FUEL SYSTEM

CONTENTS

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 original designed performance.

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

(1) All parts (except the choke diaphragm assembly) should be carefully cleaned in a suitable solvent, then inspected for damage or wear.

(2) Use air pressure only, to clean 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 case, NEW parts be installed.

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

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.

AUTOMATIC CHOKE (Well Type)

To function properly, it is important that all parts be clean and move freely. Other than an occasional cleaning, the automatic choke control requires no servicing. However, it is very important that the choke control unit works freely at the thermostatic coil spring housing and at the choke shaft. Move the choke rod up and down to check for free movement of the coil housing on the pivot. If the unit binds, a new unit should be installed. **The well type choke is serviced as an assembly. Do not attempt to repair or change the setting, unless authorized by service literature. Changes of the choke setting materially affect summer temperature cold starting and seldom are a satisfactory correction of driveability problems, which are generally associated with carburetors or vacuum diaphragms.**

When installing the well type choke unit, make certain that the coil housing does not contact the sides or bottom of the well. Any contact at this point will affect choke operation.

Do not lubricate any of the choke parts or the control unit, since this causes dirt to accumulate, which would result in a binding condition of the choke mechanism.

The choke control unit is accurately adjusted when originally assembled. Under normal service operation, it is recommended **not** to change the setting, or to disassemble the components for servicing. If however, the setting has been disturbed, reset as follows:

Loosen locknut "A" and turn part with screwdriver until index mark on disk "B" coincides with the correct mark on the bracket. Hold in this position with screwdriver while tightening nut.

PART 1

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
POOR IDLING	(a) Idle air bleed carbonized or of incorrect size.	(a) Disassemble the carburetor. Then, use compressed air to clear idle bleed after soaking it in a suitable solvent.
	(b) Idle discharged holes plugged or gummed.	(b) Disassemble the carburetor. Then, use compressed air to clear idle discharge holes after soaking the main and throttle bodies in a suitable solvent.
	(c) Throttle body carbonized or worn throttle shaft.	(c) Disassemble the carburetor. Check the throttle valve shaft for wear. If excessive wear is apparent, replace the throttle body assembly.
	(d) Damaged or worn idle mixture needle.	(d) Replace the worn or damaged idle needle. Adjust the air mixture.
	(e) Low grade fuel or incorrect float level.	(e) Test the fuel level in the carburetor. Adjust as necessary to obtain the correct float level.
	(f) Loose main body to throttle body screws.	(f) Tighten the main body to throttle body screws securely to prevent air leaks and cracked housings.
	(g) Worn or corroded needle valve and seat.	(g) Clean and inspect the needle valve and seat. If found to be in questionable condition, replace assembly. Then, test fuel pump pressure. Refer to Specifications for correct fuel pump pressure.
	(h) Incorrect timing.	(h) Reset timing.
POOR ACCELERATION	(a) Accelerator pump piston (or plunger) leather too hard, worn, or loose on stem.	(a) Disassemble the carburetor. Replace accelerator pump assembly if leather is hard, cracked or worn. Test follow-up spring for compression.
	(b) Faulty accelerator pump discharge ball.	(b) Disassemble the carburetor. Use compressed air to clean the discharge nozzle and channels after soaking the main body in a suitable solvent. Test the fuel pump capacity.
	(c) Faulty accelerator pump inlet check ball.	(c) Disassemble the carburetor. Check the accelerator pump inlet check ball for poor seat or release. If part is faulty, replace.
	(d) Incorrect fuel or float level.	(d) Test the fuel or float level in the carburetor. Adjust as necessary to obtain the correct float level.
	(e) Worn accelerator pump and throttle linkage.	(e) Disassemble the carburetor. Replace the worn accelerator pump and throttle linkage and measure for the correct position.
	(f) Manifold heat valve sticking.	(f) Free up manifold heat control valve; using recommended solvent.
	(g) No power mixture.	(g) Test power piston operation.
	(h) Incorrect timing.	(h) Reset timing.
CARBURETOR FLOODS OR LEAKS	(a) Cracked body.	(a) Disassemble the carburetor. Replace the cracked body. Make sure main to throttle body screws are tight.

Condition	Possible Cause	Correction
	(b) Faulty body gaskets.	(b) Disassemble the carburetor. Replace the defective gaskets and test for leakage. Be sure the screws are tightened securely.
	(c) High float level.	(c) Test the fuel level in the carburetor. Make the necessary adjustment to obtain correct float level.
	(d) Worn needle valve and seat.	(d) Clean and inspect the needle valve and seat. If found to be in a questionable condition, replace the complete assembly and test the fuel pump pressure. Refer to Specifications for correct fuel pump pressure.
	(e) Excessive fuel pump pressure.	(e) Test the fuel pump pressure. If the pressure is in excess of recommended pressure (refer to Specifications), replace fuel pump.
POOR PERFORMANCE MIXTURE TOO RICH	(a) Restricted air cleaner.	(a) Remove and clean the air cleaner.
	(b) Leaking float.	(b) Disassemble the carburetor. Replace leaking float. Test the float level and correct as necessary, to the proper level.
	(c) High float level.	(c) Adjust the float level as necessary to secure the proper level.
	(d) Excessive fuel pump pressure.	(d) Test the fuel pump pressure. Refer to specifications for recommended pressure. If pressure is in excess of recommended pressure, replace the fuel pump assembly.
	(e) Worn metering jet.	(e) Disassemble the carburetor. Replace the worn metering jet, using a new jet of the correct size and type.
POOR COLD ENGINE STARTING INCORRECT PROCEDURE	(a) Throttle must be opened to free choke system. Best position for all temperatures and all conditions is ⅓ open.	(a) Instruct owner.
CHOKE VALVE FAILS TO CLOSE	(a) Choke thermostat adjustment leaner than specified.	(a) Adjust.
	(b) Choke thermostat corroded such that it has cracked and distorted lean.	(b) Replace assembly.
	(c) Choke linkage, shaft or related parts corroded, bent or dirty such that the system is not entirely free to move from the open to the closed position.	(c) Repair, clean or replace.
	(d) Choke valve improperly seated.	(d) Reseat valve.
	(e) Air cleaner interferes with choke shaft or linkage.	(e) Rotate cleaner to correct position, instruct owner.
	(f) Air cleaner gasket interferes with choke valve or linkage.	(f) Reinstall gasket properly.
	(g) Spring staging spring distorted or missing.	(g) Replace or install new spring.
LOW ENGINE OUTPUT (10°F or lower)	(a) Engine lubricating oil of incorrect viscosity.	(a) Recommend 5W-20.
	(b) Valve lash incorrect.	(b) Readjust.
	(c) Choke thermostat adjustment incorrect, rich.	(c) Adjust to correct setting.
ENGINE RUNS LEAN, FIRST HALF MILE		
CHOKE LEAN	(a) Review items under (Poor Starting).	(a) See "Choke Valve Fails to Close."
	(b) Diaphragm adjustment lean.	(b) Readjust to specification.

Condition	Possible Cause	Correction
ENGINE RUNS LEAN AFTER HALF MILE		
ENGINE HEAT INSUFFICIENT	(a) Heat valve stuck open.	(a) Free with solvent.
	(b) Heat valve thermostat distorted.	(b) Replace thermostat.
	(c) Heat valve failed within exhaust. See engine section for proper diagnosis.	(c) Replace heat valve.
	(d) Water temperature subnormal.	(d) Check thermostat.
CARBURETOR MIXTURES LEAN	(a) Air leak bypassing the carburetor.	(a) Repair.
	(b) Carburetor has economy metering system.	(b) Inform customer.
ENGINE RUNS EXCESSIVELY RICH AFTER COLD START		
CHOKE SYSTEM RICH	(a) Choke thermostat adjustment richer than specified.	(a) Correct.
	(b) Choke thermostat distorted rich by overheating.	(b) Replace, since this problem can be corrected by use of proper choke assembly.
	(c) Choke vacuum diaphragm inoperative or misadjusted.	(c) Correct or replace.
	(d) Choke vacuum passage blocked or leaking.	(d) Correct.
CARBURETOR RICH	(a) Incorrect gasket or gasket installation between carburetor and intake manifold.	(a) Replace or correct.
EXCESSIVE STALLS AFTER COLD START		
CHOKE SYSTEM LEAN	(a) Review items under "Poor Starting-Choke Valve Fails to Close."	
	(b) Choke vacuum diaphragm adjustment lean.	(b) Adjust to Specification.
ENGINE OUTPUT LOW	(a) Fast Idle speed low.	(a) Adjust to Specification.
	(b) Fast idle cam position adjustment incorrect.	(b) Adjust to Specification.
	(c) Engine lubrication oil of incorrect viscosity.	(c) Recommend 5W-20.
	(d) Incorrect timing.	(d) Reset timing.
CARBURETOR LEAN	(a) Curb idle set very lean.	(a) Adjust.
	(b) Air leak bypassing the carburetor.	(b) Repair.

PART 2

WWC3 SERIES STROMBERG

CARBURETOR

Description

The WWC3 Series Stromberg carburetor is a dual throat downdraft type, with each throat having its own idle system, main metering system and throttle valve. The idle and main metering systems are supplemented by the float system, the accelerating system and the power system.

The WWC3 Series carburetor incorporates an idle system vent, operated from the throttle linkage, a double venturi cluster which in addition to the small venturi also includes the discharge nozzles, the main discharge tubes and the idle in a single assembly.

SERVICE PROCEDURES

DISASSEMBLY

To disassemble the carburetor for cleaning or overhaul, refer to (Figs. 1 and 2), then proceed as follows:

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

(2) Remove the hairpin clip that holds the pump rod in the center of the pump arm. Remove rod from slot and disengage from the throttle lever.

(3) Remove the hairpin clip that holds the fast idle rod in the fast idle cam. Disengage the rod from cam, then rotate the rod to disengage from choke lever.

(4) Remove the three short air horn attaching screws, then remove the two long air horn attaching screws. Install the two short screws through the main body into the throttle body to hold the bodies together. (Refer to Fig. 3.)

(5) Remove the vacuum hose between the carburetor air horn and the vacuum diaphragm.

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

(7) Remove the remaining air horn attaching screws, then lift the air horn straight up and away from main body, as shown in (Fig. 3).

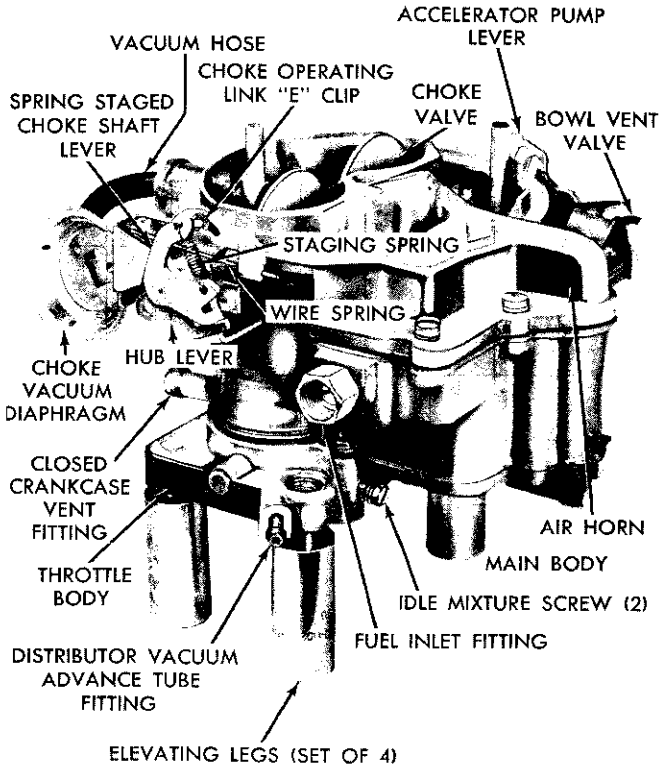


Fig. 1—Carburetor Assembly WWC3-254 or WWC3-255 (Right Side)

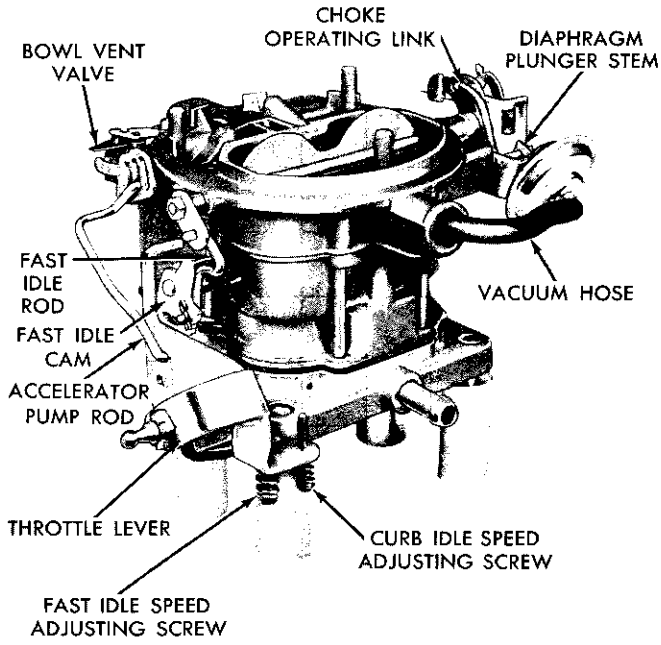


Fig. 2—Carburetor Assembly WWC-3-254 or WWC-3-255 (Left Side)

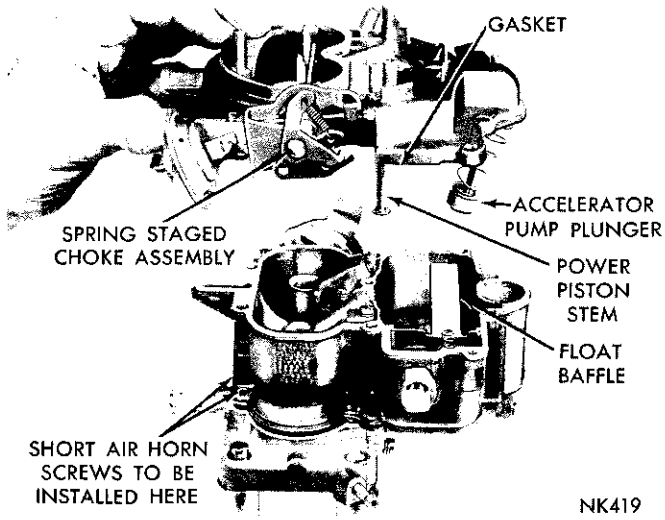


Fig. 3—Removing or Installing the Air Horn

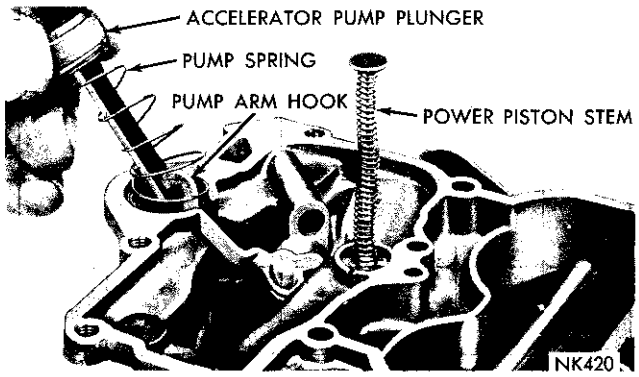


Fig. 4—Removing or Installing the Accelerator Pump Plunger

Disassembling the Air Horn

(1) Disengage the accelerator pump plunger from the pump arm hook by tilting down and out from under hook, as shown in (Fig. 4). Remove the compression spring.

Place the accelerator pump plunger in a jar of clean gasoline or kerosene to prevent the leather from drying out.

(2) Remove the vacuum power piston from the air horn, using an open end wrench and wood block, as shown in (Fig. 5). (Exert sufficient pressure on end of wrench to force piston out of its well in air horn. This assembly is staked in the air horn and care should be used at removal.) Discard the air horn gasket.

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

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

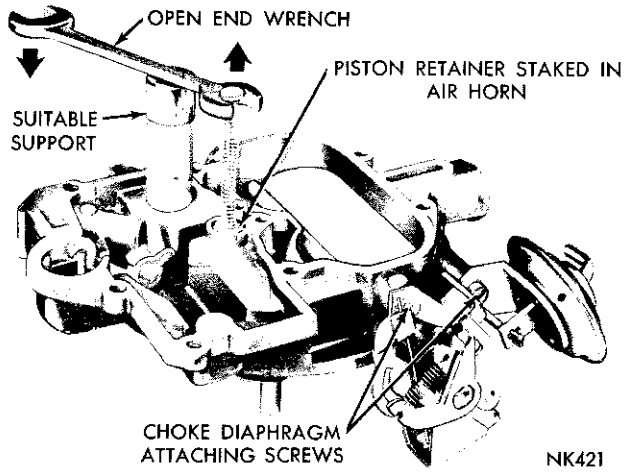


Fig. 5—Removing the Vacuum Power Piston

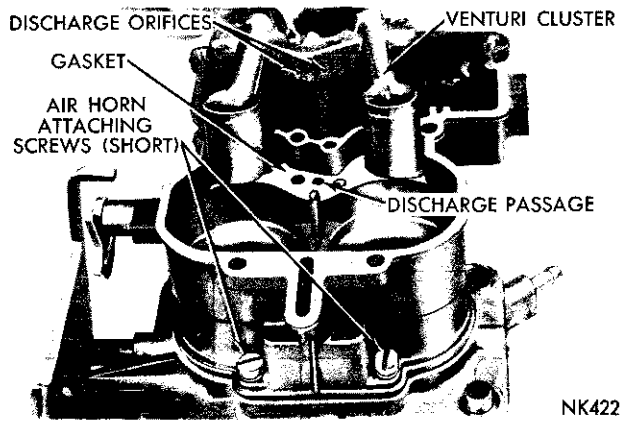


Fig. 6—Removing or Installing the Venturi Cluster

Main Body

(1) Remove the float fulcrum pin spring, then remove the fuel inlet needle valve, seat and gasket.

(2) Slide the float baffle up out of its grooves, then remove the float and fulcrum pin.

(3) Remove the venturi cluster attaching screws, then remove the venturi cluster gasket, as shown in (Fig. 6). Discard the gasket.

(4) Invert the carburetor main body and drop out the discharge check ball from the discharge passage, refer to (Fig. 6), and the accelerator pump inlet check ball from the pump well.

(5) Using T109-73S, remove the power by-pass jet and gasket, as shown in (Fig. 7).

(6) Using Tool T109-173, remove the two main metering jets, as shown in (Figs. 7 or 8).

(7) Remove the two air horn screws, used to hold the main and throttle bodies together. Separate the throttle and main bodies, and discard the gasket.

