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1960 - 1967 Carburetor Service Manual

Poly A-block 313 and 318

Contents

(PDF Page Numbers)

GENERAL INFORMATION

The fuel system consists of the fuel tank, fuel pump, fuel filter, carburetor, fuel lines and vacuum lines. (See Figure 1.)

The fuel tank assembly consists of the tank, filler neck cap, air vent, and a fuel gauge sending unit.

In operation, the fuel pump draws fuel from the tank and forces it to the filter and carburetor. The carburetor meters the fuel into the air stream drawn into the engine, in quantities suitable for all engine speed and load conditions.

The fuel filter for 1965 is a paper element sealed, disposable type unit, located in the fuel line between the fuel pump and the carburetor. The filter unit should be replaced every 20,000 miles.

SERVICING THE CARBURETORS

Often, the carburetor is blamed for a great variety of trouble which is classed as "POOR CAR PERFORMANCE." Therefore, be definitely sure that the trouble is not located elsewhere before disassembling the carburetor.

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

(1) The carburetor must be completely disassembled.

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

(3) Use air pressure only, to clean the various orifices or channels.

(4) Replace questionable parts with NEW ONES. When checking parts removed from the carburetor, it is at times difficult to be sure they are satisfactory for further service. It is therefore recommended that in such case, NEW parts be installed.

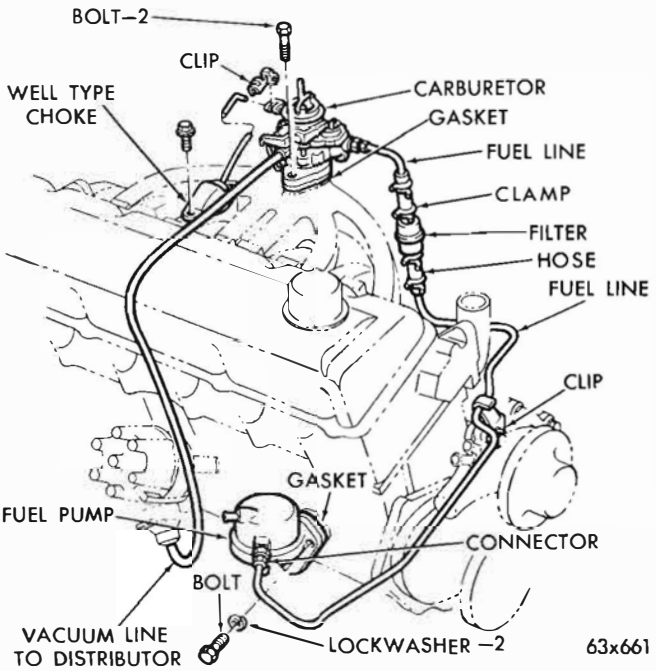

Fig. 1—Fuel System (Engine Compartment)

CLEANING CARBURETOR PARTS

The recommended solvent for gum deposits is denatured alcohol which is easily obtainable. However, there are other commercial solvents 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 a soft wire brush. Shake dirt or other foreign material from the stem (plunger) side of the diaphragm. Depressing the 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 diaphragm 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 kerosene or gasoline to be certain no trace of moisture remains. Never clean jets with a wire, drill, or other mechanical means, because the orifices may be-

come enlarged, making the 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 choke requires no servicing. However, it is very important that the choke control unit work freely in the well and at the choke shaft. Move the choke rod up and down to check for free movement in the pivot. If the unit binds, a new choke 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 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, be certain that the coil housing does not contact the sides of the well in the exhaust manifold. Any contact at this point will affect choke operation. DO NOT lubricate any parts of the choke or the control unit. This causes an accumulation of dirt which will result in binding of the mechanism.

CLOSED CRANKCASE VENT SYSTEM

The closed crankcase ventilator valve is located in the crankcase vent tube cap and is connected to the carburetor throttle body via a rubber tube.

The function of the valve is to regulate the flow of unburned hydrocarbons from the crankcase and return them to the intake manifold. From here they enter the combustion chamber and then exit via the exhaust system as completely burned exhaust products.

For servicing procedures of this valve, refer to Engine Section of this Manual.

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 discharge 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 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.
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.

Condition	Possible Cause	Correction
	(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.
CARBURETOR FLOODS OR LEAKS	(a) Cracked body.	(a) Disassemble the carburetor. Replace the cracked body. Make sure main to throttle body screws are tight.
	(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.
CARBURETOR MIXTURES LEAN	(a) Air leak bypassing the carburetor.	(a) Correct the air leak.
	(b) Carburetor has economy metering system.	(b) Install standard metering jets and/or step-up wires.
ENGINE RUNS EXCESSIVELY RICH AFTER COLD START		
CHOKE SYSTEM RICH	(a) Choke thermostat adjustment richer than specified.	(a) Adjust the choke.
	(b) Choke thermostat distorted rich by overheating.	(b) Replace, since this problem can be corrected by use of proper choke assembly.

Condition	Possible Cause	Correction
	(c) Choke vacuum diaphragm inoperative or misadjusted.	(c) Repair or replace the vacuum unit.
	(d) Choke Vacuum passage blocked or leaking.	(d) Open the passage. Correct any leaks.
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) Check 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.
CARBURETOR LEAN	(a) Curb idle very lean.	(a) Adjust the idle mixture.
	(b) Air leak bypassing the carburetor.	(b) Correct the air leak.
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 in correct procedure for starting.
CHOKE VALVE FAILS TO CLOSE	(a) Choke thermostat adjustment leaner than specified.	(a) Adjust the choke thermostat.
	(b) Choke thermostat corroded such that it has cracked and distorted lean.	(b) Replace the choke thermostat 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 linkage as required.
	(d) Choke valve improperly seated.	(d) Relocate the choke valve.
	(e) Air cleaner interferes with choke shaft or linkage.	(e) Rotate cleaner to correct position, and tighten.
	(f) Air cleaner gasket interferes with choke valve or linkage.	(f) Install gasket properly.
LOW ENGINE OUTPUT (10°F or lower)	(a) Engine lubricating oil of incorrect viscosity.	(a) Recommend 5W-20.
	(b) Valve clearing incorrect.	(b) Adjust tappets.
	(c) Choke thermostat adjustment incorrect, rich.	(c) Adjust to correct setting.
ENGINE RUNS LEAN, FIRST HALF MILE		
CHOKE LEAN	(a) Check items under (Poor Starting).	(a) See "Choke Valve Fails to Close."
	(b) Diaphragm adjustment lean.	(b) Adjust to specification.
ENGINE RUNS LEAN AFTER HALF MILE		
ENGINE HEAT INSUFFICIENT	(a) Heat valve stuck open.	(a) Free up 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 sub-normal.	(d) Test engine. Replace if necessary.

FUEL PUMP

Condition	Possible Cause	Correction
FUEL PUMP LEAKS—FUEL	(a) Worn, ruptured or torn diaphragm.	(a) Install a new fuel pump.
	(b) Loose diaphragm mounting plates.	(b) Install a new fuel pump.
	(c) Loose inlet or outlet line fittings.	(c) Tighten the line fittings.
FUEL PUMP LEAKS—OIL	(a) Cracked or deteriorated pull rod oil seal.	(a) Install a new pump.
	(b) Loose rocker arm pivot pin.	(b) Install a new fuel pump.
	(c) Loose pump mounting bolts.	(c) Tighten the mounting bolts securely.
	(d) Defective pump to block gasket.	(d) Install a new gasket.
INSUFFICIENT FUEL DELIVERY	(a) Vent in tank filler cap restricted. This will also cause collapsed fuel tank.)	(a) Install new cap, and inspect tank for leaks.
	(b) Leaks in fuel line or fittings.	(b) Tighten the line fittings.
	(c) Dirt or restriction in fuel tank.	(c) Install a new fuel filter and clean out the tank.
	(d) Worn, ruptured, or torn diaphragm.	(d) Install a new pump.
	(e) Frozen gas lines.	(e) Thaw the lines and drain the tank.
	(f) Improperly seating valves.	(f) Install a new fuel pump.
	(g) Vapor lock.	(g) Install heat shield where lines or pump are near exhaust.
	(h) Low pressure.	(h) Install a new fuel pump.
	(i) Incorrect fuel pump.	(i) Install correct fuel pump.
	(j) Restricted fuel filter.	(j) Install a new filter.
FUEL PUMP NOISE	(a) Loose mounting bolts.	(a) Tighten the mounting bolts.
	(b) Scored or worn rocker arm.	(b) Install a new fuel pump.
	(c) Weak or broken rocker arm spring.	(c) Install a new spring.

PART 3

BBS SERIES CARBURETOR

Description

The BBS series carburetor is a single throat downdraft carburetor.

The BBS-3833S and the BBS-3834S carburetors used on the 170 cu. in. engine are equipped with a spring staged choke, as shown in (Fig. 1). The BBS-3835S and the BBS-3836S carburetors are used on the 170 cubic inch engine when equipped with air conditioning and the cable control throttle linkage.

The BBS-3839S and the BBS-3840S carburetors used on the 225 cu. in. engine are equipped with the conventional choke mechanism, but have the cable control throttle lever, as shown in (Fig. 2).

The BBS-3841S carburetor on the 170/225 cu. in. engine (taxi application) and the BBS-3837S and the BBS-3838S used on the 225 cu. in. engine (High Performance with manual and automatic transmissions), the BBS-3839 and BBS-3840S carburetors used when equipped with air conditioning are serviced the same as the previously mentioned BBS carburetors.

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

The spring staged choke, shown in (Fig. 1) 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.

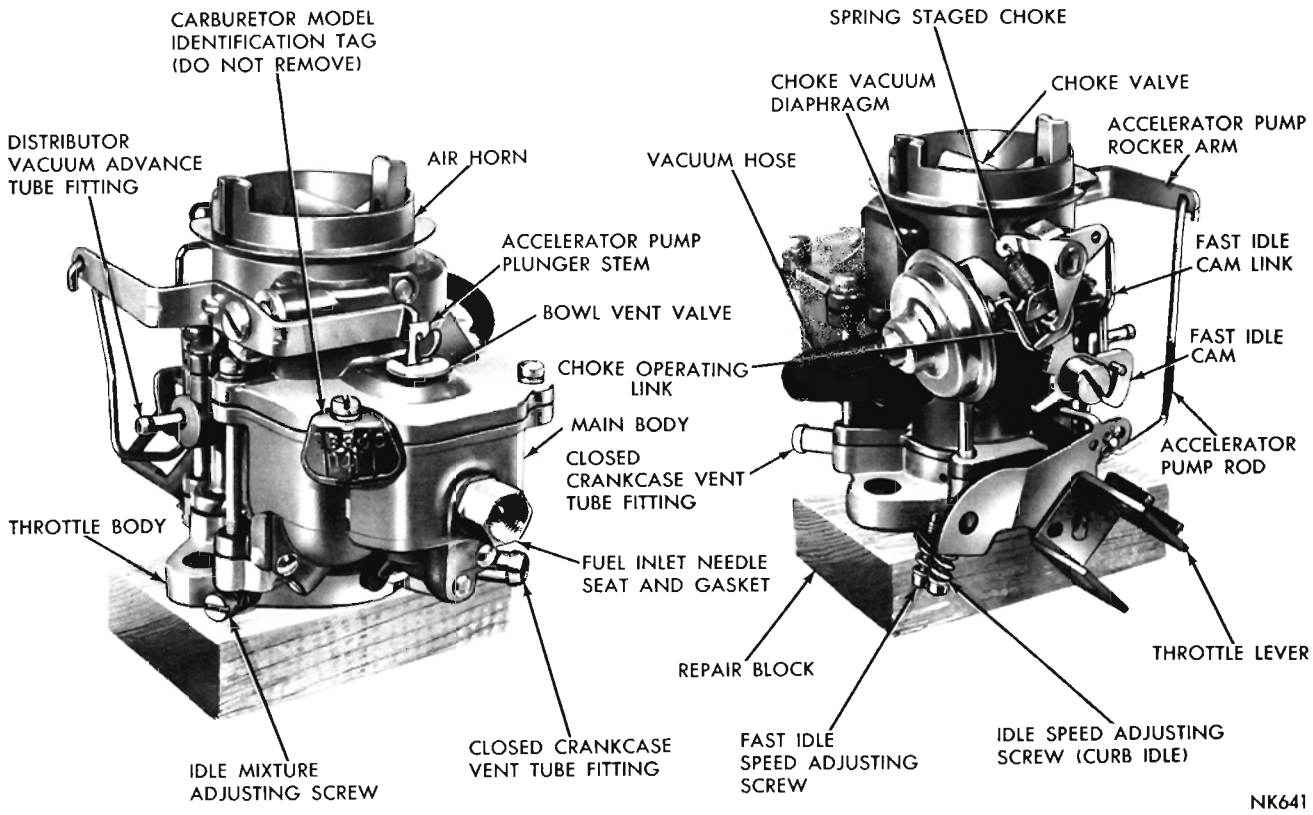

Fig. 1—Carburetor Assembly (BBS-3833S and BBS-3834S, Typical of BBS-3835S and BBS-3836S)

