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Carter and Holley 4-barrel Carburetor Service Manual

Contents
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Early Carter AFB 4-barrel without Secondary Velocity Valves

GENERAL INFORMATION

The Standard Carter AFB carburetor models AFB-4130S and AFB-4131S are used on the 383 cu. in. engine when the vehicles are equipped with the manual or automatic transmissions respectively.

The Special (CAP-Cleaner Air Package) Carter carburetors models AFB-4132S and AFB-4136S are used on the 383 cu. in. engine respectively, when the vehicles are equipped with a manual transmission. These two carburetors are supplied with a dash pot which is mounted on the carburetor. The dash pot (used only on manual transmission equipped vehicles) retards the return of the throttle to idle position. **The proper adjustment of the dash pot is very Important (See Carburetor Adjustments.) The Special (CAP-Cleaner Air Package)** Carter carburetor models AFB-4133S and AFB-4137S are used on the 383 cu. in. engine respectively, when the vehicles are equipped with the automatic transmission.

All CAP AFB carburetors are identified by a green tag mounted on an air horn attaching screw.

Since the service procedures are identical on all Carter AFB carburetors, the illustrations showing the various disassembly procedures will not always show any one specific carburetor.

The Standard Carter AFB carburetor models AFB-4119S and AFB-4120S are used on the 273 cu. in.

engine when the vehicle is equipped with a manual or automatic transmission respectively.

The Special (CAP - Cleaner Air Package) Carter carburetor models AFB-4121S and AFB-4122S are used on the 273 cu. in. engine when the vehicles are equipped with a manual or automatic transmissions respectively. The dash pot which is mounted on the carburetor, (manual transmissions only) retards the return of the throttle to idle position. **The proper adjustment of the dashpot is very important (See Carburetor Adjustments).** The 273 cu. in. AFB carburetors are equipped with a pair of velocity valves, which control the secondary valve operation.

The throttle valves of the secondary half of the carburetor are mechanically connected to the primary valves and open with the primary after an approximate 60° lag; and continue to open until both primary and secondary throttle valves reach the wide open position simultaneously. As engine speed increases, the forces exerted by the velocity of intake air down through the venturis of the carburetor increases and tends to overcome the counterweight attached to the velocity shaft, permitting the offset velocity valves to position themselves according to engine requirements.

The AFB (aluminum four barrel) carburetor contains many features, some of which are the locations for the step-up rods and pistons. The step-up rods, pistons and springs are accessible for service without removing the air horn or the carburetor from the engine. The venturi assemblies (primary and secondary) are replaceable and contain many of the calibration points for both the high and low speed system. One fuel bowl feeds both the primary and secondary nozzles on the right side while the other fuel bowl takes care of the primary and secondary nozzles on the left side. This provides improved performance in cornering, quick stops and acceleration.

All the major castings of the carburetor are aluminum, with the throttle body cast integral with the main body. This allows an overall height reduction in the carburetor. The section containing the accelerator pump is termed the primary side of the carburetor. The rear section is the secondary. The five conventional systems used in previous four barrel carburetors are also used in this unit. The five conventional systems are, two float systems, two low speed systems, (primary side only) two high speed systems, one accelerator pump system and one automatic choke control system.

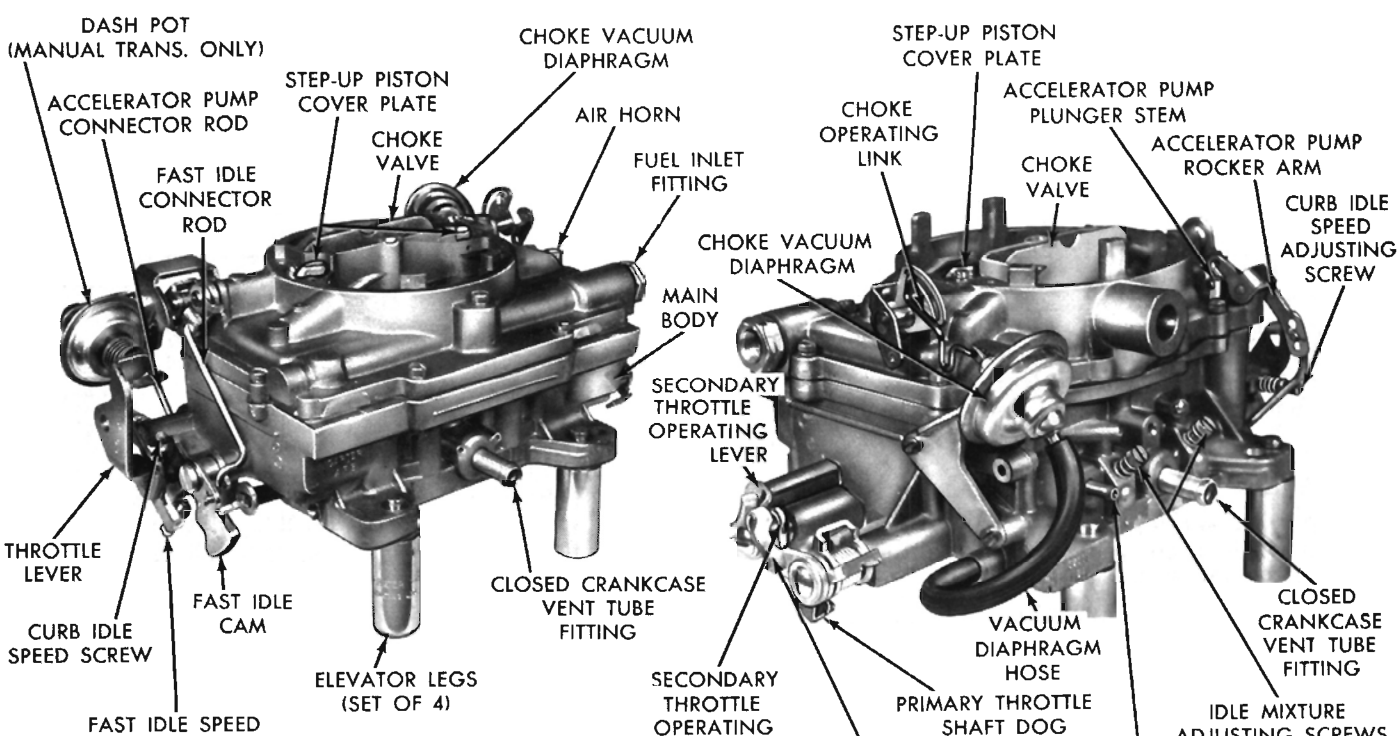


Fig. 1—Carburetor Assembly (Carter AFB)

SERVICE PROCEDURES

DISASSEMBLING THE CARBURETOR

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

(1) Place carburetor assembly on repair stand Tool C-3400 or T-109-287S elevating legs. These tools are used to protect throttle valves from damage and to provide a suitable base for working.

(2) Remove hairpin clip that attaches fast idle connector rod to choke lever. Disengage rod from lever, then swing rod at an arc until it can be disengaged from fast idle cam.

(3) Remove clevis pin that holds throttle connector rod in center hole of accelerator pump arm. Remove hairpin clip that attaches lower end of rod in primary throttle shaft lever. Disengage rod from arm and lever, then remove from carburetor.

(4) Remove screws attaching step-up piston and rod cover plates. Hold cover down with a finger to prevent piston and rods from flying out. Lift off plates and slide step-up pistons and rods out of air horn, as shown in (Fig. 2). Remove step-up piston springs.

(5) Remove vacuum hose between carburetor throttle body and vacuum diaphragm.

(6) Remove clip from choke operating link and disengage link from diaphragm plunger (stem) and choke lever. Refer to (Fig. 1).

(7) Remove vacuum diaphragm and bracket assembly and place to one side to be cleaned as a special item. A liquid cleaner may damage diaphragm material.

(8) Remove ten screws that attach air horn to main body. (1 screw in hole in air horn.) Lift air horn straight up and away from main body. When removing air horn, use care so as not to bend or damage floats. Remove accelerator pump, plunger lower spring from pump cylinder. Remove dash pot (if so equipped).

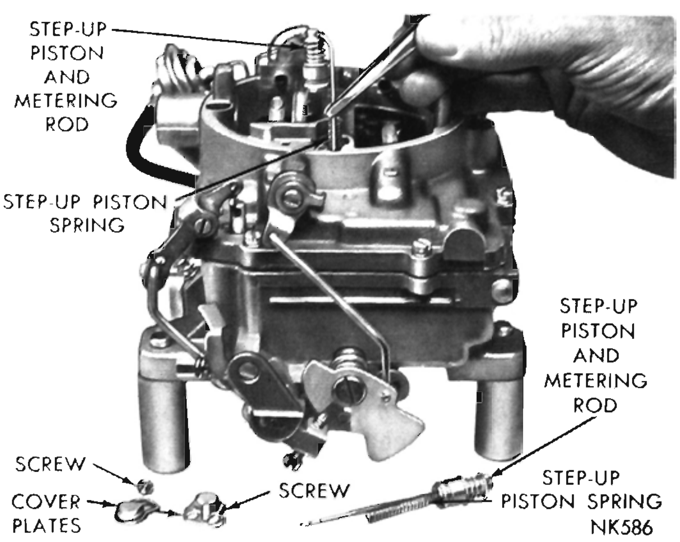


Fig. 2—Removing or Installing Step-Up Pistons and Rods

Disassembling the Air Horn

Place air horn in an inverted position on bench (to protect the floats) then proceed to disassemble as follows:

(1) Using a suitable Tool, remove float fulcrum pins, (left and right) then lift float up and out of bosses on air horn. It is suggested that the float on the pump side be marked so that the 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 spring clip that holds throttle connector rod in center hole of pump arm. Remove pump arm pivot screw and lift off pump arm, at same time,

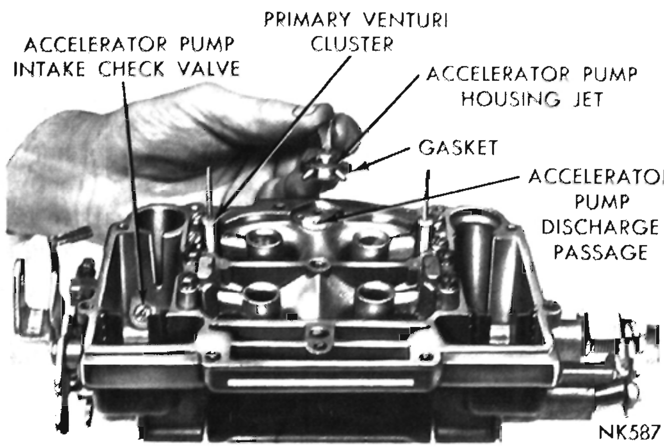


Fig. 3—Removing or Installing Accelerator Pump Jet Housing

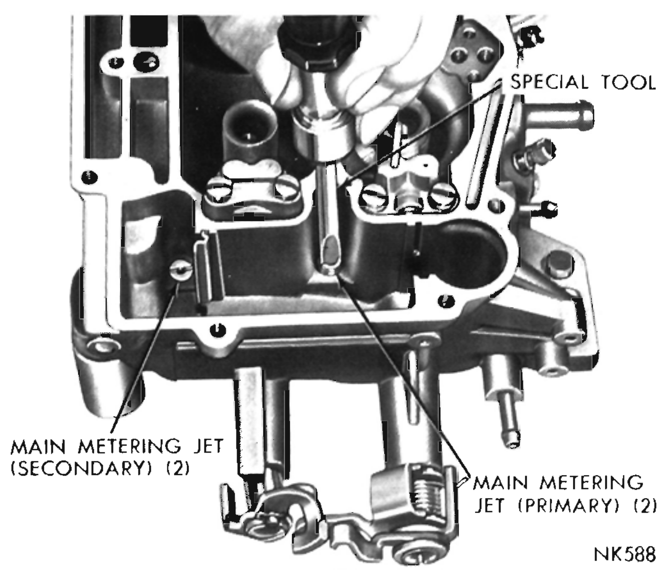


Fig. 4—Removing or Installing Main Metering Jets

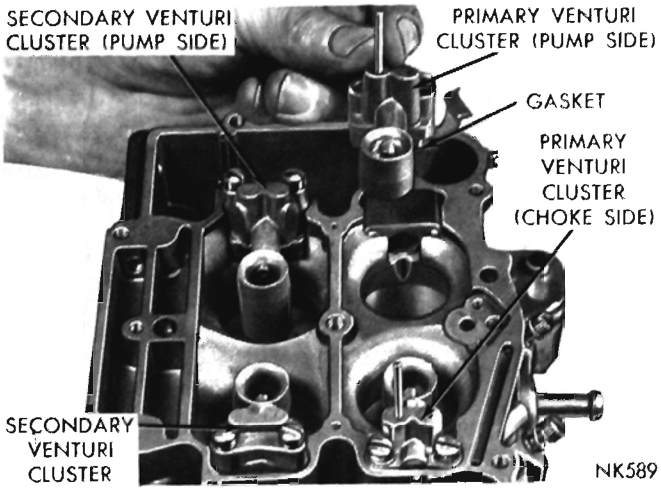


Fig. 5—Removing or Installing Primary Venturi Cluster

disengage link from arm and pump stem. Slide the accelerator pump plunger and spring out of air horn. Remove gasket.

(4) Place accelerator pump plunger in a jar of clean gasoline or kerosene, to prevent leather from drying out.

(5) Remove fuel inlet fitting and filter screen from the horn.

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

Main Body Disassembly

(1) Remove screws that attach accelerator pump jet housing to main body. Lift out jet housing and gasket as shown in (Fig. 3). Discard gasket. Now, invert main body and drop out discharge check needle from discharge passage.

(2) Using Tool T109-58, remove main metering jets (primary side), as shown in (Fig. 4). **The primary and secondary main metering jets are not interchangeable. It is very important that these jets be installed in their respective locations in the main body at reassembly.**

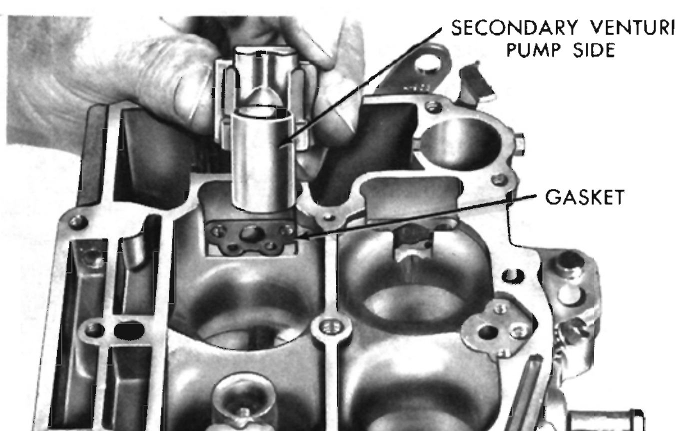


Fig. 6—Removing or Installing Secondary Venturi Cluster

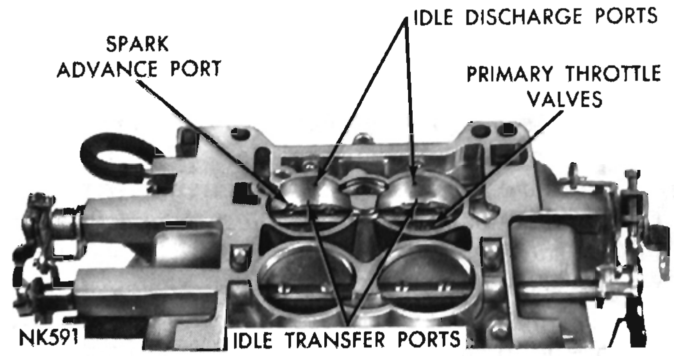


Fig. 7—Ports in Relation to Throttle Valves

(3) Again using Tool T109-58, remove main metering jets (secondary side), as shown in (Fig. 4).

(4) Remove screws that attach primary venturi (choke and pump side) to main body. Lift the venturi straight up and away from main body, as shown in (Fig. 5). Discard the gaskets. **The venturi assemblies are not interchangeable, side for side and must be reinstalled in their original locations at reassembly.**

(5) Remove screws that attach secondary venturi (choke and pump side) to main body. Lift secondary venturi assemblies straight up and away from the body, as shown in (Fig. 6). Remove velocity valves (if so equipped.)

(6) Using Tool T109-59, screw driver bit, remove accelerator pump intake check valve located inside fuel bowl, adjacent to the accelerator pump cylinder. **On CAP carburetors, do not remove the idle mixture adjusting screws from the throttle body. These screws have limited travel and will be broken if removed.**

The carburetor now has been disassembled into two units, namely the air horn and the main and throttle body casting. The component parts of each have been disassembled as far as necessary for cleaning and inspection.

It is usually 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 the idle discharge ports to the valve is carefully established for one particular assembly, as shown in (Fig. 7). The valves are milled to give the proper port relation.

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 15 and 30 miles per hour.

It is recommended that if the throttle shafts are

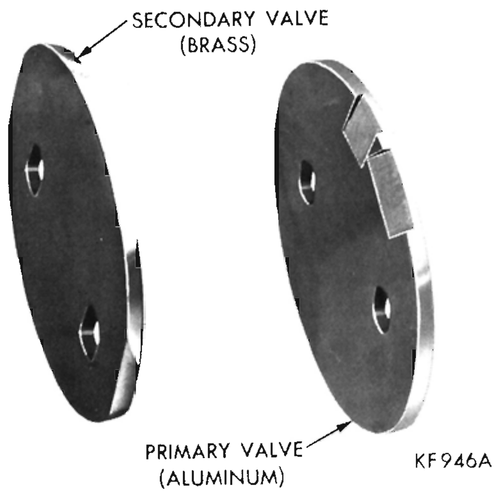


Fig. 8—Throttle Valve Identification

excessively worn, that a new carburetor be installed. However, if the throttle valves have become nicked, burred or damaged, new valves may be installed, providing the following instructions are carefully followed. **The screws that attach the throttle valves are staked on the opposite side and care should be used in removal so as not to break the screws in the throttle shaft. Remove the staked portion of the screws with a file.**

Remove the screws that attach the primary throttle valves to the throttle shaft and slide valve (or valves) out of bores.

Remove the screws that attach the secondary throttle valves to the throttle shaft and slide valve (or valves) out of bores.

The primary valves and secondary valves are not interchangeable and should be kept separate in order that each may be returned to its respective bore. (See Fig. 8).

INSPECTION AND ASSEMBLY

(1) Slide primary throttle valve (or valves) into their respective bores, install new screws, but do not tighten. Be sure idle speed adjusting screw is backed out. Hold valves in place with fingers. (Fingers pressing on high side of valves.)

(2) Tap valves lightly in this position, tighten screws securely. Stake screws by squeezing with pliers.

(3) Turn idle mixture adjusting screws lightly against their seats, then back off one full turn for an approximate adjustment. **Do not use a screwdriver.**

(4) Place new secondary venturi gaskets in position, then install secondary venturi (pump and choke side) by lowering straight down on gaskets. Install attaching screws and tighten securely. **Be sure all the metering holes and vent tubes are clean, in both the primary and secondary venturi.**

(5) Place new primary venturi gaskets in position, then install the primary venturi (pump and choke side) by lowering straight down on gaskets. Refer to (Fig. 5). Install attaching screws and tighten securely.

(6) Install primary and secondary main metering jets, using Tool T109-58. Refer to (Fig. 4.) Tighten jets securely.

(7) Install accelerator pump intake check ball using Tool T-109-59.

Accelerator Pump Test

(1) Pour clean gasoline into carburetor bowl (approximately ½ inch deep). Remove the accelerator pump plunger from the jar of gasoline. Flex the leather several times, then slide into pump cylinder.

(2) Install accelerator pump discharge check needle in discharge passage. Raise pump plunger and press lightly on plunger shaft to expel air from pump passages. Using a small clean brass rod, hold discharge check needle firmly on its seat. Again raise plunger and press downward. No fuel should be emitted from either the intake or discharge passage.

(3) If fuel does emit from intake passage, remove intake check ball and reclean the passage. Fuel leakage at the discharge check needle indicates the presence of dirt or a damaged check needle. Clean again and then install a new check needle. Retest for leakage.

(4) If either intake check assembly or discharge check needle leaks after above test and service fix, attempt to reseat as follows:

Intake Check Ball

Remove the intake check assembly from the throttle body. Install a new check assembly, then retest as described previously.

Discharge Check Needle

(1) 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.

(2) Install accelerator pump discharge check needle, jet housing and gasket. Install housing and attaching screws. Tighten screws securely.

(3) Press down on accelerator pump plunger shaft, and as plunger is being depressed, a clear straight stream should emit from each jet. If the streams are not identical, (if either one is diverted or restricted) a new accelerator pump jet housing should be installed. After test, pour gasoline from carburetor bowl and remove pump plunger.

Assembling the Air Horn

(1) Slide fuel inlet screen into fuel line fitting, then install in air horn. Tighten securely.

(2) Check to see if leather on accelerator pump

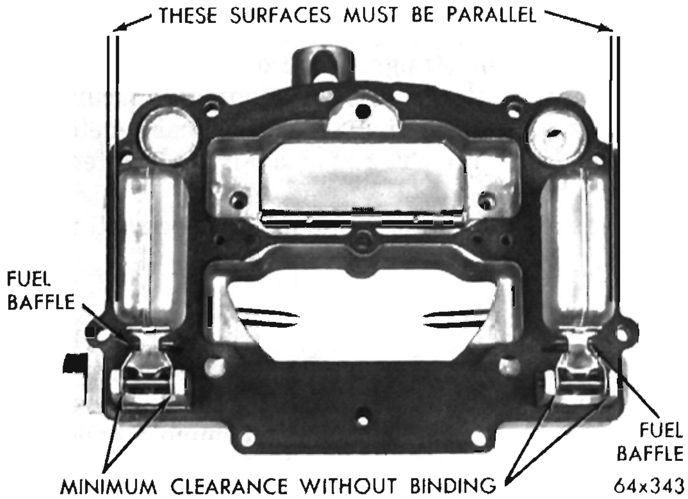


Fig. 9—Checking Float Alignment

plunger is hard, cracked or worn. If any sign of wear or deterioration is evident, install a new plunger assembly.

(3) When reassembling, make sure the large diameter of pivot screw enters hole in pump arm and that shoulder on screw has not pinched pump arm.

The carburetors are equipped with synthetic rubber tipped fuel inlet needles. The needle tip is a rubber material which is not affected by gasoline and is stable over a wide range of temperatures. The tip is flexible enough to make a good seal on the needle seat, and to give increased resistance to flooding.

The use of new inlet needles require that care be used when making float adjustments. Avoid applying any pressure on the floats which might compress the tip of the fuel inlet needles. **The tip can be compressed sufficiently to cause a false setting which will affect correct level of fuel in the bowl.**

(4) Place a new air horn to main body gasket in position on air horn, then install float needle valve seats. (Be sure each needle seat and needle is reinstalled in its original position.)

(5) Slide right and left floats into position in air horn, then install float fulcrum pins. **(Be sure marked float is installed on pump side of the air horn.)** See disassembly procedures.

(6) After floats have been installed, check float alignment, level and drop settings as follows:

Float Alignment Setting

(1) Sight down side of each float shell to determine if side of the float is parallel to outer cage of air horn casting, as shown in (Fig. 9).

(2) If sides of float are not in alignment with edge of casting, bend float lever by applying pressure to end of the float shell with thumb. **To avoid damage to the float, apply only enough pressure to bend the float lever.**

(3) After aligning floats, remove as much clearance as possible between arms of float lever and lugs of air horn. To do this, bend float lever. The arms of the float lever should be as parallel as possible to the inner surfaces of the lugs or the casting.

Float Level Setting

(1) With air horn inverted, air horn gasket in place and the float needle seated, slide float gauge (refer to specifications for carburetor being worked on) between top of the float (at outer end) and air horn gasket, as shown in (Fig. 10). Float should just touch gauge (T109-106).

(2) Check other float in same manner. If an adjustment is necessary, bend float arm using Tool T109-22, until correct clearance has been obtained. After bending arm, recheck the float alignment.

Float Drop Setting

(1) Holding air horn in an upright position, measure distance from the top of floats (outer end) to the air horn gasket, as shown in (Fig. 11). This measurement should be ¾ inch. If an adjustment is necessary, bend the stop tabs on float levers until correct drop setting has been obtained. Bend tab toward the needle seat to lessen drop, or away from seat to increase drop.

(2) After floats have been checked and adjusted, continue to assemble the carburetor as follows:

(3) Place accelerator pump plunger lower spring in

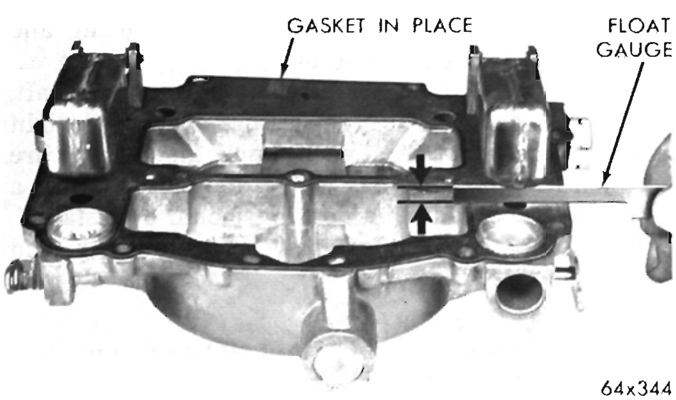


Fig. 10—Checking Float Height

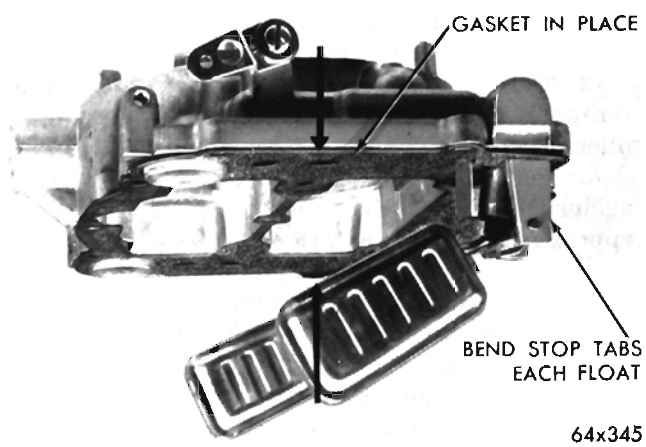


Fig. 11—Checking Float Drop

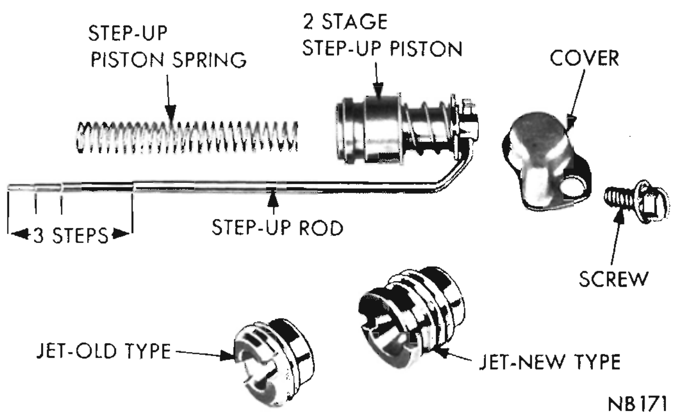


Fig. 12—Step-Up Piston, Rod and Jet

the pump cylinder, then lower the air horn carefully down on the main body. Care must be taken to center small brass main bleed tubes so that they will pass through the holes in air horn without being damaged. **Be sure the fuel baffles on the air horn, slide down in front, (bowl side) of the float chamber baffles, or the air horn will not index correctly with the main body and can cause the floats to hang up. Be sure the leather on the plunger does not curl or wrinkle. Accelerator pump operation will be affected if this precaution is not observed.**

(4) Install 10 air horn attaching screws and tighten securely. (The two long screws should be installed in holes that are located at air cleaner mounting surface. The 1 inch screw at the front and 1½ inch at the rear.)

The change from low speed, best fuel economy, road load mixtures to richer wide open throttle full power mixtures is now accomplished in two steps. This has made it possible to secure best low speed fuel economy without sacrificing performance in the intermediate speed range. To do this, there is a new step-up piston and spring assembly, new metering rods with three diameters, and new style primary metering jets, as shown in (Fig. 12).

(5) Slide step-up piston spring into piston cylinders, followed by step-up pistons and step-up rods. Install cover plates and attaching screws while holding the step-up pistons down in position. Tighten screws securely.

(6) Check fit of the choke valve in air horn. The valve should be evenly spaced on all sides. Loosen screws and reposition if necessary.

(7) Engage throttle connector rod with the primary throttle shaft lever, then install hairpin clip. Install clevis clip to rod and pump arm.

(8) Engage lower end of fast idle connector rod with fast idle cam, then swing in an arc to lock in cam. Slide other end of rod into the choke shaft lever and secure with hairpin clip.

Installing the Vacuum Diaphragm

Inspect the diaphragm 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 vacuum fitting to seal the opening. Release the diaphragm stem. If the stem moves more than 1/16 inch in ten (10) seconds, the leakage is excessive and the assembly must be replaced. Install the diaphragm assembly on the carburetor as follows:

(1) Assemble to carburetor and tighten attaching screws securely.

(2) Install choke operating link in position between diaphragm plunger (stem) and choke lever. Install the clip to secure.

(3) Inspect rubber hose for cracks, before placing it on correct carburetor fitting. Refer to (Fig. 1). **Do not connect the vacuum hose to the diaphragm fitting until after the vacuum kick adjustment has been made. (See Carburetor Adjustments.)**

CARBURETOR ADJUSTMENTS

The following adjustments should be made with the carburetor on the bench for ease of working, and, should be made in the following order:

Fast Idle Speed Cam Position Adjustment

The fast idle engine speed adjustment should be made on the vehicle, as described in the Fast Idle Speed Adjustment (On the Vehicle Paragraph.) However, the Fast Idle Cam Position Adjustment can be made on the bench.

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

(1) With fast idle speed adjusting screw contacting step on fast idle cam, shown in (Fig. 13). move choke valve toward closed position with light pressure. In-

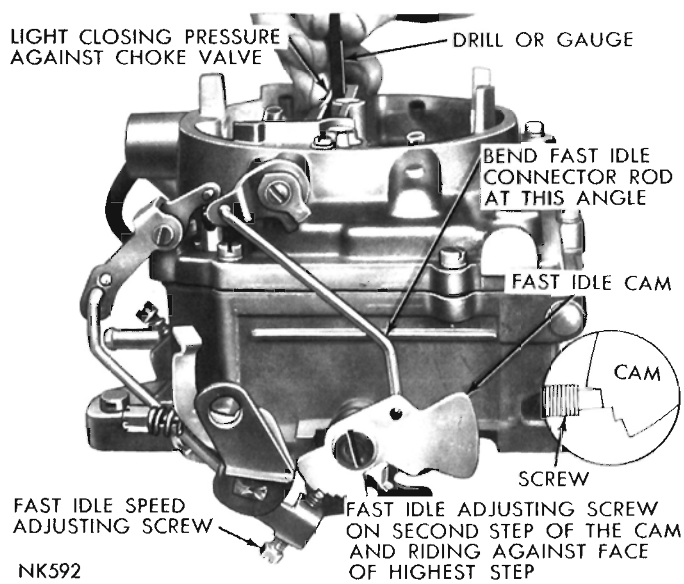


Fig. 13- Fast Idle Cam Position Adjustment

sert a NO. 50 drill between choke valve and the wall of the airhorn.

(2) An adjustment will be necessary if a slight drag is not obtained as the drill is being removed.

(3) If an adjustment is necessary, bend fast idle connector rod at angle, using Tool T109-213 until correct valve opening has been obtained. Refer to (Fig. 13).

Vacuum Kick Adjustment—(This test can be made ON or OFF the vehicle.)

The choke diaphragm adjustment controls the fuel delivery while the engine is running. It positions the choke valve within the airhorn by action of the linkage between the choke shaft and the diaphragm. The diaphragm must be energized to measure the vacuum kick adjustment. Use either a distributor test machine with a vacuum source, or vacuum supplied by another vehicle.

(1) With engine **Not** running, open throttle valves far enough to allow choke valve to be moved to closed position.

(2) Disconnect vacuum hose from diaphragm and connect hose from vacuum supply, as shown in (Fig. 14). (A minimum of 10 inches of vacuum) will be required.

(3) **Standard Carburetors,** insert a 1/8 inch drill (manual transmissions) or a Number 35 drill (automatic transmissions). Use a Number 42 drill (automatic transmission) on the 273 cu. in. engine carburetor.

Special CAP Carburetors, insert a Number 44 drill (manual transmissions) or a Number 40 drill (automatic transmissions). Use a 1/8 inch drill on both manual and automatic transmissions on the 273 cu. in. engine carburetor between choke valve and wall of the air horn. Refer to (Fig. 14). Apply sufficient closing pressure on choke shaft lever to provide smallest choke valve opening possible without distortion of diaphragm link. Note that cylindrical stem of diaphragm will extend as an internal spring is compressed. The spring must be fully compressed for proper measurement of the kick adjustment. (Refer to Specifications.)

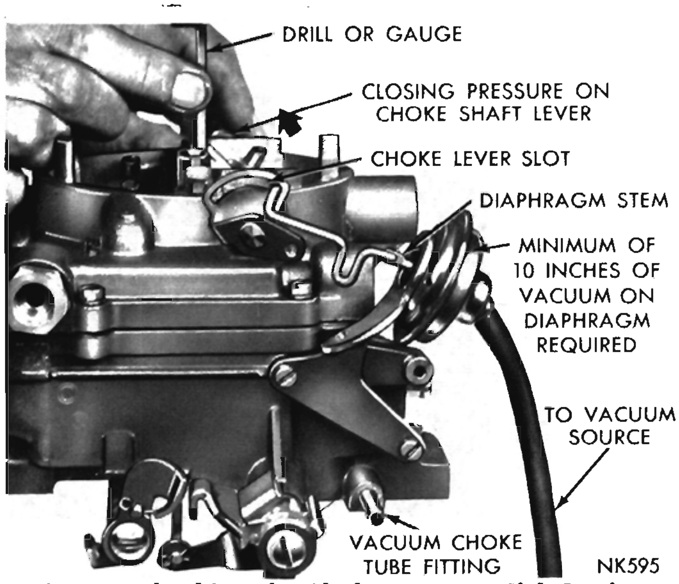


Fig. 14—Checking the Choke Vacuum Kick Setting

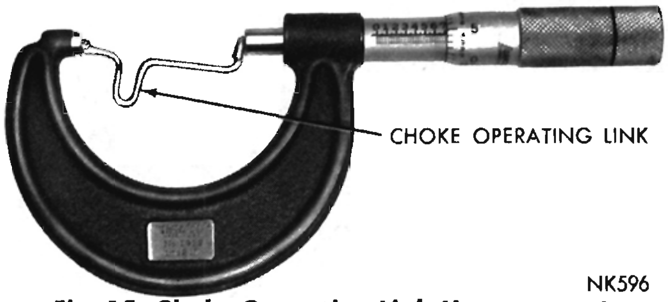


Fig. 15—Choke Operating Link Measurement

(4) An adjustment will be necessary if a slight drag is not obtained as drill or gauge is being removed.

The adjustment of this opening will require the removal of the choke operating link.

CAUTION: Damage to the diaphragm and the choke lever slot can result, if the link is not removed for the bending operation.

(5) Remove clip and disengage choke operating link from the choke lever, then disengage the link from the diaphragm stem. (The best bending results will be obtained by using a vise and a pair of pliers.)

(6) Bend choke operating link to provide the correct choke valve opening.

CAUTION: A correction in the length of the link of .015 inch, will result in a change of .010 inch in the choke valve opening.

As an example, if the choke valve opening is .010 inch in error, the correction in the link length would by .015.

A 2″ micrometer will be helpful in establishing the original length of the link, as shown in (Fig. 15), before completing the adjustment.

(7) Install choke operating link and recheck choke valve opening, using a drill or gauge. Refer to (Fig. 14).