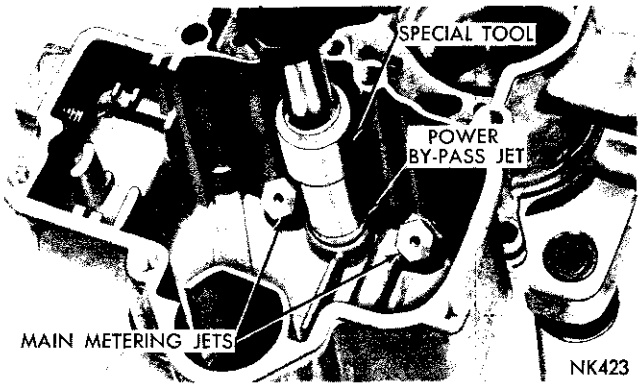


Fig. 7—Removing or Installing the Power By-Pass Jet

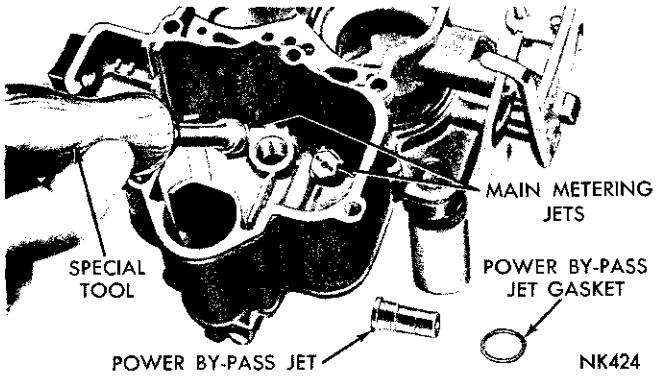


Fig. 8—Removing or Installing the Main Metering Jets

Throttle Body

(1) Unscrew and remove the two idle mixture adjusting screws and springs from the throttle body.

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

It is usually not advisable to remove the throttle shaft or valves unless wear or damage necessitates installation of new parts. To install new valves or throttle shaft, refer to Inspection and Reassembly paragraph. Normal throttle shaft clearance is .005 inch. If wear is over .010 inch, install new shaft.

INSPECTION AND ASSEMBLY

Throttle Body

(1) Check the throttle shaft for excessive wear in the throttle body. If wear is extreme, it is recommended that the throttle body be replaced, rather than installing a new throttle shaft in the old body.

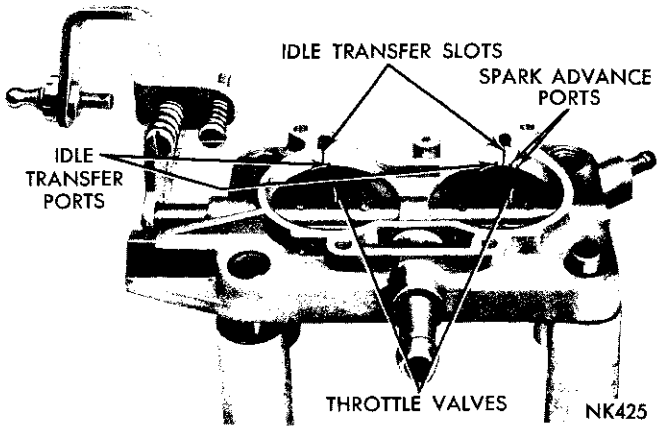


Fig. 9—Ports in Relation to Throttle Valves

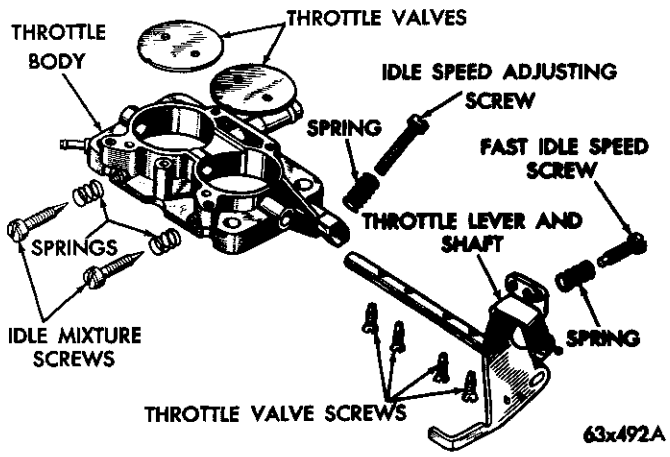


Fig. 10—Throttle Body (Exploded View)

During manufacture, the location of the idle transfer ports and the spark advance control ports to the valves are carefully established for one particular assembly. See (Fig. 9).

If a new shaft should be installed in an old worn throttle body, it would be very unlikely that the original relationship of these ports to the valves would be obtained. Changing the port relationship would adversely affect normal car operation between the speeds of 15 and 30 miles per hour. However, if it has been determined that a new shaft or valves are to be installed, adhere closely to the following instructions:

To install a new throttle shaft or valves, refer to (Fig. 10), then proceed as follows:

(2) Mark the valves to be sure each is replaced in the same bore from whence removed (if replacing throttle shaft only).

(3) Remove the screws that hold the throttle valves to the shaft. Slide the valves out of shaft and bore.

CAUTION: These screws are staked on the opposite side and care should be used at removal so as not to break the screws in the shaft.

Remove the staking with a file.

(4) Slide the throttle shaft and lever out of the throttle body.

(5) Install the new throttle shaft and lever in the throttle body. **The idle speed adjusting screw must be backed off when seating the valves in the following operation.**

(6) Slide the valves down into position. Install new screws but do not tighten. Hold the valves in place with the fingers pressing on the high side of valves.

(7) Tap the valve lightly with a screwdriver to seat in the throttle bores. Holding the valves in this position, tighten the screws securely and stake by squeezing with pliers.

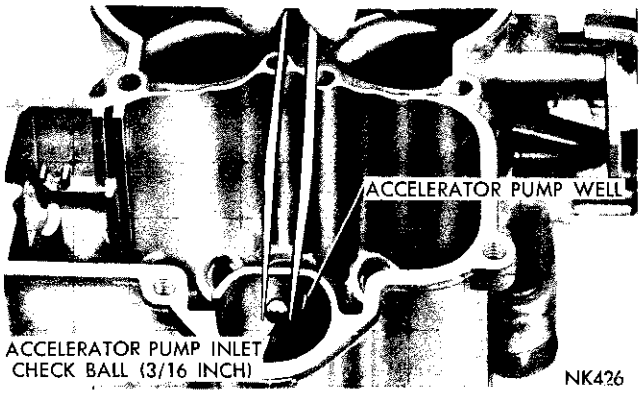


Fig. 12—Installing Accelerator Pump Inlet Check Ball

(8) Install the two idle mixture adjusting screws and springs in the throttle body. (The tapered portion must be straight and smooth.) If the tapered portion is grooved or ridged, a new idle mixture adjusting screw should be installed to insure having correct idle mixture control.

Idle Mixer Screw Adjustment

Turn the screws **lightly** against their seats, then back off one and a half turns for an approximate setting.

Main Body

To assemble the main body, refer to (Fig. 11), then proceed as follows:

(1) Place a new gasket on the throttle body, then install main body. Install two short screws to secure.

(2) Install the main metering jets in the main body. Tighten securely, using Tool T-109-173. Refer to (Fig. 8).

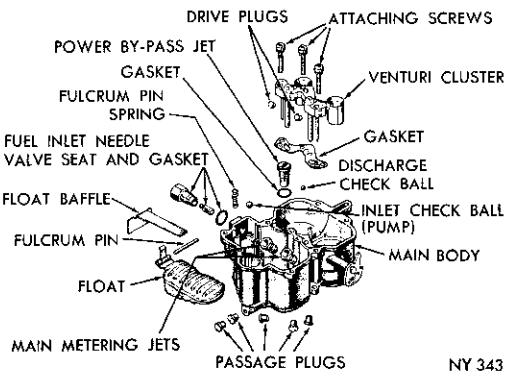


Fig. 11—Main Body (Disassembled View)

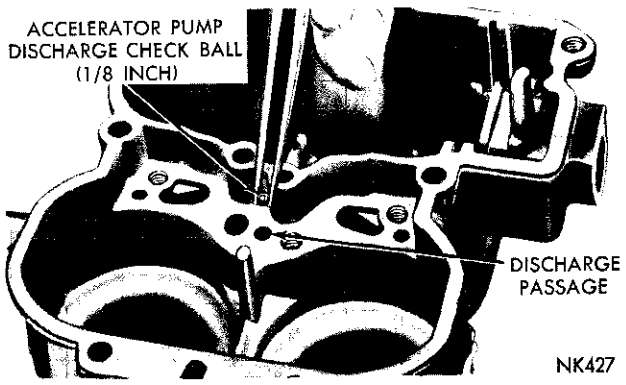


Fig. 13—Installing the Discharge Check Ball

(3) Install the power by-pass jet and new gasket. Tighten securely, using Tool 73598. Refer to (Fig. 7).

(4) Install the accelerator pump inlet check ball ($^3/_{16}$ inch) in the pump well, as shown in (Fig. 12).

(5) Install the accelerator pump discharge check ball (⅛ inch) in the discharge passage, as shown in Fig. 13.

Accelerator Pump Test

(1) Pour clean gasoline into the carburetor bowl approximately ½ inch deep. Remove the accelerator pump plunger from the jar of gasoline and slide down in its well. Raise the plunger and press lightly in the plunger shaft to expel the air from the pump passage.

(2) Using a small clean brass rod, hold the discharge check ball firmly down on its seat. Raise the pump plunger and press downward. No fuel should be emitted from either the intake or discharge passage, as shown in (Fig. 14).

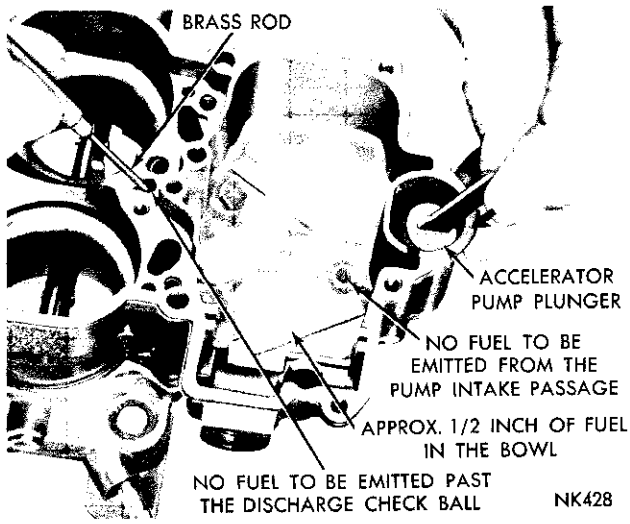


Fig. 14—Testing Accelerator Pump Discharge and Inlet Check Balls

(3) If any fuel does emit from either the intake or discharge passages, it indicates the presence of dirt or an imperfect seat. The passages should be re-cleaned and then thoroughly blown out with compressed air. Examine the ball seat for signs of damage that would not allow the check ball to seat properly.

(4) Reinstall the check ball and test again. If still leaking, place a piece of drill rod down on the check ball and rap sharply with a hammer. Remove the old check ball and install a new one. Then retest. (This operation forms a new ball seat in the carburetor casting.)

(5) Install the venturi cluster gasket, then slide the venturi cluster down into position. Install attaching screws and tighten securely. (Refer to Fig. 6.)

Again depress the accelerator plunger. A clear straight stream should emit from each jet orifice. If the streams are not identical (if either one is restricted or diverted), remove venturi cluster and reclean.

After test, pour gasoline from the bowl and remove the pump plunger.

(6) Check the float for leak or damage. If satisfactory for further service, install in position in the bowl.

(7) Assemble the fuel inlet needle valve, seat and gasket, then insert in the main body. Tighten securely. (If the needle valve is ridged or grooved, or badly worn, a new inlet needle valve assembly should be installed.)

Measuring Float Height

The carburetor is equipped with a synthetic rubber-tipped fuel inlet needle.

(1) Invert the main body so that the weight of the floats only is forcing the needle against the seat. **Be sure hinge pin does not drop out of the float hinge.** Hold down with the fulcrum pin spring.

(2) Using Tool 73725 or a "T" scale, measure the float level, as shown in (Fig. 15). There should be $^{5}/_{32}$ inch from the surface of the fuel bowl to the crown of the float at the center.

If an adjustment is necessary, remove the float and the fulcrum spring. Bend the lip of the float lever either in or out until the correct setting has been obtained.

CAUTION: Do not attempt to change the setting without removing the float, as the synthetic rubber tip can be compressed sufficiently to cause a false setting, which will affect correct level of fuel in the bowl.

It is important that the float lip is perpendicular to the needle or slanted not more than 10 degrees away from the needle when the float is set correctly. Do not bend float lip by forcing float, use Tool 73605.

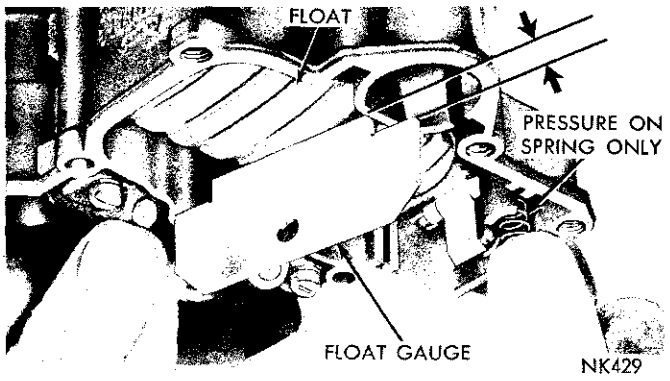


Fig. 15—Measuring the Float Setting

(3) Install the float, then slide the float baffle down into position. Install the fulcrum pin spring.

Assembling the Air Horn

To assemble the air horn, refer to (Fig. 16), then proceed as follows:

(1) Slide the choke shaft and lever into the air horn with the choke lever pointing down and away from air horn. Slide the choke valve down into the slot in shaft.

(2) Hold the choke valve closed, and install new screws. **DO NOT TIGHTEN.** Holding the valve in the closed position, tap gently with a screwdriver, to center and locate the valve.

(3) Tighten attaching screws securely, then stake by squeezing with pliers. Reinstall the fast idle lever and secure with lockwasher and nut.

(4) Remove the accelerator pump plunger from the jar of gasoline. Check the leather. If the leather is hard, cracked, or worn, install a new pump plunger. (Be sure to flex the leather several times before installing plunger in air horn.)

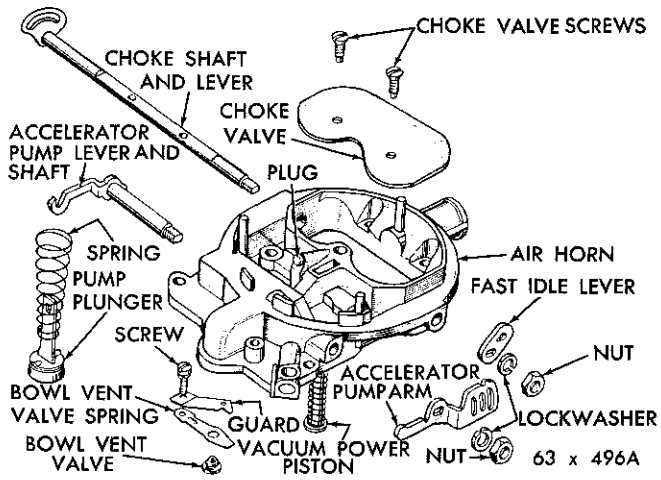


Fig. 16—Air Horn (Disassembled View)

(5) Slide the compression spring over plunger shaft, then slide plunger over hook and into position. Refer to (Fig. 4).

(6) Install a new air horn gasket, then install the vacuum power piston in air horn. Lock in position by prick punching on the air horn rim. Compress the piston plunger to be sure no binding exists. If the piston sticks or binds enough to hinder smooth operation, install a new piston assembly.

(7) Install the air horn assembly on the main body, guiding the pump plunger into its well. (Be sure the leather does not curl or fold back.) Install retaining screws and tighten securely. (Refer to Fig. 2.) **The choke valve must be held partially closed while installing the air horn.**

(8) Remove the two short screws holding the main body and throttle body together, refer to (Fig. 3), and install the air horn. Reinstall the two long screws and tighten securely.

(9) Install the fast idle rod and secure with hairpin clip.

(10) Install the pump rod and secure with hairpin clip. (Be sure rod is in the center slot of arm, refer to Fig. 1.) Work the accelerator pump plunger several times to be sure it operates smoothly.

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 stem, then place a finger over the fitting to seal the opening. Release the stem. If the stem moves more than $^1/_{16}$ inch in 10 seconds, the leakage is excessive and the assembly must be replaced.

Install the diaphragm assembly on the air horn as follows:

(1) Assemble to the air horn and tighten the attaching screws securely.

(2) Install the choke operating link in position between the diaphragm plunger (stem) and the choke lever. Install clip to secure. **Be sure the link is on the proper side of the wire spring. See (Fig. 1).**

(3) Inspect the rubber hose for cracks before placing it on the correct carburetor fitting. Refer to (Fig. 2). **Do not connect the vacuum hose to the diaphragm fitting until after the vacuum kick adjustment has been made. (See Carburetor Adjustments.)**

CARBURETOR ADJUSTMENTS

It is very important that the following adjustments be made on a reconditioned carburetor and in the sequence listed, namely:

Fast Idle Cam Position Setting
Vacuum Kick Adjustment
Unloader Adjustment (wide open kick)
Accelerator Pump Travel
Bowl Vent Valve Setting

Fast Idle Speed and 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 Car) 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.

To make the fast idle cam position adjustment refer to (Fig. 17), then proceed as follows:

(1) With the fast idle speed adjusting screw contacting the step on the fast idle cam shown in (Fig. 17), move the choke valve toward the closed position with light pressure. Insert a NO. 41 drill or gauge T109-125 (Auto. Transmission or Manual Trans.) between the choke valve and the wall of the air horn.

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

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

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.

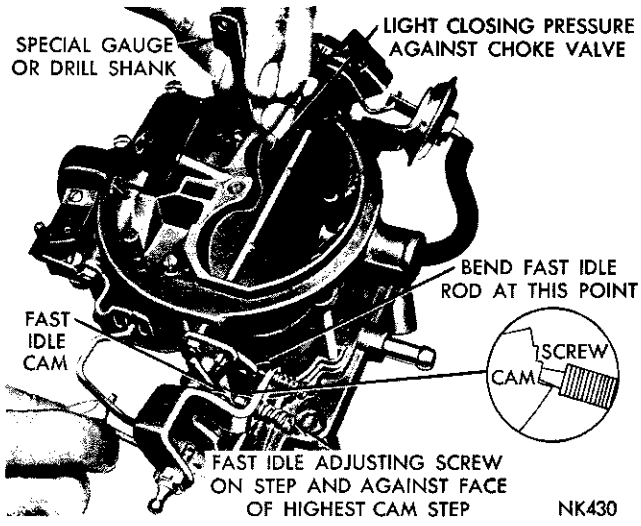


Fig. 17—Fast Idle Cam Position Adjustment

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

(2) Disconnect the vacuum hose from the diaphragm and connect the hose from the vacuum supply, as shown in (Fig. 18). (A minimum of 10 inches of mercury (HG) will be required.)

