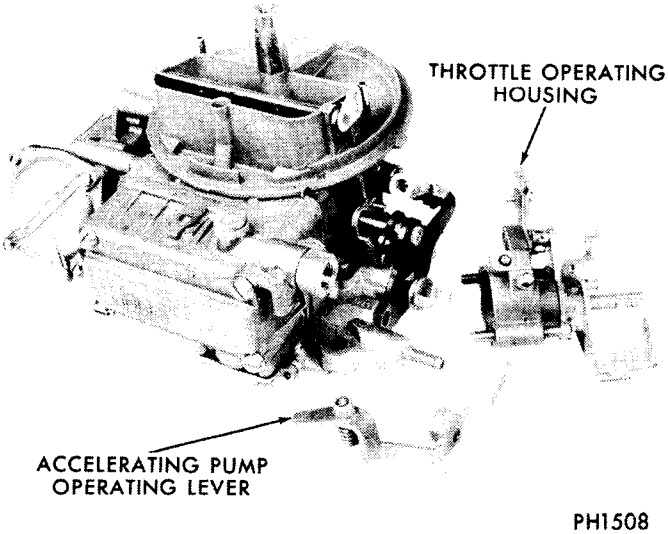


Fig. 7—Removing or Installing Throttle Operating Housing

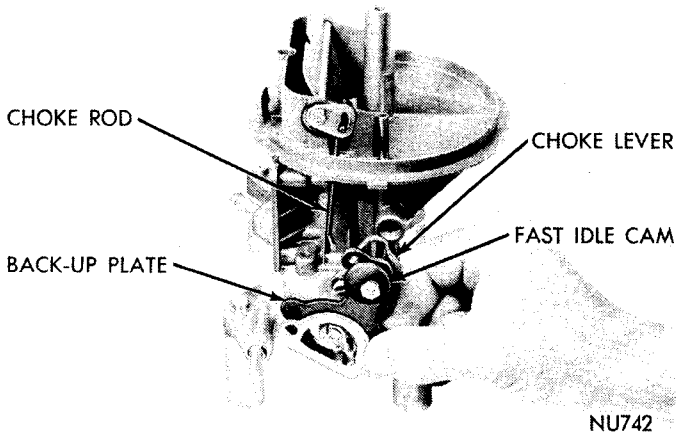


Fig. 8—Removing or Installing Back-Up Plate and Fast Idle Cam

five sub-assemblies: main body, throttle operating housing, fuel bowl, metering body, governor and throttle body.

Each one of the sub-assemblies except the main body and throttle body should be disassembled, cleaned, inspected and reassembled, using new parts as required. The main body and throttle body have been disassembled as far as necessary for cleaning and inspection.

To clean and inspect the remaining sub-assemblies, proceed as follows:

Fuel Bowl

(1) Remove float retainer "E" clip, then slide float and spring out of float chamber (Fig. 11).

(2) Remove fuel inlet baffle from bowl.

(3) Remove fuel inlet valve adjusting nut and lock-screw. Discard gaskets.

(4) Remove fuel inlet fitting screen. Discard gasket.

(5) Remove fuel inlet valve and seat. Discard "O" ring.

(6) Remove screws attaching accelerator pump cover. Remove cover, then carefully remove diaphragm and spring. (Fig. 12).

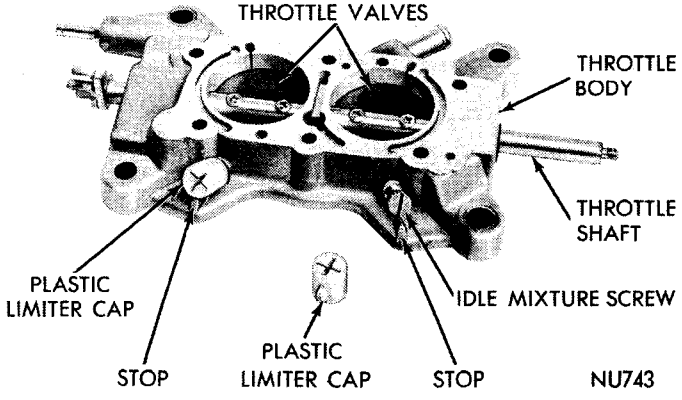


Fig. 9—Idle Mixture Adjusting Screws and Limiter Caps

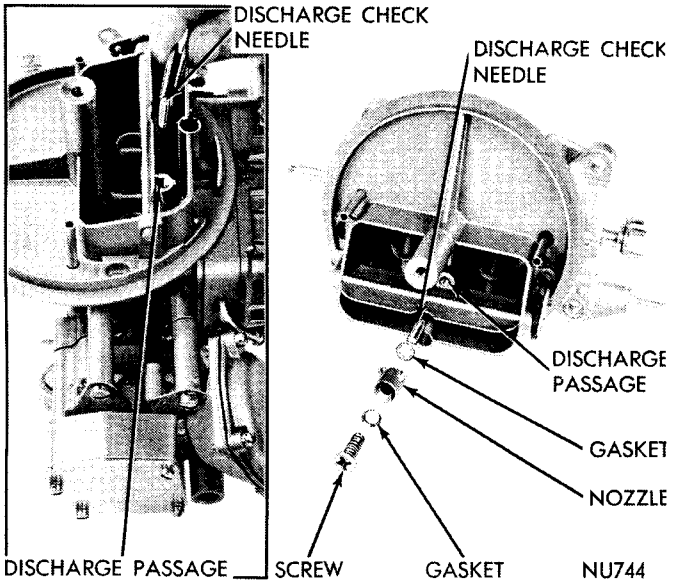


Fig. 10—Removing or Installing Discharge Check Needle

(7) Remove fuel level sight plug and gasket. Discard gasket.

Main Metering Body

(1) Using Tool C-3747, remove power valve assembly from metering body. (Fig. 13).

(2) Using Tool C-3748, remove main metering jets. (Fig. 14).

Throttle Operating Housing

(1) Remove fast idle pin and adjusting screw. (Fig. 6).

(2) Remove curb idle screw and spring from housing.

Governor Housing

(1) Remove governor lever to diaphragm rod "E" clip (Fig. 15), then remove governor lever.

(2) Remove screws that attach governor cover to housing. Lift out diaphragm and pull rod.

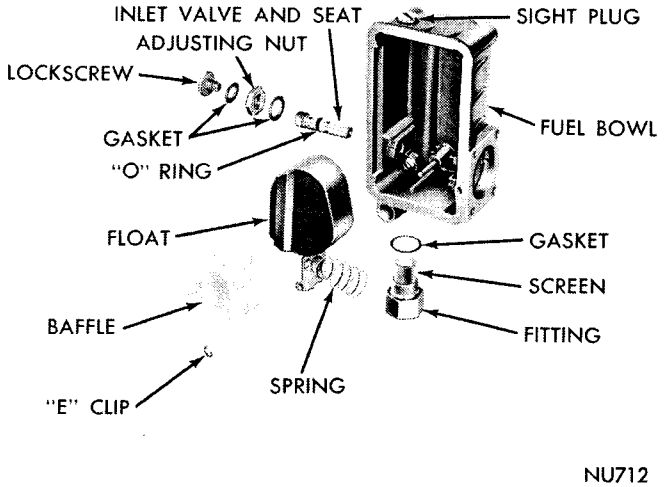


Fig. 11—Fuel Bowl (Disassembled View)

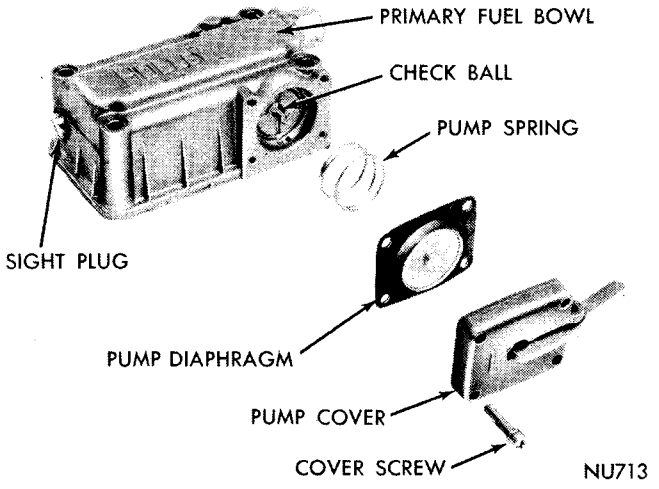


Fig. 12—Accelerating Pump (Disassembled View)

(3) Using a small screwdriver, remove governor bypass jets from rear side of governor housing. (Fig. 16). (No. 26 large and No. 43 small).

CLEANING CARBURETOR PARTS

Refer to General Information Section at front of Fuel System, for cleaning instructions.

INSPECTION AND REASSEMBLY

Check for cracks, warpage, stripped screw threads, or damaged or marred mating surfaces, on all major castings. The passages in the castings should be free of restrictions. Install new castings as required. Check the float assembly for damage or any condition that would impair this item from further service. The choke and throttle valves should be replaced if the edges have been nicked or if the protective plating has been removed. Be sure that the choke and throttle shafts are not bent or scored. Replace any choke or throttle linkage that is bent or worn. Replace any broken or distorted springs. Replace all screws and lockwashers that show signs of stripped threads or distortion.

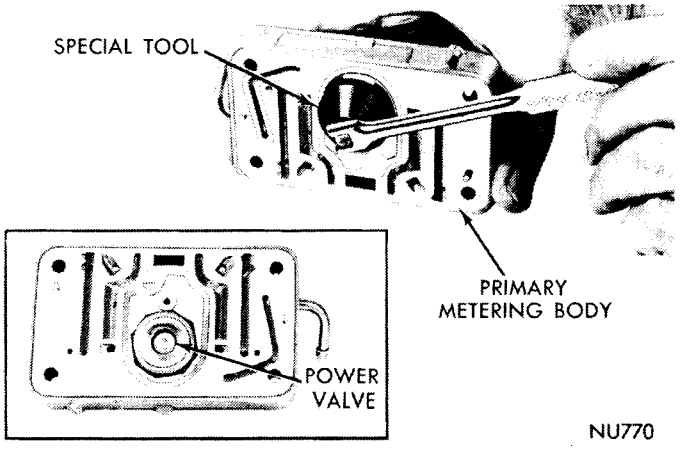


Fig. 13—Removing or Installing Power Valve

Throttle Body

If the throttle valves were removed because of damage, install new valves as follows:

(1) Slide new valves into position on throttle shaft, with the valve number on the top side and toward the idle mixture screw control ports.

(2) Install new screws but do not tighten.

(3) Hold valves in place with fingers. (Fingers pressing on high side of valves).

(4) Tap valves lightly with screw driver to center in bores. Now, tighten valve attaching screws securely. Operate the throttle shaft. From closed to open position, they must operate smoothly without drag or sticking. Hold throttle body up to a strong light. The light which is visible around outer diameter of valves in bores should be uniform.

(5) Install idle mixture screws and springs in body. (The tapered portion must be straight and smooth. If the tapered portion is grooved or ridged, a new idle mixture screw should be installed to insure having correct idle mixture control). **DO NOT USE A SCREWDRIVER.** Turn screws lightly against their seats with fingers. Back off number of turns counted at disassembly. Install new plastic caps with tab against the maximum rich stop.

(6) Slide accelerator pump lever over stud and secure with "E" clip. (Fig. 7).

Throttle Operating Housing

(1) Install curb idle screw and spring in housing. (DO NOT TIGHTEN).

(2) Install fast idle adjusting stud in housing (Flat portion toward inside).

(3) Slide throttle operating housing attaching screws into housing. Slide new housing gasket over screws, followed by throttle back up plate, (fast idle cam toward outside). Install back up plate gasket over screws and down against plate. (Fig. 8).

(4) Install completed assembly over throttle shaft clutch. (Be careful not to damage gaskets).

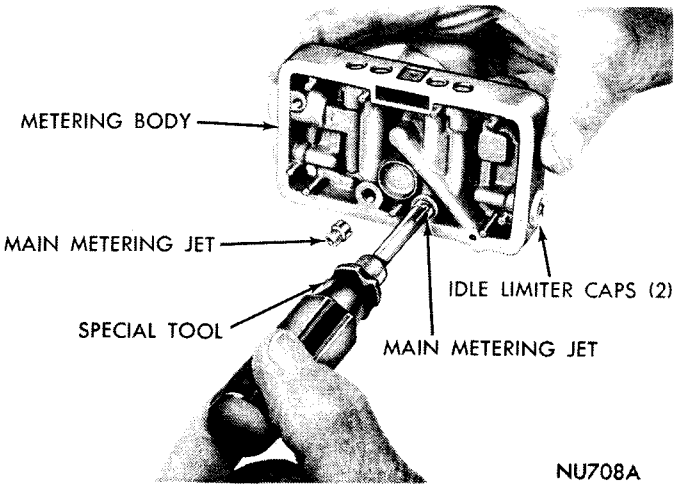


Fig. 14—Removing or Installing Main Metering Jets

(5) With throttle valves and throttle lever in closed position, slide assembly on to throttle shaft and engage throttle clutch with dog in housing. Thread screws into throttle body, being sure gaskets are aligned. Tighten screws securely. The throttle valves should open freely without throttle lever movement, and close with throttle lever movement.

(6) Move choke lever to closed position against stop. The fast idle cam should ride on fast idle stud.

(7) Install main body to throttle body using new gasket. Install screws. As main body is installed on throttle body, engage choke rod with choke lever. (Be sure all gasket holes are aligned with holes in bodies.) Tighten screws to 50 inch pounds.

Positive Throttle Return

(1) Assemble trip lever over short spring anchor. (Fig. 6).

(2) Place notched retaining lever on throttle shaft.

(3) Install throttle shaft spacer on throttle shaft.

(4) Install the curved end of the spring on the short spring anchor.

(5) Install the short straight end of the spring on the long spring anchor.

(6) Holding the spring concentric with the throttle shaft, install the spring bushing.

(7) Install the throttle shaft nut, tighten securely, and bend tab on lock washer to retain nut.

Governor Housing

(1) Install governor by-pass jets in orifices in body and tighten securely. (Fig. 16).

(2) Install governor diaphragm and pull rod in housing with vacuum hole in lip of diaphragm aligned with vacuum hole in housing. (Fig. 15).

(3) Place diaphragm cover over housing with vacuum holes aligned. Install screws and tighten securely.

(4) Install governor seal on rear of housing, governor vacuum gasket over lip of tube on main body. Slide governor assembly over throttle shaft and down against main body. Install screw with lockwasher inside governor housing and remaining screws on ex-

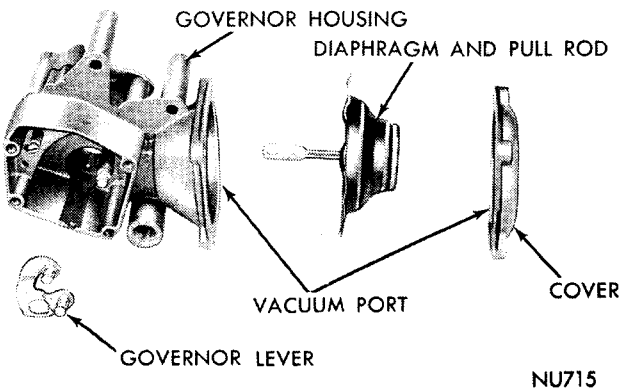


Fig. 15—Governor Assembly (Disassembled View)

terior. Tighten screws alternately from 28 to 30 inch pounds. (Fig. 4).

(5) Place governor lever in housing and engage small lever stud with diaphragm pull rod. Install "E" clip to secure. (Fig. 4).

(6) Install governor lever to throttle shaft and align flats. Install attaching lockwasher and nut. Tighten securely. Install governor spring over anchor stud and colored end in slot of lever stud. (Fig. 4).

(7) Install new gasket against governor housing, then install cover. Install attaching screws and tighten securely. Install lock wire and seal. (Fig. 4).

Main Metering Body

(1) Install main metering jets, using Tool C-3748. Tighten securely. (Fig. 14).

(2) Slide a new gasket over power valve and install in body, using Tool C-3747. Tighten to 120 inch pounds. (Fig. 13).

(3) Install new gaskets over alignment studs on metering body and press firmly into position. Place assembly to one side for later installation.

Fuel Bowl

(1) Install accelerator pump spring in position in fuel bowl, followed by diaphragm and pump cover. (When installing diaphragm, be sure contact button rivet head is toward pump lever in cover.) (Fig. 12).

(2) Place cover over diaphragm (with lever on fuel inlet fitting side) (Fig. 12). Install attaching screws and tighten securely.

(3) Install a new "O" ring on fuel inlet needle seat, (Fig. 11), after coating "O" ring with petroleum jelly. Install needle seat in fuel bowl.

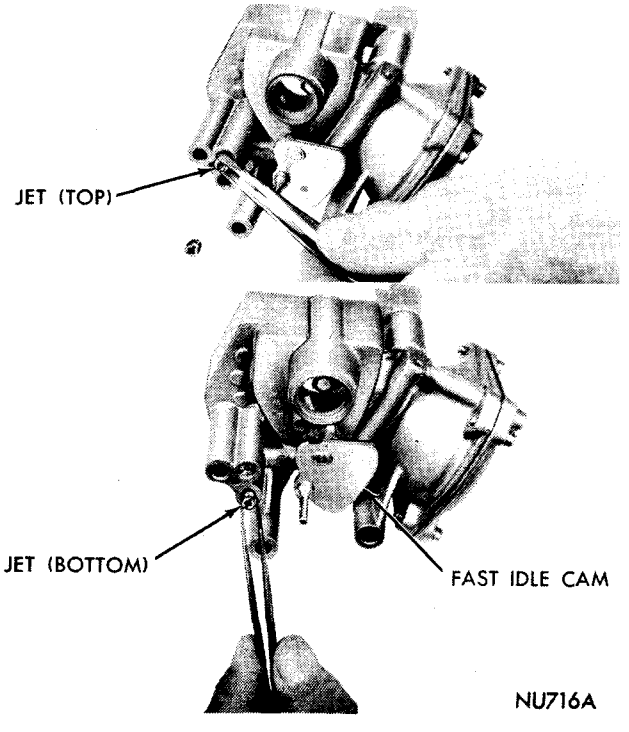


Fig. 16—Removing or Installing Governor By-Pass Jets

(4) Using a new gasket, install adjusting nut on threaded end of needle seat. Place a new gasket over lock bolt and install in needle seat and over adjusting nut. (Fig. 11).

(5) Slide fuel inlet baffle into bowl and over needle seat assembly. (Fig. 11).

(6) Slide float spring over locator on float lever then slide float and spring into fuel bowl and down into position over float pivot stud. Install "E" clip to secure.

The final float level adjustment is made with carburetor installed on vehicle, a bench adjustment should be made before installing fuel bowl. Refer to carburetor adjustments for adjusting procedures.

(7) Install filter screen in inlet fitting, then install fitting and screen in fuel bowl using a new fitting gasket. Tighten securely.

(8) Using a new gasket, install fuel level sight plug and tighten securely.

(9) Slide new gaskets over fuel bowl mounting bolts, install bolts through fuel bowl, then invert bowl and slide metering body down on bolts. (Be sure gaskets are aligned). Install fuel bowl and metering body on main body and tighten attaching bolts to 50 inch pounds, then retighten. (Be sure pump lever is under adjusting nut of pump arm). (Figs. 2 and 3).

(10) Install accelerating pump discharge check needle in discharge passage in center of venturi. (Fig. 10).

To test accelerator pump discharge check needle for sealing, pour clean gasoline into fuel bowl through sight plug hole. Push down on accelerator pump arm to expel air from pump passages. Using a small clean brass rod, hold discharge check needle firmly on its seat. Again press down on pump arm. No fuel should be emitted from the discharge passage. Fuel leakage at discharge needle indicates the presence of dirt or a damaged check needle. Clean again and install a new needle. Retest for leakage.

If fuel continues to leak past discharge check needle, attempt to reseat as follows:

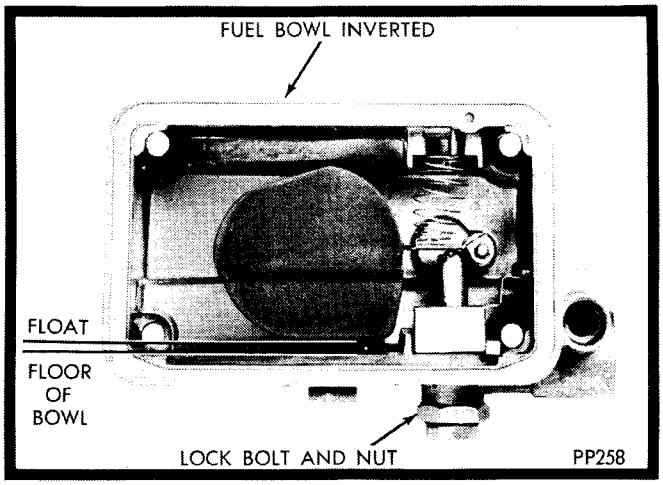
With discharge check needle installed, insert a piece of drill rod down on needle lightly tap drill rod with a hammer to form a new seat. Remove and discard old needle and install a new one. Retest as described previously. If service fix does not correct condition, a new carburetor will have to be installed.

(11) Install pump discharge nozzle gasket, nozzle and mounting screw and gasket. (The mounting screw gasket will form a conical shape when installed.) Tighten screw securely. (Be sure mating surfaces of nozzle index with boss in venturi). Test nozzle operation. Press pump lever down. The two streams from the nozzles should be identical and should strike the two venturi in the same spot.

HOLLEY 2300G CARBURETOR ADJUSTMENTS

1. FLOAT SETTING ADJUSTMENT (BENCH ADJUSTMENT)

refer to procedure below	R-7137A R-6769-1A

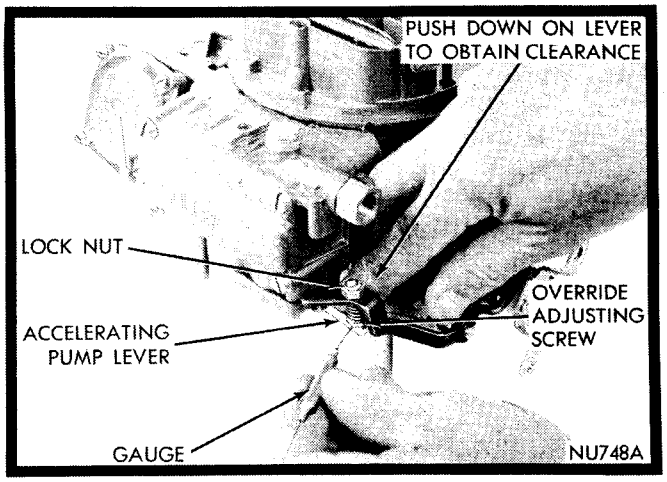


The final float level adjustment is made with carburetor installed on vehicle, a bench adjustment should be made before installing fuel bowl.

(1) With fuel bowl inverted, turn adjusting nut either **in** or **out** until float is parallel to floor of fuel bowl. Tighten lock bolt.

2. ACCELERATOR PUMP STROKE MEASUREMENT (AT IDLE)

.015"	R-7137A R-6769-1A



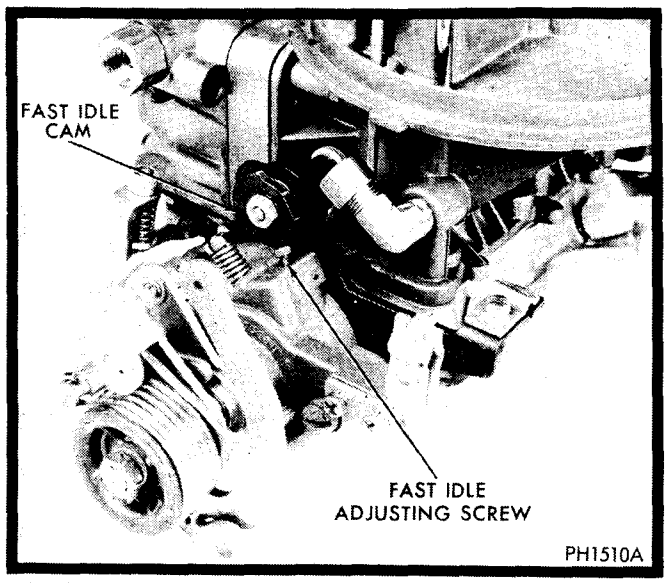
(1) With throttle valves wide open, and the pump lever held down, it should be possible to insert a .015 inch (minimum) gauge between adjusting nut and lever.

(2) If an adjustment is necessary, adjust pump override screw until correct clearance has been obtained.

(3) There must be no free movement of pump leverage when throttle is at curb idle.

3. FAST IDLE ADJUSTMENT

.035"	R-7137A R-6769-1A



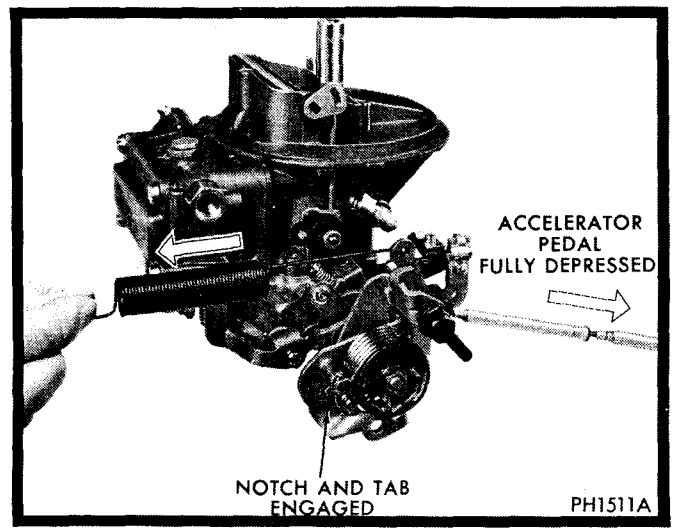
(1) Set curb idle speed (refer to Emission Control Information Label for specifications and procedure).

(2) Place manual control of choke in wide open position.

(3) Adjust clearance between fast idle cam and screw by turning fast idle speed screw.

4. LOADING POSITIVE THROTTLE RETURN SPRING

refer to procedure below	R-7137A R-6769-1A



CAUTION: Whenever the throttle return spring is disconnected at either end, the throttle lever at the carburetor will snap to the closed throttle position under a spring force sufficient to cause possible personal injury.

It is important, in order to prevent personal injury, that all throttle spring loading instructions be performed in the following order and that hands be kept clear of the carburetor throttle linkage, especially when connecting or disconnecting the throttle return spring.

(1) Depress the accelerator pedal (engine not running) to the wide open position and hold in this position.

(2) Connect throttle return spring between the trip lever and anchor bracket.

(3) Observe that the tab is engaged in the notch (keep hands clear) then release the accelerator pedal slowly.

5. IDLE SETTING PROCEDURES

refer to procedure below	R-7137A R-6769-1A

(1) Make all adjustments with engine fully warmed up.

(2) Place transmission in neutral and set parking brake.

(3) Headlights off and air conditioning compressor not operating.

(4) Remove hose at distributor and plug hose.

(5) Check timing (refer to Emission Control Label in engine compartment).

(6) Adjust mixture setting (refer to Emission Control Label in engine compartment).

NOTE: On a new vehicle (under 300 miles) idle speed setting should be reduced 75 RPM for both propane enriched speed and curb idle speed.

FLOAT ADJUSTMENT (ON VEHICLE)

Turn adjusting nut until fuel just dribbles out of sight hole.

R-7137A
R-6769-1A

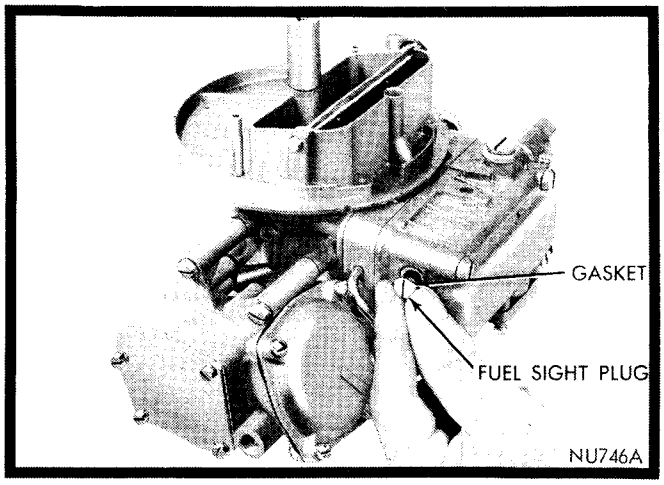


Fig. 1—Removing or Installing Sight Plug and Gasket

(1) Remove air cleaner assembly and air cleaner gasket.

(2) To check the fuel level in the bowl, start the engine then remove the sight plug from the fuel bowl. (Fig. 1).

CAUTION: It is suggested that suitable precaution be taken by placing a shop towel or a container under the bowl to catch any fuel that might be spilled due to a high improper previous setting.

(3) Using a wrench and screwdriver, turn the adjusting nut either up or down until the fuel just dribbles out of the sight hole, (Fig. 2). (Vehicle must be on level floor.)

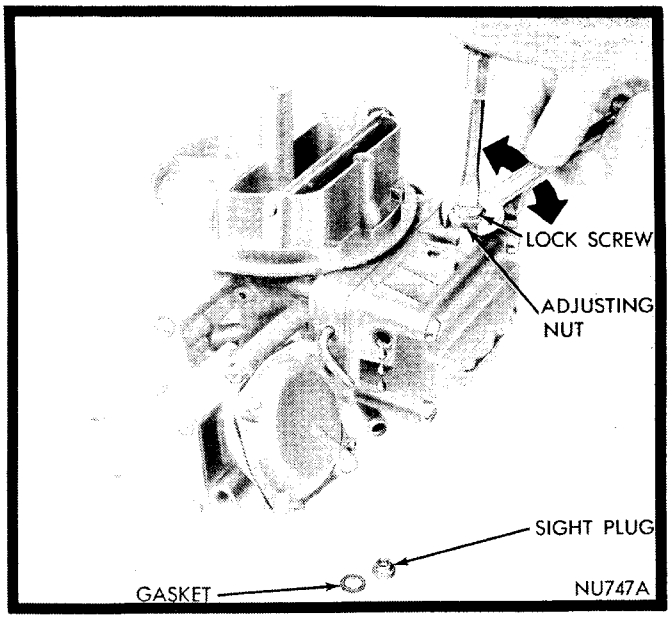


Fig. 2—Adjusting Fuel Level in Bowl

(4) After correct level has been obtained, tighten the lock screw while holding adjusting nut with wrench.

(5) Reinstall sight plug and tighten securely. (Fig. 1).

(6) Install air cleaner gasket and air cleaner.

(7) Check idle speed with tachometer. If adjustment is necessary refer to Emission Control Information Label in engine compartment for proper procedure and specifications.

HOLLEY 4150G SERIES CARBURETOR

INDEX

	Page
Carburetor Adjustments	95
Fast Idle	96
Float Level (On Bench)	95
Idle Speed (Curb Idle)	97
Checking Accelerator Pump Lever Clearance	95
Checking Fuel Level in Bowls (On Vehicle)	98
Cleaning and Inspection	88
Disassembling Carburetor	84
Fuel Bowls (Primary and Secondary)	85
Secondary Control Diaphragm Housing	87
Throttle Body	85
Throttle Operating Housing	85
General Information	78
Installing Fuel Bowls and Metering Bodies	93
In Vehicle Adjustments and Repairs	84
Positive Throttle Return Assembly	93
Reassembling Carburetor	88
Fuel Bowls (Primary and Secondary)	92
Governor Housing	91
Metering Bodies (Primary and Secondary)	92
Secondary Control Diaphragm Housing	91
Throttle Body	89
Throttle Operating Housing	91
Specifications	128

CARBURETOR APPLICATION

Requirement	Transmission	Engine	BBLS	Carburetor	Model
Fed./Can.	Man./Auto.	413 Cu. In.	Four	Holley	R-7138A
		413.3 Cu. In.	Four	Holley	R-6771A

GENERAL INFORMATION

The 4-barrel carburetor (Figs. 1, 2 and 3) is a downdraft, two-stage carburetor. It can be considered as two dual carburetors; one supplying a fuel-air mixture throughout the entire range of engine operation (primary stage), and the other functioning only when a greater quantity of fuel-air mixture is required (secondary stage).

The primary stage (front section) of the carburetor

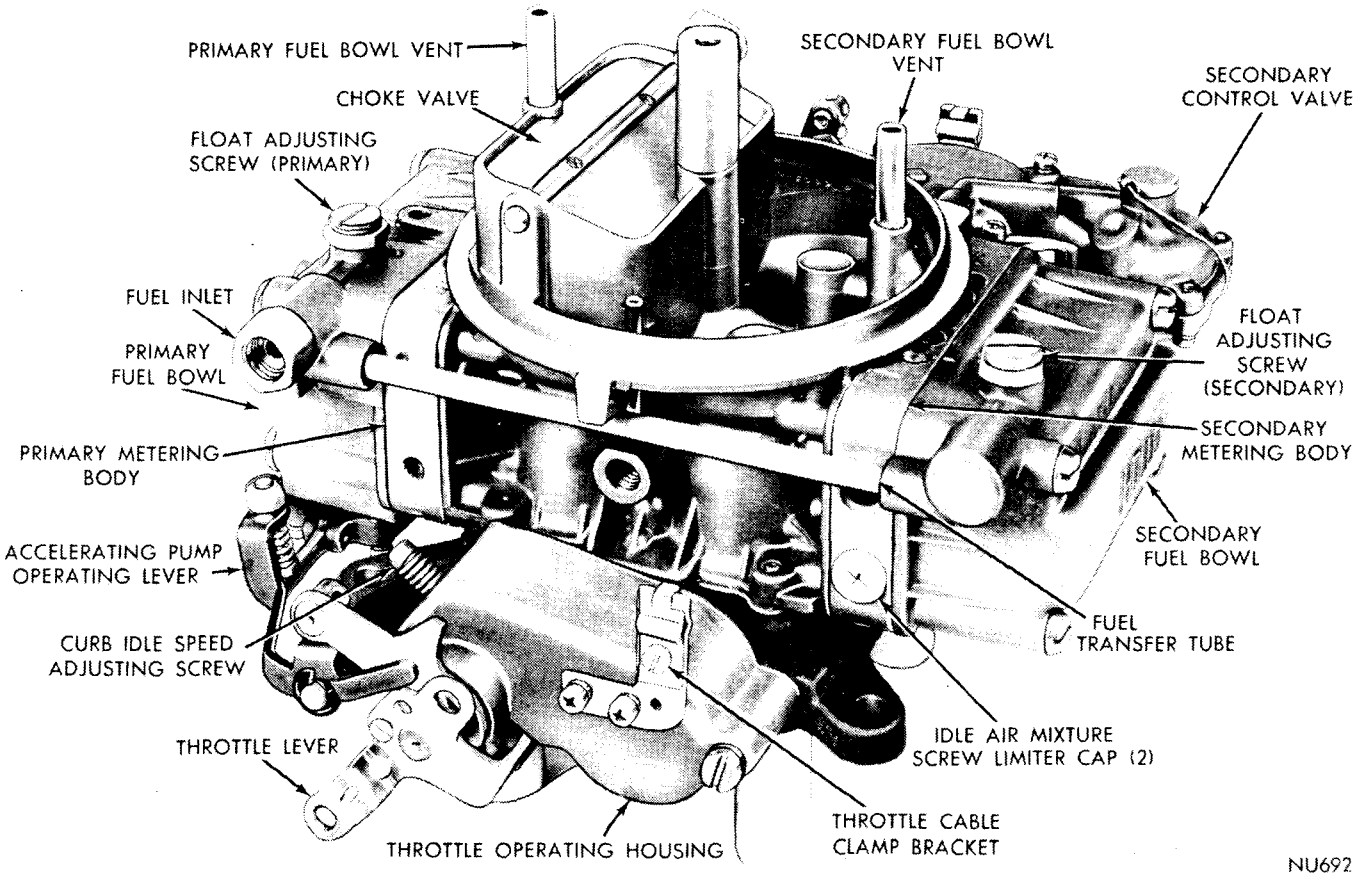


Fig. 1—Carburetor Assembly (Throttle Lever Side) 4150G Series

contains a fuel bowl, metering body and an accelerating pump assembly. The primary barrels each contain a primary and booster venturi, main fuel discharge nozzle, throttle valves, and idle fuel passage. The choke valve, mounted in the air horn above the primary barrels, is manually controlled.

The secondary stage (rear section) of the carburetor contains a fuel bowl, metering body and secondary throttle operating diaphragm assembly. The secondary barrels each contain a primary and booster venturi, idle fuel passages, main secondary fuel discharge nozzle, throttle valves and a transfer system fuel passage.

Operation

The carburetor has four primary stage fuel systems and three secondary stage fuel systems. In addition, there is a manual choke which provides a means of temporarily enriching the mixture to aid in starting and operating a cold engine.

The fuel inlet system for both the primary and secondary stages provides various fuel metering systems with a constant supply of fuel. The throttle actuating mechanism for the governor system is attached to the carburetor.

Fuel Inlet System (Fig. 4)

The fuel first enters the primary fuel bowl through a filter screen. A fuel transfer tube at the primary fuel inlet connects both fuel bowls.

The amount of fuel entering the fuel bowl is regulated by the distance the fuel inlet needle is lowered off its seat and by fuel pump pressure. Movement of the fuel inlet needle in relation to the seat is controlled by the float and lever assembly which rises and falls with the fuel level. When the fuel in the fuel bowl reaches a preset level, the float raises the fuel inlet needle to a position where it restricts the flow of fuel, admitting only enough fuel to replace that being used.

A spring located under the float assists in keeping the float stable.

The fuel bowls are internally vented by the vent tubes at all times.

Idle Fuel System (Fig. 5)

High manifold vacuum at idle creates a low pressure at the idle discharge port. The pressure in the fuel bowls is near atmospheric pressure. The difference in pressure between the fuel bowls and the idle discharge ports forces fuel through the primary and secondary idle fuel system.