Reinstall vacuum hose to diaphragm and make the following check:

(8) With no vacuum applied to diaphragm, some clearance should exist between choke operating link and choke lever slot, in both open and closed choke valve positions, as shown in (Fig. 16). **This clearance is necessary to allow the choke valve to close for starting as well as fully open after the engine reaches the normal operating temperature.**

If a clearance does not exist in both of these positions, a recheck of the operating link adjustment should be made. **Free movement of the choke valve between the closed and open positions is very necessary.**

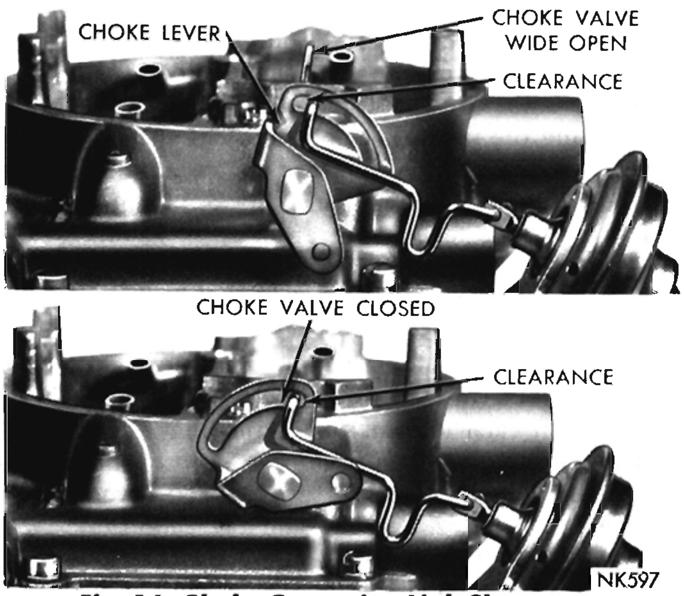


Fig. 16—Choke Operating Link Clearance

This free movement should also exist between the kick and the open choke valve positions with the engine running. If binding does exist, the choke operating link has been improperly bent and should be corrected.

Choke Unloader Adjustment

With the throttle valves in the wide open position, it should be possible to insert Tool T109-80 (3/8 inch) gauge between the upper edge of the choke valve and the inner wall of the air horn, as shown in (Fig. 17).

If an adjustment is necessary, bend the unloader lip on the throttle shaft lever, using Tool T109-41, until correct opening has been obtained.

Accelerator Pump Adjustment

Move the choke valve to wide open position, to release the fast idle cam. Back off the idle speed adjusting screw (curb idle) until the throttle valves are seated in the bores.

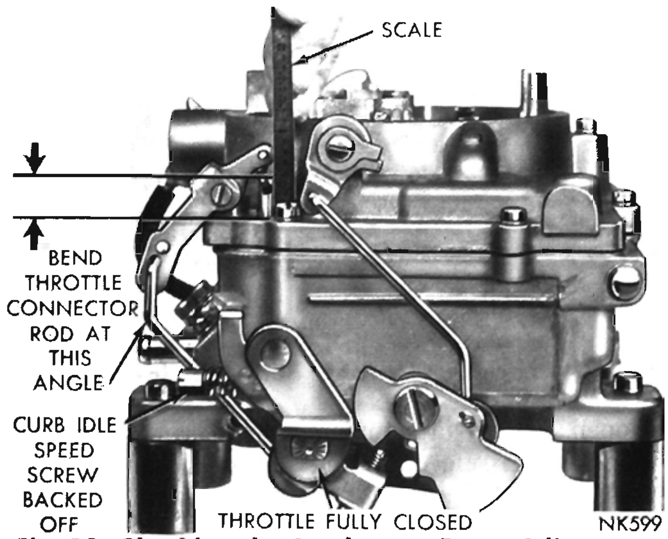


Fig. 18—Checking the Accelerator Pump Adjustment

Measure the distance from the top of the air horn to the top of the plunger shaft, using a "T" scale, as shown in (Fig. 18). This distance should be 7/16 inch.

If an adjustment is necessary, bend the throttle connector rod at the lower angle, using Tool T109-213, until correct travel has been obtained.

Secondary Throttle Lever Adjustment

To check the secondary throttle lever adjustment, block the choke valve in the wide open position and invert the carburetor. Slowly open the primary throttle valves until it is possible to measure 21/64 inch between the lower edge of the primary valve and the bore (opposite idle port) as shown in (Fig. 19). At this measurement, the secondary valves should just start

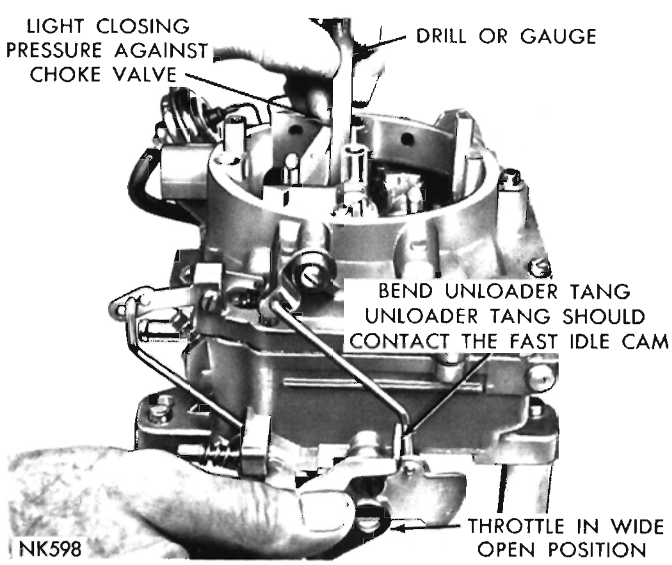


Fig. 17—Checking Choke Unloader (Wide Open Kick)

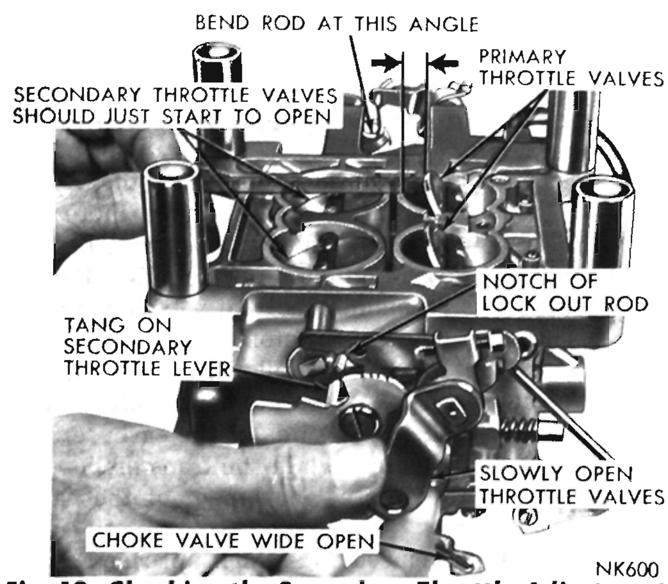


Fig. 19—Checking the Secondary Throttle Adjustment

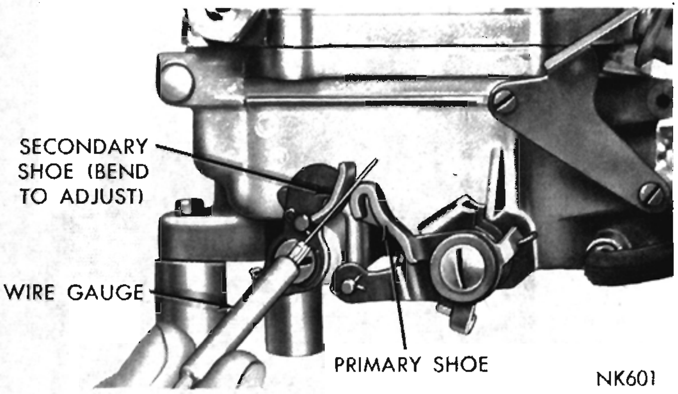


Fig. 20—Checking Clearance Between Closing Shoes

to open. If an adjustment is necessary, bend the secondary throttle operating rod at the angle, using Tool T109-213, until correct adjustment has been obtained.

With the primary and secondary throttle valves in the tightly closed position, it should be possible to insert Tool T109-29 (.020″) wire gauge, between the positive closing shoes on the secondary throttle levers, as shown in (Fig. 20).

If an adjustment is necessary, bend the shoe on the secondary throttle lever, using Tool T109-22, until correct clearance has been obtained.

Secondary Throttle Lock Out Adjustment

Crack the throttle valves, then manually open and close the choke valve. The tang on the secondary throttle lever should freely engage in the notch of the lockout dog. Refer to (Fig. 19).

If an adjustment is necessary, bend the tang on the secondary throttle lever, until engagement has been made. Use Tool T109-22 for this operation.

After adjustments have been made, reinstall carburetor on engine, using a new gasket.

It is suggested that the carburetor be filled with clean gasoline. This will help prevent dirt that is trapped in the fuel system, from being dislodged by the free flow of fuel, as the carburetor is primed.

Idle Speed Adjustment—(Curb Idle) Standard Carburetors

To make the idle speed adjustment, the engine must be thoroughly warmed up. A much more reliable idle adjustment can usually be obtained if the car has been driven a minimum of five miles. For the best results, it is recommended that a tachometer be used in this adjustment. (Before making the idle speed adjustment observe the following precautions:)

On cars equipped with the automatic transmission, loosen the nut in the sliding link of the carburetor to bellcrank rod so that the stop in the transmission will not interfere with the free movement of the carburetor throttle lever.

To make the idle speed adjustment, proceed as follows:

(1) Turn the idle speed screw **in** or **out** to obtain 500 r.p.m. (With air conditioning **On,** set the idle speed at 500 r.p.m.) Be sure the choke valve is fully open and that the fast idle adjusting screw is not contacting the fast idle cam. (Refer to Specifications.)

(2) Turn each idle mixture screw to obtain the highest r.p.m. While making the adjustment, carefully watch the tachometer and notice that the speed can be decreased by turning the screws in either direction from the setting that gave the highest r.p.m. reading.

(3) Readjust to 500 r.p.m. with the idle speed screw.

(4) Turn each idle mixture adjusting screw in the clockwise direction (leaner) until there is a slight drop in r.p.m. Now, turn each screw out, counterclockwise (richer) just enough to regain the lost r.p.m.

The procedure will assure that the idle has been set to the leanest possible mixture for smooth idle.

This setting is very important.

Since the correct speed was originally set using the speed screw, the speed obtained after finding the leanest smooth idle setting will probably be too fast.

(5) Readjust the speed screw to obtain correct idle speed. Repeat steps 2 and 4 above if necessary.

After the proper idle speed has been obtained, move the sliding link to the rear, against the stop, and tighten the nut securely.

Fast Idle Speed Adjustment (On the Vehicle)**

To set the fast idle speed on the vehicle, connect a tachometer to the vehicle, then set the curb idle speed and proceed as follows:

(1) With engine running and transmission in neutral position, open throttle slightly.

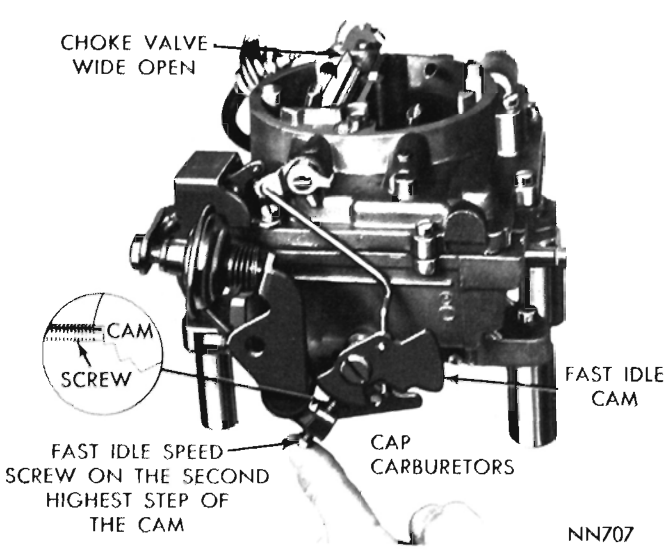
(2) **On Standard carburetors,** close the choke valve about 20 degrees, then allow throttle to close. Return choke valve to the open position. The fast idle speed adjusting screw should contact the slowest speed step on the fast idle cam (Fig. 21.)

(3) **On CAP carburetors,** open the throttle until the fast idle adjusting screw can be positioned on the second highest step of the cam (Fig. 21). **The air cleaner must be installed while measuring the engine speed.**

(4) With the engine warmed up to the normal operating temperature, turn the fast idle speed adjusting screw in or out to secure 700 rpm (Standard Carburetors) or 1500 rpm (CAP carburetors).* (Refer to Specifications.) **Reposition the cam and throttle after every fast idle speed screw adjustment to apply normal throttle closing torque.**

***Special Note: CAP equipped vehicles.** Before adjusting idle and/or fast idle speeds and mixtures, make sure that the basic timing and the distributor

**After Approx. 500 Miles (If Necessary).



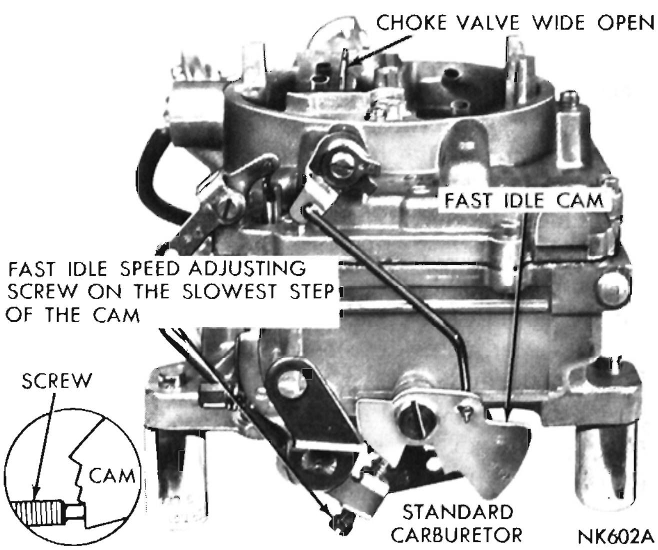


Fig. 21—Fast Idle Speed Adjustment (on the Vehicle)

control valve are correctly adjusted as outlined under Idle Speed Adjustment (Curb Idle) CAP Carburetors).

Dashpot Setting and Adjustment—C.A.P. Carburetors

(Manual Transmission Only)

With the curb idle speed and mixture properly set and a tachometer installed, position the throttle lever so that the actuating tab on the lever is contacting the stem of the dashpot but not depressing it. The tachometer should read 2000 rpm if the setting is correct. To adjust the setting if necessary, screw the dashpot in or out as required. When the desired setting is obtained, tighten the lock nut on the dashpot against the bracket.

Idle Speed Adjustment (Curb Idle) CAP Carburetors

To make the idle speed adjustment on CAP carburetors, secure an accurate ignition tachometer and a Sun Electric Combustion—Vacuum Unit, Model 80, Exhaust Condenser, Model EC, and Hose 669-14 or equivalent. (The above analyzer is recommended; however, other reliable makes of analyzers in good condition may be used.) Proceed as follows:

(1) Engine running at normal operating temperature, and timing checked and set at 5° after top dead center.

(2) Air Cleaner installed.

(3) Six cylinder engines only—turn headlights on high beam position.

(4) Automatic transmissions in neutral position (not in park position).

(5) On air conditioned vehicles turn air conditioning **off.**

(6) Connect ignition tachometer.

(7) Insert probe of the exhaust gas analyzer in the tail pipe as far as possible (2 ft. minimum distance). On dual exhaust cars use the left side tail pipe (side opposite heat valve). It is very important that the probe and connecting tubing be free of leaks to prevent erroneous readings. If a garage exhaust system is used to conduct the exhaust gases away, a plenum chamber or other means must be used to reduce the vacuum of the exhaust system to ½ inch water or less.

(8) Connect the exhaust gas analyzer, warm up and calibrate according to manufacturer's instructions.

(9) Place clamp on hose between distributor vacuum control valve and intake manifold.

(10) Set the idle speed to the specified value for the specific engine-transmission combination, as follows:

IMPORTANT: When adjusting mixture screws to obtain the air/fuel ratio specified for CAP, do not turn the mixture screw more than 1/16 turn at a time.

The combustion analyzer is so sensitive that the ratio must be changed by very small increments if accurate readings are to be obtained. The meters read in air/fuel ratio so that a higher reading indicates a leaner mixture and vice versa.

(a) Adjust each screw 1/16 turn richer (counterclockwise) and wait 10 seconds before reading the meter.

(b) If necessary, repeat step "a" until the meter indicates a definite increase in richness (lower reading). This step is very important since the meter reverses its readings and indicates a richer mixture as the carburetor is leaned out if the carburetor is set very lean.

(c) When it has been established that the meter is indicating a lower reading (richer mixture) when the idle mixture screws are turned in the richer direction, proceed to adjust the carburetor to give 14.2 air/fuel ratio, turning the screws counterclockwise (richer) to lower the meter reading and clockwise (leaner) to increase the meter reading.

(d) If the idle speed changes as the mixture screws are turned, adjust the speed to the specified value and readjust the mixture as required so that 14.2 air/fuel ratio is obtained at the specified idle speed.

(e) If the idle is rough, the screws may be adjusted independently to achieve a smooth idle, provided the air/fuel ratio is held to the 14.2 value.

(11) Remove clamp from distributor vacuum valve hose. If idle speed changes materially check and set valve as described under "Distributor Vacuum Control Valve Adjustment."

Distributor Vacuum Control Valve Adjustment

To adjust the control valve, refer to (Fig. 1), then proceed as follows:

(1) Connect a tachometer to the engine and warm engine up to the normal operating temperature.

(2) Connect a vacuum gage (0-30 in. mercury) to the distributor vacuum tube. The tee should have the same inside diameter as the distributor vacuum tube.

(3) If the carburetor is equipped with a dash pot, adjust it so that it does not contact the throttle lever at curb idle.

(4) Clamp closed the vacuum tube that connects the vacuum valve to manifold vacuum.

(5) Remove the distributor vacuum tube at the distributor and clamp the tube closed.

(6) Set the basic ignition timing to manufacturers specifications (5° ATC). The curb idle speed must be at the specified rpm before the timing is adjusted.

(7) Adjust carburetor to obtain the specified engine speed and exhaust emission level. The distributor vacuum must be below 6 in. of mercury at curb idle.

(8) Remove the clamps from the vacuum tubes and reconnect vacuum tube to the distributor. Remove vacuum valve cover (Fig. 1).

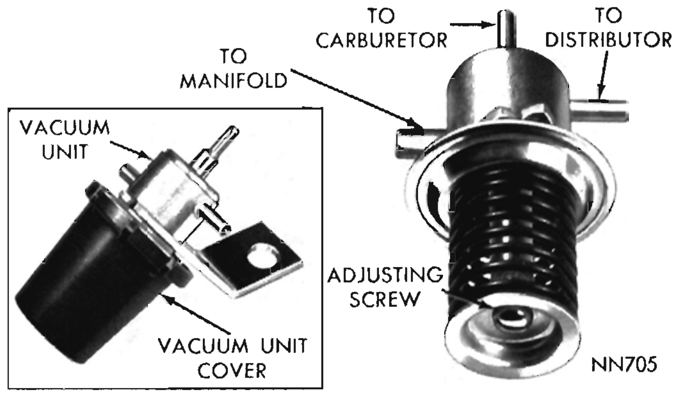


Fig. 1—Distributor Vacuum Control Valve Adjustment

(9) Speed engine up to 2000 rpm in neutral and hold speed for approximately 5 seconds. Release throttle and observe distributor vacuum. When the throttle is released, the distributor vacuum should increase to above 16 inches of mercury and remain there for a minimum of 1 second. The distributor vacuum must fall below 6 inches of mercury within 3 seconds after the throttle is released.

(10) Adjust valve if necessary. Turning the spring end adjusting screw counterclockwise will increase the time the distributor vacuum remains above 6 inches of mercury after the throttle is released. One turn of the adjusting screw will change the valve setting by approximately ½ inch of mercury. If the valve cannot be adjusted to the specifications described in Step No. 9, replace valve (Fig. 1).

(11) Replace vacuum valve cover. Reset the carburetor dash pot (if so equipped) and check valve performance as outlined in step no. 9. If the distributor vacuum does not fall below 6 inches of mercury within 4 seconds after the throttle is released, readjust or replace the dash pot.

Carter AFB 4-barrel with Secondary Velocity Valves

GENERAL INFORMATION

The twin four barrel carburetors (Fig. 1) are used on the 426 cu. in. Hemi engine. Carburetor Models AFB-4619S (front) are used on the 426 cu. in. engine (Street Hemi), when the vehicles are equipped with the manual or automatic transmissions.

Carburetor Models AFB-4620S (rear) and AFB-4621S (rear) are used on the 426 cu. in. engine (Street Hemi), when the vehicles are equipped with the manual or automatic transmissions respectively.

Since the service procedures are identical on all Carter AFB carburetors, the illustrations showing the various disassembly procedures will not always show any one specific carburetor.

The throttle valves of the secondary half of the carburetor are mechanically connected to the primary valves and open with the primary after an approximate 60° lag; and continue to open until both primary and secondary throttle valves reach the wide open position simultaneously. As engine speed increases, the forces exerted by the velocity of intake air down through the venturis of the carburetor increases and tends to overcome the counterweight attached to the velocity shaft, permitting the offset velocity valves to position themselves according to engine requirements.

The AFB (aluminum four barrel) carburetor contains many features, some of which are the locations for the step-up rods and pistons. The step-up rods, pistons and springs are accessible for service without removing the air horn or the carburetor from the engine. The venturi assemblies (primary and secondary) are replaceable and contain many of the calibra-

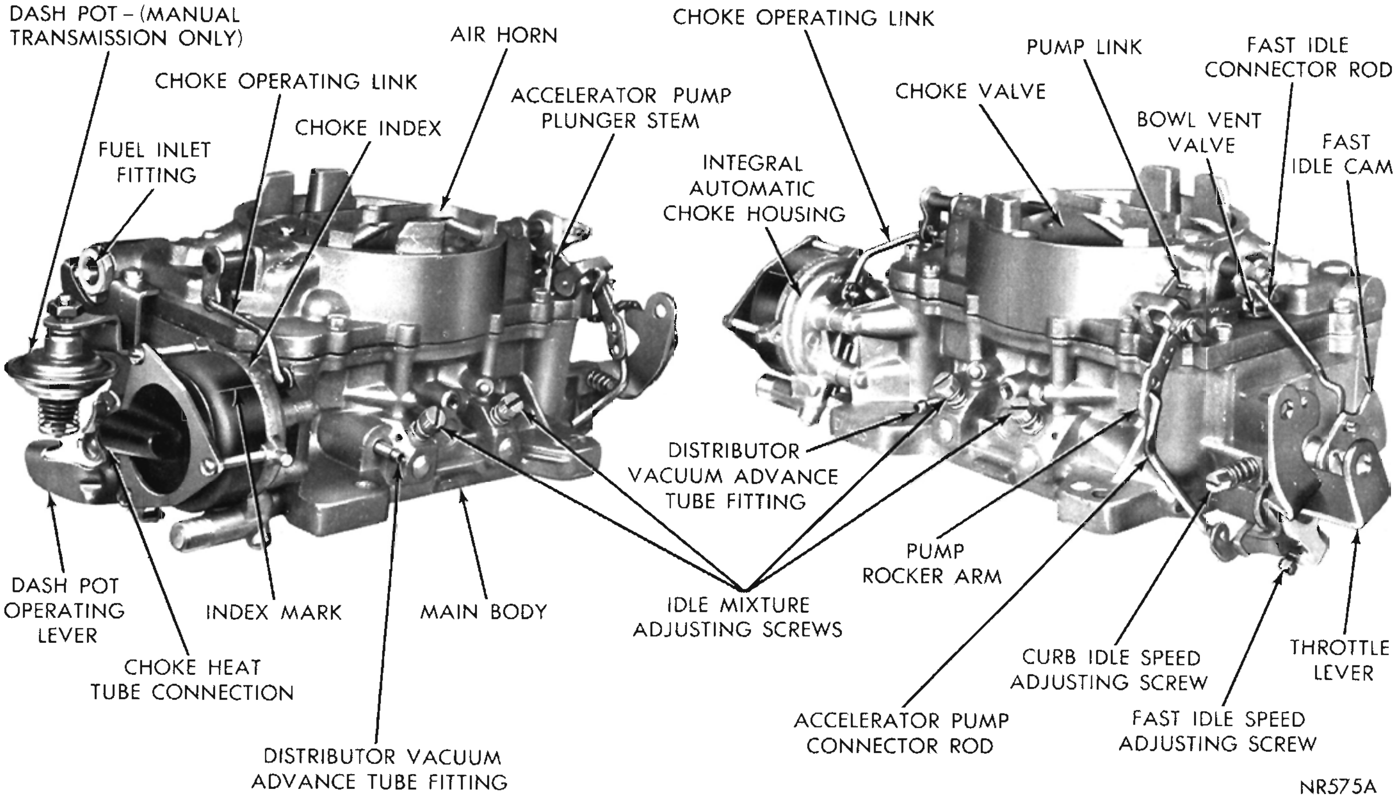


Fig. 1—Carburetor Assembly (AFB)

tion points for both the high and low speed system. One fuel bowl feeds both the primary and secondary nozzles on the right side while the other fuel bowl takes care of the primary and secondary nozzles on the left side. This provides improved performance in cornering, quick stops and acceleration.

All the major castings of the carburetor are aluminum, with the throttle body cast integral with the main body. This allows an overall height reduction in the carburetor. The section containing the accelerator pump is termed the primary side of the carburetor. The rear section is the secondary. The five conventional systems used in previous four barrel carburetors are also used in this unit. The five conventional systems are, two float systems, two low speed systems, (primary side only on front carburetors only) two high speed systems, one accelerator pump system and one automatic choke control system.

The carburetors are equipped with a pair of velocity valves, which control the secondary valve operation.

SERVICE PROCEDURES

DISASSEMBLING CARBURETOR (Fig. 1)

(1) Place carburetor assembly on repair stand Tool C-3400 or T-109-287S elevating legs. These tools are used to protect throttle valves from damage and to provide a suitable base for working.

(2) Remove hairpin clip that attaches fast idle connector rod to choke lever. Disengage rod from lever, then swing rod at an arc until it can be disengaged from fast idle cam.

(3) Remove retainer that holds throttle connector rod in center hole of accelerator pump arm. Remove hairpin clip that attaches lower end of rod in primary throttle shaft lever. Disengage rod from arm and lever, then remove from carburetor.

(4) Remove screws attaching step-up piston and rod cover plates. Hold cover down with a finger to prevent piston and rods from flying out. Lift off plates and slide step-up pistons and rods out of air horn, (Fig. 2). Remove step-up piston springs. Step-up rods are not interchangeable.

(5) Remove ten screws that attach air horn to main body. (1 screw in hole in air horn.) Lift air horn straight up and away from main body. When removing air horn, use care so as not to bend or damage floats. Remove accelerator pump, plunger, lower

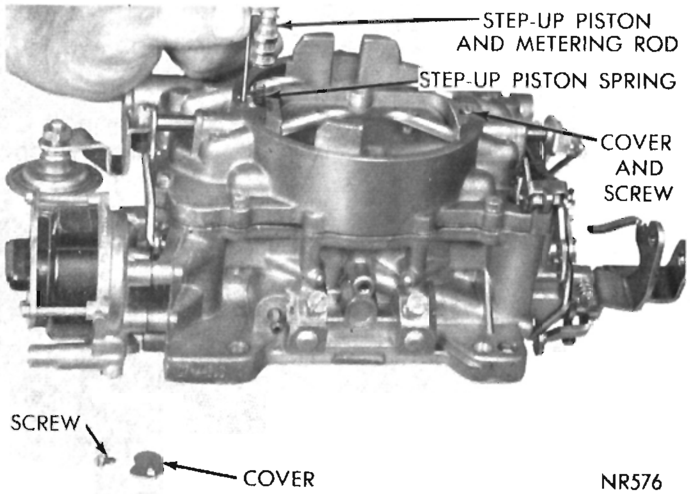


Fig. 2—Removing or Installing Step-Up Piston and Rods

spring from pump cylinder. Remove dashpot (if so equipped).

Disassembling the Air Horn

Place air horn in an inverted position on bench (to protect the floats) then proceed to disassemble as follows:

(1) Using a suitable Tool, remove float fulcrum pins, (left and right) then lift float up and out of bosses on air horn. 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 spring clip that holds throttle connector rod in center hole of pump arm. Remove pump arm pivot screw and lift off pump arm, at same time, disengage link from arm and pump stem. Slide accelerator pump plunger and spring out of air horn. Remove gasket.

(4) Place accelerator pump plunger in a jar of clean gasoline or kerosene, to prevent leather from drying out.

(5) Remove fuel inlet fitting and filter screen from air horn.

(6) Remove screws and retainer holding thermostatic coil housing to choke housing. Remove housing, gasket and baffle plate. To remove choke piston, remove nut and washer, then slide piston off shaft and work out of well.

Main Body Disassembly

(1) Remove screws that attach accelerator pump jet housing to main body. Lift out jet housing and gasket (Fig. 3). Discard gasket. Now, invert main body and drop out discharge check needle from discharge passage.

(2) Using Tool T-109-58, remove main metering jets (primary side), (Fig. 4). **The primary and secondary main metering jets are not interchangeable. It is very important that these jets be installed in their respective locations in the main body at reassembly.**

(3) Again using Tool T-109-58, remove main metering jets (secondary side), (Fig. 4).

(4) Remove screws that attach primary venturi (choke and pump side) to main body. Lift venturi straight up and away from main body, (Fig. 5). Discard gaskets. **The venturi assemblies are not interchangeable, side for side and must be reinstalled in their original locations at reassembly.**

(5) Remove screws that attach secondary venturi (choke and pump side) to main body. Lift secondary venturi assemblies straight up and away from body, (Fig. 6). Remove velocity valves (Fig. 7).

(6) Using Tool T-109-59, screw driver bit, remove accelerator pump intake check valve located inside

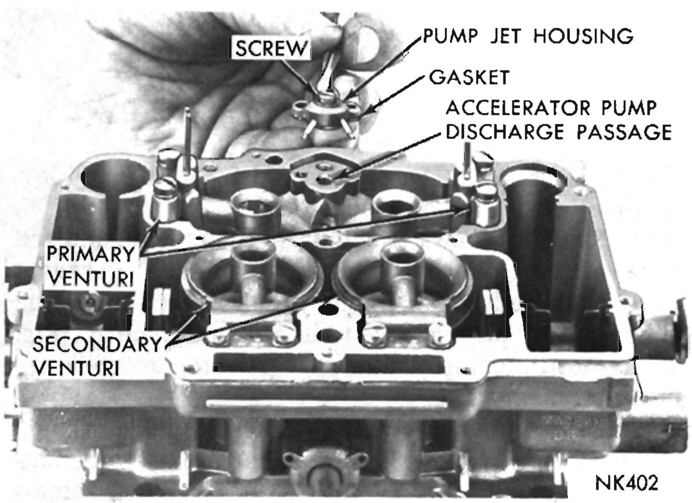


Fig. 3—Removing or Installing Accelerator Pump Jet Housing

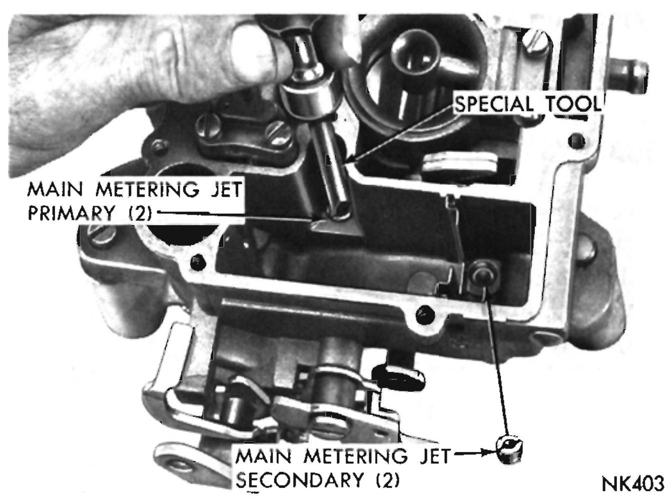


Fig. 4—Removing or Installing Main Metering Jets

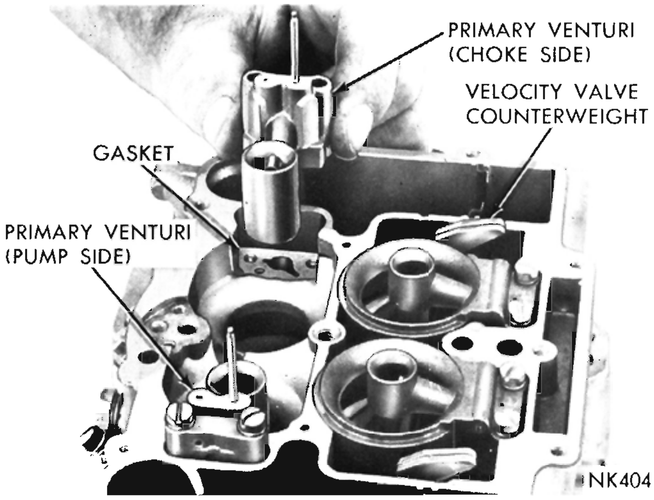


Fig. 5—Removing or Installing Primary Venturi Cluster

fuel bowl, adjacent to accelerator pump cylinder.

The carburetor now has been disassembled into two units, namely air horn and the main and throttle body casting. The component parts of each have been disassembled as far as necessary for cleaning and inspection.

It is usually 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 the idle discharge ports to the valve is carefully established for one particular assembly, (Fig. 8).

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 15 and 30 miles per hour.

It is recommended that if the throttle shafts are excessively worn, that a new carburetor be installed. However, if the throttle valves have become nicked,

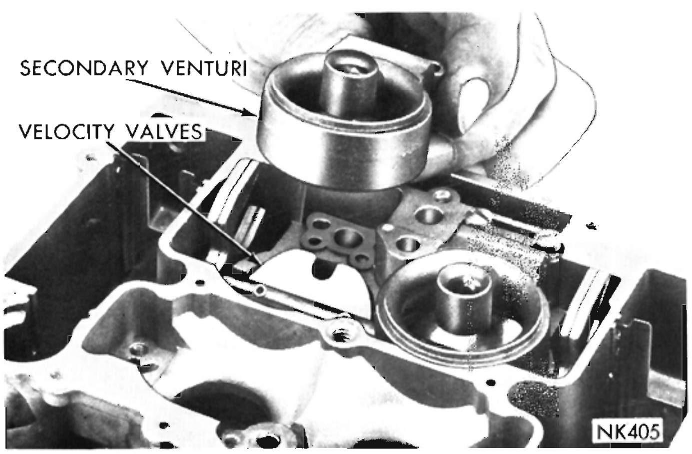


Fig. 6—Removing or Installing Secondary Venturi Cluster

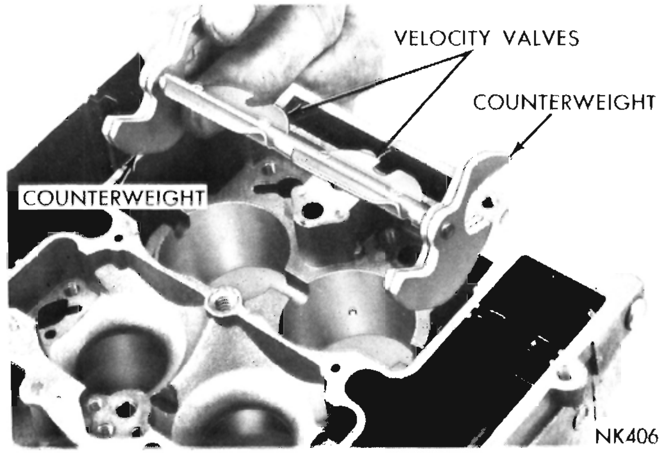


Fig. 7—Removing or Installing Velocity Valves

burred or damaged, new valves may be installed, providing the following instructions are carefully followed. **The screws that attach the throttle valves are staked on the opposite side and care should be used in removal so as not to break the screws in the throttle shaft. Remove the staked portion of the screws with a file.**

Remove the screws that attach the primary throttle valves to the throttle shaft and slide valve (or valves) out of bores.