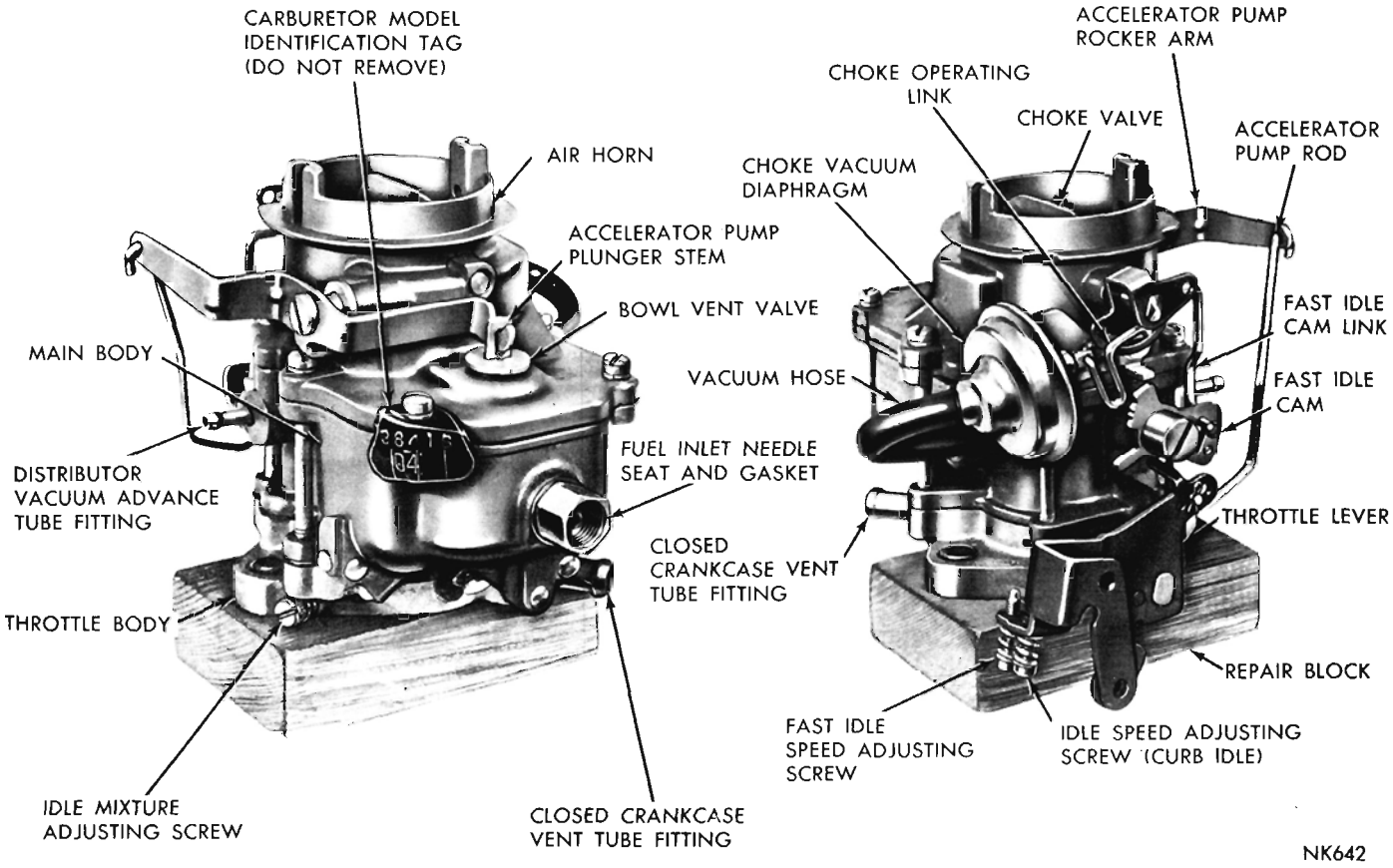

Fig. 2—Carburetor Assembly (BBS-3839S, BBS-3840S and S-3841S Typical of BBS-3837S and BBS-3838S

SERVICE PROCEDURES

DISASSEMBLY

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

(1) Place the carburetor assembly on repair block, Tool C-3225.

(2) Remove hairpin clip and disengage the accelerator pump operating rod.

(3) Remove the vacuum hose between the carburetor main body and the vacuum diaphragm.

(4) 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).

(5) 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.

(6) Remove the air horn retaining screws.

(7) Tilt the air horn toward the throttle lever far enough to disengage the fast idle cam link from the fast idle cam, as shown in (Fig. 3). Lift air horn up and away from main body. Discard the gasket.

(8) Disengage the accelerator pump plunger from the rocker arm, by pushing up on the bottom of plunger and sliding plunger shaft off hook. Slide plunger out of air horn and remove bowl vent valve, spring seat and spring. If the old plunger can be used

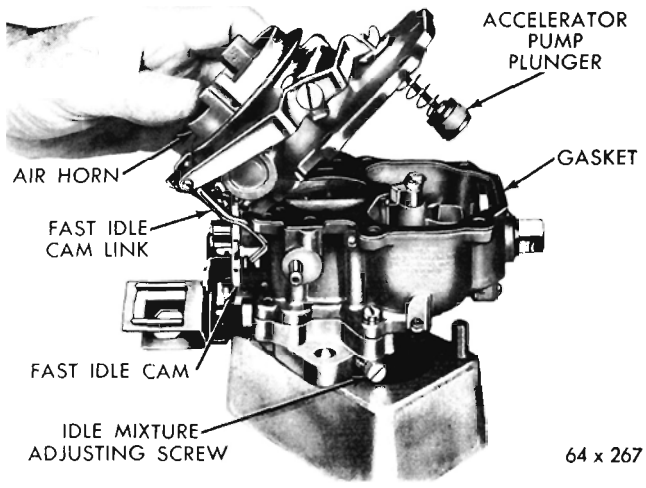

Fig. 3—Removing or Installing Air Horn

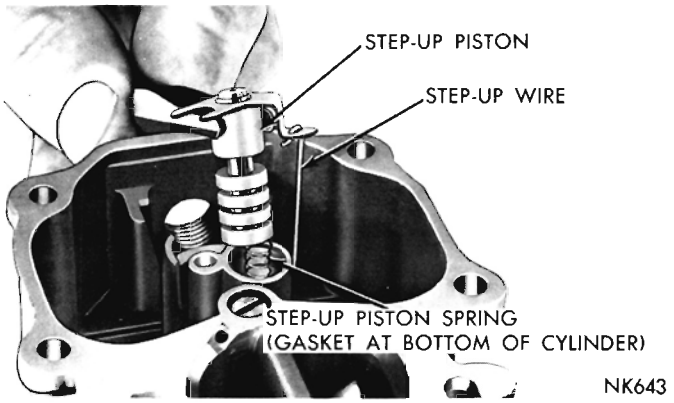

Fig. 4—Removing or Installing Step-Up Piston

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

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

(11) Remove the step-up piston retaining screw, and slide step-up piston and rod out of well, as shown in (Fig. 4). Now lift out the step-up piston spring. Remove the step-up piston gasket from the bottom of the well.

(12) Remove the main metering jet and gasket, as shown in (Fig. 5).

(13) Unscrew and remove the idle orifice tube, as shown in (Fig. 6).

(14) Invert the carburetor and drop out the accelerator pump check balls from their respective seats.

(15) Using Tool T109-43 plug remover, remove the accelerator pump jet plug. Using Tool T109-59T, remove the accelerator pump jet, as shown in (Fig. 7).

(16) Unscrew and remove the idle mixture adjusting screw and spring.

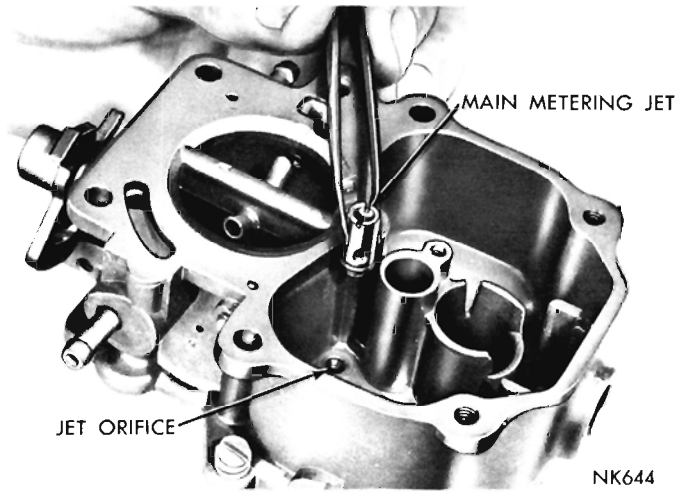

Fig. 5—Removing or Installing Main Metering Jet

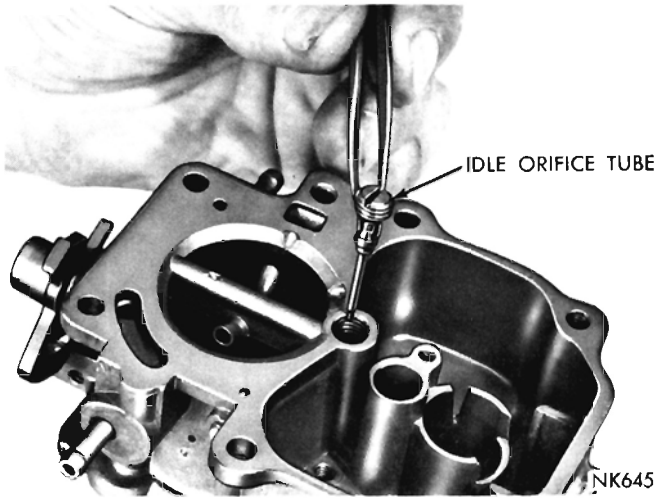

Fig. 6—Removing or Installing Idle Orifice Tube

The carburetor now has been disassembled into three main 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 valve from the throttle body, unless wear or damage necessitates the installation of new parts.

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 assembly be replaced rather than installing a new shaft in the old body.

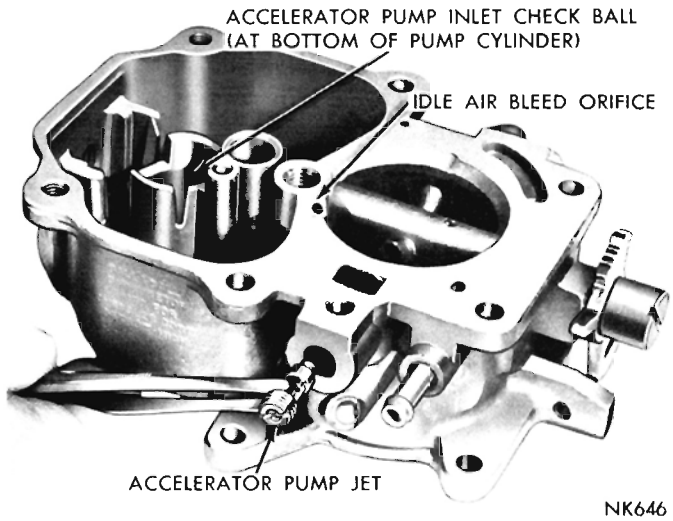

Fig. 7—Removing or Installing Accelerator Pump Jet

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. See (Fig. 8).

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 valve would be obtained. Changing the relationship of the valve to the ports 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 valve is to be installed, adhere to the following instructions:

(2) Mark the position of the throttle valve in the bore, so that it can be reinstalled in the same position.

(3) Remove the screws that hold the throttle valve to the shaft, then slide the valve out of the bore.

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

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

(5) Install new throttle shaft and lever (or new valve).

(6) Install NEW screws but do not tighten. Hold the valve in place, with the fingers pressing on the high side of valve. Tap the valve lightly with a screwdriver to seat in the throttle bore. Now tighten the screws securely and stake by squeezing with pliers.

(7) Install the idle mixture screw and spring in the throttle body. (The tapered position must be straight and smooth. If the tapered portion is grooved or ridged, a new idle mixture screw should be installed to insure having correct idle mixture control). **Do not use a screwdriver.** Turn the screw **lightly** against its seat with the fingers. Back off 1 full turn for approximate adjustment.

Main Body

(1) Install the accelerator pump discharge and intake check balls in their respective passages, as shown in (Fig. 9).