(3) Insert a NO. 17 drill or gauge T109-205 (Manual Trans.) or a NO. 35 drill (Auto. Trans.) between the choke valve and the wall of the air horn. Refer to (Fig. 18). Apply sufficient closing pressure on the choke shaft lever to provide the smallest opening possible, without distortion of the diaphragm link. Note that the link must deflect a wire spring before it reaches the end of travel within the lever slot. The link must travel to the end of the slot for proper measurement of the kick adjustment.

(4) An adjustment will be necessary if a slight drag is not obtained as the 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 the clip and disengage the 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 the choke operating link at the angle to provide the correct choke valve opening.

CAUTION: A correction in the length of the link of .010 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 be .010 inch.

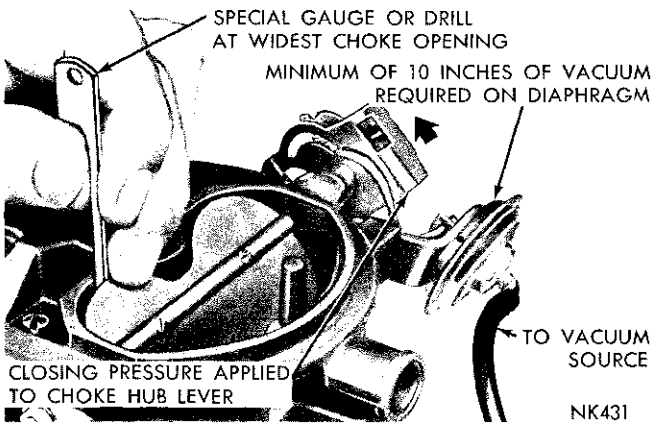


Fig. 18—Checking the Vacuum Kick Setting

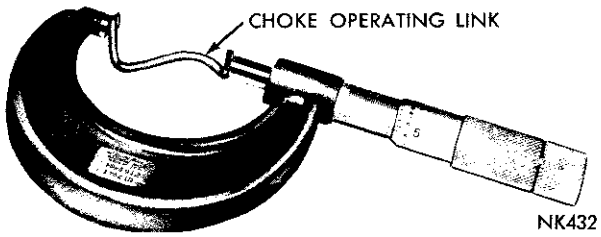


Fig. 19—Choke Operating Link Measurement

A 2″ micrometer will be helpful in establishing the original length of the link, as shown in (Fig. 19), before completing the adjustment.

(7) Install the choke operating link and recheck the choke valve opening, using a gauge or drill. Refer to (Fig. 18).

Reinstall the vacuum hose to the diaphragm and make the following check:

(8) With no vacuum applied to the diaphragm, some clearance should exist between the choke operating link and the choke lever slot, in both the open and closed choke valve positions, as shown in (Fig. 20).

NOTE: 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.

NOTE: Free movement of the choke valve between the closed and open positions is very necessary.

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.

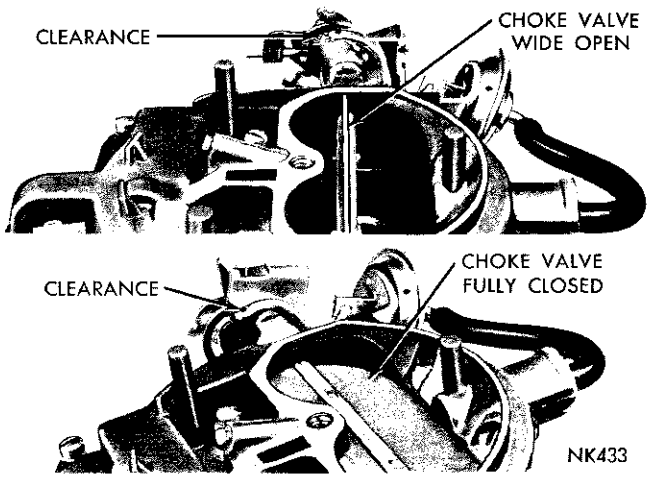


Fig. 20—Choke Operating Link Clearances

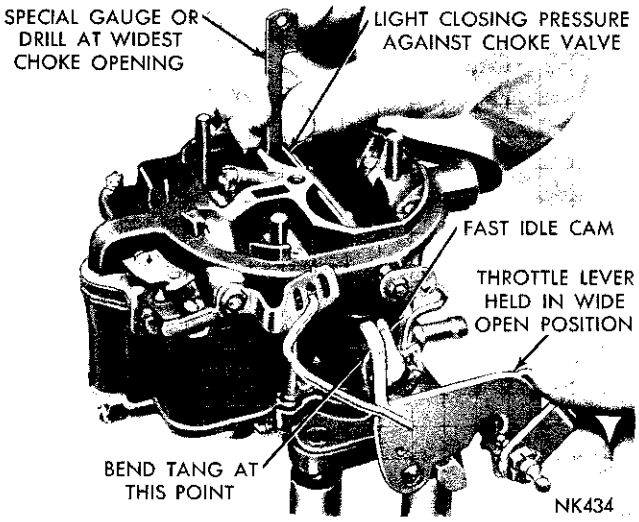


Fig. 21—Choke Unloader Adjustment (Wide Open Kick)

Unloaded Adjustment (Wide Open Kick)

To make the unloaded adjustment, refer to (Fig. 21), then proceed as follows:

(1) Lightly hold the choke valve closed, then open the throttle valves to the wide open position. The choke valve should open sufficiently to allow a $^{15}/_{64}$ inch drill or gauge T109-32 to be inserted between the choke valve and the wall of the air horn as shown.

(2) To adjust, bend the tang on the throttle lever, using Tool T109-214 until correct opening has been obtained.

(3) Hold the choke valve open and then open and close the throttle valves. Failure to obtain full throttle operation indicates improper assembly or adjustment of the choke mechanism.

(4) With the throttle valves held in an open position, the choke valve should fall open freely. There should be no bind throughout the entire travel of the choke mechanism.

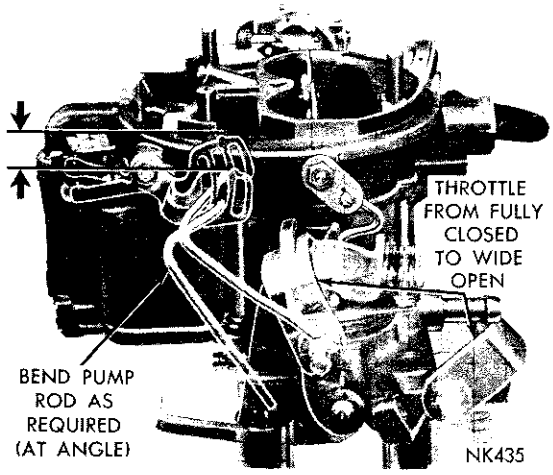


Fig. 22—Accelerator Pump Travel

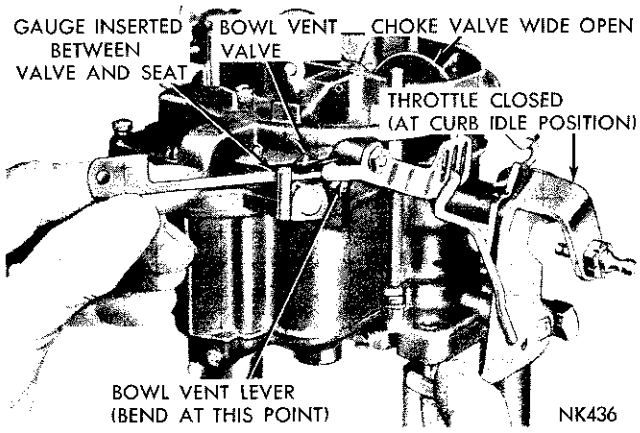


Fig. 23—Checking the Bowl Vent Valve Opening

Accelerator Pump Travel

To check the accelerator pump travel, refer to (Fig. 22), then proceed as follows:

(1) With the throttle valves fully closed, measure the pump travel from the fully closed to the fully open throttle.

(2) This travel should be $^{11}/_{32}$ inch Manual Trans. and $^{7}/_{16}$ inch Auto. Trans. as shown.

(3) If an adjustment is necessary, bend the pump rod at the point shown, using Tool T109-213, until correct travel has been obtained.

Bowl Vent Valve Setting

To make the bowl vent valve setting, refer to (Fig. 23), then proceed as follows:

This setting is made after the pump travel setting.

(1) With the throttle valves at curb idle, there should be $^{1}/_{16}$ inch clearance between the bowl vent valve and the air horn, when measured (at the center of the vent valve and the seat) with a gauge or drill shank.

(2) If an adjustment is necessary, bend the bowl vent lever, using Tool T109-214, until correct opening has been obtained.

NOTE: Any adjustment to the accelerator pump setting, means that the bowl vent must be readjusted.

Idle Speed Adjustment

The idle speed adjustment is made after the carburetor has been installed on the engine.

For the best results, it is recommended that a tachometer be used in this adjustment.

(1) Turn the idle speed screw in or out to obtain

500 rpm. (On vehicles with air conditioning, set the idle speed at 500 rpm, with air conditioning ON.) Be sure the choke valve is fully open and that the fast idle adjusting screw is not contacting the fast idle cam (engine off fast idle).

(2) Turn each idle mixture screw **in** or **out** until smooth idle has been obtained.

(3) Readjust to 500 rpm with the idle speed screw.

(4) Repeat the idle mixture screw adjustment.

*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 the engine running and the transmission in the neutral position, open the throttle slightly.

(2) Close the choke valve about 20 degrees then allow the throttle to close. Return the choke valve to the open position.

(3) The fast idle speed adjusting screw should be contacting the lowest step on the fast idle cam, as shown in (Fig. 24).

(4) With the engine warmed-up to the normal operating temperature, turn the fast idle speed adjusting screw **in** or **out** to secure 700 r.p.m. (Automatic Transmission) or 700 r.p.m. (Manual Transmission). **Reposition the cam and throttle after every screw adjustment to apply normal throttle closing torque.** (*After Approx. 500 Miles) (If Necessary).

Measuring the Float Setting or Fuel Level (On the Vehicle)

Remove the three short air horn to main body attaching screws. Then remove one long air horn to throttle body screw next to fuel bowl and assemble short screw through main body flange and thread into the throttle body. Remove long screw from side away from fuel bowl and on opposite side and assemble short screw through main body flange. Securely tighten. Remove the air horn as follows:

(1) Remove the spring clip and disconnect the choke operating rod.

(2) Remove the hairpin clip and disconnect the fast idle rod.

(3) Remove the hairpin clip that holds the pump rod in the center slot of the pump arm. Disconnect the pump rod.

(4) Remove the remaining two long screws and lift off the air horn.

Check the float setting as follows:

(5) Seat the float fulcrum pin by pressing finger against the fulcrum pin spring.

There should be enough fuel in the bowl to raise the float so that the lip bears firmly against the needle. Additional fuel may be admitted by slightly depressing the float. If the pressure in the line is insufficient to force additional fuel into the bowl, add the necessary fuel from a clean container.

CAUTION: Since the manifolds may be hot, it is dangerous to spill onto these surfaces. Therefore, take the necessary precautions to avoid spillage.

(6) With only the pressure from the buoyant float holding the lip against the inlet needle, check the float setting, using Tool 73725 or "T" scale. There should be $^{5}/_{32}$ inch from the surface of the bowl (gasket removed) to the top of the float at the center.

If an adjustment is necessary, hold the float on the bottom of the bowl, then bend the float lip toward or away from the needle, using Tool 73605. Recheck the $^{5}/_{32}$ inch setting again, then repeat the lip bending operation as required.

CAUTION: When bending the float lip, do not allow the lip to push against the needle as the rubber tip can be compressed sufficiently to cause a false setting which will affect correct level of fuel in the bowl. After being compressed, the rubber tip is very slow to recover its original shape.

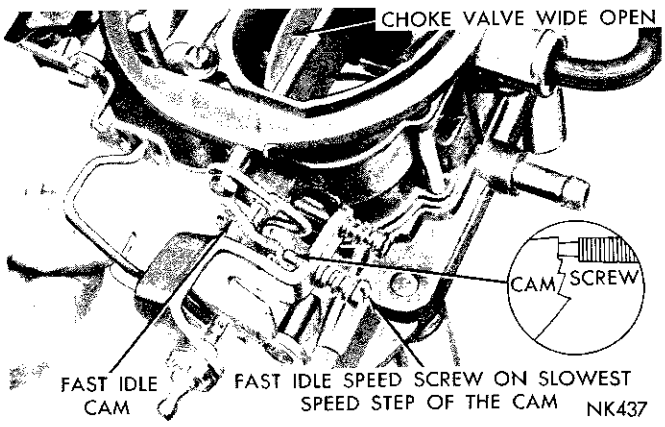


Fig. 24—Fast Idle Speed Adjustment (on the Engine)

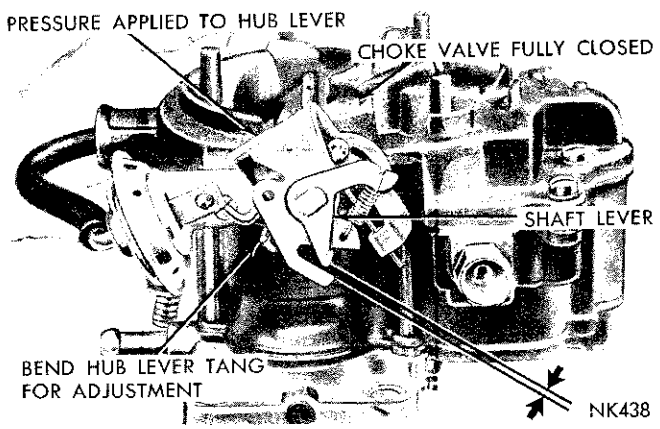


Fig. 25—Spring Staged Choke Clearance

It is very important that the float lip be perpendicular to the needle or slanted not more than 10 degrees away from the needle when the float is set correctly.

(7) Reassemble the air horn.

Spring Staged Choke Adjustment

The new spring staged choke, shown in (Fig. 25) is a device incorporated in the choke mechanism which limits the choke blade closing torque when cranking the engine at temperatures below zero. Thus the spring staging of the choke is a better match for the engine's starting mixture requirements at the low temperatures.

To check the spring staged choke for correct operating clearance, refer to (Fig. 25), then proceed as follows:

(1) Push on the hub lever with the finger, at the closed choke position. A small opening should exist between the shaft and the hub levers, as shown in (Fig. 25).

(2) Using a drill or gauge, measure the opening. The opening should be from .010 to .040 inches.

(3) If an adjustment is necessary, bend the hub lever tang until the correct opening has been obtained.

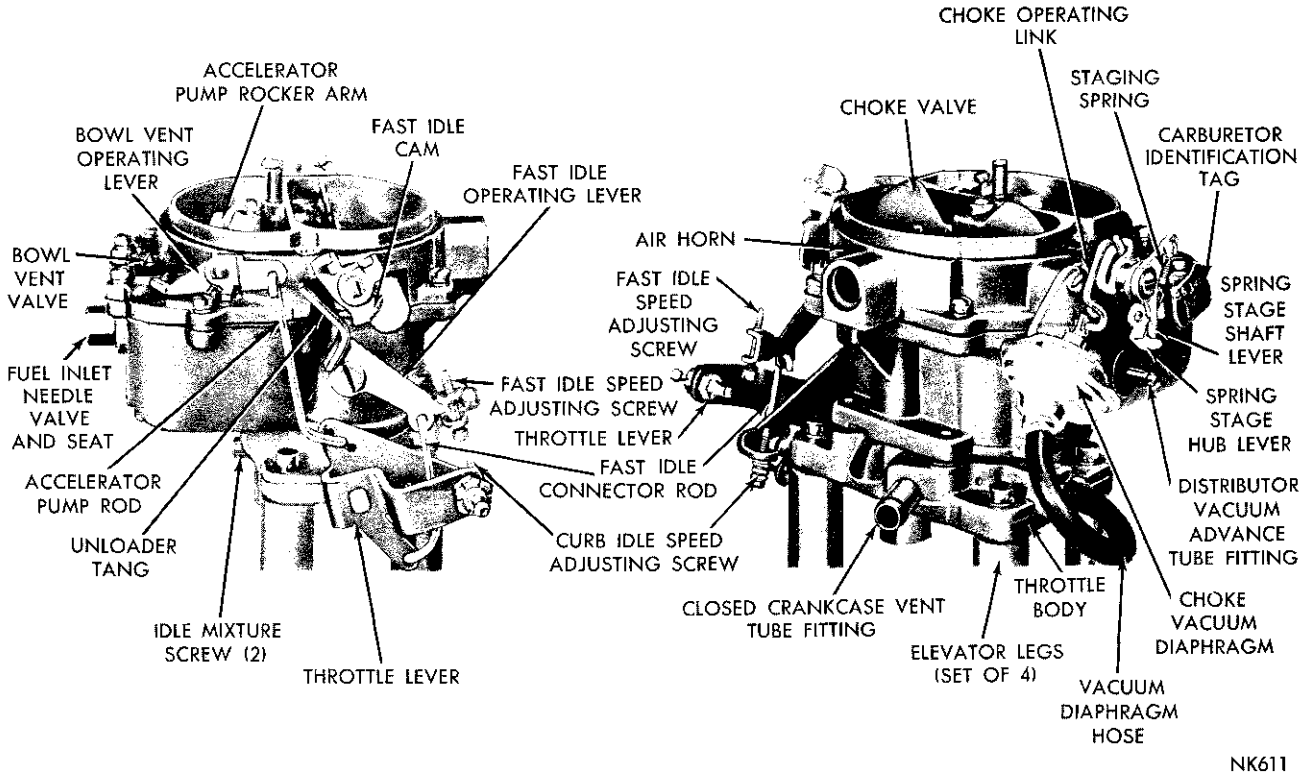


Fig. 1—Carburetor Assembly (BBD-3849S and BBD-3850S)

PART 3

BBD SERIES CARBURETORS

Description

The Ball and Ball carburetor is of the dual downdraft type. Each throat has its own throttle valve, idle and main metering systems and are supplemented by the float, accelerating and power systems.

On each BBD series carburetor, the model number is stamped on metal tag attached to air horn. Do not remove or destroy this tag, as it is the only means provided for carburetor model identification. Before attempting to repair or overhaul carburetor, refer to model number and secure a repair kit for number indicated on tag.

SERVICE PROCEDURES

DISASSEMBLY

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

(1) Insert three Tool T-109-287S and one Tool T109-288S elevating legs through the carburetor throttle body stud holes. (These tools are used to protect the throttle valves from damage and to provide a suitable base for working.)