Idle fuel is discharged into both the primary and secondary barrels. Idle fuel for the primary barrels is drawn from the primary fuel bowl and idle fuel for

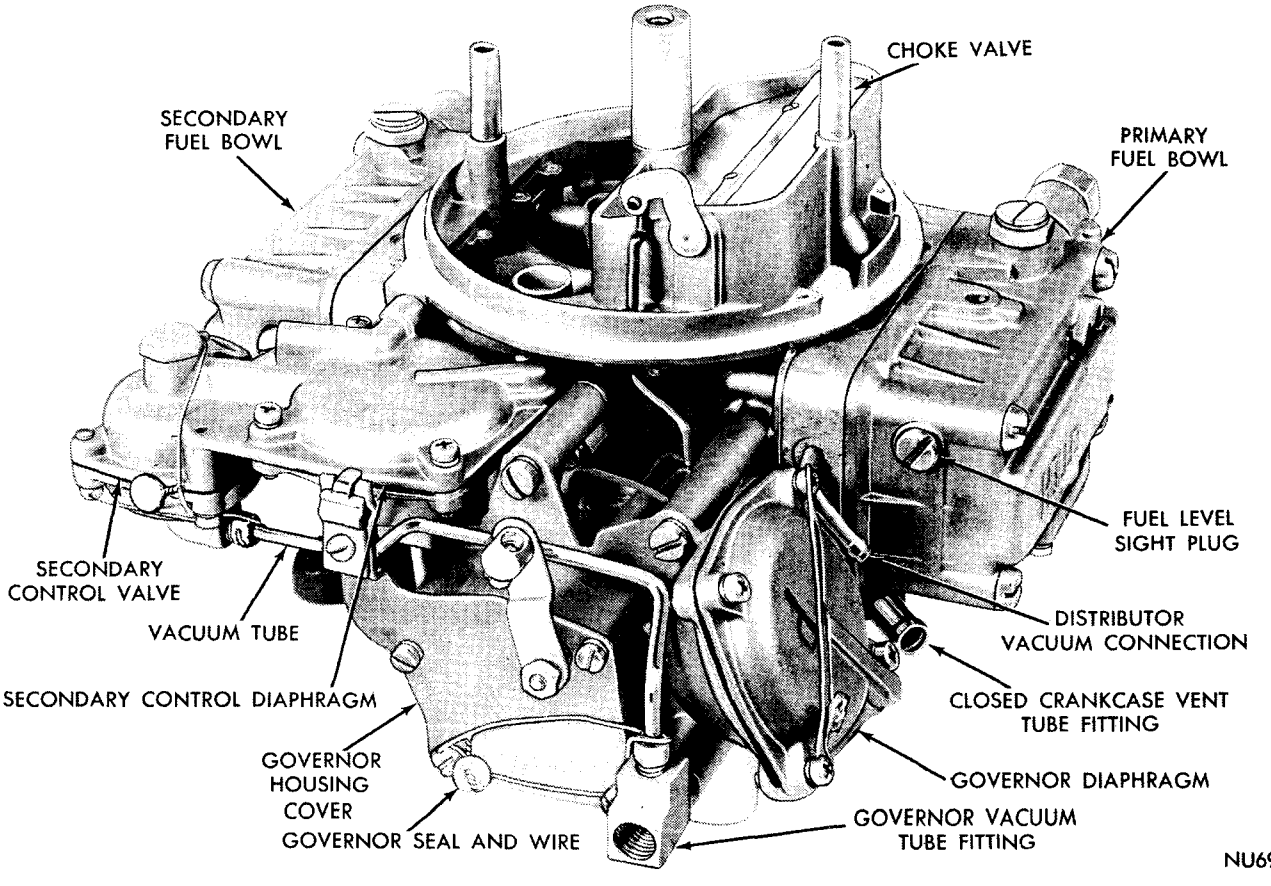


Fig. 2—Carburetor Assembly (Governor Side)

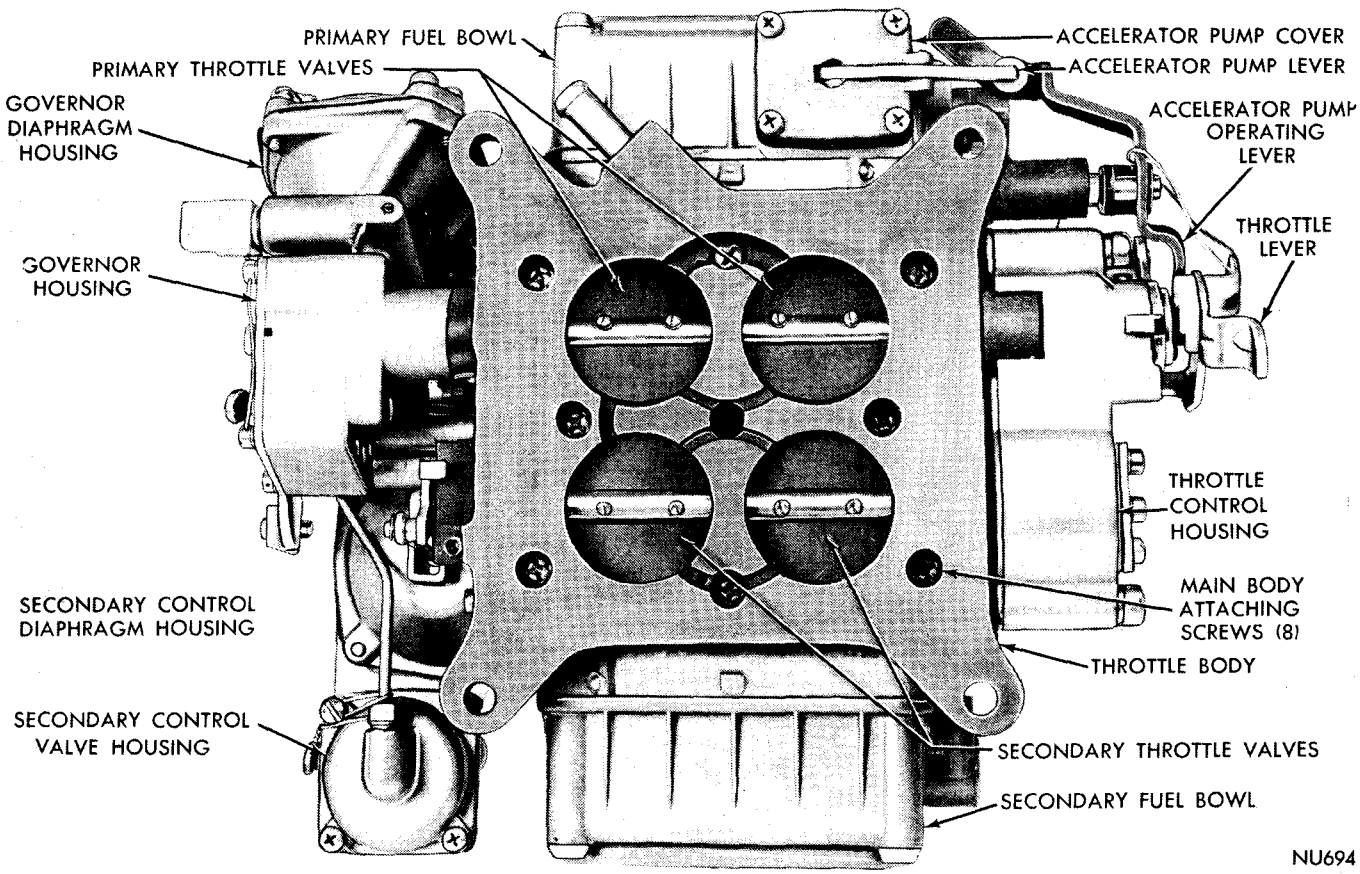


Fig. 3—Carburetor Assembly (Bottom View)

the secondary barrels is drawn from the secondary fuel bowl.

Fuel flows from the fuel bowl through the main jet and into a small angular passage that leads across to the idle well. The fuel flows up the idle well where it is mixed with air from the idle air bleeds. The air vaporizes the fuel. The fuel-air mixture flows through a short horizontal passage and then down another vertical passage.

Primary Stage—At the bottom of the vertical passage in the metering body, the fuel-air mixture flows through a short passage into the main body, and then into the throttle body. The fuel is discharged below the closed throttle valves.

During off-idle operation as the throttle valves are opened wider and more of the idle discharge slot is exposed to manifold vacuum, more fuel is discharged through the idle system.

The flow from the primary stage idle fuel system begins tapering off as the main fuel system begins discharging fuel.

The flow of fuel and air through the idle fuel system on the primary side of the carburetor is not adjustable.

Secondary Stage—At the bottom of the vertical passage in the metering body, the fuel-air mixture branches into two directions, one through the idle discharge passage and the other to the transfer passage.

The fuel in the idle discharge passage flows past the idle adjusting needle which controls the fuel discharge at idle. From the idle adjusting needle chamber, the fuel goes through a short passage into the main body. The fuel is discharged below the throttle valves.

As the primary throttle valves are opened and the primary main fuel system begins discharging fuel,

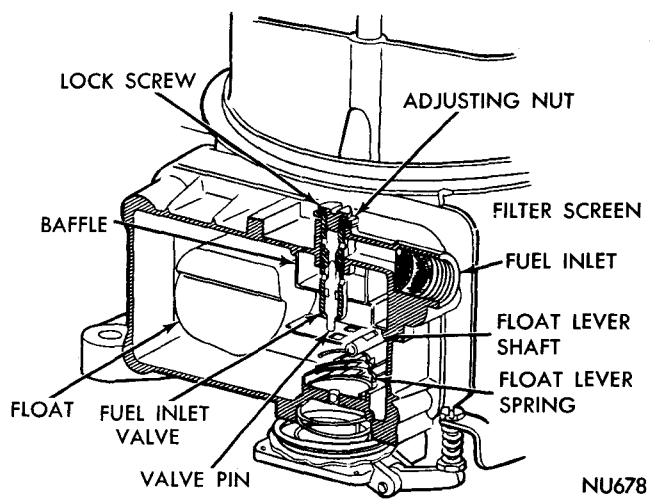


Fig. 4—Primary Fuel Inlet System

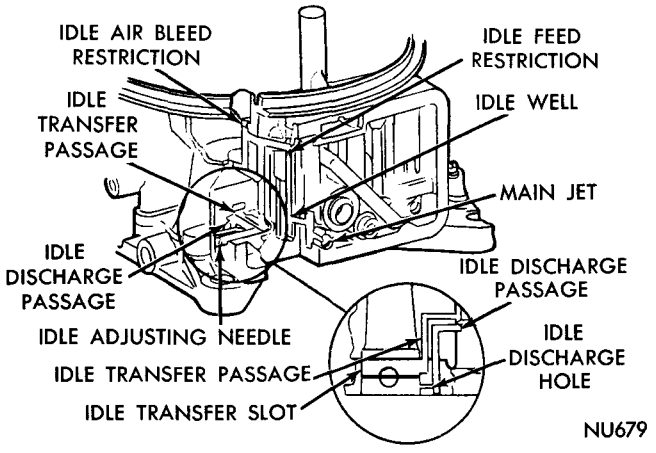


Fig. 5—Idle System

fuel flow from the primary idle fuel system begins tapering off. However, there is a continuous discharge of fuel from the secondary idle fuel system until the secondary main fuel system begins to discharge fuel.

Primary Stage Main Fuel System (Fig. 6)

As engine speed increases, the air passing through the booster venturi creates a vacuum. The amount of vacuum is determined by the air flow through the venturi, which in turn is regulated by the speed of the engine. The difference in air pressure between the primary booster venturi and the fuel bowl causes fuel to flow through the primary stage main fuel system.

The fuel moves up the main well past the main well air bleeds in the side of the well. Filtered air enters through the main air bleed in the main body and then into the metering body by interconnecting passages where the air vaporizes the fuel.

The mixture of fuel and air moves up the main well passage in the metering body and passes into the short horizontal passage leading to the main body, then through the horizontal channel of the discharge nozzle. The fuel is discharged into the booster venturi where it is further vaporized and mixed with air flowing through the carburetor.

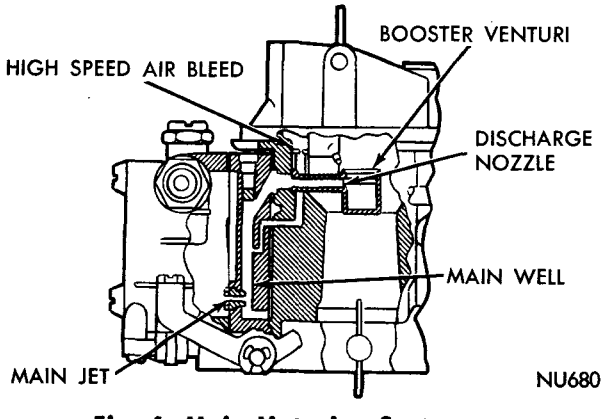


Fig. 6—Main Metering System

Accelerating System (Fig. 7)

Upon acceleration, the air flow through the carburetor responds almost immediately to the increased throttle opening. There, however, is a brief interval before the fuel, which is heavier than air, can gain speed and maintain the desired balance of fuel and air. During this interval, the accelerating pump supplies fuel until the other systems can once again provide the proper mixture.

The accelerating pump is located in the bottom of the primary fuel bowl. It begins to function when the operating lever is actuated by throttle movement.

When the throttle is opened, the accelerating pump linkage, actuated by a cam on the primary throttle shaft, forces the pump diaphragm up. As the diaphragm moves up, the inlet ball check is forced on its seat preventing fuel from flowing back into the fuel bowl.

The fuel flows from the short passage in the primary fuel bowl into the long diagonal passage in the primary metering body. The fuel passes into the main body and then into the pump discharge chamber. The pressure of the fuel raises the discharge needle and fuel is discharged into the venturi from the pump discharge nozzles.

As the throttle is moved toward the closed position, the linkage returns to its original position and the diaphragm spring forces the diaphragm down. As the diaphragm returns to its original position, the inlet ball check is moved off its seat and the chamber is filled with fuel from the fuel bowl.

Power Fuel System (Fig. 8)

During periods of increased road loads or high speed operation, a richer fuel mixture is needed for added power. The added fuel required during this period is supplied to the primary stage main fuel system by the power fuel system.

Manifold vacuum is transmitted from an opening in the base of the throttle body, through a passage in the throttle body and main body to the power valve chamber in the primary metering body. The manifold

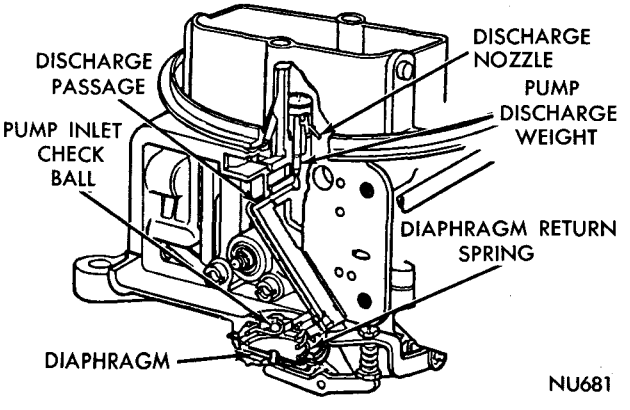


Fig. 7—Accelerating Pump System

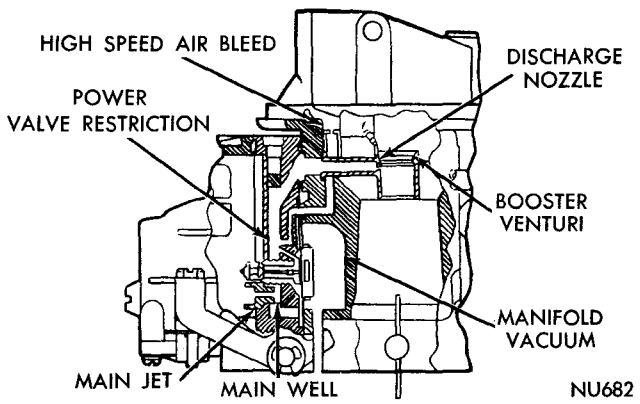


Fig. 8—Power Enrichment System

vacuum acting on the power valve at idle speed or normal road load conditions is great enough to overcome the tension of the power valve spring and holds the diaphragm closed. When high power operation places a greater load on the engine and manifold vacuum drops below a pre-determined value, the power valve spring overcomes the reduced vacuum and opens the power valve.

Fuel flows from the fuel bowl through the power valve and through the diagonal restrictions in the metering body into the main well. Here the fuel is added to the fuel from the primary stage main fuel system, enriching the mixture.

Secondary Stage Transfer System

The transfer system begins to function when the secondary throttle valves begin to open. The fuel flows through the idle transfer passages from the metering body into the main body passage through a restriction and then into the throttle body passage (see insert, Fig. 5). As the transfer slot is exposed to manifold vacuum, fuel is discharging into the throttle bore.

The fuel from the transfer system begins tapering off as the secondary main fuel system begins discharging fuel.

Secondary Stage Throttle Operation and Main Fuel System (Fig. 9)

The secondary stage throttle valves are operated by a spring-loaded vacuum diaphragm assembly attached to the side of the main body and linked to the secondary throttle shaft.

Opening of the secondary throttle valves controlled by vacuum from the right primary venturi. At high speeds when engine requirements approach the capacity of the two primary barrels, the increased vacuum at the right primary venturi moves the secondary diaphragm, compressing the diaphragm spring. The diaphragm, acting through the diaphragm link and lever, starts to open the secondary throttle valves. The position of the throttle valves depends upon the strength of the vacuum. This, in turn, is determined by the air-flow through the carburetor. As top speed is reached, the secondary throttle valves will approach wide open.

The bleed past the ball check valve in the vacuum passage of the secondary diaphragm housing (see insert, Fig. 9), limits the rate at which the secondary throttle valves will open. Any rapid increase in vacuum which would tend to open the secondary throttle valves too suddenly merely holds the ball check valve securely against its seat. The opening of the throttle valves is slowed to a rate governed by the amount of air passing through an air bleed in the ball check valve seat. This allows the vacuum to build up slowly at the diaphragm which results in a controlled rate of opening for the secondary throttle valves.

When engine speed is reduced, venturi vacuum becomes weaker. An immediate flow of air passes into the diaphragm chamber. As the vacuum acting on the diaphragm is lessened the load on the diaphragm spring will start closing the secondary valves. The diaphragm spring is assisted by the design of the secondary valves. Each secondary valve is slightly offset. When the valves are closing, the combined force of manifold vacuum and the air stream has greater effect on the larger, upstream area of the valves forcing them to a closed position. The secondary valves are retained in the closed position when the primary valves are fully closed by the secondary connecting rod. This rod is fastened to the primary throttle lever and rides in a slot in the secondary throttle lever.

As the secondary throttle valves begin to open, the fuel flows through the secondary main jets into the transfer passages (as previously explained).

When the secondary throttle valves are opened further, the difference in pressure between the secondary fuel bowl and the secondary main discharge nozzle causes the secondary main fuel system to begin discharging fuel. The passages in this system are identical to those in the primary main fuel system.

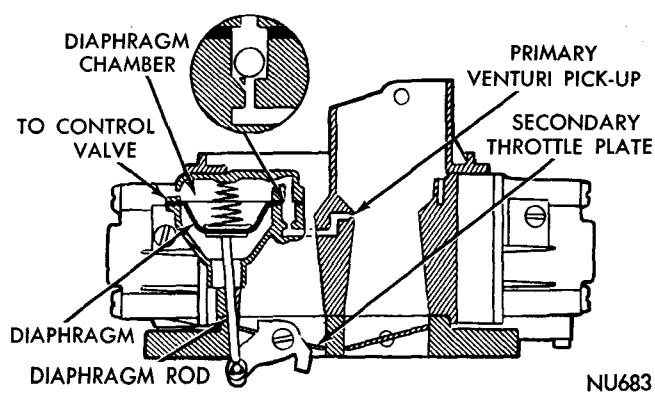


Fig. 9—Secondary Throttle Operating System

Control of Secondary System During Governor Operation (Fig. 10)

During the time the secondary diaphragm is fully compressed and the secondary throttle valves are at their full position, low pressure or vacuum exists in the channel and above the needle in the secondary diaphragm control chamber.

If and when the governed speed is reached, and the governor slave unit becomes operative, the governor low pressure or vacuum is exerted on the control chamber diaphragm at "B". The spring is compressed and the needle is pulled off its seat, permitting clean air to flow through passage "D" by needle "C" and through a channel into "A". This permits the secondary diaphragm to close in conjunction with governor operation. This system is only in operation when governed speed is reached.

Governor (Fig. 11)

Internal Vacuum Type 4150G—A Centri-Vac vacuum operated engine speed governor is incorporated on the carburetor as a positive means of controlling engine speed. The governor contains a throttle actuating mechanism attached to the primary throttle of the carburetor, through an overriding clutch. The throttle actuating mechanism consists of a diaphragm assembly, governor spring, and governor lever assembly. Below governing speeds, the operator, through a simple clutch arrangement on the throttle body of the carburetor, controls the throttle body of the carburetor, and throttle valves in the usual manner. When governing speed is reached, a combination of venturi and manifold vacuum acts on the governor diaphragm to close the throttle valves. Two calibrated by-pass jets in the vacuum passages meters the vacuum from the venturi and the manifold to provide the correct balance for proper operating of the governor. At speeds below governing rpm, this vacuum is weakened by air bleeding through the governor valve in the governor spinner which is assembled on the distributor shaft. Filtered air from the carburetor air cleaner enters the governor system through a passage in the main body and then into the governor clean air tube. The air flows through an air line to the housing enclosing the governor control or spinned valve. A combination of low pressure from the venturi and manifold transmitted through the governor system passages, draws the air past the governor valve and through another air line to the throttle actuating unit on the carburetor. In the controlling unit, centrifugal force acting on the rotor, which has kept pace with engine speed, overcomes the tension of the valve spring and tends to close the governor valve when governing speed is reached. This greatly restricts the amount of air bleeding through to the diaphragm on the carburetor, thus allowing the combined venturi and manifold pressure differential to operate the diaphragm. As the pressure differential across the diaphragm increases, the diaphragm moves the governor lever against the tension of the governor spring to close the throttle valves. The governed engine speed is held constant by centrifugal force on the valve balanced against the tension of the valve spring. Any slight change in engine speed due to load variation will cause the governor valve to react immediately, either increasing or decreasing the amount of air bleeding through the governor valve orifice. A change in the amount of air bleed will, in turn, cause an instant response from the diaphragm to increase or decrease the throttle valve opening. When the accelerator is released, control is taken from the governor by the external throttle lever and the return spring in the accelerator pedal linkage, closes the throttle valves to bring the engine to any desired lower speed.

Although the entire governor system is described, only the throttle actuating mechanism on the carburetor is included in the overhaul procedure presented in this section. This portion of the

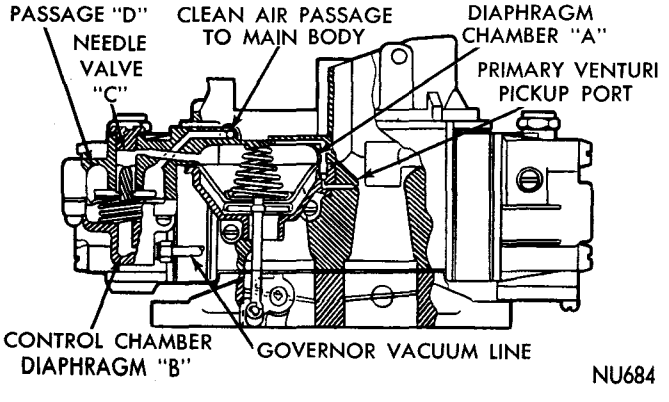


Fig. 10—Secondary Control Valve

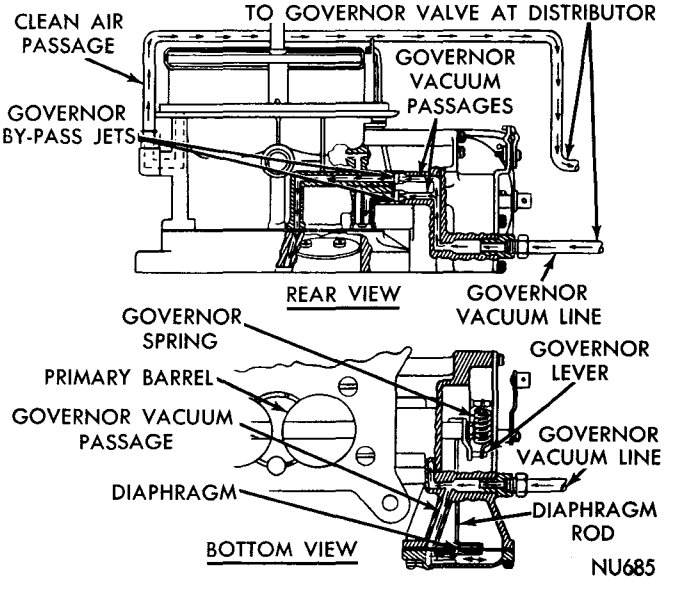


Fig. 11—Governor System

governor can be cleaned and serviced readily, also the governor can be serviced independently. The control valve service is covered in the ignition section of this manual (See Group 8). Governor speed adjustments are made at the distributor.

IN-VEHICLE ADJUSTMENTS AND REPAIRS

Carburetor Adjustments

The fuel level float adjustment (dry) is performed only as a bench adjustment.

The accelerating pump stroke and lever screw adjustment, fast (cold) idle adjustment, and preliminary idle mixture and speed adjustments can be performed with the carburetor on the bench or installed on the engine.

The engine idle mixture and speed adjustments and fuel level adjustments are performed only with the carburetor installed on the engine.

Fuel Bowl, Gasket, Main Metering Body and Gasket Replacement

(1) Remove fuel inlet line and vacuum line.

(2) Place a suitable container under fuel bowl and drain bowl by loosening one of lower fuel bowl retaining screws. Remove container.

(3) Remove four fuel bowl retaining screws.

(4) Remove fuel bowl, gasket, metering body and gasket. Discard gaskets.

(5) If fuel bowl or metering body is being replaced, transfer parts to new unit.

Installation

(1) Position metering body gasket on dowels on back of metering body.

(2) Place metering body in place on main body.

(3) Position fuel bowl gasket on metering body.

(4) Place new compression gaskets on the retaining screws and install the screws in the bowl. Tighten screws to 50 in. lbs.

(5) Place fuel bowl in place on metering body and tighten retaining screws.

Power Valve Replacement

Removal

(1) Remove fuel bowl and metering body.

(2) Using tool C-3747, remove power valve and gasket.

(3) Discard gasket.

Installation

(1) Place a new gasket on specified power valve.

(2) Using tool C-3747, install power valve and gasket. Tighten to 120 inch pounds.

(3) Install the fuel bowl and metering body.

Main Jet Replacement

Removal

(1) Remove fuel bowl and metering body.

(2) Using tool C-3748, remove jets.

Installation

(1) Using tool C-3748, install jets. Tighten securely.

(2) Install fuel bowl and metering body.

SERVICE PROCEDURES

DISASSEMBLING CARBURETOR

To disassemble carburetor (Fig. 1) for cleaning or overhaul, proceed as follows:

(1) Place carburetor on repair stand C-3886 to prevent damage to the throttle valves and to provide a suitable base for working.

(2) Remove screws and seal washers that attach primary fuel bowl to main body. Disengage fuel bowl from fuel transfer tube and remove from metering body (Fig. 2).

(3) Remove primary metering body from main body. (Fig. 3). Discard gaskets.

(4) Disengage fuel transfer tube from secondary fuel bowl. Discard "O" ring seals.

(5) Remove screws and seal washers that attach secondary fuel bowl to main body. Remove fuel bowl and secondary metering body from main body. Discard gaskets. (Fig. 4).

(6) Using a 5/16 inch end wrench, remove governor vacuum supply tube, (Fig. 5) from fitting and control valve housing.

(7) Remove nut and lockwasher that retains choke control lever to choke shaft. Slide choke lever off flats on choke shaft. (Fig. 6).

(8) Remove governor cover attaching screws, then remove cover (Fig. 7). This will expose governor housing mounting screw and lever, spring and diaphragm pull rod.

(9) Remove governor spring from anchor posts, then remove "E" clip that holds diaphragm pull rod to governor lever. Disengage rod from lever. (Fig. 7). Do not remove spring post.

(10) Using a 3/8 inch wrench, remove nut and lockwasher that retains governor lever to throttle shaft. Slide lever off flats of shaft (Fig. 7).

(11) Remove governor attaching screws (one screw located inside governor housing) (Fig. 7). Remove governor housing from main body. (Fig. 8). Discard seal and vacuum passage gaskets.

(12) Remove "E" clip that retains secondary con-

trol valve diaphragm pull rod to secondary throttle lever. Disengage rod from lever. (Fig. 9).

(13) Remove screws that attach control valve housing to main body. Remove control valve housing from main body. Remove and discard vacuum orifice gaskets. (Fig. 9).

(14) Remove "E" clip that retains accelerating pump operating lever. Slide lever off pivot post.

(15) Remove screws that attach throttle control housing to throttle body. Slide throttle control housing straight out and away from throttle body. (Fig. 10).

(16) Remove cotter pins that retain throttle connecting rod to primary and secondary shaft levers. Disengage rod from levers. Remove spacer and flat washer. (On outside of levers). (Fig. 11).

(17) Remove pump discharge nozzle retaining screw, then lift out discharge nozzle. Remove gasket from nozzle (top and bottom).

(18) Invert carburetor body and drop out pump discharge jet needle from discharge passage.

(19) With carburetor inverted, remove screws that attach throttle body to main body. Remove throttle body and discard gasket.

Throttle Body

In normal routine cleaning and overhaul of the carburetor, do not remove the throttle valves unless they are nicked or damaged. If necessary to remove, proceed as follows:

(1) Remove screws that hold throttle valves to throttle shafts. **These screws are staked to prevent loosening and care is necessary at removal to avoid breaking off in shaft. (Fig. 12). Remove staking with a file.**

(2) Slide damaged throttle valves out of bores. It should be noted at this time, that the secondary throttle valves are slightly thicker than the primary valves. **Do not install secondary valves in primary bores as the relationship of the primary valves to the idle transfer port and spark advance control ports is carefully established for one particular assembly.**

The carburetor now has been disassembled into seven sub-assemblies: namely, main body, throttle body, governor, control valve, throttle operating housing, fuel bowls and metering bodies.

Each one of the sub-assemblies except the main body and throttle body should be disassembled, cleaned, inspected and reassembled, using new parts as required. The main body and throttle bodies have been disassembled as far as necessary for cleaning and inspection.

Metering Bodies—(Primary and Secondary)

Primary

(1) Using Tool C-3747 remove power valve assembly from metering body (Fig. 13).

(2) Using Tool C-3748, remove main metering jets from primary and/or secondary metering body. (Fig. 14).

Secondary

(1) Using a suitable tool, pry plastic limiter caps off the two idle air mixture screws. (Be sure and count the number of turns to seat screws, as the same number of turns from the seat must be maintained at installation). (Fig. 15).

(2) Remove idle mixture adjusting screws from secondary metering body. Discard seal. (Fig. 16).

Fuel Bowl

Primary

(1) Remove float retainer "E" clip, then slide float and spring out of float chamber (Fig. 17).

(2) Remove fuel inlet baffle from bowl.

(3) Remove fuel inlet valve adjusting nut and lockscrew. Discard gaskets.

(4) Remove fuel inlet fitting and screen. Discard gasket. (Fig. 18).

(5) Remove fuel inlet valve and seat. Discard "O" ring.

(6) Remove screws attaching accelerator pump cover. Remove cover, then carefully remove diaphragm and spring. (Fig. 19).

(7) Remove fuel level slight plug. Discard gasket.

Secondary

(1) Remove float retainer "E" clip, then slide float and spring out of float chamber. (Fig. 20).

(2) Remove fuel inlet baffle from bowl.

(3) Remove fuel inlet valve adjusting nut and lockscrew. Discard gaskets.

(4) Remove fuel inlet valve and seat. Discard "O" ring.

(5) Remove fuel level sight plug and gasket. Discard gasket.

Governor Housing

(1) Remove screws that attach governor cover to housing. Lift out diaphragm and pull rod. (Fig. 21).

(2) Using a small screwdriver, remove governor bypass jets from rear side of governor housing. (Fig. 22). (No. 25 large jet and No. 43 small jet).

Throttle Operating Housing

(1) Remove curb idle screw and spring from housing (Fig. 1).

(2) Remove screws attaching throttle cable clamp bracket. Remove bracket and clamp.

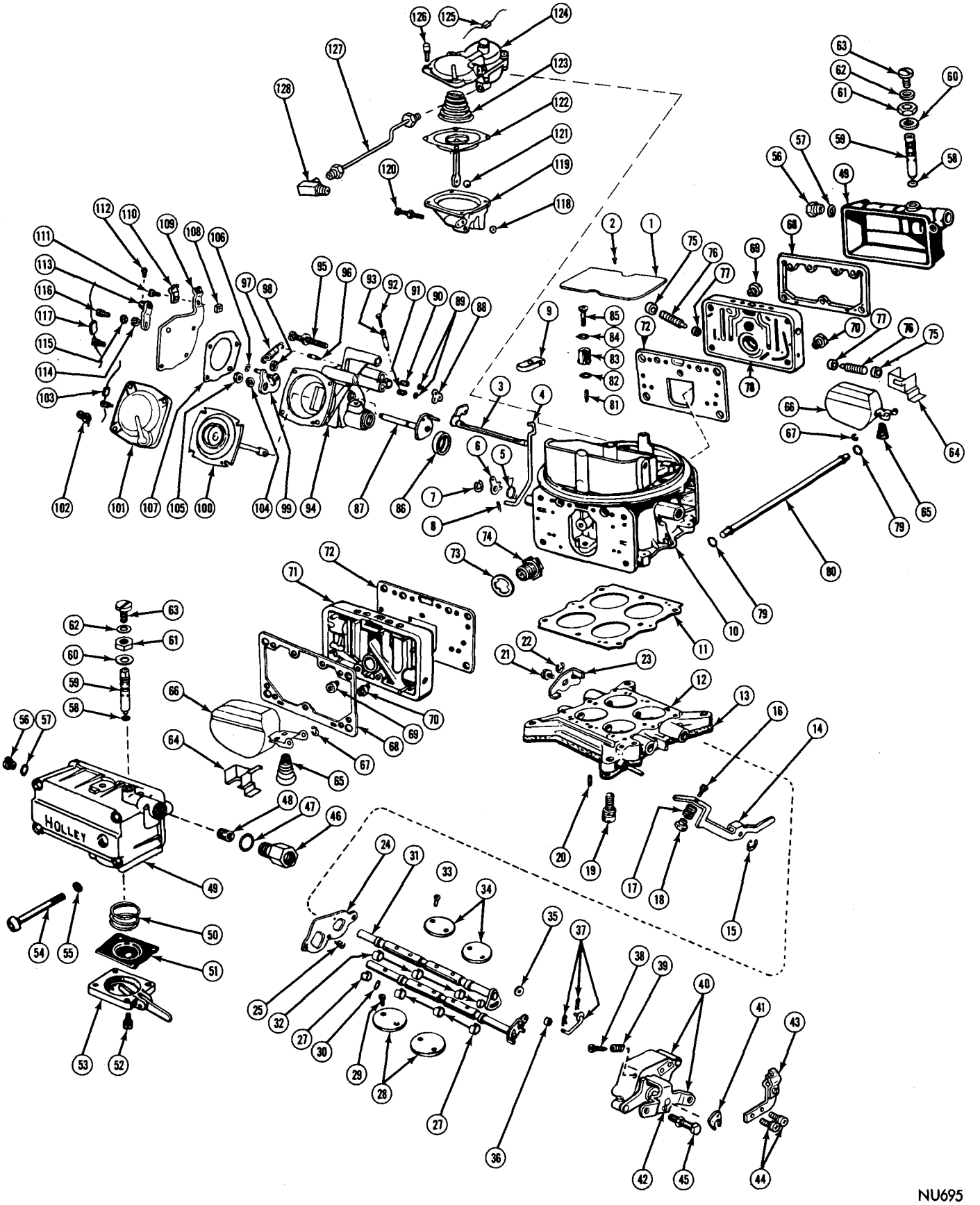


Fig. 1—Carburetor Assembly 4150G Series (Disassembled View)

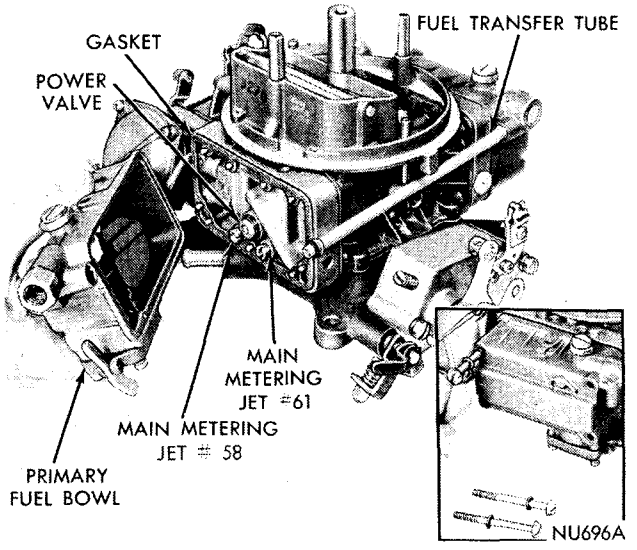


Fig. 2—Removing or Installing Primary Fuel Bowl

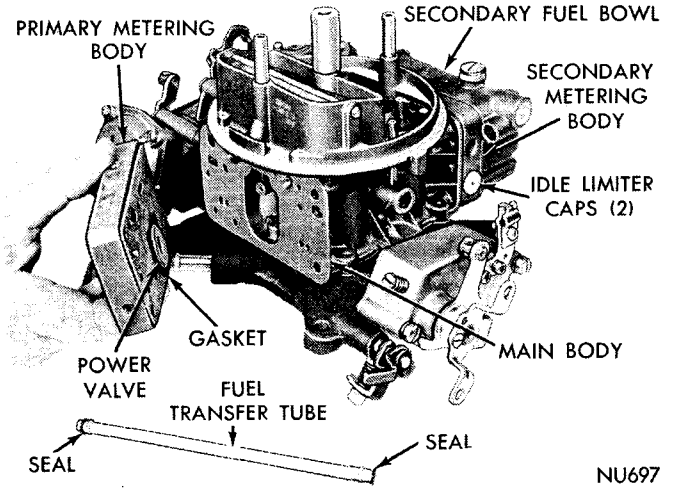


Fig. 3—Removing or Installing Primary Metering Body

Secondary Control Diaphragm Housing

(1) Remove screws that attach secondary control diaphragm cover to housing. Lift out diaphragm and spring. (Fig. 23).

(2) Invert control housing and drop out check ball.