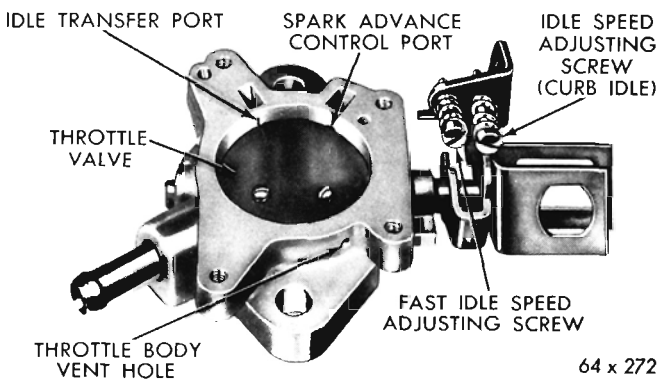

Fig. 8—Ports in Relation to Throttle Valves

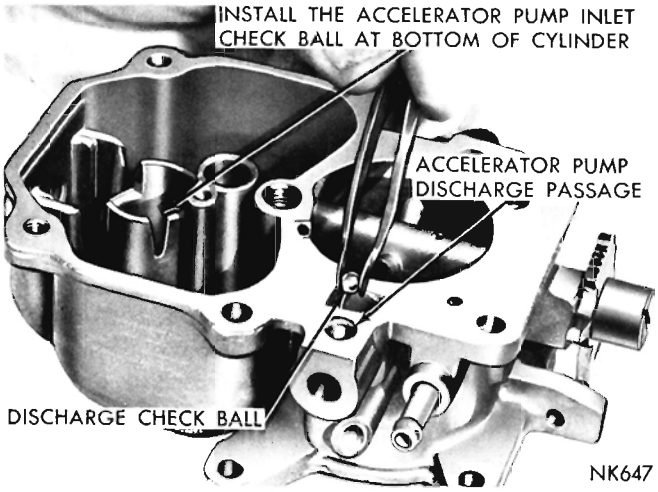

Fig. 9—Installing Accelerator Pump Discharge and Intake Check Balls

To check the accelerator pump system fuel inlet and discharge check balls proceed as follows:

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

(3) 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. 10).

If any fuel does emit from either passage, it indicates the presence of dirt or a damaged check ball. Clean 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.

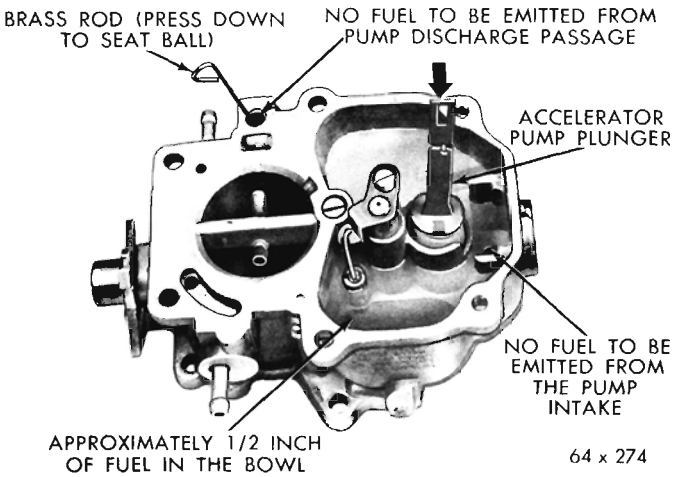

Fig. 10—Testing Accelerator Pump Intake and Discharge Check Balls

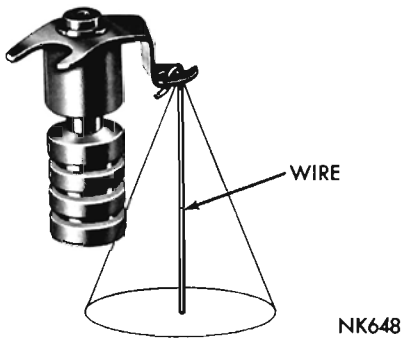

Fig. 11—Step-Up Piston Wire Free Play

(4) Install the accelerator pump jet, as shown in (Fig. 7). Tighten securely, using Tool T109-59T. Install a new plug and drive tightly in place.

(5) Install the idle orifice tube, refer to (Fig. 6). Tighten securely.

(6) Install the main metering jet and gasket refer to (Fig. 5). Tighten securely.

(7) Before installing the step-up piston, be sure the step-up rod is able to move freely each side of the vertical position, as shown in (Fig. 11). The step-up rod must be straight and smooth.

(8) Slide the step-up piston gasket down into position in the piston well, then install the step-up piston spring and step-up piston and rod (Refer to Figure 4). Install retaining screw and tighten securely. Carefully guide the step-up rod into the main metering jet. Be sure the step-up piston slides freely in its cylinder. 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 the Float Setting

The carburetors are equipped with a synthetic rubber tipped fuel inlet needle. 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.

The use of the new inlet 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.

To correctly set the float height, when the carburetor is being overhauled, proceed as follows:

(1) Install the floats with the fulcrum pin and pin retainer in the main body.

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

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

(4) Using Tool T109-282 or T109-220; or a T scale, check the float, as shown in (Fig. 12). There should be $^{1}/_{4}$ or $^{9}/_{32}$ inch (Taxi) (depending on carburetor, Refer to Specifications), from the surface of the fuel bowl to the crown of each float at the center.

If an adjustment is necessary, bend the lip of the float lever either in or out until 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 level of fuel in the bowl.

After being compressed, the tip is very slow to recover its original shape. Recheck as described in Step 4 above.

NOTE: 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) Place a new gasket on the throttle body and position the main body making sure they are aligned.

Air Horn

Check the freedom of the choke mechanism in the air horn. The shaft must float free to operate correctly.

(1) Assemble pump plunger, spring and spring seat and slide plunger shank through opening in air horn. Install bowl vent cap over plunger shank, then engage with pump rocker arm. (On the BBS-3841S carburetor, be sure the hairpin clip is in the upper position on the plunger rod; all others in the middle position.)

(2) Place a new gasket on the main body, then install air horn by tilting air horn, as shown in (Fig. 3), in order to engage fast idle link with fast idle cam. After engaging link, slowly lower air horn and at the same time guide accelerator plunger into its well.

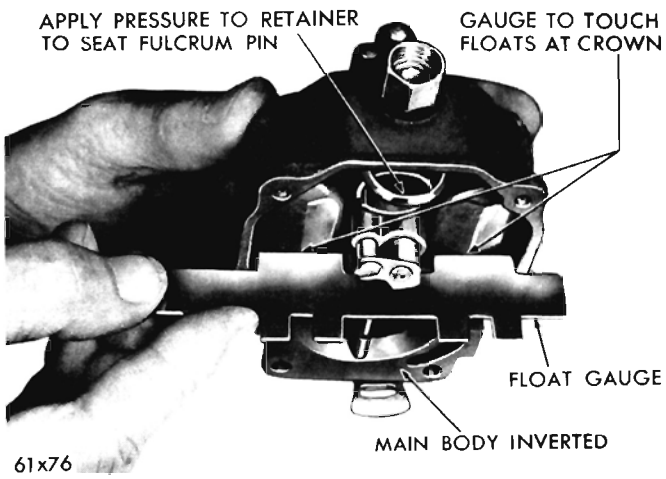

Fig. 12—Measuring the Float Setting

(3) Install air horn attaching screws. Tighten securely.

(4) Install the accelerator pump operating rod and secure with hairpin clip. Normal operation of the accelerator pump is obtained by installing pump rod in the center hole of the throttle arm. (On the BBS-3841S carburetor, be sure the pump rod is in the short stroke hole of the throttle arm).

Choke Vacuum Diaphragm

Inspect the diaphragm vacuum fitting to insure that the passage is not plugged with foreign material. Leak test 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 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 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.)

ADJUSTMENTS

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

Accelerator Pump and Bowl Vent

When assembling the accelerator pump to the air horn, note that the hairpin clip (which opens the bowl vent) can be placed in any one of three positioning notches. These notches correspond to the long, medium and short pump stroke holes in the throttle lever. Normally, the bowl vent clip on the pump stem will be at the middle notch and the pump operating rod in the medium stroke hole.

The proper procedure is to adjust the amount of bowl vent opening instead of measuring and setting the height of the pump plunger.

To check or set the adjustment, proceed as follows:

(1) Back off the idle speed adjusting screw. Open the choke valve, so that when the throttle valves are closed, the fast idle adjusting screw will not contact the fast idle cam.

(2) Be sure the pump operating rod is in the medium stroke hole in the throttle lever, and that the bowl vent clip on the pump stem is in the center notch.

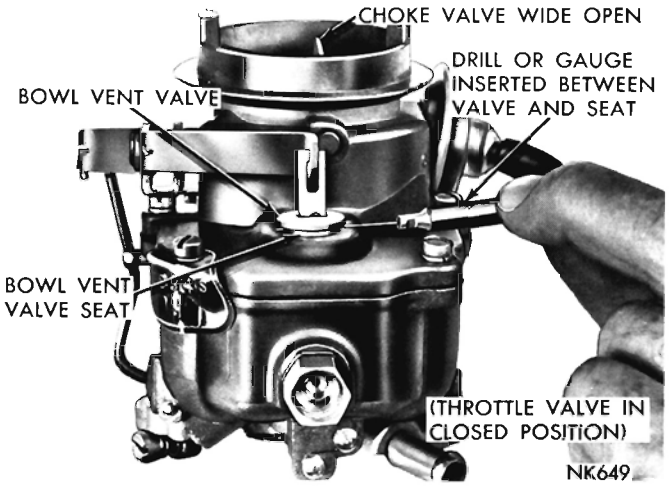

Fig. 13—Measuring Bowl Vent Opening

(3) Close the throttle valves tightly. It should be just possible to insert a $^1/_{16}$ inch drill (.060) between the bowl vent and the air horn, as shown in (Fig. 13).

If an adjustment is necessary, bend the pump operating rod, using Tool T109-213, at the lower angle, until the correct bowl vent opening has been obtained.

This is an important adjustment, since too much lift at the bowl vent will result in considerable loss in low speed fuel economy.

Remember that if the pump operating rod is moved to either the short or long stroke position, a corresponding change must be made in the location of the bowl vent clip, and the amount of lift of the bowl vent should be retested and adjusted.

The accelerator pump travel is automatically taken care of when the bowl vent is properly adjusted.

Fast Idle Speed and Cam Position

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. 14), move the choke valve toward the closed position with light pressure. Insert a drill or gauge between the choke valve and the wall of the air horn. (Refer to Specifications for Drill or Gauge Size.)

(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, un-

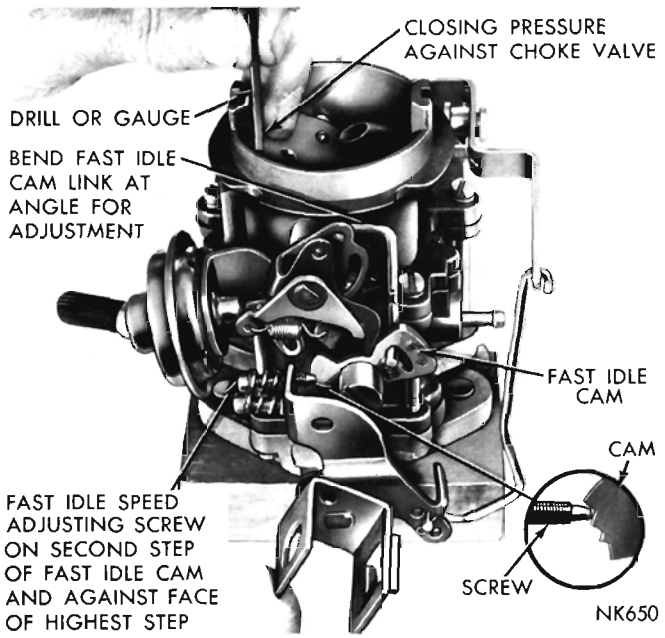

Fig. 14—Fast Idle Cam Position Adjustment

til the correct valve opening has been obtained. Refer to (Fig. 14).

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 air horn by action of the linkage between the choke shaft and the diaphragm. The diaphragm must be energized to measure the vacuum kick adjustment. 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. 15). (A minimum of 10 inches of mercury (HG) will be required.)

(3) Insert the specified drill or gauge between the choke valve and the wall of the air horn. Refer to (Fig. 15). 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.

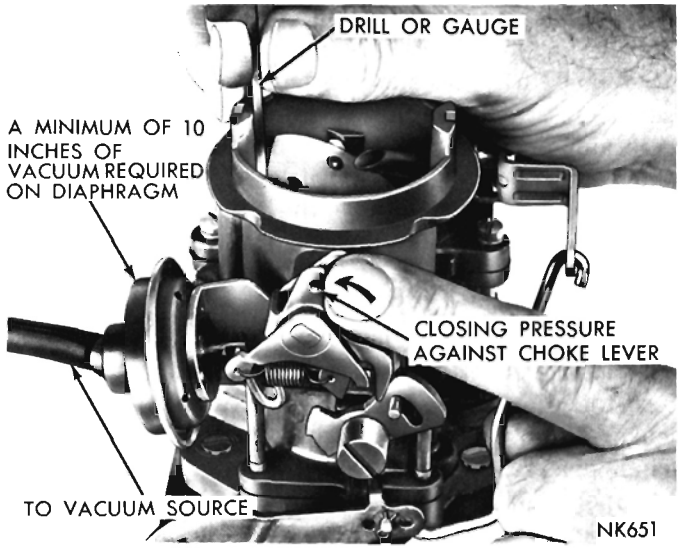

Fig. 15—Vacuum Kick Adjustment

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, 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 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 .015 inch in the choke valve opening.