(2) Remove the hairpin clip and disengage the fast idle connector rod from the throttle and fast idle levers.

(3) Remove the hairpin clip and disengage the accelerator rod from the throttle lever and the pump rocker arm.

(4) Remove the vacuum hose between the carburetor throttle body fitting and the vacuum diaphragm.

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

(6) Remove the vacuum diaphragm and bracket assembly and place to one side, to be cleaned as a special item.

NOTE: A liquid cleaner may damage the diaphragm material.

(7) Remove the air horn retaining screws and lift air horn straight up and away from the main body. Discard the gasket (2 screws recessed).

(8) Disengage the accelerator pump plunger from the accelerator pump arm by pushing up on bottom of plunger and sliding plunger shaft off hook. Slide plunger out of air horn and remove the compression spring and seat.

If the old plunger can be used again or if a new plunger is to be installed, place the plunger in a jar of clean gasoline or kerosene to prevent the leather from drying out.

(9) Remove the fuel inlet needle valve, seat and gasket from the main body.

(10) Lift out the float fulcrum pin retainer, and lift out the floats and fulcrum pin.

(11) Remove the step-up piston and retaining screw and slide the step-up piston and rods out of well, as shown in (Fig. 2). Lift out the step-up piston spring. Remove the step-up piston gasket from the bottom of

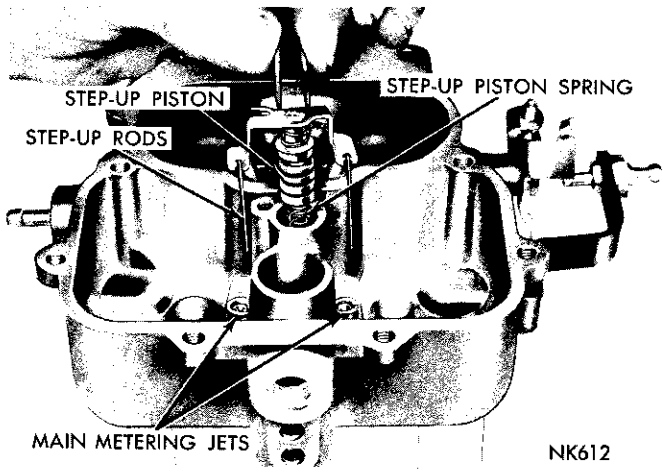


Fig. 2—Removing or Installing the Step-Up Piston

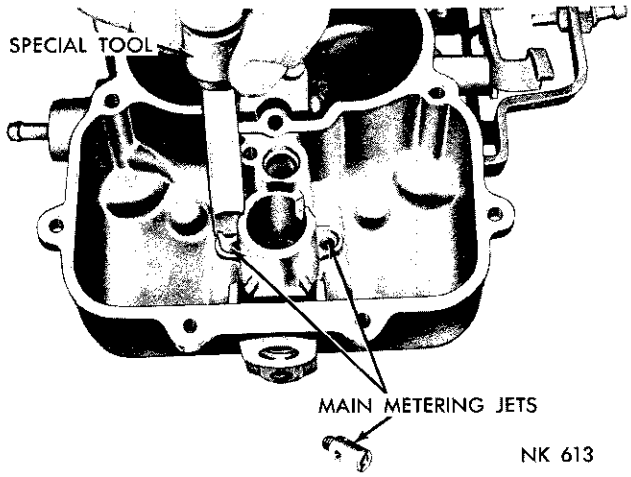


Fig. 3—Removing or Installing the Main Metering Jets

the well.

(12) Remove the main metering jets as shown in (Fig. 3).

(13) Remove the venturi cluster screws, then lift the venturi cluster and gaskets up and away from the main body, as shown in (Fig. 4). Discard the gaskets. **Do not remove the idle orifice tubes or the main vent tubes from the cluster.** They can be cleaned in a solvent and dried with compressed air.

(14) Invert the carburetor and drop out the accelerator pump discharge check ball and the intake check ball. (The intake check ball is the largest.)

(15) Remove the idle mixture adjusting screws and springs from the throttle body.

(16) Remove the screws that attach the throttle body to the main body. Separate the bodies and discard the gasket.

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

It is usually not advisable to remove the throttle shaft or valves from the throttle body, unless wear or damage necessitates the installation of new parts.

There is about .005 inch clearance between the throttle shaft and the throttle shaft bores in the throttle body. Any clearance over .010 inch, a new throttle shaft and/or throttle body should be installed.

INSPECTION AND ASSEMBLY

Throttle Body

(1) Inspect the throttle shaft and throttle body

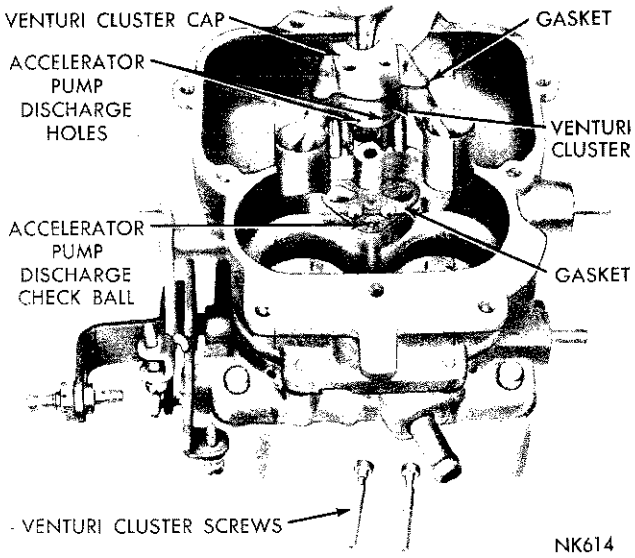


Fig. 4—Removing or Installing the Venturi Cluster

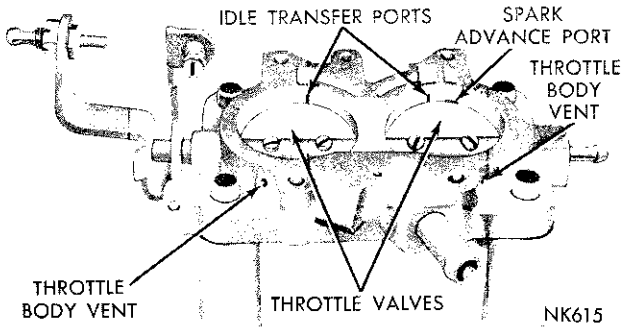


Fig. 5—Ports in Relation to the Throttle Valves

for excessive wear. If either or both are worn to the point where the carburetor operation will be affected, replace as required.

During manufacture, the location of the idle transfer port and the spark advance control ports to the throttle valve, is carefully established for one particular assembly, refer to (Fig. 5).

If a new shaft should be installed in an old, worn throttle body, it would be very unlikely that the original relationship of the ports to the valves would be obtained. Changing the relationship of the valves to the ports would adversely affect normal car operation between the speeds of 15 and 30 miles per hour. If it has been determined, however, that a new shaft or valves is to be installed, adhere to the following instructions:

(2) Mark the position of the throttle valves in the bores. Be sure the idle speed screw is backed off.

(3) Remove the screws that hold the throttle valves to the shaft and slide the valves out of the bores.

NOTE: These screws are staked on the opposite side and care should be used at removal so as not to break off in the shaft.

Remove the staked end of the screws with a file.

(4) Slide the throttle shaft and lever out of the body.

(5) Install new throttle shaft and lever.

(6) Install throttle valves in their respective bores (with the valve numbers toward the manifold). Install new screws but do not tighten. Hold the valves in place, with the fingers pressing on the high sides of the valves. Tap the valves lightly with a screwdriver to seat in the throttle bores. Tighten the screws securely and stake by squeezing with pliers.

(7) Install the idle mixture screws and springs in the throttle body. (The tapered portion must be straight and smooth. If the tapered portion is grooved or ridged, new idle mixture screws should be installed to insure having correct idle mixture control.) **DO NOT USE A SCREWDRIVER.** Turn the screws **lightly** against their seats with the fingers. Back off one full turn for approximate adjustment.

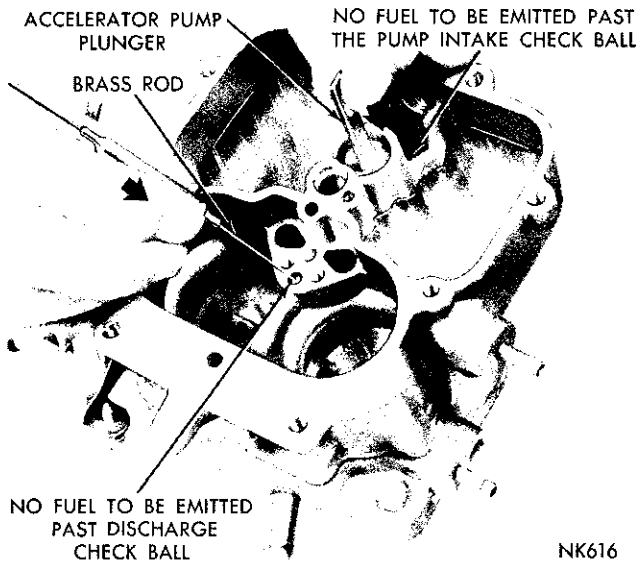


Fig. 6—Testing the Accelerator Pump Intake and Discharge Check Balls

Main Body

(1) Invert the main body and place a new gasket in position and place the throttle body on the main body and align. Install screws and tighten securely.

(2) Install the accelerator pump discharge check ball in the discharge passage and check the accelerator pump system; fuel inlet and discharge check balls as follows:

(3) Pour clean gasoline into the carburetor bowl, approximately ½ inch deep. Remove the pump plunger from the jar of gasoline, flex the leather several times, then slide down into the pump cylinder. Raise the plunger and press lightly on the plunger shaft to expel all air from the pump passage.

(4) Using a small clean brass rod, hold the discharge check ball down firmly on its seat. Again raise the plunger and press downward. No fuel should be emitted from either the intake or discharge passage, as shown in (Fig. 6).

If any fuel does emit from either passage, it indicates the presence of dirt or a damaged check ball seat. Check the passage again and repeat test. If leakage is still evident, install a new check ball. The fuel inlet check ball is located at the bottom of the plunger well.

(5) Install new gaskets on the venturi cluster, and install in position in the main body. Install the cluster screws and tighten securely. Test pump discharge by pressing pump plunger down. Two fine streams of fuel should be forced from the cluster. If either stream is restricted or diverted, remove cluster and reclean. After test, pour the fuel from the bowl and remove pump plunger.

(6) Install the main metering jets. Tighten securely. (Refer to Fig. 3.)

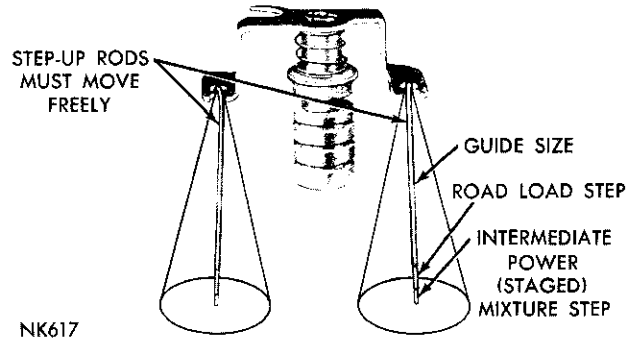


Fig. 7—Step-Up Rods Free Play

(7) Before installing the step-up piston, be sure the step-up rods are able to move freely, each side of the vertical position, as shown in (Fig. 7). The step-up rods must be straight, smooth and free to move forward and backward from vertical.

(8) Slide the step-up piston gasket down into position in the piston well, then install the step-up piston spring, step-up piston and rods. Carefully guide the step-up rods into the main metering jets. (Fig. 2.) Install the retaining screw and tighten securely. Check piston for free operation in the well.

A step-up piston stuck in the **Up** position will cause a rich mixture at part throttle, whereas a piston stuck in the **Down** position will cause a lean mixture at wide open throttle and poor acceleration.

Measuring Float Setting

The carburetors are equipped with a rubber-tipped fuel inlet needle. The rubber tip is flexible enough to make a good seal on the needle seat, and to give increased resistance to flooding.

The use of the rubber-tipped needle requires a new procedure in adjusting the float setting. Care should be taken to perform this operation accurately in order to secure the best performance and fuel economy.

(1) To correctly set the float height when the carburetor is being overhauled, install the floats with the fulcrum pin and pin retainer in the main body.

(2) Install the rubber-tipped needle, seat and gasket in the body and tighten securely.

(3) Invert the main body so that the weight of the float only is forcing the needle against the seat. Hold finger against the retainer to fully seat the fulcrum pin.

(4) Using Tool T109-280 or a "T" scale, measure the float, as shown in (Fig. 8). There should be $^{5}/_{16}$ inch from the surface of the fuel bowl to the **crown of each float at the center.**

If an adjustment is necessary, hold the floats on

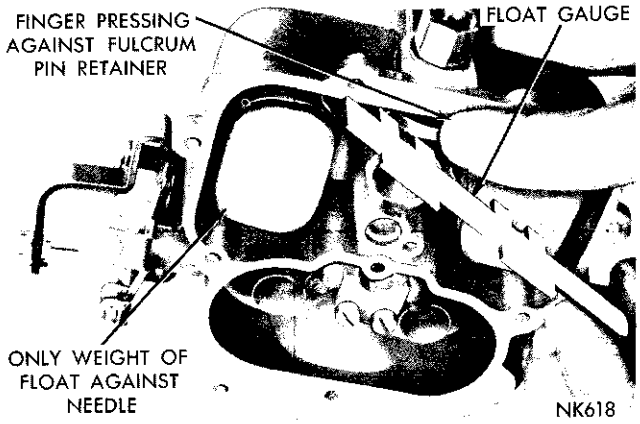


Fig. 8—Checking the Float Setting

the bottom of the bowl and bend the float lip toward or away from the needle. Recheck the $^{5}/_{16}$ inch setting again and repeat the lip bending operation as required.

CAUTION: When bending the float lip, do not allow the lip to push against the needle as the synthetic rubber tip can be compressed sufficiently to cause a false setting which will affect correct level of fuel in the bowl.

After being compressed, the tip is very slow to recover its original shape.

CAUTION: It is very important that the float lip be perpendicular to the needle or slanted not more than ten degrees away from the needle when the float height is correct.

Air Horn

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

(2) Remove the accelerator pump plunger from the gasoline, slide the compression spring and spring seat over the shaft. Install the assembly in the air horn and engage with the accelerator pump arm.

(3) Place a new gasket on the main body, and install the air horn. Install attaching screws and tighten securely. (When installing air horn, be sure the leather on the plunger does not wrinkle or fold back.)

(4) Engage the accelerator pump rod with the pump rocker arm and install loose end in the center hole of throttle lever. Install hairpin clip to secure. (Fig. 1.)

(5) Engage the fast idle connector rod in the fast idle lever and throttle lever. Install hairpin 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 airhorn as follows:

(1) Assemble the diaphragm to the airhorn and tighten the attaching screws securely.

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

(3) Inspect the rubber hose for cracks before placing it on the 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

It is very important that the following adjustments are made on a reconditioned carburetor and in the sequence listed:

Accelerator Pump

(1) Back off the idle speed adjusting screw. Open the choke valve so that the fast idle cam allows the throttle valves to be completely seated in the bores. Be sure that the pump connector rod is installed in the center hole of the throttle lever.

(2) Close the throttle valves tightly. Measure the distance between the top of the air horn and the end of plunger shaft, as shown in (Fig. 9). This measure-

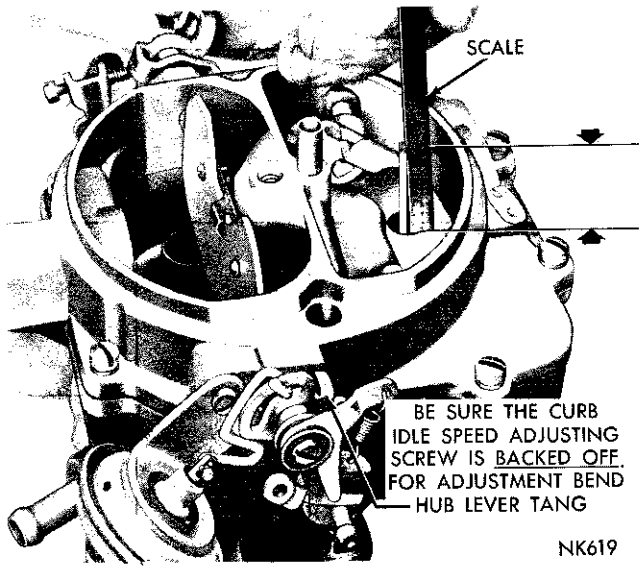


Fig. 9—Checking the Accelerator Pump Setting

ment should be 1" + or — 1/64 inch.

(3) To adjust pump travel, bend the pump connector rod, using Tool T109-213, at the lower angle of rod, until correct setting has been obtained.

Fast Idle Speed and 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) With the fast idle speed adjusting screw contacting the step on the fast idle cam shown in (Fig. 10), move the choke valve toward the closed position with light pressure. Insert a NO. 35 drill between the choke valve and the wall of the air horn.

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

(3) If an adjustment is necessary, bend the stop on the choke shaft, using Tool T109-22 until the correct valve opening has been obtained. Refer to (Fig. 10).

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.

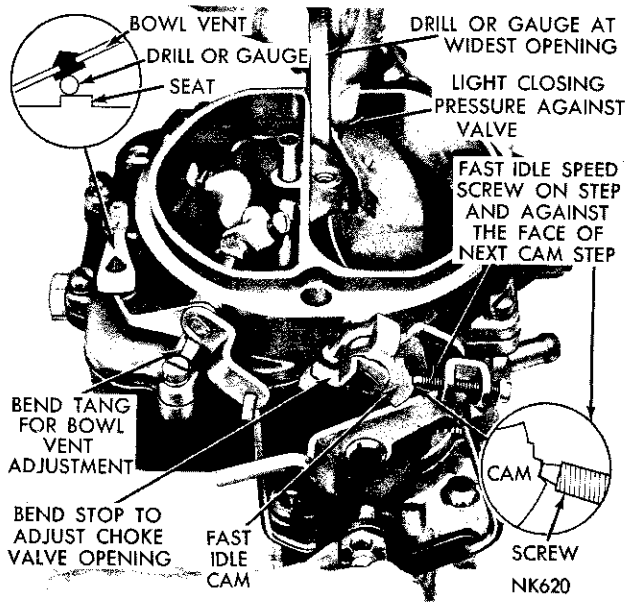


Fig. 10—Fast Idle Cam Position Adjustment

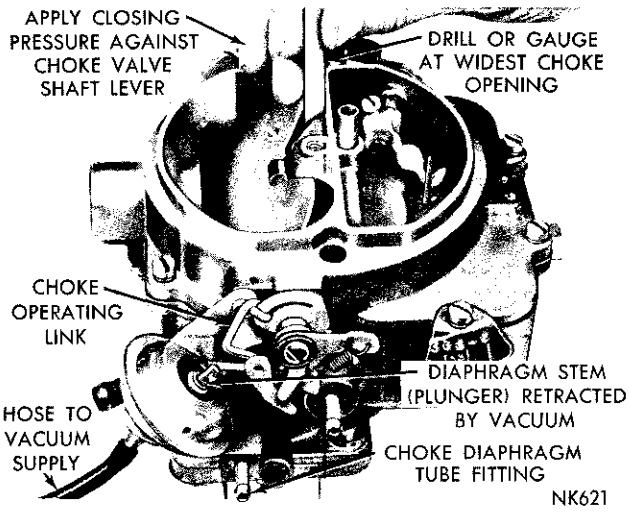


Fig. 11—Checking the Choke Vacuum Kick Setting

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

(2) Disconnect the vacuum hose from the diaphragm and connect the hose from the vacuum supply, as shown in (Fig. 11). (A minimum of 10 inches of mercury (HG) will be required.)