It should be noted at this time, that the secondary control valve cover should not be removed for servicing. The valve adjustment is made at the factory and should not be disturbed. If a new diaphragm is required, install a new valve housing. (Fig. 24). **Use**

LEGEND FOR FIGURE 1

1. Choke Valve
2. Choke Valve Screw (2)
3. Choke Shaft
4. Choke Rod
5. Choke Rod Spring
6. Choke Rod Lever
7. Lever Rteainer ("E" Clip)
8. Rod Retainer (Cotterpin)
9. Choke Rod Seal
10. Main Body
11. Main Body Gasket
12. Throttle Body
13. Throttle Body Flange Gasket
14. Pump Operating Lever
15. Lever Retainer ("E" Clip)
16. Adjusting Screw
17. Adjusting Screw Spring
18. Adjusting Screw Nut
19. Throttle to Main Body Screw (8)
20. Secondary Throttle Stop Screw
21. Secondary Diaphragm Lever Screw
22. Diaphragm Link Retainer ("E" Clip)
23. Secondary Diaphragm Lever
24. Throttle Shaft Housing Plate
25. Plate Attaching Screw
26. Throttle Shaft (Primary)
27. Throttle Shaft Bushings (4)
28. Throttle Valves (Primary) (2)
29. Throttle Valve Screws (4)
30. Throttle Shaft Pin (Primary)
31. Throttle Shaft (Secondary)
32. Throttle Shaft Bushings (4)
33. Throttle Valve Screws (4)
34. Throttle Valves (Secondary) (2)
35. Throttle Connecting Rod Flatwasher
36. Throttle Connecting Rod Spacer
37. Connecting Rod Retainers (2) Cotterpins
38. Curb Idle Adjusting Screw
39. Adjusting Screw Spring
40. Throttle Operating Housing Assembly
41. Accelerating Pump Cam
42. Pump Cam Screw
43. Throttle Control Cable Bracket
44. Bracket Screws (2)
45. Housing Attaching Screws (2)
46. Fuel Inlet Fitting
47. Inlet Fitting Gasket
48. Fuel Inlet Screen
49. Fuel Bowl (2)
50. Accelerator Pump Diaphragm Spring
51. Pump Diaphragm
52. Cover Attaching Screw (4)
53. Pump Cover and Lever
54. Fuel Bowl Mounting Bolt (8)
55. Mounting Bolt Gasket (Seal)
56. Sight Plug (2)
57. Sight Plug Gasket (2)
58. Inlet Needle Valve Seal (2)
59. Inlet Needle Valve (2)
60. Valve Seat Gasket (2)
61. Valve Adjusting Nut (2)
62. Valve Adjusting Screw Gasket (2)
63. Valve Adjusting Screw (2)
64. Fuel Bowl Baffle (2)
65. Float Spring (2)
66. Float (2)
67. Float Retaining ("E" Clip) (2)
68. Metering Body/Fuel Bowl Gasket (2)
69. Metering Jet #58 (Primary)
    #72 (Secondary)
70. Metering Jet #61 (Primary)
    #72 (Secondary)
71. Metering Body (Primary)
72. Metering Body/Main Body Gasket (2)
73. Power Valve Gasket
74. Power Valve
75. Idle Mixture Adjusting Screw Limiter Caps (2)
76. Idle Mixtuer Adjusting Screw (2)
77. Adjusting Screw Seal (2)
78. Metering Body (Secondary)
79. Fuel Transfer Tube Seal (2)
80. Fuel Transfer Tube
81. Discharge Check Needle
82. Discharge Nozzle Gasket
83. Discharge Nozzle
84. Nozzle Screw Gasket
85. Nozzle Screw
86. Governor Housing Seal
87. Fast Idle Cam and Shaft
88. Governor Housing Gasket
89. Governor Vacuum Passage Seal (2)
90. Governor By-Pass Jet #43
91. Governor By-Pass Jet #25
92. Fast Idle Adjusting Screw
93. Adjusting Screw Lock-Nut
94. Governor Housing
95. Governor Housing Mounting Screw (3)
96. Governor Spring Post
97. Governor Spring
98. Diaphragm Pull Rod Retainer ("E" Clip)
99. Governor Lever
100. Governor Diaphragm
101. Governor Cover
102. Cover Mounting Screw (4)
103. Cover Seal and Wire
104. Governor Lever Lockwasher
105. Governor Lever Nut
106. Governor Lever Retainer ("E" Clip)
107. Governor Cover Gasket
108. Choke Cable Clamp Nut
109. Governor Cover
110. Choke Cable Clamp
111. Choke Cable Clamp Screw
112. Choke Swivel Set Screw
113. Choke Lever
114. Choke Lever Lockwasher
115. Choke Lever Nut
116. Governor Cover Mounting Screw (4)
117. Governor Cover Seal and Wire
118. Secondary Control Housing/Main Body Gasket
119. Control Valve Housing
120. Control Valve Housing Mounting Screw (2)
121. Control Valve Check Ball
122. Conrtol Valve Diaphragm
123. Diaphragm Spring
124. Secondary Control Valve Assy. (Serviced as an Assembly Only)
125. Control Valve Seal and Wire
126. Control Valve Cover Screw (4)
127. Control Valve Vacuum Tube
128. Vacuum Tube Fitting

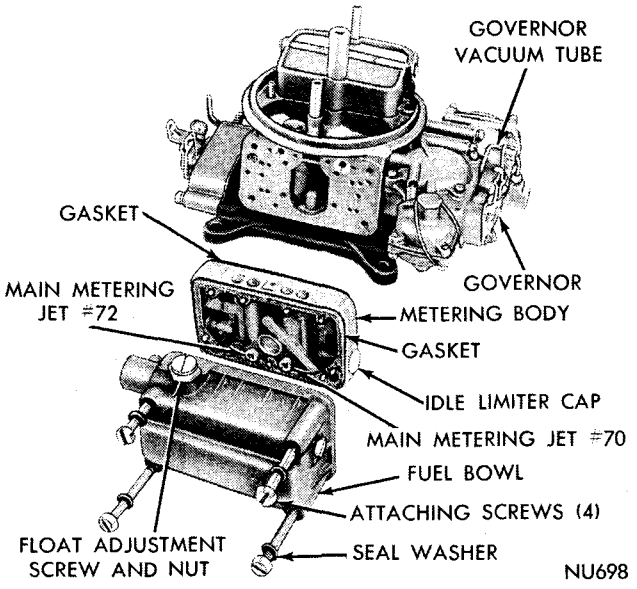


Fig. 4—Removing or Installing Secondary Fuel Bowl and Metering Body

care when cleaning control valve housing so as not to damage the diaphragm with cleaning solvent. (Do not immerse unit).

CLEANING CARBURETOR PARTS

Refer to General Information Section at front of Fuel System, for cleaning instructions.

INSPECTION AND REASSEMBLY

Check for cracks, warpage, stripped screw threads, or damaged or marred mating surfaces, on all major castings. The passages in the castings should be free of restrictions. Install new castings as required. Check the float assembly for damage or any condition that would impair this item from further service. The

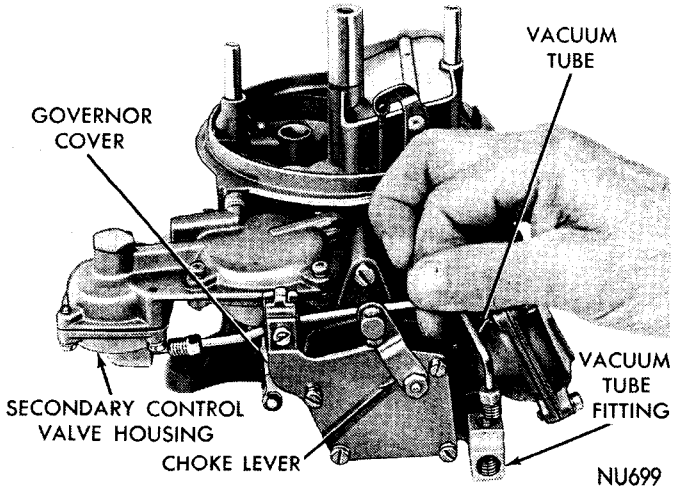


Fig. 5—Removing or Installing Governor Vacuum Tube

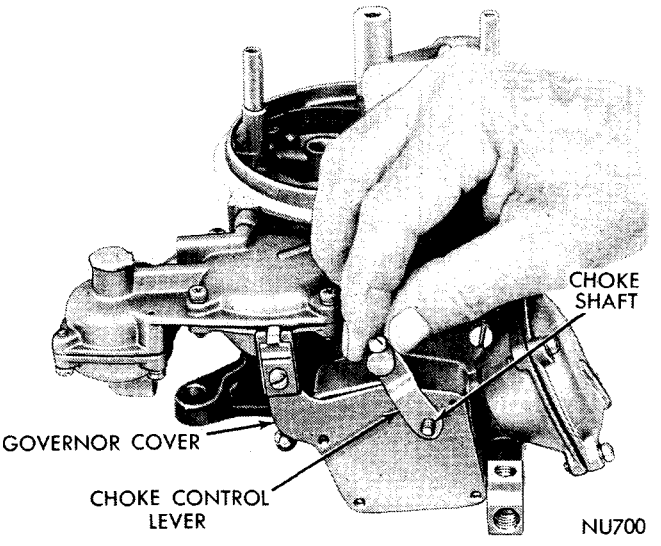


Fig. 6—Removing or Installing Choke Control Lever

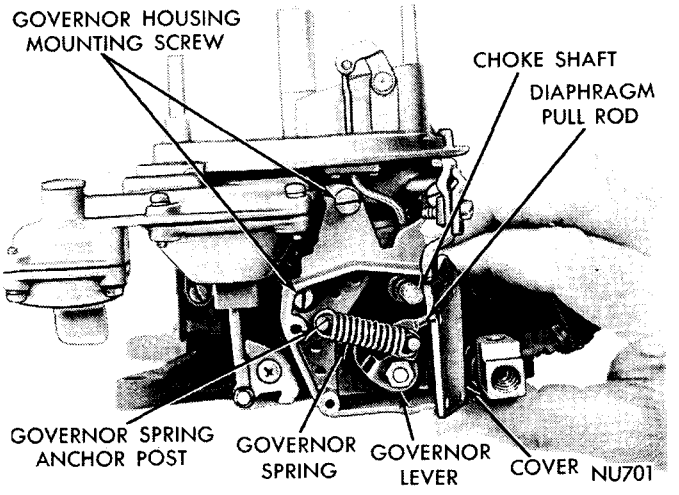


Fig. 7—Removing or Installing Governor Cover

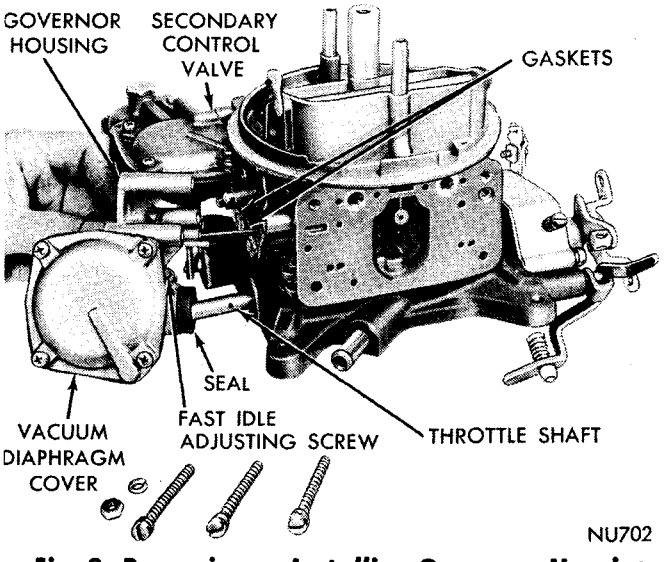


Fig. 8—Removing or Installing Governor Housing

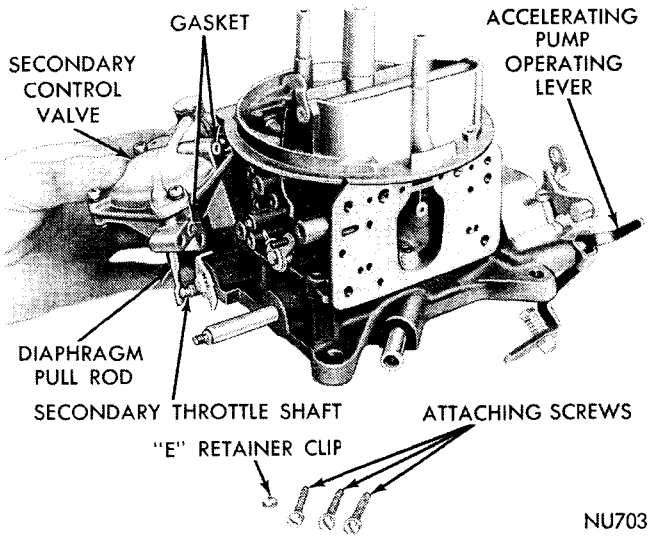


Fig. 9—Removing or Installing Secondary Control Valve

choke and throttle valves should be replaced if the edges have been nicked or if the protective plating has been removed. Be sure that the choke and throttle shafts are not bent or scored. Replace any choke or throttle linkage that is bent or worn. Replace any broken or distorted springs. Replace all screws and lockwashers that show signs of stripped threads or distortion.

Throttle Body

If throttle valves were removed because of damage, install new valves as follows:

(1) Slide new primary throttle valves into position on throttle shaft with the valve number on top side (toward main body) and away from idle transfer and spark advance control ports.

(2) Install new attaching screws but do not tighten.

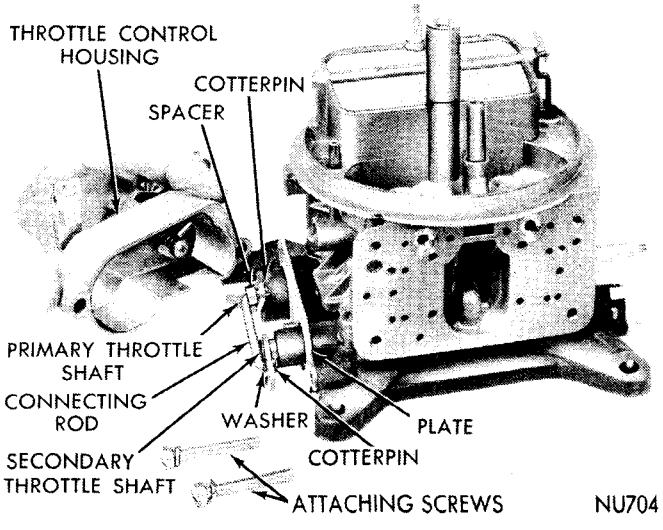


Fig. 10—Removing or Installing Throttle Control Housing

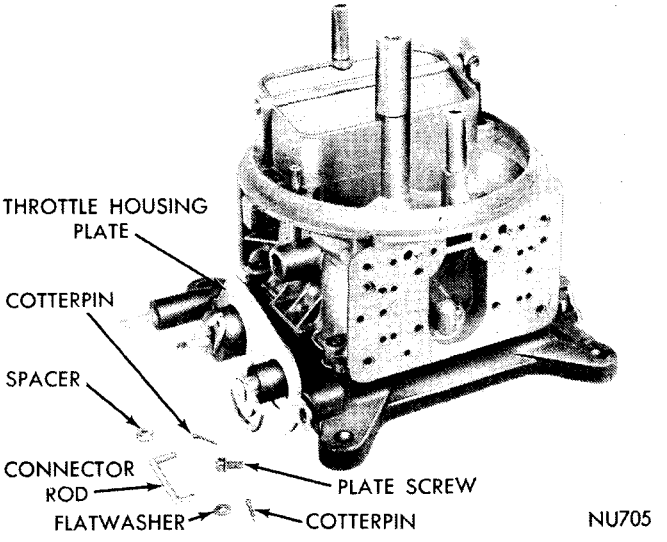


Fig. 11—Throttle Connector Rod

(3) Hold valves in place with fingers. (Fingers pressing on high side of valves).

(4) Tap valves lightly with screwdriver (in this position to center in bores. Tighten securely. Operate throttle shaft. From closed to open position, they must operate smoothly without drag or sticking. Hold throttle body up to a strong light. The light which is

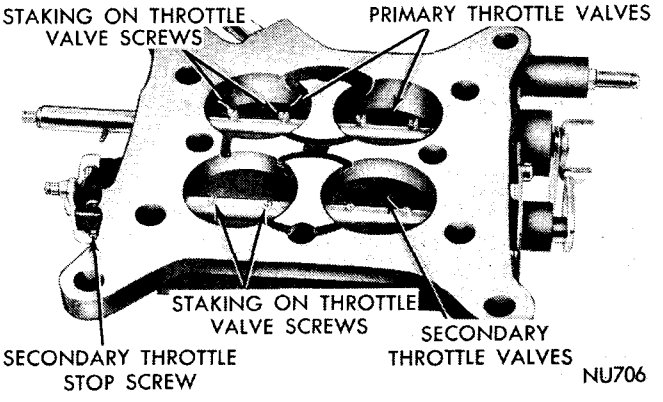


Fig. 12—Throttle Body Assembly

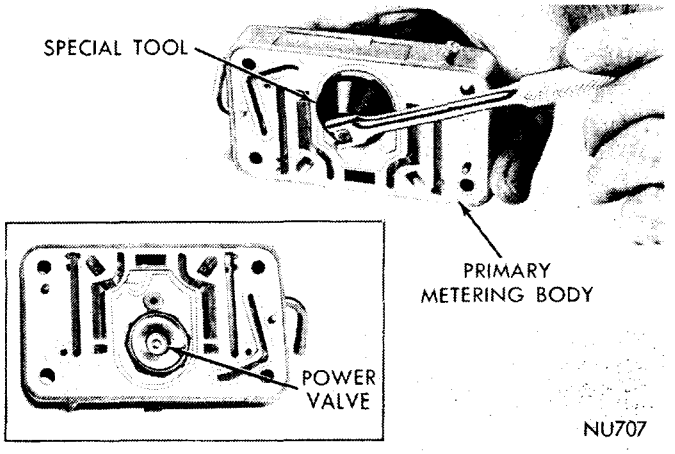


Fig. 13—Removing or Installing Power Valve

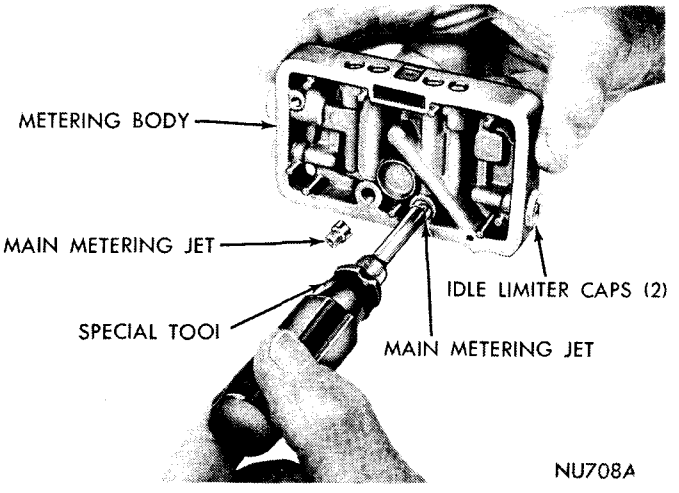


Fig. 14—Removing or Installing Main Metering Jets

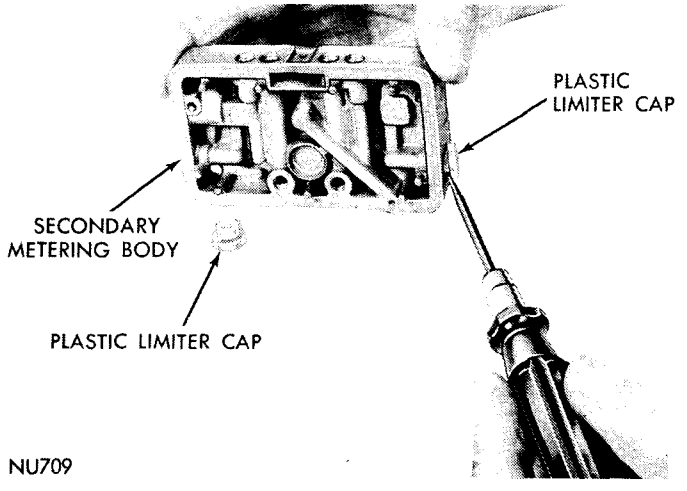


Fig. 15—Removing Plastic Limiter Caps

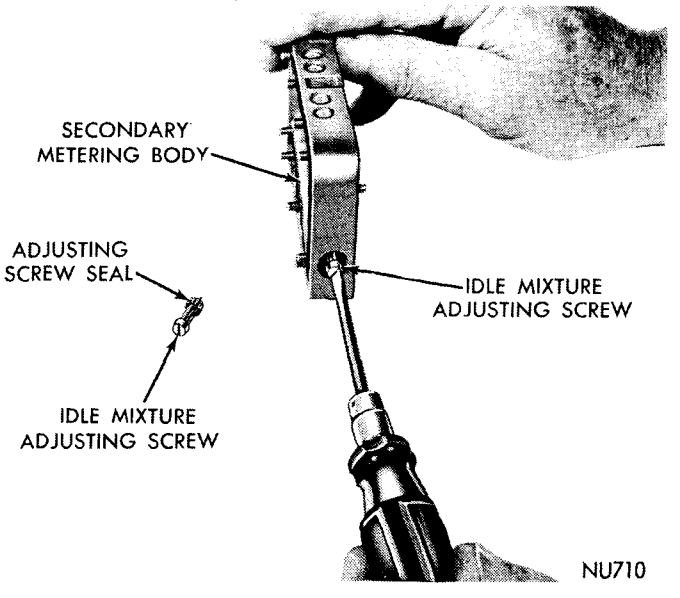


Fig. 16—Removing or Installing Idle Mixture Adjusting Screws

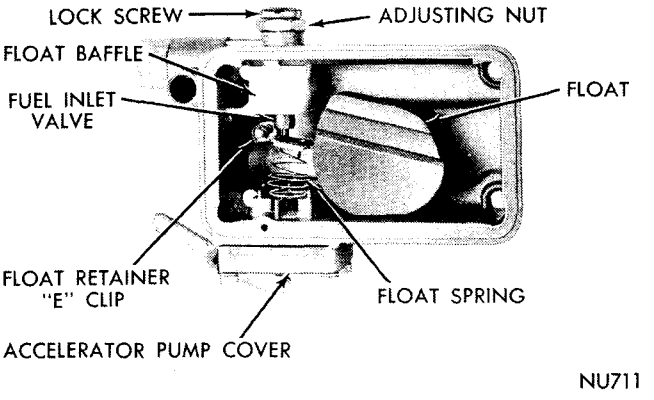


Fig. 17—Fuel Bowl Assembly—Primary

visible around outer diameter of valves and bores should be uniform.

(5) Install secondary throttle valves in same manner as described previously. However, the numbers stamped on the valves must be toward the flange and away from the idle transfer and discharge ports. For adjustment (See Secondary Throttle Adjustment).

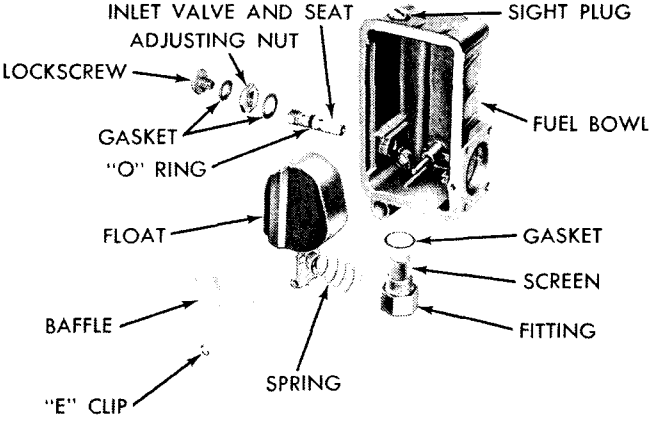


Fig. 18—Fuel Bowl Assembly—Primary (Disassembled View)

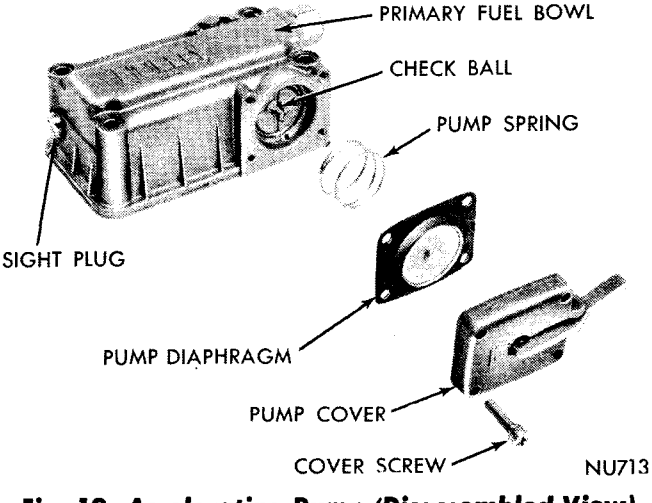


Fig. 19—Accelerating Pump (Disassembled View)

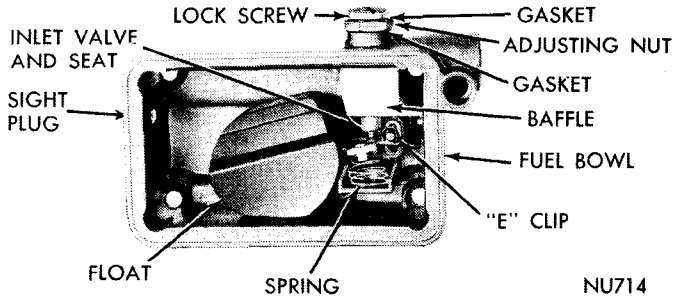


Fig. 20—Fuel Bowl—Secondary

(6) Slide accelerator pump lever over stud and secure with "E" clip.

(7) Slide spacer over long end of throttle connector rod and install rod in primary and secondary throttle levers, respectively. Install cotterpin to secure. Slide flat washer over short end of rod and secure with cotterpin. (Fig. 11).

Throttle Operating Housing

(1) Install curb idle screw and spring in housing. (DO NOT TIGHTEN).

(2) Install throttle cable clamp bracket on housing. Install attaching screws and tighten securely.

(3) With primary throttle valves in closed position, engage throttle clutch with dog in housing. Thread screws into housing and tighten securely. The throttle valves should open freely without throttle lever movement, and close with throttle lever movement.

(4) Install main body to throttle body, using a new gasket. Install attaching screws (8) and tighten to 50 inch pounds. (Be sure choke rod and spring loaded lever are on side opposite throttle operating housing) and gasket holes are aligned.

Secondary Control Diaphragm Housing

(1) Slide diaphragm and pull rod into housing, being sure vacuum check ball port is aligned with port in cover. Install check ball in well. (Fig. 23).

(2) Install diaphragm spring over shoulder in cover, then install cover. (When installing attaching screws, be sure diaphragm is in correct position).

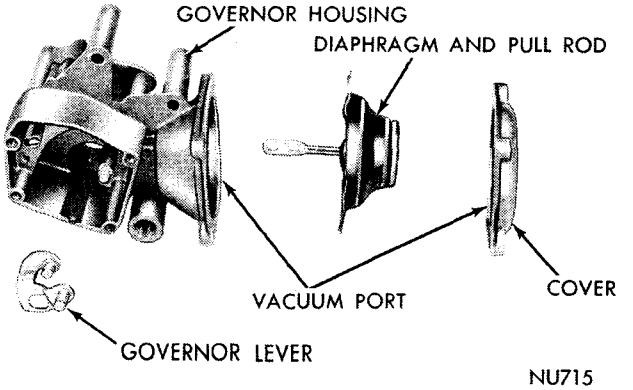


Fig. 21—Governor Assembly (Disassembled View)

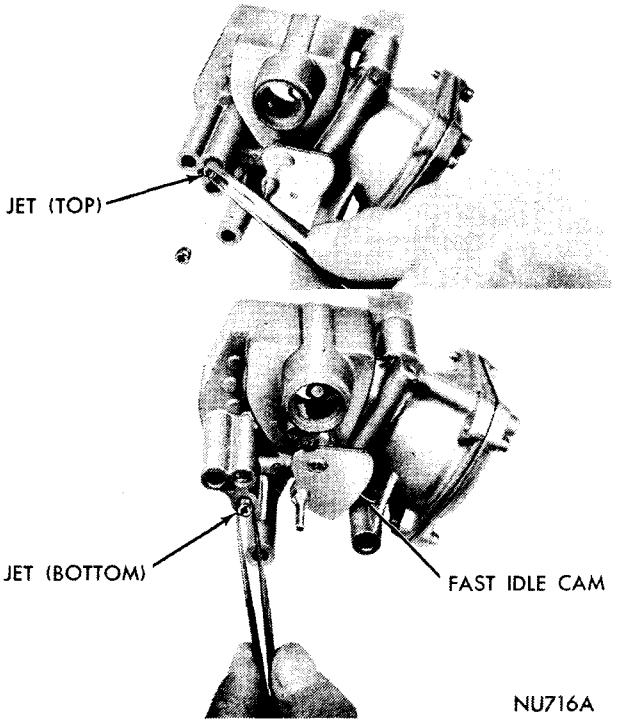


Fig. 22—Removing or Installing Governor By-Pass Jets

Install screws and tighten securely.

(3) Place new vacuum port gaskets in position in recesses in housing, then install housing in position on main body. Install attaching screws and tighten securely.

(4) Engage diaphragm pull rod with stub shaft on secondary throttle shaft lever, then install "E" clip to secure.

Governor Housing

(1) Install governor by-pass jets in orifices in body. (Fig. 22). Tighten securely.

(2) Install governor diaphragm and pull rod in housing with vacuum hole in lip of diaphragm aligned with vacuum hole in housing. (Fig. 21).

(3) Place diaphragm cover over housing with vacuum holes aligned. Install screws and tighten securely.

(4) Install governor housing seal on shoulder of

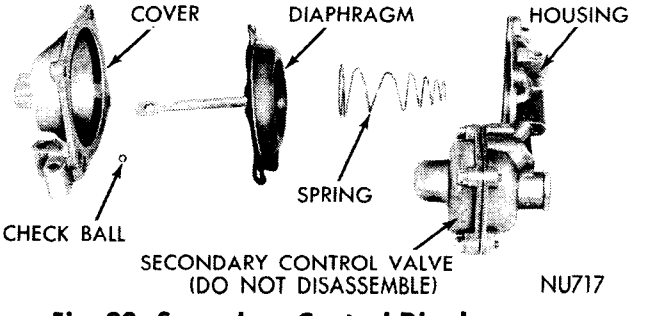


Fig. 23—Secondary Control Diaphragm (Disassembled View)

housing (at rear) and two gaskets in recesses of main body (1 over vacuum tube). Slide governor assembly over throttle shaft and down against main body. Install one screw inside governor housing (Fig. 7) and remaining screws from exterior. Tighten screws alternately from 28 to 30 inch pounds. (Fig. 8).

(5) Place governor lever in housing and engage small lever stud with diaphragm pull rod. (Fig. 7). Install "E" clip to secure.

(6) Install governor lever on end of throttle shaft and align flats. Install attaching lockwasher and nut. Tighten securely. Install governor spring over anchor post and lever stud. (Fig. 7).

(7) Install governor cover on governor housing. Install attaching screws and tighten securely. (Fig. 7).

(8) Install choke control lever over flats on choke shaft. Install attaching lockwasher and nut. Tighten securely. (Fig. 6).

(9) Install governor vacuum supply tube into control valve housing and governor housing fitting (Fig. 5). Using a 5/16 inch end wrench, tighten tube nuts securely.

Main Metering Bodies (Primary and Secondary)

Primary

(1) Install main metering jets (See Specifications) using Tool C-3748. Tighten securely. (Fig. 14).

(2) Slide a new gasket over power valve and install in body. Using Tool C-3747. Tighten to 120 inch pounds. (Fig. 13).

(3) Install new gaskets over alignment studs on metering body and press down into position, using tips of fingers. Place assembly to one side for later installation.

Secondary

(1) Install main metering jets (See Specifications) using Tool C-3748. Tighten securely. (Fig. 14).

(2) Press a new gasket in each of the idle air mixture ports, then thread idle air mixture screws through gaskets and into body, using a screwdriver. **Lightly** seat screws, then back off number of turns (from seat) counted at disassembly. (Fig. 16).

Before installing screws, be sure the tapered portion is straight and smooth. If the tapered portion is grooved or ridged, a new idle air mixture screw must be installed to insure having correct idle mixture control.

(3) Install new plastic caps over idle screws, with tabs on caps against stops in bore. (Fig. 15).

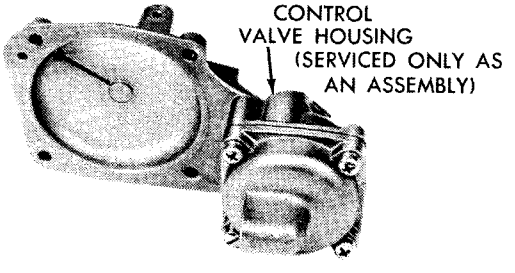


Fig. 24—Secondary Control Valve Housing

Fuel Bowl (Primary and Secondary)

Primary

(1) Install accelerator pump spring in position in fuel bowl, followed by diaphragm and pump cover. (When installing diaphragm, be sure contact button rivet head is toward pump lever in cover). (Fig. 19).

(2) Place cover over diaphragm with lever on fuel inlet fitting side (Fig. 17). Install attaching screws and tighten securely.

(3) Coat a new "O" ring with lubricant and slide over fuel inlet needle seat and down into position. Install needle seat in fuel bowl. (Fig. 18).

(4) Using a new gasket, install adjusting nut on threaded end of needle seat. Place a new gasket over lockscrew and install in needle seat and over adjusting nut. (Fig. 18).

(5) Slide fuel inlet baffle into fuel bowl and over needle seat assembly. (Fig. 18).

(6) Slide float spring over locator on float lever, then install float and spring into fuel bowl and down into position on float pivot stud. Install "E" clip to secure.

(7) Insert filter screen into fuel inlet fitting, followed by fitting gasket. Install assembly into primary fuel bowl and tighten securely.

Secondary

(1) Coat a new "O" ring with lubricant and slide over fuel inlet needle seat and down into position. Install needle seat in fuel bowl.

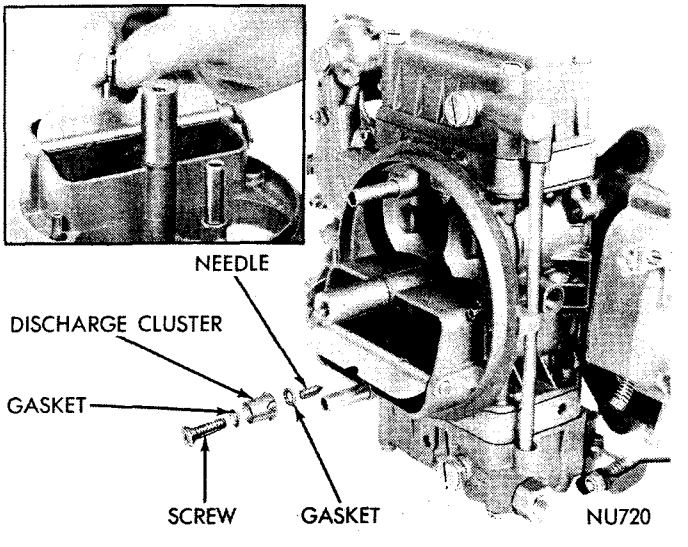


Fig. 25—Installing Accelerator Pump Discharge Needle

(2) Using a new gasket, install adjusting nut on threaded end of needle seat. Place a new gasket over lockscrew and install in needle seat and over adjusting nut (Fig. 18).

(3) Slide fuel inlet baffle into fuel bowl and over needle seat assembly (Fig. 20).

(4) Slide float spring over locator on float lever, then install float and spring into fuel bowl and down into position on float pivot stud. Install "E" clip to secure (Fig. 20).

Float Level Adjustment (On Bench)

(Primary and Secondary)

The final float level adjustment is made with the carburetor installed on vehicle. Refer to carburetor adjustments for adjusting procedure.

Installing Fuel Bowls and Metering Bodies

Primary

(1) Slide new gaskets over fuel bowl mounting screws. Install screws through fuel bowl and metering body. Be sure all gaskets are aligned, then install primary fuel bowl and metering body on carburetor main body. (Figs. 2, 3, and 4). Be sure accelerator pump lever is under adjusting screw of accelerating pump operating lever. Tighten screws to 50 inch pounds.

(2) Slide a new gasket over each end of fuel transfer tube then install tube in opening in primary fuel bowl.

Secondary

(1) Slide new gaskets over fuel bowl mounting screws. Install screws through fuel bowl and metering body. Be sure all gaskets are aligned, then install secondary fuel bowl and metering body on carburetor main body. (Figs. 2, 3 and 4). At the same time, insert end of fuel transfer tube into secondary fuel bowl opening. Tighten screws securely. (Be sure tube is spaced evenly between bowls).

(2) Install accelerating pump discharge needle in discharge passage in center of primary venturi. (Fig. 25).

To test needle for sealing, pour clean gasoline into primary fuel bowl through sight plug opening. Push down on accelerator pump lever to expel air from the pump passages. Using a small clean brass rod, hold the discharge check needle firmly on its seat. Again press down on pump arm. No fuel should be emitted from the discharge passage. Fuel leakage at the discharge needle indicates the presence of dirt or a damaged check needle. Clean again and install a new needle. Retest for leakage.

If fuel continues to leak past discharge check needle, attempt to reseat as follows:

With the discharge check needle installed, insert a piece of drill rod down on the needle. Lightly tap the drill rod with a hammer to form a new seat. Remove and discard old needle and install a new one. Retest as described previously. If the service fix does not correct the condition, a new carburetor will have to be installed.

(3) Install pump discharge nozzle gasket, nozzle mounting screw and gasket. Tighten screw securely. Test nozzle operation. Press pump lever down. The two streams from the nozzle should be identical and should strike the two venturi in the same spot. (The mounting screw gasket will form a conical shape when installed).

POSITIVE THROTTLE RETURN ASSEMBLY

If the throttle return spring has been disconnected or removed, the carburetor throttle linkage will be UNLOADED as shown in (Fig. 26). The vehicle can be driven with the carburetor linkage UNLOADED, however, increased accelerator pedal effort will be required.

Loading the linkage is accomplished by rotating the throttle assembly to the wide open throttle position (engine not running). Refer to carburetor adjustments for adjusting procedure.

Removal

(1) Straighten lock tab on throttle shaft nut. (Fig. 27).

(2) Remove throttle shaft nut and slide lock washer, spring bushing (Lining up the spring concentric with the shaft will aid in removing the spring bushing.) and throttle shaft spacer off the throttle shaft.