As an example, if the choke valve opening is 0.015 inch in error, the correction in the link length would be .010 inch.

A 2 inch micrometer will be helpful in establishing the original length of the link, as shown in (Fig. 16), before completing the adjustment.

(7) Install the choke operating link and recheck the choke valve opening, using a gauge or drill. Refer to (Fig. 15).

Reinstall the vacuum hose to the diaphragm and

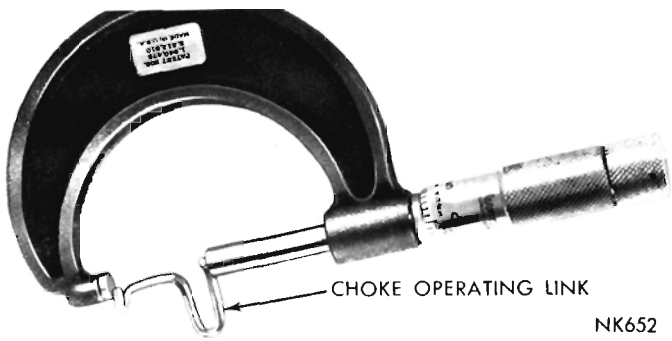

Fig. 16—Choke Operating Link Measurements

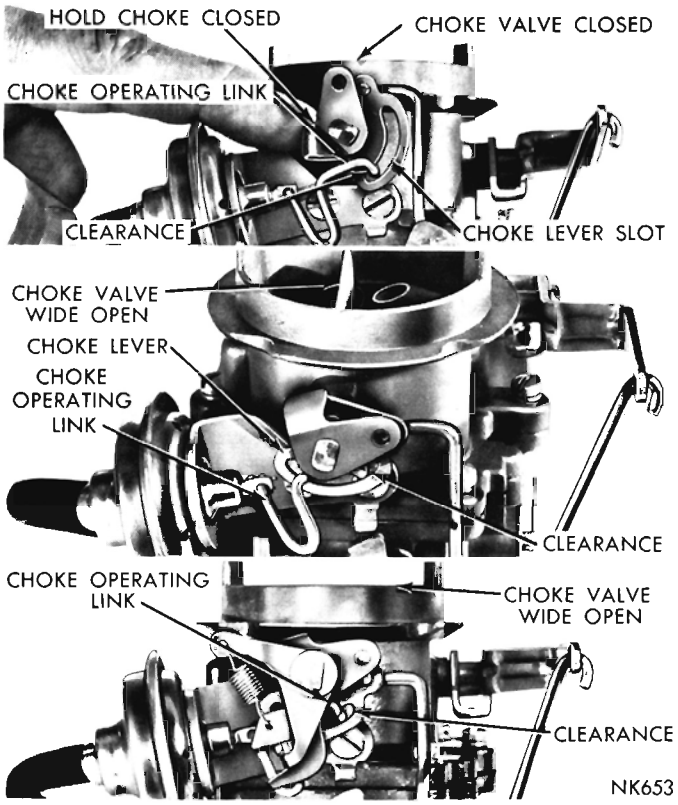

Fig. 17—Choke Operating Link Clearances

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. 17). **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.

Choke Unloader (Wide Open Kick)

(1) Hold the throttle valve in the wide open position, insert Tool T109-28 or $^{3}/_{16}$ drill between the upper edge of the choke valve and the inner wall of the air horn, as shown in (Fig. 18).

(2) If no drag is felt, or if too much drag is apparent, bend the unloader tang on the throttle lever, until correct clearance has been obtained.

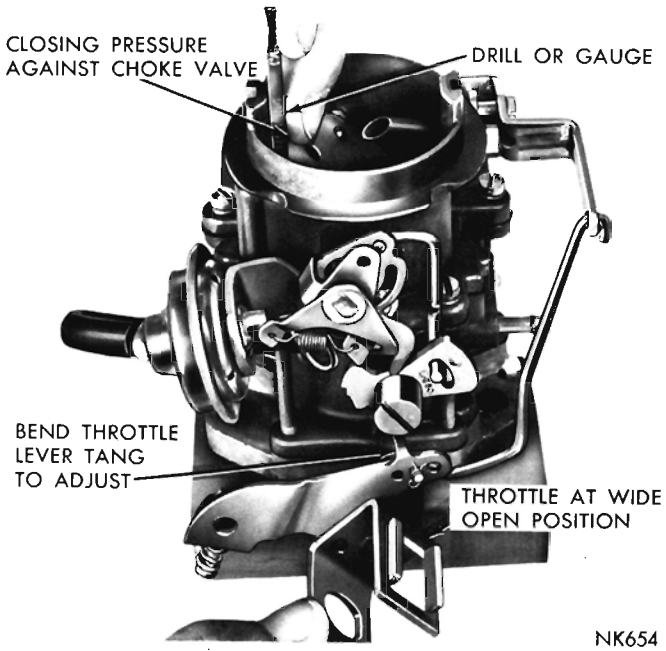

Fig 18—Measuring the Choke Unloader Setting (wide open kick)

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:)

Because the alternator can charge at idle speeds and impose a load on the engine, the headlights should be turned on. This will assure setting the idle to compensate for the alternator load. On cars equipped with automatic transmissions, unsnap the ball joint connection at the accelerator shaft bell crank. If this is not done, it is possible that the carburetor throttle will be held open against the stop in the transmission. The carburetor would therefore not respond to adjustment of the idle speed screw. After the proper idle speed has been obtained at the carburetor, screw the ball joint connector up or down until the ball on the bell crank will exactly mate with the socket. Snap into place.

To make the idle speed adjustment, proceed as follows:

(1) Turn the idle speed screw **in** or **out** to obtain 550 r.p.m. (Be sure that the choke valve is fully open and that the fast idle adjusting screw is not contacting the cam.)

(2) Adjust the 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 screw in either direc-

tion from the setting that gave the highest r.p.m. reading.

(3) From the highest idle speed setting, turn the mixture screw clockwise (leaner) until the speed starts to drop. Turn the screw in the opposite direction (counter-clockwise) just far enough to recover the speed that was lost.

This procedure will assure that the idle has been set 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 setting will probably be too fast.

(4) Readjust the speed screw to obtain correct idle speed. Repeat steps 2 and 3 above.

Fast Idle Speed (On the vehicle after Approximately 500 miles if necessary)

To set the fast idle speed on the car, 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 slowest speed step on the fast idle cam, as shown in (Fig. 19).

(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. **Reposition the cam and throttle after every screw adjustment to apply normal throttle closing torque.**

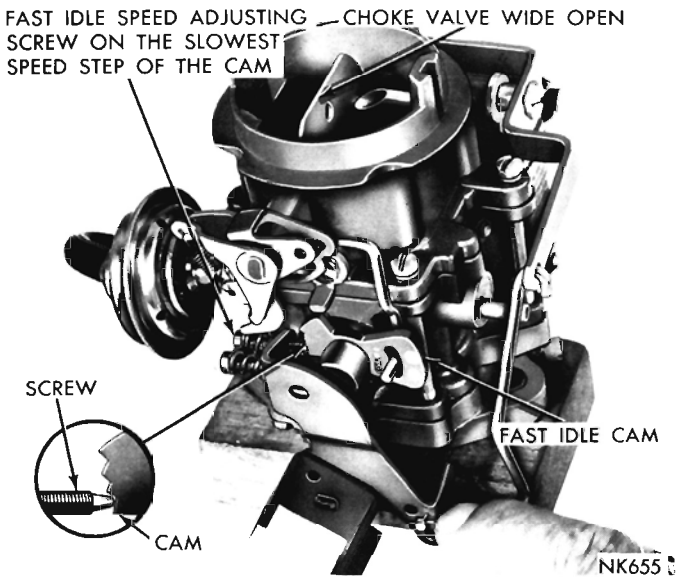

Fig. 19—Fast Idle Speed Adjustment (on the vehicle)

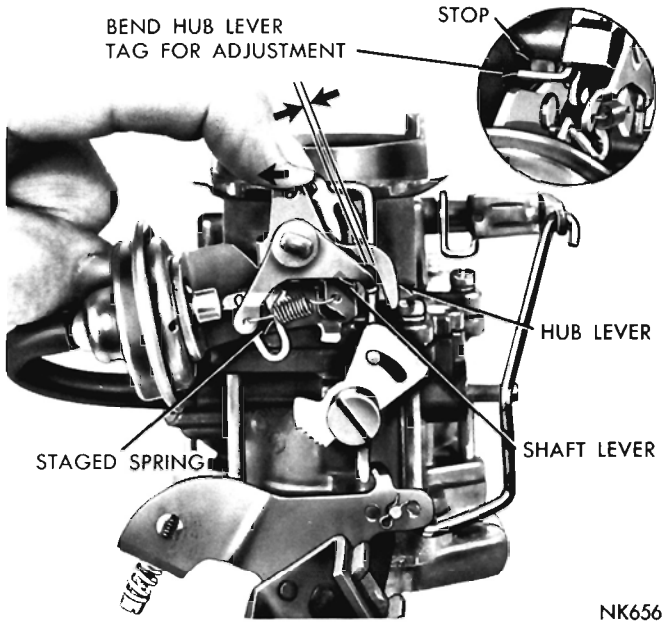

Fig. 20—Spring Stage Choke Adjustment

Spring Staged Choke Adjustment

To check the spring staged choke for correct operating clearance, refer to (Fig. 20), 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. 20).

(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.

The Float Setting (On the Vehicle)

To check the float setting with the carburetor mounted on the vehicle, proceed as follows:

(1) Remove the accelerator pump operating rod.

(2) Remove two of the long air horn attaching screws and two short screws, then install the two short screws in place of the two long screws removed. This will hold the main body to the throttle body. Tighten screws securely.

(3) Remove the remaining air horn screws, then tilt the air horn far enough to disengage the fast idle cam link from the fast idle cam. Remove the air horn and gasket.

Check the float setting as follows:

(4) Seat the float fulcrum pin by pressing on the fulcrum pin retainer.

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 de-

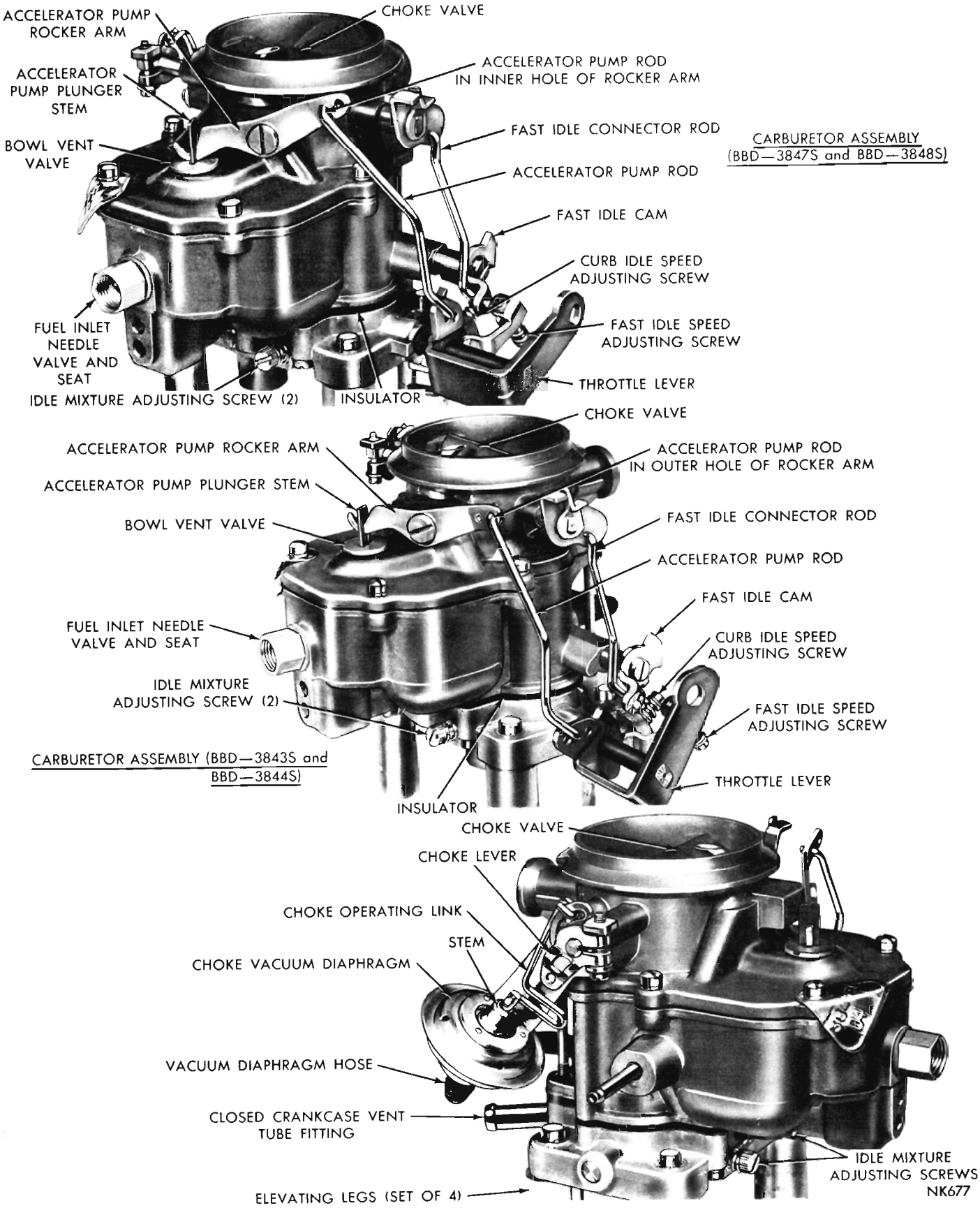

Fig. 1—Carburetor Assembly

pressing the float. If the fuel 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 fuel on these surfaces. Therefore, take the necessary precautions to avoid spillage.