Remove the screws that attach the secondary throttle valves to the throttle shaft and slide valve (or valves) out of bores.

The primary valves and secondary valves are not interchangeable and should be kept separate in order that each may be returned to its respective bore. (Fig. 9).

INSPECTION AND REASSEMBLY

(1) Slide primary throttle valve (or valves) into their respective bores, install new screws, but do not tighten. Be sure idle speed adjusting screw is backed

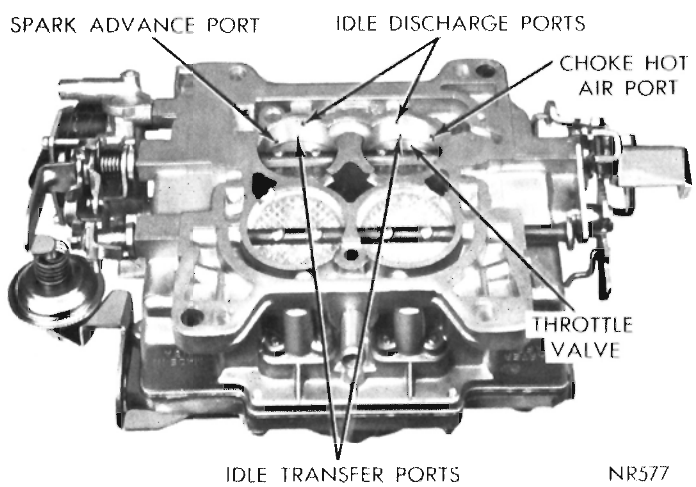


Fig. 8—Ports in Relation to Throttle Valves

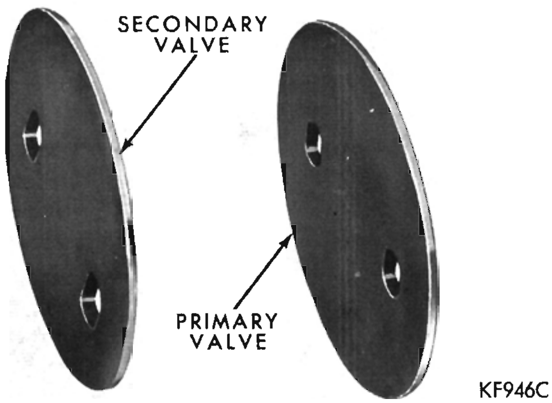


Fig. 9—Throttle Valve Identification

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

(2) Tap valves lightly in this position, tighten screws securely. Stake screws by squeezing with pliers.

(3) Turn idle mixture adjusting screws lightly against their seats, then back off one full turn for an approximate adjustment. **Do not use a screwdriver.** Install velocity valves.

(4) Place new secondary venturi gaskets in position, then install secondary venturi (pump and choke side) by lowering straight down on gaskets. Install attaching screws and tighten securely. **Be sure all the metering holes and vent tubes are clean, in both the primary and secondary venturi.**

(5) Place new primary venturi gaskets in position, then install the primary venturi (pump and choke side) by lowering straight down on gaskets. (Fig. 5). Install attaching screws and tighten securely.

(6) Install primary and secondary main metering jets, using Tool T-109-58. (Fig. 4). Tighten jets securely.

(7) Install accelerator pump intake check ball using Tool T-109-59.

Accelerator Pump Test

(1) Pour clean gasoline into carburetor bowl (approximately 1/2 inch deep). Remove accelerator pump plunger from jar of gasoline. Flex leather several times, then slide into pump cylinder.

(2) Install accelerator pump discharge check needle in discharge passage. Raise pump plunger and press lightly on plunger shaft to expel air from pump passages. Using a small clean brass rod, hold discharge check needle firmly on its seat. Again raise plunger and press downward. No fuel should be emitted from either the intake or discharge passage.

(3) If fuel does emit from intake passage, remove intake check ball and reclean the passage. Fuel leakage at discharge check needle indicates presence of dirt or a damaged check needle. Clean again and then install a new check needle. Retest for leakage.

(4) If either intake check assembly or discharge check needle leaks after above test and service fix, attempt to reseat as follows:

Intake Check Ball

Remove the intake check assembly from the throttle body. Install a new check assembly, then retest as described previously.

Discharge Check Needle

(1) 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 will have to be installed.

(2) Install accelerator pump discharge check needle, jet housing and gasket. Install housing and attaching screws. Tighten screws securely.

(3) Press down on accelerator pump plunger shaft, and as plunger is being depressed, a clear straight stream should emit from each jet. If streams are not identical, (if either one is diverted or restricted) a new accelerator pump jet housing should be installed. After test, pour gasoline from carburetor bowl and remove pump plunger.

Assembling Air Horn

(1) Slide fuel inlet screen into fuel line fitting, then install in air horn. Tighten securely.

(2) Check to see if leather on accelerator pump plunger is hard, cracked or worn. If any sign of wear or deterioration is evident, install a new plunger assembly.

(3) Slide the accelerator plunger into air horn, then install the accelerator pump link. When reassembling, make sure the large diameter of pivot screw enters hole in pump arm and that shoulder on screw has not pinched pump arm.

The carburetors are equipped with synthetic rubber tipped fuel inlet needles. The needle tip is a rubber material which is not affected by gasoline and is stable over a wide range of temperatures. The tip is flexible enough to make a good seal on the needle seat, and to give increased resistance to flooding.

The use of new inlet needles require that care be used when making float adjustments. Avoid applying any pressure on the floats which might compress the tip of the fuel inlet needles. **The tip can be compressed sufficiently to cause a false setting which will affect correct level of fuel in the bowl.**

(4) Place a new air horn to main body gasket in position on air horn, then install float needle valve seats. (Be sure each needle seat and needle is reinstalled in its original position.)

(5) Slide right and left floats into position in air

horn, then install float fulcrum pins. **(Be sure marked float is installed on pump side of the air horn.) See disassembly procedures.**

(6) After floats have been installed, check float alignment, level and drop settings as follows:

Float Alignment Setting

(1) Sight down side of each float shell to determine if side of the float is parallel to outer cage of air horn casting, (Fig. 10).

(2) If sides of float are not in alignment with edge of casting, bend float lever by applying pressure to end of float shell with thumb. **To avoid damage to the float, apply only enough pressure to bend the float lever.**

(3) After aligning floats, remove as much clearance as possible between arms of float lever and lugs of air horn. To do this, bend float lever. The arms of float lever should be as parallel as possible to inner surfaces of lugs of casting.

Float Level Setting

(1) With air horn inverted, air horn gasket in place and float needle seated, slide float gauge (refer to specifications for carburetor being worked on) between top of the float (at outer end) and air horn gasket, (Fig. 11). Float should just touch gauge (T-109-106).

(2) Check other float in same manner. If an adjustment is necessary, bend float arm using Tool T-109-22, until correct clearance has been obtained. After bending arm, recheck the float alignment.

Float Drop Setting

(1) Holding air horn in an upright position, measure distance from the top of floats (outer end) to the air horn gasket, (Fig. 12). This measurement should be 3/4 inch. If an adjustment is necessary, bend stop tabs on float levers until correct drop setting has

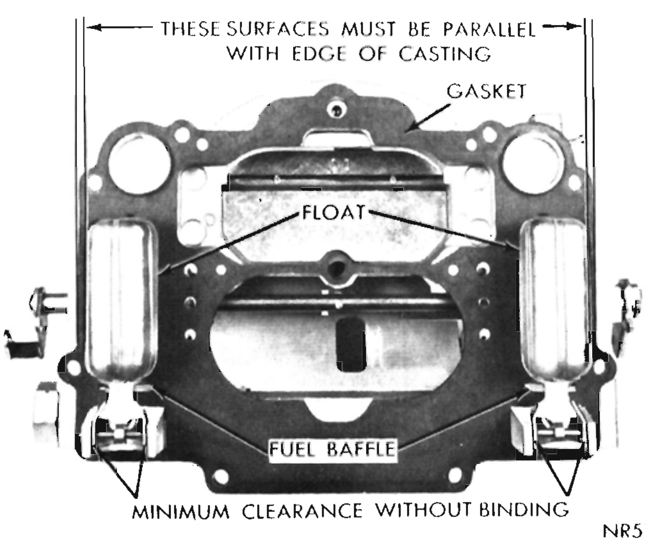


Fig. 10—Checking Float Alignment

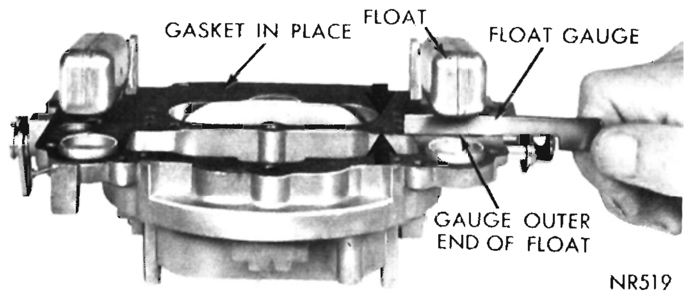


Fig. 11—Checking Float Height

been obtained. Bend tab toward needle seat to lessen drop, or away from seat to increase drop.

(2) After floats have been checked and adjusted, continue to assemble carburetor as follows:

(3) Place accelerator pump plunger lower spring in pump cylinder, then lower air horn carefully down on main body. Care must be taken to center small brass main bleed tubes so that they will pass through holes in air horn without being damaged. **Be sure the fuel baffles on the air horn, slide down in front, (bowl side) of the float chamber baffles, or the air horn will not index correctly with the main body and can cause the floats to hang up. Be sure the leather on the plunger does not curl or wrinkle. Accelerator pump operation will be affected if this precaution is not observed. Install dashpot (if so equipped.)**

(4) Install 10 air horn attaching screws and tighten securely. (The two long screws should be installed in holes that are located at air cleaner mounting surface. The 1 inch screw at front and 1-1/2 inch at rear.)

The change from low speed, best fuel economy, road load mixtures to richer wide open throttle full power mixtures is now accomplished in two steps. This has made it possible to secure best low speed fuel economy without sacrificing performance in the intermediate speed range. To do this, there is a new step-up piston and spring assembly, new metering rods with three diameters, and new style primary metering jets, (Fig. 13).

(5) Slide step-up piston spring into piston cylinders,

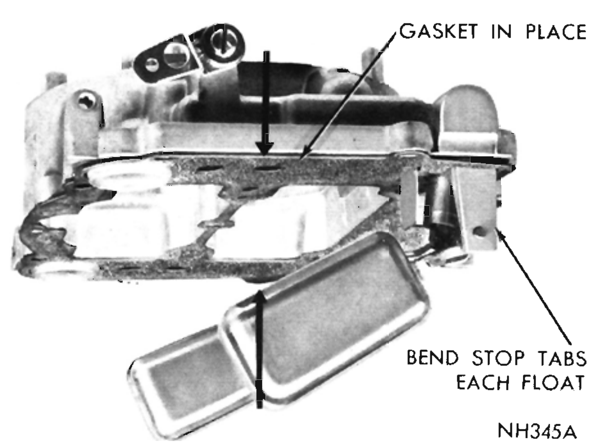


Fig. 12—Checking Float Drop

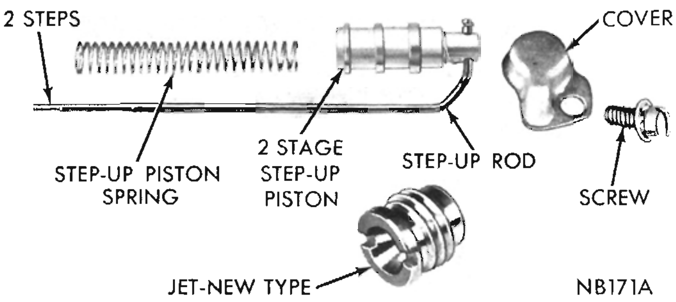


Fig. 13—Step-Up Piston, Rod and Jet

followed by step-up pistons and step-up rods. Install cover plates and attaching screws while holding step-up pistons down in position. Tighten screws securely.

(6) Slide choke piston down into well. Slide piston arm over shaft and install nut and washer. Tighten securely. Install baffle plate, gasket and coil housing. Install retainer and attaching screws. Turn coil housing to align index marks at two notches rich.

(7) Engage throttle connector rod with primary throttle shaft lever, then install hairpin clip. Install clevis clip to rod and pump arm.

(8) Engage lower end of fast idle connector rod with fast idle cam, then swing in an arc to lock in cam. Slide other end of rod into choke shaft lever and secure with hairpin clip.

CARBURETOR ADJUSTMENTS AFB-4620S and AFB-4621S Carburetors Only

The following adjustments should be made with the carburetor on the bench for ease of working, and, should be made in the following order:

Fast Idle Speed Cam Position Adjustment

The fast idle engine speed adjustment should be made on the vehicle, as described in the Fast Idle Speed Adjustment (On the Vehicle Paragraph.) However, the Fast Idle Cam Position Adjustment can be made on the bench.

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

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

(2) Insert specified drill (refer to Specifications), between choke valve and wall of air horn (Fig. 14). An adjustment will be necessary if a slight drag is not obtained as the drill is being removed.

(3) To adjust, bend fast idle connector rod at angle, using Tool T-109-213 until correct valve opening has been obtained (Fig. 14).

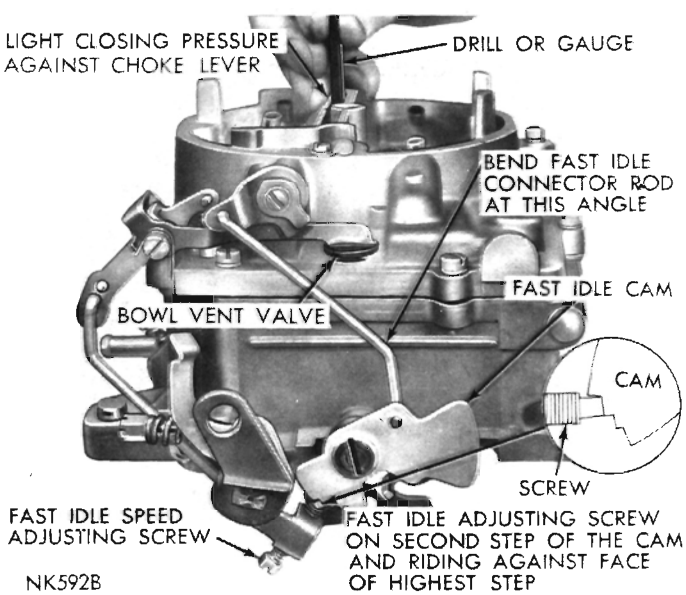


Fig. 14—Fast Idle Cam Position Adjustment

CHOKE PISTON INDEX (AFB-4620S and AFB-4621S Rear Carburetors Only)

The choke piston should be indexed to provide proper fuel delivery during warm-up, proceed as follows:

(1) Remove choke housing retainer ring, heat tube cap and choke coil housing, baffle plate and gasket.

(2) Remove throttle return spring so throttle can be set to a mid position.

(3) Let choke blade go wide open.

(4) Insert an .026 inch wire gauge* into choke piston slot so that hook on the end goes into slot in cylinder (Fig. 15).

(5) Push on choke piston lever thermostat tang

*This gauge can be made by bending a piece of .026 x 2 (inches long) wire bent at a right angle (1/8") as shown. If this size wire is not readily available, .026 inch step-up wire used in BBD Carburetors can be bent to shape and used for this purpose.

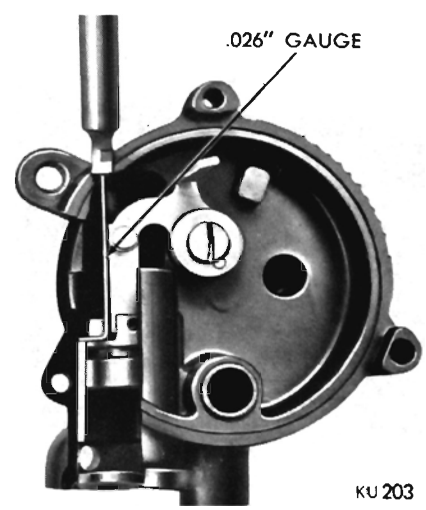


Fig. 15—Choke Piston Indexing

trapping the wire gauge between piston and cylinder slots with linkage hanging free.

(6) Adjust the link connecting the choke shaft to the choke piston lever by bending the link at an angle to give correct opening between choke valve and wall of air horn. (Refer to Specifications). Remove wire gauge before bending link.

(7) Reassemble choke, setting the coil two notches rich and install the throttle return spring.

Choke Unloader Adjustment (Wide Open Kick)

The choke unloader is a mechanical device to partially open the choke at wide open throttle. It is used to eliminate choke enrichment during cranking of an engine. Engines which have been flooded or stalled by excessive choke enrichment can be cleared by use of the unloader. Adjust the system as follows:

(1) Hold throttle valves in wide open position. Insert specified drill (refer to Specifications), between upper edge of choke valve and inner wall of air horn (Fig. 16).

(2) With a finger lightly pressing against choke valve lever, a slight drag should be felt as drill is being withdrawn. If an adjustment is necessary, bend unloader tang on throttle shaft lever, using Tool T-109-41, until correct opening has been obtained (Fig. 16).

Accelerator Pump Adjustment

Move the choke valve to wide open position, to release the fast idle cam. Back off the idle speed adjustment screw (curb idle) until the throttle valves are seated in the bores.

Measure the distance from the top of the air horn to the top of the plunger shaft, using a "T" scale,

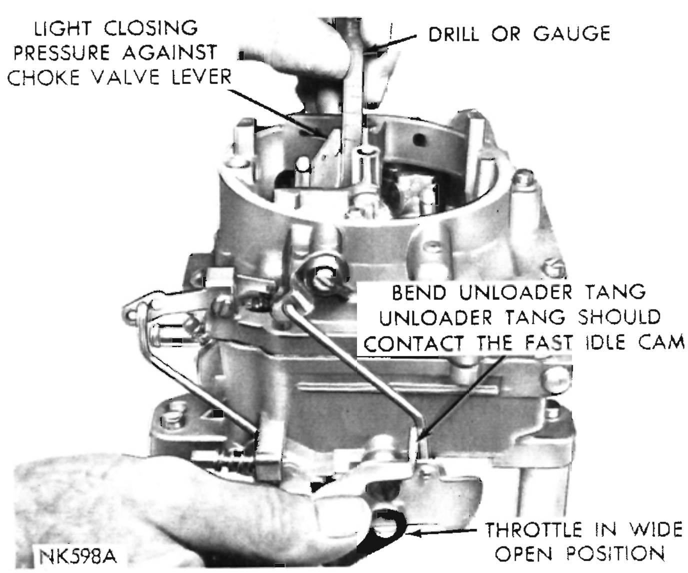


Fig. 16—Checking Choke Unloader (wide open kick)

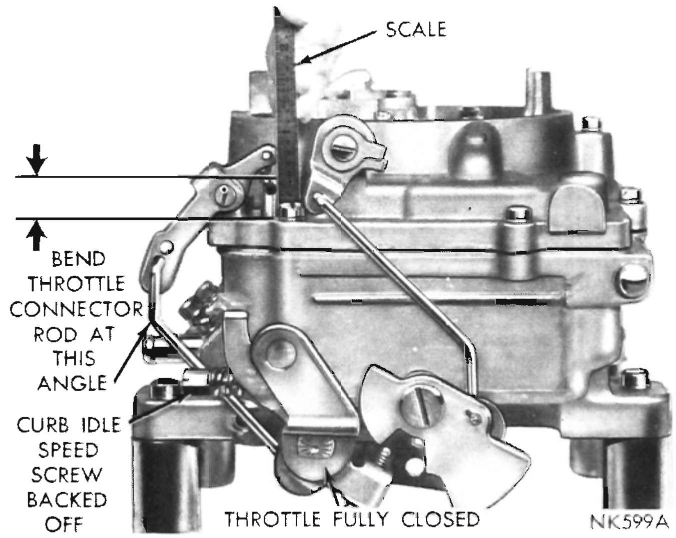


Fig. 17—Checking Accelerator Pump Adjustment

(Fig. 17). This distance should be 7/16 inch.

If an adjustment is necessary, bend the throttle connector rod at the lower angle, using Tool T-109-213, until correct travel has been obtained.

Secondary Throttle Lever Adjustment

To check the secondary throttle lever adjustment, block the choke valve in the wide open position and invert the carburetor. Slowly open the primary throttle valves until it is possible to measure 17/64 inch between the lower edge of the primary valve and the bore (opposite idle port) (Fig. 18). At this measurement, the secondary valves should just start to open. If an adjustment is necessary, bend the secondary throttle operating rod at the angle, using Tool T-109-213, until correct adjustment has been obtained.

With primary and secondary throttle valves in tightly closed position, it should be possible to insert

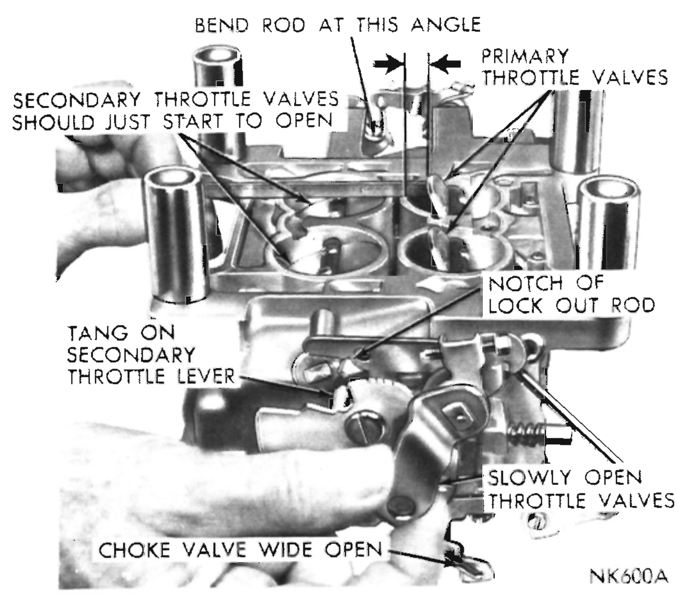


Fig. 18—Checking Secondary Throttle Adjustment

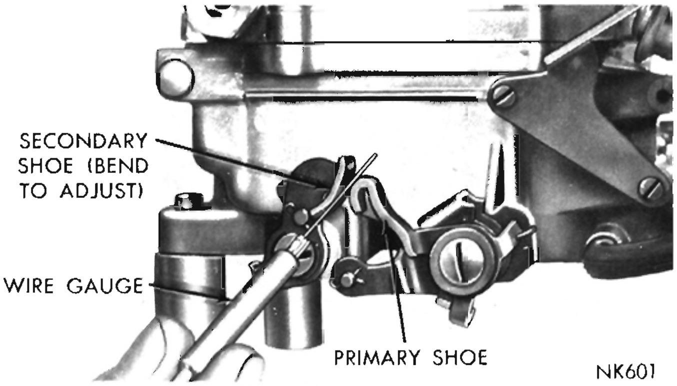


Fig. 19—Checking Clearance Between Closing Shoes

Tool T-109-29 (.020″) wire gauge, between positive closing shoes on the secondary throttle levers, (Fig. 19).

If an adjustment is necessary, bend the shoe on the secondary throttle lever, using Tool T-109-22, until correct clearance has been obtained.

Secondary Throttle Lock Out Adjustment

Crack the throttle valves, then manually open and close the choke valve. The tang on the secondary throttle lever should freely engage in the notch of the lockout dog (Fig. 18).

If an adjustment is necessary, bend the tang on the secondary throttle lever, until engagement has been made. Use Tool T-109-22 for this operation.

After adjustments have been made, reinstall carburetor on engine, using a new gasket.

It is suggested that the carburetor be filled with clean gasoline. This will help prevent dirt that is trapped in the fuel system, from being dislodged by the free flow of fuel, as the carburetor is primed.

Bowl Vent Valve Adjustment (If so Equipped)

To check the bowl vent valve adjustment, proceed as follows:

(1) With throttle valves tightly closed, insert a 5/32 $\pm$ 1/64 inch drill between air horn and valve at smallest opening.

(2) If an adjustment is necessary, bend adjusting tang (on pivot end of lever) until correct opening has been obtained.

Fast Idle Speed Adjustment (On Vehicle)

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 5 miles. Connect a tachometer and set curb idle speed and mixture, then proceed as follows:

(1) With engine off and transmission in **PARK** or **NEUTRAL** position open throttle slightly.

(2) Close choke valve until fast idle screw can be positioned on the second highest speed step of fast idle cam (Fig. 20).

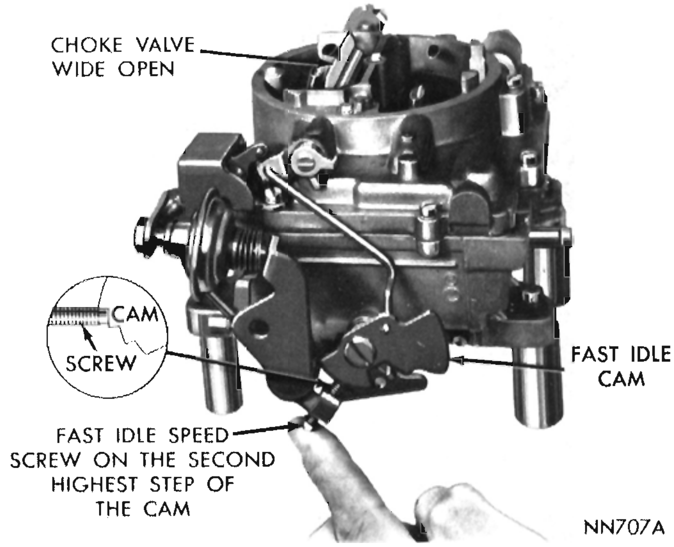


Fig. 20—Fast Idle Speed Adjustment (On Vehicle)

(3) Start engine and determine stabilized speed. Turn fast idle speed screw **in** or **out** to secure specified speed. (Refer to Specifications).

(4) Stopping engine between adjustments is not necessary. However, reposition fast idle 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 and the distributor control valve are correctly adjusted as outlined under Idle Speed Adjustment (Curb Idle).

Idle Speed and Mixture Adjustment— AFB-4620S and AFB-4621S Rear Carburetors AFB-4619S Front Carburetor

Connect a tachometer and warm-up the engine to normal operating temperature. Be sure the choke is fully off and that the engine is at curb idle, (transmission in Neutral). Proceed as follows:

(1) Turn the idle mixture screws from 1 to 2 turns open.

(2) Set the idle screws 2 turns open and adjust the idle speed to 750 rpm. (Manual or Automatic Transmissions).

Adjust the idle mixture screws on each carburetor for maximum rpm. Repeat on each carburetor.

Before attaching the rod at each carburetor, check the transmission to throttle linkage adjustments, so that the idle position is not disturbed.

Accurate carburetor synchronization or balance is extremely important and when performed should be rechecked and rebalanced in the outside ambient temperature after a five mile or more road test. This readjustment will prevent rough engine idle performance and possible engine stalling when the vehicle is returned to the owner.

FORM NO.
16-C-42A

Carter AFB 4-barrel Adjustment Specifications

NOTE: Some models of the Carter AFB carburetors may vary slightly in general design and appearance from others, but basic cleaning and adjustment procedure will remain the same.

1. DISASSEMBLY

Using the exploded view as a guide, disassemble carburetor only far enough to permit a thorough cleaning. Removal of choke or throttle valves is not necessary unless parts require special attention.

Note: Beginning 1966 C.A.P. (Cleaner Air Package carburetors — identified by green tag), the idle adjusting screws (59) are not removable. They lock at a maximum of 1¾ to 3 turns open and will be broken if an attempt is made to remove them from carburetor. All other regular carburetor models contain removable idle adjusting screws.

Caution: Idle Limiter Caps

Beginning 1968; do not remove idle limiter caps or idle mixture screws unless required calibrating equipment and new replacement caps are available.

2. CLEANING

Soak parts in a regular carburetor cleaning solution, as directed by the manufacturer's instructions, long enough to remove all dirt, carbon or foreign matter. Do not soak any parts containing rubber, leather or plastic if they are to be reused. Use a small bristle brush to aid in cleaning of sharp corners or areas of excessive dirt buildup. Rinse parts in hot water or a suitable solvent and thoroughly blow out all parts and passages with dry compressed air.

Caution: Do not soak dashpot or choke vacuum break diaphragm assemblies, in carburetor cleaner, when so equipped.

3. REASSEMBLY

Reassemble carburetor in the reverse order of disassembly, paying particular attention to the following:

A. Make initial setting of idle adjusting screws (59) and idle air adjusting screw (61, if used) by turning inward until lightly seated, then back screws out number of turns listed; Idle adjusting screws 1½ turns; Idle air adjusting screw 1½ to 3½ turns.

Note: On C.A.P. carburetors, do not back screw out more than 2 turns maximum. On all models, make final hot idle setting on engine as stated in adjustment section 4-K.

B. On some models, a pump intake check assembly is located inside of fuel bowl at base of pump well. When used it replaces plug, seat and ball (56-58) as shown in exploded view.

C. Make sure metering jets are installed correctly. Primary jets (43) have large hole — Secondary jets (45) have small hole.

D. If an auxiliary throttle valve (38) is used, position valve with letter "C" toward center of carburetor, facing up. Valve must move freely and return to closed position.

E. The primary and secondary venturis (31, 32, 35 and 36) must be reinstalled in their original positions. They each have a cutout notch which must correctly match step in main body.

F. Some models will contain a "T" shaped Thermostatic Valve Assembly located between the secondary venturis and held in place with two screws. Purpose of valve is to prevent engine stalling by supplying additional air to the idle mixture during prolonged hot idle periods. Valve must be closed at normal idle. If bimetal spring is bent out of shape, it must be replaced.

G. Use care when installing step up pistons and rods (18 and 19). Rods must not be forced into position or bent out of alignment.

H. Some late model carburetors will contain an "S" shaped pump connector link (14). Reinstall with upper end, through hole in pump lever, facing away from center of carburetor. Lower end must face center of carburetor through hole in pump plunger stem.

4. ADJUSTMENTS

A. Float Level: (Fig. 1)

(Floats must be vertically aligned and sides parallel with outer edge of air horn casting.) Assemble and calibrate adjustable gauge to dimension listed in specification table using "A" scale on gauge. With gasket in place, invert air horn and position gauge as shown measuring for specified distance between gasket surface and top of float (at outer end). To adjust, bend float arm. Adjust both floats, making certain resilient tip needle is not pressed into seat.

B. Float Drop: (Fig. 2) 23/32"

Calibrate adjustable float gauge to 23/32" dimention using "A" scale on gauge. With gasket in place, air horn held upright and floats hanging freely, position gauge as shown. The distance measured between gasket surface and outer end of float should be as listed. To adjust, bend stop tab on float bracket. Adjust both floats.

C. Pump: (Fig. 3)

Calibrate gauge to dimension listed in table using "B" scale on gauge. With pump rod in specified hole in pump arm, back out throttle stop screw until throttle valves are completely closed. With gauge placed on air horn surface, top of pump plunger shaft should just touch lower edge of upper gauge leg. To adjust, bend pump rod.

D. Choke Piston Linkage:

Type I (Fig. 4)

Hold choke valve closed by applying pressure to piston lever in choke housing. The clearance (B) between piston lever and stop in housing should be as listed in table. To adjust, bend choke connector rod.

Type II (Fig. 5)

Bend a .026" wire gauge (paper clip) at a 90° angle 1/8" from the end. Open throttle half way to prevent fast idle cam from touching adjusting screw. Open choke and insert gauge so that bent end is between top of slot in choke piston cylinder and bottom of slot in piston. Holding gauge in place, close choke by pressing on piston lever until gauge is locked in position. There should now be the clearance, as listed in table, between top of choke valve and inner wall of air horn. To adjust, bend choke connector rod.

E. Fast Idle — Linkage:

Type I (Fig. 6)

With choke valve closed, the index mark on fast idle cam should align with center of fast idle screw. To adjust, bend fast idle rod.

Type II and III (Fig. 7)

Place fast idle screw on bottom step and against middle step of fast idle cam for Type II. Place screw on second step and against top step of cam for Type III. With cam and screw positioned as stated above, lightly close choke valve as far as possible without forcing. Using a drill as a gauge, the distance that upper edge of choke valve remains open should be as listed in table. To adjust, bend fast idle rod.

F. Fast Idle — Throttle Valve: (Fig. 6)

With choke valve closed, turn fast idle screw in against high step of fast idle cam (or index mark, if used) until clearance (D) between lower edge of primary throttle valve and bore of carburetor is as listed in table.

G. Unloader: (Fig. 3)

Hold primary throttle valves wide open and lightly close choke valve as far as possible without forcing. The distance measured that upper edge of choke valve remains open should be as listed in table. To adjust, bend unloader lip on throttle lever.

H. Vacuum Break: (Fig. 8)

1964 carburetors, press diaphragm "stem" inward until bottomed. 1965 and later, press diaphragm "plate" (not end of stem) inward until diaphragm is bottomed. Lightly close choke valve as far as possible without forcing. Using a drill as a gauge, the distance that upper edge of choke valve remains open should be as listed in table. To adjust, bend choke operating link.

Caution: Remove link when bending to prevent damage to diaphragm.

Note: Optional method of bottoming diaphragm is to apply a separate source of vacuum to diaphragm assembly. (Use length of hose from manifold of another engine or a distributor tester with a minimum of 10" of vacuum.) Lightly close choke and measure valve opening as above.

I. Automatic Choke:

Integral Type (Unit on Carb.)

With cover retaining screws loosely in place, rotate cover against spring tension until mark on cover is aligned with specified mark on housing. Tighten screws. Choke valve should be completely closed but free to open with slight finger pressure.

Cross-Over Type (Unit in Manifold)

Remove unit from manifold, loosen lock nut and turn mounting post with screw driver until index mark on disc is aligned with specified mark (between "L" and "R" scale markings) as listed in table. Tighten locknut and reinstall in manifold. Connect to carburetor and check for proper choke valve tension when cold.

J. Secondary Throttle Valve:

Block choke valve in wide open position. Open primary throttle valves until distance between lower edge of valve and carburetor bore on side opposite idle ports is as listed in specification table. Secondary throttle valves should just start to open at this point. To adjust, bend secondary throttle operating rod.

Note: With primary and secondary throttles fully closed, there should be .010 to .030 clearance between closing shoes on primary and secondary throttle levers.

K. Idle Mixture and Speed: (Fig. 6)

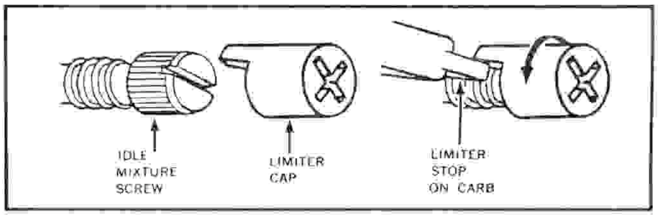
Run engine until hot, choke wide open and (if used) hot idle compensator valve closed. Adjust both idle adjusting screws (2) for highest RPM. Then turn screws inward until lean mixture causes engine to run rough and lose speed. Finally turn screws out just enough to regain lost speed and smoothest idle. Adjust throttle stop screw (1) for correct RPM and recheck idle adjusting screws.

Note: On some models, idle speed is controlled by use of an idle air adjusting screw (61, exploded view). It replaces the conventional throttle stop screw. Turning it outward (counter-clockwise) increases engine speed by allowing more air to enter the manifold, but also leans out the mixture. The idle adjusting screws must be readjusted to compensate for this action.

C.A.P., C.A.S., E.C.S. & V.S.S. Models:

Beginning 1966 carburetors with these systems require special idle mixture and speed settings with use of an electric tachometer, vacuum gauges and exhaust analyzer. Follow car model manufacturer's instructions. If special calibrating equipment is not available, temporary adjustment can be made in normal manner providing idle adjusting screws are not backed out more than 2 turns from lightly seated position. Idle adjusting screws must be adjusted to maintain a 14.2 air/fuel ratio or "lean as possible" idle mixture.