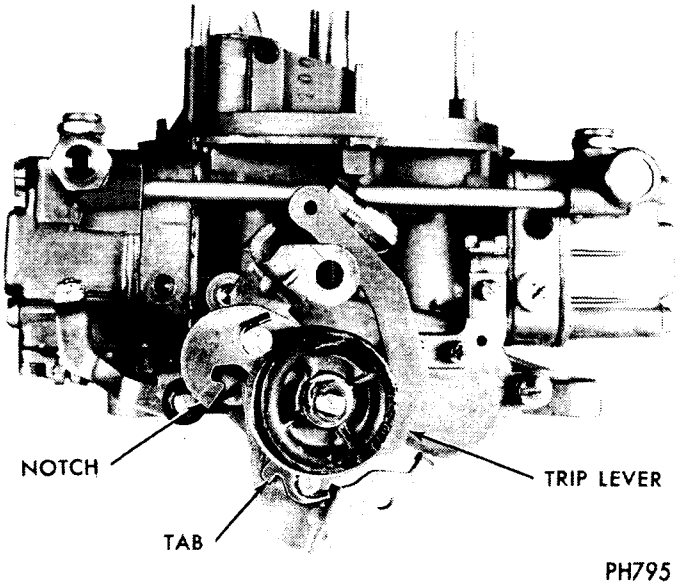


Fig. 26—Positive Throttle Return Assembly (Unloaded)

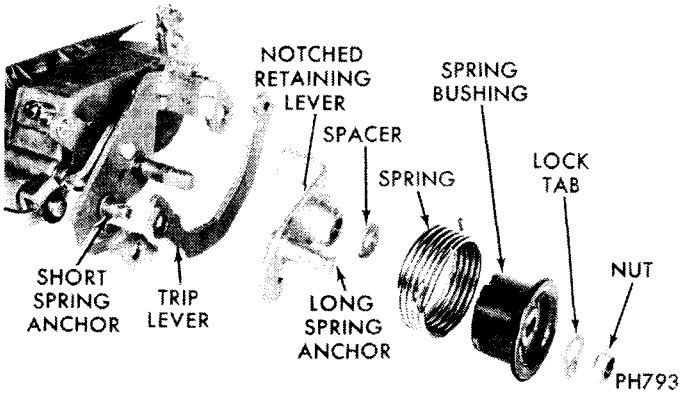


Fig. 27—Positive Throttle Return Assembly (Disassembled View)

(3) Coil spring counterclockwise and disengage hook from long spring anchor. (Noting the short straight section of coil spring.)

(4) Remove notched retaining lever.

(5) Remove trip lever.

Installation

(1) Assemble trip lever over short spring anchor.

(2) Place notched retaining lever on throttle shaft.

(3) Install throttle shaft spacer on throttle shaft.

(4) Install the curved end of the spring on the short spring anchor.

(5) Install the short straight end of the spring on the long spring anchor.

(6) Holding the spring concentric with the throttle shaft, install the spring bushing.

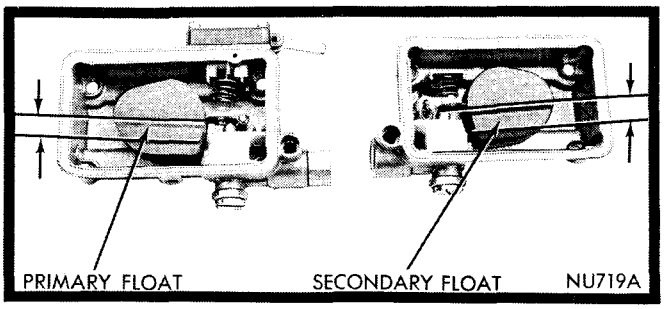
(7) Install the throttle shaft nut lock washer on the throttle shaft.

(8) Install the throttle shaft nut, tighten securely, and bend tab on lock washer to retain nut.

HOLLEY 4150G CARBURETOR ADJUSTMENTS

1. FLOAT SETTING ADJUSTMENT (BENCH ADJUSTMENT)

refer to procedure below	R-7138A R-6771A



The final float level adjustment is made with carburetor installed on vehicle, a bench adjustment should be made before installing fuel bowl.

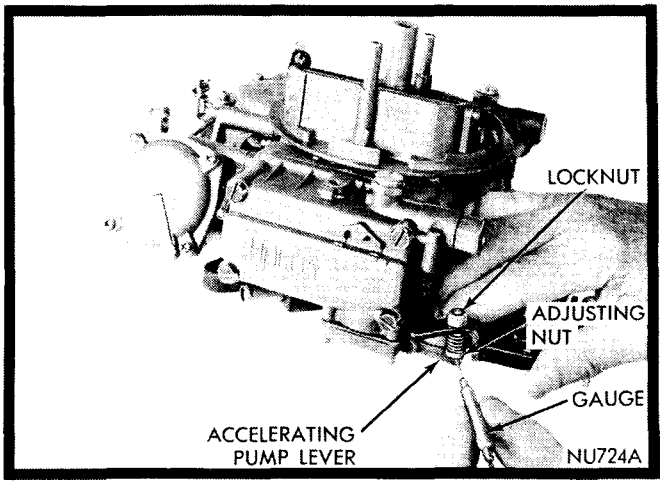
(1) With fuel bowls inverted, turn adjusting nut either **in** or **out** until float is parallel to floor of fuel bowl. Tighten lockscrew.

(2) Perform same adjustment on other fuel bowl.

(3) Install sight plugs in both fuel bowls, using new gaskets. Do not tighten.

2. ACCELERATOR PUMP STROKE MEASUREMENT (AT IDLE)

.015″	R-7138A R-6771A



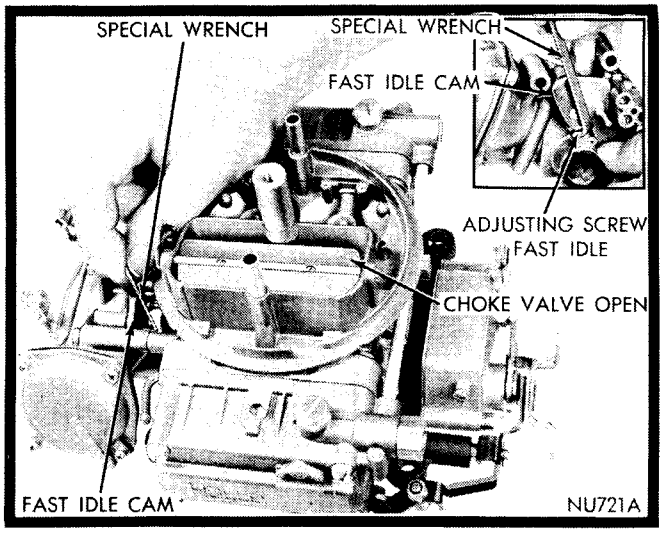
(1) With throttle valves wide open, and pump lever held down, it should be possible to insert a .015 inch gauge between adjusting nut and lever.

(2) If an adjustment is necessary, adjust pump override screw until correct clearance has been obtained.

(3) There must be no free movement of pump leverage when throttle is at curb idle.

3. FAST IDLE SPEED ADJUSTMENT

.035"	R-7138A R-6771A



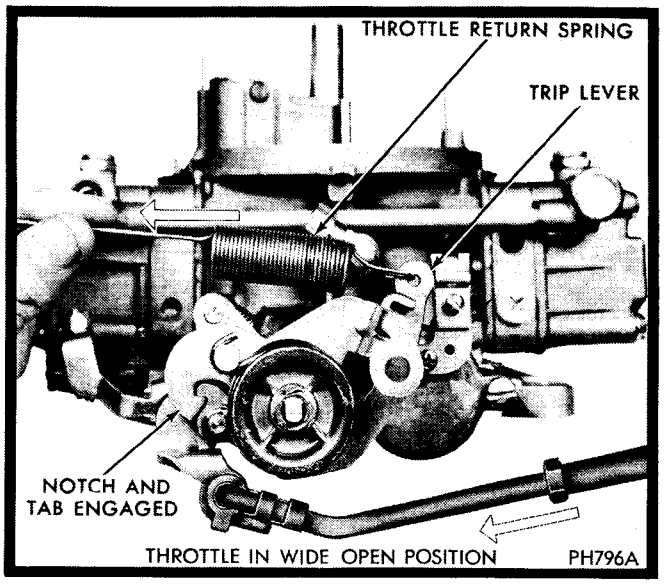
(1) Set curb idle speed (refer to Emission Control Information Label for specifications and procedure).

(2) Place manual control of choke in wide open position.

(3) Adjust clearance between fast idle cam and screw by turning fast idle speed screw using special wrench DD 1276.

4. POSITIVE THROTTLE RETURN ASSEMBLY

refer to procedure below	R-7138A R-6771A



CAUTION: Whenever throttle return spring is disconnected at either end, throttle linkage at carburetor will snap to the closed throttle position under a spring force sufficient to cause possible personal injury. It is essential, in order to prevent personal injury, that all instructions be followed, in the stated order, and hands be kept clear of carburetor throttle linkage, especially when connecting or disconnecting the throttle return spring.

(1) Depress the accelerator pedal (engine not running) to the wide open position.

(2) Connect throttle return spring between the trip lever and anchor bracket.

(3) Observe that the tab is engaged in the notch (keep hands clear) then release the accelerator pedal slowly.

5. IDLE SETTING PROCEDURES

refer to procedures below	R-7138A R-6771A

(1) Make all adjustments with engine fully warmed up.

(2) Place transmission in neutral and set parking brake.

(3) Headlights off and air conditioning compressor not operating.

(4) Remove hose at distributor and plug hose.

(5) Check timing (refer to Emission Control Label in engine compartment).

(6) Adjust mixture setting (refer to Emission Control Label in engine compartment).

NOTE: On a new vehicle (under 300 miles) idle speed setting should be reduced 75 RPM for both propane enriched speed and curb idle speed.

FLOAT ADJUSTMENT (ON VEHICLE)

Turn adjusting nut until fuel just dribbles out of sight hole.	R-7138A R-6771A
All	

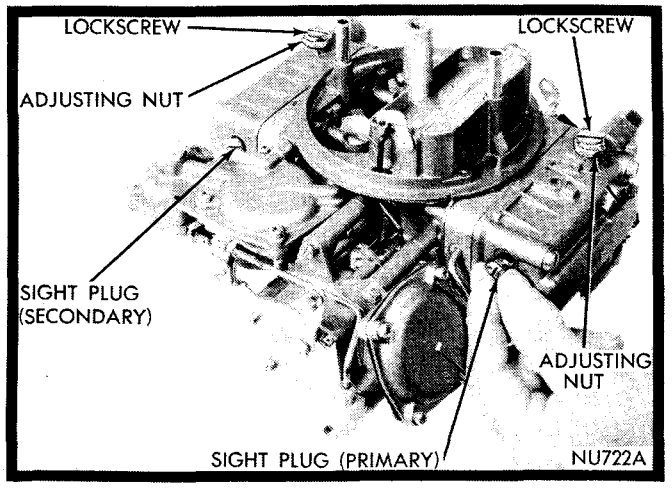


Fig. 1—Removing or Installing Sight Plug (Fuel Level)

(1) Remove air cleaner assembly and air cleaner gasket.

(2) To check the fuel level in the bowl, start the engine then remove the sight plug from the fuel bowl. (Fig. 1).

CAUTION: It is suggested that suitable precaution be taken by placing a shop towel or a container under the bowl to catch any fuel that might be spilled due to a high improper previous setting.

(3) Using a wrench and screwdriver, turn the adjusting nut either up or down until the fuel just dribbles out of the sight hole, (Fig. 2). (Vehicle must be on level floor.)

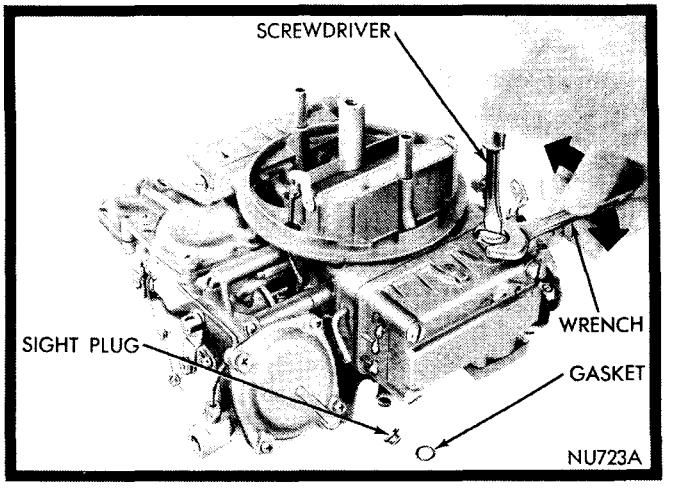


Fig. 2—Adjusting Fuel Level in Fuel Bowls

(4) After correct level has been obtained, tighten the lock screw while holding adjusting nut with wrench.

(5) Reinstall sight plug and tighten securely. (Fig. 1).

(6) Install air cleaner gasket and air cleaner.

(7) Check idle speed with tachometer. If adjustment is necessary refer to Emission Control Information Label in engine compartment for proper procedure and specifications.

CARTER THERMO-QUAD® CARBURETOR

INDEX

	Page
Carburetor Adjustments	107
Accelerator Pump Stroke	109
Choke Control Lever Adjustment	110
Choke Diaphragm Connector Rod	110
Choke Unloader Adjustment (Wide Open Kick)	112
Fast Idle Cam and Linkage	111
Fast Idle Speed Adjustment (On Vehicle)	113
Idle Speed (Curb Idle)	113
Secondary Air Valve Opening	108
Secondary Air Valve Spring Tension	109
Secondary Throttle Linkage	107
Secondary Throttle Lockout	112
Vacuum Kick Adjustment (Off or On Vehicle)	111
Disassembling Carburetor	103
General Information	99
Inspection and Reassembly	104
Service Diagnosis	3
Service Procedures	103
Special Service Tools	129
Specifications	128

CARBURETOR APPLICATION

Requirement	Transmission	Engine	BBLS	Carburetor	Model
Federal and Canada	Automatic	440-1 Cu. In.	Four	Carter	TQ-6545S
California	Automatic	440-1 Cu. In.	Four	Carter	TQ-9096S

GENERAL INFORMATION

The Carter Thermo-Quad® carburetor is designed to help reduce exhaust emissions and to permit the maximum performance that high-output engines are capable of delivering. (Fig. 1).

This carburetor has a unique black main body or fuel bowl of molded phenolic resin. This acts as a

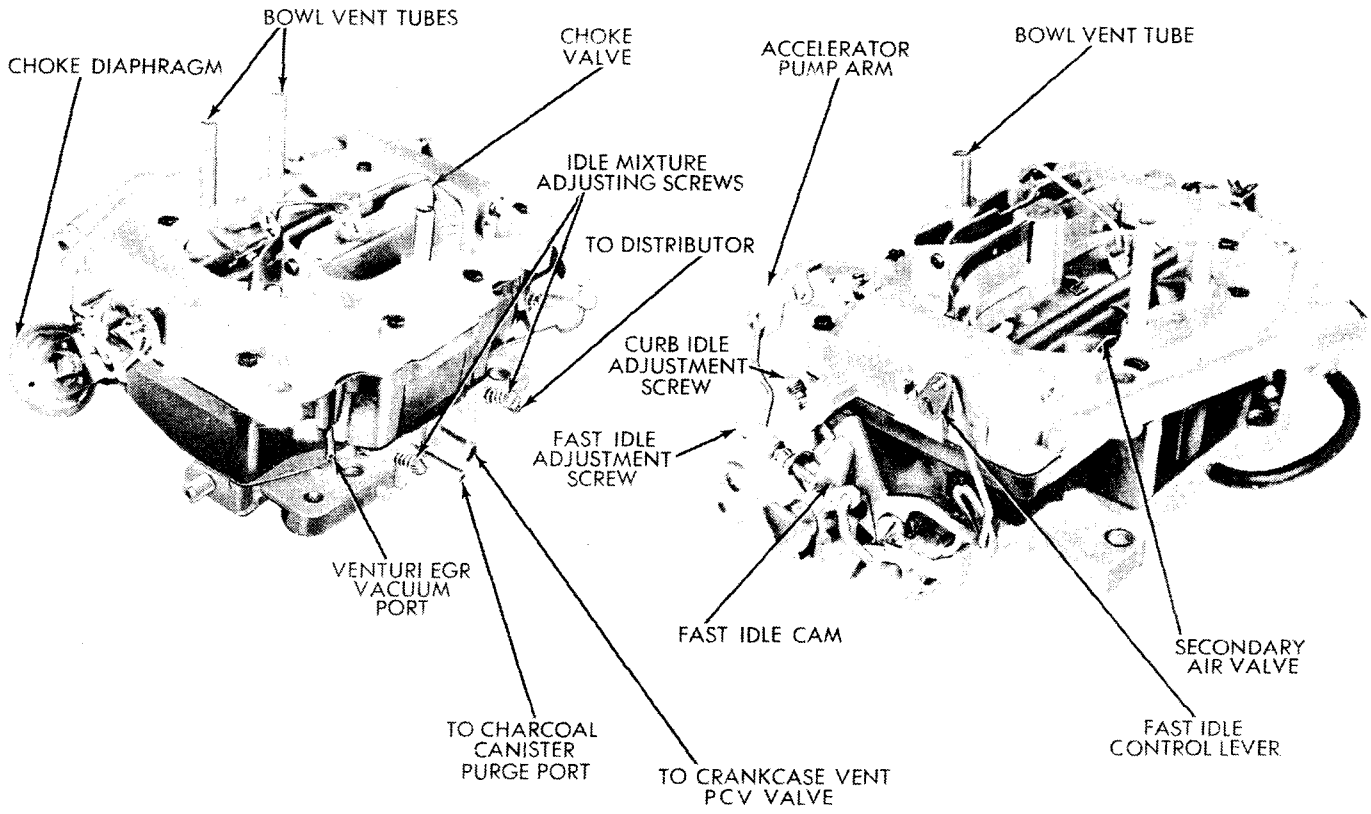


Fig. 1—Carburetor Assembly

very effective heat insulator. Fuel is kept cooler (approximately 20 degrees F) than in all metal carburetor designs.

The air horn houses the choke valve, the air valve for the secondaries and its controls and adjustments, the fuel inlet system (two floats and inlet needles and seats) the complete accelerating pump system, primary boost ventures, vacuum controlled step-up piston and rods, low and high speed fuel metering systems (secondary jets, fuel discharge nozzles and all air bleeds and restrictions) (Fig. 2). The primary jets are in the main body.

A curb idle speed solenoid is mounted on the choke side of the carburetor. This solenoid is used to maintain a high idle speed when the engine is running and allows the throttle to close to a low speed position when the ignition key is turned off, to prevent "after running".

The Thermo-Quad carburetor has unique features which require extra caution during all adjustments. The vacuum kick diaphragm provides **two separate functions**. It still provides for vacuum kick but it also controls the secondary air valve. Because of the separate nature of the two functions, two separate but interrelated adjustments are necessary and these adjustments must be performed in the proper sequence.

Vacuum Port Identification

All Thermo-Quad carburetors used on vehicles equipped with exhaust gas recirculation (EGR) will have a venturi vacuum port on the side of the carburetor; this is the only vacuum port located in the main body. All other vacuum supply ports are located in the throttle body as shown in (Fig. 3).

See "Emission Control System", Group 25, of this manual for detailed information.

Five conventional circuits are found in the Thermo-Quad carburetor:

(1) Float circuit
(2) Low-speed circuit (in the primary side)
(3) High-speed circuit (primary and secondary)
(4) Pump circuit
(5) Choke circuit (consisting of linkages to operate from a choke mechanism in the manifold cavity).

The Float Circuit (Fig. 4)

The purpose of the float circuit is to maintain an adequate supply of liquid fuel at the proper, predetermined level in the bowl for use by the low-speed, high-speed, pump and choke circuits.

Two separate float circuits are used, each circuit containing a fuel cavity float assembly and needle and seat assembly. The primary low-speed circuit plus primary and secondary high-speed circuits are supplied with fuel taken from the fuel cavities in the fuel bowl.

The Low-Speed Circuit (Fig. 5)

Fuel for idle and early part throttle operation is metered through the low-speed circuit which is located on the primary side only.

Liquid gasoline enters the idle wells through the main metering jets. Each low-speed jet has a calibrated orifice at its lower tip which measures the amount of fuel for idle and early part throttle operation. The air by-pass passages, economizers and idle air bleeds are carefully calibrated and serve to break up the liquid fuel and mix it with air as it moves through the passages to the idle ports and idle adjustment screw ports. Turning the idle adjustment screws toward their seats reduces the quantity of fuel mixture supplied by the idle circuit.

The idle ports, located directly above the idle adjusting screw ports, are slot shaped. As the Throttle valves are opened, more of the idle ports are uncovered, allowing a greater quantity of the fuel-air mixture to enter the carburetor bores. The secondary throttle valves always remain seated at idle.

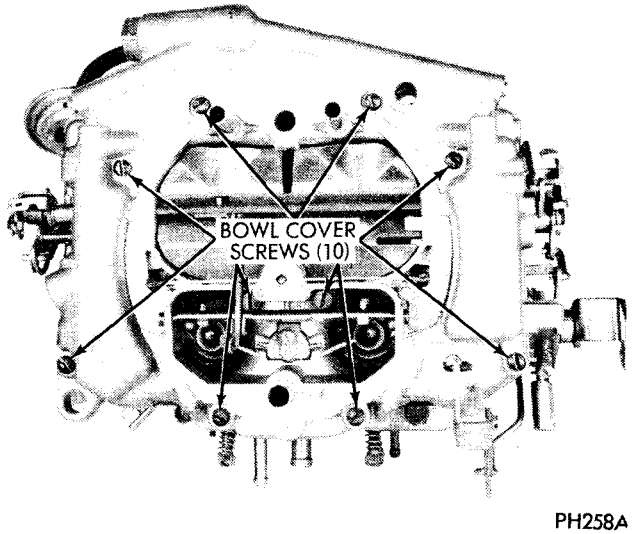


Fig. 2—Carburetor Assembly (Top View)

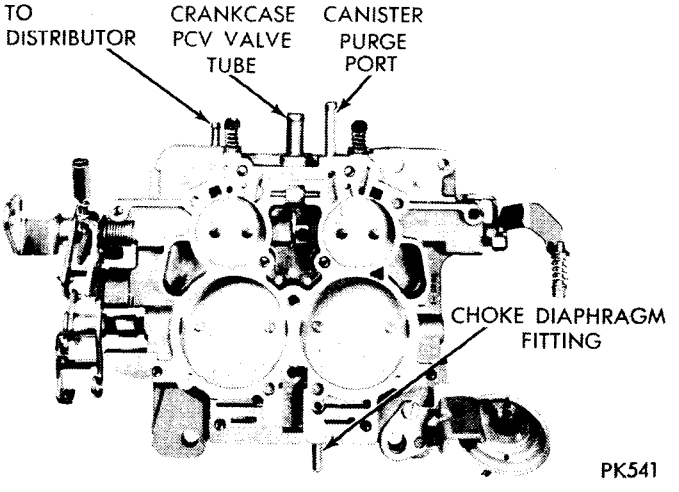


Fig. 3—Vacuum Port Identification

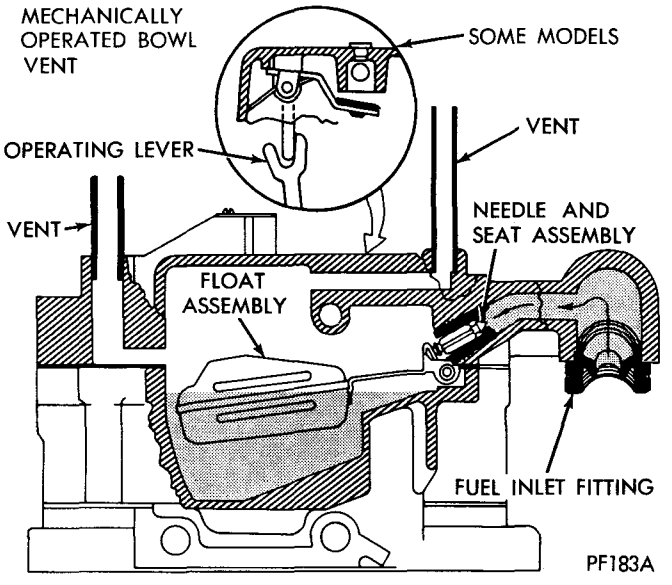


Fig. 4—Float Circuit

The High-Speed Circuits

Fuel for part throttle and full throttle engine operation is supplied through the high-speed circuit, which is divided into the primary high-speed circuit and secondary high-speed circuit. These two circuit functions are described separately, as follows:

High Speed Circuit—Primary Side (Fig. 6)

In the primary metering section, the two metering rods are yoked to a single step-up piston which rides in a cylinder in the bowl cover casting. The primary jets which work with the metering rods are located in the plastic fuel bowl. The step-up piston has a lift rod which extends down through a passage in the fuel bowl into the throttle body. The bottom end of the rod rides on a lever operated by a cam on the primary throttle shaft.

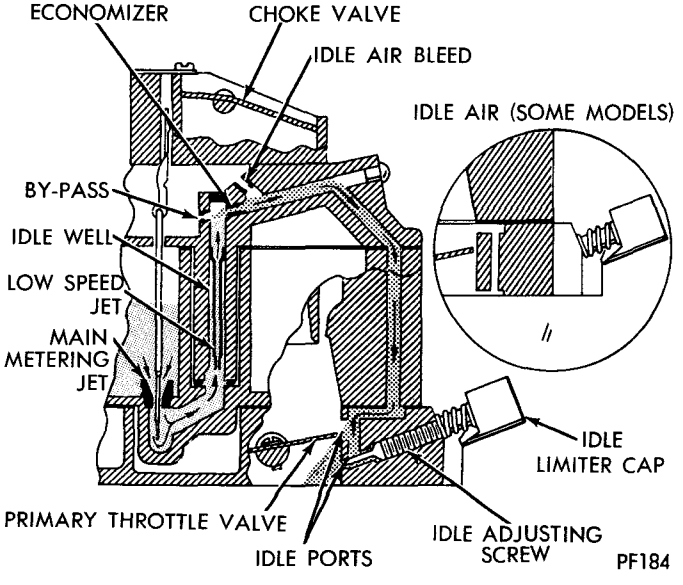


Fig. 5—Low Speed Circuit

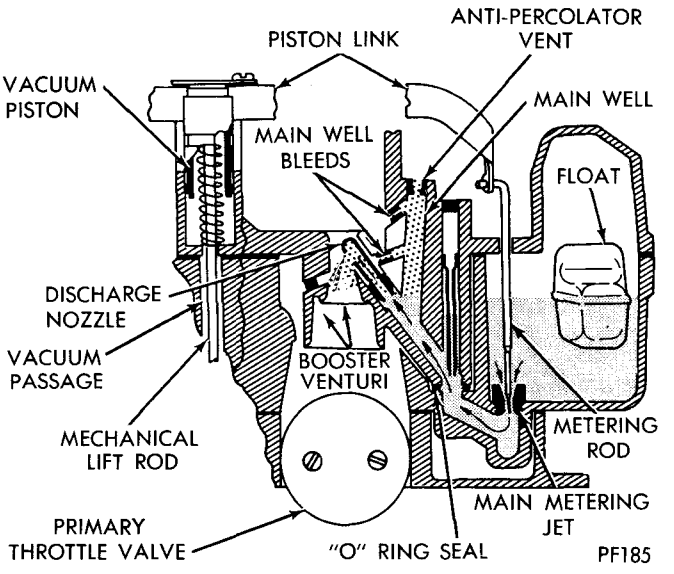


Fig. 6—Primary High Speed Circuit

In the low- and medium-speed range, the cam and lever lift the step-up piston and metering rods in proportion to the primary throttle valve opening. This action provides positive mixture control.

The length of the step-up piston lift rod is factory-adjusted on equipment not available in service. Tampering with the setting will upset performance and emission control.

High-Speed Circuit—Secondary Side (Fig. 7)

Liquid fuel for the high-speed circuit in the secondary portion of the carburetor is metered at the secondary metering jets. There are no step-up rods in the secondary metering jets.

The main bleed tubes in the secondary side with their calibrated perforations and air bleeds, function to provide sensitively calibrated air-fuel mixtures in

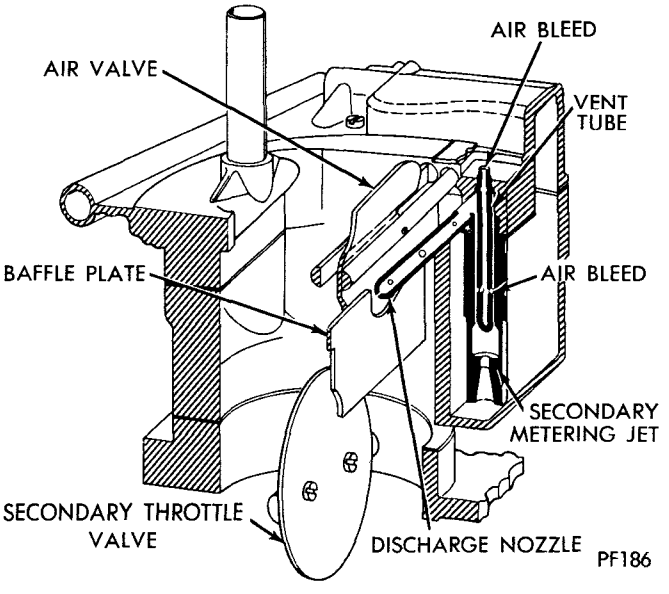


Fig. 7—Secondary High Speed Circuit

response to engine demands.

A spring-loaded air valve is located in the secondary side of the carburetor which is opened by air velocity through the secondary bores and closed by accurately-adjusted spring tension. A unique feature of this air valve is its shape. The lower edge of the valve is contoured in such a manner that when air velocity through the carburetor is high, and the lower edge of the air valve approaches the secondary nozzles, the contours act as venturi to increase air velocity at the tips of the nozzles.

Air Valve Dashpot (Diaphragm) Operation (Fig. 8)

In addition to the air-valve functions described, an air valve dashpot (or diaphragm) is used to further control the air valve. The operation of the dashpot plus the control restrictions and passages is as follows:

During primary throttle operating condition (secondary valves not open) manifold pressure (vacuum) is transmitted through the passages connecting the air valve diaphragm to the underside of the carburetor flange. If the secondary valves are opened from either a closed throttle or part throttle position of the primary valves, the restrictions "A", "B" and "C" bleed off manifold pressure to the diaphragm thus allowing the air valve to open at a rate that will provide smooth secondary operation.

Restrictions "A" and "C" are series restrictions for controlling rate of pressure bleed off to the diaphragm with the secondary throttle valves closed. Restriction "B" has an added function: During steady, extreme high-speed operation (70 mph approx.) it is possible that the secondary valves may be opened very slightly. If the diaphragm was directly connected to manifold vacuum at all times, the diaphragm might pull the air valve to a closed position causing an over-rich mixture. Restriction "B" prevents this possibility of over-richness. When the secondary is slightly opened the restriction at "B" bleeds off a part of the manifold vacuum to the diaphragm. The diaphragm can then properly position the air valve for satisfactory performance.

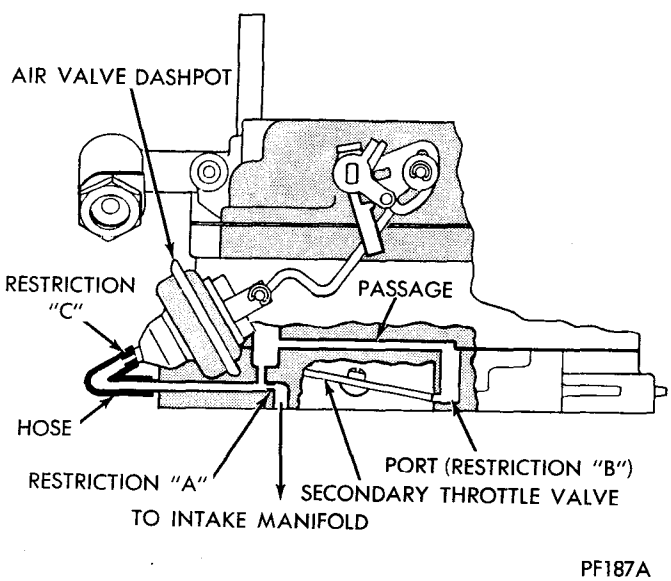


Fig. 8—Air Valve Dashpot Operation

Accelerator Pump Circuit (Fig. 9)

The accelerator pump circuit, located in the primary side of the carburetor, provides a measured amount of fuel necessary to insure smooth engine operation upon acceleration at lower vehicle speeds.

When the throttle is closed, the pump plunger moves upward in the pump cylinder and fuel is drawn into the pump cylinder through the intake check, located at the bottom of the cylinder. The discharge check (needle) is seated at this time to prevent air from being drawn into the pump cylinder.

When the throttle is opened, the pump plunger moves downward closing the intake check and forcing fuel out through the discharge passage, past the discharge check needle and out through the pump jets.

At higher speeds, pump discharge is no longer necessary to insure smooth acceleration. Therefore, in order to prevent unnecessary plunger movement, external pump linkage is so constructed that it travels "over center" when the throttle is in the higher speed positions, thus imparting just enough stroke to the plunger to keep all passages filled with liquid fuel.

A plastic tube is used to connect the outlet opening at the bottom of the pump cylinder with passage just below the discharge check. Make sure this tube is not damaged or collapsed when servicing the carburetor.

The spring in the pump cylinder, above the plunger is used to remove all free play from the pump operating linkage and insure an instant fuel discharge the instant the throttle valves are cracked.

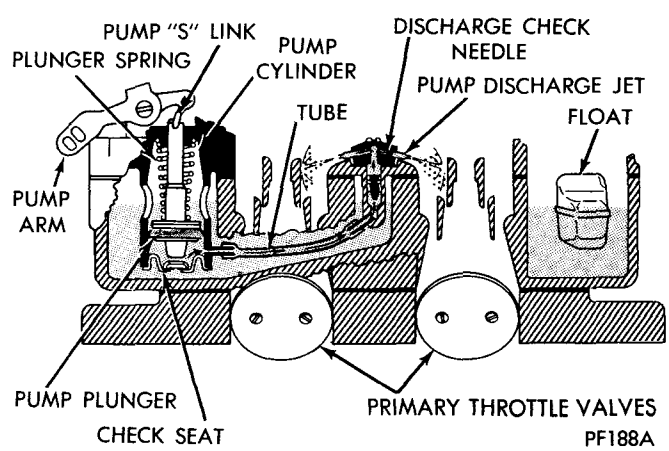


Fig. 9—Accelerator Pump Circuit

SERVICE PROCEDURES

DISASSEMBLING CARBURETOR

(1) Place carburetor assembly on repair stand Tool C-3886. Repair stand is used to protect throttle valves from damage and to provide a suitable base for working.

(2) Remove rod retainers that hold throttle connector rod to accelerator pump arm and throttle lever, then remove rod from carburetor.

(3) Remove accelerator pump arm screw and disengage from pump rod "S" link, (leave "S" link connected to pump rod) then remove lever.

(4) Remove choke countershaft fast idle lever attaching screw while holding lever. Disengage lever from countershaft, then swing fast idle connector rod at an arc until it can be disengaged from fast idle operating lever.

(5) Remove rod retainers and washer that holds choke diaphragm connector rod to choke vacuum diaphragm and air valve lever.

(6) Remove rod retainer that holds choke connector rod to choke countershaft, then disengage rod and swing rod at an arc to disengage choke shaft lever assembly.

(7) Remove step up piston cover plate attaching screw and cover plate, then remove step up piston and link assembly with step up rods. Remove step up piston spring.

(8) Remove pump jet housing screw, housing with gasket. Invert carburetor and remove discharge check needle.

(9) Remove 10 bowl cover screws, two of the bowl cover screws are located between choke valve and wall of bowl cover. Remove bowl cover and invert on bench to protect floats.

Disassembling Bowl Cover

(1) Remove float lever pins and lift out float assemblies. It is suggested that the float on the pump side be marked so that floats can be reinstalled in their respective positions.

(2) Remove two needle valves from their respective seats, after marking one on pump side for identification. Using a wide blade screw driver, remove needle valve seats. Be sure each needle valve is returned to its original seat at reassembly.

(3) Remove secondary metering jets.

(4) Remove acceleration pump passage tube (plastic) and bowl cover gasket.

(5) Remove accelerator pump rod "S" link. To remove pump plunger assembly, use a small rod placed on upper end of plunger shaft and tap lightly with a smaller hammer (Fig. 10). **Use care not to damage plunger shaft hole in bowl cover. This should be done with fingers under lower portion of pump cylinder in order to catch intake check seat, pump plunger and spring. Check seat will be damaged when pump plunger is being driven out. Always install a new check seat upon reassembly.**

(6) If inspection shows plunger can be used again, place it in a container of clean mineral spirits to prevent leather from drying out.

(7) **Note position of bowl vent actuating lever and arm spring** (if so equipped) before removing retainer clip from lever, then remove lever from bowl vent operating arm. Remove grommet seal from operating arm.

(8) Remove fuel inlet fitting and gasket.

Throttle Body

(1) Remove step-up actuating lever.

(2) Remove choke diaphragm and bracket assembly with hose and place to one side to be cleaned as a special item. Liquid cleaners may damage diaphragm material. Note: that the carburetor vacuum fitting hides a very small vacuum passage restriction. Clean passage only with compressed air.

(3) Remove plastic limiter caps from idle air mixture screws. Be sure to count number of turns to seat the screws (from stop), as the same number of turns (from seat) must be maintained at installation. Remove idle mixture screws and springs.

It is not advisable to remove the throttle shafts or valves unless wear or damage necessitates the installation of new parts. During the manufacture of the carburetor, the location of the idle transfer ports and

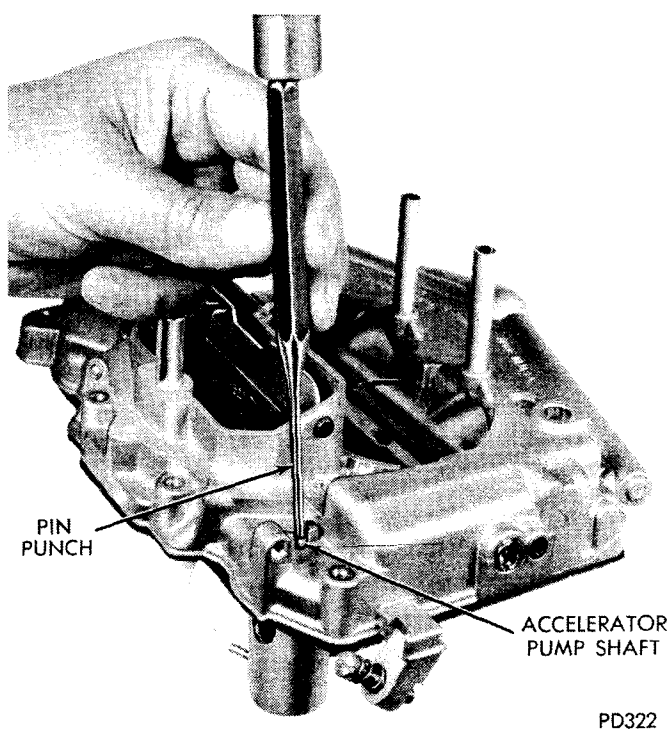


Fig. 10—Removing Accelerator Pump

the idle discharge ports to the valve is carefully established for one particular assembly. (Fig. 11).

If new throttle shafts should be installed in an old worn body, it would be very unlikely that the original relationship of these ports to the valves would be obtained. A very slight change in the port relationship to the valves would adversely affect normal carburetor operation, between the speeds of curb idle to 30 miles per hour.