(3) Insert a NO. 11 drill (Manual Trans.) or a NO. 22 drill (Auto. Trans.) between the choke valve and the wall of the airhorn. Refer to (Fig. 11). Apply sufficient closing pressure on the choke shaft lever to provide the smallest choke valve opening possible 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 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 the clip and disengage the choke operating link from the diaphragm stem (plunger), then disengage the link from the choke lever. (The best bending results will be obtained by using a vise and a pair of pliers.)

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

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

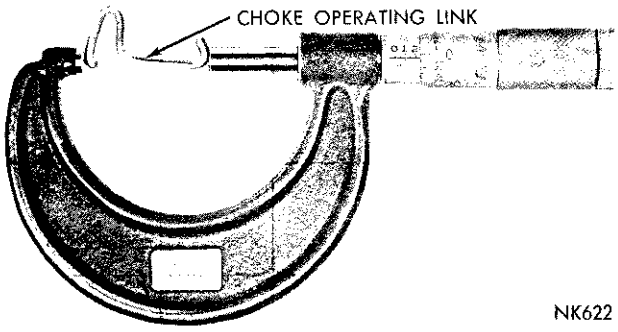


Fig. 12—Choke Operating Link Measurements

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

A 2″ micrometer will be helpful in establishing the original length of the link, as shown in (Fig. 12), before completing the adjustment.

(7) Install the choke operating link and recheck the choke valve opening, using a gauge or drill. (Refer to Fig. 11.)

Reinstall the vacuum hose to the diaphragm and make the following check:

(8) With no vacuum applied to the diaphragm, some clearance should exist between the choke operating link and the choke lever slot, in both the open and closed choke valve positions, as shown in (Fig. 13).

NOTE: This clearance is necessary to allow the choke valve to close for starting as well as fully open position after the engine reaches the normal operating temperature.

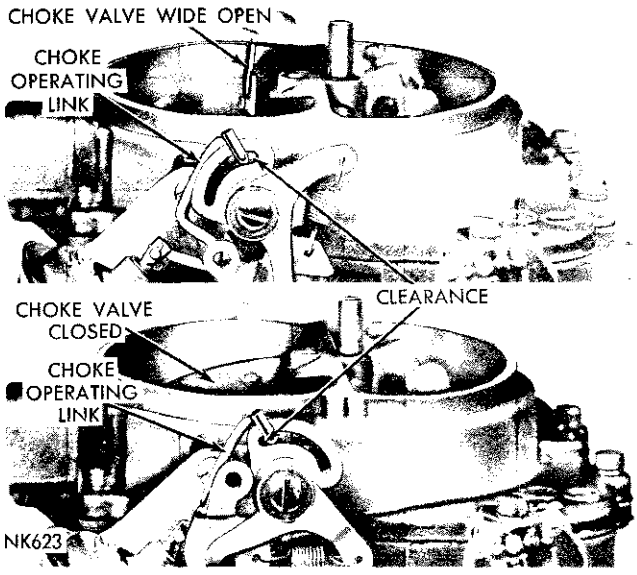


Fig. 13—Choke Operating Link Clearances

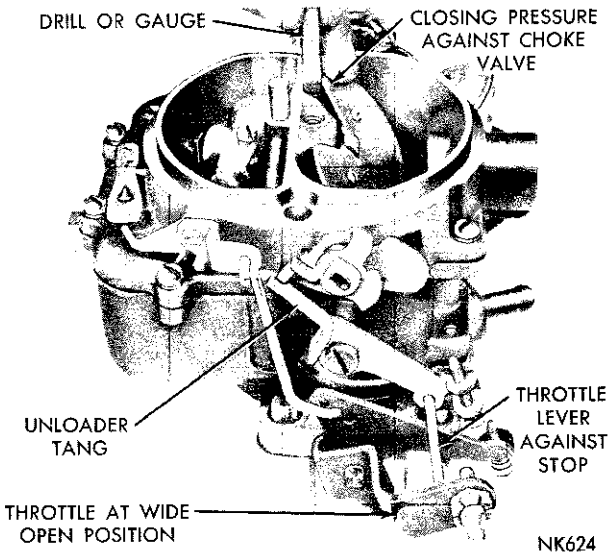


Fig. 14—Checking the Choke Unloader Setting

If a clearance does not exist in both of these positions, a recheck of the operating link adjustment should be made.

NOTE: Free movement of the choke valve between the closed and open positions is very necessary.

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 (Wide Open Kick)

(1) Hold the throttle valves in the wide open position. Insert Tool T109-31 (or a ¼″ drill shank) between the upper edge of the choke valve and the inner

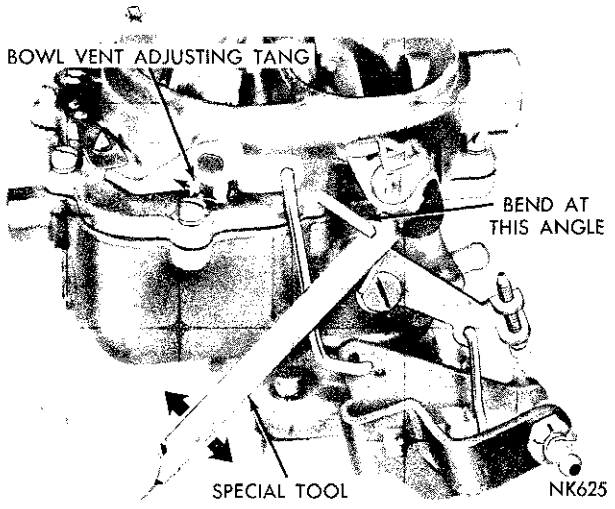


Fig. 15—Bending the Choke Unloader Tang

wall of the air horn, as shown in (Fig. 14).

(2) With a finger lightly pressing against the valve, a slight drag should be felt as gauge is being withdrawn. If an adustment is necessary, bend the tang on the fast idle lever, using Tool T109-22, as shown in (Fig. 15) until correct clearance has been obtained.

Bowl Vent Adjustment

(1) With the throttle valves at curb idle, there should be $^{1}/_{16}$ inch clearance between the bowl vent valve and the air horn, when measured at the innermost or smallest dimension with a drill shank.

(2) If an adjustment is necessary, bend the short tang on the vent valve operating lever, using Tool T109-22 until correct opening has been obtained.

NOTE: Any adjustment to the accelerator pump means, that the bowl vent valve must be readjusted.

Idle Speed Adjustment (Curb Idle)

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

The following precautions should be taken before making the idle speed adjustment:

(1) To make the idle speed adjustment, turn the idle speed screw in or out to obtain 500 rpm. (On cars with air conditioning, set the idle speed at 500 rpm **with air conditioning On.**) Be sure the choke valve is fully open and that the fast idle adjusting screw is not contacting the fast idle cam.

(2) Turn each idle mixture screw **in** or **out** to obtain the highest rpm. 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 rpm reading.

(3) Readjust to 500 rpm with the idle speed screw. (With air conditioning ON.)

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

This procedure will assure that the idle has been set to the leanest mixture possible 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 will probably be too fast.

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

Measuring Float Setting (On the Vehicle)

To measure the float setting with the carburetor mounted on the engine, proceed as follows:

(1) Remove the hairpin clip and disengage the accelerator pump rod from the throttle lever and the pump rocker arm. Disconnect the automatic choke rod by unsnapping clip.

(2) Remove the air horn attaching screws and lift the air horn straight up and away from the main body. Remove the gasket.

(3) Set the float fulcrum pin by pressing a finger against the fulcrum pin retainer.

There should be enough fuel in the bowl to raise the floats so that the lip bears firmly against the needle. Additional fuel may be admitted by slightly depressing the float. If the fuel pressure in the line is insufficient to force the additional fuel into the bowl, add the necessary fuel from a clean container.

WARNING: Since the manifolds may be hot, it is dangerous to spill fuel onto these surfaces. Take the necessary precautions to avoid spillage.

(4) With only the pressure from the buoyant float holding the lip against the inlet needle, check the float setting, using Tool T109-280, or a "T" scale. There should be $^{5}/_{16}$ inch from the surface of the bowl (gasket removed) to the crown of the floats at the center.

If an adjustment is necessary, hold the floats on the bottom of the bowl, then bend the float lip toward or away from the needle. Recheck the $^{5}/_{16}$ inch setting again, then repeat the lip bending operation as required.

NOTE: When bending the float lip, do not allow the lip to push against the needle as the rubber tip can be compressed sufficiently to cause a false setting which will affect correct level of fuel in the bowl.

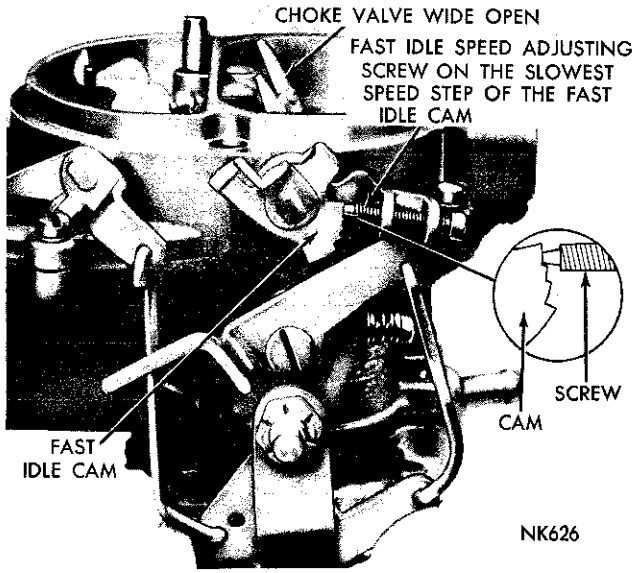


Fig. 16—Fast Idle Speed Adjustment (On the Vehicle)

After being compressed, the rubber tip is very slow to recover its original shape. It is very important that the float lip be perpendicular to the needle or slanted not more than 10 degrees away from the needle when the float is set correctly.

(5) After the float has been correctly set, reassemble the air horn.

*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 the engine running and the transmission in the neutral position, open the throttle slightly.

(2) Close the choke valve about 20 degrees, then allow the throttle to close. Return the choke valve to the open position.

(3) The fast idle adjusting screw should be contacting the slowest speed step on the fast idle cam (Fig. 16).

(4) With the engine warmed-up to the normal operating temperature, turn the fast idle adjusting screw **in** or **out** to secure 700 rpm. (Automatic Transmission) or 600 rpm (Manual Transmission). **Reposition the cam and throttle after every screw adjustment to apply normal throttle closing torque.**

*After Approx. 500 Miles (If Necessary).

Spring Staged Choke Adjustment

The new spring staged choke, shown in (Fig. 17) is a device incorporated in the choke mechanism which limits the choke blade closing torque when cranking the engine at temperatures below zero. Thus the spring staging of the choke is a better match for the engine's starting mixture requirements at the low temperatures.

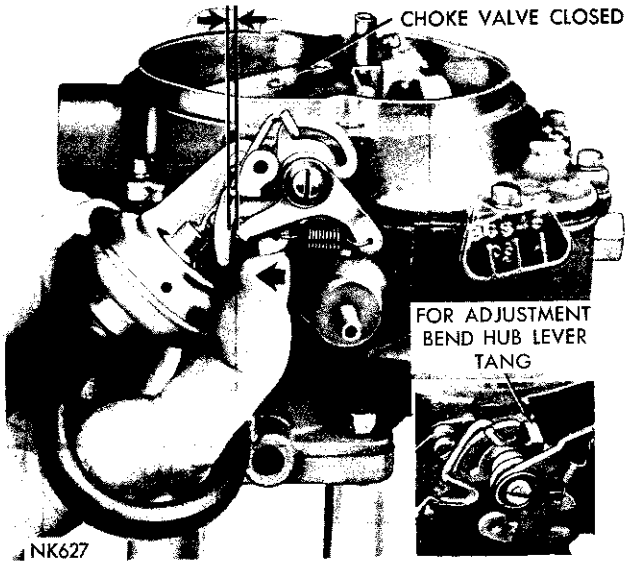


Fig. 17—Spring Staged Choke Adjustment

To check the spring staged choke for correct operating clearance, refer to (Fig. 17) then proceed as follows:

(1) Push on the hub lever with the finger, at the closed choke position. A small opening should exist between the shaft and the hub levers.

(2) Using a drill or gauge, measure the opening. The opening should be from .020 to .030 inches.

(3) If an adjustment is necessary, bend the hub lever tang until the correct opening has been obtained.

PART 4

AFB SERIES CARTER CARBURETOR

Description

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.

SERVICE PROCEDURES

DISASSEMBLY

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

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

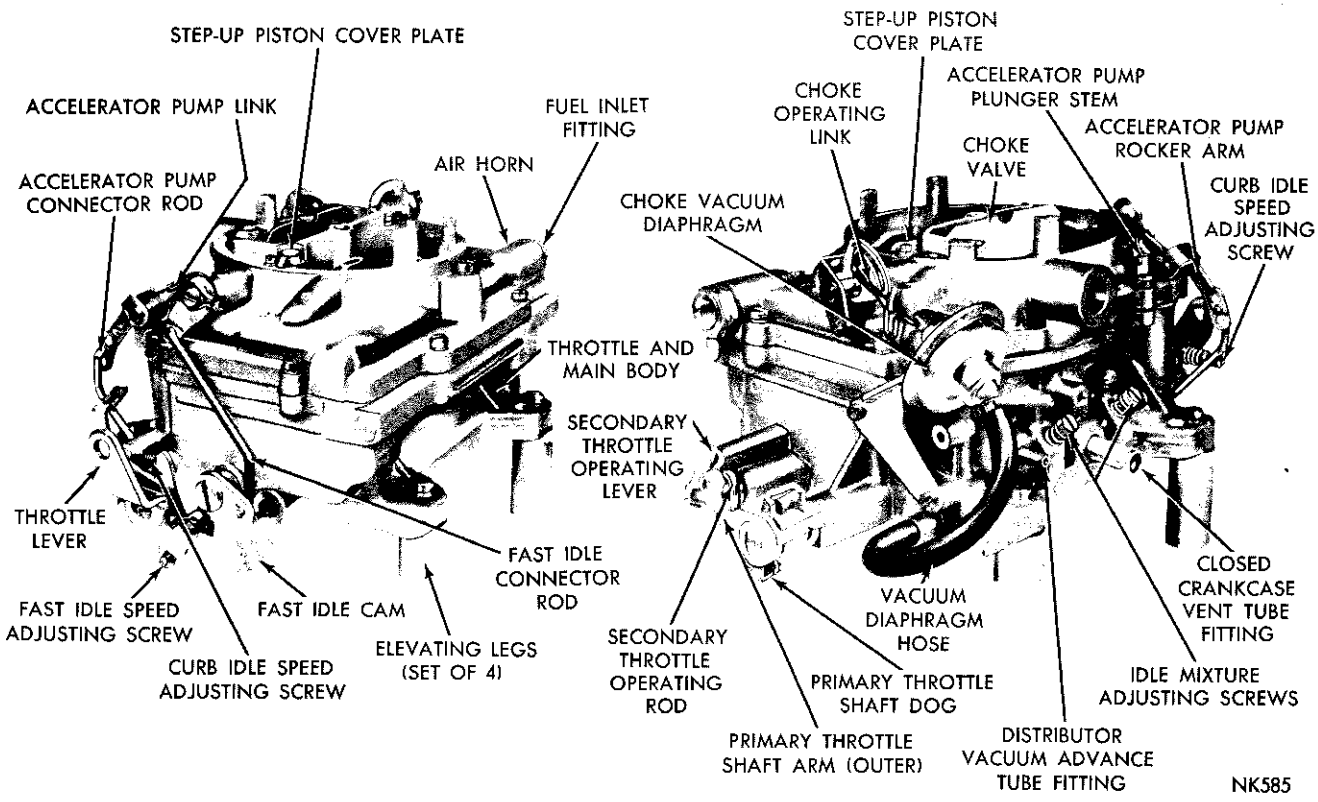


Fig. 1—Carburetor Assembly (AFB)

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

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

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

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

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

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

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

Disassembling the Air Horn

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

(1) Using a suitable Tool, remove the float fulcrum pins, (left and right) then lift the float up and out of bosses on air horn.

NOTE: It is suggested that the float on the pump side be marked so that the floats can be re-installed in their respective positions.

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

(3) Remove the spring clip that holds the throttle connector rod in the center hole of the pump arm. Remove the pump arm pivot screw and lift off the pump arm, at the same time, disengage the link from the arm and the pump stem. Slide the accelerator pump plunger and spring out of the air horn. Remove gasket.