(5) With only the pressure of the buoyant float holding the float lip against the inlet needle, check the float setting, using Tool T109-239 or a "T" scale. There should be ¼ inch from the surface of the bowl (gasket removed) to the crown of the floats at the center. ($^{9}/_{32}$ on certain Carburetors.)

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. Recheck the ¼ 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 tip can be compressed sufficiently to cause a false setting which will affect correct level of the fuel in the bowl.

After being compressed, the 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 correctly set.

(6) Reassemble the air horn.

PART 4

BBD SERIES (1¼ INCH) CARBURETOR

SERVICE PROCEDURES

DISASSEMBLY

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

(1) Place the carburetor assembly on repair block Tool C-3225.

(2) Remove the hairpin clips and disengage the accelerator pump operating rod. On the 273 cubic inch engine, the accelerator pump rod is located in the outer hole of the accelerator pump rocker arm and in the inner hole of the rocker arm for the 318 cubic inch engine; refer to (Fig. 1).

(3) Remove the hairpin clip and disengage the fast idle connector rod from the fast idle cam and choke lever.

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

(5) 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).

(6) 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.**

(7) Remove the air horn retaining screws and lift air horn straight up and away from main body, as shown in (Fig. 2). Discard the gasket.

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

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, then lift out the floats and fulcrum pin.

(11) Remove the step-up piston retaining screw, and slide step-up piston and rods out of well, as shown in (Fig. 3). Now, lift out the step-up piston spring. Remove the step-up piston gasket from the bottom of the well.

(12) Remove the main metering jets, as shown in

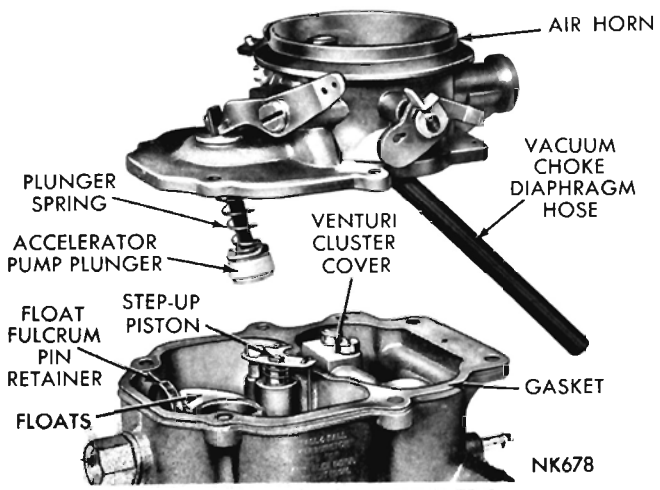

Fig. 2—Removing or Installing Air Horn

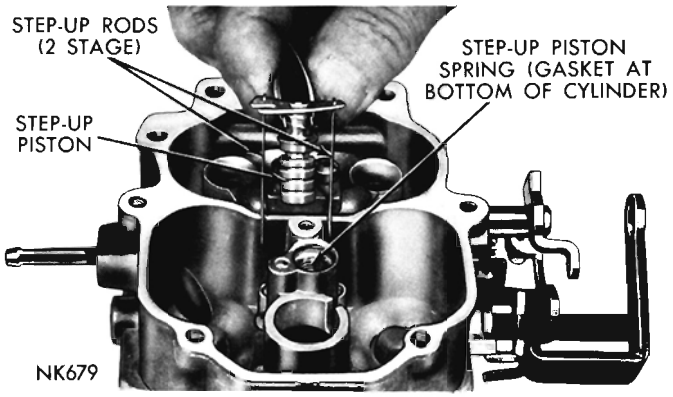

Fig. 3—Removing or Installing Step-Up Piston

(Fig. 4).

(13) Remove the venturi cluster screws, then lift the venturi cluster and gaskets up and away from main body, as shown in (Fig. 5). Discard the gaskets.

Do not remove the idle orifice tubes or 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 and intake check balls.

(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.

(17) 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 bearings, or appears to be gummed from deposits in the air horn, a thorough cleaning will be required.

The carburetor now has been disassembled into three main 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.

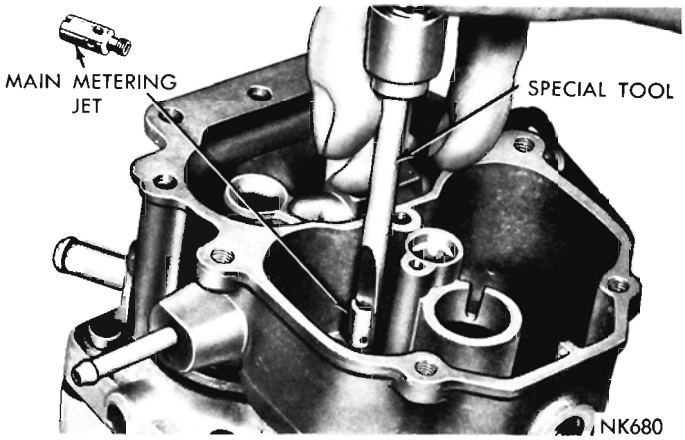

Fig. 4—Removing or Installing Main Metering Jets

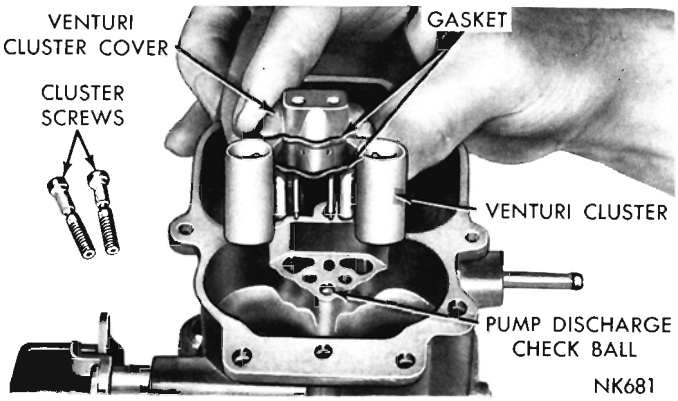

Fig. 5—Removing or Installing Venturi Cluster

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.

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 assembly be replaced rather than installing a new shaft in the old body).

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. (See Fig. 6.)

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. However, if it has been determined that a new shaft or valves is to be installed, adhere to the following instructions:

(2) Mark the position of the throttle valves to the shaft, then slide the valves out of the bores.

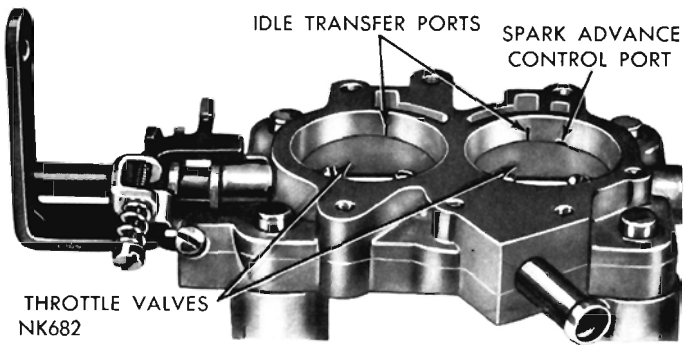

Fig. 6—Ports in Relation to Throttle Valves

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

(4) Slide the throttle shaft out of the throttle body. Remove the fast idle speed screw lever.

(5) Slide the fast idle speed screw lever over new throttle shaft and insert into throttle body.

(6) Install throttle valves in their respective bores (with the valve numbers toward manifold flange). 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 valves 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 1 full turn for approximate adjustment.

Main Body

(1) Invert the main body and place the insulator in position, then place the throttle body on main body and align. Install screws and tighten securely.

(2) Install the accelerator pump discharge check ball ($^{5}/_{32}$ inch diameter) in the discharge passage, as shown in (Fig. 7). Drop the accelerator pump intake check ball ($^{3}/_{16}$ inch diameter) into the bottom of the pump cylinder.

To check the accelerator pump system; fuel inlet and discharge check balls, proceed as follows:

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

(4) Using a small clean brass rod, hold the discharge check ball down firmly on its seat. Again raise

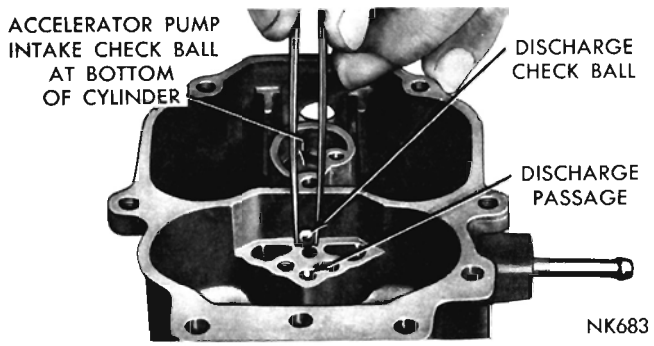

Fig. 7—Installing Accelerator Pump Discharge Check Ball

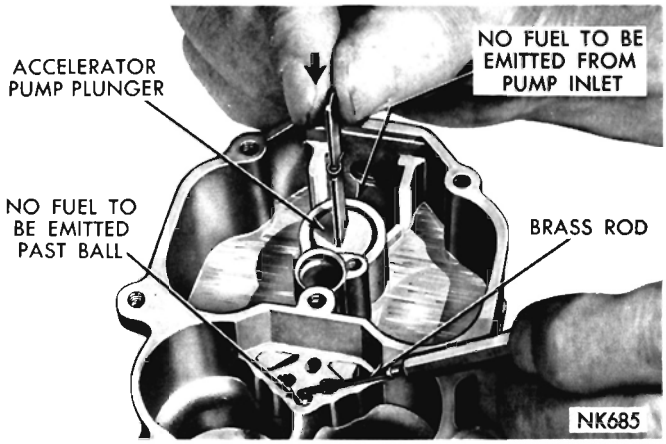

Fig. 8—Testing Accelerator Pump Intake and Discharge Check Balls

the plunger and press downward. No fuel should be emitted from either the intake or discharge passage, as shown in (Fig. 8).

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

(5) Install new gaskets on venturi cluster, then install in position in the main body. Refer to (Fig. 5). Install the cluster screws and tighten securely.

(6) Install the main metering jets and tighten securely. Refer to (Fig. 4).

(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. 9). The step-up rods must be straight and smooth.

(8) Slide the step-up piston gasket down into position in the piston well, then install the step-up piston spring and step-up piston and rods. Carefully guide the step-up rods into the main metering jets. Refer to

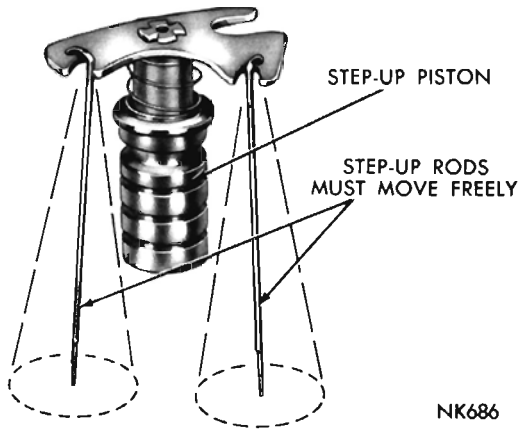

Fig. 9—Step-Up Piston and 2 Stage Rods

(Fig. 3). Install retaining screw and tighten securely.

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 the Float Setting

The carburetors are equipped with a synthetic rubber tipped fuel inlet needle. 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 needle requires a new procedure in adjusting the float setting. Care should be taken to perform this accurately in order to secure the best performance and fuel economy.