Main Body

(1) Remove primary "O" ring seals and discard.

(2) Remove primary metering jets (Fig. 12).

It is not necessary to remove the baffle plate from the main body. (Do not immerse main body in cleaning solvents for a prolonged period of time). The carburetor now has been disassembled into three main units, the air horn, main body and throttle body and the component parts of each disassembled as far as necessary for cleaning and inspection.

CLEANING CARBURETOR PARTS

Refer to General Information Section at front of Fuel System, for cleaning instructions.

INSPECTION AND REASSEMBLY

Check for cracks, warpage, stripped screw threads, or damaged or marred mating surfaces, on all major castings. The passages in the castings should be free of restrictions. Check the float assemblies for damage or any condition that would impair these items from further service. The throttle valves should be replaced if the edges have been nicked, burred or damaged. New valves may be installed. Be sure that the choke and throttle shafts are not bent or scored. Replace any broken or distorted springs. Replace all screws and lockwashers that show signs of stripped threads or distortion.

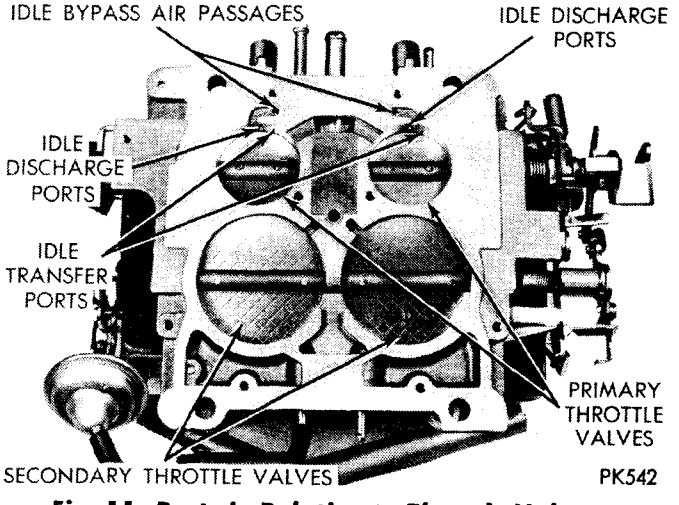


Fig. 11—Ports in Relation to Throttle Valves

Throttle Body

If necessary to replace throttle valves, remove staking with a file. These screws are staked to prevent loosening and care is necessary to avoid breaking off in shaft.

(1) Remove screws that hold throttle valves to throttle shaft.

(2) Slide damaged throttle valves out of bores. It should be noted at this time, that the numbered side is on the bottom (or carburetor mounting flange side) and opposite the vacuum port.

(3) Slide new throttle valves in position on throttle shaft, with the valve number on the bottom (flange side) and opposite the vacuum port.

(4) Install new screws, but do not tighten. Be sure fast idle speed adjusting screw is backed out. Hold valves in place with fingers (fingers pressing on high side of valves).

(5) Tap valves lightly in this position, tighten screws securely. Stake screws. Be sure to support shaft when staking screws. Operate the throttle shaft, from closed to open position, it should operate smoothly without drag or sticking. Hold throttle body up to a strong light. The light visible around the outer diameter of the valves on the bores should be uniform.

(6) Install secondary throttle valves in the same manner as described previously. The numbers stamped on the valves must be toward primary bores. For adjustment (See Secondary Throttle Adjustment).

(7) Install idle mixture screws and springs in the throttle body. (The tapered portion must be straight and smooth to insure having correct idle mixture control.) **Do not use a screw driver.** Turn screws lightly against their seats with fingers. Back off the

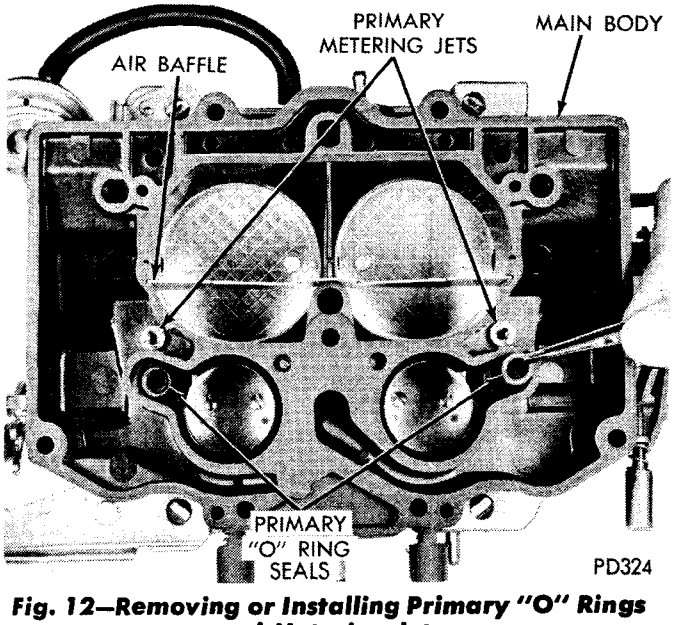


Fig. 12—Removing or Installing Primary "O" Rings and Metering Jets

number of turns counted at disassembly. **Do not install limiter caps at this time.**

Choke Vacuum Diaphragm (Also Air Valve Dashpot)

(1) Inspect the vacuum diaphragm fitting to be sure that the passage is not plugged with foreign material. Leak test diaphragm to determine if it has internal leaks. To do this, depress diaphragm stem, then place finger over fitting to seal opening. Release stem. If stem moves more than 1/16 inch in ten seconds, leakage is excessive and assembly must be replaced.

(2) Position diaphragm and bracket assembly on locating dowel on mounting surface. Install and tighten attaching screw.

(3) Inspect rubber hose for cracks before installing on correct carburetor fitting. (Fitting next to diaphragm bracket). **Do not connect vacuum hose to diaphragm fitting until after vacuum kick adjustment has been made.** (See Carburetor Adjustments).

(4) Install step-up actuating lever with edges up (Fig. 13).

(5) Install throttle body gasket and main body.

(6) Carefully install new primary "O" ring seals. **Be sure "O" ring seals are centered over holes in main body.**

(7) Install primary metering jets in floor of main body and tighten securely.

Bowl Cover

(1) Install secondary metering jets over bleed tubes and tighten securely (Fig. 14).

(2) Position accelerator upper spring (heavy) on pump plunger with large diameter up (Fig. 15). Install spring and plunger in cylinder, compressing spring until rod extends through bowl cover, then install pump "S" link to retain assembly.

(3) Position intake check seat with flange down on a clean flat surface.

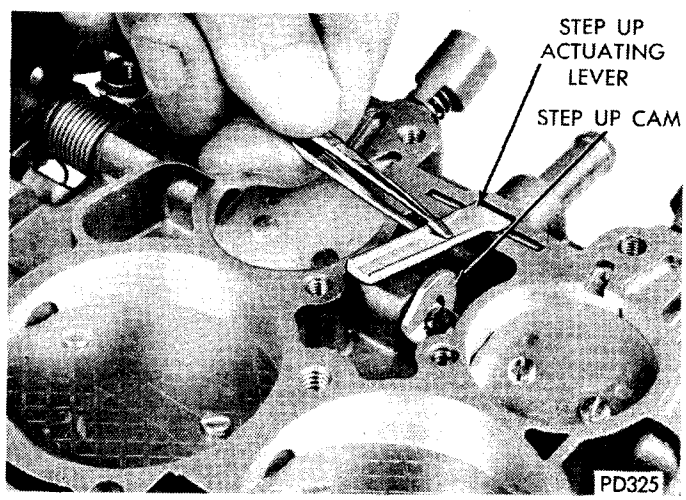


Fig. 13—Step-Up Actuating Lever Installation

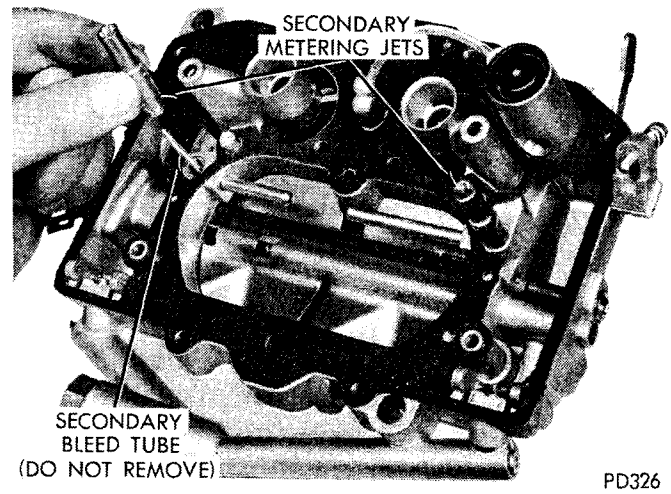


Fig. 14—Removing or Installing Secondary Metering Jets

(4) Position accelerator pump cylinder over the assembly, then apply firm hand pressure to bowl cover to seat intake check seat in pump bore (Fig. 16).

(5) Install accelerator pump passage tube (plastic).

(6) Pour clean gasoline into clean container, approximately 1/2 inch deep and carefully lower pump housing into gasoline. Raise plunger and press lightly on plunger shaft to expel air from pump passage.

(7) Install accelerator pump discharge check needle in discharge passage. Using a small clean rod, hold discharge check needle firmly on its seat. Again raise plunger and press downward. No fuel should be emitted from the discharge passage. Fuel leakage at discharge passage indicates presence of dirt or a

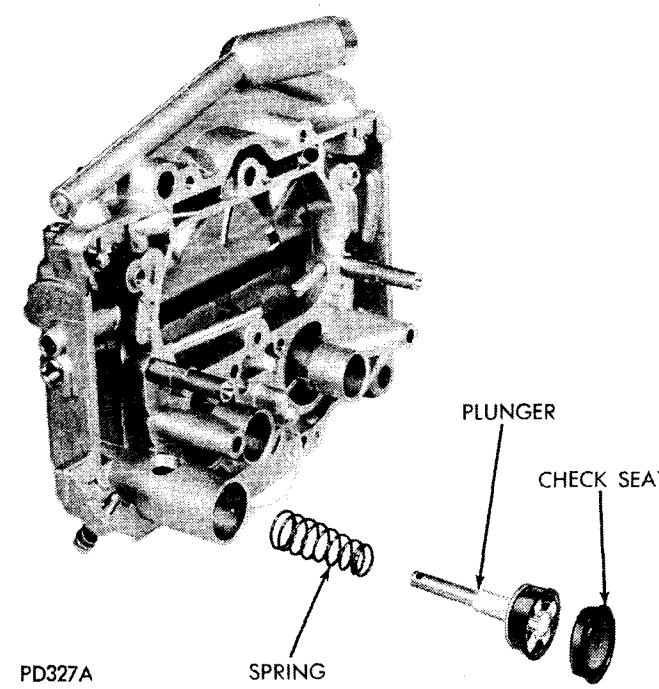


Fig. 15—Accelerating Pump Assembly (Disassembled View)

damaged check needle. Clean again and install a new check needle. Retest for leakage.

(8) If discharge check needle leaks after above test, attempt to reseat as follows:

(a) Insert a piece of drill rod down on needle. Lightly tap drill rod with a hammer to form a new seat. Remove and discard needle and install a new one. Retest as described previously. If service fix does not correct the condition, a new carburetor will have to be installed.

(b) Install accelerator pump jet housing, new gasket and attaching screw. Tighten securely.

(c) Test operation, a clear straight stream should emit from each jet. If streams are not identical, a new accelerator pump jet housing should be installed. After test, remove bowl cover and accelerate pump passage tube (plastic) from bowl cover.

(9) If carburetor is equipped with bowl vent, install new grommet seal on bowl vent arm, position bowl vent arm in bowl cover with bowl vent arm spring hooked in arm, then install bowl vent actuating lever, being sure lever goes through loop of spring and flat end engages slot in bowl vent arm. Install retainer clip. **Bowl vent lever should be up when installed with bowl cover in an inverted position.**

(10) Install gaskets on fuel inlet needle seats, then install in bowl cover. Tighten securely. (Be sure each needle seat and needle is reinstalled in its original position if being reused).

(11) Place a new bowl cover to main body gasket in position on bowl cover, then slide right and left floats into position in bowl cover, then install float fulcrum pins. **Be sure marked float is installed on pump side of the bowl cover.** Refer to Carburetor Adjustments for Adjustment Procedure.

(12) Install accelerator pump passage tube (plastic).

(13) **Caution: Examine primary "O" ring seals in bottom of main body to be certain that they are centered over holes (Fig. 12), then carefully lower bowl cover down on main body. The "O" rings will hold the bowl cover up slightly until screws are installed. Be sure bowl vent operating lever engages bowl vent actuating lever. Install ten cover screws and tighten to 50 inch-pounds, in two operations.**

(14) Install fuel inlet fitting with a new gasket and tighten securely.

(15) Engage pump rod "S" link with hole in accelerator pump arm, then position arm on air horn and install pump arm screw (Fig. 17).

(16) Engage throttle connector rod with hole in throttle lever. Install other end in accelerator pump arm (center hole) and install rod retainers.

(17) Install step up piston spring in piston cylinder, followed by step up rods and piston and arm assembly. Install cover plate and attaching screw. Tighten securely.

(18) Engage choke connector rod with hole in choke shaft lever, then swing rod at an arc until rod can engage choke countershaft. Install rod retainer.

(19) Engage fast idle connector rod with slot in fast idle operating lever, then swing rod at an arc until lever can engage choke countershaft (with choke valve held in open position) install lever and attaching screw. Tighten securely while holding lever.

(20) Engage choke diaphragm connector rod to air valve lever, then install washer and rod retainer. Install other end to choke vacuum diaphragm plunger and install rod retainer.

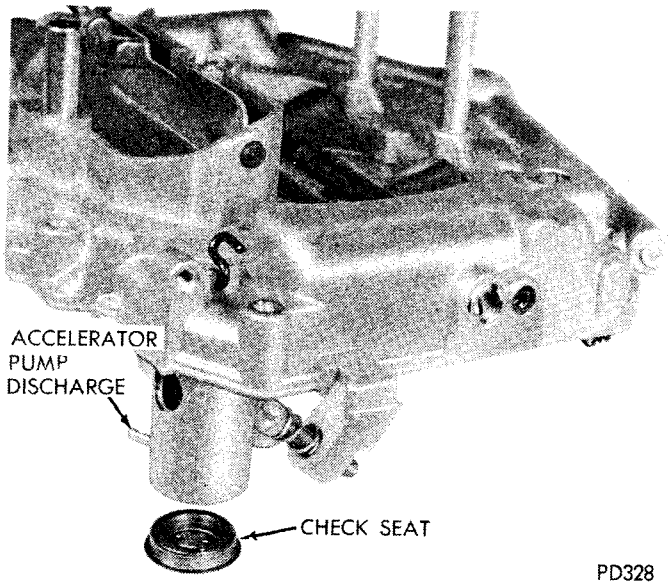


Fig. 16—Installing Check Seat

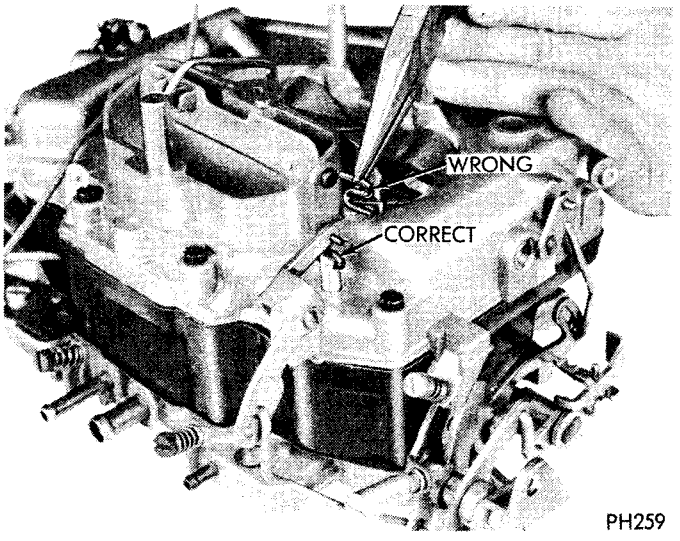
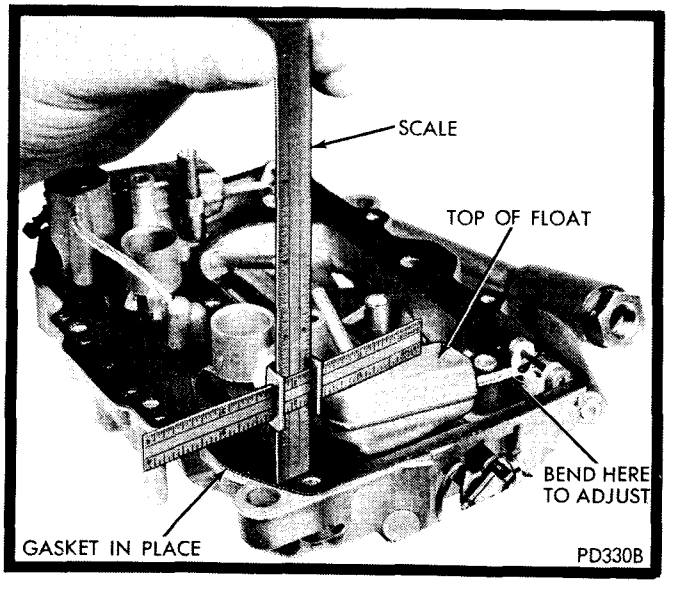


Fig. 17—Pump Shaft "S" Link Installation

THERMO-QUAD CARBURETOR ADJUSTMENT

1. FLOAT SETTING ADJUSTMENT

27/32" (± 1/32")	TQ-6545S TQ-9096S



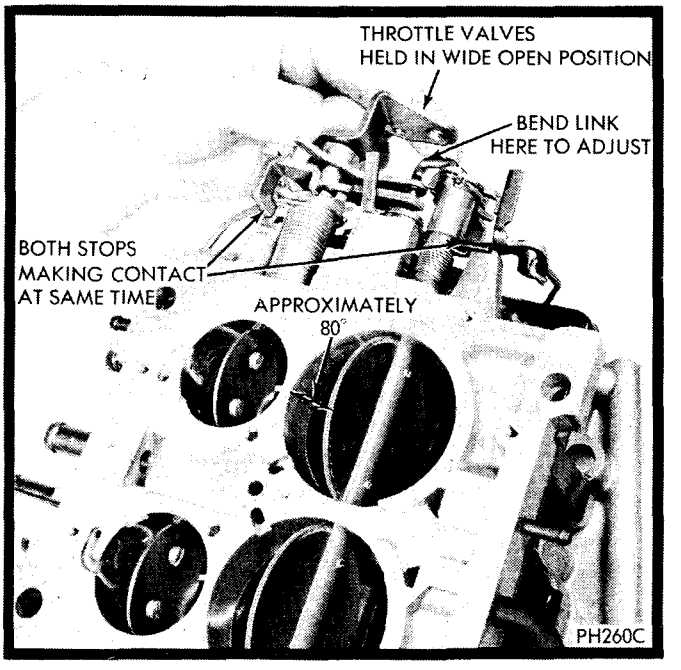
(1) Invert bowl cover.

(2) Install bowl cover gasket and with floats resting on seated needle the dimension of each float from bowl cover gasket to bottom side of float should be as indicated in "Specifications."

(3) If adjustment is necessary bend lever as shown above. **Never allow lip of float lever to be pressed against needle when adjusting.**

2. SECONDARY THROTTLE LINKAGE ADJUSTMENT

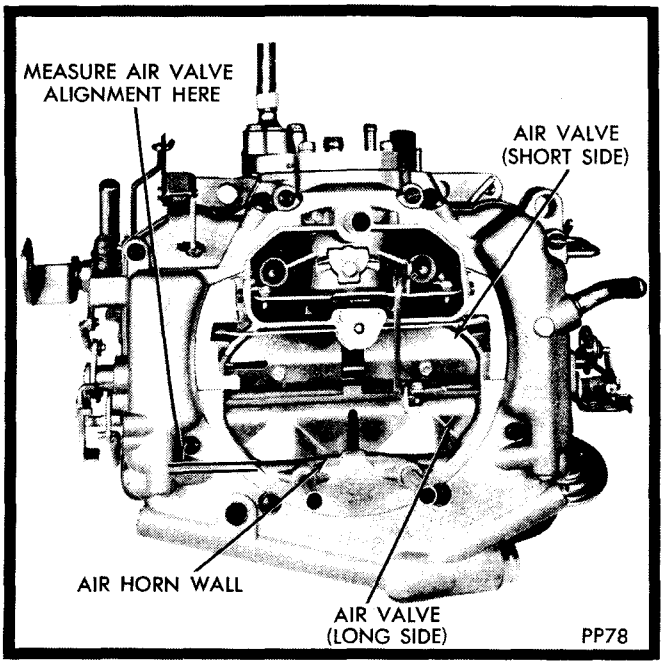
adjust link so that primary and secondary levers both contact stops at the same time	TQ-6545S TQ-9096S



To check the secondary throttle linkage adjustment, hold fast idle lever in curb idle position and invert carburetor. Slowly open primary throttle valves until it is possible to measure specified distance between lower edge of primary valve and the bore (opposite idle port). At this measurement secondary valves should just start to open. If an adjustment is necessary, bend secondary throttle operating rod at angle with Tool T-109-213, until correct adjustment has been obtained. See Specifications.

3. SECONDARY AIR VALVE ALIGNMENT

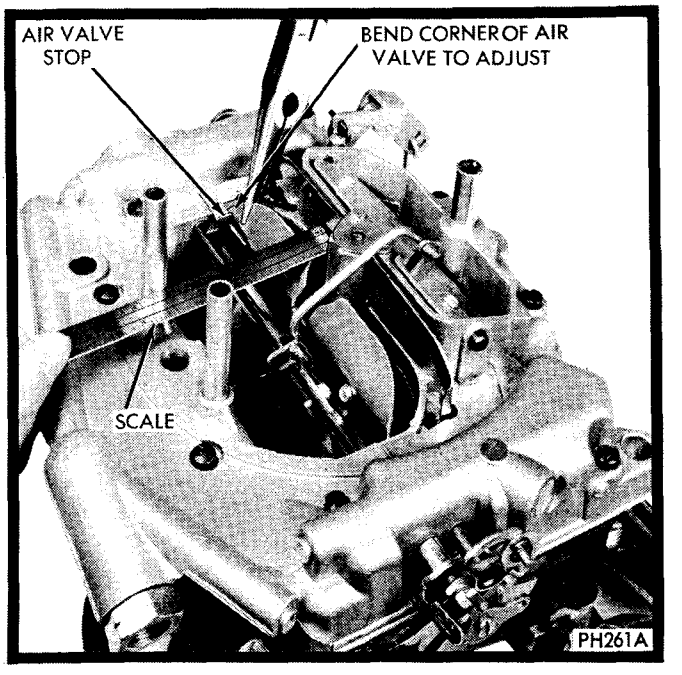
refer to procedure below	TQ-6545S TQ-9096S



(1) With air valve in closed position the opening between the air valve and air horn wall at the long side must be at its maximum and parallel with air horn gasket surface.

4. SECONDARY AIR VALVE OPENING ADJUSTMENT

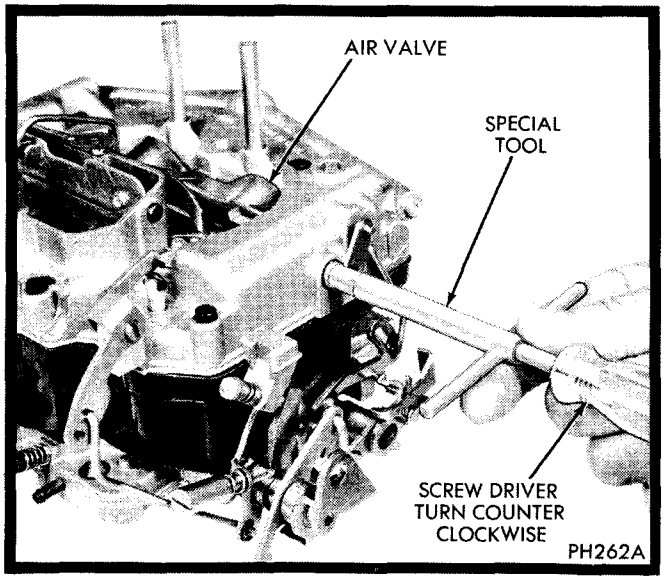
1/2"	TQ-6545S TQ-9096S



(1) With air valve in wide open position, the opening of the air valve at the short side and air horn should be as shown in Specifications. The corner of air valve is notched for adjustment. Bend the corner with a pair of pliers to give proper opening.

5. SECONDARY AIR VALVE SPRING TENSION ADJUSTMENT

1-1/4 turns	TQ-6545S
from contact	TQ-9096S



(1) Hold air valve adjustment plug with screwdriver when loosening lock plug or the spring may snap out of position requiring disassembly of the carburetor to retrieve the spring.

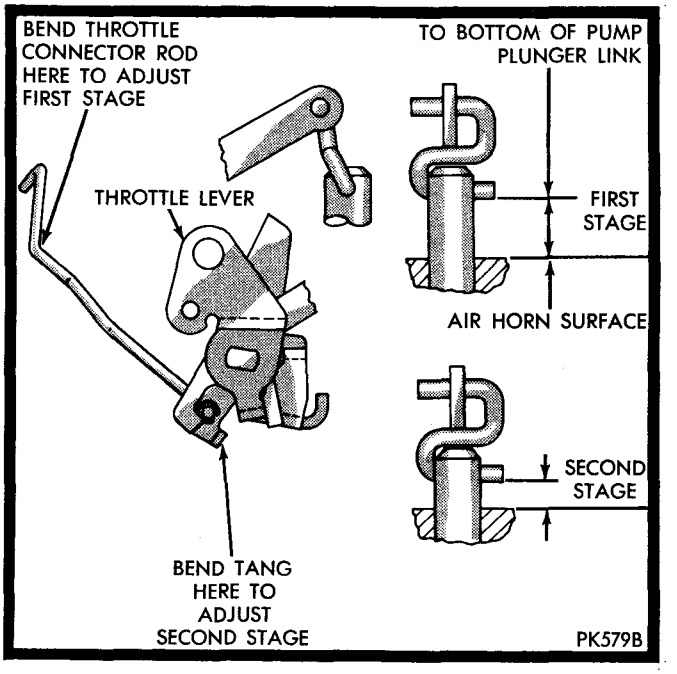
(2) Loosen air valve lock plug and allow air valve to position itself to wide open position.

(3) With a long screwdriver that will enter center of Tool C-4152 positioned on air valve adjustment plug, turn plug **counterclockwise** until air valve contacts stop lightly, test with finger, then an additional turn (refer to specifications).

(4) Hold adjustment plug with screwdriver, and tighten lock plug securely with Tool C-4152. Be sure adjustment does not move. Check air valve for freedom of movement.

6. ACCELERATOR PUMP STROKE ADJUSTMENT

at curb idle	at secondary pick up	TQ-6545S
5/16"	3/16"	TQ-9096S



Accelerator pump stroke is determined by measurement of the accelerator pump plunger height above the air horn surface **at curb idle.** Carburetors with staged pump systems require a second height measurement at a throttle position related to a secondary throttle lockout. Adjust as follows:

FIRST STAGE

(1) Be sure throttle connector rod is in center hole of three hole pump arm or in the inner hole of a two hole arm.

(2) Use scale to measure height of accelerator pump plunger link (bottom) **at curb idle** (ignition ON when equipped with a solenoid idle stop, not throttle positioner). Pump measurements are shown in specifications.

(3) Adjust plunger height by bending the throttle connector rod in the proper area.

SECOND STAGE

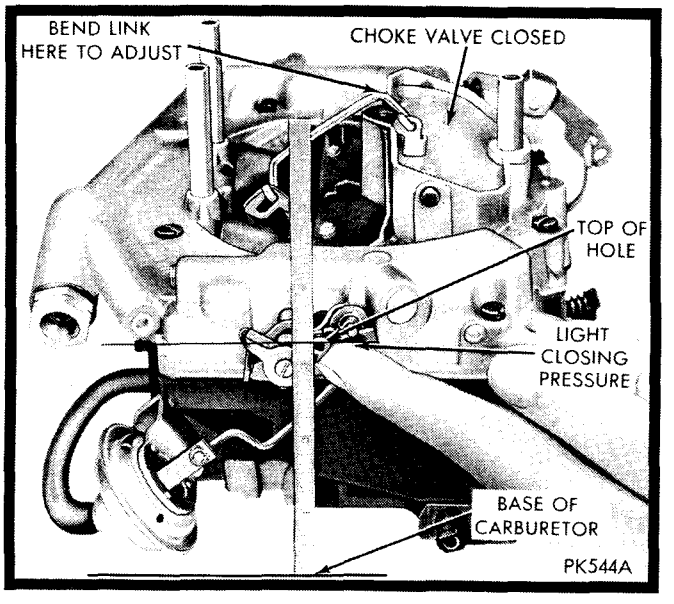
(1) When second stage specifications are indicated, open choke then open throttle until secondary lockout latch is **just** applied. Note that plunger travel downward stops at that point.

(2) Use scale to measure to bottom of accelerator pump plunger link. See specifications.

(3) Adjust by bending proper tang.

7. CHOKE CONTROL LEVER ADJUSTMENT

3-3/8" (off vehicle)	TQ-6545S TQ-9096S



(1) Place carburetor on flat object with surface flush against bottom of flange and extending out under choke control lever.

(2) Close choke by pushing on choke lever with throttle partly open.

(3) Measure vertical distance from top of rod hole in control lever down to flat surface simulating carburetor bottom.

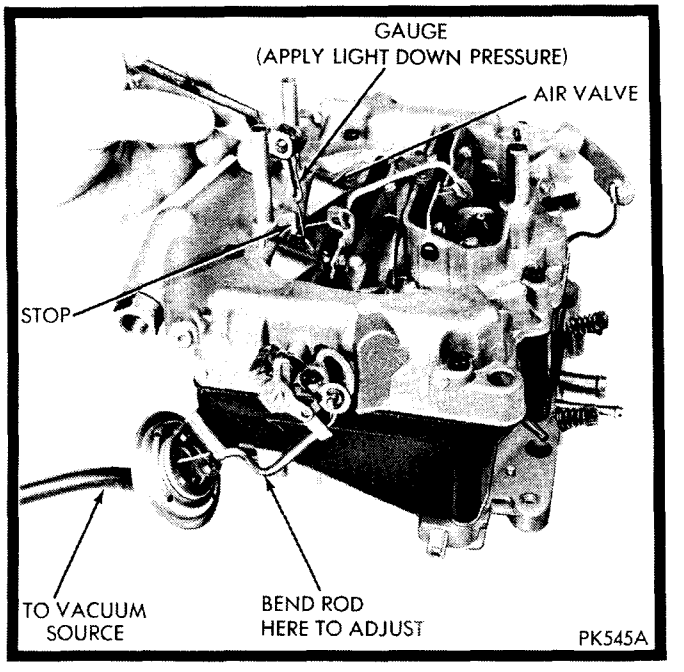
(4) Scale should read 3-3/8 inches.

(5) Adjust by bending the link connecting the two choke shafts as indicated.

NOTE: IF CHOKE CONTROL LEVER ADJUSTMENT IS CHANGED THE VACUUM KICK, FAST IDLE CAM POSITION AND CHOKE UNLOADER ADJUSTMENTS MUST ALSO BE RESET.

8. CHOKE DIAPHRAGM CONNECTOR ROD ADJUSTMENT

.040"	TQ-6545S TQ-9096S



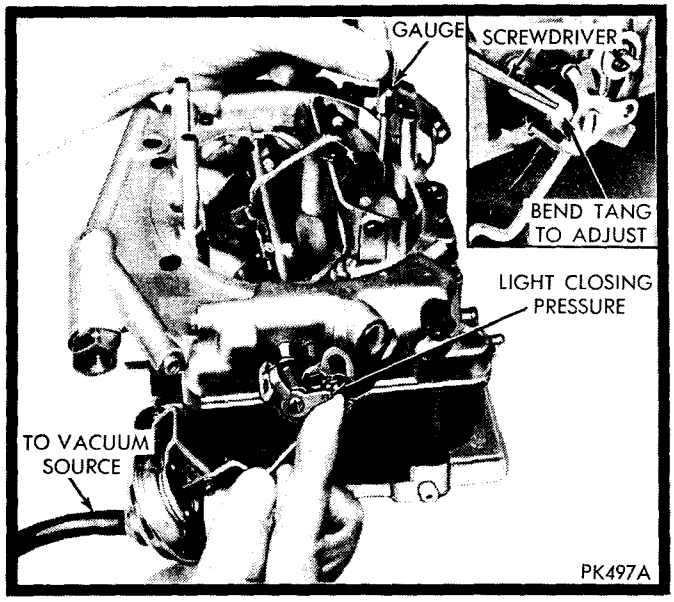
(1) Be sure diaphragm is securely mounted on carburetor. Apply a vacuum of 15 or more inches of Hg to diaphragm to fully depress diaphragm stem.

(2) With light opening pressure on air valve adjust connector rod to give specified clearance between air valve and stop.

NOTE: IF CHOKE DIAPHRAGM CONNECTOR ROD ADJUSTMENT IS CHANGED THE VACUUM KICK ADJUSTMENT MUST ALSO BE RESET.

9. CHOKE VACUUM KICK ADJUSTMENT

.160"	TQ-6545S
.100"	TQ-9096S



(1) **Off vehicle,** using an auxiliary vacuum source, disconnect vacuum hose from carburetor and connect it to hose from vacuum supply with a small length of tube to act as a fitting. Removal of hose from diaphragm may require forces which could bend the diaphragm bracket. **Be sure diaphragm is securely mounted on carburetor.** Apply 15 inches of vacuum to the diaphragm.

(2) Insert specified gauge between long side (lower edge) of choke valve and the air horn wall at a point close to the outboard end of the gauging area. See Specifications. **Apply sufficient closing pressure on choke control lever to provide a minimum choke valve opening without distortion of choke linkage.** Note that only this system rotates a spring connecting the control lever to an adjustment lever. The correct stops must be in contact for proper measurement of vacuum kick adjustment.

(3) **Adjustment will be necessary if slight drag is not obtained as gauge is being removed.** Bend the tang indicated in to change contact with end of diaphragm rod. **Do not adjust diaphragm rod.** Adjust tang carefully with a twisting force on screwdriver.

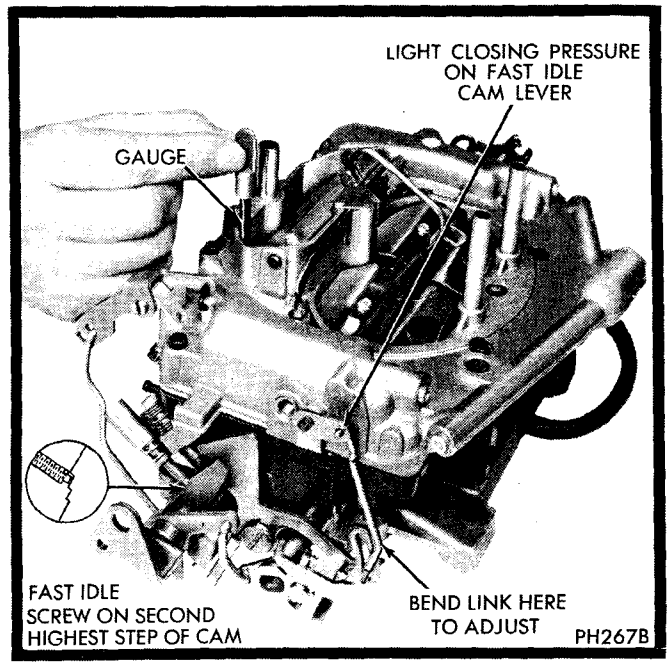
(4) With vacuum applied to diaphragm **Choke Valve Should Move Freely** between open and adjusted positions. If movement is not free, examine system for misalignment or interferences and correct. Repeat adjustment if necessary.

(5) Reinstall vacuum hose on correct carburetor fitting.

10. FAST IDLE CAM POSITION ADJUSTMENT

.100"	TQ-6545S TQ-9096S

measure at the lowest edge of the choke plate



(1) With fast idle speed adjusting screw contacting second highest speed step on fast idle cam, move choke valve towards closed position with light pressure on cam control lever.

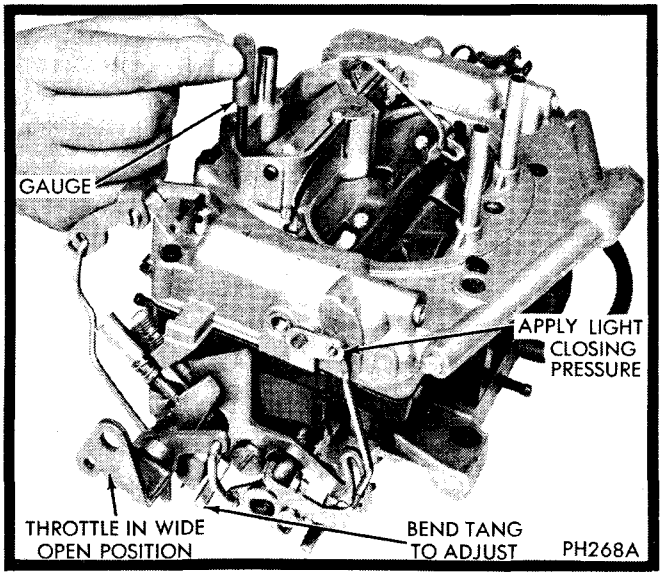
(2) Insert specified gauge (see Specifications) between choke valve and wall of air horn. An adjustment will be necessary if a slight drag is not obtained as gauge is being removed.

(3) If an adjustment is necessary, bend fast idle connector rod at angle until correct valve opening has been obtained. (Use Tool T-109-213).

NOTE: IF FAST IDLE CAM POSITION ADJUSTMENT IS CHANGED THE CHOKE UNLOADER AND SECONDARY THROTTLE LOCKOUT ADJUSTMENTS MUST BE RESET.

11. CHOKE UNLOADER ADJUSTMENT (WIDE OPEN KICK)

.310″	TQ-6545S TQ-9096S

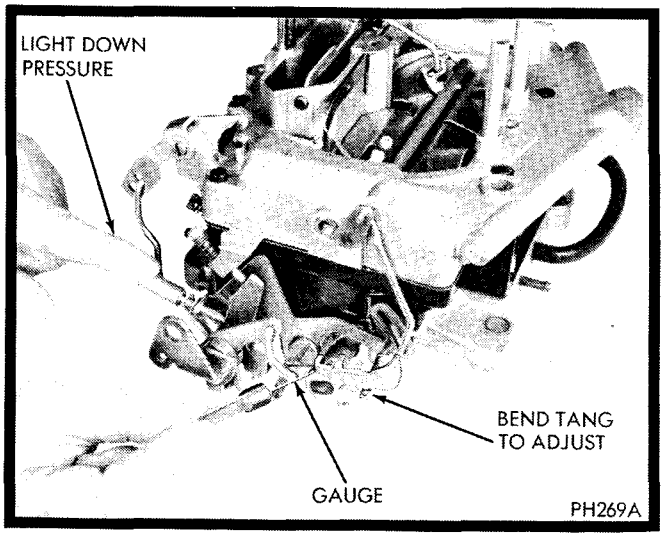


(1) Hold throttle valves in wide open position. Insert specified gauge between long side (lower edge) of choke valve and inner wall of air horn. See Specifications.