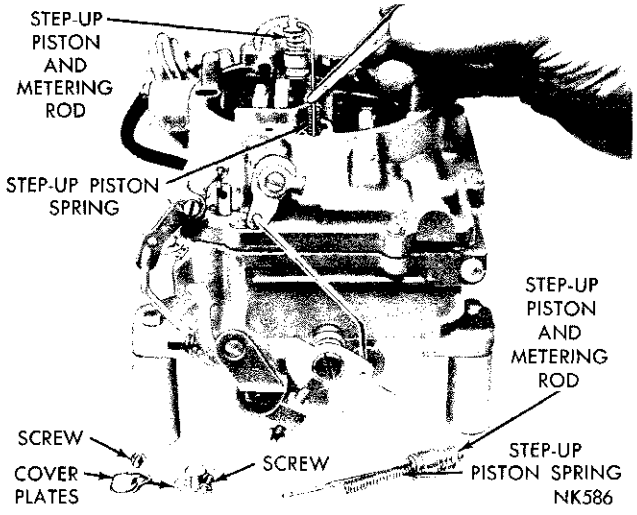


Fig. 2—Removing or Installing Step-Up Pistons and Rods

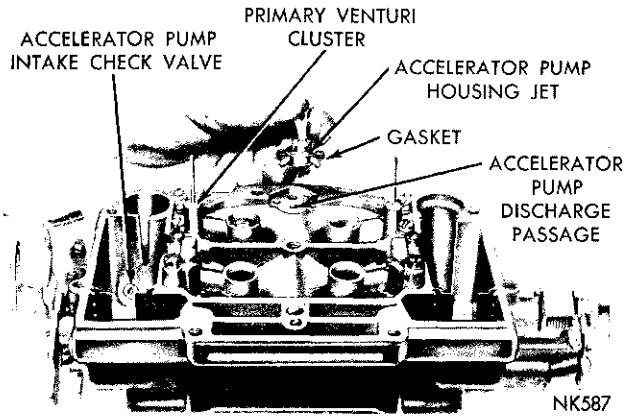


Fig. 3—Removing or Installing Accelerator Pump Jet Housing

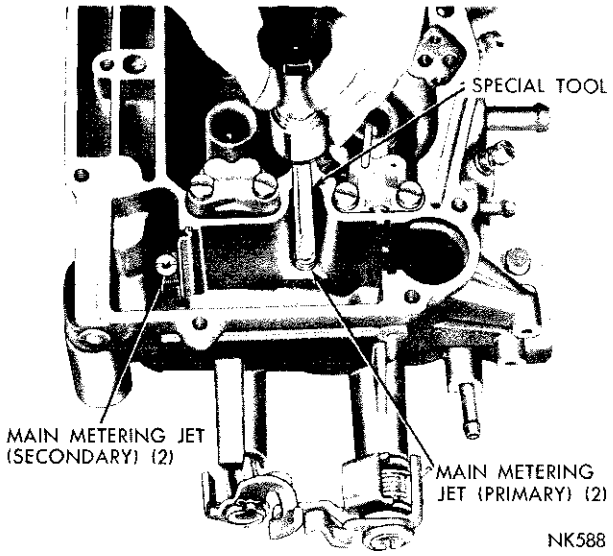


Fig. 4—Removing or Installing Main Metering Jet

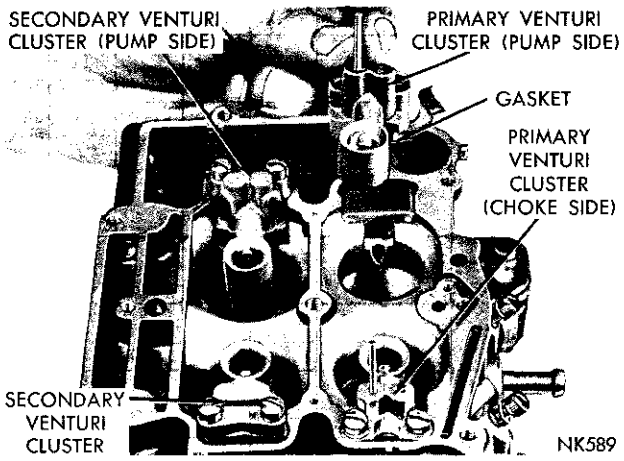


Fig. 5—Removing or Installing Primary Venturi Cluster

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

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

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

Main Body Disassembly

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

(2) Using Tool T109-58, remove the main metering jets (primary side), as shown in (Fig. 4).

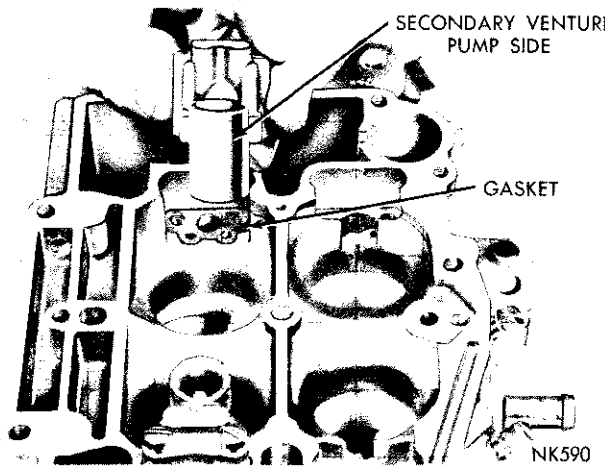


Fig. 6—Removing or Installing Secondary Venturi Cluster

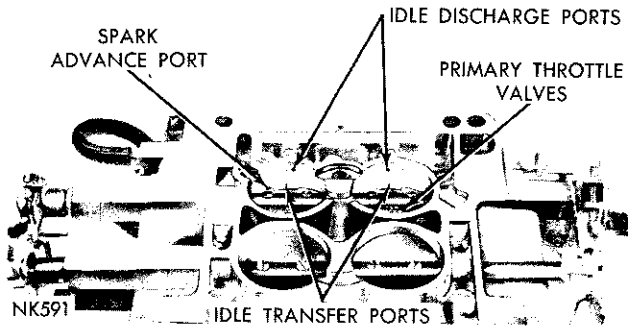


Fig. 7—Ports in Relation to Throttle Valves

NOTE: 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 T109-58, remove the main metering jets (secondary side), as shown in (Fig. 4).

(4) Remove the screws that attach the primary venturi (choke and pump side) to the main body. Lift the venturi straight up and away from the main body, as shown in (Fig. 5). Discard the gaskets.

NOTE: The venturi assemblies are not interchangeable, side for side and must be reinstalled in their original locations at reassembly.

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

(6) Using Tool T109-59, screw driver bit, remove the accelerator pump intake check valve located inside the fuel bowl, adjacent to the accelerator pump cylinder.

(7) Remove the two idle mixture adjusting screws and springs from the throttle body portion of the main casting.

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 carburet-

or 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.

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

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

(3) Install the two idle mixture adjusting screws and springs in the throttle body portion of the casting. The tapered portion must be straight and smooth. If the tapered portion is grooved or ridged, a new idle mixture adjusting screw should be installed to insure having correct idle mixture control. **Do not use a screw driver.** The adjustment should be made with the fingers. Turn the idle mixture adjusting screws lightly against their seats, then back off one full turn for an approximate adjustment.

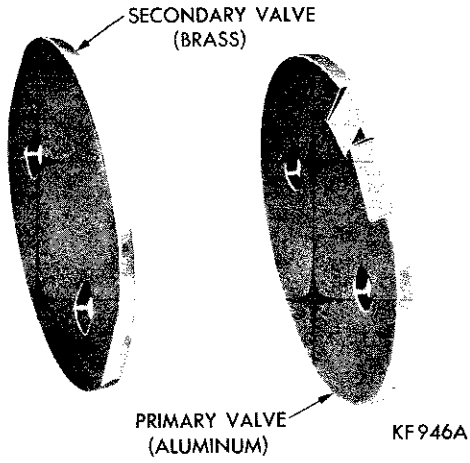


Fig. 8—Throttle Valve Identification

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

NOTE: 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 the gaskets. Refer to (Fig. 5). Install attaching screws and tighten securely.

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

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

Accelerator Pump Test

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

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

(3) If fuel does emit from the intake passage, remove the 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 the 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 the accelerator pump discharge check needle, jet housing and gasket. Install housing and attaching screws. Tighten screws securely.

(3) Press down on the accelerator pump plunger shaft, and as the 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 the gasoline from the carburetor bowl and remove pump plunger.

Assembling the Air Horn

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

(2) Check to see if the leather on the accelerator pump 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 the pivot screw enters the hole in the pump arm and that the shoulder on the screw has not pinched the 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 the new inlet needles requires 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.

NOTE: 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 the air horn, then install the float needle valve seats. (Be sure each needle seat and needle is reinstalled in its original position.)

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

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

Float Alignment Setting

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

(2) If the sides of the float are not in alignment

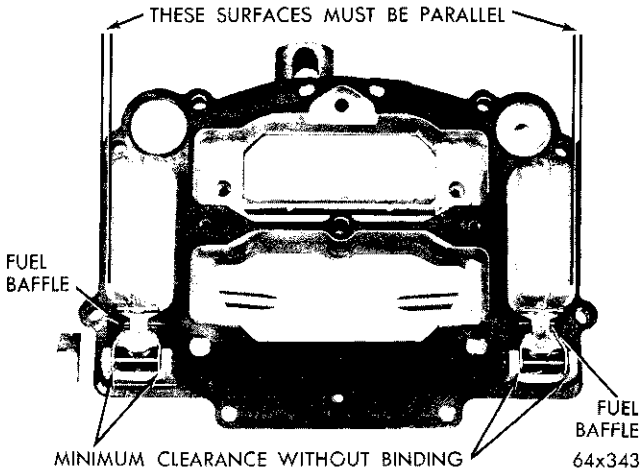


Fig. 9—Checking Float Alignment

with the edge of casting, bend the float lever by applying pressure to the end of the float shell with the thumb.

NOTE: To avoid damage to the float, apply only enough pressure to bend the float lever.

(3) After aligning the floats, remove as much clearance as possible between the arms of the float lever and the lugs of the air horn. To do this, bend the 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 the air horn inverted, the air horn gasket in place and the float needle seated, slide float gauge (refer to specifications for carburetor being worked on) between the top of the float (at outer end) and the air horn gasket, as shown in (Fig. 10). Float should just touch gauge (T109-106).

(2) Check the other float in the same manner. If an adjustment is necessary, bend the float arm using

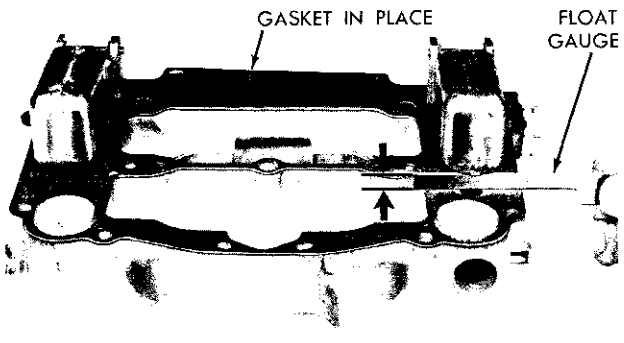


Fig. 10—Checking Float Height

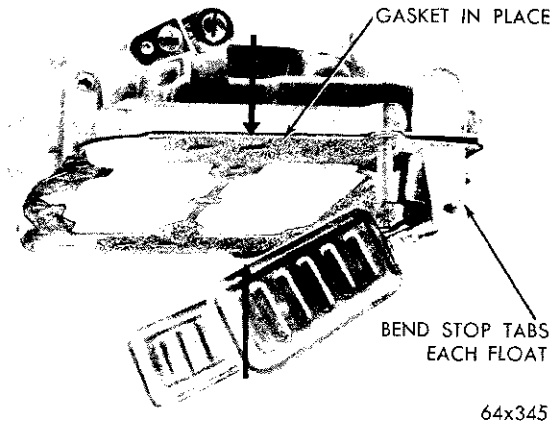


Fig. 11—Checking Float Drop

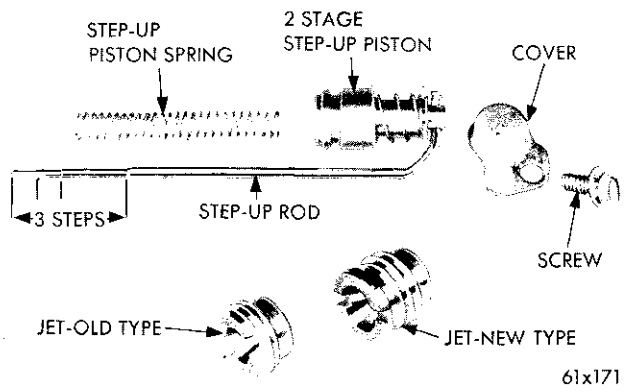


Fig. 12—Step-Up Piston, Rod and Jet

Tool T109-22, until correct clearance has been obtained. After bending arm, recheck the float alignment.

Float Drop Setting

(1) Holding the air horn in an upright position, measure the distance from the top of the 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 the float levers until the correct drop setting has been obtained. Bend the tab toward the needle seat to lessen the drop, or away from the seat to increase the drop.

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

(3) Place the accelerator pump plunger lower spring in the pump cylinder, then lower the air horn carefully down on the main body. Care must be taken to center the small brass main bleed tubes so that they will pass through the holes in the air horn without being damaged.

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

The change from the low speed, best fuel economy, road load mixtures to the 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 the step-up piston spring into the piston cylinders, followed by the step-up pistons and step-up rods. Install the cover plates and attaching screws while holding the step-up pistons down in position. Tighten screws securely.

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

(8) Engage the lower end of the fast idle connector rod with the 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 the carburetor and tighten the attaching screws securely.

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

(3) Inspect the rubber hose for cracks, before placing it on the 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 and 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 the fast idle speed adjusting screw contacting the step on the fast idle cam, shown in (Fig. 13), move the choke valve toward the closed position with light pressure. Insert a NO. 50 drill between the 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 the fast idle connector rod at the angle, using Tool T109-213 until the 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 the engine **Not** running, open the throttle valves far enough to allow the choke valve to be moved to the closed position.

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

(3) Insert the specified drill between the choke valve and the wall of the air horn. Refer to (Fig. 14). Apply sufficient closing pressure on the choke shaft lever to provide the smallest choke valve opening possible without distortion of the diaphragm link. Note that the cylindrical stem of the diaphragm will extend as an internal spring is compressed. The spring must be fully compressed for proper measurement of the kick adjustment.

(4) An adjustment will be necessary if a slight drag is not obtained as the 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 the clip and disengage the 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 the choke operating link to provide the correct choke valve opening.

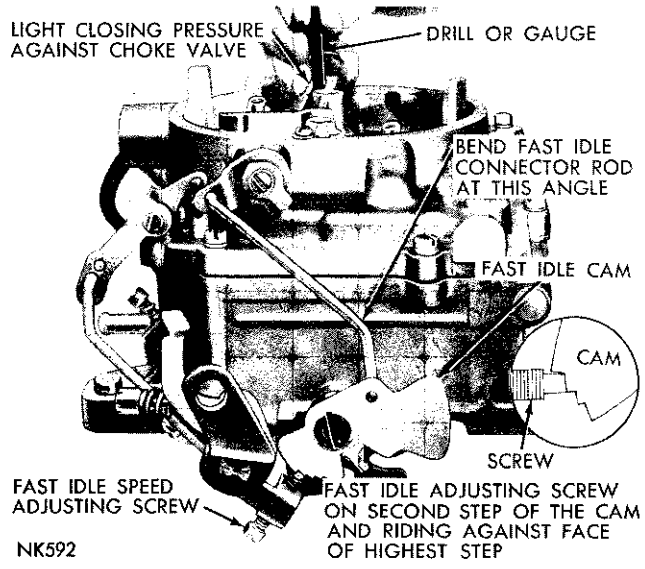


Fig. 13—Fast Idle Cam Position Adjustment

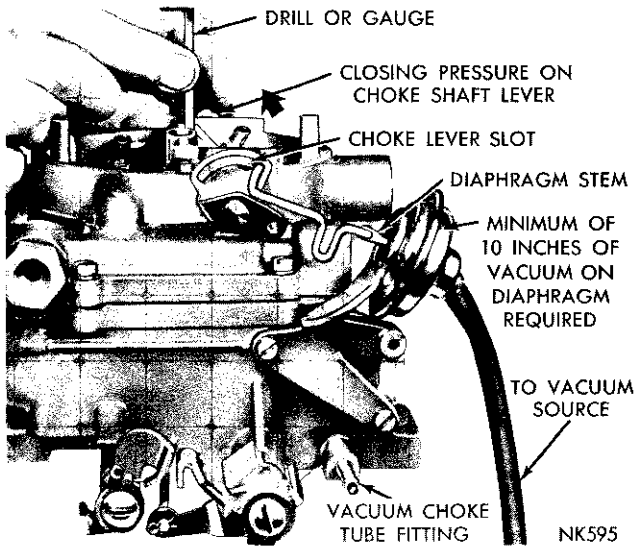


Fig. 14—Checking the Choke Vacuum Kick Setting

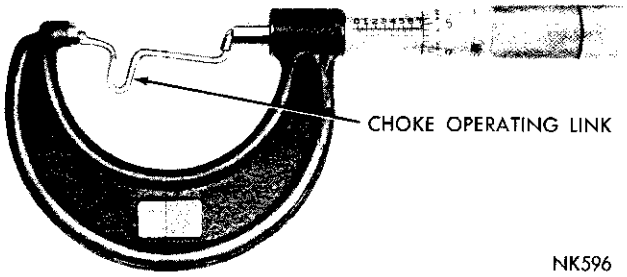


Fig. 15—Choke Operating Link Measurement

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

Reinstall the vacuum hose to the diaphragm and make the following check:

(8) With no vacuum applied to the diaphragm, some clearance should exist between the choke operating link and the choke lever slot, in both the open and closed choke valve positions, as shown in (Fig. 16).

NOTE: 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.

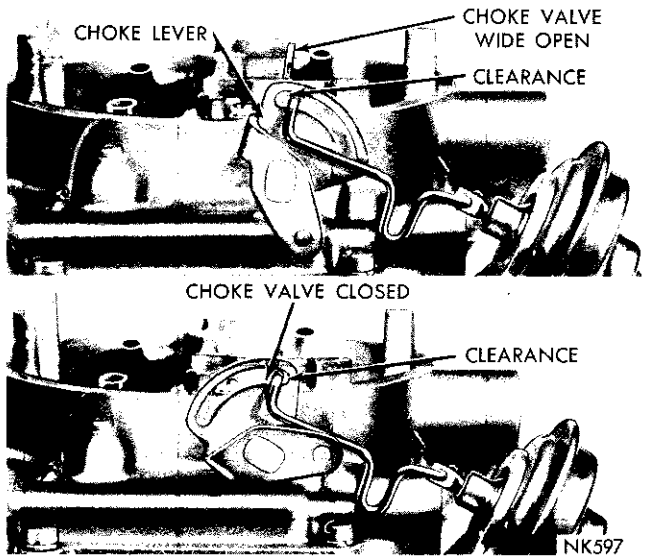


Fig. 16—Choke Operating Link Clearances

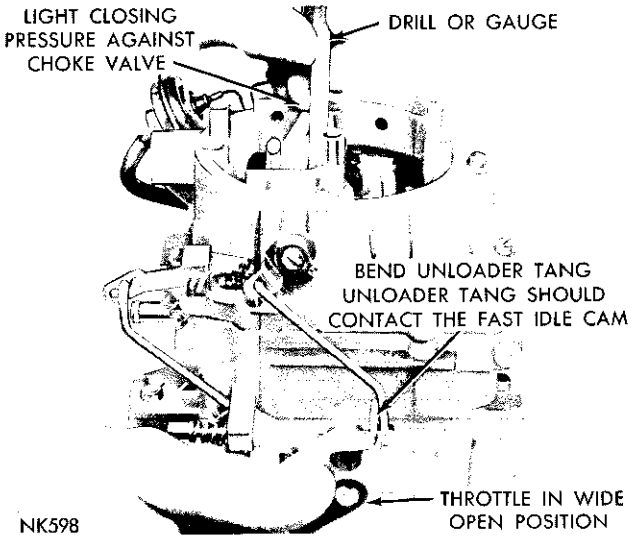


Fig. 17—Checking Choke Unloader (Wide Open Kick)

If a clearance does not exist in both of these positions, a recheck of the operating link adjustment should be made.