L. TO INSTALL NEW IDLE LIMITER CAPS



If original idle limiter caps have been removed, new caps must be installed, after completing idle adjustments, to comply with State and Federal regulations regarding Emission Control by limiting range of idle mixture screw travel.

1. Soften cap in hot water.
2. Place cap on head of mixture screw in extreme counter-clockwise position with tab on cap against stop on carburetor.
3. Press firmly until cap locks in place. Use care not to change screw setting when installing cap.

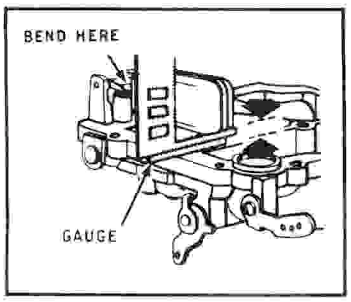


Figure 1

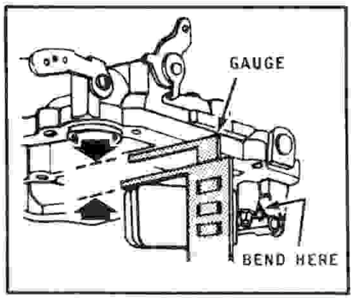


Figure 2

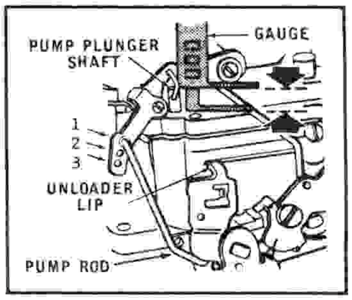


Figure 3

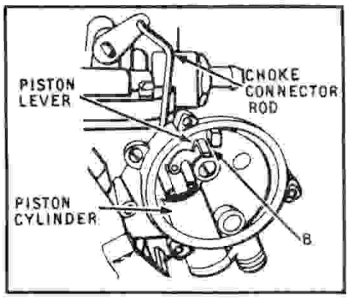


Figure 4

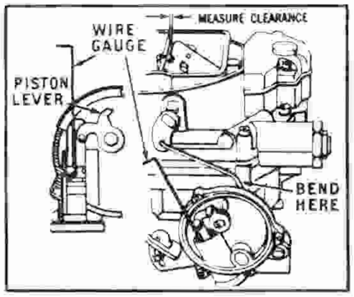


Figure 5

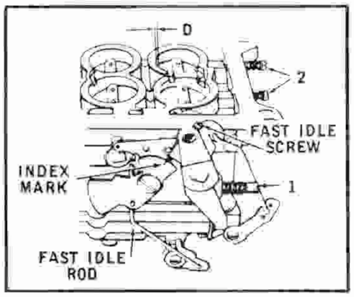


Figure 6

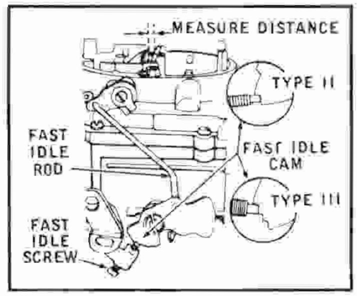


Figure 7

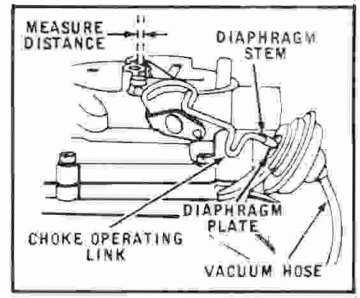


Figure 8

SPECIFICATION AND ADJUSTMENT TABLE

*** Note:** Beginning 1968, see "Decal" in engine compartment for additional Idle Mixture procedure and specifications.

Application	Float Level	Pump		Choke Piston Linkage		Fast Idle Linkage		Fast Idle Throttle Valve	Un-loader	Vacuum Break	Auto Choke	Secondary Throttle Valve	Engine Speed — R.P.M.*		
		Hole	Setting	Type	Setting	Type	Setting						Hot Idle (1) S/T	Hot Idle (1) A/T	Fast Idle
CHRYSLER															
1957-58	7/32	2	7/16	I	.040 (2)	I	Index	.012	1/4	—	1 Rich	(3)	500	500	1400 (4)
1959 & 62 Hi Perf Duals (Front)	9/32	2	7/16	—	—	—	—	—	—	—	—	23/64	—	—	—
(Rear)	7/32	2	7/16	II	1/8	I	Index	.012	1/4	—	1 Rich	23/64	650	—	1400 (4)
1959-63	7/32	2	7/16	—	—	I	Index	.020	1/4	—	2 Rich	3/8	500	500	1800 (4)
1960-61 Duals 2903	9/32	2	7/16	II	1/8	I	Index	.010	1/4	—	1 Rich	—	500	500	1800 (4)
1963-64 Duals 3505	9/32	2	7/16	—	—	—	—	—	—	—	—	29/64	700	—	1400 (4)
1964 413" & 383" Eng's (Incl. Can. 383")	7/32	2	7/16	—	—	II	7/32 (5)	.020	3/8	1/8	2 Rich (6)	21/64	500	500	700 (7)
1965 (Incl. 4200 Service Carb.)	7/32	2	7/16	—	—	III	1/16	.020	3/8	1/8	Index (8)	21/64	500	500	700 (7)
1966 w/o C.A.P.	7/32	2	7/16	—	—	III	1/16	.020 (9)	3/8	1/8 (10)	2 Rich	21/64	500	500	700 (7)
1966 w/ C.A.P.	7/32	2	7/16	—	—	III	1/16	.018	5/16	5/64	Index	21/64	650	600	1500 (11)
1967 w/o C.A.P.	5/16 (12)	2	7/16	—	—	III	1/16	.020 (9)	3/8	1/8 (13)	2 Rich	(14)	500	500	700 (7)
1967 w/ C.A.P.	5/16	2	7/16	—	—	III	1/16	.020	5/16 (15)	1/8 (16)	Index	(14)	650	600	1400 (11)
CHRYSLER MARINE															
1961-66 3213 & 3214	7/32	2	7/16	—	—	I	Index	.020	1/4	—	(17)	13/64	550	—	700 (7)
1962-67 3392 M/Choke	7/32	2	7/16	—	—	—	—	.020	—	—	—	13/64	550	—	700 (7)
1962-67 Duals, 3394 (Rear)	7/32	2	7/16	—	—	—	—	.020	—	—	Manual	13/64	550	—	700 (7)
1962-69 Duals, 3393 (Front)	17/64	2	7/16	—	—	—	—	—	—	—	—	23/64	550	—	700 (7)
1963-69 Duals, 3564 (Rear)	7/32	2	7/16	II	5/64	I	Index	.020	3/8	—	1 Rich	1/4	550	—	700 (7)
1963-69 (Exc 4699)	7/32	2	7/16	II	5/16 (18)	(19)	(19)	.020	1/4 (20)	3/32 (21)	(22)	(23)	550	—	700 (7)
1969 4699	5/16	1	7/16	—	—	III	1/16	.020	3/8	1/8	Index	23/64	550	—	700 (7)
Carb. No. 6130	5/16	1	7/16	—	—	III	1/16	—	11/64	—	Index	3/8	650	—	1700 (11)
DESOTO - DODGE - PLYMOUTH**															
1958-59 Duals (Front)	9/32	2	7/16	—	—	—	—	—	—	—	—	23/64	—	—	—
(Rear)	7/32	2	7/16	I (24)	.040	I	Index	.012	1/4	—	1 Rich	23/64	600	—	1400 (4)
1958-63	7/32	2	7/16	—	—	I	Index	.020	1/4	—	1 Rich	3/8	500	500	1800 (4)
1960 Std. Trans (Dodge only)	5/16	2	7/16	II	1/8	I	Index	.010	1/4	—	Index	23/64	500	—	1250 (4)
1960-61 Duals 2903	9/32	2	7/16	II	1/8	I	Index	.010	1/4	—	1 Rich	—	500	500	1800 (4)
1963 Duals 3447	9/32	2	7/16	—	—	—	—	—	—	—	—	29/64	900	900	—
1964 Police, Hi Perf. & Canada	7/32	2	7/16	—	—	II	7/32	.020	3/8	1/8	Index (8)	21/64	500	500	700 (7)
1964-65 Duals	7/32 (25)	1	9/16	—	—	—	—	—	—	—	—	23/32	900	900	—
1965	7/32	2	7/16	—	—	III	1/16	.020	3/8 (15)	—	Index (8)	21/64	500	500	700 (7)
1966-67 Duals, w/o C.A.P. (Front)	9/32	2	7/16	—	—	—	—	—	—	—	—	17/64	750	750	—
(Rear)	7/32	2	7/16	—	—	III	1/16	.030	1/4	—	1 Rich	17/64	750	750	1500 (11)
1966 w/o C.A.P.	7/32	2	7/16	—	—	III	1/16	.020	3/8 (15)	1/8 (10)	2 Rich	21/64	500	500	700 (11)
1966 w/ C.A.P.	7/32	2	7/16	—	—	III	1/16	.018 (9)	5/16 (15)	5/64 (27)	Index	21/64	650	600	1500 (11)
1967 w/o C.A.P.	5/16	2	7/16	—	—	III	1/16	.020 (9)	3/8 (15)	1/8 (13)	2 Rich	(13)	500	500	700 (7)
1967 w/ C.A.P.	5/16	2	7/16	—	—	III	1/16	.020	5/16 (15)	1/8 (16)	Index	(13)	650	600	1400 (11)
1967 Duals, w/ C.A.P. (Front)	19/64	2	7/16	—	—	—	—	—	—	—	—	17/64	750	750	—
(Rear)	7/32	2	7/16	II	1/8	III	1/16	.020	1/4	—	2 Rich	17/64	750	750	1800 (11)
1968-69 Duals, w/ C.A.P. (Front)	19/64	2	7/16	—	—	—	—	—	—	—	—	17/64	750	750	—
(Rear)	7/32	2	7/16	II	(28)	III	1/16	.024	1/4	—	2 Rich	17/64	750	750	1800 (11)
1970-71 Duals, w/ E.C.S. (Front)	19/64	2	7/16	—	—	—	—	—	—	—	—	17/64	900	900	—
(Rear)	7/32	2	7/16	II	(29)	III	1/16	—	1/4 (30)	—	2 Rich	17/64	900	900	(31) (11)
DODGE TRUCK (Incl. Canada)															
1960-68 Std. Trans.	7/32	2	33/64	—	—	—	—	—	—	—	—	3/8	500	—	—

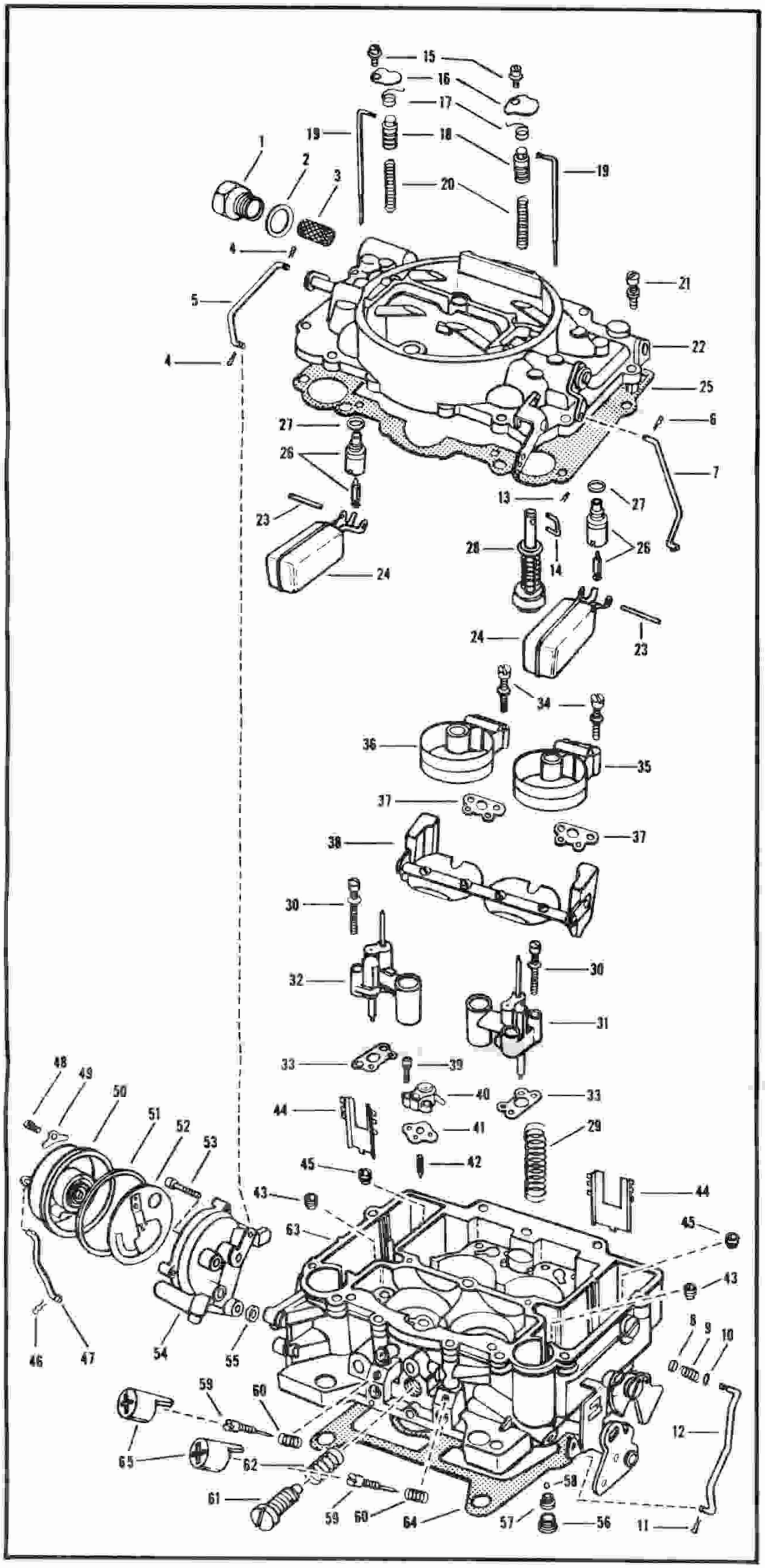
**** Includes Barracuda, Challenger, Dart and Valiant**

Abbreviations: C.A.P. = Cleaner Air Package, C.A.S. = Cleaner Air System, E.C.S. = Emission Control System, V.S.S. = Vapor Saver System, Eng.(s) = Engine(s), w/ = with, w/o = without, Incl. = Includes, Can. = Canada, Hi Perf. = High Performance, S/T = Standard Transmission, A/T = Automatic Transmission, M/Choke = Manual (Hand) Choke, Carb. = Carburetor.

(1) In "Neutral"
(2) 1958 Carb. No. 2836 = .067.
(3) 1957 = 19/64; 1958 = 3/8.
(4) Fast idle screw on "Index" mark on top step of cam.
(5) Service Carb. No. 4200 = Type III - 1/16
(6) Carb. No's 3614 & 4200 = Index
(7) Fast idle screw on "Bottom" step of cam.
(8) Carb. No's 3612, 3853, 3854, 3858 & 3871 = 2 Rich.
(9) Carb. No's 4119 & 4294 = .013 4131, 4299 & 4326 = .025
(10) Carb. No's 4120 = 3/32; 4131 = 7/16
(11) Fast idle screw on second step against top step of cam.
(12) Carb. No's 4326 & 4327 = 7/32
(13) Carb. No's 4295 = 3/32; 4299 = 7/64
(14) 383" Eng. = 21/64; 440" Eng. = 23/64
(15) Carb. No's 4328 & 4329 = 3/8; 273" Eng. = 7/32
(16) Carb. No's 4309, 4310, 4311 = 5/64
(17) Carb. No's 3213 = Index; 3214 = 2 Rich
(18) Carb. No. 3543 only
(19) Carb. No's 3543 & 4476 = I - Index; 3980 = Type III = 1/16
(20) Carb. No. 3543 = 3/8
(21) Carb. No. 3980 only
(22) Carb. No's 3543 = 1 Rich 3980 & 4476 = 2 Rich
(23) Carb. No's 3543 = 13/64; 3980 = 21/64; 4476 = 7/16
(24) 1958 = Type II - 1/8
(25) 1965 = 5/32
(26) Carb. No's 4318 = 9/32
(27) Carb. No's 4121 & 4122 = 1/8
(28) Carb. No's 4431 = 5/32; 4432 = 7/64
(29) Carb. No's 4745 = .055; 4756 = .100
(30) 1970 only
(31) 1970 = 2000 R.P.M.; 1971 = 2300 R.P.M.

Form No. 16-C-42A Revised 1971

EXPLODED VIEW OF TYPICAL CARTER CARBURETOR MODEL AFB



Ref. No.	Nomenclature
1	Fuel Inlet Fitting
2	Fuel Inlet Fitting Gasket
3	Fuel Inlet Strainer
4	Pin Spring
5	Choke Connector Rod (upper)
6	Pin Spring
7	Fast Idle Connector Rod
8	Connector Rod Retainer
9	Retainer Spring
10	Washer
11	Pin Spring
12	Throttle Connector Rod
13	Pin Spring
14	Pump Connector Link
15	Step-up Piston Cover Screw
16	Step-up Piston Cover
17	Step-up Rod Retainer Spring
18	Step-up Piston
19	Step-up Rod
20	Vacuum Piston Spring
21	Air Horn Screw and Washer
22	Air Horn Assembly
23	Float Pin
24	Float Assembly
25	Air Horn Gasket
26	Needle and Seat Assembly
27	Needle Seat Gasket
28	Pump Plunger Assembly
29	Pump Return Spring
30	Primary Venturi Attaching Screw
31	Primary Venturi Assembly (pump side)
32	Primary Venturi Assembly (opposite pump)
33	Primary Venturi Gasket
34	Secondary Venturi Attaching Screw
35	Secondary Venturi Assembly (pump side)
36	Secondary Venturi Assembly (opposite pump)
37	Secondary Venturi Gasket
38	Auxiliary Throttle Valve
39	Pump Discharge Nozzle Screw
40	Pump Discharge Nozzle Assembly
41	Pump Nozzle Gasket
42	Pump Discharge Needle
43	Primary Metering Jet
44	Fuel Bowl Baffle
45	Secondary Metering Jet
46	Pin Spring
47	Choke Connector Rod (lower)
48	Coil Housing Attaching Screw
49	Coil Housing Retainer
50	Thermostatic Coil and Housing Assembly
51	Coil Housing Gasket
52	Baffle Plate
53	Choke Housing Screw and Washer
54	Choke Housing Assembly
55	Choke Housing Gasket
56	Pump Intake Check Plug
57	Pump Intake Check Ball Seat
58	Pump Intake Check Ball
59	Idle Adjusting Screw
60	Idle Adjusting Screw Spring
61	Idle Air Adjusting Screw*
62	Idle Air Adjusting Screw Spring
63	Main Body Assembly
64	Flange Gasket
65	Idle Screw Limiter Cap**

* Not used on all models

** Beginning 1968

Carter AVS 4-barrel

GENERAL INFORMATION

The Carter carburetor model AVS-4711S is used on the 383 cu. inch engine when the vehicle is equipped with a manual transmission. The carburetor is supplied with a dash pot which is mounted on the air horn. The dash pot (used only on manual transmission equipped vehicles) retards the return of the throttle to idle position. **The proper adjustment of the dash pot is very important (See Carburetor Adjustments.)** The Carter carburetor model AVS-4616S is used on the 383 cu. in. engine respectively, when the vehicle is equipped with the automatic transmission. Carburetor Models AVS-4617S and AVS-4618S are used on the 440 cu. in. engine when the vehicles are equipped with the manual or automatic transmissions respectively. AVS-4611S and AVS-4612S are used on the 340 cu. in. engine when equipped with manual or automatic transmission respectively.

Carburetor models AVS-4639S and AVS-4638S are used on the 340 and 383 cu. in. engines respectively, when the vehicles are equipped with automatic transmission and air conditioning only. AVS-4640S is used on the 440 cu. in. engine when the vehicle is equipped with automatic transmission and air conditioning only. These carburetors are equipped with a hot idle compensator. This device is a thermostatically operated air bleed, to relieve an over-rich condition at idle. This condition is the result of excessive heat and resultant overrich mixtures.

Carburetor models AVS-4615S and AVS-4682S are used on the 383 cu. in. engine when the vehicle is equipped with manual and automatic transmissions respectively (without air conditioning.)

Since the service procedures are identical on all Carter AVS carburetors, the illustrations showing the various disassembly procedures will not always show any one specific carburetor.

The throttle valves of the secondary half of the carburetor are mechanically connected to the primary valves and open with the primary after an approximate 60° lag; and continue to open until both primary and secondary throttle valves reach the wide open position simultaneously. As engine speed increases, the forces exerted by the velocity of intake air down through the venturis of the carburetor increases and tends to overcome the air valve spring attached to the air valve, permitting the air valve to position its self according to engine requirements.

The AVS (air valve secondary) carburetor contains many features, some of which are the locations for the step-up rods and pistons. The step-up rods, pistons and springs are accessible for service without removing the air horn or the carburetor from the engine. The primary venturi assemblies are replaceable and contain many of the calibration points for both the high and low speed system. One fuel bowl feeds both the primary and secondary nozzles on the right side while the other fuel bowl takes care of the primary and secondary nozzles on the left side. This provides improved performance in cornering, quick stops and acceleration.

All the major castings of the carburetor are aluminum, with the throttle body cast integral with the main body. This allows an overall height reduction in the carburetor. The section containing the accelerator pump is termed the primary side of the carburetor. The rear section is the secondary. The five conventional systems used in previous four barrel carburetors are also used in this unit. The five conventional systems are, two float systems, two low speed systems, (primary side only) two high speed systems, one accelerator pump system and one automatic choke control system.

These carburetors are equipped with two idle limiter and one off idle mixture control screws (Fig. 1). These adjustments are set at the factory and no further adjustment of these screws should be necessary. However, if an adjustment is necessary, refer to "Rough Idle and Low Speed Surge" paragraph under General Information.

SERVICE PROCEDURES

DISASSEMBLING CARBURETOR (Fig. 1)

(1) Place carburetor assembly on repair stand Tool C-3400 or T-109-287S elevating legs. These tools are used to protect throttle valves from damage and to provide a suitable base for working.

(2) Remove hairpin clip that attaches fast idle connector rod to choke lever. Disengage rod from lever, then swing rod at an arc until it can be disengaged from fast idle cam.

(3) Remove hairpin clip that holds throttle connector rod in center hole of accelerator pump arm. Disengage rod from arm and lever, then remove from carburetor.

(4) Remove screws attaching step-up piston and rod cover plates. Hold cover down with a finger to prevent piston and rods from flying out. Lift off plates and slide step-up pistons and rods out of air horn, (Fig. 2). Remove step-up piston springs.

(5) Remove vacuum hose between carburetor throttle body and vacuum diaphragm.

(6) Remove clip from choke operating link and dis-

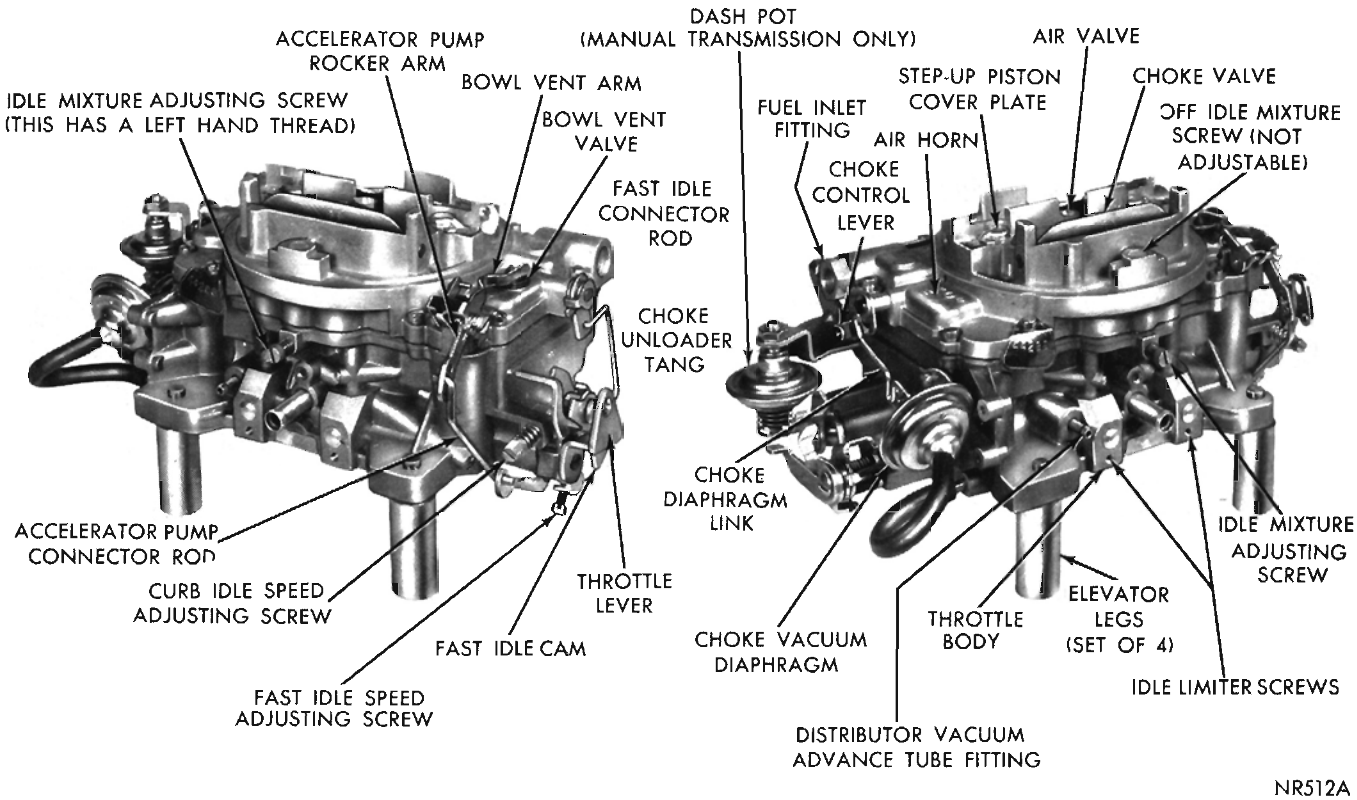


Fig. 1—Carburetor Assembly

engage link from diaphragm plunger (stem) and choke lever. (Fig. 1).

(7) Remove vacuum diaphragm and bracket assembly and place to one side to be cleaned as a special item. A liquid cleaner may damage diaphragm material.

(8) Remove eight screws that attach air horn to main body. Lift air horn straight up and away from main body. When removing air horn, use care so as not to bend or damage floats. Remove accelerator pump, plunger lower spring from pump cylinder. Remove dash pot (if so equipped).

(9) Remove hot idle compensator and gasket, (if so equipped).

Disassembling the Air Horn

Place air horn in an inverted position on bench (to protect the floats) then proceed to disassemble as follows:

(1) Using a suitable Tool, remove float fulcrum pins, (left and right) then lift float up and out of bosses on air horn. 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 shoulder screw and spring holding accelerator pump rocker arm and bowl vent arm to air horn. Remove arms and disengage pump link from pump stem. Slide accelerator pump plunger and spring out of air horn. Remove gasket.

(4) Place accelerator pump plunger in a jar of clean gasoline or kerosene, to prevent leather from drying out.

(5) Remove fuel inlet fitting and filter screen from air horn.

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

Main Body Disassembly

(1) Remove screws that attach accelerator pump jet housing to main body. Lift out jet housing and gasket (Fig. 3). Discard gasket. Now, invert main body and drop out discharge check needle from discharge passage.

(2) Using Tool T-109-58, remove main metering jets (primary side), (Fig. 4). **The primary and secondary main metering jets are not interchangeable. It is very important that these jets be installed in their respective locations in the main body at reassembly.**

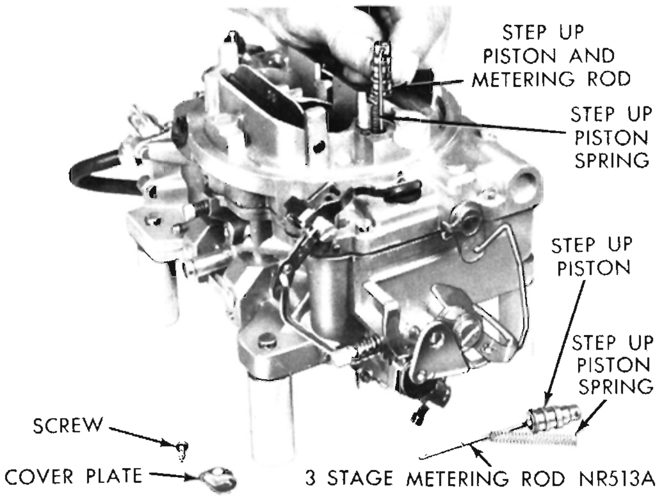


Fig. 2—Removing or Installing Step-Up Pistons and Rods

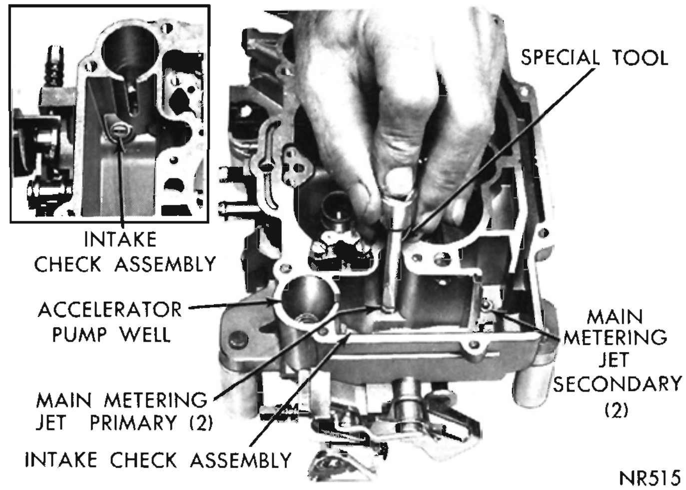


Fig. 4—Removing or Installing Main Metering Jets

(3) Again using Tool T-109-58, remove main metering jets (secondary side), (Fig. 4). Remove intake check.

(4) Remove screws that attach primary venturi (choke and pump side) to main body. Lift venturi straight up and away from main body, (Fig. 5). Discard gaskets. **The venturi assemblies are not interchangeable, side for side and must be reinstalled in their original locations at reassembly.**

(5) Using Tool T-109-59, screw driver bit, remove accelerator pump intake check valve located inside fuel bowl, adjacent to accelerator pump cylinder.

(6) Remove idle mixture adjusting screw. **(Caution: This screw has a left hand thread.)**

The carburetor now has been disassembled into two units, namely air horn and the main and throttle body casting. The component parts of each have been disassembled as far as necessary for cleaning and inspection.

It is usually 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 the idle discharge ports to the valve is carefully established for one particular assembly, (Fig. 6). The valves are milled to give proper port relation.

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 15 and 30 miles per hour.

It is recommended that if the throttle shafts are excessively worn, that a new carburetor be installed. However, if the throttle valves have become nicked, burred or damaged, new valves may be installed, providing the following instructions are carefully followed. **The screws that attach the throttle valves are staked on the opposite side and care should be used in**

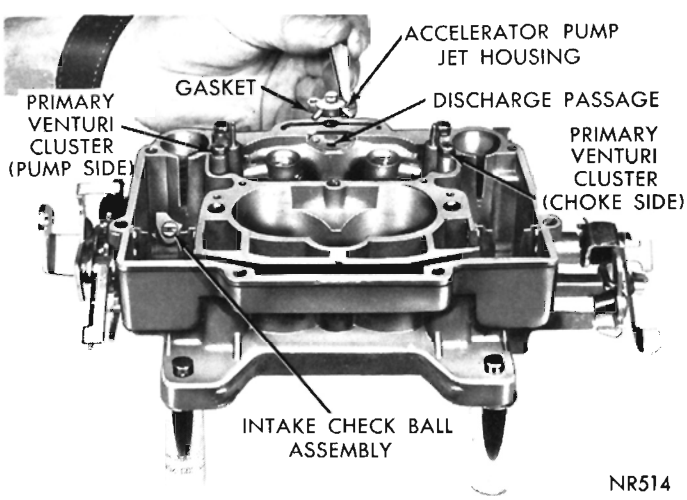


Fig. 3—Removing or Installing Accelerator Pump Jet Housing

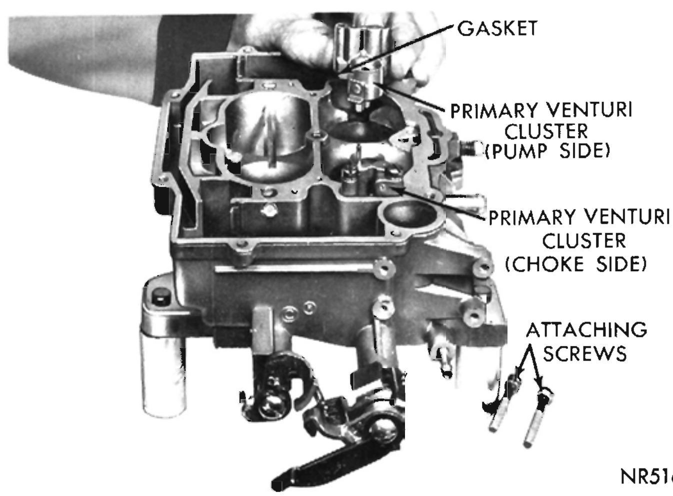


Fig. 5—Removing or Installing Primary Venturi Cluster

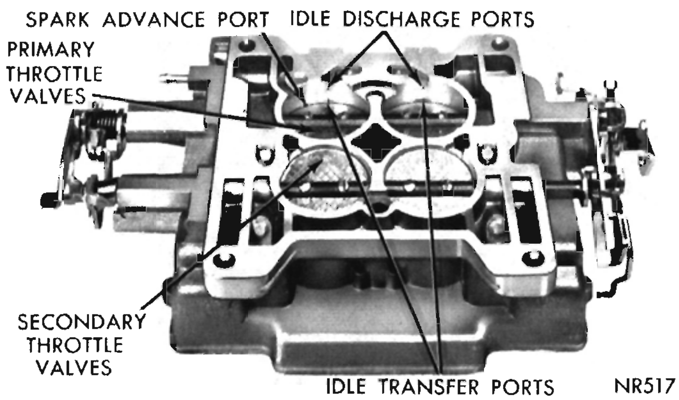


Fig. 6—Ports in Relation to Throttle Valves

removal so as not to break the screws in the throttle shaft. Remove the staked portion of the screws with a file.

Remove the screws that attach the primary throttle valves to the throttle shaft and slide valve (or valves) out of bores.

Remove the screws that attach the secondary throttle valves to the throttle shaft and slide valve (or valves) out of bores.

The primary valves and secondary valves are not interchangeable and should be kept separate in order that each may be returned to its respective bore. (Fig. 7).

INSPECTION AND REASSEMBLY

(1) Slide primary throttle valve (or valves) into their respective bores, install new screws, but do not tighten. Be sure idle speed adjusting screw is backed out. Hold valves in place with fingers. (Fingers pressing on high side of valves.)

(2) Tap valves lightly in this position, tighten screws securely. Stake screws by squeezing with pliers.