(2) With finger lightly pressing against cam control lever, a slight drag should be felt as gauge is being withdrawn. If necessary, adjust by bending tang on fast idle lever until correct opening has been obtained.

12. SECONDARY THROTTLE LOCKOUT ADJUSTMENT

.060″-.090″	TQ-6545S TQ-9096S



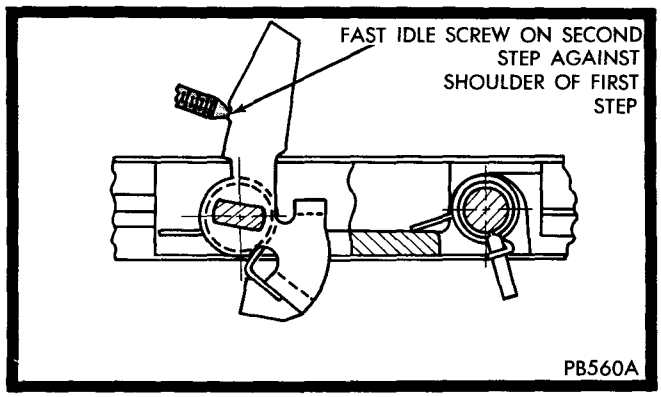
(1) Move fast idle control lever to open choke position.

(2) Measure clearance between lockout lever and stop. It should be as shown in specifications.

(3) Bend tang on fast idle control lever to provide proper clearance.

13. FAST IDLE SPEED ADJUSTMENT

1700 RPM	TQ-6545S TQ-9096S



Fast idle engine speed is used to overcome cold engine friction, stalls after cold starts and stalls because of carburetor icing. Set this adjustment after vehicle odometer indicates over 500 miles to insure a normal engine friction level. Prepare engine by driving at least five miles. Connect a tachometer and set curb idle speed and mixture, then proceed as follows:

(1) Remove air cleaner.

(2) With engine off, transmission in NEUTRAL and parking brake set, open throttle and close choke.

(3) Close throttle to place fast idle speed screw on highest speed step.

(4) Move fast idle speed screw until screw drops to second highest speed step.

(5) Start engine and determine stabilized speed. Turn fast idle speed screw to obtain speed listed in specifications.

(6) Stopping engine between adjustments is not necessary. However, reposition speed screw on cam after each speed adjustment to provide correct throttle closing torque.

Before adjusting idle and/or fast idle speeds and mixtures, make sure that the basic timing is correctly adjusted.

FUEL TANKS

INDEX

	Page
Fuel Tank (Frame Mounted)	115
Removal	115
Installation	118
Fuel Tank (In Cab)	114
Removal	114
Installation	115

GENERAL INFORMATION

The standard equipment fuel tank on the D-200 and W-200 149 inch wheelbase crew cab models, all conventional cab, cab chassis models, and W-300 models, is an in-cab fuel tank of twenty-four gallons capacity. On the D-100, D-200 and D-300, W-100 and W-200 conventional cab sweptline models and D-200 crew cab sweptline models, the in-cab tank is an auxiliary fuel tank. (Fig. 1).

The standard equipment fuel tank on all other D-100, D-200 and D-300, W-100 and W-200 models is located between the left frame structure and the propeller shaft, forward of the rear axle, the tank is constructed of high density polyethylene and has a twenty gallon capacity (eighteen gallons on 115-inch wheelbase). (Fig. 2).

The auxiliary fuel tank on the D-100, D-200 and D-300, W-100 and W-200 club cab models is located behind the rear axle. This tank is also constructed of high density polyethylene and has a capacity of twenty-one gallons. (Fig. 5).

When an auxiliary tank is used in either vehicle, each tank can be filled independently.

The fuel lines from both tanks are connected to a solenoid valve. A fuel tank selector switch mounted on the instrument panel will position the solenoid valve so that fuel can be used from one tank or the other but not both tanks at the same time. When the selector switch is "in", fuel is being used from the standard equipment tank and when the switch is pulled "out" fuel is being used from the auxiliary tank. One fuel gauge on the instrument panel responds to the fuel tank selected. Each tank has its own sending unit. (Figs. 3 and 6).

FUEL TANK (IN CAB)

Removal

(1) Disconnect battery ground cable.

(2) Remove fuel tank filler cap before disconnecting any fuel or vent lines. The tank could be under a small pressure.

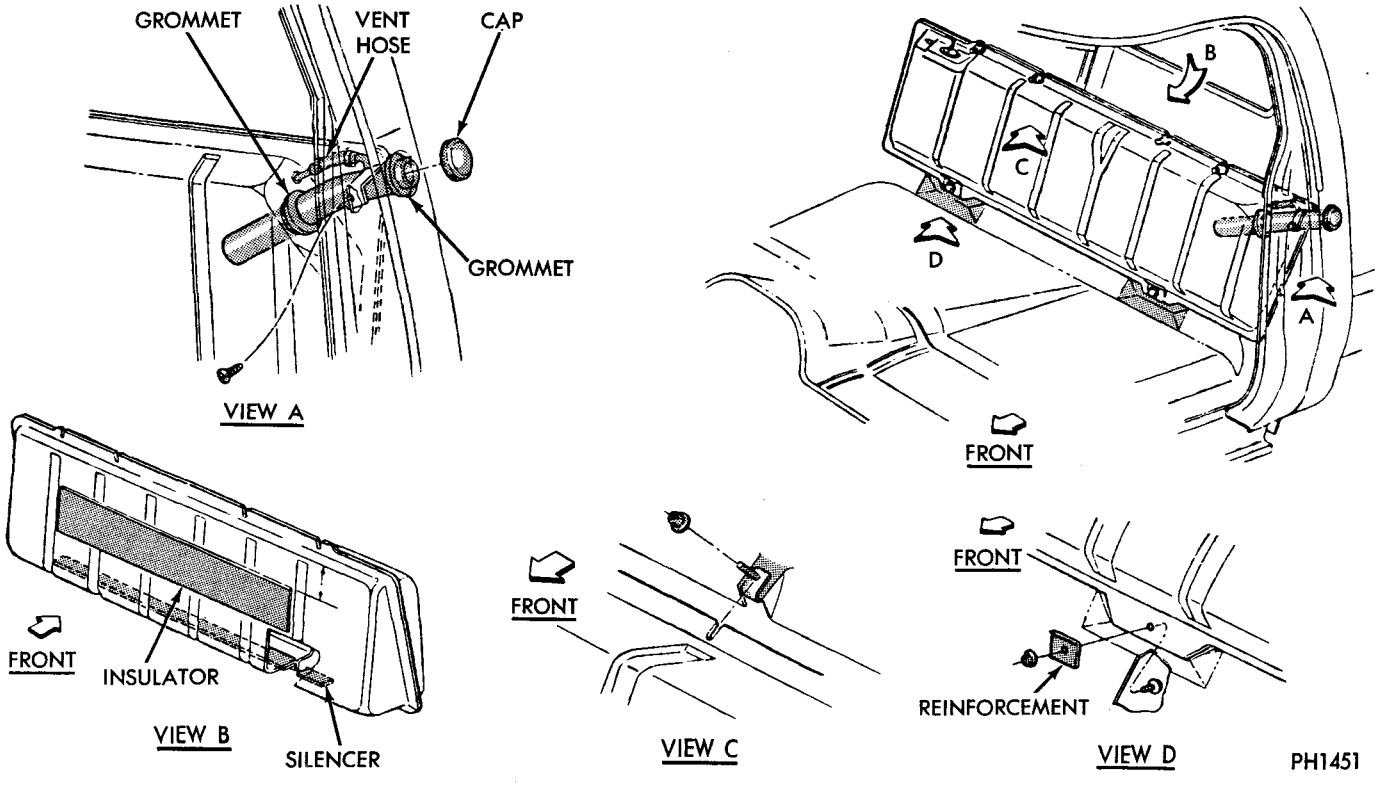


Fig. 1—Fuel Tank Installation—D100, D200, D300 and W100, W200, W300 Conventional Cab Models

(3) Pump all fuel from fuel tank and auxiliary tank if so equipped into an approved portable holding tank. If this equipment is not available, disconnect fuel line and connect a siphon hose to the tube at the tank gauge unit. Drain fuel tank dry into a properly identified "Gasoline" safety container.

(4) From under vehicle, remove four nuts from seat mounting studs and remove seat from cab.

(5) Disconnect gauge wire, vent lines, fuel line and remove rubber grommet from outer end of filler tube.

(6) Remove screw from filler tube mounting bracket (located on the face of the "B" pillar).

(7) Loosen four nuts from mounting studs along the top of the tank and remove two bolts from the bottom of the tank.

(8) Working through the passenger side door opening, tip the bottom of the tank forward and remove the tank from the vehicle.

(9) Remove the tank gauge unit using spanner wrench C-3582. Slide gauge unit assembly out of the tank. Discard gasket.

Installation

(1) Insert a new gasket in the fuel gauge opening recess then slide gauge assembly into tank. Align the positioning tangs on the gauge with those in the tank. Install the lock ring, then tighten securely using tool C-3582.

(2) Position tank in cab and tighten bolts and nuts securely.

(3) Connect gauge wire, vent tubes and fuel line.

(4) Install filler tube grommet over end tube and install retaining screw in filler tube mounting bracket.

(5) Place seat in vehicle and install nuts on seat mounting studs under vehicle. Tighten securely.

(6) Refill fuel tank and check all lines and hoses for leaks. Connect battery cable.

(7) For testing fuel gauge, refer to Electrical "Group 8".

FUEL TANK (FRAME MOUNTED)

Removal

(1) Disconnect battery ground cable.

(2) Remove fuel tank filler cap before disconnecting any fuel or vent lines. The tank could be under a small pressure.

(3) Pump all fuel from fuel tank into an approved portable holding tank. If this equipment is not available, disconnect the fuel line and drain tank dry into a properly identified "Gasoline" safety container.

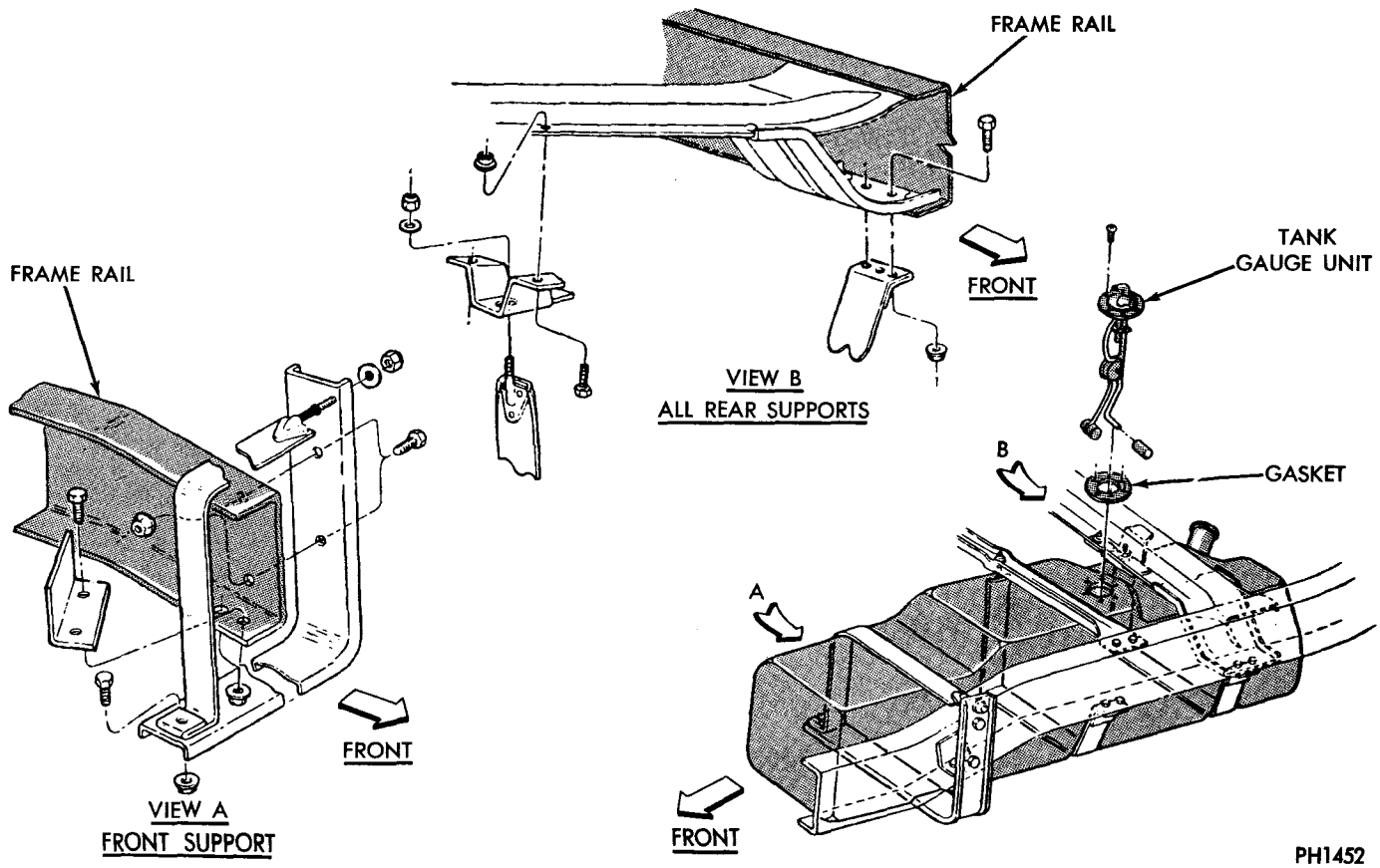


Fig. 2—Frame Mounted Fuel Tank—D100 and W100 Conventional Cab Models with 115" Wheelbase

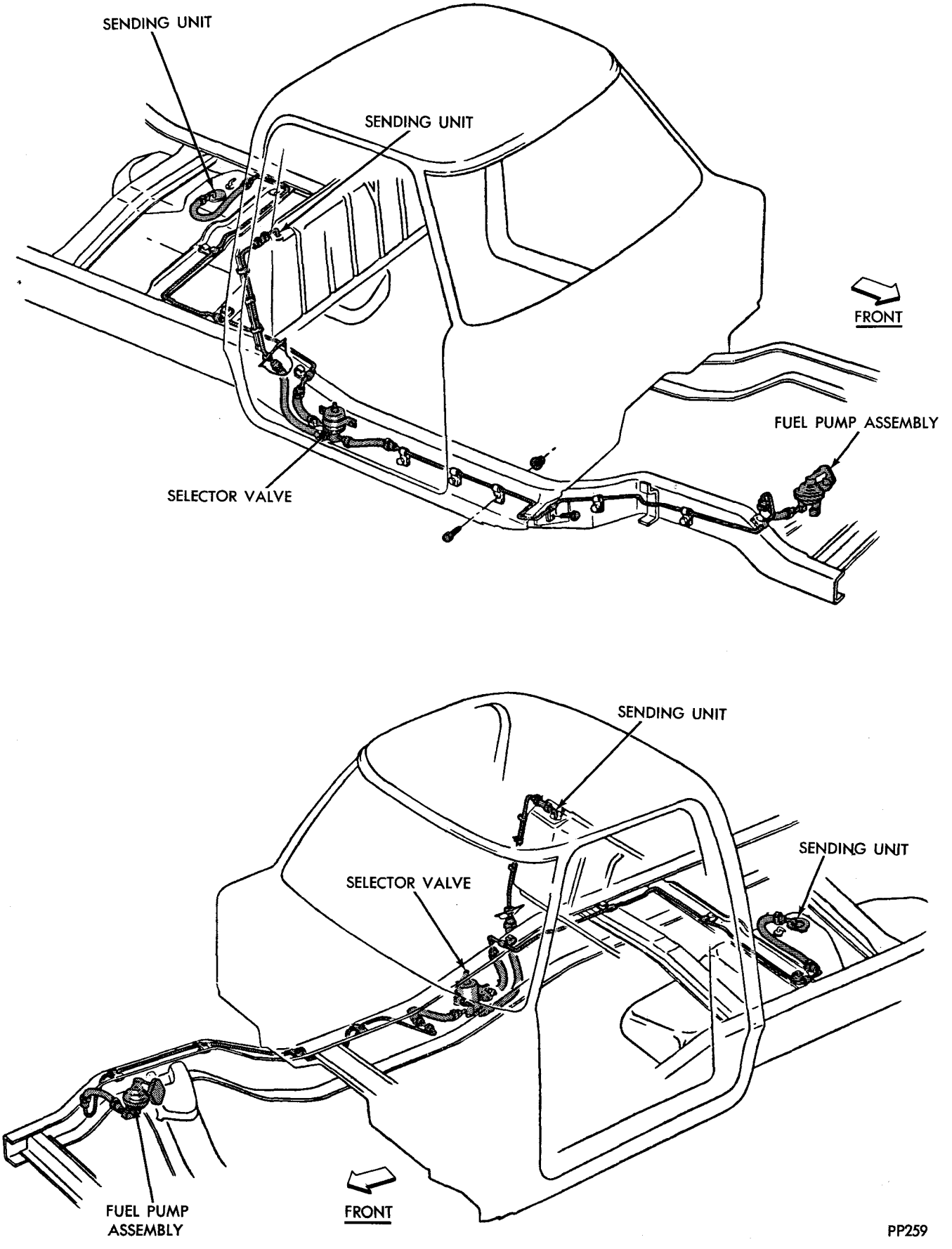


Fig. 3—Fuel Line Routing and Solenoid Valve—D100, D200, D300 and W100, W200, W300 Models

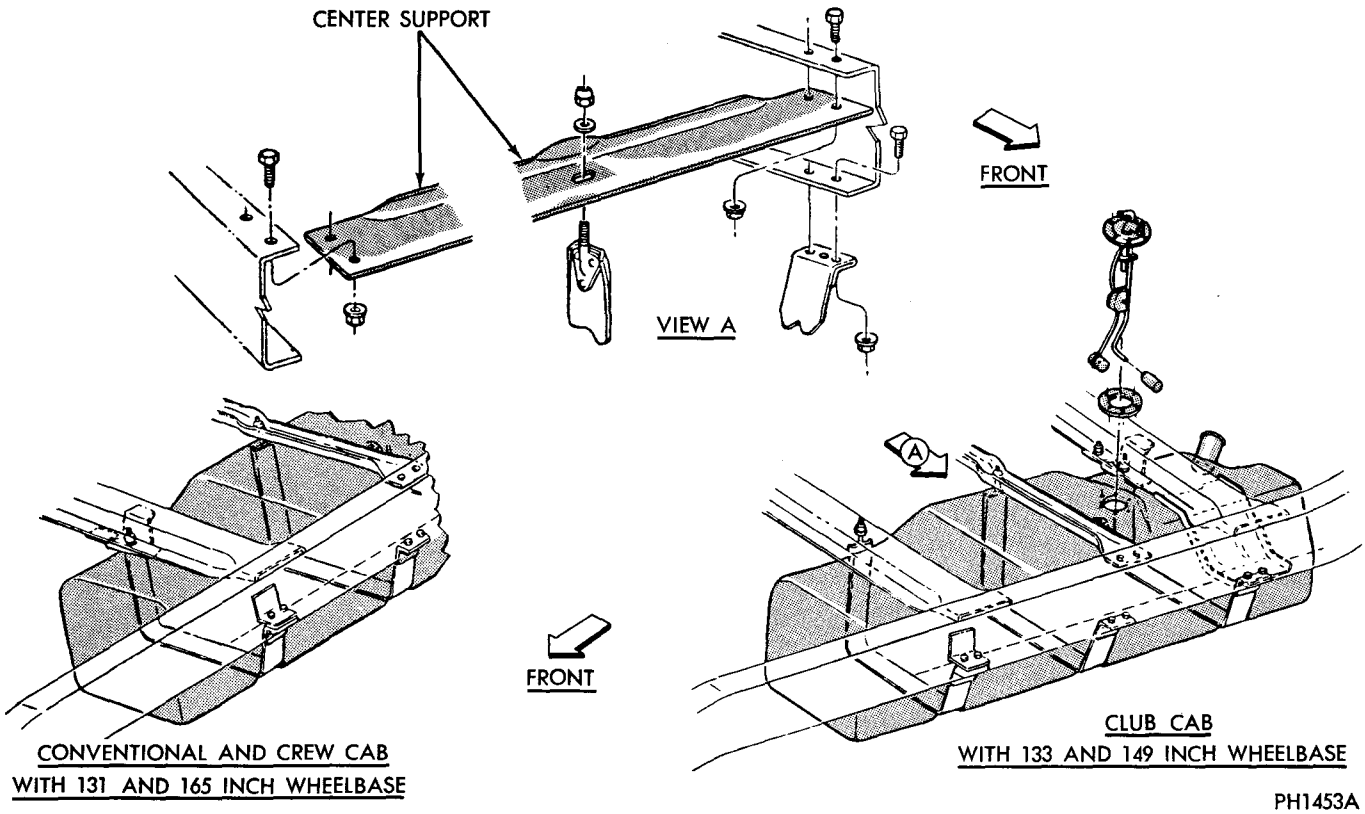


Fig. 4—Frame Mounted Fuel Tanks—D100, D200, D300 and W100, W200 Models

(4) Raise vehicle on hoist and disconnect all vent hoses and filler hose. Remove the vent hoses from hose routing bracket attached to the top of the frame rail.

(5) Remove the nut from the outboard end of the center retaining strap and allow strap to hang free.

(6) Place a transmission jack, centrally, under the fuel tank and apply slight pressure.

(7) Remove the nuts from the outboard ends of the two remaining straps and lower tank far enough to allow the gauge wire and fuel line to be disconnected

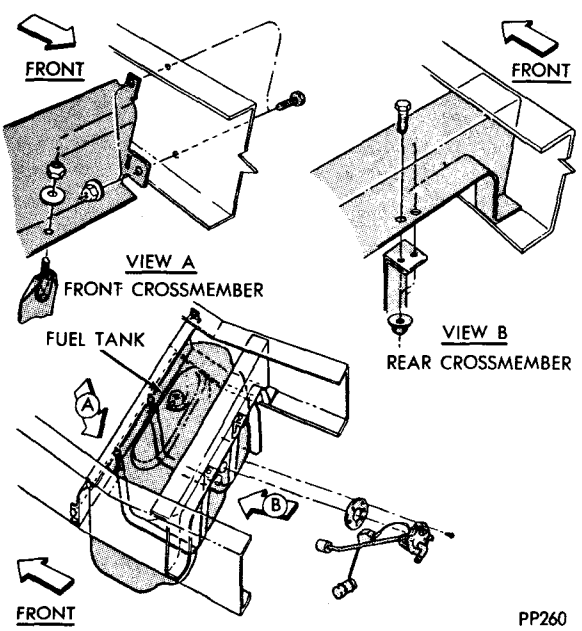


Fig. 5—Rear Mounted Fuel Tanks—D100, D200, D300 and W100, W200 Club Cab Models

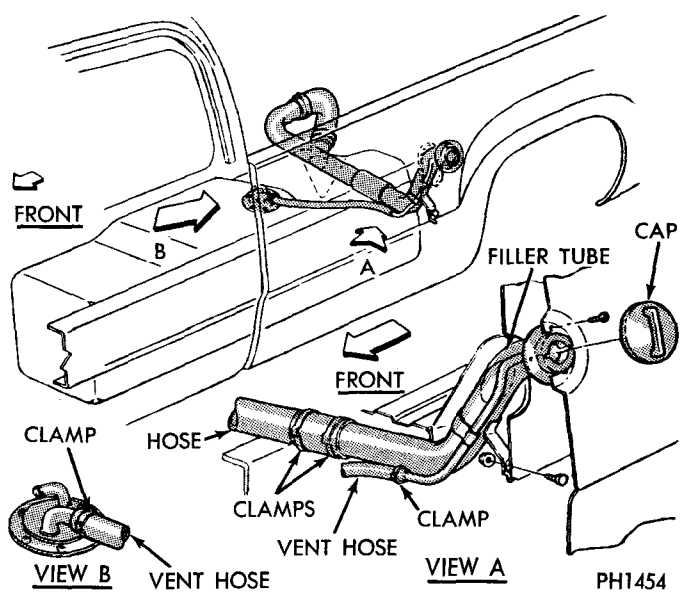


Fig. 7—Fuel Tank Filler Tube Assembly—D100, D200, D300 and W100, W200 Sweptline Models

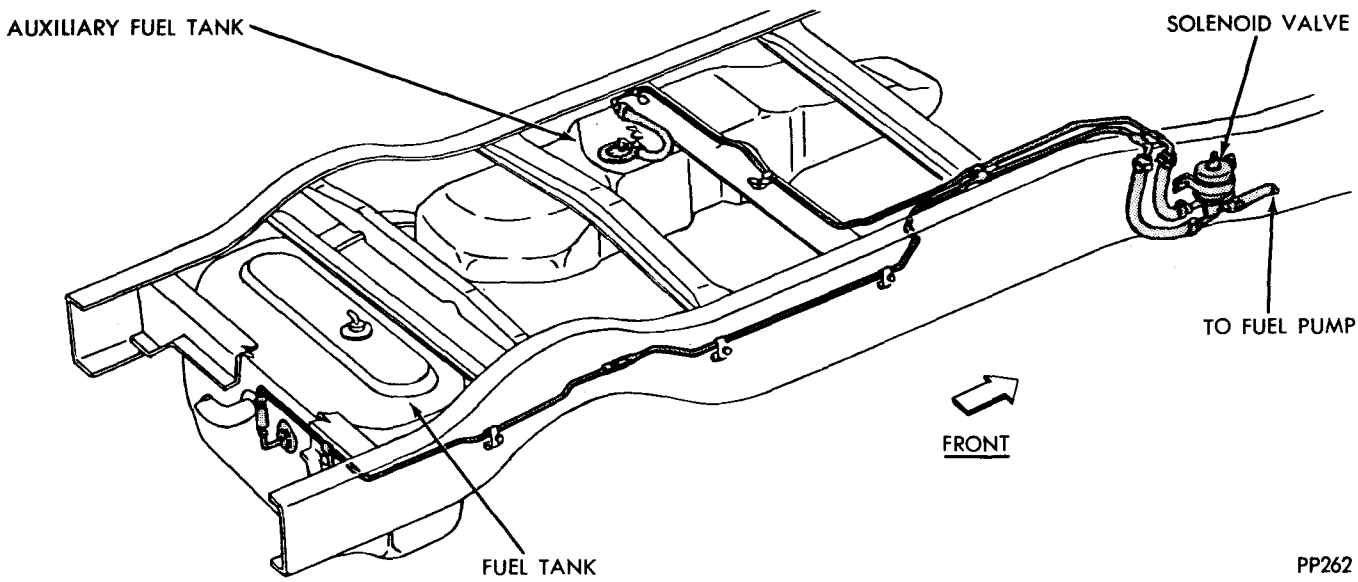


Fig. 6—Fuel Line Routing and Solenoid Valve—D100, D200, D300 and W100, W200 Club Cab Models

from the gauge unit on top of the tank. Then lower tank further and remove from under vehicle.

Installation

If the gauge unit or filler hoses are removed it is advisable to install new gaskets when reassembling.

(1) Place fuel tank on top of transmission jack and raise high enough to connect the fuel line and gauge wire to the gauge unit on top of the tank.

(2) Raise tank into position in crossmembers and connect the two end retaining straps. Remove transmission jack and connect the center strap. Tighten all three straps firmly. (Figs. 2 and 4).

Do not over tighten retaining strap nuts.

(3) Connect vent hoses.

(4) Connect filler hose to adapter at back of cab. Connect fuel line if it was disconnected to drain tank.

(5) Refill fuel tank and inspect all hoses and lines for leaks. Connect battery cable.

Frame mounted fuel tank installation for D500, D600, D800 and W600 models is shown in Figures 10 and 11.

FUEL TANK (REAR MOUNTED)

Removal

(1) Disconnect battery ground cable.

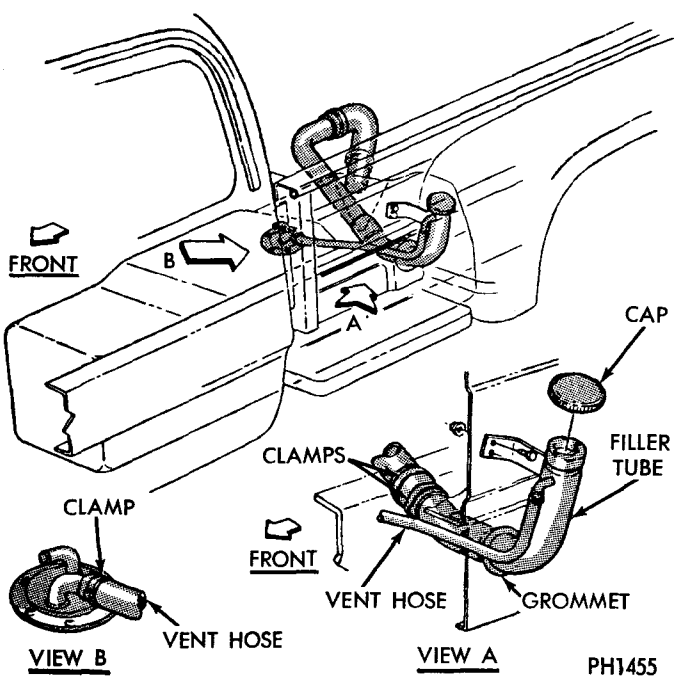


Fig. 8—Fuel Tank Filler Tube Assembly—D100, D200 and W100, W200 Utiline Models

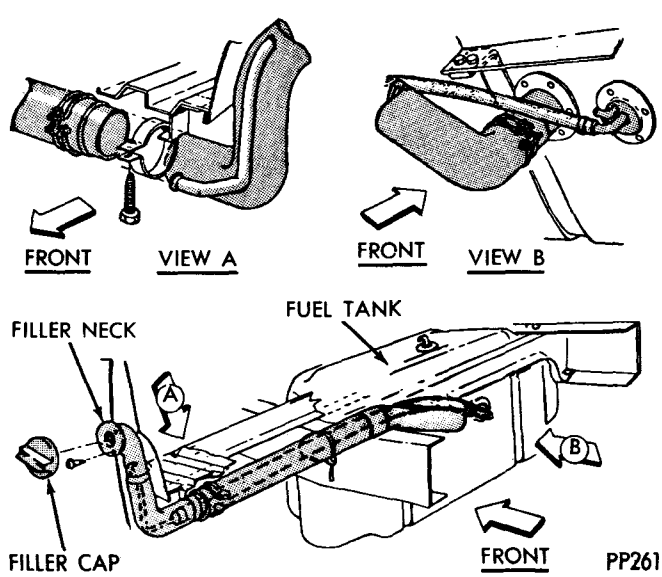


Fig. 9—Fuel Tank Filler Tube Assembly—D100, D200, D300 and W100, W200 Club Cab Models

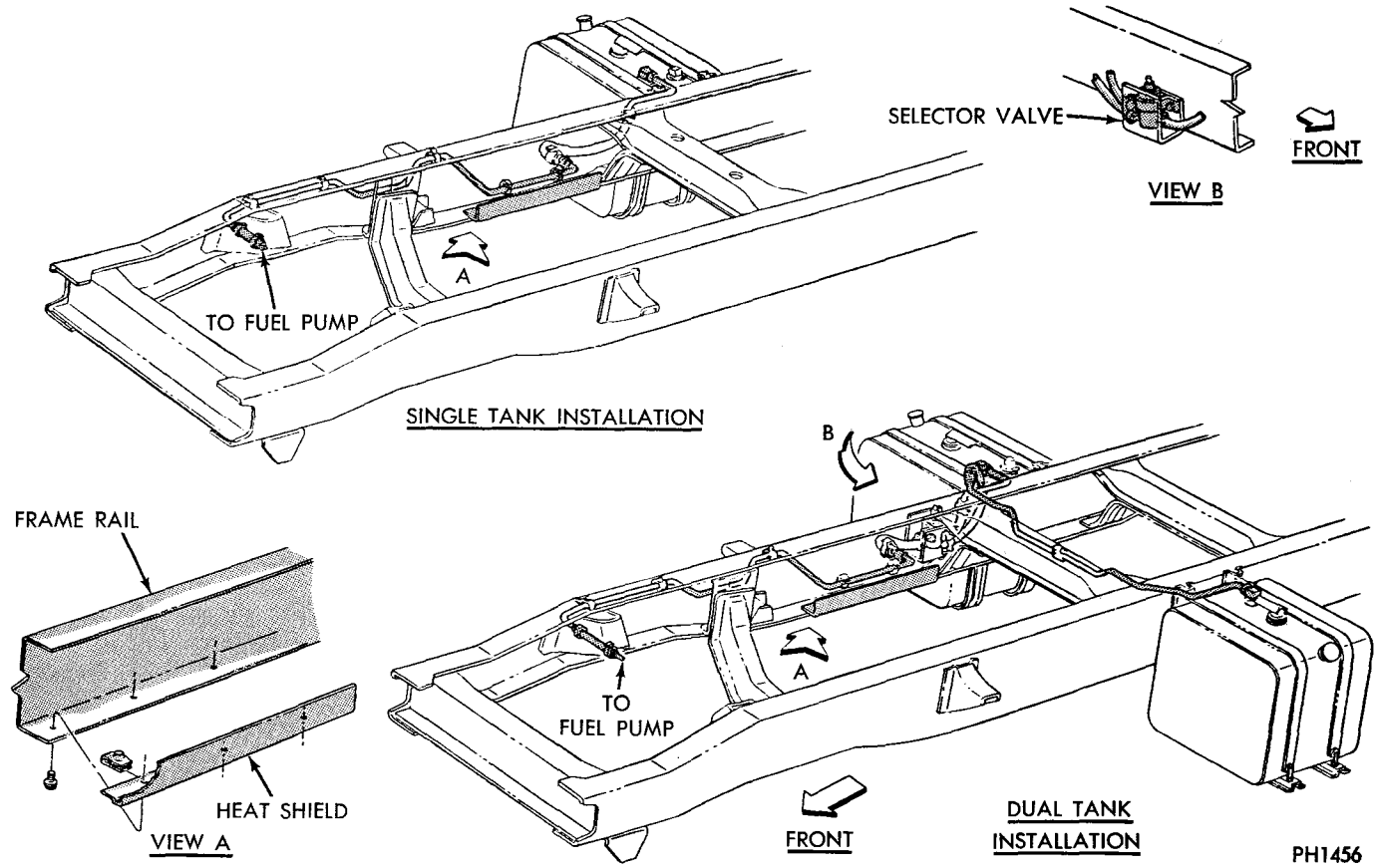


Fig. 10—Frame Mounted Fuel Tanks—D500, D600, D800 and W600 Models

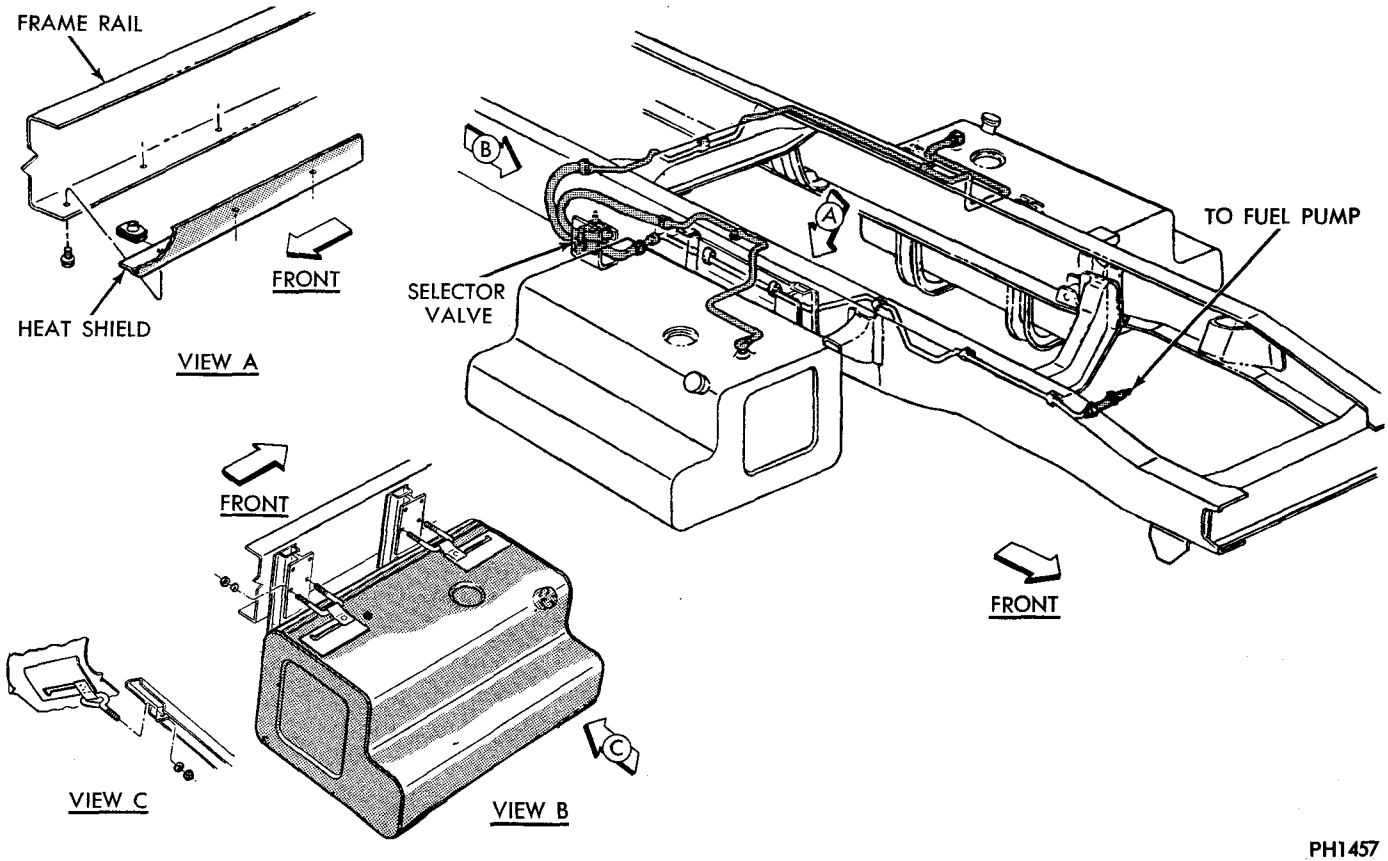


Fig. 11—Step Tank Installation (Single or Dual) D800 Models

(2) Remove fuel tank filler cap before disconnecting any fuel or vent lines. The tank could be under a small pressure.