NOTE: Free movement of the choke valve between the closed and open positions is very necessary.

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 (⅜ 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.

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.

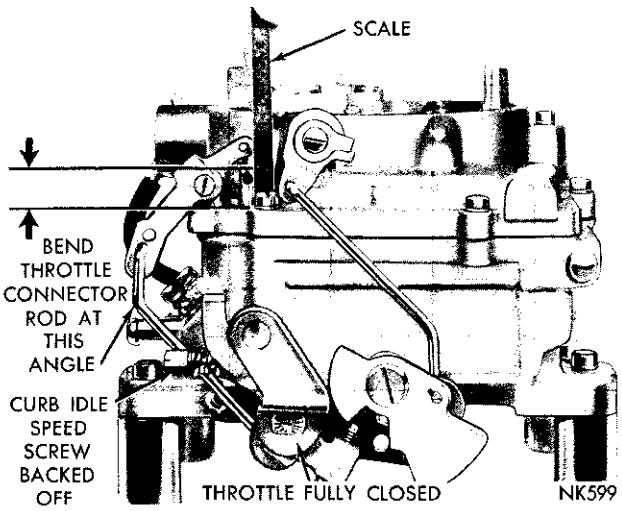


Fig. 18—Checking the Accelerator Pump Adjustment

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 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).

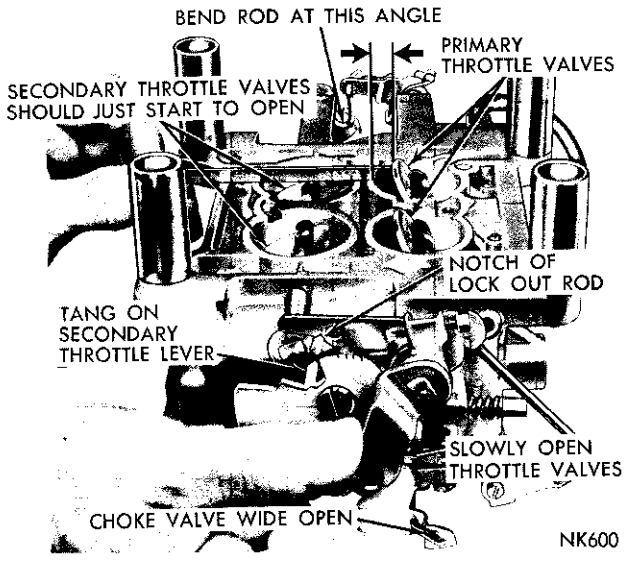


Fig. 19—Checking the Secondary Throttle Adjustment

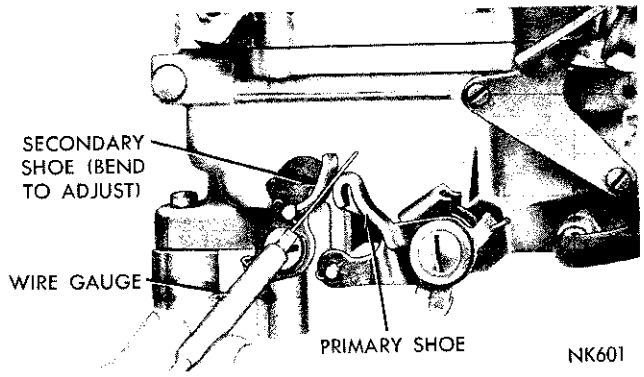


Fig. 20—Checking Clearance Between Closing Shoes

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)

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.

(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.

This 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 the engine running and the transmission in the neutral position, open the throttle slightly.

(2) Close the choke valve about 20 degrees, then allow the throttle to close. Return the choke valve to the wide open position.

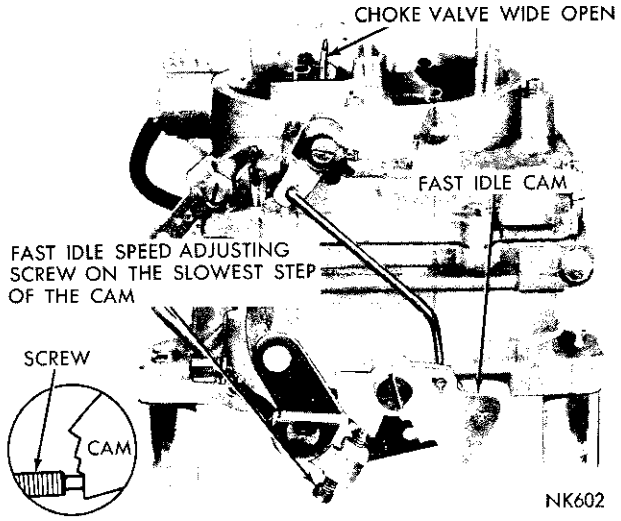


Fig. 21—Fast Idle Speed Adjustment (on the Vehicle)

(3) The fast idle speed adjusting screw should be contacting the slowest speed step on the fast idle cam, as shown in (Fig. 21).

(4) With the engine warmed-up to the normal operating temperature, turn the fast idle speed adjusting screw **in** or **out** to secure 700 r.p.m.

NOTE: Reposition the cam and throttle after every fast idle speed screw adjustment to apply normal throttle closing torque.

*After Approx. 500 Miles (If Necessary).

PART 5

FUEL PUMP—TANK

FUEL PUMP

Description

Fuel pump Model M-3672S is used on all Chrysler and Imperial engines. The fuel pump is of the pressed steel type and cannot be disassembled for service. If a pump malfunction occurs, remove the old pump and install a new one.

Operation

The fuel pump (Fig. 1) is driven by an eccentric cam (cast integral with the camshaft) through the medium of a short push rod.

As the camshaft rotates, the eccentric cam presses against the push rod, forcing the pump rocker arm down. This action lifts the pull rod and diaphragm upwards against the fuel pump main spring, thus creating a vacuum in the valve housing, which opens the inlet valve, forcing fuel into the valve housing chamber. On the return stroke, the main spring forces the diaphragm to the down position which closes the inlet valve and expels the fuel in the valve housing chamber, through the oulet valve to the fuel filter and the carburetor.

It is recommended that the fuel filter be replaced when performing an engine tuneup or at least every 20,000 miles. DO NOT ATTEMPT TO CLEAN.

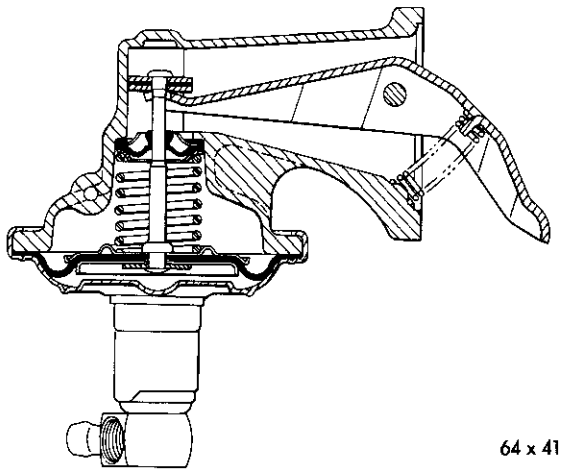


Fig. 1—Fuel Pump Assembly

Testing (On the Vehicle)

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

Pressure Test

If leakage is not apparent, test pump for pressure, as follows:

(1) Insert a "T" fitting in the fuel line at the carburetor, as shown in (Fig. 2).

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

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

(4) Connect a tachometer, then start the engine and run at 500 rpm. The reading should be from 3½ to 5 psi. The pressure should remain constant or return to zero very, very slowly when the engine is stopped. An instant drop to zero indicates a leaky outlet valve. If the pressure is too low, a weak main spring or improper assembly of the diaphragm may be the cause. If the pressure is too high, the main spring is too strong.

Vacuum Test

The vacuum test should be made with the fuel line

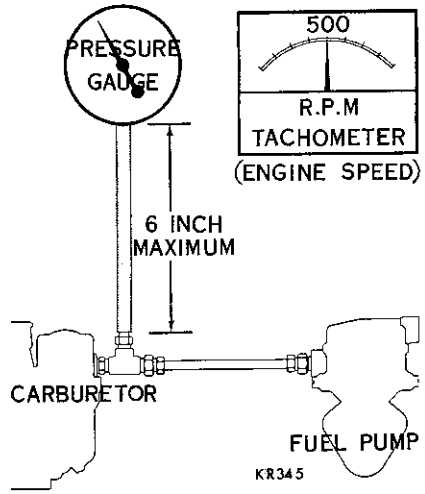


Fig. 2—Pressure Testing the Fuel Pump

disconnected from the carburetor. (This will allow the pump to operate at full capacity, which it must do to prime a dry carburetor.) The vacuum reading should be at least 10 inches of vacuum at 500 r.p.m. with the fuel line disconnected at the carburetor.

The vacuum reading should be at least 10″ of vacuum at 500 rpm with the fuel line disconnected at the carburetor.

Volume Test

The fuel pump should supply 1 quart of fuel in 1 minute or less at 500 rpm.

Inlet Valve Test

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

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

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

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

If the fuel pump does not perform to the above test requirements, the fuel pump should be removed from the vehicle.

FUEL TANK

The fuel tank on all models except Station Wagon Models is located at the rear of the body, under the trunk compartment floor, as shown in (Fig. 1). In Station Wagon models, the fuel tank is mounted in the left rear quarter panel beyond the wheel house, as shown in (Fig. 2).

If the vehicle is to be stored for any appreciable length of time, the gasoline should be drained from the entire system, in order to prevent gum formation. If the vehicle has been undercoated, be sure the fuel tank vent tube (under kickup in floor pan) is open. If this is not done, a collapsed fuel tank will result.

The fuel tank on all models except Station Wagon has a 25 gallon capacity. The Station Wagon capacity is 22 gallons. The filler tube on the conventional models is accessible through the center of the deck opening lower panel, while the Station Wagon fills at the left rear upper quarter panel between the quarter post and the fin. The fuel tank is fitted with a gauge unit, including the suction pipe, as shown in (Fig. 3).

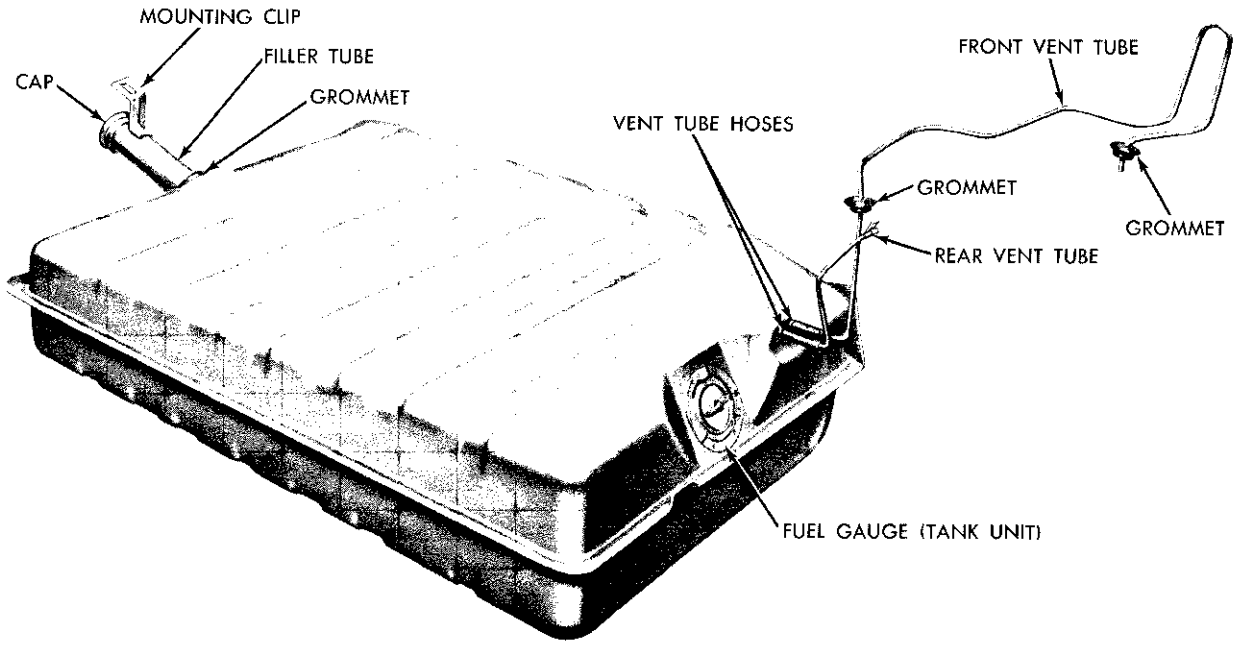


Fig. 1—Fuel Tank Mounting (Chrysler—Except Station Wagon)

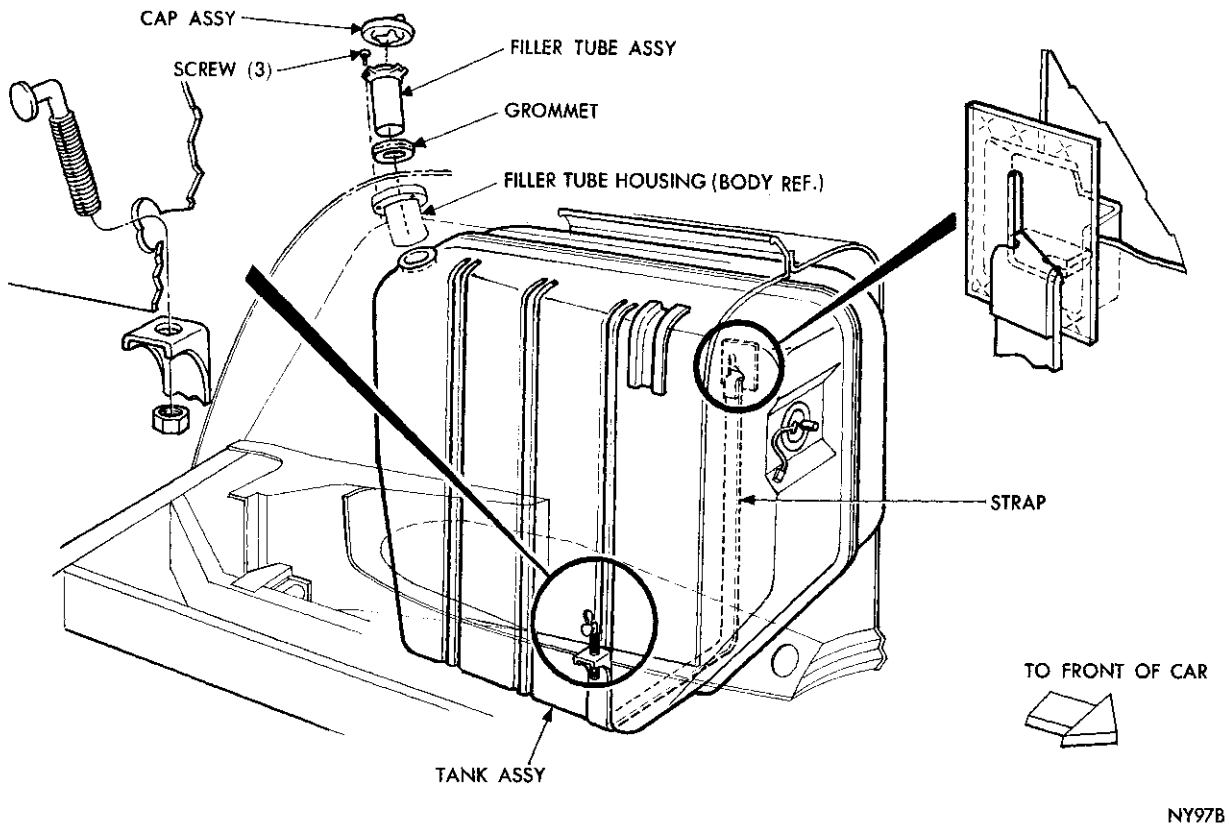


Fig. 2—Fuel Tank Mounting (Station Wagon)

The filter on the end of the suction pipe is replaceable unit and prevents the entry of water and dirt. When installing a tank unit, be sure the filter is pushed on the end of the tube until seated.

REMOVING THE FUEL TANK (Except Station Wagon and Imperial)

CAUTION: Be sure the ignition switch is turned off before disconnecting or connecting the gauge wire.

Removal

(1) Drain the tank into a safety can, then disconnect the fuel line and the wire lead to the gauge unit.

(2) Disconnect the vent tube at the hose connection at the leading edge of the tank.

(3) Remove the screw that attaches the filler tube bracket to the trunk panel.

(4) Remove the nuts that hold the ends of the fuel tank hold down straps to the frame. Lower the front

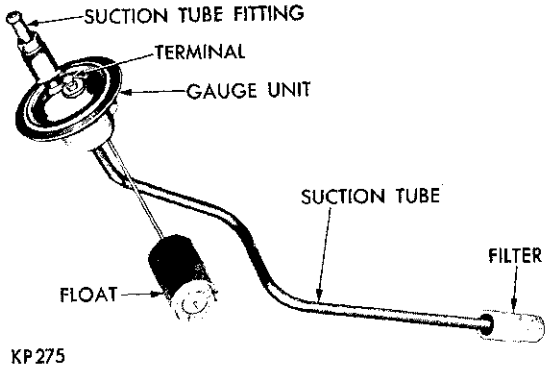


Fig. 3—Fuel Gauge (Tank Unit)

end of the tank far enough to disengage the filler tube from the rear panel and slide out from under the vehicle.

(5) Remove the tank gauge unit, using spanner wrench Tool C-3582 (Fig. 3). Check the rubber grommet around the filler tube. If cracked or deteriorated, install a new grommet at reassembly.

Installation

Before installing the tank gauge unit, check the condition of the filter on the end of suction tube. If the filter is plugged, plastic will not corrode, install a new filter.

(1) Position the fuel tank gauge unit in the tank, using a new gasket. Tighten securely, using Tool C-3582.

(2) Slide the fuel tank under the vehicle. Raise the tank far enough to engage the filler spout with the opening in the rear panel, and the locator embossments on the floor pan.

(3) Push the tank toward the rear to fully engage the filler spout in the opening.

(4) Hold the fuel tank in this position, and place the hold down straps in position, feeding the attaching studs through holes in the end of the straps. Install the nuts but do not tighten.

(5) Guide the button head of the studs into the slots in the frame and down into position. Tighten the hold down strap attaching nuts securely. (60 in-lbs).

(6) Install the filler tube mounting screw and tighten securely.