To correctly set the float height, when the carburetor is being overhauled, proceed as follows:

(1) Install the floats with the fulcrum pin and pin retainer in the main body.

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

(3) Invert the main body (catch the pump intake check ball) so that the weight of the floats **only,** is forcing the needle against the seat. Hold finger against retainer to fully seat the fulcrum pin.

(4) Using Tool T109-282 or a "T" scale, check the float, as shown in (Fig. 10). There should be ¼ 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 the bottom of the bowl and bend the float lip toward or away from the needle. Recheck the ¼ 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 synthetic rubber tip can be compressed sufficiently to cause a false setting which will affect correct level of fuel in the bowl.

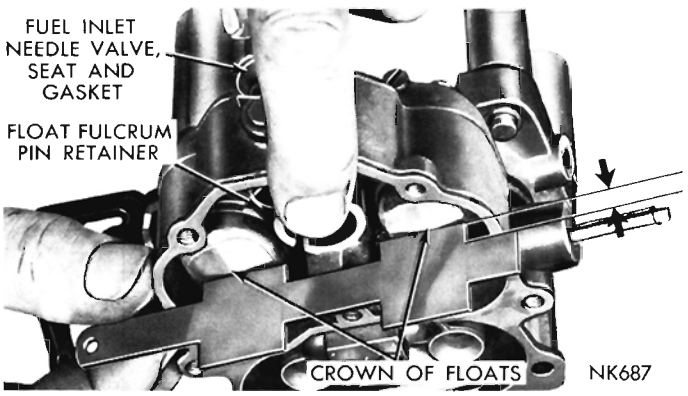

Fig. 10—Measuring the Float Setting

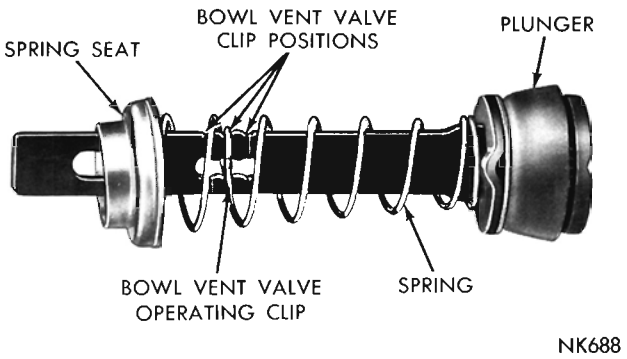

Fig. 11—Accelerator Pump Assembly

After being compressed, the 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 ten degrees away from the needle when the float is set correctly.

Air Horn

(1) Assemble the pump plunger, spring and spring seat, as shown in (Fig. 11). Slide plunger shaft through opening in air horn. Install bowl vent valve over plunger shaft, then engage with pump rocker arm.

(2) Place a new gasket on the main body, then install the air horn. Refer to (Fig. 2). Install attaching screws and tighten securely. (When installing air horn be sure the leather on the plunger does not fold back).

(3) Engage the fast idle connector rod in the choke lever and fast idle cam. Secure with hairpin clip.

(4) Engage the accelerator pump operating rod in the proper hole in the rocker arm (depending on carburetor) and in the center hole in the throttle lever. Refer to (Fig. 1). Install clips to secure.

Choke Vacuum Diaphragm

Inspect the diaphragm vacuum fitting to insure 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 10 seconds, the leakage is excessive and the assembly must be replaced.

Install the diaphragm assembly on the airhorn as follows:

(1) Assemble 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 plac-

ing 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.)

ADJUSTMENTS

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

Accelerator Pump and Bowl Vent

When assembling the accelerator pump to the air horn, note that the hair pin clip (which opens the bowl vent) can be placed in any one of the three positioning notches. These notches correspond to the long, medium and short pump stroke holes in the throttle lever. Normally, the bowl vent clip on the pump stem will be at the middle notch and the pump operating rod in the medium stroke hole.

The proper procedure is to adjust the amount of bowl vent opening instead of measuring and setting the height of the pump plunger.

To check or set the adjustment, proceed as follows:

(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.

(2) Be sure the pump operating rod is in the medium stroke hole in the throttle lever, and that the bowl vent clip on the pump stem is in the center notch.

(3) Close the throttle valves tightly. It should be just possible to insert a $^{1}/_{16}$ inch drill between the bowl vent and its seat, as shown in (Fig. 12).

If an adjustment is necessary, bend the pump operating rod, using Tool T109-213, at the lower angle, until the correct bowl vent opening has been obtained.

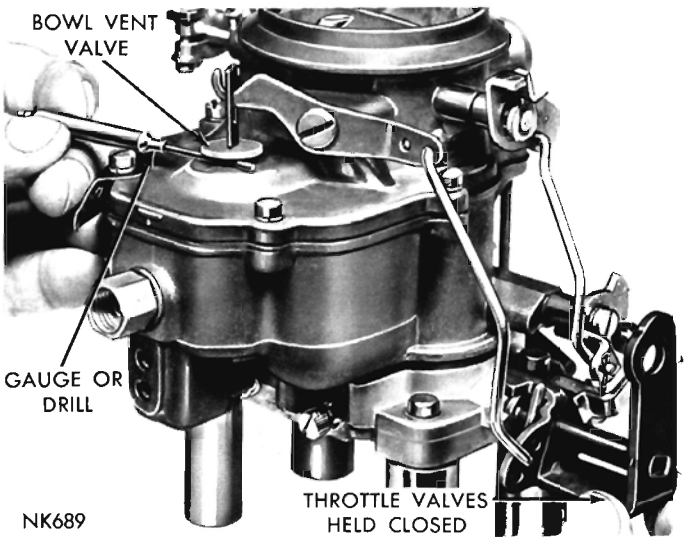

Fig. 12—Measuring Bowl Vent Opening

This is an important adjustment, since too much lift at the bowl vent will result in considerable loss in low speed fuel economy.

Remember that if the pump operating rod is moved to either the short or long stroke position, a corresponding change must be made in the location of the bowl vent clip, and the amount of lift of the bowl vent rechecked and adjusted.

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 be sure that the speeds of each cam step occur at the proper time during the 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 $^{7}/_{64}$ inch (manual trans. or automatic trans.) drill or gauge 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 of the shaft lever, using Tool T109-22, 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

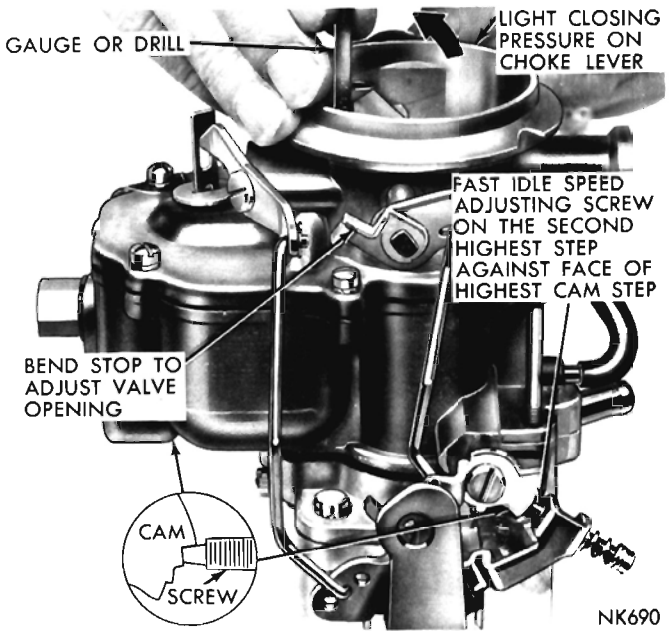

Fig. 13—Fast Idle Cam Position Adjustment

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

(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 mercury (HG) will be required.)

(3) Insert the specified size drill or gauge between choke valve and the wall of the air horn. Refer to (Fig. 1). 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 diaphragm stem, then disengage the link from the choke lever. (The best bending results will be obtained by using a vise and a pair of pliers.)

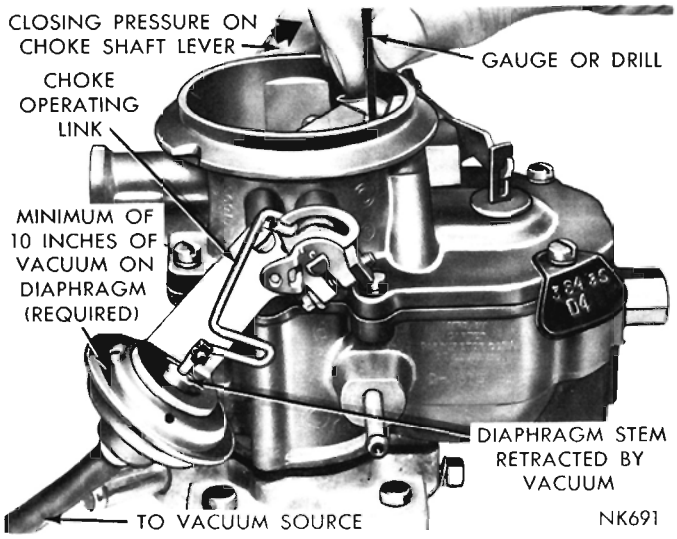

Fig. 14—Measuring the Choke Vacuum Kick Setting

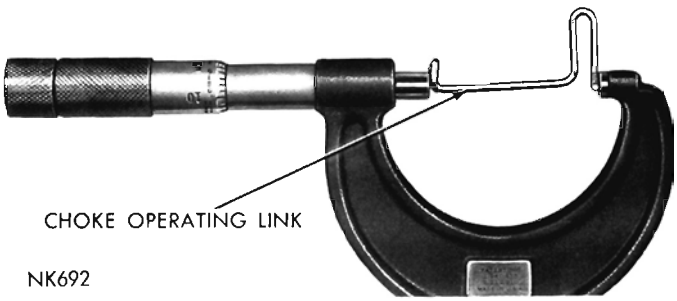

Fig. 15—Choke Operating Link Measurements

(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 .015 inch in the choke valve opening.

As an example, if the choke valve opening is 0.015 inch in error, the correction in the link length would be .010 inch.

A "2" inch 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 guage or drill. Refer to (Fig. 14).

(8) Reinstall the vacuum hose to the diaphragm

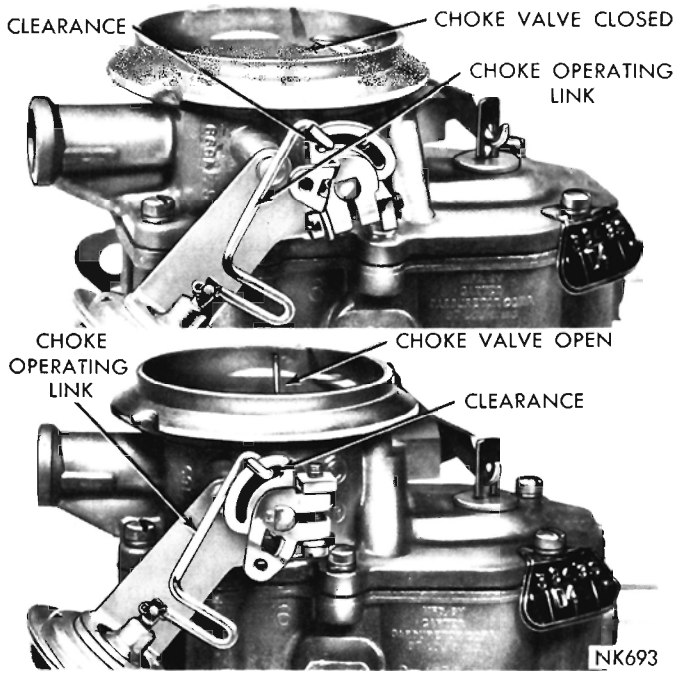

Fig. 16—Choke Operating Link Clearances

and 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). **This clearance is necessary to allow the choke valve to close for starting as well as fully open after the engine reaches the normal operating temperature.**

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

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

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 Unloaded (Wide Open Kick)

(1) Hold the throttle valves in the wide open position. Insert Tool T109-31 or ¼" drill shank between the upper edge of the choke valve and the inner wall of the air horn, as shown in (Fig. 17).

(2) If no drag is felt, or if too much drag is apparent, bend the unloader tang on the throttle lever, until correct clearance has been obtained.

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):

Because the alternator can charge at idle speeds and impose a load on the engine, the headlights should be turned on (high beam). This will assure setting the idle to compensate for the alternator load. On vehicles equipped with the automatic transmission, disconnect the transmission control rod from the ball joint on the carburetor lever so that the stop in the transmission will not interfere with the free movement of the carburetor throttle lever.

(1) Turn the idle speed screw **in** or **out** to obtain 500 r.p.m. (On cars with air conditioning, set the idle speed at 500 r.p.m., with air conditioning **On.**) Be sure that 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, 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.