(3) Install idle mixture adjusting screw and turn lightly against its seat with fingers. Back off one full turn for approximate adjustment. **DO NOT USE A SCREWDRIVER. This screw has a left hand thread. Turn Counter clockwise (Richer) and clockwise (Leaner).**

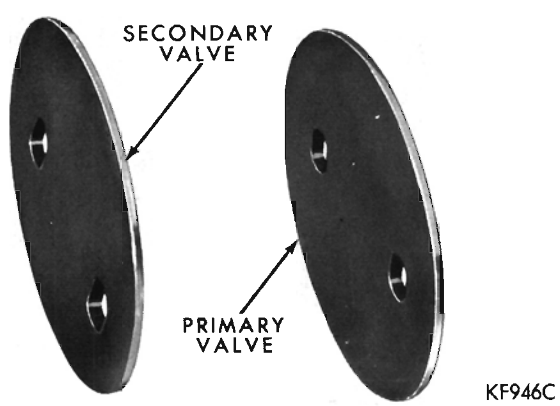


Fig. 7—Throttle Valve Identification

(4) **Be sure all the metering holes and vent tubes are clean, in the primary venturi.** Place new primary venturi gaskets in position, then install the primary venturi (pump and choke side) by lowering straight down on gaskets. (Fig. 5). Install attaching screws and tighten securely.

(5) Install primary and secondary main metering jets, using Tool T-109-58. (Fig. 4.) Tighten jets securely. Install intake check.

(6) Install accelerator pump intake check ball using Tool T-109-59.

(7) Install hot idle compensator and gasket, (if so equipped). Tighten screws securely.

Accelerator Pump Test

(1) Pour clean gasoline into carburetor bowl (approximately 1/2 inch deep). Remove accelerator pump plunger from jar of gasoline. Flex leather several times, then slide into pump cylinder.

(2) Install accelerator pump discharge check needle in discharge passage. Raise pump plunger and press lightly on plunger shaft to expel air from pump passages. Using a small clean brass rod, hold discharge check needle firmly on its seat. Again raise plunger and press downward. No fuel should be emitted from either the intake or discharge passage.

(3) If fuel does emit from intake passage, remove intake check ball and reclean the passage. Fuel leakage at discharge check needle indicates presence of dirt or a damaged check needle. Clean again and then install a new check needle. Retest for leakage.

(4) If either intake check assembly or discharge check needle leaks after above test and service fix, attempt to reseat as follows:

Intake Check Ball

Remove the intake check assembly from the throttle body. Install a new check assembly, then retest as described previously (Fig. 4).

Discharge Check Needle

(1) 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 will have to be installed.

(2) Install accelerator pump discharge check needle, jet housing and gasket. Install housing and attaching screws. Tighten screws securely.

(3) Press down on accelerator pump plunger shaft, and as plunger is being depressed, a clear straight

stream should emit from each jet. If streams are not identical, (if either one is diverted or restricted) a new accelerator pump jet housing should be installed. After test, pour gasoline from carburetor bowl and remove pump plunger.

Assembling the Air Horn

(1) Slide fuel inlet screen into fuel line fitting, then install in air horn. Tighten securely.

(2) Check to see if leather on accelerator pump plunger is hard, cracked or worn. If any sign of wear or deterioration is evident, install a new plunger assembly. Install pump link.

(3) Place pump arm in position over boss of air horn and engage pump link. Install bowl vent arm in position over pump arm. Slide spring over pivot screw and install through arms and boss. Be sure shoulder of screw enter arms. Tighten securely. Engage ends of spring with tang on vent arm and pin on air horn. Check for proper operation.

The carburetors are equipped with synthetic rubber tipped fuel inlet needles. The needle tip is a rubber material which is not affected by gasoline and is stable over a wide range of temperatures. The tip is flexible enough to make a good seal on the needle seat, and to give increased resistance to flooding.

The use of new inlet needles require that care be used when making float adjustments. Avoid applying any pressure on the floats which might compress the tip of the fuel inlet needles. **The tip can be compressed sufficiently to cause a false setting which will affect correct level of fuel in the bowl.**

(4) Place a new air horn to main body gasket in position on air horn, then install float needle valve seats. (Be sure each needle seat and needle is reinstalled in its original position.)

(5) Slide right and left floats into position in air horn, then install float fulcrum pins. **(Be sure marked float is installed on pump side of the air horn.) See disassembly procedures.**

(6) After floats have been installed, check float alignment, level and drop settings as follows:

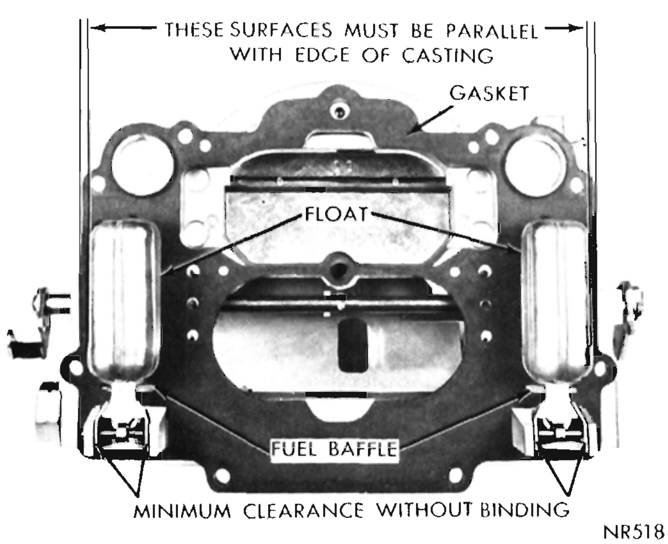


Fig. 8—Checking Float Alignment

Float Alignment Setting

(1) Sight down side of each float shell to determine if side of the float is parallel to outer cage of air horn casting (Fig. 8).

(2) If sides of float are not in alignment with edge of casting, bend float lever by applying pressure to end of float shell with thumb. **To avoid damage to the float, apply only enough pressure to bend the float lever.**

(3) After alining floats, remove as much clearance as possible between arms of float lever and lugs of air horn. To do this, bend float lever. The arms of float lever should be as parallel as possible to inner surfaces of lugs of casting.

Float Level Setting

(1) With air horn inverted, air horn gasket in place and float needle seated, slide float gauge (refer to specifications for carburetor being worked on) between top of the float (at outer end) and air horn gasket, (Fig. 9). Float should just touch gauge (T-109-107).

(2) Check other float in same manner. If an adjustment is necessary, bend float arm using Tool T-109-22, until correct clearance has been obtained. After bending arm, recheck the float alignment.

Float Drop Setting

Float drop is the distance the floats move from the inverted air horn (float level setting position) to the airhorn in upright position.

(1) With air horn inverted (upside down) place air horn in upright position and measure the distance floats move from inverted to upright position. This measurement should be 1/2 inch. (Fig. 10). Air horn gasket installed. If an adjustment is necessary, bend stop tabs on float levers until correct drop setting has been obtained. Bend tab toward needle seat to lessen drop, or away from seat to increase drop.

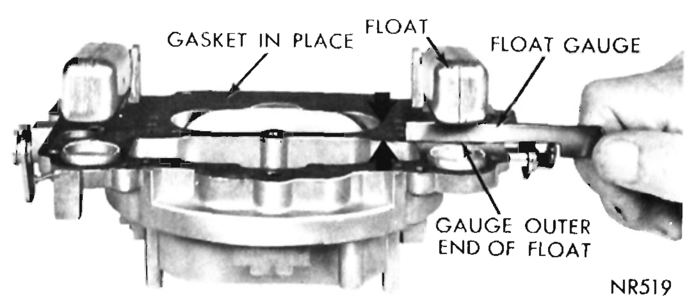


Fig. 9—Checking Float Height

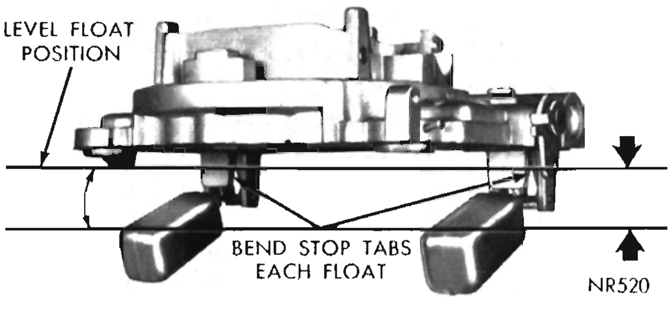


Fig. 10—Checking Float Drop

(2) After floats have been checked and adjusted, continue to assemble carburetor as follows:

(3) Place accelerator pump plunger lower spring in pump cylinder, then lower air horn carefully down on main body. Care must be taken to center small brass main bleed tubes so that they will pass through holes in air horn without being damaged. **Be sure the fuel baffles on the air horn, slide down in front, (bowl side) of the float chamber baffles, or the air horn will not index correctly with the main body and can cause the floats to hang up. Be sure the leather on the plunger does not curl or wrinkle. Accelerator pump operation will be affected if this precaution is not observed. Place dashpot in position (if so equipped).**

(4) Install air horn attaching screws and tighten securely. (The two long screws should be installed in dash pot mounting bracket.)

The change from low speed, best fuel economy, road load mixtures to richer wide open throttle full power mixtures is now accomplished in two steps. This has made it possible to secure best low speed fuel economy without sacrificing performance in the intermediate speed range. To do this, there is a step-up piston, new metering rods with two diameters, and primary metering jets, (Fig. 11).

(5) Slide step-up piston spring into piston cylinders, followed by step-up pistons and step-up rods. Install cover plates and attaching screws while holding step-up pistons down in position. Tighten screws securely.

(6) Check fit of choke valve in air horn. The valve should be evenly spaced on all sides. Loosen screws and reposition if necessary.

(7) Engage throttle connector rod with primary

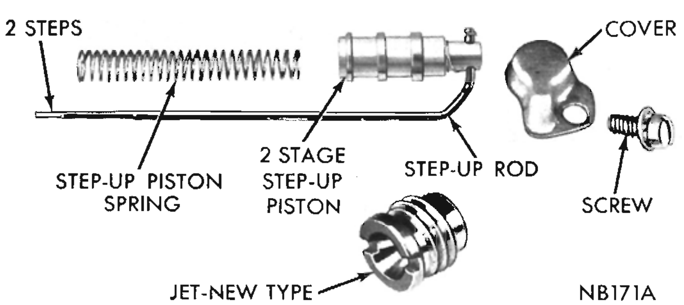


Fig. 11—Step-Up Piston Rod and Jet

throttle shaft lever, then install hairpin clip. Install hairpin clip to rod and pump arm.

(8) Engage lower end of fast idle connector rod with fast idle cam, then swing in an arc to lock in cam. Slide other end of rod into choke shaft lever and secure with hairpin clip.

Installing the Vacuum Diaphragm

Inspect the diaphragm 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 vacuum fitting to seal the opening. Release the diaphragm stem. If the stem moves more than 1/16 inch in ten (10) seconds, the leakge is excessive and the assembly must be replaced. Install the diaphragm assembly on the carburetor as follows:

(1) Assemble to carburetor and tighten attaching screws securely.

(2) Install choke operating link in position between diaphragm plunger (stem) and choke lever. Install clip to secure. Secure choke lever end with spring "E" clip.

(3) Inspect rubber hose for cracks, before placing it on correct carburetor fitting. (Fig. 1). **Do not connect the vacuum hose to the diaphragm fitting until after the vacuum kick adjustment has been made. (See Carburetor Adjustments.)**

(4) Loosen choke valve attaching screws slightly. Hold valve closed, with fingers pressing on high side of valve. Tap valve lightly with a screw driver to seat in air horn. Tighten attaching screws securely and stake by squeezing with pliers.

CARBURETOR ADJUSTMENTS

The following adjustments should be made with the carburetor on the bench for ease of working, and, should be made in the following order:

Fast Idle Speed Cam Position Adjustment

The fast idle engine speed adjustment should be made on the vehicle, as described in the Fast Idle Speed Adjustment (On Vehicle Paragraph.) However, the Fast Idle Cam Position Adjustment can be made on the bench.

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

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

(2) Insert specified drill (refer to Specifications), between choke valve and wall of airhorn (Fig. 12.) An adjustment will be necessary if a slight drag is not obtained as the drill is being removed.

(3) To adjust, bend fast idle connector rod at angle, using Tool T-109-213 until correct valve opening has been obtained. (Fig. 12.)

Vacuum Kick Adjustment—(This test can be made ON or OFF vehicle.)

The choke diaphragm adjustment controls the fuel delivery while the engine is running. It positions the choke valve within the airhorn by use of the linkage between the choke shaft and the diaphragm. The diaphragm must be energized to measure the vacuum kick adjustment. Use either a distributor test machine with a vacuum source, or vacuum supplied by the vehicle.

(1) If adjustment is to be made with engine running, disconnect fast idle linkage to allow choke to close to kick position with engine at curb idle. If an auxiliary vacuum source is to be used, open throttle valves (engine not running) and move choke valve to closed position. Release throttle first, then release choke.

(2) When 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 damage the system. Apply a vacuum of 10 or more inches of Hg.

(3) Insert specified drill (refer to Specifications) between choke valve and wall of air horn. (Fig. 13). 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 on most units, a cylinderical stem extends as an internal spring is compressed. This spring must be fully compressed for proper measurement of vacuum kick adjustment.

(4) An adjustment will be necessary if a slight drag is not obtained as drill is being removed. Shorten or lengthen diaphragm link to obtain correct choke opening. Length changes should be made by carefully opening or closing the bend provided in diaphragm link. **CAUTION: DO NOT APPLY TWISTING OR BENDING FORCE TO DIAPHRAGM.**

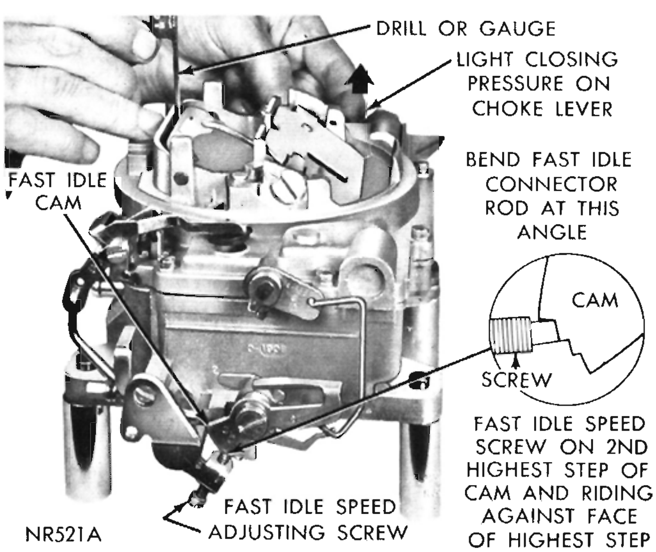


Fig. 12—Fast Idle Cam Position Adjustment

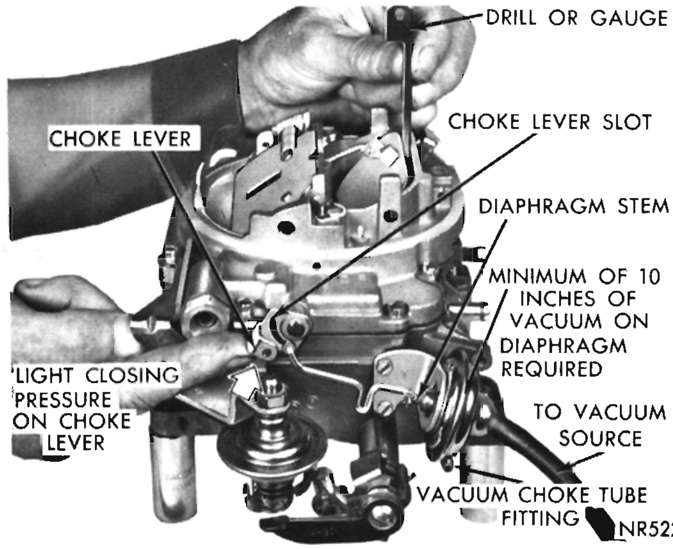


Fig. 13—Checking Choke Vacuum Kick Setting

(5) Reinstall vacuum hose on correct carburetor fitting. Return fast idle linkage to its original condition if disturbed as suggested in step no. 1.

(6) Make following check. With no vacuum applied to diaphragm. **CHOKE VALVE SHOULD MOVE FREELY** between open and closed 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.

Choke Unloader Adjustment

The choke unloader is a mechanical device to partially open the choke at wide open throttle. It is used to eliminate choke enrichment during cranking of an engine. Engines which have been flooded or stalled by excessive choke enrichment can be cleared by use of the unloader. Adjust the system as follows:

(1) Hold throttle valves in wide open position. Insert specified drill (refer to Specifications), between upper edge of choke valve and inner wall of air horn. (Fig. 14).

(2) With a finger lightly pressing against choke lever, a slight drag should be felt as drill is being withdrawn. If an adjustment is necessary, bend unloader tang on fast idle cam, using Tool T-109-22, until correct opening has been obtained. (Fig. 14).

Accelerator Pump Adjustment

Move the choke valve to wide open position, to release the fast idle cam. Back off the idle speed adjusting screw (curb idle) until the throttle valves are seated in the bores.

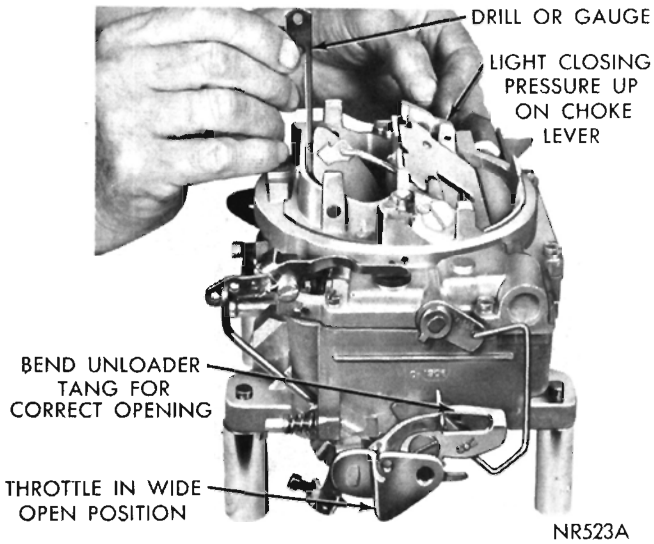


Fig. 14—Checking Choke Unloader (wide open kick)

Measure the distance from the top of the air horn to the top of the plunger shaft, using a "T" scale, (Fig. 15). This distance should be 7/16 inch.

If an adjustment is necessary, bend the throttle connector rod at the lower angle, using Tool T-109-213, until correct travel has been obtained.

Secondary Throttle Lever Adjustment

To check the secondary throttle lever adjustment, block the choke valve in the wide open position and invert the carburetor. Slowly open the primary throttle valves until it is possible to measure 21/64 inch between the lower edge of the primary valve and the bore (opposite idle port) (Fig. 16). At this measurement, the secondary valves should just start to open. If an adjustment is necessary, bend the secondary throttle operating rod at the angle, using Tool T-109-213, until correct adjustment has been obtained.

With primary and secondary throttle valves in tightly closed position, it should be possible to insert Tool T-109-29 (.020") wire gauge, between positive closing shoes on the secondary throttle levers, (Fig. 17).

If an adjustment is necessary, bend the shoe on the secondary throttle lever, using Tool T-109-22, until correct clearance has been obtained.

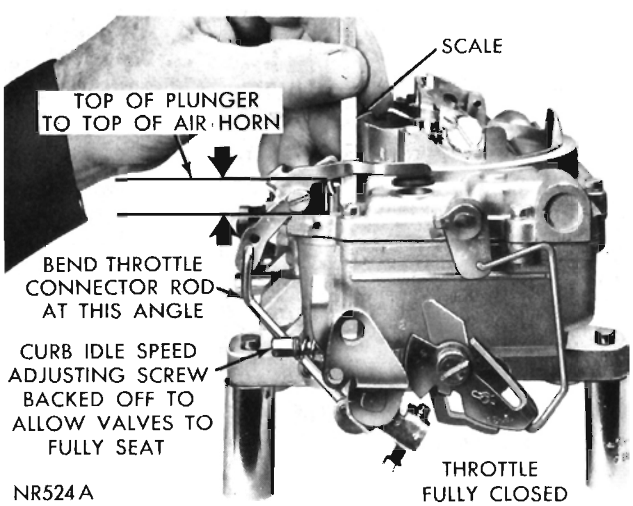


Fig. 15—Checking Accelerator Pump Adjustment

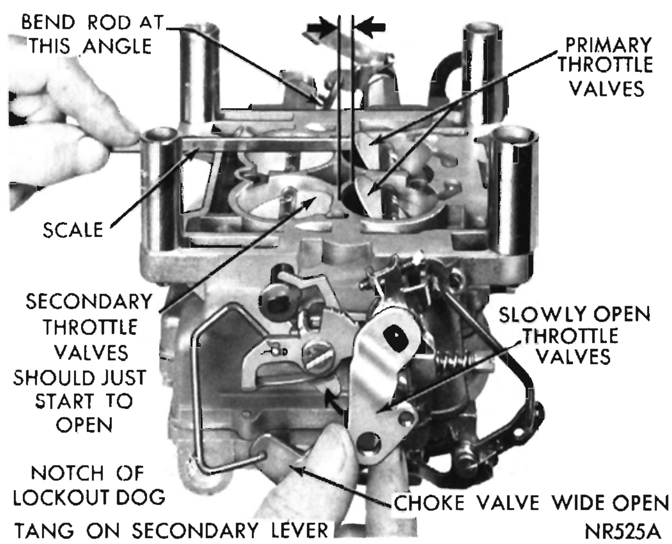


Fig. 16—Checking Secondary Throttle Adjustment

Secondary Throttle Lock Out Adjustment

Crack the throttle valves, then manually open and close the choke valve. The tang on the secondary throttle lever should freely engage in the notch of the lockout dog. (Fig. 16).

If an adjustment is necessary, bend the tang on the secondary throttle lever, until engagement has been made. Use Tool T-109-22 for this operation.

After adjustments have been made, reinstall carburetor on engine, using a new gasket.

It is suggested that the carburetor be filled with clean gasoline. This will help prevent dirt that is trapped in the fuel system, from being dislodged by

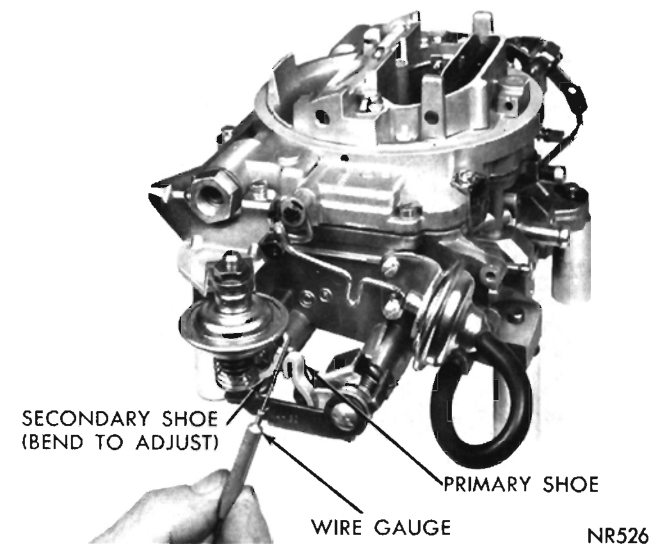


Fig. 17—Checking Clearance Between Closing Shoes

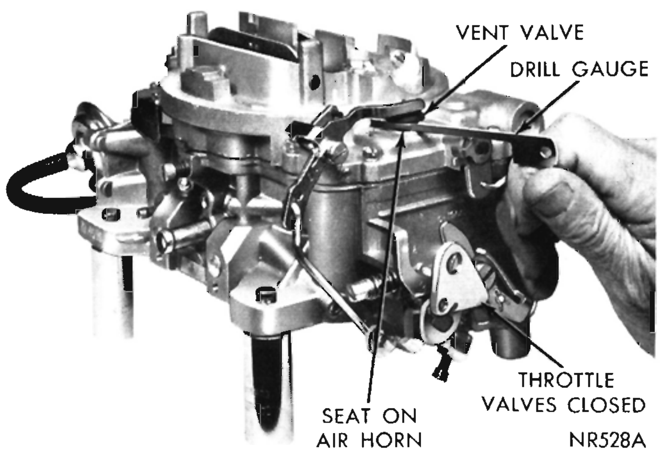


Fig. 18—Bowl Vent Valve Adjustment

the free flow of fuel, as the carburetor is primed.

Bowl Vent Valve Adjustment

To check the bowl vent valve adjustment, proceed as follows:

(1) With throttle valves tightly closed, insert a 1/8 inch drill between air horn and valve at smallest opening (Fig. 18).

(2) If an adjustment is necessary, bend adjusting tang (on pivot end of lever) until correct opening has been obtained.

Secondary Air Valve Adjustment

(1) Loosen lock screw (Fig. 19) and allow air valve to position itself at wide open position.

(2) From wide open position, (spring barely moving valve), turn slotted sleeve **two full turns** counter clockwise, (Fig. 19).

(3) Hold in this position with finger, then tighten lock screw securely. Check valve for freedom of movement.

Idle Speed Adjustment—(Curb Idle)

Refer to General Information at Front of Group.

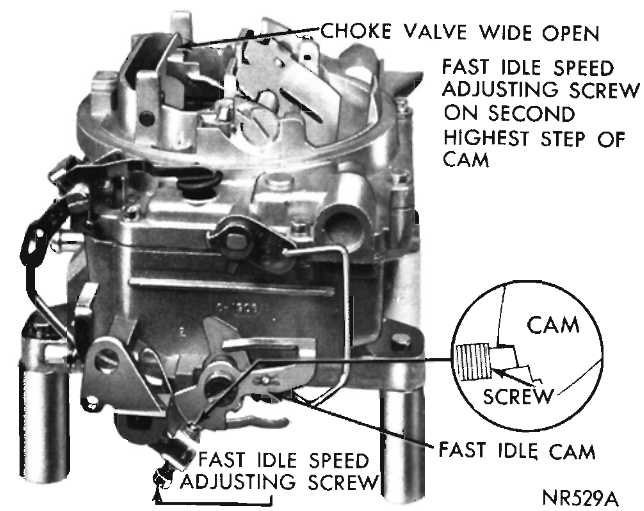


Fig. 20—Fast Idle Speed Adjustment (On Vehicle)

Fast Idle Speed Adjustment (On Vehicle)

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 5 miles. Connect a tachometer and set curb idle speed and mixture, then proceed as follows:

(1) With engine off and transmission in **PARK** or **NEUTRAL** position open throttle slightly.

(2) Close choke valve until fast idle screw can be positioned on the second highest speed step of fast idle cam. (Fig. 20).

(3) Start engine and determine stabilized speed. Turn fast idle speed screw **in** or **out** to secure specified speed. (Refer to Specifications).

(4) Stopping engine between adjustments is not necessary. However, reposition fast idle speed screw on came 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 and the distributor control valve are correctly adjusted as

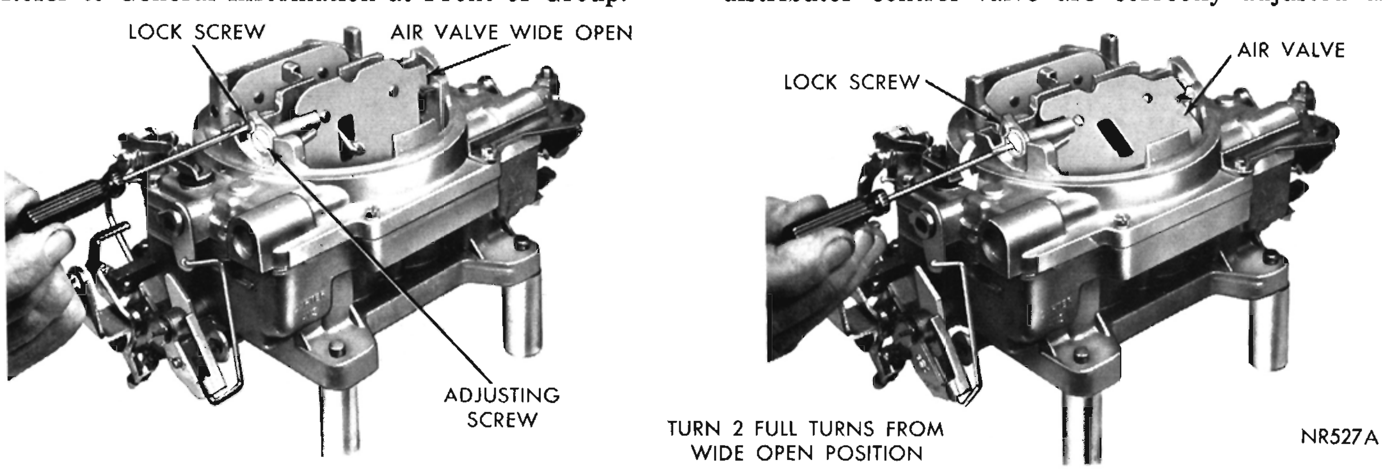


Fig. 19—Secondary Air Valve Adjustment

outlined under Idle Speed Adjustment (Curb Idle).

Dashpot Setting and Adjustment—(Manual Transmission Only)

With the curb idle speed and mixture properly set and a tachometer installed, position the throttle lever so that the actuating tab on the lever is contacting the stem of the dashpot but not depressing it. The tachometer should read 2000 rpm if the setting is correct. To adjust the setting if necessary, screw the dashpot in or out as required. When the desired setting is obtained, tighten the lock nut on the dashpot against the bracket.

To set the idle speed on vehicles, refer to the Fuel System General Information Paragraph.

Holley 4160 4-barrel

GENERAL INFORMATION

The Holley 4160 Series Carburetor Model R-4166A (Figs. 1, 2 and 3) can be considered as two dual downdraft carburetors mounted side by side, each having its own fuel bowl and float system. The two fuel bowls insure a constant supply of fuel for all the fuel metering systems. Fuel from the bowls flow into the primary and the secondary metering bodies where the fuel is mixed with air for all phases of engine operation. This type of metering provides for adequate diagnosis and easier servicing.

The two primary bores have one choke valve, connected to a well type automatic choke. Each bore has its own venturi, booster venturi, main fuel discharge nozzle and throttle valve.

Additional fuel for acceleration is supplied by a diaphragm type, mechanically operated pump which is located on the primary fuel bowl. The pump is actuated from a cam on the primary throttle. An override spring on the pump operating lever prolongs the discharge of fuel for smoother acceleration.

A power valve, mounted on the primary metering body, which is actuated by manifold vacuum, delivers

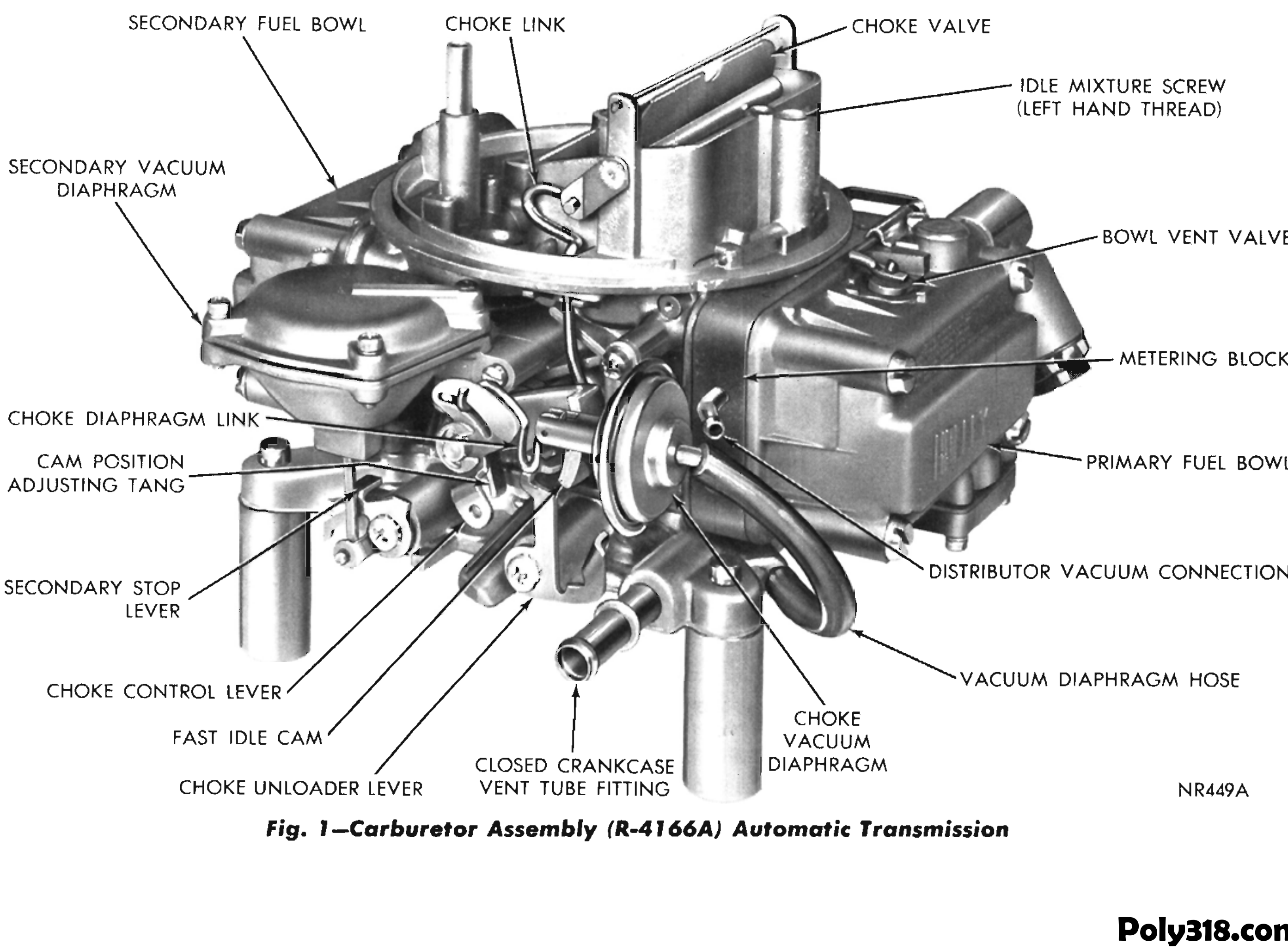


Fig. 1—Carburetor Assembly (R-4166A) Automatic Transmission

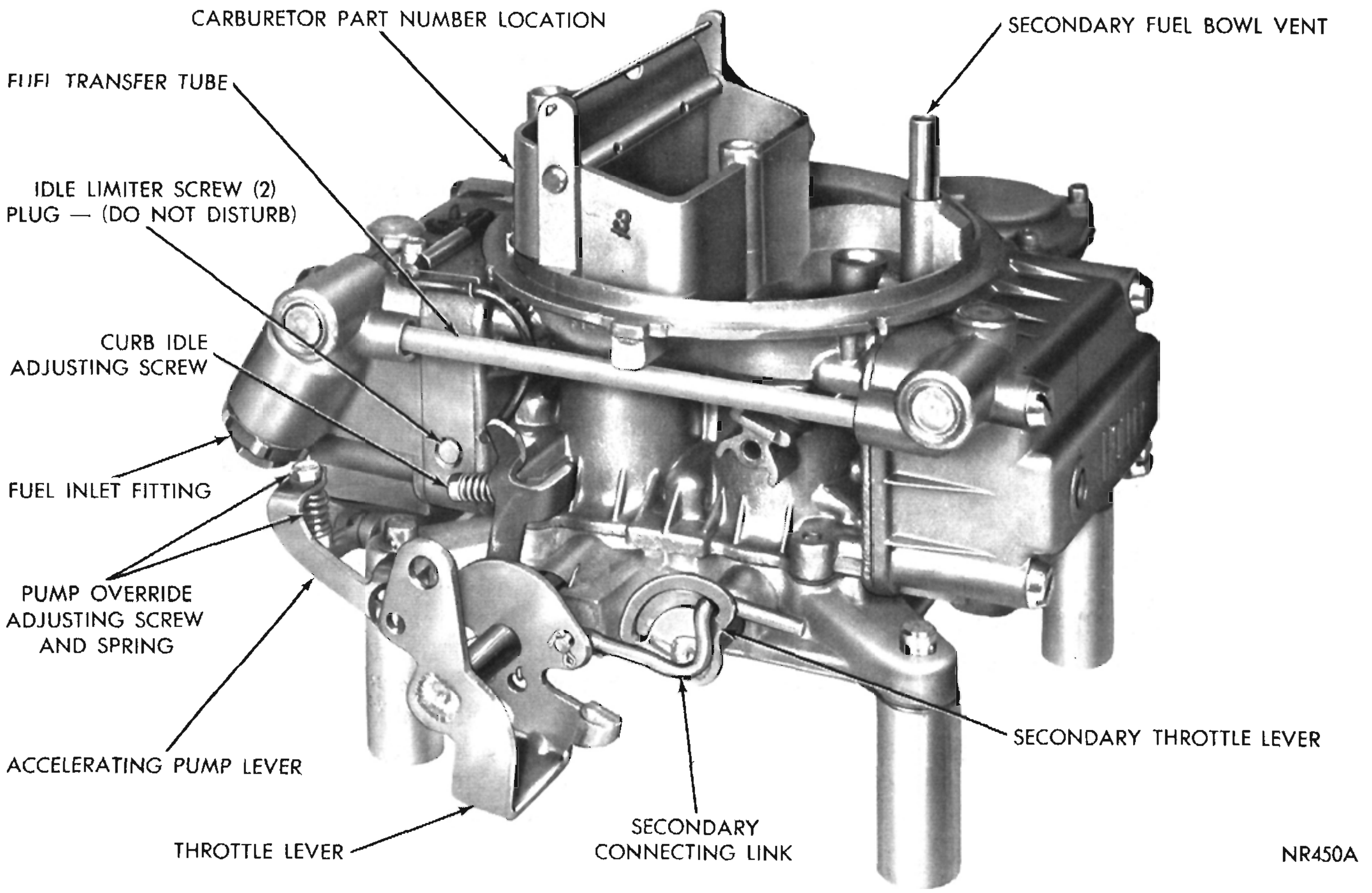


Fig. 2—Carburetor Assembly (Throttle Lever Side)

the additional fuel necessary for full power and high speed operation.