(3) Pump all fuel from fuel tank into an approved portable holding tank. If this equipment is not available, disconnect the fuel line and drain tank dry into a properly identified "gasoline" safety container.

(4) Raise vehicle on hoist and disconnect gauge wire, fuel line, filler hose and fill vent hose.

(5) Place a transmission jack, centrally, under the fuel tank and apply slight pressure.

(6) Remove the nuts from the forward ends of the two retaining straps and lower tank far enough to allow the ECS vent hose to be disconnected from the top of the tank. Then lower tank further and remove from under the vehicle.

Installation

If the gauge unit is removed it is advisable to install a new gasket when reassembling.

(1) Place fuel tank on top of transmission jack and raise high enough to connect the ECS vent hose to the top of the tank.

(2) Raise tank into position and connect the two retaining straps. Remove transmission jack. Tighten both straps firmly. (Fig. 5). **Do not over tighten retaining strap nuts.**

(3) Connect gauge wire, fuel line, filler hose and fill vent hose.

(4) Refill fuel tank and inspect all hoses and lines for leaks. Connect battery cable.

FUEL PUMPS

INDEX

	Page
General Information	120
Service Diagnosis	121
Service Procedures	122
Special Service Tools	129
Specifications	125
Testing Fuel Pump (On Vehicle)	122

GENERAL INFORMATION

Fuel Pump Model MS-6771S is used on the 225 CID engines (Fig. 1).

Fuel Pump Model MS-6866S or MS6772S is used on the 318 and 360 CID engine (Fig. 2). Fuel Pump Model MS-6486S is used on 361 and 413 CID engines. (Fig. 3). Models MS-6775S are used on the 440 CID engines (Fig. 4).

The fuel pumps are driven by an eccentric cam that is cast on the camshaft in the 225, 400 and 440 cubic inch engines, or by a pressed steel eccentric cam mounted on the gear end of the camshaft in the 318 and 360 cubic inch engines.

As the camshaft rotates, the eccentric cam presses down on the pump rocker arm. (On the 440 cubic

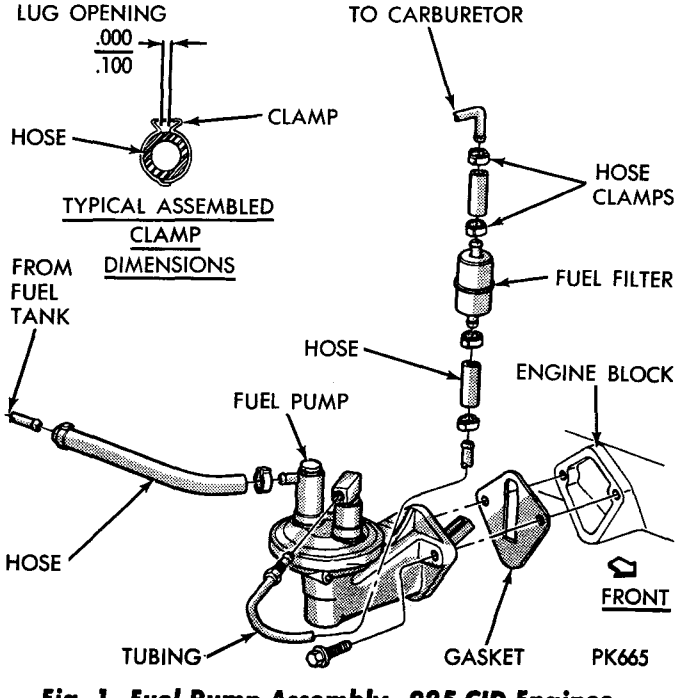


Fig. 1—Fuel Pump Assembly—225 CID Engines

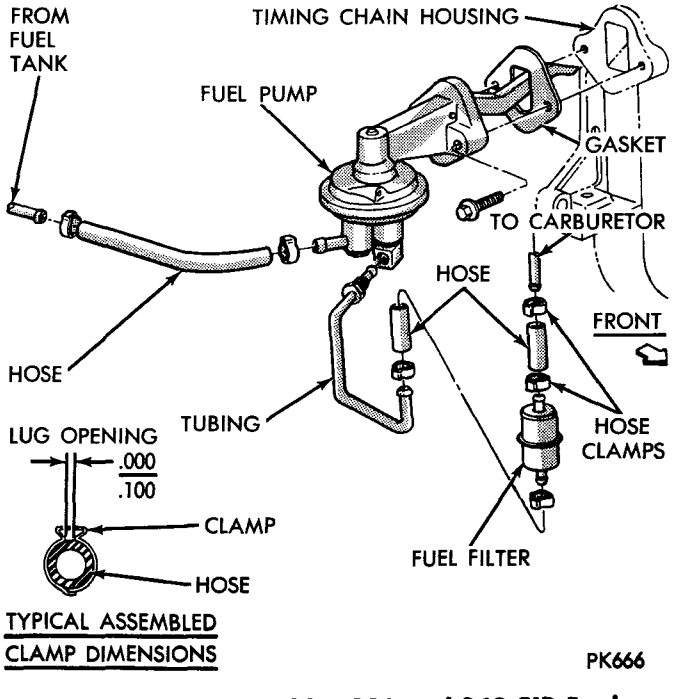


Fig. 2—Fuel Pump Assembly—318 and 360 CID Engines

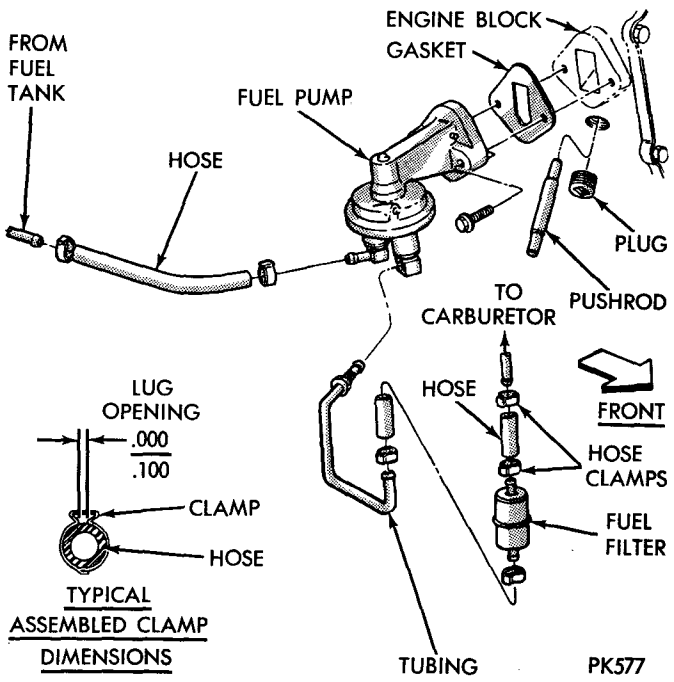


Fig. 3—Fuel Pump Assembly—440 CID Engines

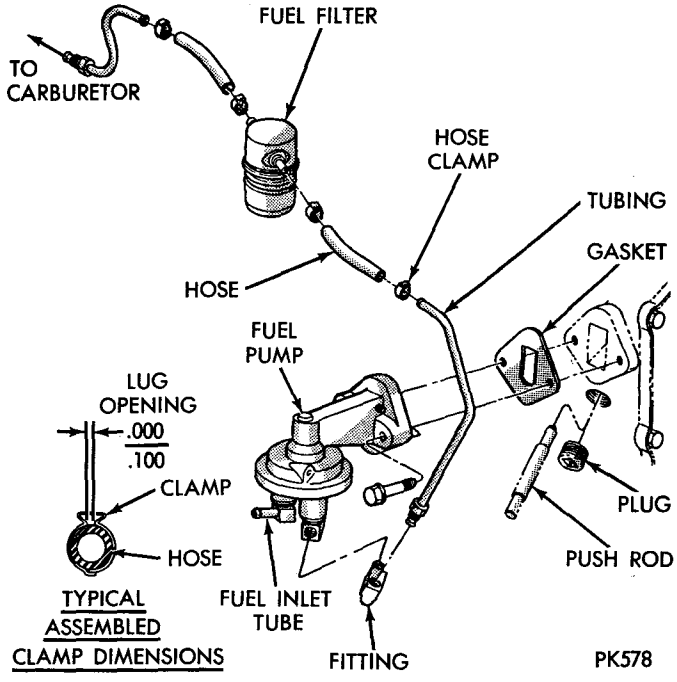
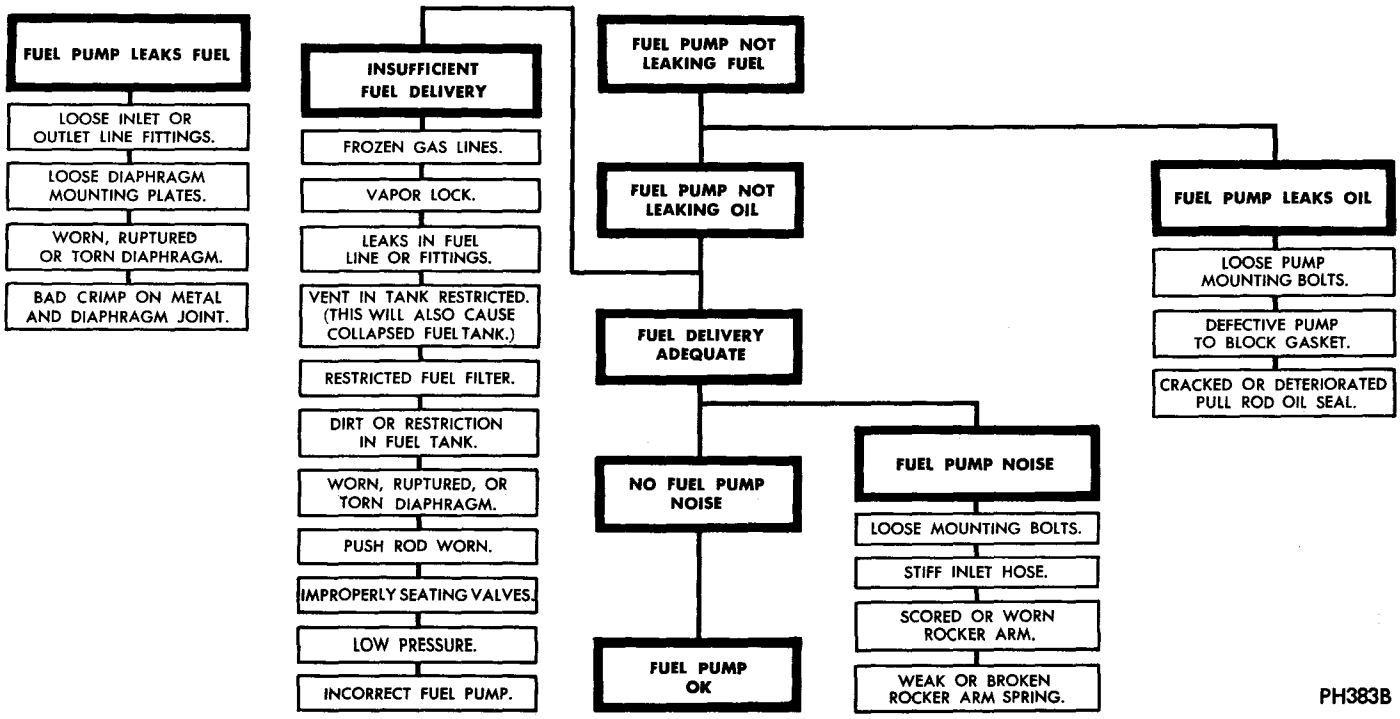


Fig. 4—Fuel Pump Assembly—361-413 CID Engines

inch engine, a push rod operates between the camshaft and the fuel pump rocker arm.) This action lifts the pull rod and diaphragm upwards against the fuel pump main spring, creating a vacuum in the valve housing and opens the inlet valve and fuel is drawn into the valve housing chamber. On the return stroke the main spring forces the diaphragm upwards against the fuel pump main spring, creating a vacuum in the valve housing and opens the inlet valve and fuel is drawn into the valve housing chamber. On

FUEL PUMP DIAGNOSIS (MECHANICAL)



the return stroke the main spring forces the diaphragm to the **down** position, which closes the inlet valve and expels the fuel in the valve housing chamber through the outlet valve, to the fuel filter and the carburetor.

The fuel filter should be changed as recommended in the owners manual. To insure having an unrestricted flow of fuel at all times. **Do not attempt to clean.** See "Lubrication and Maintenance", Group 0, of this manual.

SERVICE PROCEDURES

TESTING FUEL PUMP (On Vehicle)

If the fuel pump fails to supply fuel properly to the carburetor, the following tests should be made before removing the fuel pump from the vehicle.

Pressure Test

(1) Insert a "T" fitting in fuel line at carburetor, (Fig. 5).

(2) Connect a 6 inch piece of hose between "T" fitting and gauge C-3411. (The hose should not exceed 6 inches. A longer hose may collect fuel and additional weight of fuel would be added to pressure of pump and result in an inaccurate reading.)

(3) Vent pump for a few seconds (this relieves air trapped in fuel chamber). If this is not done, pump will not operate at full capacity and low pressure reading will result.

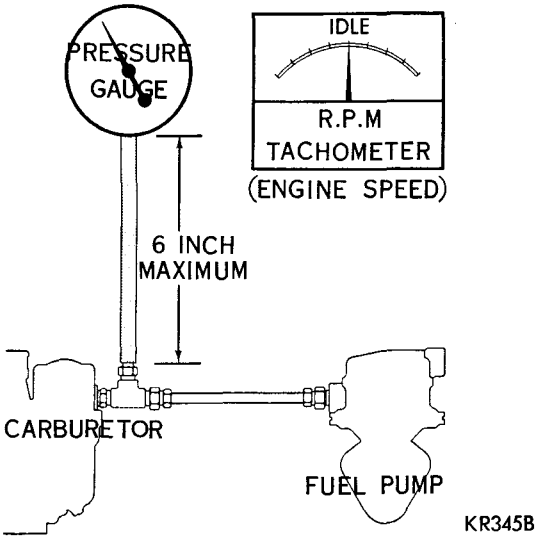


Fig. 5—Pressure Testing Fuel Pump

(4) Connect a tachometer, then start engine and run at idle. The reading should be as shown in specifications (depending on pump) and remain constant or return to zero slowly, when engine is stopped. An instant drop to zero indicates a leaky outlet valve. If pressure is too low a weak diaphragm main spring, or improper assembly of diaphragm may be the cause. If pressure is too high, main spring is too strong.

Vacuum Test

The vacuum test should be made with the fuel line disconnected from the carburetor. (This will allow the pump to operate at full capacity, which it must do to prime a dry carburetor). The minimum reading should be at least 10 inches of vacuum at idle, with the fuel line disconnected at the carburetor.

Volume Test

The fuel pump should supply 1 quart of fuel in 1 minute or less at idle.

Inlet Valve Test

To test the inlet valve, connect a vacuum gauge on the inlet fitting while the line is disconnected.

(1) Start engine or turn over with starting motor.

(2) There should be a noticeable vacuum present, not altered by blowback.

(3) If blowback is present, inlet valve is not seating properly and a new pump should be installed.

If fuel pump does not perform to above test requirements, a new fuel pump should be installed.

GOVERNORS

INDEX

	Page		Page
General Information	123	Vacuum Governor	(See Group 8 Electrical)
Sandwich Governor	123		

GENERAL INFORMATION

Governors are used to hold maximum engine speeds within safe limits. Dodge Trucks use one model of velocity type governor and one model of the vacuum type governor.

Identification numbers are stamped on the cover of all sandwich governors. Each governor is carefully calibrated and adjusted for one range of engine speed. These governors can be adjusted for another range as listed in "Specifications." Adjustments should be made ONLY WHEN THE ENGINE IS PROPERLY TUNED and is at normal operating temperature. Use a tachometer when adjusting to a no-load rpm. Vacuum governor adjustments are covered in the Electrical Section under distributors.

SERVICE PROCEDURES

SANDWICH GOVERNOR (Fig. 1)

Speed Adjustment

(1) Obtain governor identification on cover plate and refer to "Specifications" for proper speed range and calibration.

(2) Remove seal.

(3) Turn speed screw adjusting cap, one-half turn at a time, counterclockwise to increase speed and clockwise to decrease speed. Each 1/2 turn will change engine speed approximately 150 rpm. More than two turns counterclockwise from factory setting is not recommended.

Surge Adjustment (Fig. 2)

(1) Locate hollow wrench A-24283 (obtainable through governor service stations) in calibrating nut.

(2) Locate hex wrench A-25264 speed screw through hollow wrench.

(3) Block throttle linkage to produce surge at governed speed.

(4) Hold speed screw from turning with hex wrench while turning calibrating nut clockwise 1/4 turn at a time until surge is minimized. It may be necessary to reset speed screw to bring engine rpm within specifications at the time that surge is eliminated.

Slow Action Adjustment

If governor does not cut in promptly at maximum speed or if it does not open promptly at governed speed when load is applied, governor is said to be slow acting.

Correction of this condition is made in same manner as for surge except that calibrating nut is turned counterclockwise.

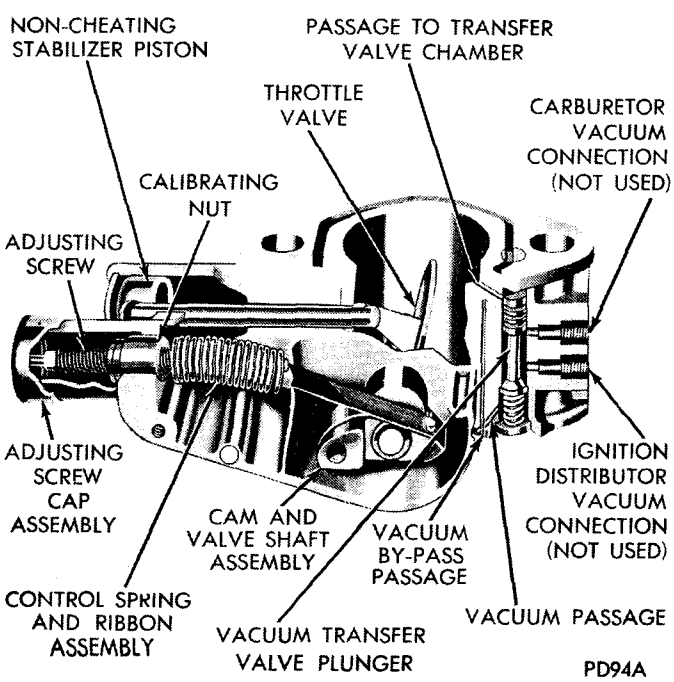


Fig. 1—Sandwich Velocity Type Governor

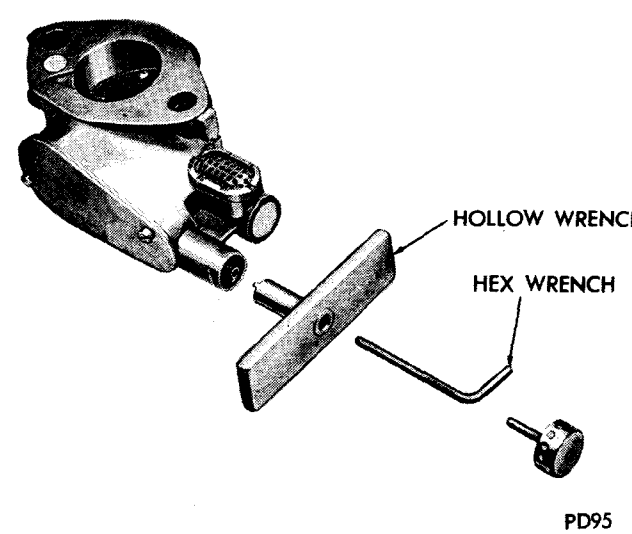


Fig. 2—Governor Adjusting Wrenches

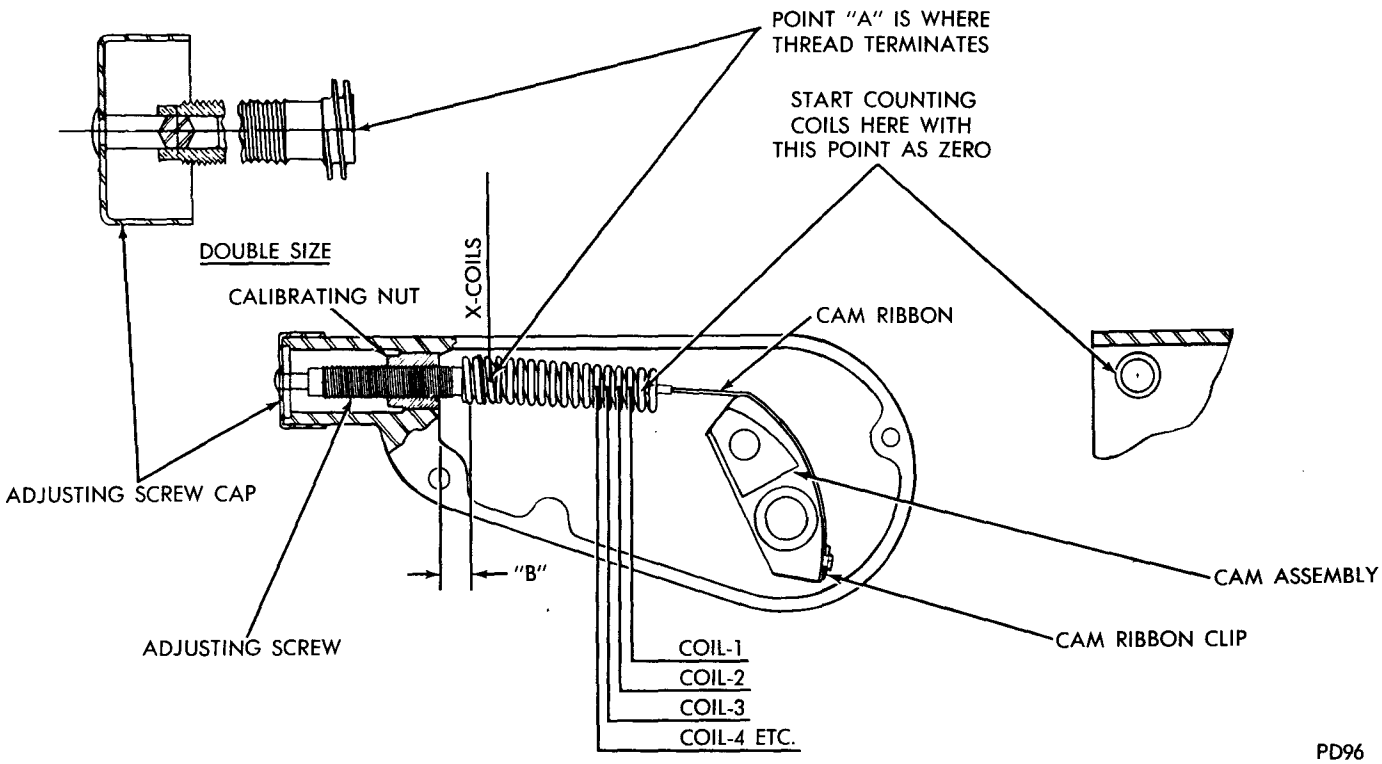


Fig. 3—Control Spring Calibration

Calibration

When adjustments do not bring governor performance within specifications, internal calibrations should be checked and set as follows:

(1) Remove governor cover, refer to "Specifications" for calibrations for governor number stamped on cover. (See Engine, Group 9, Specifications.)

(2) Clean and inspect governor for wear and damage. The vacuum piston can be removed by removing throttle plate and piston cover. Do not lubricate governor.

(3) Turn speed screw to obtain specified number of active coils from end of anchor to end of speed screw (A, Fig. 3).

(4) Locate hollow wrench A-25283 in calibrating nut.

(5) Locate hex wrench A-25264 in speed screw through hollow wrench.

(6) Hold screw from turning. Turn hollow wrench to obtain specified distance "B" from end of spring to housing.

(7) Remove hex wrench and tap hollow wrench to seat calibrating nut. Recheck "B" dimension.

(8) Install gasket and cover.

(9) Recheck adjustment with engine running before installing a new wire-and-lead seal.

When installing sandwich type King-Seeley velocity governor, (Fig. 4), install governor in direction shown and use correct gaskets and spacers. If vehicle is equipped with closed crankcase vent system, be sure spacer and gasket for use with this system are installed correctly.

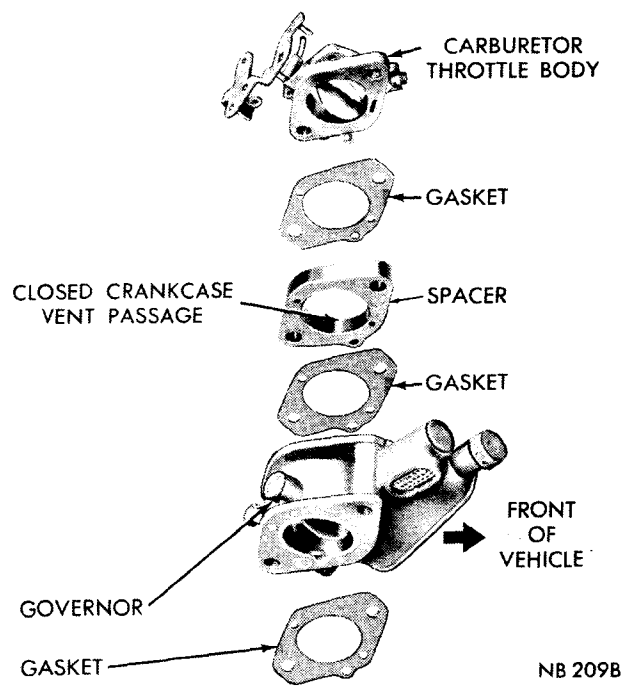


Fig. 4—Governor Mounting (Disassembled View)

THROTTLE LINKAGE

Refer to Transmission Section 21 for Throttle Linkage Adjustment.

FUEL PUMP SPECIFICATIONS

Engine	225 Cu. In.	318 Cu. In. 360 Cu. In.	440 Cu. In.	361 Cu. In. 413 Cu. In.
Fuel Pump				
Make	Carter	Carter	Carter	Carter
Model	MS-6771S	MS-6866S or MS-4587SA MS-6772S	MS-6775S	MS-6486S
Make	—	—	—	—
Model	—	—	—	—
Type	Diaphragm	Diaphragm	Diaphragm	Diaphragm
Number of Valves	2	2	2	2
Driven By	Camshaft	Camshaft	Camshaft	Camshaft
Pump Pressure (Pounds)	3-1/2 to 5	5 to 7	5 to 7	6 to 7-1/2

CARBURETOR SPECIFICATIONS

The following specifications are published from the latest information available at the time of publication. If Curb Idle RPM, Ignition Timing, or Carbon Monoxide (CO) percentages differ from those on the Emission Control Information Label, use the specification on the label.

HOLLEY MODEL 1945 SINGLE VENTURI CARBURETOR

Holley Carburetor Number	R-7849A	R-7815A	R-7816A	R-7847A	R-7848A
Requirement	**Fed/Can**	**Calif**	**Calif**	**Fed/Can**	**Fed/Can**
Engine Displacement (Cu. In.)	225-1	225-1	225-1	225-1	225-1
Transmission	4 Sp/OD	Man	Auto	Man	Auto
Bore	1-11/16"	1-11/16"	1-11/16"	1-11/16"	1-11/16"
Venturi	1-9/32"	1-9/32"	1-9/32"	1-9/32"	1-9/32"
Main Metering Jet	#623	#631	#623	#623	#623
Adjustments					
Accelerator Pump	2-21/64"	2-7/32"	2-21/64"	2-7/32"	2-21/64"
Dry Float Setting (± 1/32")	3/64"	3/64"	3/64"	3/64"	3/64"
Vacuum Kick	.110	.110	.110	.110	.110
Fast Idle Cam Position	.080	.080	.080	.080	.080
Choke Unloader	.250	.250	.250	.250	.250
Curb Idle Speed (RPM)	750	800	750	750	750
Fast Idle Speed (RPM after 500 miles)	1600	1600	1700	1600	1700
Ignition Timing	2BTDC	TDC	2ATDC	2BTDC	2BTDC
*Carbon Monoxide (CO) (enriched or speed rise)	825	.3%P	.3%P	825	825

*P = @ Front of Catalyst
T = @ Tailpipe

CARTER MODEL BBD CARBURETOR

Carter Model Number	BBD-8085S	BBD-8115S	BBD-8081S	BBD-8082S	BBD-8108S	BBD-8146S
Requirement	**Fed/Can**	**Fed/Can**	**Fed/Can/Calif**	**Calif**	**Fed/Calif**	**Fed/Can**
Engine Displacement (Cu. In.)	318-1	318-1	318-1	318-1	318-1	318-1
Transmission	Man	Man/4 Sp.	Auto	Man	Auto	Man
Bore	1-7/16"	1-7/16"	1-7/16"	1-7/16"	1-7/16"	1-7/16"
Venturi	1-3/16"	1-3/16"	1-3/16"	1-3/16"	1-3/16"	1-3/16"
Main Metering Jets						
Standard	120-392	120-389	120-392	120-392	120-392	120-386
Metering Rods (Standard)	2105	2170	2158	2104	2158	2092
Adjustments						
Step-Up Piston Gap	.035	.035	.035	.035	.035	.035
Float Setting (At Center of Floats (± 1/32")	.250	.250	.250	.250	.250	.250
Accelerator Pump Setting (At Idle)	.500	.500	.500	.500	.500	.500
Choke Unloader	.280	.280	.280	.280	.310	.280
Idle Speed RPM (Curb Idle)	750	750	750	750	750	750
Vacuum Kick	.130	.130	.150	.130	.150	.070
Fast Idle Cam Position	.070	.070	.070	.070	.070	.070
Fast Idle Speed (RPM after 500 Miles)	1500	1500	1500	1500	1500	1600
Ignition Timing	2B	2B	2B(TDC-Calif.)	2BTDC	Cal. TDC	2 ATC
*Carbon Monoxide (enriched or speed rise)	.5%-(850)	.3%-(850)	.5%-(920)	.3%	.3%	800

Carter Model Number	BBD-8147S BBD-8121S	BBD-8113S	BBD-8112S	BBD-6585S	BBD-8110S	BBD-6586S
Requirement	**Fed/Can**	**Calif**	**Fed. Altitude**	**Fed/Can**	**Fed/Can**	**Fed/Can**
Engine Displacement (Cu. In.)	318-1	318-1	318-1	318-3	225	318-3
Transmission	Auto	Man/Auto	Auto	Man	Man/Auto	Auto
Bore	1-7/16"	1-7/16"	1-7/16"	1-7/16"	1-7/16"	1-7/16"
Venturi	1-3/16"	1-3/16"	1-3/16"	1-3/16"	1-3/16"	1-3/16"
Main Metering Jets						
Standard	120-386	120-392	120-392	120-392	120-392	120-392
Metering Rods (Standard)	2092	2083	2112	2023	2203	2023
Adjustments						
Step-Up Piston Gap	.035"	.035"	.035"	.035"	.035"	.035"
Float Setting (At Center of Floats (± 1/32")	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
Accelerator Pump Setting (At Idle)	.500"	.500"	.500"	.500"	.500"	.500"
Choke Unloader	.310	.310	.310	—	.380	—
Idle Speed RPM (Curb Idle)	750	700	750	700	700	700
Vacuum Kick	.070	.130	.110	—	.095	—
Fast Idle Cam Position	.070	.070	.070	—	.070	—
Fast Idle Speed (RPM after 500 Miles)	1500	1500	1500	1900	1500	1900
Ignition Timing	2 ATC	TDC	6BTDC	TDC	TDC	TDC
*Carbon Monoxide (enriched or speed rise)	820	.5%T	885	750	750-M 770-Auto.	770

*P = @ Front of Catalyst T = @ Tailpipe

HOLLEY DUAL VENTURI CARBURETORS

	MODEL 2210		MODEL 2245		
Holley Carburetor Number	R-6764A	R-7870A	R-6886A	R-7697A	R-7103A
Requirement	**Fed/Can**	**Fed/Can**	**Fed/Can**	**Calif.**	**Fed/Can**
Engine Displacement (Cu. In.)	360-1	360-1	400	360-1	360-3
Transmission	Man	Auto	Man/Auto	Auto	Man
Bore	1-9/16"	1-9/16"	1-9/16"	1-9/16"	1-9/16"
Venturi	1-3/8"	1-3/8"	1-3/8"	1-3/8"	1-3/8"
Main Metering Jet	642	642	653	643	642
Adjustments—Rod in Slot Number	2	1	1	1	2
Accelerator Pump Setting (From Curb Idle)	.260	.260	.260	.260	.260
Accelerator Pump Setting (From Closed Throttle)	.310	.310	.310	.310	.310
*Dry Float Setting Between Toe of Float and Float Stop (± 1/32")	.180	.180	.180	.180	.180
Vacuum Kick	.150	.90	.150	.150	.150
Fast Idle Cam Position	.110	.110	.110	.110	.110
Choke Unloader	.170	.170	.170	.170	.170
Curb Idle Speed (RPM)	750	750	700	750	750
Fast Idle Speed (RPM after 500 Miles)	1700	1800	1600	1600	1600
Ignition Timing	TDC	TDC	2BTDC	TDC	TDC
*Carbon Monoxide (enriched or speed rise)	790	810	740-M 760-A	1.0%T	810

	MODEL 2245				
Holley Carburetor Number	R-7088A	R-7698A	R-7871A	R-7091A	R-7092A
Requirement	**Fed/Can**	**Calif**	**Fed/Can**	**Fed/Can**	**Fed/Can**
Engine Displacement (Cu. In.)	360-3	360-3	360-1	360-3	360-3
Transmission	Auto	Man/Auto	Man/Auto	Man	Auto
Bore	1-9/16"	1-9/16"	1-9/16"	1-9/16"	1-9/16"
Venturi	1-3/8"	1-3/8"	1-3/8"	1-3/8"	1-3/8"
Main Metering Jet	642	642	642	642	642
Adjustments—Rod in Slot Number	1	2	1	2	1
Accelerator Pump Setting (From Curb Idle)	.260	.260	.260	.260	.260
Accelerator Pump Setting (From Closed Throttle)	.310	.310	.310	.310	.310
*Dry Float Setting Between Toe of Float and Float Stop (± 1/32")	.180	.180	.180	.180	.180
Vacuum Kick	.150	.150	.130	.150	.150
Fast Idle Cam Position	.110	.110	.110	.110	.110
Choke Unloader	.170	.170	.170	.170	.170
Curb Idle Speed (RPM)	750	750	750	750	750
Fast Idle Speed (RPM after 500 Miles)	1600	1600	1600	1600	1600
Ignition Timing	TDC	TDC	4BTDC	TDC	TDC
*Carbon Monoxide (enriched or speed rise)	810	1.0%T	810	790	810

* = @ Tailpipe

HOLLEY MODEL 2300G DUAL VENTURI CARBURETOR

Holley Carburetor Number	R-6769-1A	R-7137-A
Requirement	**Fed/Can**	**Fed/Can**
Engine Displacement (Cu. In.)	361-4	361-4
Transmission	Man/Auto	Man/Auto
Bore	1-9/16"	1-9/16"
Venturi	1-1/4"	1-1/4"
Main Metering Jet	#622	#622
Power Valve	#7	#7
Adjustments		
Accelerator Pump Setting (Wide Open Throttle)	#1 Position .015	#1 Position .015
Curb Idle Speed	700	700
Fast Idle Speed	.035	.035
Float Setting (Dry) (± 1/32")	Float Parting Line Parallel with Floor of Bowl	
Float Setting (Wet on Vehicle)	Fuel Level with Bottom of Sight Plug Hole	
Ignition Timing	2-1/2 BTC	2-1/2 BTC
Carbon Monoxide (CO) (enriched or speed rise)	750-M 770-A	750-M 770-A

HOLLEY 4150G SERIES 4-BARREL CARBURETOR

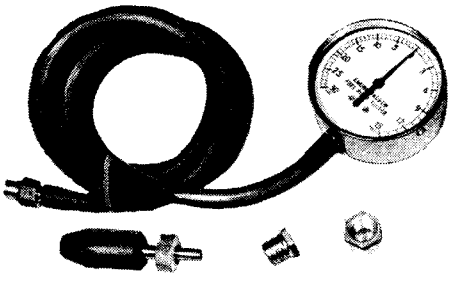
Holley Carburetor Number	R-6771-A	R-7138-A
Requirement	**Fed/Can**	**Fed/Can**
Engine Displacement (Cu. In.)	413-3	413-3
Transmission	Man/Auto	Man/Auto
Throttle Bore		
Primary	1-9/16″	1-9/16″
Secondary	1-9/16″	1-9/16″
Main Venturi		
Primary	1-3/16″	1-3/16″
Secondary	1-3/16″	1-3/16″
Main Metering Jet		
Standard	#582-#612 Primary #74 Secondary	#582-#612 Throt Side #74 Secondary
Power Valve (stamped)	#5	#5
Adjustments		
Curb Idle Speed RPM	700	700
Fast Idle Speed RPM	.035	.035
Float Setting (Dry)		
Primary and Secondary (± 1/32″)	Float Lever Parallel with Floor of Bowl	
Float Setting (Wet)		
Primary and Secondary	Fuel Level with Bottom of Sight Plug Hole	
Accelerator Pump		
Override Adjustment (wide open throttle)	.015 Minimum	.015 Minimum
Pump Position	#1 Hole	#1 Hole
Ignition Timing	5 BTC	5 BTC
Carbon Monoxide (CO) (enriched or speed rise)	750-M 770-A	750-M 770-A

CARTER THERMO-QUAD CARBURETOR

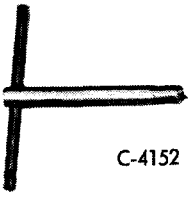
Carter Model Number	TQ-6545S	TQ-9096S
Requirement	**Fed/Can**	**Calif**
Engine Displacement (Cu. In.)	440-1	440-1
Transmission	Auto	Auto
Bore		
Primary	1-1/2″	1-1/2″
Secondary	2-1/4″	2-1/4″
Main Venturi		
Primary	1-3/16″	1-3/16″
Secondary	2-1/4″	2-1/4″
Metering Rods	2024	2110
Adjustments		
Float Setting (± 1/32″)	27/32″	27/32″
Secondary Throttle Linkage	Adjust link so that primary and secondary stops both contact at the same time.	
Secondary Air Valve Opening	1/2	1/2
Secondary Air Valve Spring Tension (From Contact)	1-1/4 turn	1-1/4 turn
Accelerator Pump Stroke		
(Top of plunger to top of bowl cover		
@ curb idle)	1/2″	1/2″
At Secondary Pick Up	5/16″	5/16″
Choke Control Lever Adjustment Off Vehicle	3-3/8″	3-3/8″
Choke Diaphragm Connector Rod (Clearance		
between air valve and stop)	.040	.040
Vacuum Kick**	.160	.100
Fast Idle Cam Position**	.100	.100
Choke Unloader (Wide Open Kick)**	.310	.310
Secondary Throttle Lockout	.060-.090	.060-.090
Fast Idle Speed (RPM—after 500 miles)	1700	1700
Curb Idle Speed RPM	700	700
Ignition Timing	8 BTC	8 BTC
*Carbon Monoxide (enriched or speed rise)	760	760

**Thermo-Quad Choke Adjustments are measured at the lowest edge of the choke plate.
*T = @ Tailpipe

FUEL SYSTEM — SPECIAL TOOLS



C-3411A

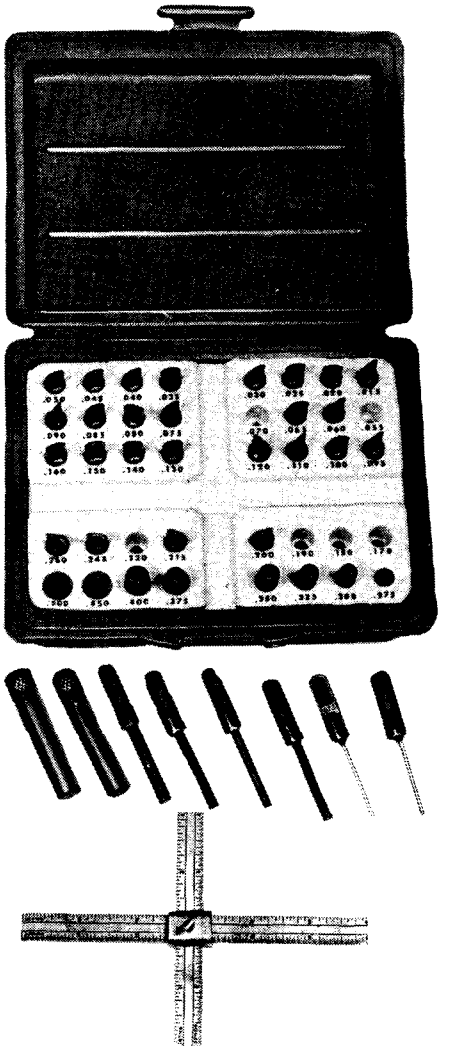


C-4152

C-3748

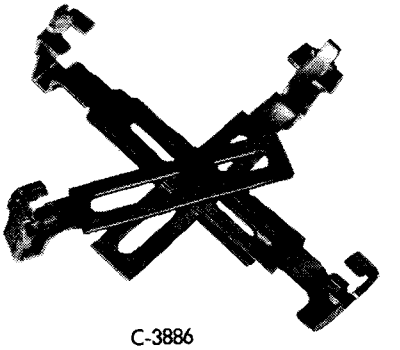
C-4231

C-4206



C-4161 KIT

C-4207



C-3886

C-3582

PK371

PROPELLER SHAFT AND UNIVERSAL JOINTS

CONTENTS

	Page		Page
GENERAL INFORMATION	1	SERVICE DIAGNOSIS	1
INSPECTION PROCEDURES	2	SERVICE PROCEDURES	4
PROPELLER SHAFT BALANCE	12		

GENERAL INFORMATION

Drive line systems utilized for models released for this publication employ tubular yoke propeller shafts with sliding spline yokes and cross type universal joints.