(7) Connect the lead wire to the tank gauge unit and reconnect the fuel line.

(8) Refill the tank and check for leaks.

FUEL TANK AND FILLER TUBE (Imperial)

Removal

CAUTION: Disconnect the battery cable at the battery post before disconnecting or connecting the fuel gauge wire.

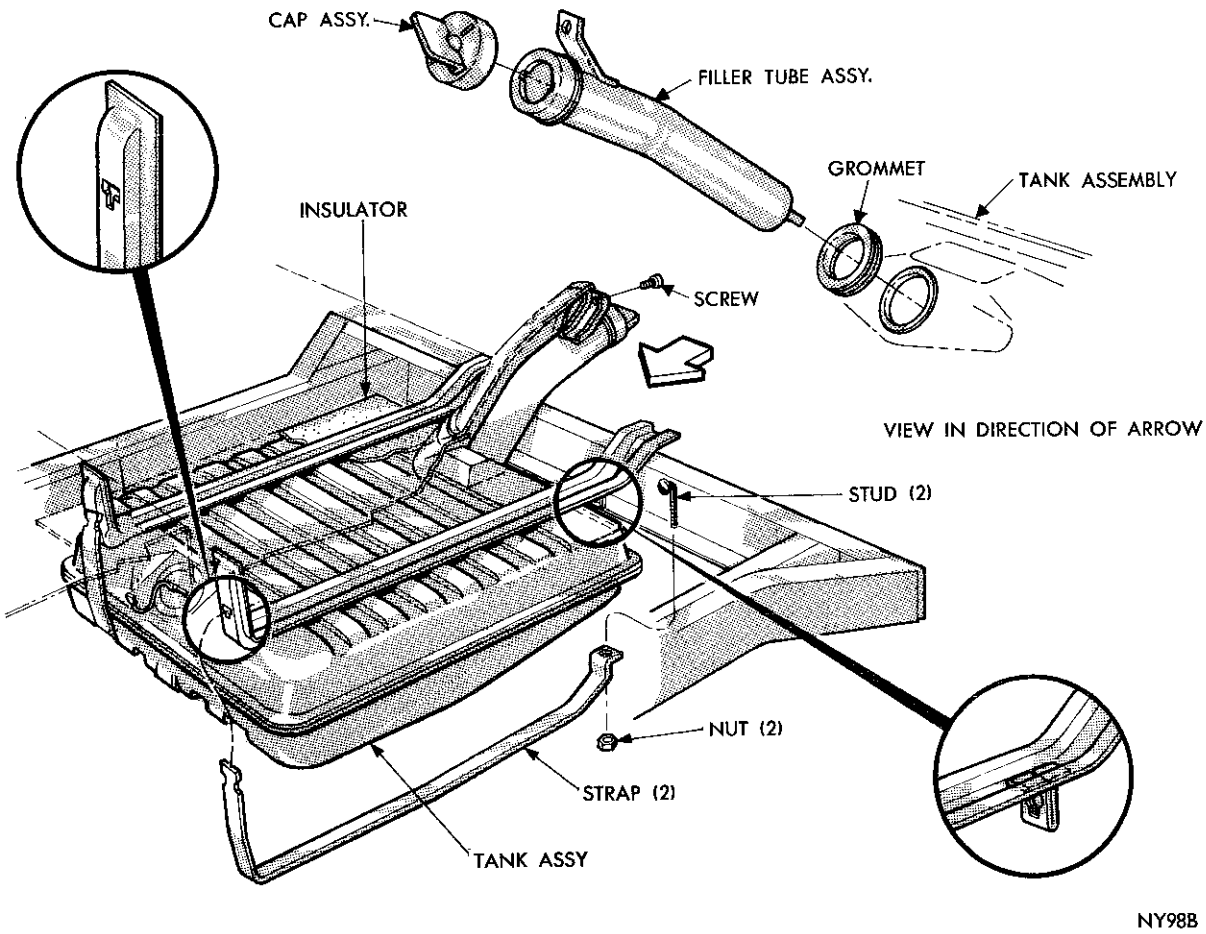


Fig. 4—Fuel Tank Mounting (Imperial)

(1) Drain the tank, then disconnect the fuel line and the lead wire to the fuel gauge unit.

(2) Remove the screw that attaches the filler tube bracket to the trunk panel.

(3) Push the tube into the tank far enough for the tube bracket to clear the trunk panel. Push the tube downward slightly so that the mounting bracket clears the opening in the panel. Pull the tube out of the tank, using a suitable tool.

(4) Loosen the nuts that hold the ends of the fuel tank tie down straps until the button heads can be disengaged from the floor pan brackets. Disengage the studs from the brackets, then lower the tank to the floor.

(5) Remove the tube grommet and inspect. If the grommet is cracked or deteriorated, install a new grommet at reassembly.

(6) Remove the gauge tank unit, using spanner wrench Tool C-3582. Discard the gasket.

Installation

NOTE: When installing a new tube seal, be sure the diameter of the seal lip is placed in the tank opening. Do not use any lubricant on the seal at the tank contact surface.

NOTE: Before installing the tank gauge unit, inspect the condition of the filter on the end of the suction tube. If the filter is plugged, install a new filter unit.

(1) Position the fuel tank gauge unit in the tank, using a new gasket. Using Tool C-3582, tighten the unit securely.

(2) Install a new filler tube seal in the tank opening, as described above. Lightly coat the inner side of the seal with lubriplate.

(3) Slide the tank up into position, against the locator embossments on the floor pan. Install the button head studs in the slots in the floor pan brackets. Snug down the nuts, but do not tighten.

(4) Check and be sure the fuel tank is in the correct position, then tighten the nuts securely.

(5) Connect the fuel line to the tank fitting and the lead wire to the gauge unit.

(6) Insert the filler tube through the trunk panel and insert into the seal. Push the tube into the tank far enough for the tube mounting bracket to clear the trunk panel opening. Slightly pull the tube out of the tank until the bracket aligns with the mounting screw hole. Install the screw and tighten securely.

(7) Refill the tank and inspect for leaks.

FUEL TANK (Station Wagon) (Fig. 2)

Removal

CAUTION: Be sure the Ignition Switch is turned OFF before disconnecting or connecting the gauge wire.

(1) Drain the tank into safety can, then disconnect the fuel line and the lead to the gauge unit under the rear fender, behind the wheel house.

(2) Remove the screws that attach the stone shield to the lower edge of the wheel house at the rear. Remove the shield.

(3) Remove the button plug at the rear of wheel house (in front of gauge unit).

(4) Raise the vehicle on a frame type hoist to allow the rear axle to fall away from the body. Disconnect the left shock absorber.

(5) Disconnect the rear hangers on both springs and swing the axle forward, using a suitable support.

(6) Remove the bolt and washer that attaches the tank hold down strap to the lower support.

(7) Remove the filler cap and the filler tube sleeve attaching screws. Using a suitable tool, or Tool C-3584, put out the filler tube. (In some cases, it will be necessary to lubricate the rubber grommet to remove the filler tube. Squirt light engine oil (SAE 10) down the side of the filler tube. Work the filler tube back and forth to work the oil between the filler tube and the grommet.) Slide the sleeve out of the body opening. Remove the gasket from sleeve.

(8) Slide the tank down and out from under the quarter panel. Reach up under the quarter panel and disengage the hold down strap from the bracket. If strap is to be replaced, refer to (Fig. 2).

(9) Loosen the tank gauge unit, using a spanner wrench Tool C-3582. Slide the unit up and out of the tank.

Check the condition of the rubber grommet. If cracked or deteriorated, install a new grommet at reassembly.

Installation

Before installing the fuel gauge assembly, check the filter on the end of the suction tube. If the filter is plugged, install a new filter. Position the fuel tank gauge in the tank, using a new gasket. Tighten securely, using Tool C-3582.

To install the fuel tank, refer to (Fig. 2), then proceed as follows:

(1) Position the fuel tank gauge unit in tank, using a new gasket. Tighten securely using Tool C-3582.

(2) Slide the hold down strap up under this quarter panel, inserting the end of strap into slot. Allow the strap to hang.

(3) Install a new grommet in the neck of the tank. Refer to (Fig. 2).

(4) Slide the tank up under the quarter panel with the gauge unit facing front of the vehicle. Push the tank up into position, with the locator embossments on the body aligned with those on the tank. Make sure the filler neck is aligned with the opening in top

of the quarter panel. Attach with the strap and bolt. Do not tighten.

(5) Place a new gasket over the filler tube and down against the flange. Insert the filler tube down into neck of tank. Be sure the anchor tab on the tube is aligned with a screw hole. Install the screws and tighten securely.

(6) Tighten the fuel tank hold down strap bolt squarely.

(7) Install the stone shield. Connect fuel line and lead to gauge unit. Reinstall the button plugs. Refill the tank and check for leaks.

(8) Swing the rear axle rearward and connect the rear hangers on both springs.

(9) Connect the left rear shock absorber.

For cleaning the fuel gauge, refer to the "Electrical" Group 8 "Gauges."

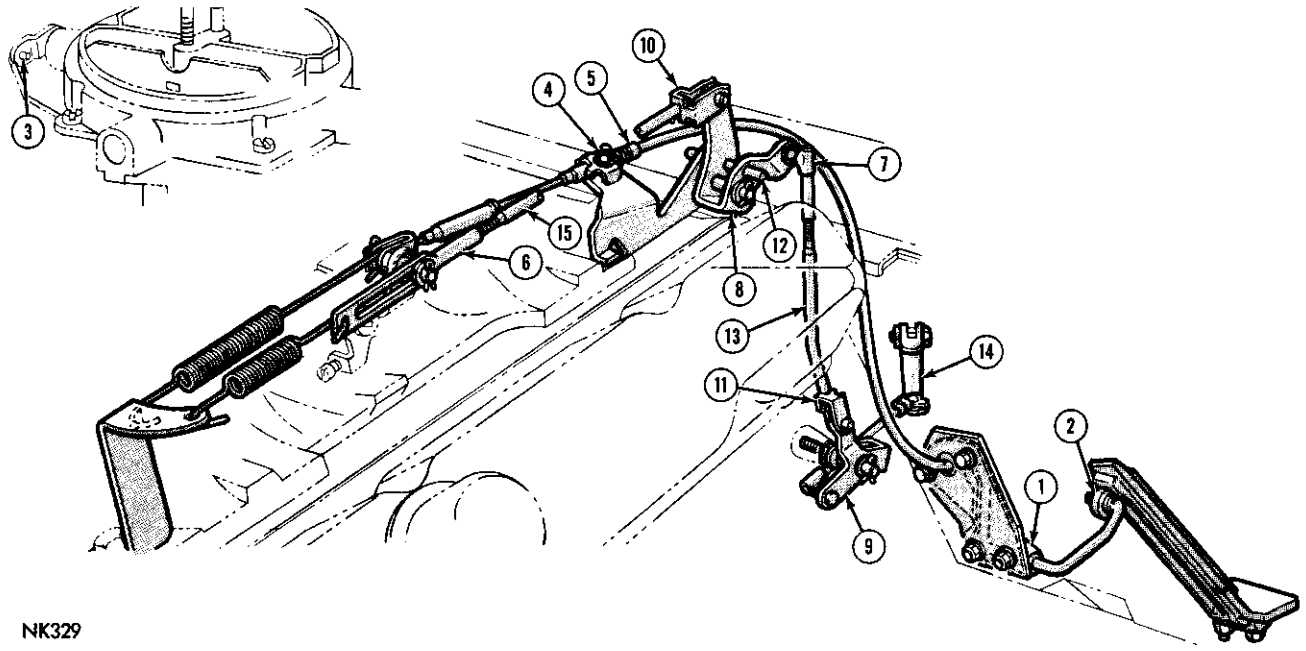


Fig. 1—Throttle Linkage Adjustment AC-1, AC-2, AC-3 with 383 or 413 Cu. In. Eng.

PART 6

THROTTLE LINKAGE ADJUSTMENT

AUTOMATIC TRANSMISSION (FIG. 1)

(Models AC-1, AC-2, AC-3 with 383 or 413 Cu. In. Eng.)

(1) Apply a thin film of multi-purpose grease on both ends of the accelerator shaft [1] where it turns in the bracket, nylon roller [2] where it contacts the pedal, pivot points of both upper [8] and lower [9] transmission linkage bellcranks, also the clipped ends of transmission linkage rod bearing areas [10] [11].

(2) Disconnect the return spring and slotted transmission rod [6] from the carburetor lever pin. Disconnect the transmission intermediate rod ball socket [7] from the upper bellcrank ball end.

(3) Disconnect choke [3] at carburetor or block choke valve in full open position. Open throttle slightly to release fast idle cam, then return carburetor to curb idle.

(4) With a $^{3}/_{16}$ inch diameter rod [12] placed in the holes provided in the upper engine mounted bellcrank and lever [8], adjust the length of the intermediate transmission rod [13] by means of the threaded adjustment at the upper end. The ball socket [7] must line up with the ball end with the rod held upward against the transmission stop [14].

(5) Assemble ball socket [7] to ball end and remove $^{3}/_{16}$ inch rod [12] from upper bellcrank and lever.

(6) Hold the carburetor rod [15] forward against the transmission stop [14] and adjust its length by means of the threaded adjustment so that the rear end of the slot in the adjusting link [6] just contacts the carburetor lever pin.

(7) Lengthen the carburetor rod [15] two full turns by turning the slotted link [6].

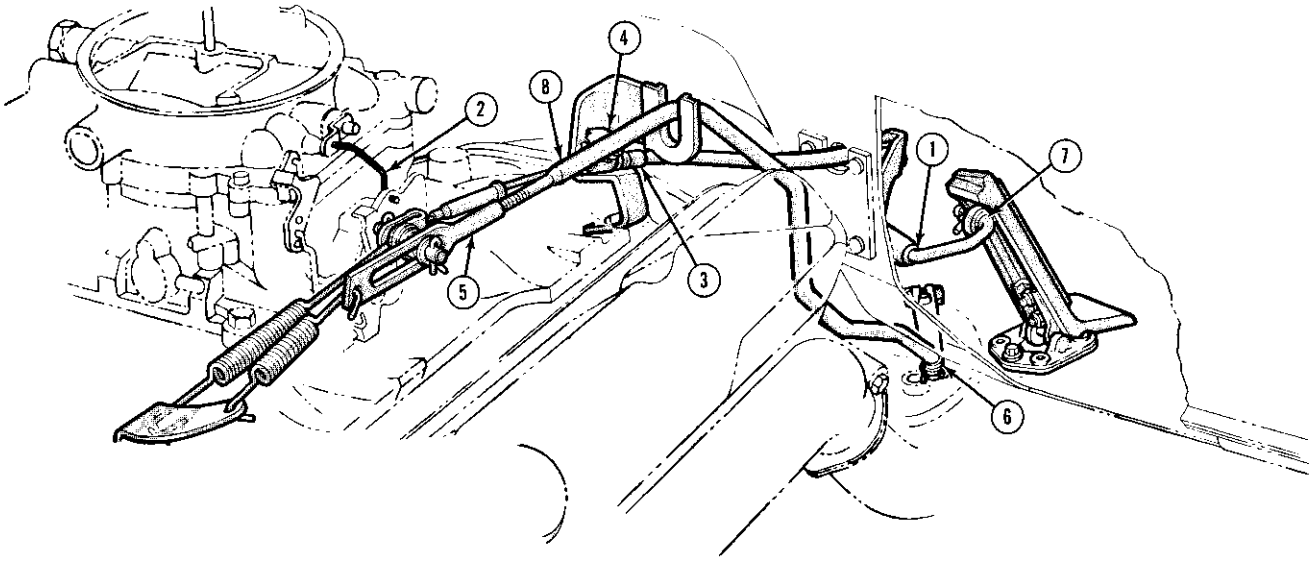
(8) Assemble slotted link [6] to the carburetor.

(9) Loosen the cable clamp nut [4], then adjust the position of the cable housing ferrule [5] in the clamp so that all slack is removed from the cable with the carburetor at curb idle. To remove slack from the cable, move the ferrule [5] in the clamp in the direction away from the carburetor lever.

(10) Back off ferrule [5] ¼ inch. This provides ¼ inch cable slack at idle. Tighten cable clamp nut [4].

(11) Route cable so it does not interfere with the carburetor rod [15] or upper bellcrank [8] throughout full throttle linkage travel.

(12) Connect choke rod [3] or remove blocking fixture.



NK 335

Fig. 2—Throttle Linkage Adjustment (Imperial)

MANUAL TRANSMISSION (FIG. 1)

(Models AC-1, AC-2 with 383 or 413 Cu. In. Eng.)

(1) Apply a thin film of multi-purpose grease on both ends of the accelerator shaft [1] where it turns in the bracket, and nylon roller [2] where it contacts the pedal.

(2) Disconnect choke [3] at carburetor or block choke valve in full open position. Open throttle slightly to release fast idle cam, then return carburetor to curb idle.

(3) Loosen the cable clamp nut [4], then adjust the position of the cable housing ferrule [5] in the clamp so that the slack is removed from the cable with the carburetor at curb idle. To remove slack from the cable move the ferrule [5] in the clamp in the direction away from the carburetor lever.

(4) Back off ferrule [5] ¼ inch. This provides ¼ inch cable slack at idle. Tighten cable clamp nut [4].

(5) Connect choke rod [3] or remove blocking fixture.

AUTOMATIC TRANSMISSION—Imperial (Fig. 2)

(1) Apply a thin film of multi-purpose grease on both ends of the accelerator shaft [1] where it turns in the bracket, and nylon roller [7] where it contacts the pedal.

(2) Disconnect the return spring and slotted transmission rod [5] from the carburetor lever pin.

(3) Disconnect choke [2] at carburetor or block choke valve in full open position. Open throttle slightly to release fast idle cam, then return carburetor to curb idle.

(4) Hold the transmission lever [8] forward against its stop (rod or lever must not be moved vertically while holding against the stop) and adjust the length of the transmission rod by means of the threaded adjustment [5] at the upper end. The rear end of the slot should contact the carburetor lever pin without exerting any forward force.

(5) Lengthen rod by 1 full turn of the adjustment [5].

(6) Assemble slotted adjustment [5] to carburetor lever pin and install washer and retainer pin. Assemble transmission linkage return spring in place. To check transmission linkage freedom of operation, move slotted adjuster link [5] to the full rearward position, then allow it to return slowly, making sure it returns to the full forward position.

(7) Loosen cable clamp nut [4], then adjust the position of the cable housing ferrule [3] in the clamp so that all slack is removed from the cable with the carburetor at curb idle. To remove slack from the cable, move the ferrule [3] in the clamp in the direction **away** from the carburetor lever.

(8) Back off ferrule [3] ¼ inch. This provides ¼ inch cable slack at idle. Tighten cable clamp [4] nut.

(9) Route cable so that it does not interfere with the transmission rod throughout its full travel.

(10) Connect choke rod [2] or remove blocking fixture.