The larger volume of fuel, in two separate bowls exposed to the cooling air stream, is an effective means of reducing percolation and hard starting when the engine is hot. An external vent on the primary bowl, vents the primary fuel bowl when the throttle is closed.

The primary and/or secondary bowls can be quickly removed to adjust the fuel level or change the fuel inlet valve without removing the carburetor from the engine.

Primary Fuel Inlet System

All fuel first enters the primary fuel bowl which supplies the four basic metering systems with the required amount of fuel (Fig. 4).

The fuel enters the fuel bowl through a fuel inlet fitting and into the fuel inlet valve. The amount of fuel entering the fuel bowl is determined by the space between the top of the movable needle and its seat and also by the pressure from the fuel pump.

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.

A float spring is incorporated under the float to keep the float in a stable position.

The float chamber is vented internally by the vent tube at all times. At curb idle or when the engine is stopped, the chamber is also vented by the external vent on top of the primary fuel bowl. This external vent provides a release of excess fuel vapors from the bowl.

Idle System (Fig. 5)

At idle and low speeds, the air flow through the carburetor is not sufficiently strong enough to draw fuel through the primary barrel 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 which operates the idle system.

The carburetor utilizes two idle systems, one for each primary barrel. Since the two passages function identically, only one side will be considered in this explanation (Fig. 5).

At idle, the near atmospheric pressure in the float chamber causes the fuel to flow through the idle system to the greatly reduced pressure are below throttle plate. Fuel flows from the float chamber through a restriction into the curb idle well.

The fuel flows up this vertical idle well through the

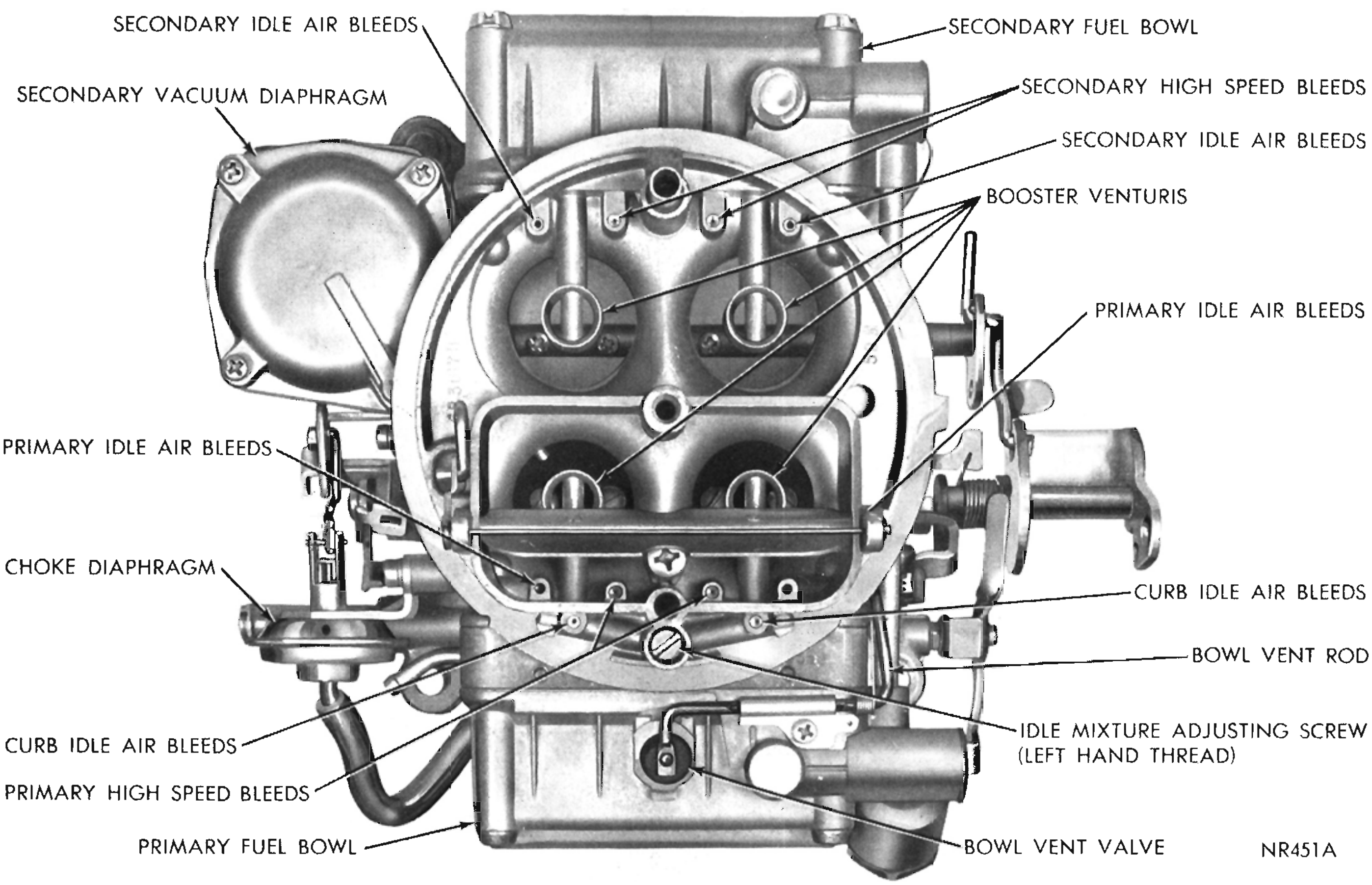


Fig. 3—Carburetor Assembly (Top View)

idle feed restriction, and then it is mixed with air coming in from the idle air bleed. This fuel-air mixture then flows down another vertical passage. At the bottom of this vertical passage the fuel-air mixture is metered by an idle limiter screw. (This adjustment is made at the factory and no field adjustment should be required). However, if an adjustment is necessary, refer to "Rough Idle and Low Speed Surge" paragraph under General Information.

The mixture then flows through a channel in the throttle body to the curb idle discharge port. The fuel is discharged into the throttle bore just below the throttle valve.

The air that is supplied to the curb idle system is supplied through two idle air bleed restrictions and by a curb idle air bleed adjusting screw.

This is the only screw used to adjust curb idle mixture.

The screw is located near the primary bowl vent on the choke air horn.

Turning the screw clockwise leans the curb idle mixture; counter-clockwise enrichens the mixture.

Primary Idle Transfer System (Fig. 5)

A separate off-idle system is used in the carburetor to provide fuel air mixture from idle operation until the main system is in full operation.

Fuel for the idle transfer system enters the main well through the main jet and travels up through the idle transfer tube and crosses over a passage into a vertical channel where air is added from the idle air bleeds. The fuel air mixture is then discharged through the primary transfer slots.

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

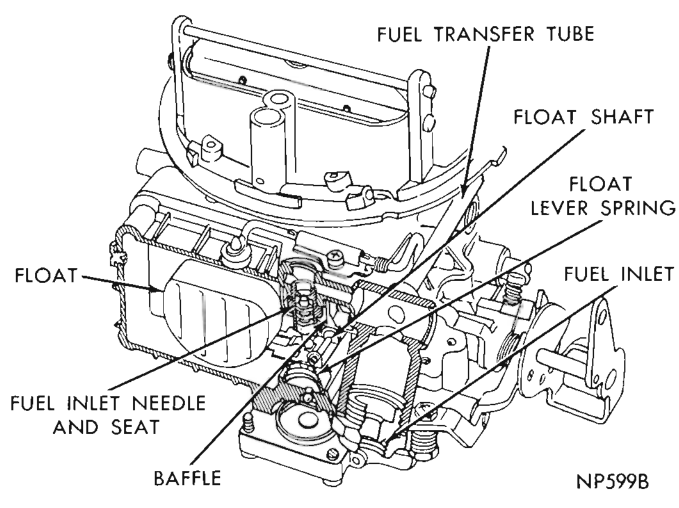


Fig. 4—Primary Fuel Inlet System

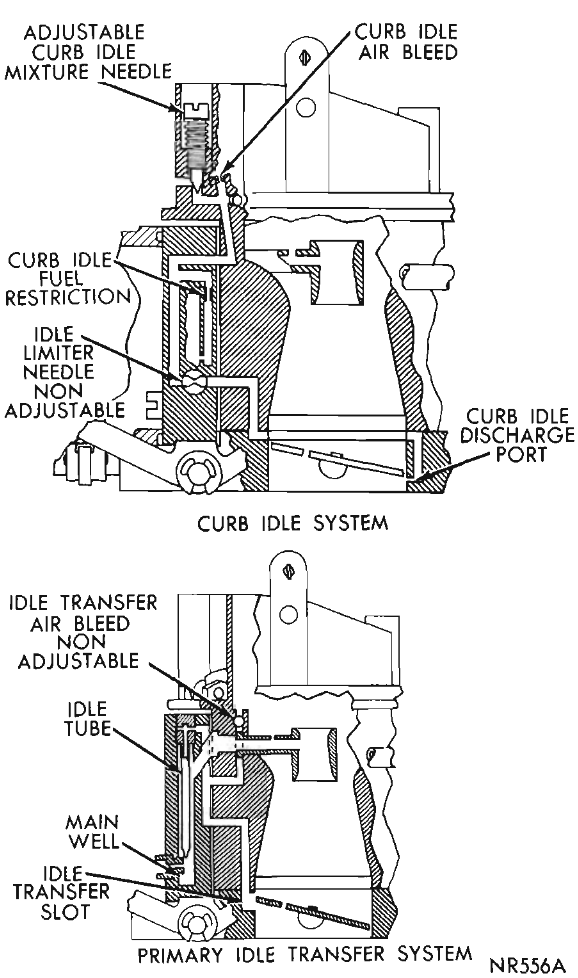


Fig. 5—Idle System

system into operation. The flow from the idle transfer system tapers off as the main metering systems begin discharging fuel. The two systems are engineered to provide smooth gradual transition from idle to cruising speeds.

Main Metering System

As the engine is running, the intake stroke of each piston draws the air through the carburetor venturi and booster venturi. The air, passing through the restriction of the venturi, creates a low pressure commonly called a vacuum. The strength of this low pressure is determined primarily by the velocity of the air flowing through 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 (Fig. 6).

At cruising speed, the fuel flows from the float chamber through the main jet, which measures or meters the 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,

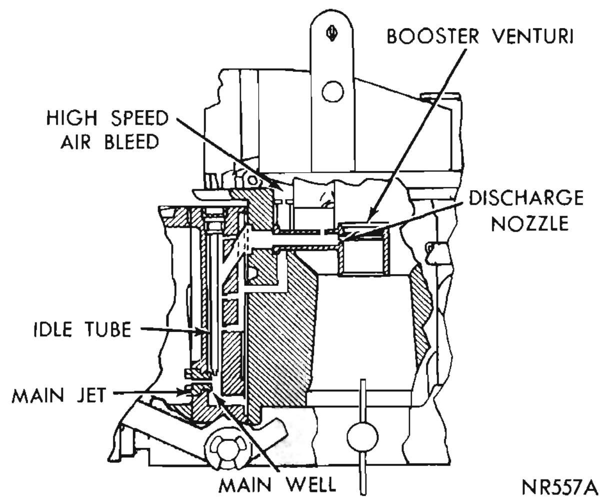


Fig. 6—Main Metering System

enters through the high speed 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 well 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

During high power operation, the carburetor must provide a mixture richer than is needed when the engine is running at cruising speed under no great power requirements. The added fuel for power operation is supplied by the power enrichment system (Fig. 7).

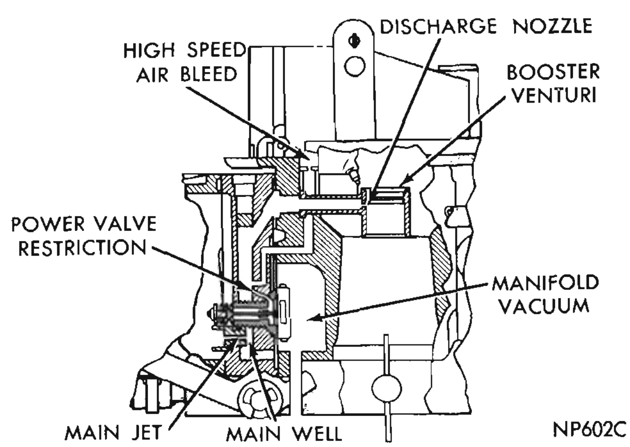


Fig. 7—Power Enrichment System

This system is controlled by manifold vacuum which gives an accurate indication of the power demands placed upon the engine. Manifold vacuum is strongest at idle and decreases as the load on the engine increases. As the load on the engine is increased, the throttle valve must be opened wider to maintain a given speed. Manifold vacuum is thus reduced because the opened throttle valve offers less restriction to air entering the intake manifold.

A vacuum passage in the throttle body transmits manifold vacuum to the power valve chamber in the main body. The power valve which is located in the main metering body is effected by this manifold vacuum. The manifold vacuum, acting on the diaphragm at idle or normal load conditions, is strong enough to hold the diaphragm closed, and overcomes the tension of the power valve spring. When high power demands place a greater load on the engine and manifold vacuum drops below a predetermined point, the power valve spring overcomes the reduced vacuum opening the power valve. Fuel flows from the float chamber, through the valve and out the small holes in the side of the valve through the diagonal restrictions in the main metering body and then into the main well. In the main well, the fuel joins the fuel flow in the main metering system, enriching the mixture.

As engine power demands are reduced, 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.

Accelerating Pump System

Upon acceleration, the air flow through the carburetor responds almost immediately to the increased throttle opening.

Therefore during the brief interval before the fuel, which is heavier than air, can gain speed and maintain the desired balance of fuel and air, the accelerating pump supplies fuel until the other systems can once again provide the proper mixture (Fig. 8).

The accelerating pump is located in the bottom of the primary 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 primary throttle shaft, 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 passage in the fuel bowl into the long diagonal passage in the primary 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 valve to raise and fuel is discharged into the venturi.

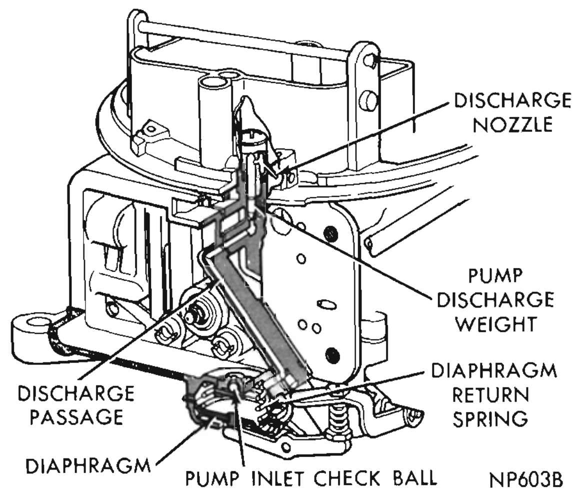


Fig. 8—Accelerating Pump System

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 float bowl.

Secondary Throttle Operating System

At lower speeds, the secondary throttle valves remain nearly closed, allowing the engine to maintain satisfactory fuel air velocities and distribution. When engine speed increases to a point where additional breathing capacity is needed, the vacuum controlled secondary throttle valves open automatically.

Vacuum taken from one of the primary barrels and one of the secondary barrels acts upon a diaphragm which controls the secondary throttle valves. At high speeds when engine requirements approach the capacity of the two primary bores, the increased primary venturi vacuum moves the diaphragm, compressing the diaphragm spring. The diaphragm, acting through the diaphragm link and lever, will commence to open the secondary throttle valves (Fig. 9).

The position of the secondary throttle valves depends on the strength of the vacuum. This in turn, is determined by the air-flow through the bores to the engine. As the air-flow increases, a greater secondary throttle valve opening will result and the secondary barrels will supply a greater portion of the engine's requirements. As top speed is reached, the secondary throttle valves will approach wide open.

As the secondary throttle valves begin to open, a vacuum is created in the secondary barrels, first at the throttle valves and then, as air flow increases, at the throat of the secondary venturi. This vacuum assists the secondary metering system to operate.

When engine speed is reduced, venturi vacuum in

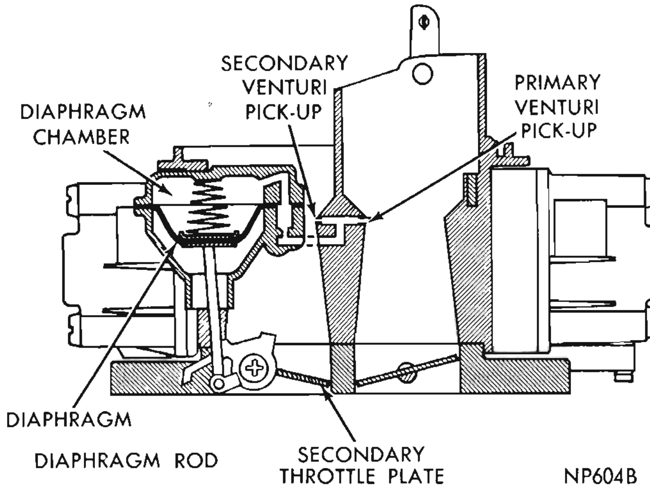


Fig. 9—Secondary Throttle Operating System

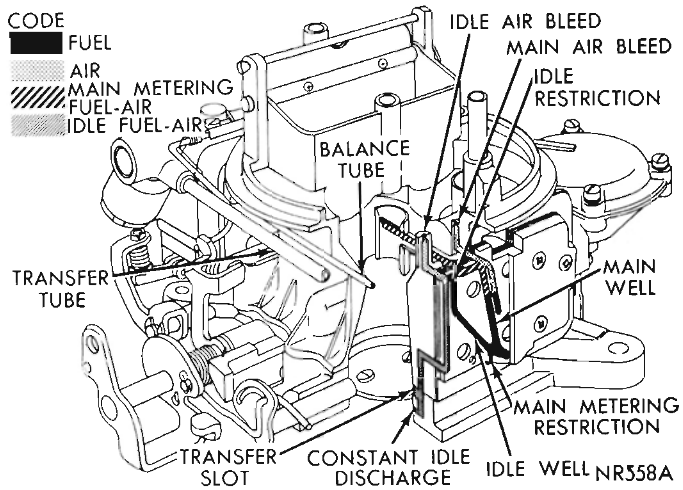


Fig. 10—Secondary Fuel Metering System

the bores become weaker. As the vacuum acting on the diaphragm is lessened, the load on the diaphragm spring will commence 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 the valves to a closed position. The secondary valves are retained in the closed position when the primary valves are fully closed by the secondary throttle connecting rod. This rod, which is fastened to the primary throttle lever, rides in a slot in the secondary throttle lever.

Secondary Fuel Metering Systems

The secondary system is supplied with fuel from the secondary fuel bowl, which receives its fuel through a connecting tube, from the primary fuel inlet.

The secondary fuel bowl is equipped with a fuel inlet assembly which regulates the flow of fuel into the bowl, the same as the primary fuel bowl. The secondary fuel inlet system must maintain a specified level of fuel as the two secondary fuel systems are calibrated to deliver the proper mixture only when the fuel is at this level.

As the valves begin to open the fuel flows through the secondary metering restrictions into the idle well (Fig. 10).

A secondary fixed curb idle discharge passage supplies fuel directly to the intake manifold, thus allowing a smoother idle.

When the secondary throttle valves are opened further the pressure differential causes the secondary main metering system to begin functioning.

Automatic Choke

The automatic choke supplies enriched fuel-air mixture for starting and operating a cold engine (Fig. 11). Most of the fuel from the carburetor of a cold engine is liquid. This fuel in liquid form burns slowly and incompletely. Power loss and stalls result. The choke valve supplies the extra fuel by restricting air flow during cranking and warm-up. Vacuum created by the restriction causes this fuel flow from both the main metering and idle systems.

The thermostat spring of a cold engine pushes the choke valve toward the closed position. When the engine is started, manifold vacuum acts on both the choke valve and a vacuum diaphragm attached to the carburetor body. This vacuum acts to oppose the thermostat spring and partially opens the choke valve to prevent stalls from richness. The choke shaft does not pass through the center of a choke valve. Instead, it is offset to expose a large area at one side to manifold vacuum. During idle or low temperature cranking, manifold vacuum is not sufficiently strong to open the choke valve. But air impact against the valve

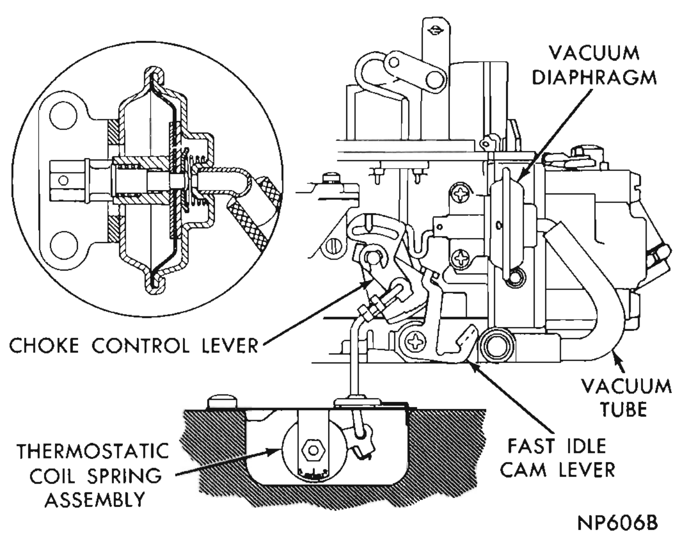


Fig. 11—Automatic Choke System

causes partial opening. These two factors, vacuum and air impact allow ample air to run the engine. Continued running of the engine develops heat and causes the thermostat assembly to move to the open choke position.

During the warm-up period, air flow past the partially open offset choke valve acts to open the valve. Just as in the start cycle, vacuum and air impact combine to control the choke valve. The engine required less choking at high speeds. The offset choke valve, vacuum diaphragm and thermostat spring are engineered to provide satisfactory choking for most conditions of engine speed, output and temperature.

Fast Idle

The choke control lever at the carburetor actuates a fast idle cam during choking. A cam has a series of steps designed to increase carburetor air flow to maintain satisfactory cold engine speed levels. The proper cam step is moved into position as the choke rod is moved from closed to open conditions. Each step permits a slower idle rpm as engine temperature rises and choking is reduced.

Spark Advance

The distributor utilizes changes in air pressure within the carburetor to control spark timing to satisfy all engine speed and load conditions.

In order to obtain a vacuum to operate the spark advance as dictated by the engine speed and load conditions, a port is located in the throttle bore just above the full closed position of the throttle valves, as the throttle is opened, this port is subject to manifold vacuum, which varies with changes in engine load. This port in the throttle body is connected to the main body by a short vertical passage, and then to a passage in the main metering body. This passage leads to an outlet on the side of the main metering body which connects to a single flexible tube to the distributor.

SERVICE PROCEDURES

Servicing the 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 or 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 the carburetor (Fig. 1) for cleaning or overhaul, proceed as follows:

(1) Install four elevating legs, Tool T109-287S in mounting flange holes in throttle body, or use Carburetor Stand C-3886. (These tools are used to protect the throttle valves from damage and to provide a suitable base for working).

(2) Remove primary fuel bowl assembly by sliding straight off balance tube (Fig. 2).

(3) Remove primary metering body by sliding straight off balance tube (Fig. 3). Remove plate to body gasket.

(4) Remove accelerating pump operating lever "E" clip and slide lever assembly off stub shaft. Remove adjusting nut, spring and screw.

(5) Remove fuel transfer tube and "O" rings (Fig. 3).

(6) Remove secondary fuel bowl assembly.

(7) Using a clutch head screwdriver (Tool CL-13) remove clutch head screws, carefully work secondary metering body, plate and gaskets off balance tube (Fig. 4).

(8) Remove balance tube, washers and "O" rings by sliding out of main body (either end).

(9) Disconnect choke diaphragm hose from throttle body fitting, then remove diaphragm assembly, at the same time disengaging link from fast idle cam lever.

(10) Remove "E" clip that retains fast idle cam lever and cam. Slide lever and cam off stub shaft, and at the same time, disengage choke rod from cam lever. (Note position of fast idle cam to cam lever.)

(11) Remove secondary diaphragm attaching screws and remove diaphragm assembly. Disengage diaphragm stem from secondary stop lever. Remove gasket.

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

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

(14) With carburetor inverted, remove screws that

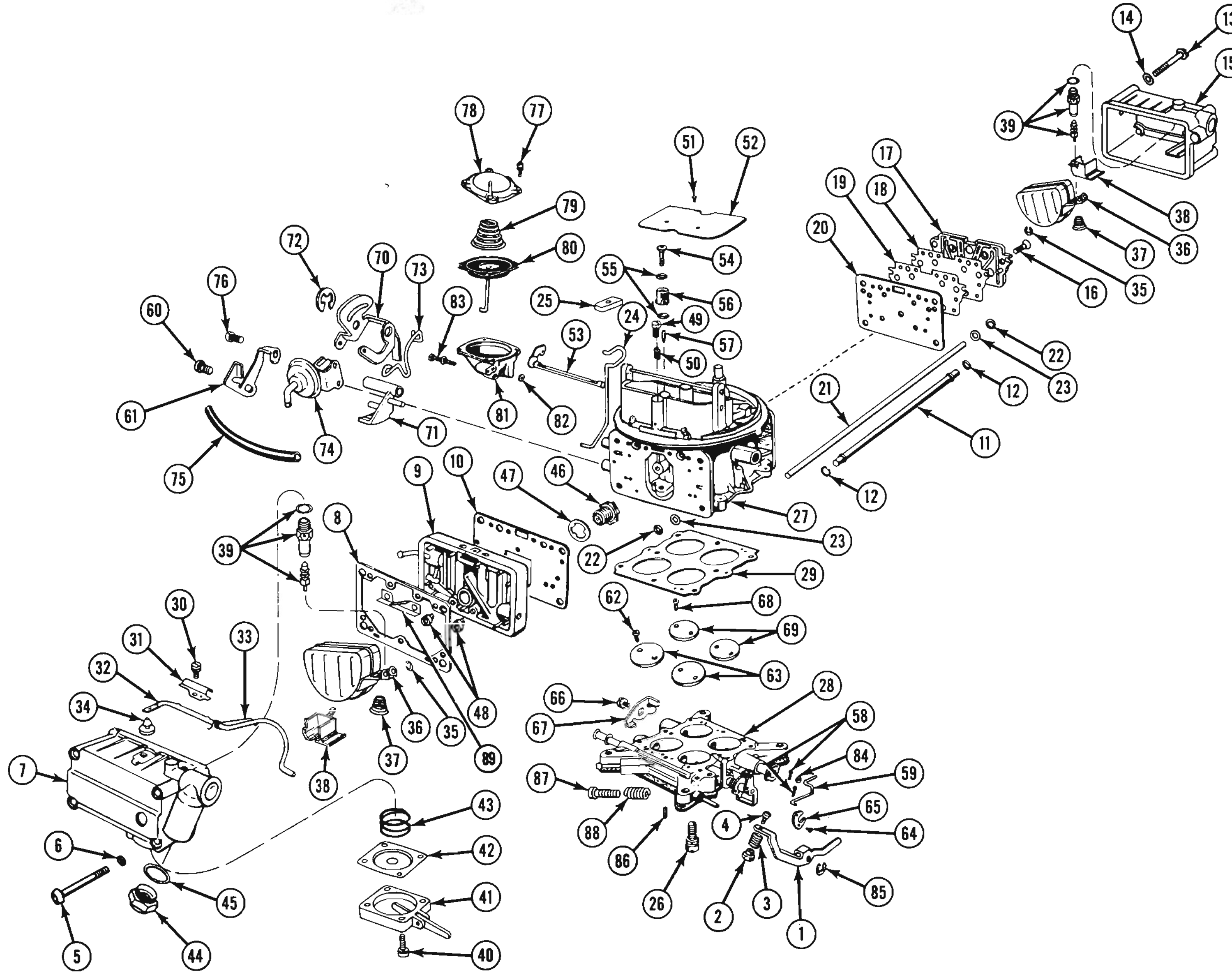


Fig. 1—Carburetor Assembly (Exploded View)

1—Lever, Pump Operating
2—Locknut
3—Spring override
4—Screw, Pump Adjusting
5—Screw, Fuel Bowl (Primary)
6—Gasket, Bowl Screw
7—Fuel Bowl (Primary)
8—Gasket, Fuel Bowl
9—Metering Body (Primary Side)
10—Gasket, Metering Body
11—Fuel Tube (Float Bowl Connecting)
12—"O" Rings, Fuel Tube
13—Screw, Fuel Bowl (Secondary)
14—Gasket, Bowl Screw
15—Fuel Bowl (Secondary)
16—Screw, Metering Body (Secondary)
17—Metering Body (Secondary)
18—Gasket, Metering Body (Secondary)
19—Plate, Metering Body (Secondary)
20—Gasket, Metering Body Plate
21—Balance Tube
22—Washers, Balance Tube
23—"O" Rings, Balance Tube
24—Choke Link
25—Seal, Choke Rod
26—Throttle Body Screws
27—Main Body
28—Throttle Body
29—Gasket, Main to Throttle Body
30—Screw, Bowl Vent Valve Rod Clamp
31—Clamp, Valve Rod
32—Rod, Bowl Vent Valve
33—Spring, Vent Valve Rod
34—Valve, Bowl Vent
35—Retainer, Clip, Float
36—Float
37—Spring, Float
38—Baffle, Float
39—Needle Valve and Seat
40—Screws, Fuel Pump Cover
41—Cover Assembly, Fuel Pump
42—Diaphragm, Fuel Pump
43—Spring, Fuel Pump Diaphragm
44—Fitting, Fuel Inlet
45—Gasket, Fuel Inlet, Fitting
46—Valve Assembly, Power
47—Gasket, Power Valve
48—Primary Jets
49—Needle, Idle Adjusting (Left Hand Thread)
50—Spring, Idle Needle
51—Screws, Choke Valve
52—Choke Valve
53—Choke Shaft & Lever Assembly
54—Discharge Nozzle Screw, Pump
55—Gasket, Nozzle Screw
56—Nozzle, Pump Discharge
57—Needle, Pump Discharge Jet
58—Cotter Pins, Connecting Rods
59—Rod, Secondary Connecting
60—Screw and Lockwasher, Fast Idle Cam Lever
61—Lever, Fast Idle Cam
62—Screws, Primary Throttle Valve
63—Throttle Valves, Primary
64—Screw, Pump Cam
65—Pump Cam
66—Screw and Lockwasher, Secondary Stop Lever
67—Lever, Secondary Stop
68—Screws, Secondary Throttle Valves
69—Throttle Valves, Secondary
70—Fast Idle Cam Lever
71—Fast Idle Cam
72—Retainer (E-Clip)
73—Choke Diaphragm Link
74—Choke Diaphragm Assembly
75—Choke Vacuum Hose
76—Choke Diaphragm Bracket Screw
77—Secondary Diaphragm Cover Screw
78—Diaphragm Cover (Machine)
79—Secondary Diaphragm Return Spring
80—Secondary Diaphragm Assembly
81—Secondary Diaphragm Housing (Machine)
82—Secondary Diaphragm Housing Gasket
83—Secondary Diaphragm Assembly Screw
84—Throttle Connecting Rod Retainer Washer
85—Pump Operating Lever (E-Clip)
86—Secondary Stop Screw
87—Throttle Stop Screw
88—Throttle Stop Screw Spring
89—Baffle

attach the throttle body to main body (Fig. 5). Remove throttle body and discard gasket.

Disassembling the Fuel Bowls (Primary and Secondary)

Primary

(1) Remove primary bowl vent valve assembly (Fig. 6).

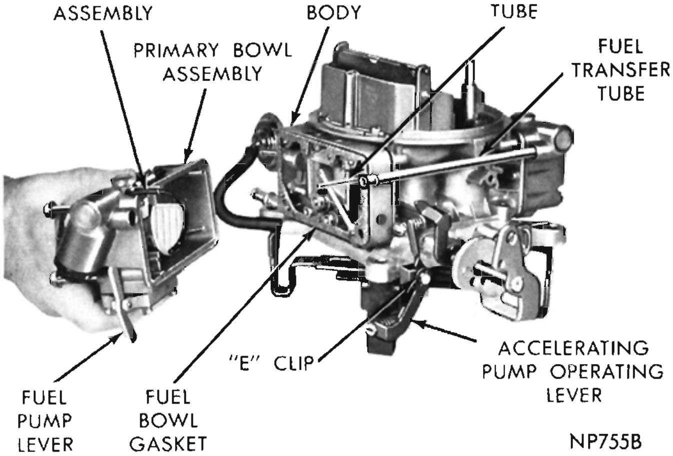


Fig. 2—Removing or Installing Primary Fuel Bowl

(2) Remove float retainer "E" clip, then slide float and spring out of float chamber. (As float is being removed, the fuel inlet needle may drop out of seat assembly.) Remove float baffle.

(3) Remove fuel inlet needle valve seat. Discard the gasket.

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

(5) Remove fuel inlet fitting and discard gasket.

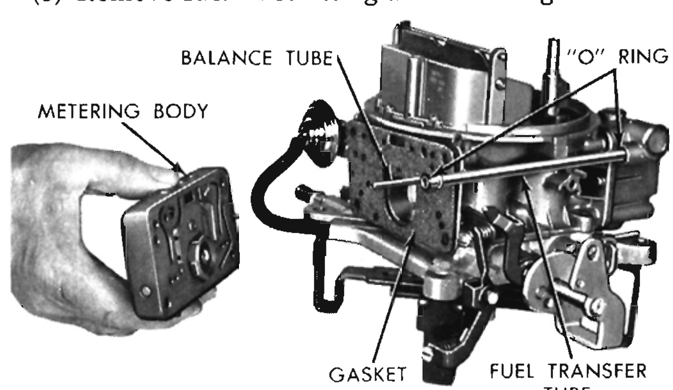


Fig. 3—Removing or Installing Primary Metering Body and Plate

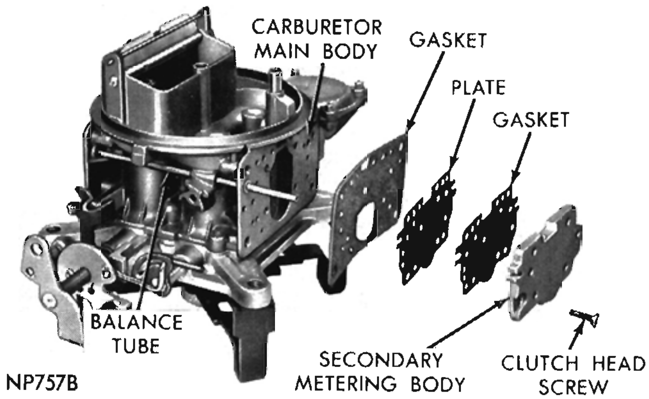


Fig. 4—Secondary Metering Body, Plate and Gaskets

Secondary

(1) Remove float retainer "E" clip, then slide float and spring out of float chamber. (As float is being removed, the fuel inlet needle may drop out of seat assembly.) Remove float baffle.