All propeller shafts and couplings are balanced. In the event vehicle is to be undercoated, drive shafts and universal joints should be covered to prevent undercoating material from getting on shafts and joints causing an unbalanced condition.

No adjustments are provided to compensate for wear of universal joint parts. The universal joint should be reconditioned when excessive play exists between the bushings, bearings and cross. Should replacement of cross be necessary, bearings, bushings, retainer and seals should be also replaced. Avoid getting undercoating on these parts, causing unbalance and vibration.

When propeller shaft vibration is evident, make certain that correct rear spring shims are on vehicle. These parts provide the correct propeller shaft alignment. Always install a tapered rear spring shim if so specified for the vehicle.

In some cases vibration may be corrected by loosening center bearing mounting bolts, jacking up the rear wheels of vehicle and driving the propeller shaft with the engine. This will allow center bearing to seek its own alignment. After this is done, tighten mounting bolts securely.

Correct propeller shaft working angles are important to maximum parts life and performance together with proper lubrication maintenance.

Proper propeller shaft attaching parts such as bolts and nuts are vital to operation of vehicle systems. Always replace these parts with identical part numbers or their equivalents when replacement becomes necessary. Likewise, specified torque standards must be strictly adhered to during reassembly.

All joints should be inspected every time the vehicle is serviced. When leaks or damage is evident, consider replacement of universal joint. For lubrication information see Group 0 Lubrication and Maintenance in this manual.

Unbalance in the propeller shaft system due to damage or accumulation of dirt and other foreign matter or loose worn parts can cause unnecessary vibration in the drive line. Another possibility of propellor shaft vibration is misalignment of rear axle. Shifting of the rear axle can be caused by spring u-bolts becoming loose and spring center bolt breaking.

Clean all parts using suitable cleaning fluid. Allow parts to remain in cleaner for some time to loosen up any particles of grease or foreign matter. Remove any burrs or rough spots from machined surfaces.

- **Needle Bearings**—Do not disassemble. Clean with short stiff brush and blow out with compressed air. Work a small quantity of lubricant (140 S.A.E. Oil) into each bearing cap and turn the needle bearing on the trunnion to check wear.
- **Journal Cross**—Because worn needle bearings used with a new journal cross or new needle bearings used with a worn journal cross will wear more rapidly making another replacement necessary in a short time, always replace the journal cross and four needle bearing caps as a unit.

Alignment of the rear axle can be checked by measurement. When shims are removed for any reason they should be marked and installed in the same position. For further information see Rear Axle Section.

A constant velocity type universal joint is utilized between the transfer case and front propeller shaft as illustrated in Figure 1 and described under "Service Procedures". See Axle Section of this manual for additional information.

Refer to Group 0 in this publication for lubrication specifications.

All tightening torques are referenced in illustrations and are also listed in specifications data at the end of this group.

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
UNIVERSAL JOINT NOISE	(a) Improper lubrication. (b) Worn universal joint bearings.	(a) Lubricate. (b) Replace bearings and/or damaged distorted yokes.

Condition	Possible Cause	Correction
	(c) Defective or loose propeller shaft flange bolts.	(c) Tighten as specified.
	(d) Center bearing worn.	(d) Replace bearing(s).
PROPELLER SHAFT VIBRATION	(a) Loose universal joint yoke.	(a) Replace and tighten as specified.
	(b) Distorted or damaged yokes.	(b) Install new yokes.
	(c) Propeller shaft out of balance.	(c) Check for foreign material on propeller shaft.
	(d) Misalignment of rear axle.	(d) Tighten or replace spring "U" bolts.
	(e) Parking brake drum out of balance.	(e) Replace drum.
	(f) Yokes out of parallel to each other.	(f) Change propeller shaft. Change yoke.
	(g) Rear axle or transmission yoke runout.	(g) Replace with new yokes.
	(h) Yokes in phase on multiple shaft installations.	(h) Correct phasing.

INSPECTION PROCEDURES

UNIVERSAL YOKES (BEFORE MEASURING ANGULARITY)

Before checking yoke angles, the yoke must be inspected for lug distortion or damage. Be sure that shaft nut is tightened to the correct torque before beginning yoke inspection. A straight piece of round bar stock which is a slip fit in the universal yoke bearing bore can be used as a gauge bar.

Inspection (Method No. 1)

(1) If gauge bar is a slip fit through both bearing bores simultaneously, bores are properly aligned and yoke is not distorted or damaged.

(2) If bar goes through one bearing bore, but strikes inner face of opposite lug, yoke is distorted and must be replaced.

Inspection (Method No. 2)

In the event a gauge bar of the proper diameter is not available, yoke distortion can be checked with a level protractor in the following manner:

(1) Remove burrs or nicks from yoke outer lug faces and machined surface of bearing retainers.

(2) Turn yoke so that bearing bores are horizontal.

(3) Hold level protractor vertically on one lug outer face or on machined surface of bearing retainer. Adjust protractor so that scale reads zero or 90 degrees when bubble is centered between the two marks on tube.

(4) Next, place protractor in same location on opposite lug face or bearing retainer and note position of the bubble.

(5) If necessary, reset scale so that bubble falls exactly between marks on tube. If scale setting must be changed more than 1/2 degree, yoke is probably distorted and should be replaced.

TRANSMISSION FLANGE OR YOKE HORIZONTAL

Horizontal alignment of the flange or yoke is as important as vertical alignment. Tools needed to inspect the flange are:

- Straightedge of a length of about 20 to 40 inches long depending on vehicle frame width.
- Straightedge of a length to be at least 12 inches longer than the track of the rear wheels.
- Two large and two small "C" clamps.
- Steel tape measure.
- Large carpenter's square.

(1) Locate vehicle on a level floor or level it across its transverse section to eliminate possibility of incorrect readings.

(2) Clamp the long straightedge at right angles to side frame members. Check the 90 degree angle with the large carpenter's square.

(3) Clamp the shorter straightedge to the main transmission flange so straightedge is parallel to the floor. Check the horizontal angle of this straightedge with a spirit level. It must be exactly level to make accurate measurements.

(4) Measure distance "X" between the two straightedges at both ends of the shorter one with the tape measure. The tape must be held parallel to the sides of frame so measurements will be accurate.

Check condition of engine rear mounts. Worn or loose engine or transmission mounts could cause engine misalignment and give an inaccurate measurement.

(5) The two dimensions should be within 1/16 inch of each other. If they are not, flange is not properly aligned and should be replaced.

Horizontal alignment of a main transmission yoke can be checked in the same manner as outlined in preceding steps. However, substitute a straight piece of round bar stock, for the straightedge used when checking the flange.

Make sure bar is a snug fit in the bearing bores. Otherwise, drive a wooden wedge between it and end of the yoke shaft.

PINION FLANGE OR YOKE HORIZONTAL

When vehicle does not run straight in evidence, for example, by presence of dog tracking, three common causes of horizontal misalignment are:

- Loose or sheared spring seat dowels.
- Loose spring clips.
- Loose spring shackle brackets.

Before inspecting pinion flange or yoke for horizontal misalignment, first check the tracking of the rear wheels. A tool for this purpose can be made of drill rod.

(1) Fabricate this tool from a long piece of 1/2 inch drill rod and a short piece of 3/4 inch rod, one end ground to a point (Fig. 1).

Drill a 1/2 inch hole through the 3/4 inch rod near end opposite pointer to accommodate the 1/2 inch rod. Drill and tap an intersecting hole in same end to permit use of a small set screw.

(2) Measure the distance "Y" from the straightedge to centers of the rear axle with the fabricated tool. In the event dimensions vary more than approximately 1/8 inch, check for one or more of the three common causes.

(3) Clamp the short straightedge to pinion flange (or use round bar and wedge if pinion is fitted with a yoke), so the straightedge or bar is parallel to floor. Check the horizontal angle of the straightedge or bar with a spirit level.

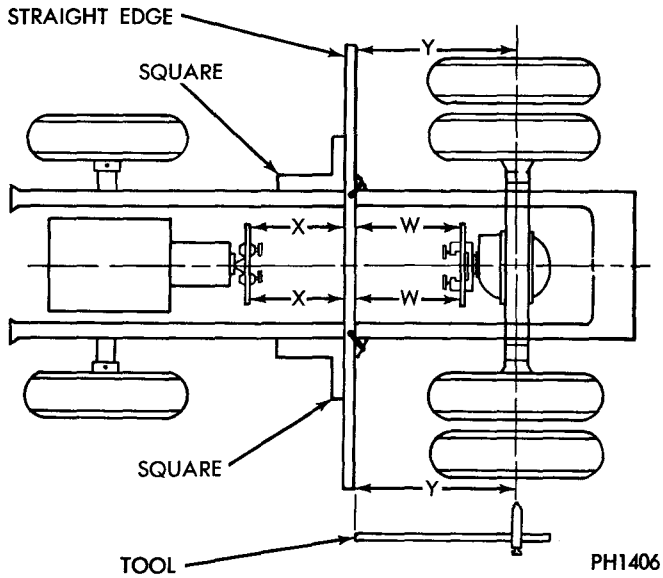


Fig. 1—Drive Assembly Alignment Inspection

(4) Measure distance "W" between two straightedges at both ends of the shorter one with a tape measure. Be sure tape is held parallel to frame.

(5) Dimensions should be within 1/16 inch of each other. In the event they are not, flange or yoke is misaligned and should be replaced.

YOKE VERTICAL

To accurately check drive-line alignment, vehicle must be on the floor with weight of vehicle resting on all four wheels. Tighten spring clips, check center bearing support and bracket for correct length (if so equipped). Check stamped arrows on yoke and propeller shaft for correct alignment.

(1) On one-piece propeller shafts, rotate shaft until transmission yoke is in exact vertical position (Fig. 2).

(2) Place a level protractor on yoke bearing "A" parallel to shaft. Adjust protractor so bubble in spirit level is centered. Note reading on protractor scale.

(3) Place level protractor on yoke bearing "B" (parallel to shaft). Adjust protractor so bubble in spirit level is centered. Note reading on protractor scale.

(4) The difference in protractor readings taken at "A" and "B" indicates amount of yoke misalignment. The vertical alignment of one-piece shaft yokes should be kept as near 1 degree as possible.

(5) On two-piece propeller shafts, rotate shaft until transmission yoke is in vertical position (Fig. 3).

(6) Place a level protractor on yoke bearing "A" (parallel to shaft). Adjust the protractor so the bubble in spirit level is centered. Note reading on the protractor scale.

(7) Perform the same operation on yoke bearings "B" and "C" with protractor parallel to shaft. Note protractor scale readings as both "B" and "C".

(8) The difference in protractor readings taken at "A", "B" and "C" indicates the amount of yoke misalignment. The vertical alignment of the two-piece shaft yokes should be kept as near 1 degree as possible.

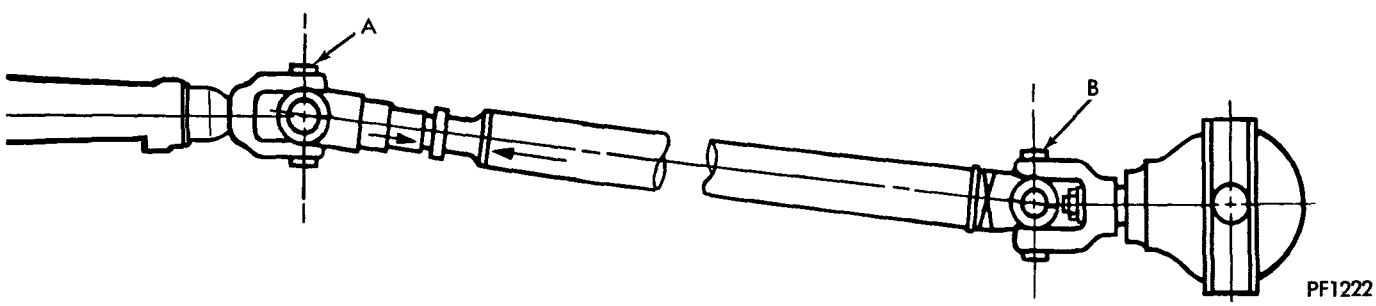


Fig. 2—Yoke Vertical Alignment (Single Shaft)

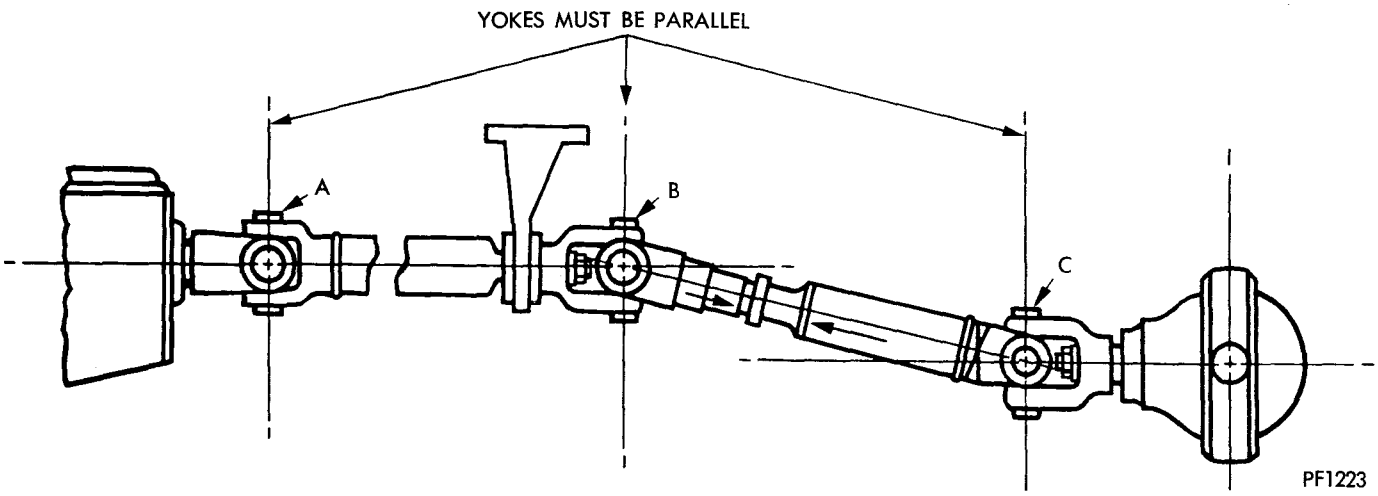


Fig. 3—Two-Piece Shaft Yoke Vertical Alignment

Driveline disturbances that are not associated with balance or runout such as not continuing or to worsen as speed increases, will be most responsive to rear axle pinion adjustments. This includes center bearing adjustments for the two (2) or three (3) propshaft installations.

Correction

(1) Adjustment of the pinion yoke vertical alignment is accomplished by installing tapered shims between the rear springs and saddle of the rear axle.

(2) If the yoke alignment is found to be off at the front shaft, or shafts in vehicles using a two-piece shaft, the center bearing brackets should be checked for correct length. Shims may be used between the support bracket and frame crossmember to correct out of alignment, if necessary.

SERVICE PROCEDURES

SINGLE PIECE PROPELLER SHAFT

There are two (2) types of single piece shafts.

- **Outboard slip type** as used on D100, D200 and D300 models.
- **Inboard slip type** as used on W100, W200 and W300 models.

Removal (Rear Shaft)

(1) Mark shaft and pinion hub yoke to reinstall in same position.

(2) Remove both rear universal joint roller and bushing assembly clamps from rear axle drive pinion hub yoke. Do not disturb the retaining strap used to hold bushing assemblies on universal joint cross, if so equipped (Fig. 1).

(3) Do not allow propeller shaft to drop or hang loose from either joint during removal. Wire up or otherwise support loose end of shaft to prevent damage to joint.

NOTE: Before removing propeller shaft with sliding yoke from transmission, vehicle front end should be lowered slightly to prevent loss of transmission fluid.

Removal (Front Shaft)

(1) Slide propeller shaft with front yoke from transmission output shaft. Do not damage splines on output shaft or yoke. Examine sliding yoke seal for evidence of leakage and if no leakage is evident, do not disturb the seal. To replace the seal, see Group 21.

(2) Protect the machined surface of the sliding yoke from damage after propeller shaft has been removed.

Installation (Front Shaft)

(1) Before installing propeller shaft, wipe sliding yoke clean, inspect machined surface for scratches, nicks or burrs.

(2) Do not burr the splines when engaging yoke splines on end of output shaft.

Installation (Rear Shaft)

(1) Install rear universal joint cross and roller bushings in the seats of drive pinion hub yoke, aligning marks made during removal. Install bushing clamps and attaching screws.

(2) Tighten 1/4-28 clamp screws to 170 inch-pounds or 5/16-24 clamp screws to 300 inch-pounds.

TWO PIECE PROPELLER SHAFT

Removal (Rear Shaft)

(1) Mark shaft and pinion hub yoke to reinstall in same position. Also mark center bearing spline and slip yoke. To prevent damage, do not allow propeller

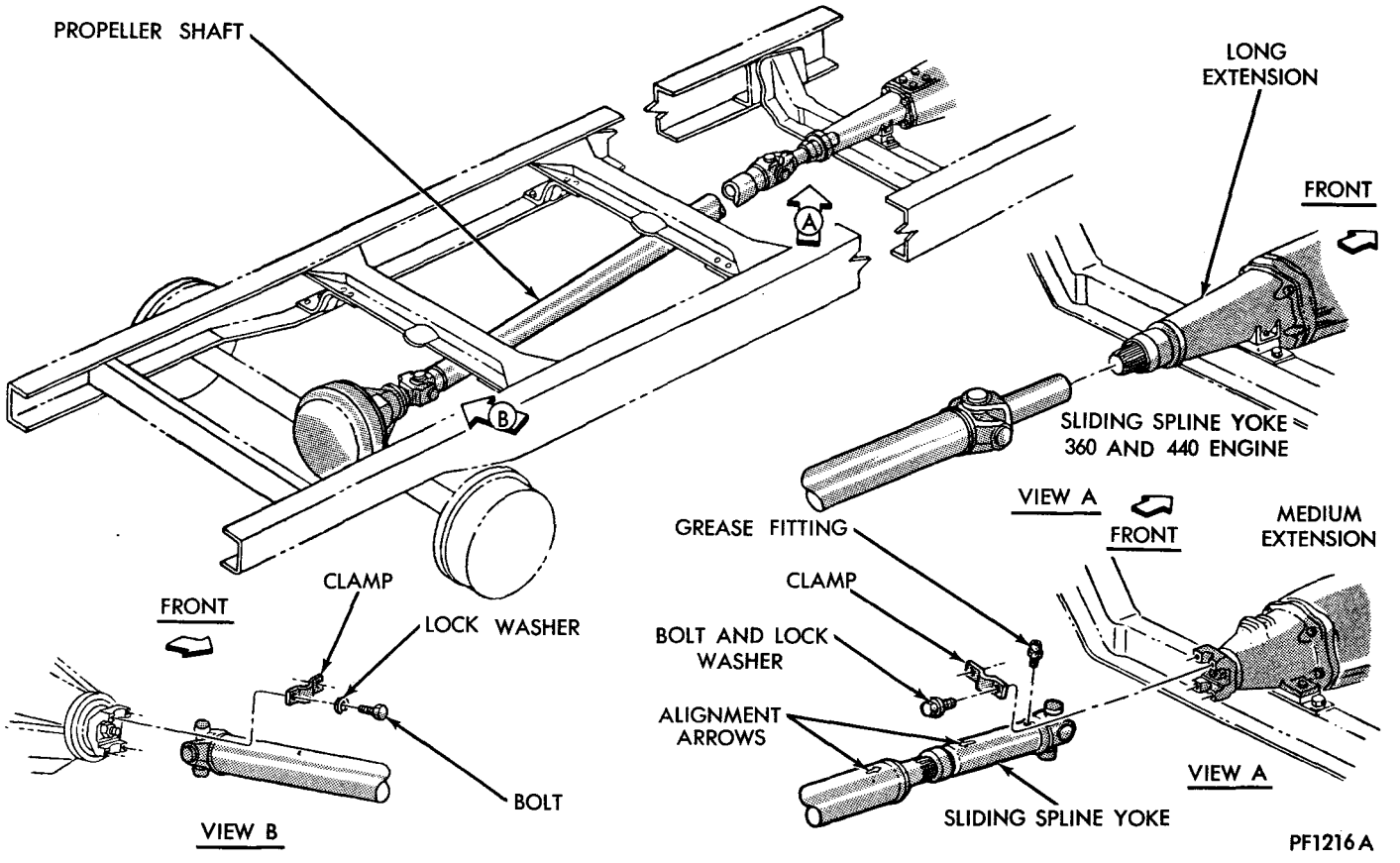


Fig. 1—Single Prop Shaft (Typical)

shaft to drop or hang loose from either joint during removal. Wire up or otherwise support loose end of shaft.

(2) Remove both rear universal joint roller and bushing assembly clamps from rear axle drive pinion hub yoke. Do not disturb the retaining strap used to hold bushing assemblies on universal joint cross, if so equipped. Slide rear shaft off the splines of front shaft at center bearing and remove shaft from vehicle (Fig. 2).

Removal (Front Shaft)

(1) Remove from transmission end of propeller shaft, bushing retaining bolts and clamps (or flange nuts if equipped with brake). Mark the parts to reinstall in same position.

(2) Remove two center bearing mounting nuts and bolts. Also remove shaft with center bearing.

Installation (Front Shaft)

(1) Position front end of shaft by aligning marks made during removal. Start all attaching bolts and nuts at front universal and center bearing.

(2) Tighten 1/4 inch clamp bolts to 170 inch-pounds or 5/16 inch clamp bolts to 300 inch-pounds. If equipped with brake, tighten universal flange nuts to 35 foot-pounds. Leave center bearing bolts just snug.

Installation (Rear Shaft)

(1) Align marks made during removal and slide yoke onto splined front shaft.

(2) Align to marks made during removal while positioning rear universal in axle hub yoke.

(3) Install bushing clamps and bolts.

(4) Tighten 1/4 inch bolts to 170 inch-pounds or 5/16 inch bolts to 300 inch-pounds.

(5) Jack up rear wheels and drive propeller shaft with the engine. This will allow center bearing to seek alignment. Finally tighten center bearing support mounting bolts to 50 foot-pounds.

WORKING ANGLE CORRECTION

All universal joints must be set up to operate at a small angle if it is to operate without bearing failure for an extended period of time.

(1) On models equipped with two or three piece propeller shafts, front shaft and intermediate (if so equipped) shaft must be misaligned by at least 1/2 of a degree from transmission and from each other.

(2) On models equipped with a two piece propeller shaft, rear axle pinion must be parallel to front shaft. On models equipped with a 3 piece propeller shaft, the rear axle must be parallel to intermediate propeller shaft.

(3) On two and three piece propeller shaft assem-

blies, working angles differ according to length. The center joint angle can be adjusted by changing center bearing brackets. Adjusting working angle at rear joint is accomplished by installing tapered shims between rear springs and saddle of rear axle.

UNIVERSAL JOINT CROSS AND ROLLER

Disassembly (Fig. 3 and 4)

(1) Hammer bushings slightly inward to relieve pressure from snap rings and remove snap rings.

(2) Position yoke in press or vise with a socket large enough to receive bushing on one side and a socket slightly smaller than bushing on the other side.

(3) With pressure applied, one roller will move into yoke and opposite roller will move into receiving socket.

(4) After one roller is out, press on cross end to move opposite roller into receiving socket. Discard cross and rollers.

UNIVERSAL JOINT CROSS PACKAGE

Assembly

(1) Position yoke in vise or press with new bushing assemblies and new cross assembly.

(2) As pressure is applied, guide cross ends into bushing and roller assemblies.

(3) Press bushings just far enough in to expose snap ring grooves and install new snap rings.

(4) When second yoke is not used, install bushings with snap rings on cross ends and hold them in place with tape or wire until installation of propeller shaft.

CENTER BEARING

When two or more propeller shafts are used in tandem, a rubber mounted center bearing supports the center portion of drive line. This type of assembly is supported in a bracket which is bolted to frame crossmember (Fig. 5).

Removal and Disassembly

(1) Mark parts for reassembly and remove propeller shafts as previously described.

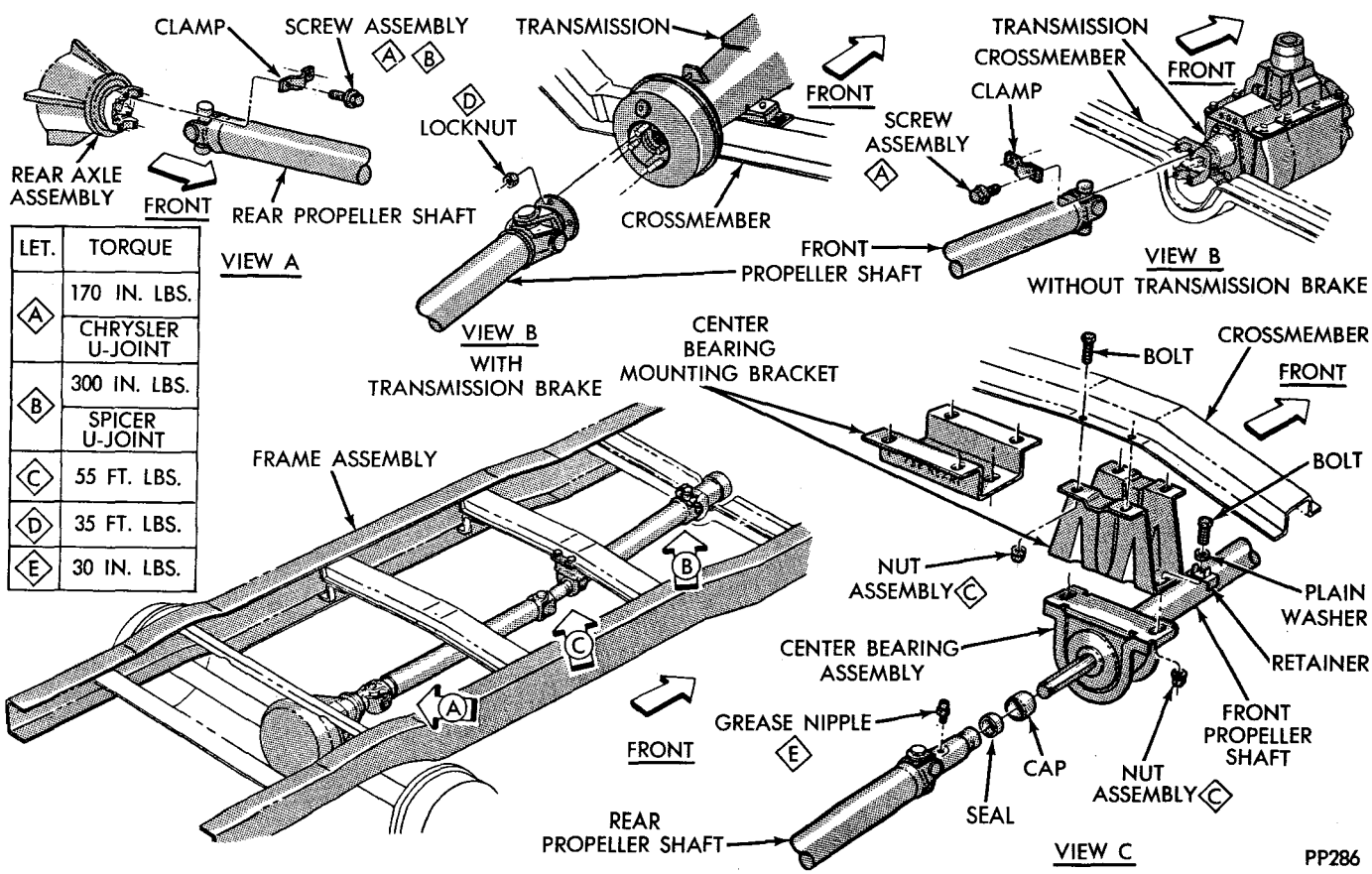
(2) Place front shaft in vise and pull bearing support and insulator from bearing. Discard parts.

(3) Bend slinger away from bearing with hammer to obtain clearance to install bearing puller.

(4) Remove bearing with puller and remove slinger. Discard all parts because replacement package includes complete bearing assembly plus slinger and retainer.

Assembly and Installation

(1) Place new slinger, bearing assembly, and re-



LET.	TORQUE
A	170 IN. LBS.
	CHRYSLER U-JOINT
B	300 IN. LBS.
	SPICER U-JOINT
C	55 FT. LBS.
D	35 FT. LBS.
E	30 IN. LBS.

Fig. 2—Dual Prop Shaft (Typical)

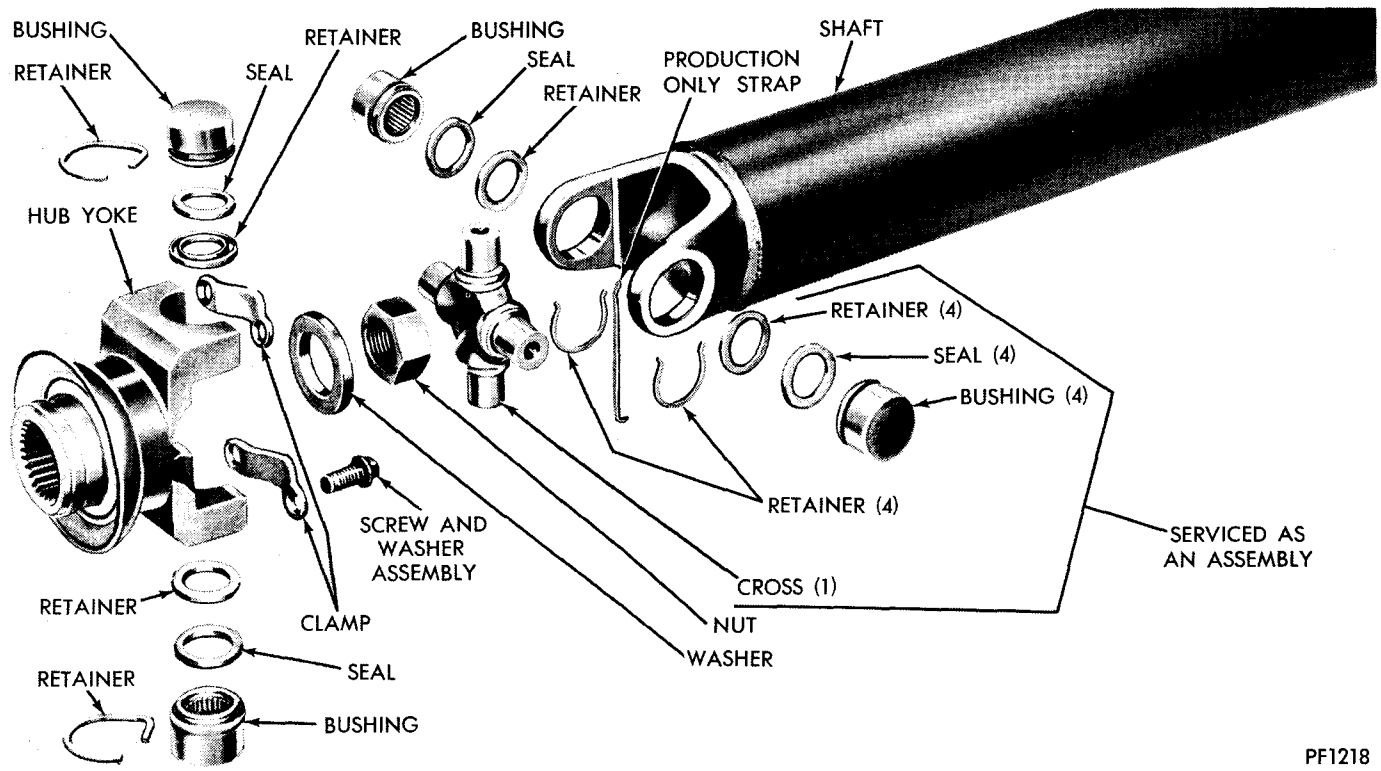


Fig. 3—Hub Yoke Type Universal Joint

tainer on shaft. Each part is a press fit on splined shaft.

(2) Using a strong tube or pipe which clears splines, press or drive parts forward on shaft till they bottom on shoulder.

(3) If seal on rear shaft slip yoke requires replacement, pry cap from yoke and discard seal and cap.

(4) Place new seal cap and felt seal on center bearing splines, to be final assembled to yoke after propeller shafts are installed.

(5) Install front and rear propeller shafts as previously described. Slide seal and cap to yoke and crimp cap tabs to yoke.

ALIGNMENT OF UNIVERSAL JOINT YOKE

All propeller shaft slip joints and yokes with

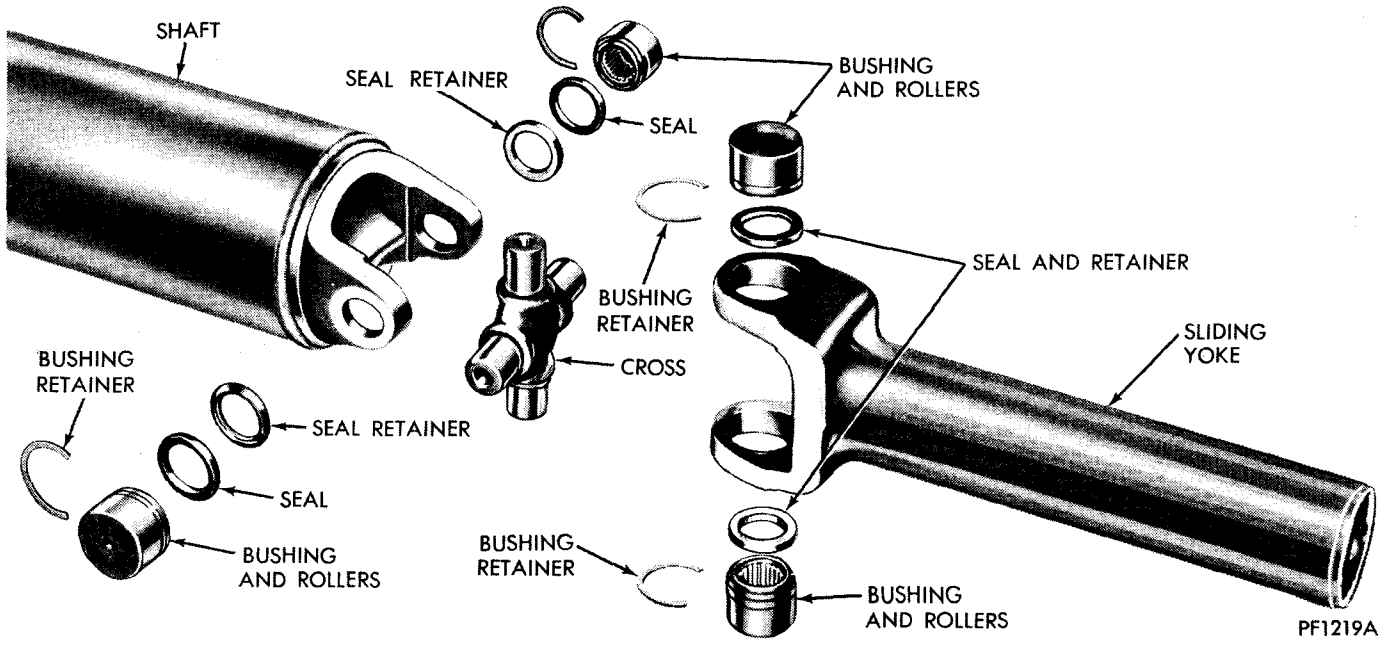


Fig. 4—Slider Yoke Type Universal Joint