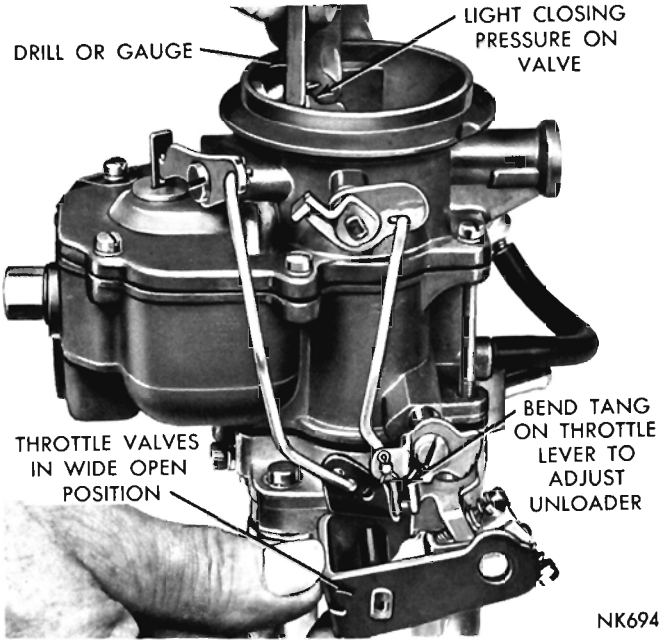

Fig. 17—Measuring the Choke Unloader Setting

(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 counter-clockwise (richer) just enough to regain the lost r.p.m.

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 setting will probably be too fast.

(5) Readjust the speed screw to obtain correct idle

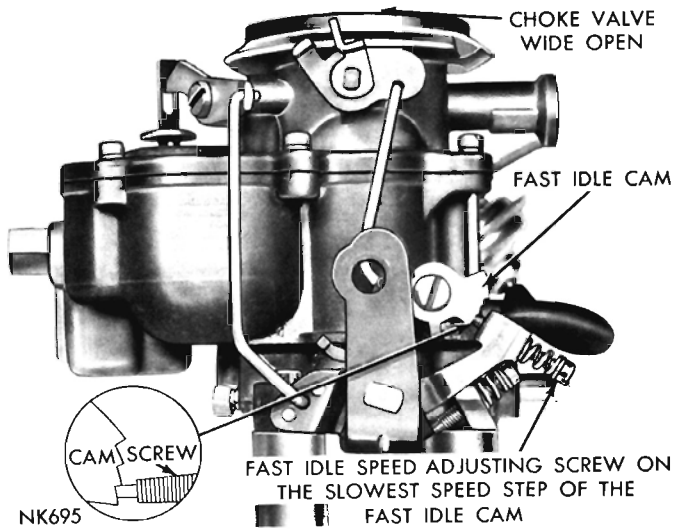

Fig. 18—Fast Idle Speed Adjustment (on the vehicle)

speed. Repeat steps 2 and 4 above if necessary. After the proper idle speed has been obtained, refer to (Fig. 3) of the Throttle Linkage Group in this Section, for the procedure on adjusting the transmission control rod.

Fast Idle Speed (On the Vehicle after Approximately 500 miles if necessary)

To set the fast idle speed on the car, connect a tachometer, 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 slowest speed step on the fast idle cam, as shown in (Fig. 18).

(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. **Reposition the cam and throttle after every screw adjustment to apply normal throttle closing torque.**

BBD (1½ INCH) CARBURETORS

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 T109-287S and one Tool

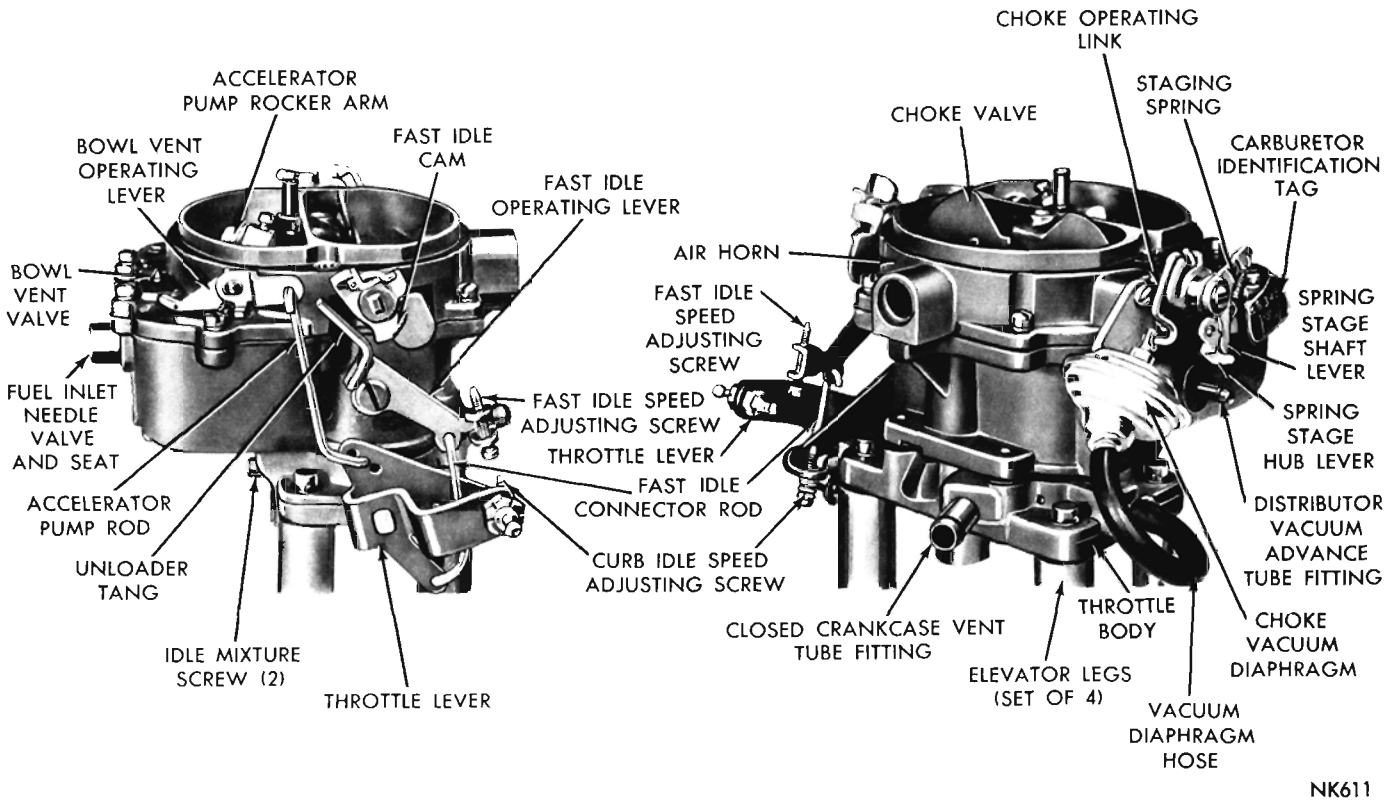

Fig. 1—Carburetor Assembly (BBD-3849S and BBD-3850S)

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. **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.

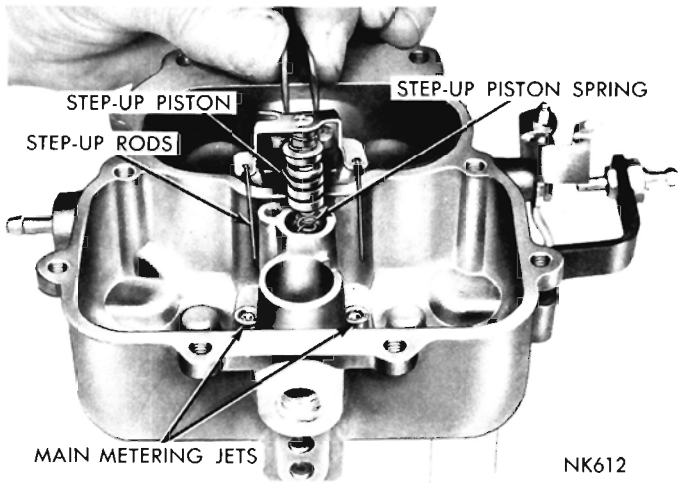

Fig. 2—Removing or Installing the Step-Up Piston

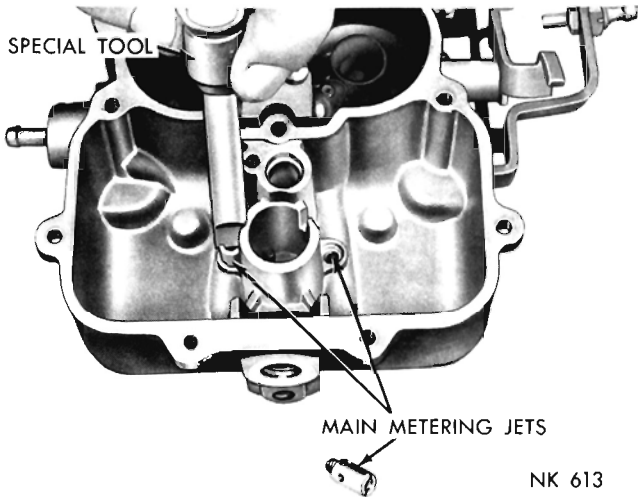

Fig. 3—Removing or Installing the Main Metering Jets

Remove the step-up piston gasket from the bottom of 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.

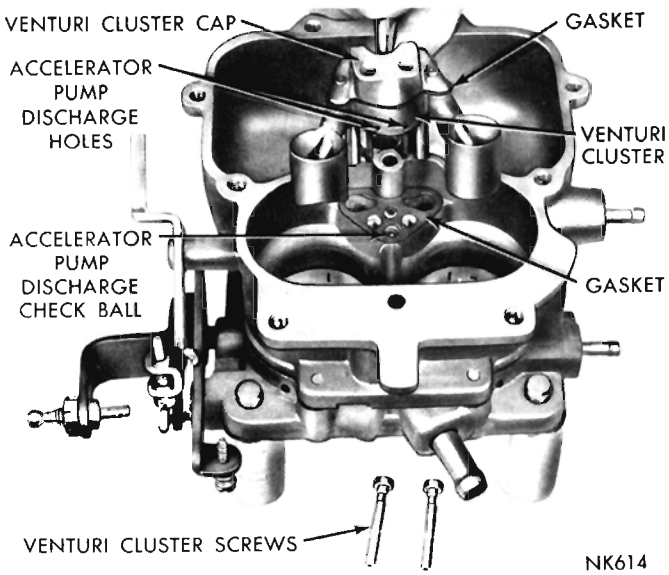

Fig. 4—Removing or Installing the Venturi Cluster

(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 is excessive and a new throttle shaft and/or throttle body should be installed.

INSPECTION AND ASSEMBLY

Throttle Body

(1) Inspect the throttle shaft and throttle body 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.

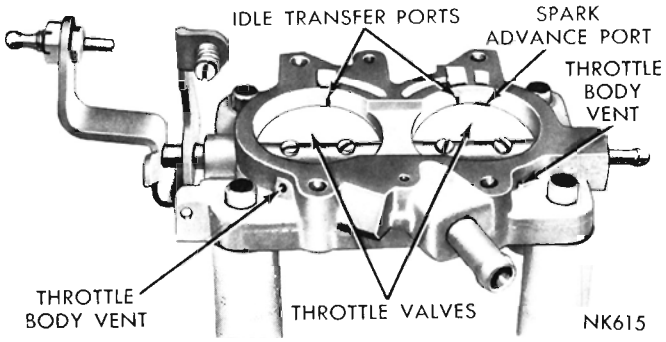

Fig. 5—Ports in Relation to the Throttle Valves

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.

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

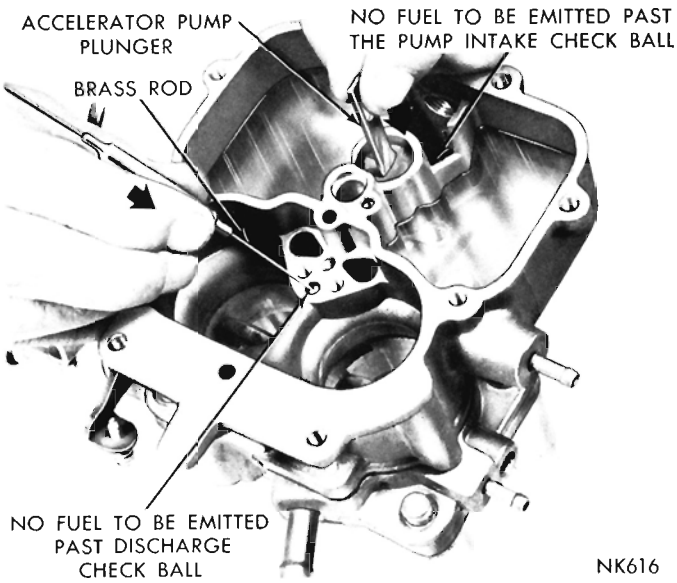

Fig. 6—Testing the Accelerator Pump Intake and Discharge Balls Check

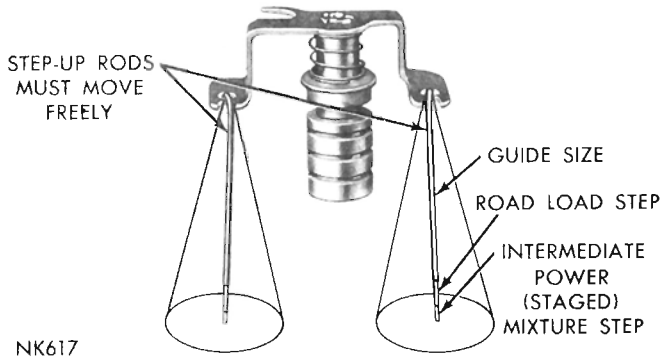

Fig. 7—Step-up Rods Free Play

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).