(2) Remove fuel inlet needle valve seat. Discard gasket.

It should be noted that the Primary and Secondary fuel bowl baffles are of a different design and should be installed in the correct bowl at reassembly.

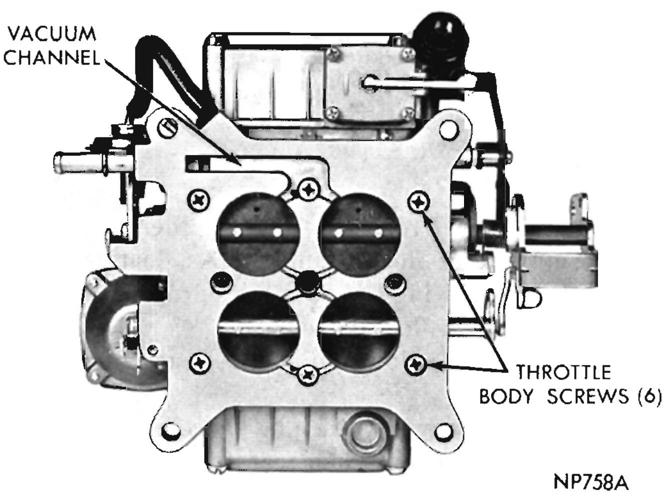


Fig. 5—Carburetor Assembly—Inverted

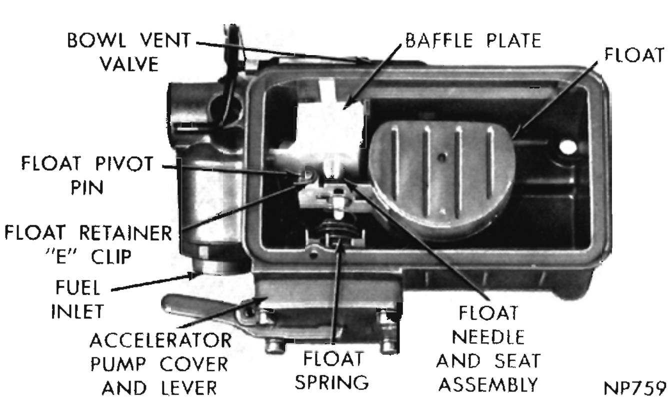


Fig. 6—Primary Fuel Bowl Assembly

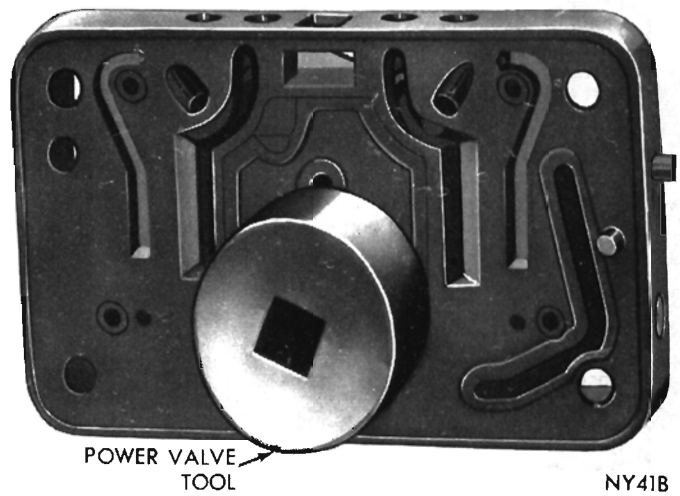


Fig. 7—Removing or Installing Power Valve

Disassembling the Main Metering Body

Primary

(1) Using Tool C-3747, remove power valve assembly from primary metering body (Fig. 7).

(2) Using Tool C-3748, remove main metering jets. (Fig. 8).

(3) Remove idle adjusting needles and gaskets.

Secondary

No disassembly required, but it is very important that the well bleed parts, main metering restrictions and idle feed restrictions are clean (Fig. 9).

Disassembling the Secondary Diaphragm

(1) Remove the diaphragm cover screws and separate diaphragm cover from housing.

(2) Remove diaphragm return spring from cover, then slide diaphragm out of housing.

Disassembling the Throttle Body

CAUTION: 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:

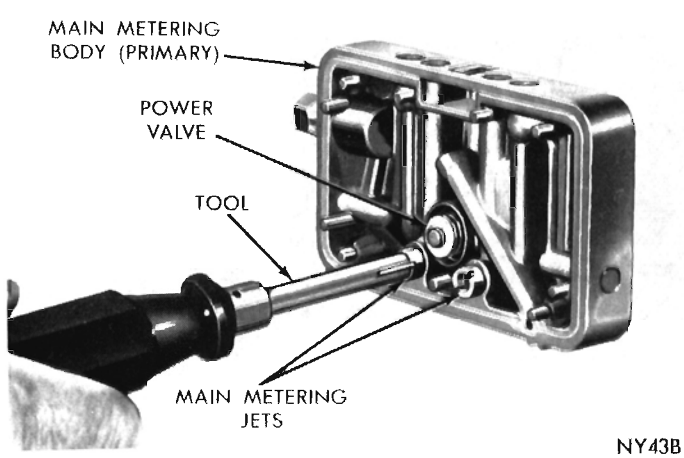


Fig. 8—Removing or Installing Main Metering Jets

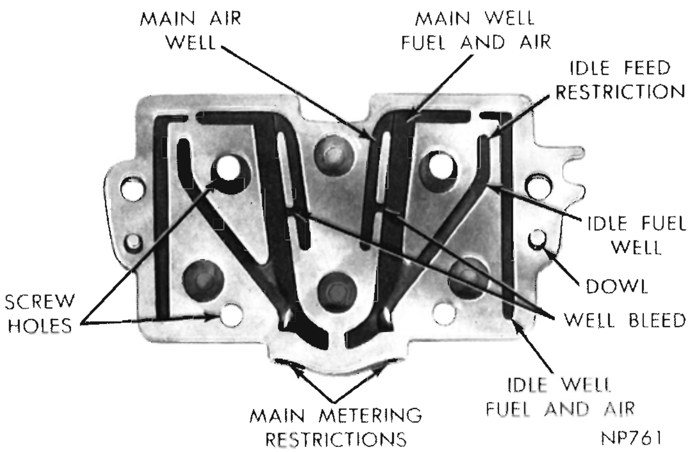


Fig. 9—Secondary Metering Body

(1) Remove screws that hold throttle valves to throttle shafts. **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 valves out of bores. It should be noted at this time, that the secondary throttle valves are thicker than the primary valves. **Do not install secondary valves in primary bores or visa versa as the relationship of the primary valves to the idle transfer port and spark advance control ports is carefully established for one particular assembly.**

CLEANING CARBURETOR PARTS

The recommended solvent for gum deposits is denatured alcohol which is easily obtainable. However, there are other commercial solvents, (such as Metalclene) which may be used with satisfactory results.

The choke diaphragm can be damaged by solvents. Avoid placing the diaphragm assembly in ANY liquid. Clean the external surfaces with a clean cloth or soft wire brush. Shake dirt or other foreign material from the stem side of the diaphragm. Depressing the diaphragm stem to the retracted position, will provide an additional hole for the removal of dirt. Compressed air can be used to remove loose dirt, **but should not be connected to the vacuum inlet fitting.**

IMPORTANT: If the commercial solvent or cleaner recommends the use of water as a rinse, it should be "HOT". After rinsing, all trace of water must be blown from the passages with air pressure. It is further advisable to rinse all parts in clean gasoline or kerosene to be certain no trace of moisture remains. Never clean jets with a wire, drill or other mechanical means because the orifices may become enlarged, making the fuel mixture too rich for proper performance.

DO NOT clean any rubber diaphragms in cleaning solvent because of possible damage.

INSPECTION AND REASSEMBLY

Throttle Body

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

(1) Slide new primary throttle valves in position on throttle shaft, with the valve number on the bottom (flange side) and toward idle transfer and spark advance control ports.

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

(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 the throttle shafts. 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 the outer diameter of the valves and the bores should be uniform.

(5) Install secondary throttle valves in the same manner as described previously. The numbers stamped on the valves must be toward idle transfer and spark advance ports in primary bores. For adjustment (See Secondary Throttle Adjustment).

Assembling the Main Metering Body

(Primary)

(1) Install new idle mixture adjusting needle gaskets and then install needles finger tight. Back off one full turn for approximate adjustment (Fig. 3).

(2) Slide a new gasket over power valve and install, using Tool C-3747. Tighten securely (Fig. 7).

(3) Install main metering jets (Fig. 8), using Tool C-3748. Tighten securely.

Assembling the Fuel Bowls

Primary

(1) Install accelerator pump spring in position in fuel bowl, followed by diaphragm and pump cover. (When installing diaphragm, be sure contact button is toward pump lever in cover.) (Fig. 10).

(2) Place cover over diaphragm (with lever on fuel inlet fitting side) (Fig. 10). Install attaching screws and tighten securely.

(3) Install new gasket on fuel inlet needle seat (Fig. 11) then install in fuel bowl. Tighten securely. Slide fuel inlet needle into seat.

(4) Install float baffle in position, then slide float hinge over pivot and secure with "E" clip. Install float spring.

(5) Install new gasket over fuel inlet fitting, then install fitting in primary fuel bowl. Tighten securely.

Secondary

(1) Install new gasket on fuel inlet needle seat (Fig.

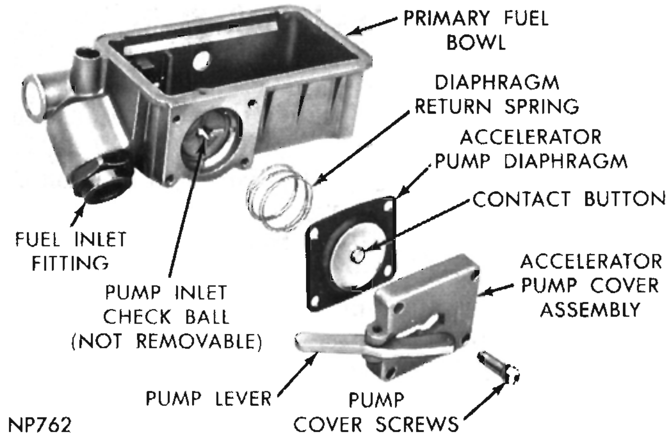


Fig. 10—Accelerating Pump (Exploded View)

11), then install in fuel bowl. Tighten securely. Slide fuel inlet needle into seat.

(2) Install float baffle in position, then slide float hinge over pivot and secure with "E" clip. Install float spring.

Adjusting the Floats

(1) Invert the primary fuel bowl and using a 15/64 inch drill shank or gauge, measure the clearance between toe of float and surface of fuel bowl. (Fig. 12). If an adjustment is necessary, bend float tang until correct clearance has been obtained.

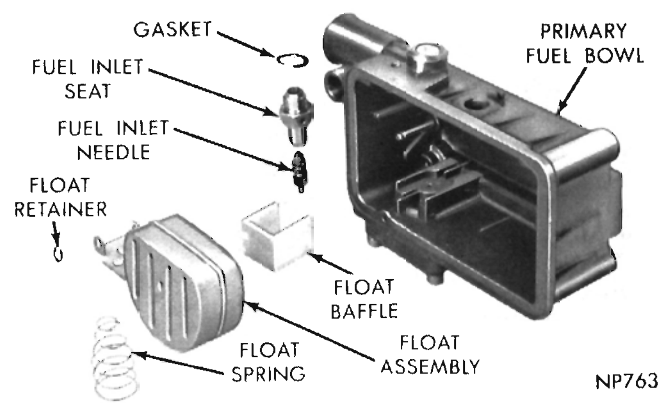


Fig. 11—Float, Needle, Seat and Baffle (Exploded View)

(2) Invert the secondary fuel bowl and using a 17/64 inch drill shank or gauge, measure the clearance between heel of float and surface of fuel bowl (Fig. 12). If an adjustment is necessary, bend float tang until correct clearance has been obtained.

Assembling the Main Body

(1) Place a new gasket on throttle body, then lower main body (Fig. 13) down on throttle body, aligning roll pin guides with openings in main body. Be sure primary bores of throttle body are on the same side as primary venturi.

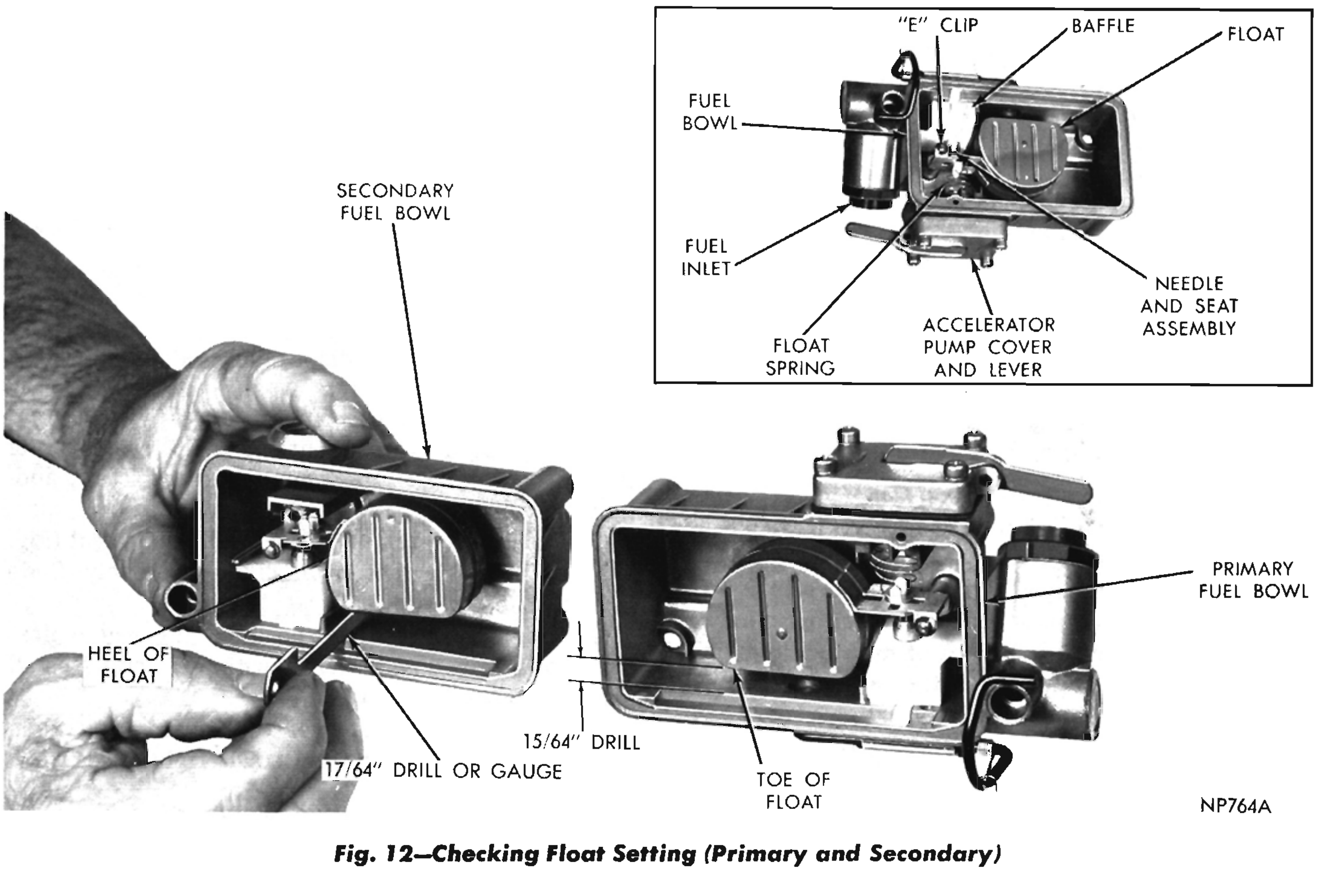


Fig. 12—Checking Float Setting (Primary and Secondary)

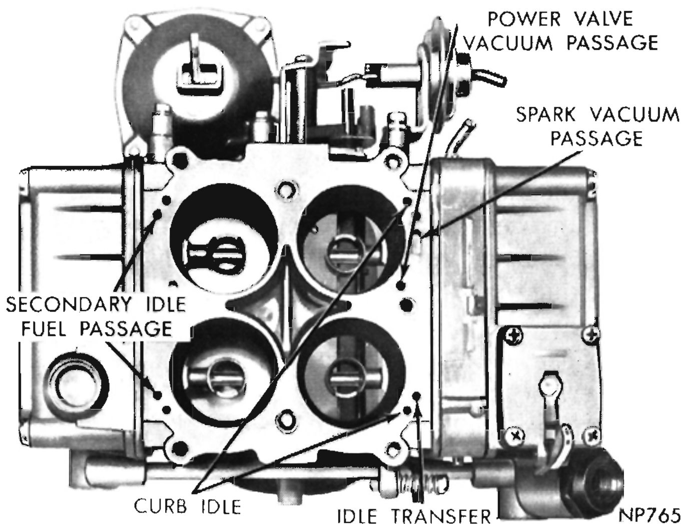


Fig. 13—Main Body Identification (Bottom View)

(2) Holding assembly together, invert assembly and install attaching screws. Tighten securely.

(3) Install balance tube into main body and install new "O" rings and washers at each end. Be sure "O" rings are seated in recesses, followed by washers.

(4) Install a new secondary metering body to main body gasket (Fig. 4) followed by metering body plate, plate gasket and body. Install clutch head screws and tighten securely. (Be sure the main metering restriction ports are at the bottom).

(5) Position balance tube so that only 1 inch extends beyond the secondary metering body (Fig. 14). (Use a 6 inch ruler for this measurement.)

(6) Place a new gasket over primary metering body aligning pin. (Rear) Carefully slide metering body over balance tube and down into position against main body.

(7) Slide a new gasket over metering body alignment studs and carefully position against body.

(8) Carefully install primary fuel bowl over balance

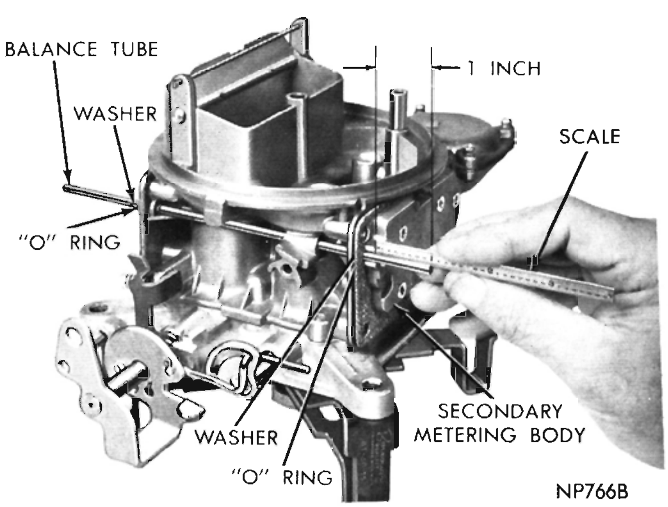


Fig. 14—Positioning Balance Tube

tube and down against metering body. Slide new gaskets over the long fuel bowl mounting screws, then install in position through fuel bowl. Tighten securely. If new gaskets are not used, a fuel leak will develop.

(9) Slide a new "O" ring on each end of fuel tube, then install fuel tube into opening in primary fuel bowl. Press in on tube end until seated.

(10) Carefully slide secondary fuel bowl over balance tube and fuel tube and seat against gasket. Install secondary fuel bowl attaching screws after installing new gasket. Tighten securely.

(11) Install accelerating pump discharge needle in the discharge passage in the center of primary venturi.

To test needle for sealing, pour clean gasoline into primary fuel bowl through vent valve opening. Push down on accelerator pump arm 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.

(12) Install pump discharge nozzle gasket, nozzle and 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.

(13) Slide the bowl vent valve shaft down between fuel tube and carburetor body. Hold in position, then install clamp, after engaging stub end of spring in clamp. Install retaining screw and tighten securely.

(14 Loosen choke valve attaching screws slightly.

(15) Tap lightly on choke valve to center valve in air horn. Holding choke valve with the fingers, tighten attaching screws securely. Stake by squeezing with pliers.

(16) Engage fast idle cam with fast idle cam lever, then slide assembly onto stub shaft positioning fast idle cam behind fast idle cam lever. At the same time engage fast idle cam lever with choke rod. Install "E" clip to secure.

Choke Vacuum Diaphragm

Inspect the diaphragm 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 ten (10) seconds, the leakage is excessive and the assembly must be replaced.

Install the diaphragm assembly on the carburetor as follows:

(1) Engage choke link in slot in choke lever.

(2) Place the diaphragm on the mounting surface. Install and tighten the attaching screws securely.

(3) Inspect the rubber hose for cracks before placing it on the correct carburetor fitting. Do not connect the vacuum hose to the diaphragm fitting until after the vacuum kick adjustment has been made.

Assembling the Secondary Diaphragm

(1) Slide diaphragm into housing (Fig. 15).

(2) Position diaphragm so that the vacuum hole in housing is aligned with vacuum hole in diaphragm.

(3) Install diaphragm return spring with coiled end snapped over button in cover.

(4) Support diaphragm stem in order to keep diaphragm flat as spring and cover are installed.

(5) Align vacuum port in cover with port in housing then carefully lower cover. Install attaching screws and tighten securely.

(6) Check diaphragm by pressing **in** on stem and placing finger over port. Diaphragm should stay in retracted position.

(7) Install a new gasket in vacuum passage recess in diaphragm housing, then install secondary diaphragm on main body of carburetor and at the same time engage stem with secondary stop lever. Install screws and tighten securely.

(8) Install pump lever on stub shaft and secure with "E" clip. Slide spring and locknut between fuel pump lever and pump operating lever. Open throttle valve and install adjusting screw. Tighten 2 or 3 threads to hold. The correct setting of the adjusting screw will be covered under adjustments.

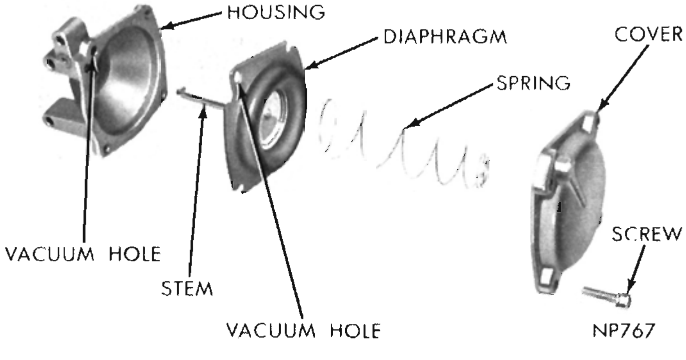


Fig. 15—Secondary Throttle Diaphragm (Exploded View)

CARBURETOR ADJUSTMENTS

It is very important that the following adjustments be made on a reconditioned carburetor:

Qualifying the Choke Control Lever
Choke Unloader Adjustment (wide open kick)
Fast Idle Cam Position Adjustment
Vacuum Kick Adjustment (On or off vehicle)
Fast Idle Speed Adjustment (On the vehicle)
Checking the Bowl Vent Valve Clearance
Checking the Pump Lever Clearance
Idle Speed Adjustment (Curb idle)
Adjusting the Float
Secondary Throttle Adjustment
Idle Mixture Adjustment
Checking Wet Fuel Level

Checking the Bowl Vent Valve Clearance

To check the bowl vent valve clearance (Fig. 16), proceed as follows:

(1) With throttle valves at curb idle, it should be possible to insert a 5/64 inch drill shank between bowl vent valve and top of primary fuel bowl, with the idle speed properly set.

(2) If an adjustment is necessary, bend rod to change arc of contact with throttle lever, using Tool T109-213 until correct clearance has been obtained.

Checking Accelerator Pump Lever Clearance

To check accelerator pump lever clearance (Fig. 17), proceed as follows:

(1) With throttle valves wide open, and the 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.

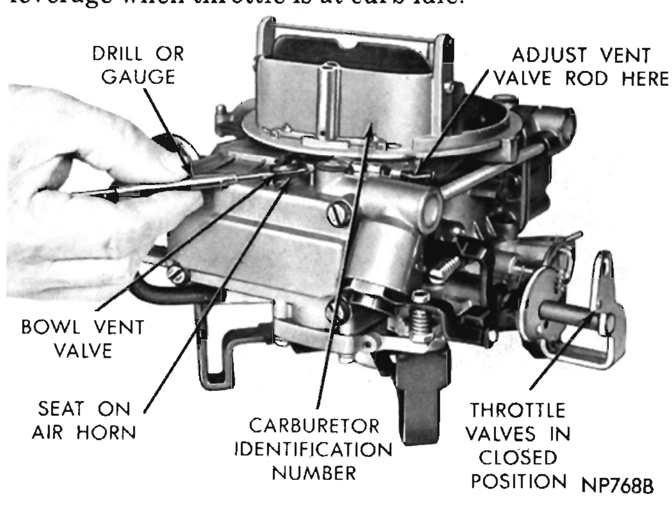


Fig. 16—Checking Bowl Vent Valve Clearance

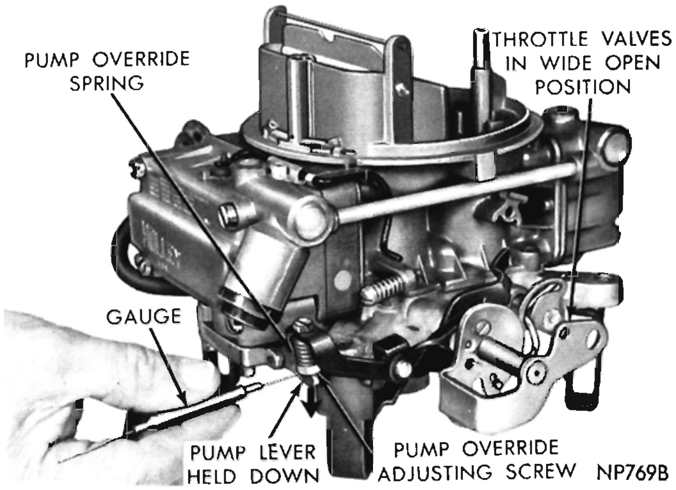


Fig. 17—Checking Accelerator Pump Lever Clearance

Qualifying Choke Control Lever

Adjustment of the choke control lever is necessary to provide correct relationship between choke valve, thermostatic coil spring and the fast idle cam. It should be checked and adjusted (if necessary) after carburetor assembly or as preparation of the choke system linkage before making the Vacuum Kick, Cam Position or Unloader Adjustment. These three adjustments must and should be made after qualification of the choke control lever.

(1) Open the throttle to mid-position.

(2) Close the choke valve by slight pressure on choke control lever.

(3) The top of choke rod hole in control lever should be 1-11/16 ± 1/64 inch above choke assembly (carburetor on engine) or 1-23/32 ± 1/64 inch above carburetor base (Carburetor on bench) (Fig. 18).

(4) Adjust if necessary by bending choke shaft rod at point indicated.

CAUTION: Improper bending will cause binding of rod. Test for free movement between open and closed choke positions and rebend if necessary to eliminate any interferences.

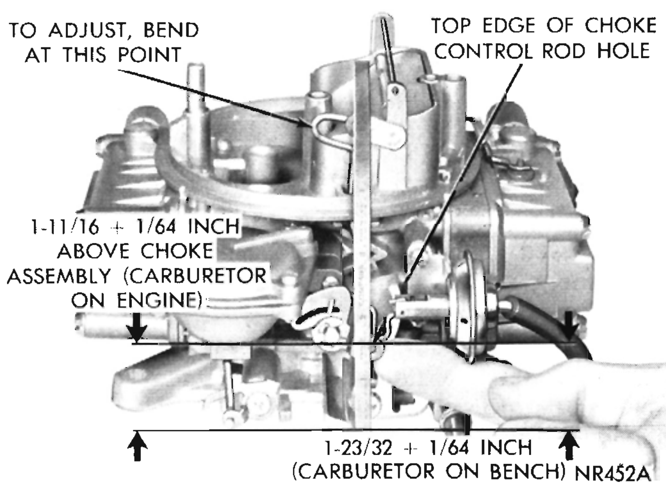


Fig. 18—Qualifying Choke Control Lever

Choke Unloader Adjustment (wide open kick)

The choke unloader is a mechanical device to partially open the choke at wide open throttle. It is used to eliminate choke enrichment during cranking of an engine. Engines which have been flooded or stalled by excessive choke enrichment can be cleared by use of the unloader. Adjust the system as follows:

(1) Qualify the choke control lever, if necessary. (See Qualifying Choke Control Lever Paragraph).

(2) Hold the throttle valves in the wide open position. Insert the specified drill between the upper edge of the choke valve and the inner wall of the air horn (see specifications).

(3) With a finger lightly pressing against the choke control lever, a slight drag should be felt as the drill is being withdrawn. If an adjustment is necessary, bend the indicated tang until correct opening has been obtained (Fig. 19).

Fast Idle Speed Adjustment (On Vehicle)

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 the engine by driving at least 5 miles. Connect a tachometer and set the curb idle speed and mixture, then proceed as follows:

(1) With the engine off and the transmission in the PARK or NEUTRAL position, open the throttle slightly.

(2) Close choke valve until fast idle screw tang can be positioned on the second hightest-speed step of the fast idle cam (Fig. 20).

(3) Start the engine and determine the stabilized

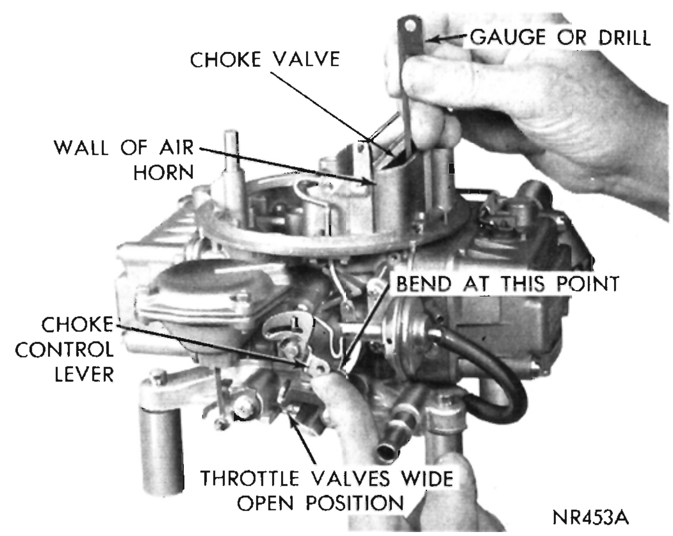


Fig. 19—Choke Unloader Adjustment (Wide Open Kick)

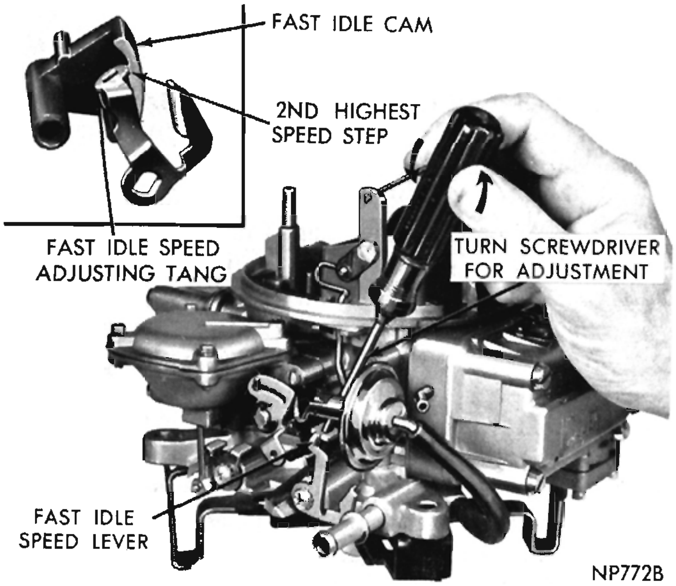


Fig. 20—Fast Idle Speed Adjustment (On Vehicle)

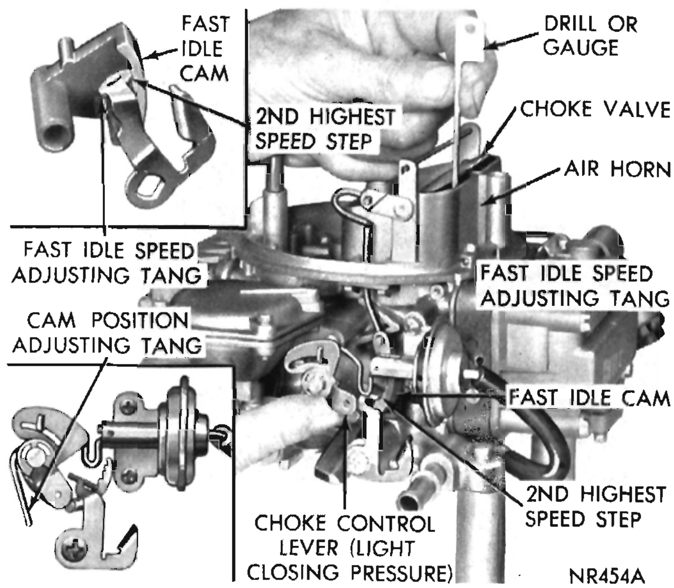


Fig. 21—Fast Idle Cam Position Adjustment

speed. Bend the fast idle tang by use of a screwdriver placed in the tang slot to secure the specified speed.* **CAUTION: Bend only in direction perpendicular to the contact surface of the cam. Movement in any other direction changes the CAM POSITION ADJUSTMENT described earlier.**

(4) Stopping the engine between adjustments is not necessary. However, reposition the fast idle tang on the cam after each speed adjustment to provide correct throttle closing torque.

Fast Idle Cam Position Adjustment

The fast idle engine speed adjustment should be made on the vehicle as described in the Fast Idle Speed Adjustment (on the vehicle) paragraph. However, the Fast Idle Cam Position Adjustment can be made on the bench. This adjustment is important to assure that the speeds of each step of the cam occur at the proper time during engine warm-up.

(1) Qualify the choke control lever, if necessary. (See Qualifying the Choke Control Lever Paragraph).

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

(3) Insert specified drill between the choke valve and wall of air horn (see specifications).

An adjustment will be necessary if a slight drag is not obtained as the drill is being removed.

(4) To adjust, bend the indicated tang (Fig. 21) until the correct choke valve opening has been obtained.

Vacuum Kick Adjustment (ON or OFF Vehicle)

The choke diaphragm adjustment controls the fuel delivery while the engine is running. It positions the choke valve within the air horn by use of linkage between the choke shaft and the diaphragm. The diaphragm must be energized to measure the vacuum kick adjustment. Vacuum can be supplied by a distributor test machine, another vehicle or vehicle to be adjusted.

(1) If the adjustment is to be made with the engine running, position the fast idle tang (Fig. 21) (Cam position adjustment) to allow choke closure to kick position. If auxiliary vacuum source is to be used, open throttle valves, (engine not running) and move choke to closed position. Release throttle first, then release choke.

(2) When using an auxiliary vacuum source, disconnect the vacuum hose from the carburetor and connect it to the hose from the vacuum supply with a small length of tube to act as a fitting. Removal of the hose from the diaphragm may require forces which damage the system. Apply a vacuum of 10 or more inches to hose.

(3) Insert the specified drill (see specifications) between the choke valve and the wall of the air horn. (Fig. 22). Apply sufficient closing pressure on the lever to which the choke rod attaches to provide a minimum choke valve opening without distortion of the diaphragm link. Note that the cylindrical stem of the diaphragm will extend as an internal spring is compressed. This spring must be fully compressed for proper measurement of the vacuum kick adjustment.

(4) An adjustment will be necessary if a slight drag is not obtained as the drill is being removed. Shorten or lengthen the diaphragm link to obtain the correct choke opening. Length changes should be made by carefully opening or closing the bend provided in the

*See specifications.

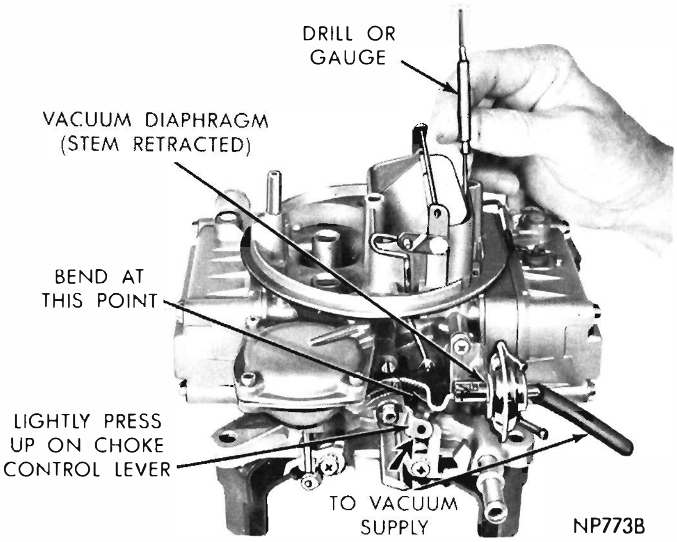


Fig. 22—Vacuum Kick Adjustment

diaphragm link. **CAUTION: DO NOT APPLY TWISTING OR BENDING FORCE TO DIAPHRAGM.**

(5) Reinstall the vacuum hose on the correct carburetor fitting.

(6) Make the following check. With no vacuum applied to the diaphragm, the CHOKE VALVE SHOULD MOVE FREELY between the open and closed positions. If movement is not free, examine the linkage for misalignment or interferences caused by the bending operation. Repeat the adjustment if necessary to provide proper link operation.

Secondary Throttle Adjustment

This adjustment no longer required as valves are pre-adjusted and need no further adjustment.

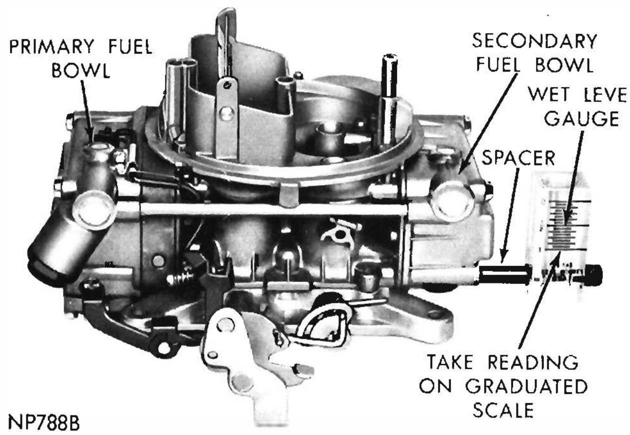


Fig. 23—Checking Wet Fuel Level (on Vehicle)

Idle Speed Adjustment (Curb Idle)

Refer to General Information at front of Group.

Checking Wet Fuel Level (On Vehicle)

Before checking wet fuel level, check the fuel pump pressure to be certain 5 pound reading is obtained.

To check wet fuel level, remove lower bolt furthest from fuel supply (Primary and Secondary) and install C-4051 wet fuel level gauge (Fig. 23).

NOTE: As screw is being removed, fuel will be lost. Start or crank engine and allow fuel bowls to fill. The reading on level gauge should be 9/16 for Primary and 13/16 inch for Secondary, with 5 pounds fuel pump pressure.*

If an adjustment is necessary remove fuel bowl and bend tang on float until correct specifications are obtained.

*Fuel level will vary 1/32 inch for every pound of fuel pump pressure under or over specifications.

Holley 4150 & 4160 Adjustment Specifications

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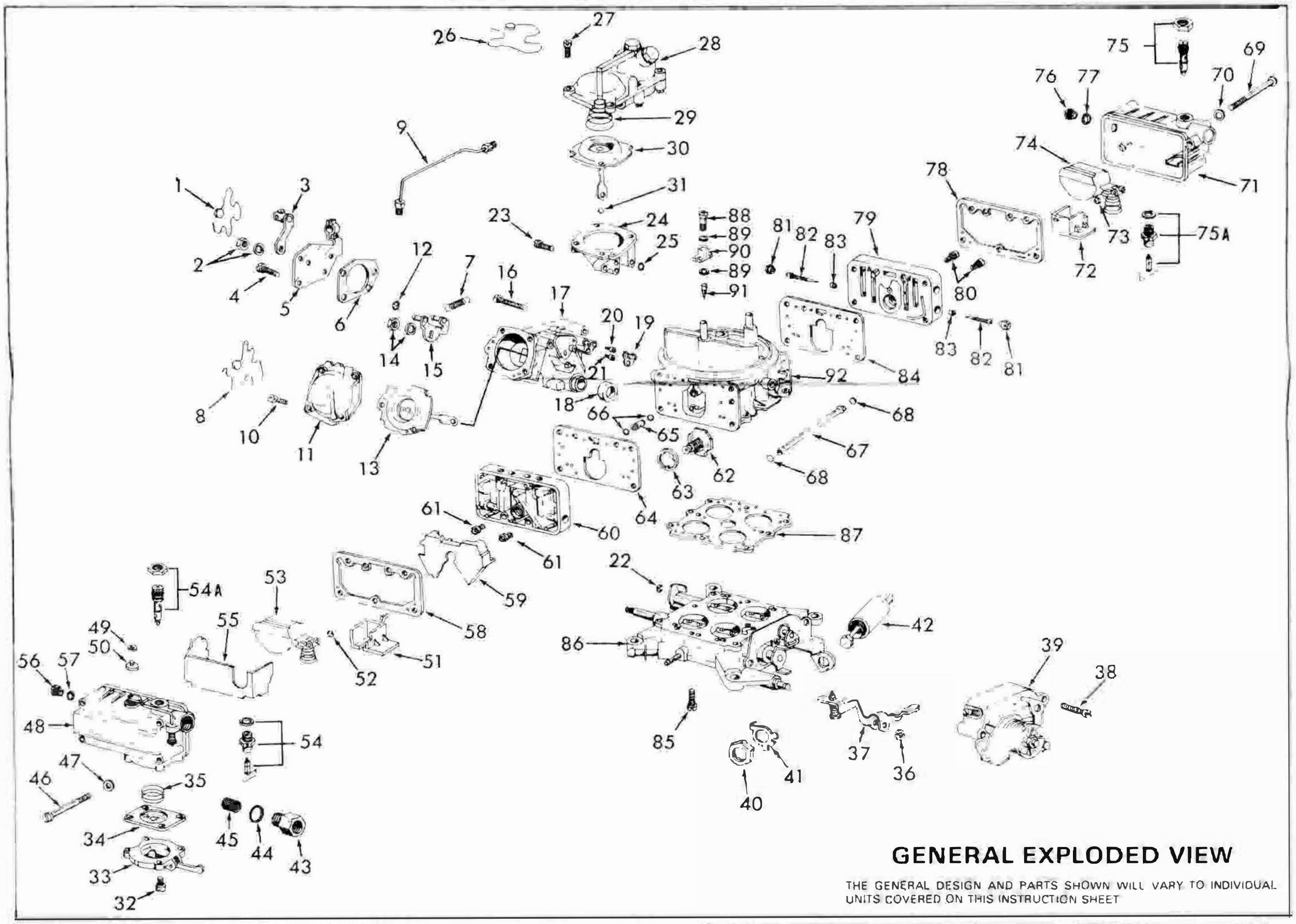


GENERAL EXPLODED VIEW

THE GENERAL DESIGN AND PARTS SHOWN WILL VARY TO INDIVIDUAL UNITS COVERED ON THIS INSTRUCTION SHEET

DISASSEMBLY

USE EXPLODED VIEW AS A GUIDE. THE NUMERICAL SEQUENCE MAY GENERALLY BE FOLLOWED TO DISASSEMBLE UNIT FAR ENOUGH TO PERMIT CLEANING AND INSPECTION. **NOTE:** ON SOME MODELS UNHOOK HEAVY SAFETY SPRING ON THROTTLE LEVER ASSEMBLY (39) FOR EASIER ACCESS TO SCREWS (38) HOLDING ASSEMBLY TO CARBURETOR. RECORD JET SIZES AND THEIR LOCATION FOR REASSEMBLY.

NOMENCLATURE

REF NO		REF NO	
1	SEAL & WIRE— COVER	28	COVER & VALVE ASSY — SEC. DIAPHRAGM
2.	NUT & LOCKWASHER—LEVER	29.	SPRING— SEC. DIAPHRAGM.
3	LEVER— CHOKE	30.	DIAPHRAGM— SECONDARY.
4	SCREW & LOCKWASHER	31.	BALL— SEC. DIAPHRAGM CHECK (SOME MODELS)
5.	COVER—GOVENOR HOUSING	32.	SCREW & LOCKWASHER (4)- COVER
6.	GASKET — GOVENOR HOUSING	33.	COVER ASSY.— PUMP.
7	SPRING— GOVERNOR	34.	DIAPHRAGM— PUMP
8	SEAL & WIRE— DIAPHRAGM COVER.	35.	SPRING— PUMP DIAPHRAGM
9.	PIPE— GOV. TO SEC. DIAPHRAGM COVER	36.	E-CLIP – LEVER.
10.	SCREW & LOCKWASHER (4)— DIAPHRAGM COVER	37.	LEVER ASSY.— PUMP
11.	COVER— GOV. DIAPHRAGM	38.	SCREW & LOCKWASHER (2)— THROTTLE OPERATING SHAFT HOUSING
12.	E-CLIP- DIAPHRAGM STEM RETAINER.	39.	HOUSING ASSY.— THROTTLE OPERATING LEVER.
13.	DIAPHRAGM ASSEMBLY	40.	NUT— SOLENOID
14.	NUT & LOCKWASHER— GOV. LEVER	41.	LOCKTAB WASHER— SOLENOID
15	LEVER— GOV.	42.	SOLENOID— THROTTLE
16.	SCREW & LOCKWASHER (3)— GOV. HOUSING	43.	FITTING— FUEL INLET
17	GOV. HOUSING ASSEMBLY	44.	GASKET— FITTING
18.	SEAL— GOV. HOUSING.	45.	SCREEN— FUEL INLET
19.	GASKET— GOV. HOUSING	46.	SCREW (4)— PRI. FUEL BOWL
20.	JET "A" — GOV. HOUSING.	47.	GASKET (4)— PRI FUEL BOWL SCREW
21.	JET "B" —GOV. HOUSING.	48.	BOWL— PRI. FUEL
22.	E-CLIP- SEC. DIAPH. STEM	49.	RETAINER— VENT VALVE
23.	SCREW & LOCKWASHER (3)— SEC. DIAPH. HOUSING	50.	VALVE— VENT (SOME MODELS)
24.	SECONDARY DIAPHRAGM HOUSING.	51.	BAFFLE PLATE
25.	GASKET— SEC. DIAPH. HOUSING.	52.	E-CLIP - FLOAT
26.	SEAL & WIRE— COVER.		
27.	SCREW & LOCKWASHER (4)- COVER		

REF NO.		REF NO.	
53.	FLOAT & SPRING ASSY.- PRI	73.	E-CLIP- FLOAT
54.	NEEDLE & SEAT ASSY. - PRI	74.	FLOAT & SPRING ASSY.- SEC
54A.	NEEDLE & SEAT ASSY.—PRI. ADJUSTABLE (SOME MODELS)	75.	NEEDLE & SEAT ASSY.- SEC.
55.	BOWL FILLER— PRI.(SOME MODELS)	75A.	NEEDLE & SEAT ASSY.— SEC. ADJUSTABLE (SOME MODELS)
56.	PLUG— FUEL LEVEL (SOME MODELS)	76.	PLUG— FUEL LEVEL (SOME MODELS)
57.	GASKET— PLUG (SOME MODELS)	77.	GASKET— PLUG (SOME MODELS)
58.	GASKET— PRI. FUEL BOWL	78.	GASKET— SEC. FUEL BOWL
59.	METER BODY FILLER— PRI (SOME MODELS)	79.	METERING BLOCK— SEC.
60.	METERING BLOCK— PRI	80.	JET (2)— MAIN
61.	JET (2)— PRI. MAIN	81.	CAP (2)— IDLE LIMITER
62.	VALVE— ENRICHMENT	82.	NEEDLE (2)— IDLE ADJUSTING
63.	GASKET— ENRICHMENT VALVE	83.	GASKET (2)— IDLE ADJ. NEEDLE.
64.	GASKET— PRI. METERING BLOCK	84.	GASKET— SEC. METERING BODY
65.	TUBE— PUMP TRANSFER	85.	SCREW & LOCKWASHER (8)— THROTTLE BODY
66.	O-RING (2)— TRANSFER TUBE	86.	THROTTLE BODY ASSY.
67.	TUBE— FUEL LINE	87.	GASKET— THROTTLE BODY
68.	O-RING (2)— FUEL LINE TUBE	88.	SCREW— PUMP DISCHARGE NOZZLE.
69.	SCREW (4)— SEC. FUEL BOWL	89.	GASKET (2)— PUMP NOZZLE
70.	GASKET (4)— SEC. FUEL BOWL SCREW	90.	NOZZLE— PUMP DISC.
71.	BOWL— SEC. FUEL	91.	NEEDLE— PUMP DISC.
72.	BAFFLE PLATE.	92.	MAIN BODY ASSEMBLY

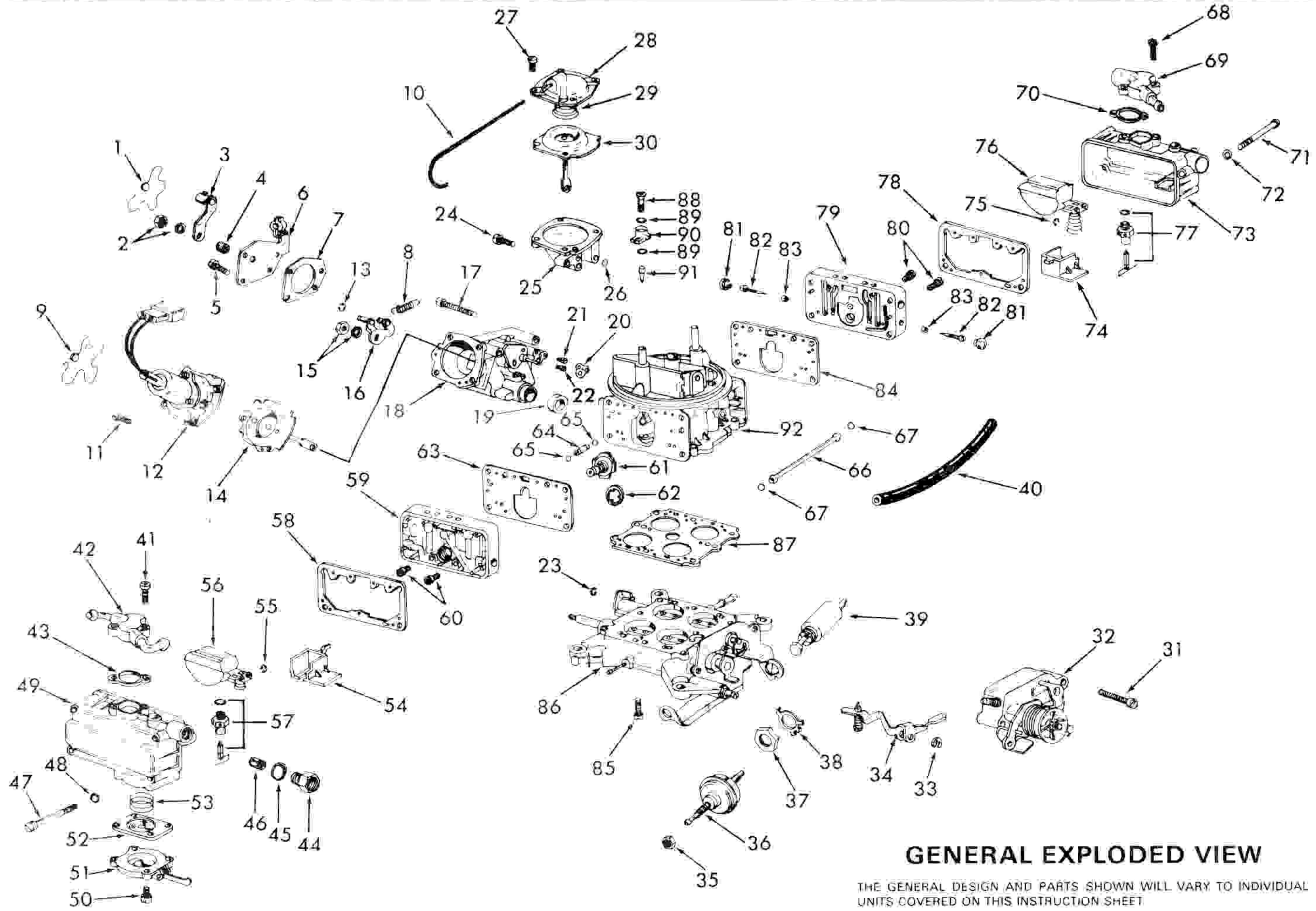
CLEANING

CLEANING MUST BE DONE WITH CARBURETOR DISASSEMBELED. SOAK PARTS LONG ENOUGH TO SOFTEN AND REMOVE ALL FOREIGN MATERIAL. USE A CARBURETOR CLEANING SOLVENT. MAKE SURE THE THROTTLE BORES ARE FREE OF ALL CARBON AND VARNISH DEPOSITS. RINSE OFF IN SUITABLE SOLVENT. BLOW OUT ALL PASSAGES IN CASTINGS WITH COMPRESSED AIR AND CHECK CAREFULLY TO INSURE THOROUGH CLEANING OF OBSCURE AREAS. **CAUTION: DO NOT SOAK FLOATS, SOLENOIDS OR PARTS CONTAINING RUBBER MATERIAL IN CLEANING SOLVENTS.**

REASSEMBLE

REASSEMBLE IN REVERSE ORDER OF DISASSEMBLY. NOTE SPECIAL INSTRUCTIONS AND FOLLOW NUMERICAL OUTLINE IN MAKING ADJUSTMENTS NECESSARY FOR CARBURETOR BEING SERVICE.

INSTRUCTION SHEET
HOLLEY CARBURETOR MODEL 4150 EG
GM PRODUCTS



GENERAL EXPLODED VIEW

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NOMENCLATURE

REF NO	
1	SEAL & WIRE—COVER (WHEN USED)
2	NUT & LOCKWASHER—LEVER
3	LEVER—CHOKE
4	SEAL DUST
5	SCREW & LOCKWASHER (4)-COVER
6	COVER—GOVERNOR HOUSING
7	GASKET - GOVERNOR COVER
8	SPRING—GOVERNOR
9	SEAL & WIRE—DIAPHRAGM COVER (WHEN USED)
10	HOSE—GOV TO SEC DIAPHRAGM COVER
11	SCREW & LOCKWASHER (4)—DIAPHRAGM & SOLENOID COVER
12	COVER ASSY —DIAPHRAGM & SOLENOID
13	E CLIP DIAPHRAGM STEM RETAINER
14	DIAPHRAGM ASSEMBLY
15	NUT & LOCKWASHER—GOV LEVER
16	LEVER—GOVERNOR
17	SCREW & LOCKWASHER (3)—GOVERNOR HOUSING
18	GOV HOUSING ASSEMBLY
19	SEAL—GOV HOUSING
20	GASKET—GOV HOUSING
21	JET "A" —GOV HOUSING
22	JET "B"—GOV HOUSING
23	E CLIP-SEC DIAPH STEM
24	SCREW & LOCKWASHER (3)—SEC DIAPH HOUSING
25	SECONDARY DIAPHRAGM HOUSING
26	GASKET —SEC DIAPH HOUSING
27	SCREW & LOCKWASHER (4)-COVER

REF NO	
28	COVER—SEC DIAPHRAGM
29	SPRING—SEC DIAPHRAGM
30	DIAPHRAGM—SECONDARY
31	SCREW & LOCKWASHER (2)—THROTTLE OPERATING SHAFT HOUSING
32	HOUSING ASSY - THROTTLE OPERATING LEVER
33	E CLIP-LEVER
34	LEVER ASSY —PUMP
35	NUT —MODULATOR
36	MODULATOR—THROTTLE
37	NUT—SOLENOID
38	LOCKTAB WASHER—SOLENOID
39	SOLENOID—THROTTLE
40	HOSE—VENT CROSS OVER
41	SCREW & LOCKWASHER (2)—PRI VENT COVER
42	VENT COVER—PRIMARY
43	GASKET - VENT COVER
44	FITTING—FUEL INLET
45	GASKET—FITTING
46	SCREEN—FUEL INLET
47	SCREW (4)—PRI FUEL BOWL
48	GASKET (4) - PRI FUEL BOWL SCREW
49	BOWL—PRI FUEL
50	SCREW & LOCKWASHER (4)-COVER
51	COVER ASSY—PUMP DIAPHRAGM
52	DIAPHRAGM ASSY —PUMP
53	SPRING—DIAPHRAGM
54	BAFFLE PLATE
55	E CLIP-FLOAT
56	FLOAT & SPRING ASSY —PRI
57	NEEDLE & SEAT ASSY —PRI

NOMENCLATURE

REF NO	
58	GASKET—PRI FUEL BOWL
59	METERING BLOCK—PRI
60	JET (2)—PRI MAIN
~~61~~	~~VALVE—ENRICHMENT~~
62	GASKET—ENRICHMENT VALVE
63	GASKET PRI METERING BLOCK
64	TUBE—PUMP TRANSFER
65	O RING (2)—TRANSFER TUBE
66	TUBE—FUEL LINE
67	O-RING (2)—FUEL LINE TUBE
68	SCREW & LOCKWASHER (2)—SEC VENT COVER
69	VENT COVER—SECONDARY
70	GASKET—VENT COVER
71	SCREW (4)—SEC FUEL BOWL
72	GASKET (4)—SEC FUEL BOWL SCREW
73	BOWL—SEC FUEL
74	BAFFLE PLATE
75	E-CLIP-FLOAT

REF NO	
76	FLOAT & SPRING ASSY.—SEC.
77	NEEDLE & SEAT ASSY —SEC
78	GASKET—SEC FUEL BOWL
~~79~~	~~METERING BLOCK—SEC~~
80	JET (2)—SEC MAIN
81	CAP (2)—IDLE LIMITER
82	NEEDLE (2)—IDLE ADJUSTING
83	GASKET (2)—IDLE ADJUSTING NEEDLE
84	GASKET—SEC METERING BODY
85	SCREW & LOCKWASHER (8)—THROTTLE BODY
86	THROTTLE BODY ASSY
87	GASKET—THROTTLE BODY
88	SCREW—PUMP DISC NOZZLE
89	GASKET (2)—PUMP NOZZLE
90	NOZZLE—PUMP DISC.
91	NEEDLE—PUMP DISC.
92	MAIN BODY ASSEMBLY

CLEANING

CLEANING MUST BE DONE WITH CARBURETOR DISASSEMBELED SOAK PARTS LONG ENOUGH TO SOFTEN AND REMOVE ALL FOREIGN MATERIAL USE A CARBURETOR CLEANING SOLVENT MAKE SURE THROTTLE BORES ARE FREE OF ALL CARBON AND VARNISH DEPOSITS RINSE OFF IN SUITABLE SOLVENT BLOW OUT ALL PASSAGES IN CASTINGS WITH COMPRESSED AIR AND CHECK CAREFULLY TO INSURE THOROUGH CLEANING OF OBSCURE AREAS **CAUTION: DO NOT SOAK FLOATS: SOLENOIDS, OR PARTS CONTAINING RUBBER MATERIAL IN CLEANING SOLVENT.**

REASSEMBLE

REASSEMBLE IN REVERSE ORDER OF DISASSEMBLY NOTE SPECIAL INSTRUTIONS AND FOLLOW NUMERICAL OUTLINE IN MAKING ADJUSTMENTS NECESSARY FOR CARBURETOR BEING SERVICED

ADJUSTMENTS

SPECIAL INSTRUCTIONS

SCREWS LISTED BELOW MUST BE TIGHTENED IN THREE STAGES CROSSWISE TO ARRIVE AT THE CORRECT TORQUE

THROTTLE BODY GASKET (87) MAKE SURE HOLES ARE PROPERLY MATCHED TO THROTTLE BODY. TORQUE BODY SCREWS TO 60 INCH POUNDS

IDLE ADJUSTING NEEDLES (82) TURN IN UNTIL LIGHTLY SEATED, THEN BACK OUT ONE TURN (DO NOT INSTALL IDLE LIMITER CAPS AT THIS TIME.)

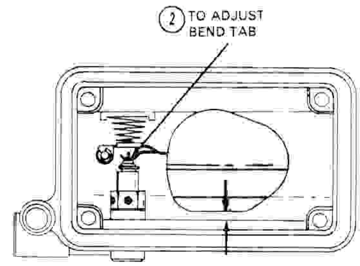
PRIMARY & SECONDARY FUEL BOWL (48)-(71) OR (49)-(73) BEFORE INSTALLING MAKE DRY FLOAT LEVEL ADJUSTMENT

BOWL SCREW INSTALLATION (46)-(69) OR (47)-(71)-INSTALL GASKETS (47)-(70) OR (48)-(72) ON SCREWS BEFORE INSTALLING, THEN TORQUE EVENLY IN STAGES TO 40 INCH POUNDS

FUEL LINE TUBE (67) OR (66) INSTALL O-RINGS (68) OR (67) ON THE EXTREME ENDS OF THE TUBE. THEY WILL ROLL ON THE TUBE WHEN INSTALLING THE FUEL BOWL

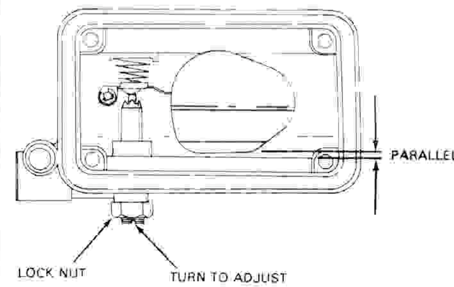
ENRICHMENT VALVE (61)-(62) INSTALLATION. TORQUE TO 100 INCH POUNDS

GOVERNOR DIAPHRAGM (13) OR (14) - INSTALLATION SEE FIGURE 7

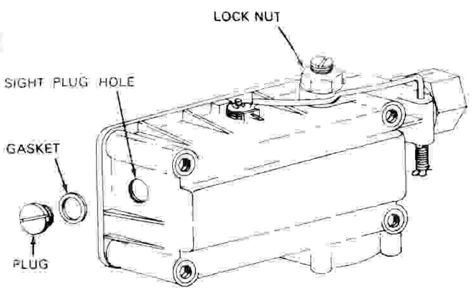


PRIMARY & SECONDARY FLOAT LEVEL INTERNAL NEEDLE & SEAT — FIG 1

FLOAT BOWL INVERTED, TURN NEEDLE SEAT ASSEMBLY UNTIL FLOAT SURFACE IS PARALLEL WITH THE SURFACE DIRECTLY BELOW THE FLOAT. TIGHTEN LOCK NUT

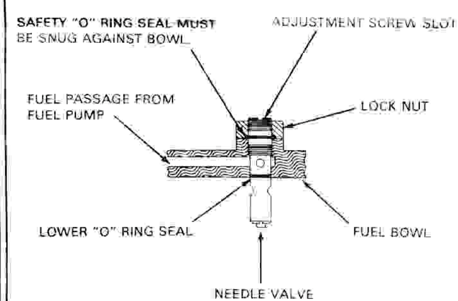


PRIMARY & SECONDARY DRY FLOAT LEVEL ADJUSTABLE NEEDLE & SEAT — FIG 2



1. VEHICLE SITTING ON LEVEL SURFACE AND ENGINE RUNNING
2. REMOVE SIGHT LEVEL PLUG FROM HOLE
3. ADJUST NEEDLE SEAT ASSEMBLY SO FUEL WILL BE AT BOTTOM EDGE OF SIGHT PLUG HOLE (1/32" TOLERANCE.)
4. TIGHTEN LOCK NUT

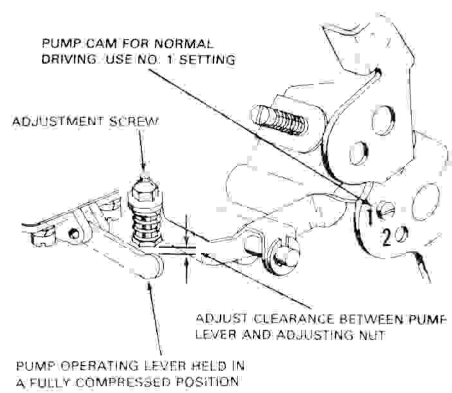
WET FLOAT LEVEL ADJUSTABLE NEEDLE & SEAT — FIG 3



THE EXCLUSIVE SEALING FEATURE OF THIS ASSEMBLY PROVIDE SAFE ADJUSTMENT OF FUEL LEVEL WHILE ENGINE IS RUNNING

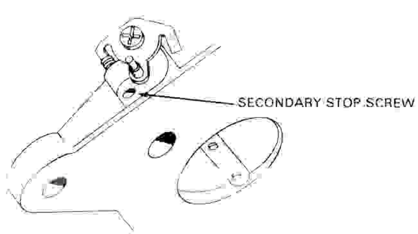
SAFETY SEAL ADJUSTABLE FUEL VALVE — FIG 4

HOLD THROTTLE IN WIDE OPEN POSITION



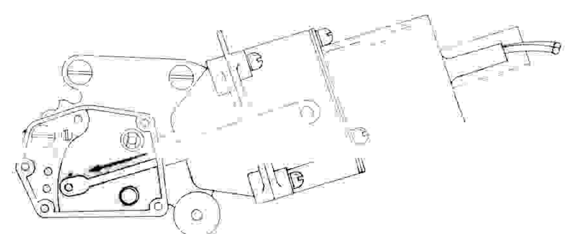
PUMP ADJUSTMENT — FIG 5

SECONDARY THROTTLE STOP SCREW, BACK OUT UNTIL SECONDARY PLATES ARE CLOSED. TURN SCREW IN UNTIL IT CONTACTS STOP. THEN TURN SCREW IN 1/2 TURN MORE



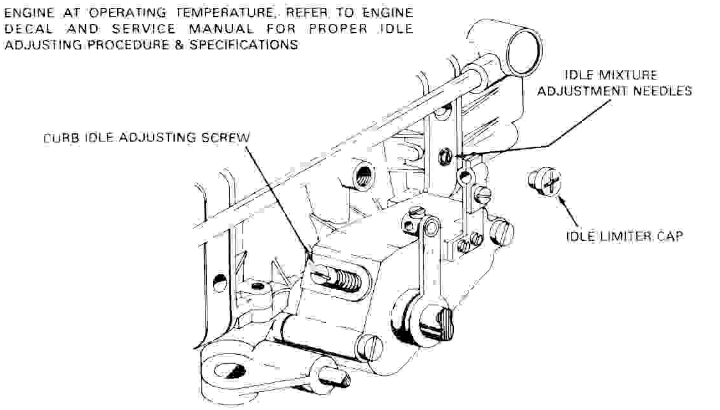
SECONDARY THROTTLE STOP ADJUSTMENT — FIG 6

INSTALL COVER WITH THE SCREWS FINGER TIGHT. PULL THE DIAPHRAGM ROD AS FAR AS IT WILL GO AND THEN TIGHTEN SCREWS EVENLY WHILE MAINTAINING DIAPHRAGM STRETCHED IN THIS POSITION.

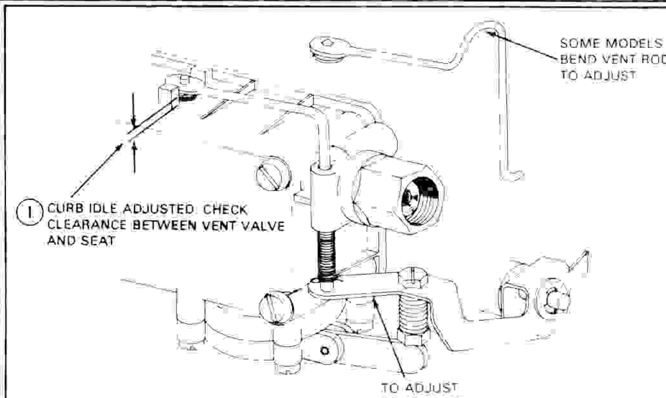


GOVERNOR DIAPHRAGM INSTALLATION — FIG 7

ENGINE AT OPERATING TEMPERATURE, REFER TO ENGINE DECAL AND SERVICE MANUAL FOR PROPER IDLE ADJUSTING PROCEDURE & SPECIFICATIONS



SLOW IDLE ADJUSTMENT — FIG 8



(ON TRUCK) VENT VALVE ADJUSTMENT — FIG 9

ADJUSTMENT DATA TABLE

YEAR	APPLICATION	PRIMARY FLOAT LEVEL	SECONDARY FLOAT LEVEL	PUMP CAM POSITION	VENT VALVE AT ENG. IDLE	GOVERNOR SPRING POST
1975	G.M. PRODUCTS 366", 427" ENG.	3/16"	5/32"	No. 1	.045-.075	2
	Carb. No. R6928A, R6929A	3/16"	5/32"	No. 1	.045-.075	3
1976-77	G.M. PRODUCTS 366", 427" ENG.	3/16"	7/32"	No. 1	.045-.075	2
	CALIF. 427" ENG.	3/16"	7/32"	No. 2	---	2
1978-85	CHEV. & GMC TRUCK 366", 427" ENG. Carb. No. R7923A, R7924A, R7925A, R7926A, R7927A, R7928A	*	*	No. 1	.045-.075	No. 4
1979	CHEVROLET & GMC TRUCK 366", 427" ENG. Carb. No. R8278A, R8279A, R8280A, R8281A, R8282A, R8283A	3/16"	7/32"	No. 1	.045-.075	---
1979	GMC TRUCK 454" ENG. Carb. No. R8443A, R8444A	3/16"	7/32"	No. 1	.045-.075	---
1980-85	GMC TRUCK 366" ENG. Carb. No. R8848A, R8849A, R8850A, R8851A	*	*	---	---	---
	427" ENG. Carb. No. R8852A, R8853A, R8854A, R8855A, R8894A	*	*	---	---	---
	454" ENG. R8856A, R8857A	*	*	---	---	---
1982-85	CHEVROLET & GMC TRUCK 366", 427" ENG. R-9714A, R-9715A, R-9716A, R-9717A	3/16"	7/32"	No. 1	---	No.4
1969-80	IHC TRUCK 392" ENG.					
	Carb. No. R4323A,-1A,-2A,-3A,-4A	*	*	2	---	2
	Carb. No. R4323-5A, 6A	*	*	2	---	1
	Carb. No. R4324A, -1A,-2A,-3A,-4A,-5A	*	*	2	---	2
	Carb. No. R4324-6A,-7A	*	*	2	---	1
	Carb. No. R6803A,1A,2A,3A	*	*	2	---	1
	Carb. No. R7028A, R7579A	*	*	2	---	3
	Carb. No. R8105A, R8737A	*	*	---	---	---
	Carb. No. R8233A,1A, R8243A, R9021A	*	*	2	---	2
	404" ENG.					
	Carb. No. R7215A	*	*	2	---	3
	Carb. No. R8246A, 8922A	*	*	2	---	2
	446" ENG.					
	Carb. No. R7251A	*	*	2	---	3
	Carb. No. R7997A, R8247A	*	*	2	---	2
	Carb. No. R8740A, R8923A	*	*	---	---	---
	537" ENG.					
	Carb. No. R-6974A	*	*	2	---	3
	Carb. No. R8139A, R8924A	*	*	2	---	3

* ADJUST FLOAT SO IT IS PARALLEL WITH SURFACE OF BOWL.

REV. 10/85