(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 the 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.

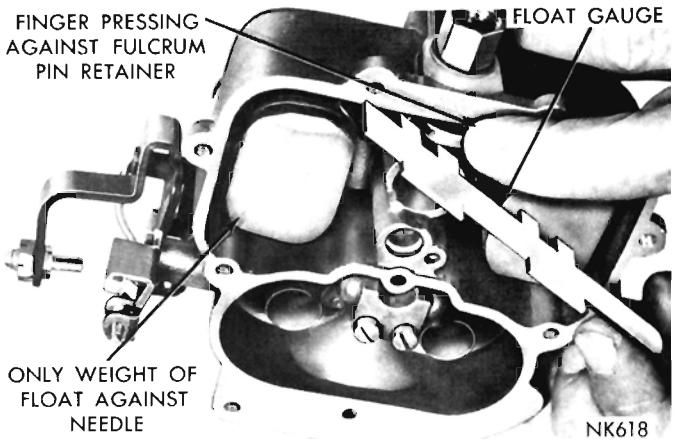

Fig. 8—Measuring the Float Setting

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 tigten 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 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.

(1) Install the diaphragm assembly on 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 the clip to secure.

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

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 measurement 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 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.

(1) With the fast idle speed adjusting screw contact-

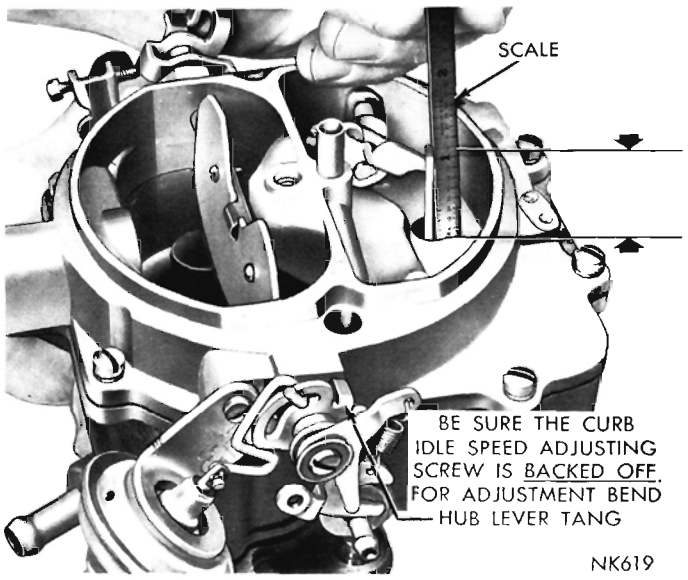

Fig. 9—Measuring the Accelerator Pump Setting

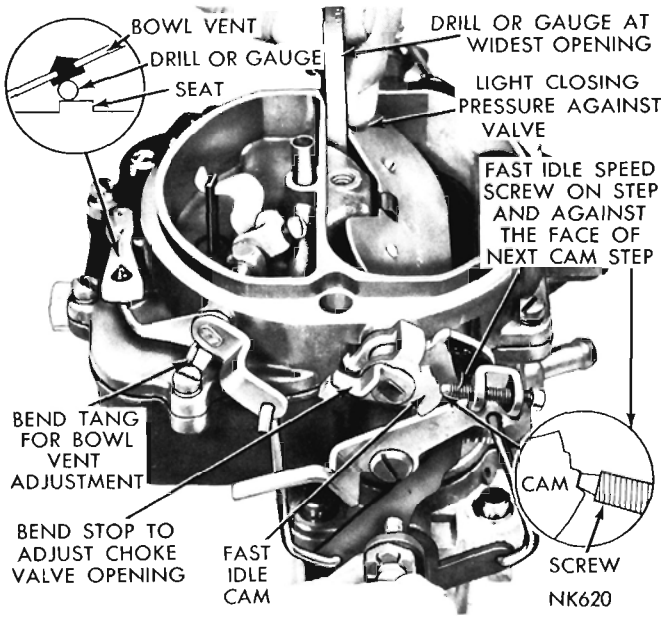

Fig. 10—Fast Idle Cam Position Adjustment

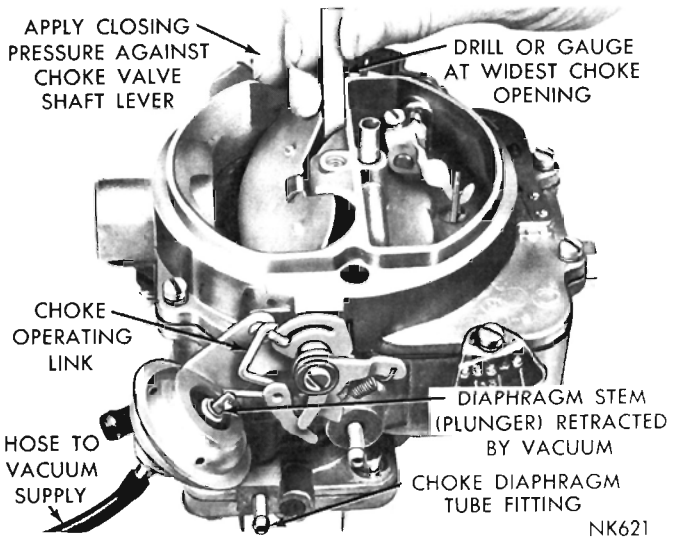

Fig. 11—Measuring the Choke Vacuum Kick Setting

ing 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).

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

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).

(8) Reinstall the vacuum hose to the diaphragm and 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). **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.**

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.

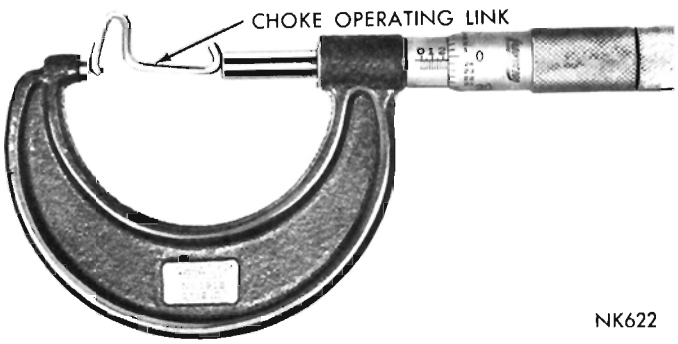

Fig. 12—Choke Operating Link Measurements

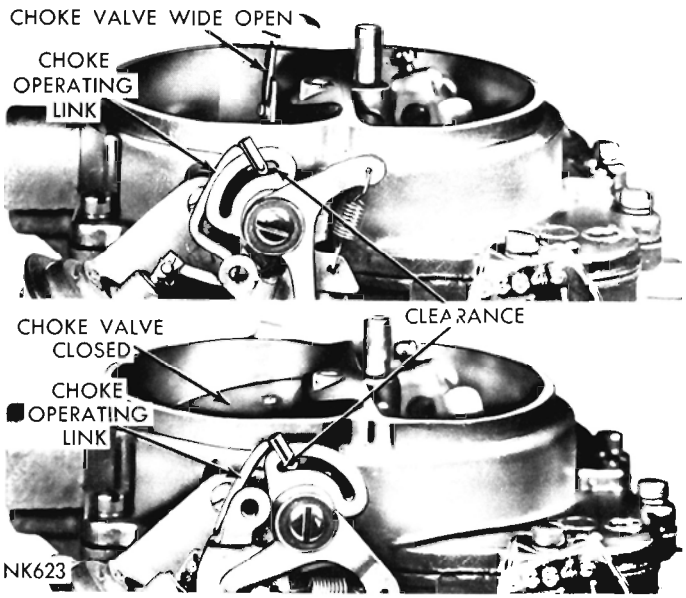

Fig. 13—Choke Operating Link Clearances

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

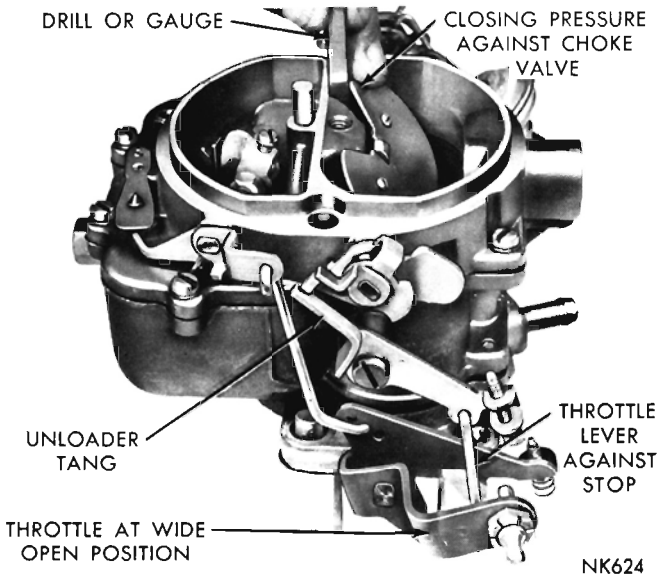

Fig. 14—Measuring the Choke Unloader Setting

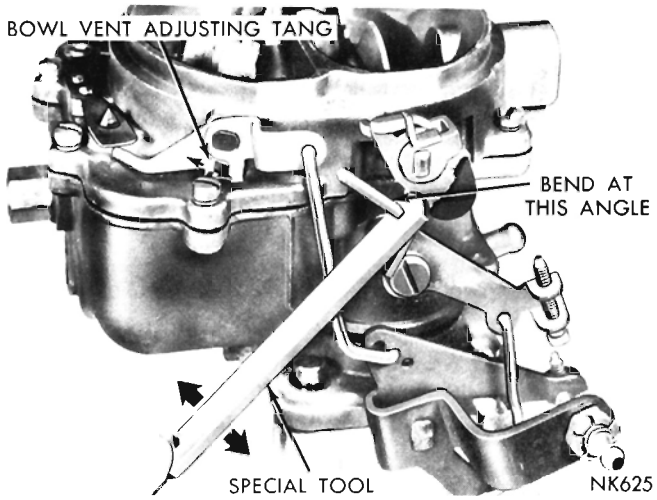

Fig. 15—Bending the Choke Unloader Tang

(2) With a finger lightly pressing against the valve, a slight drag should be felt as gauge is being withdrawn. If an adjustment 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

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

(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.

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, 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.

Checking Float Setting (On the Vehicle)

(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.

NOTE: 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.

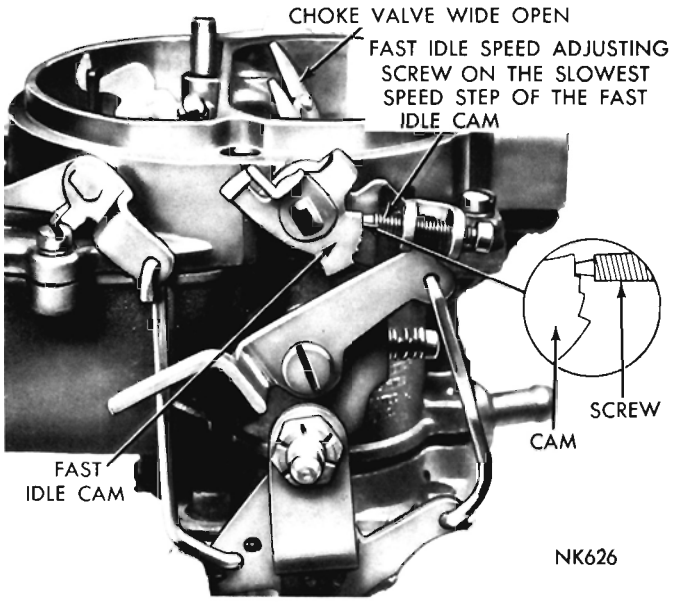

Fig. 16—Fast Idle Speed Adjustment (on the vehicle)

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

*Fast Idle Speed (On the Vehicle)**

To set the fast idle speed on the car, connect a tachometer, 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 con-

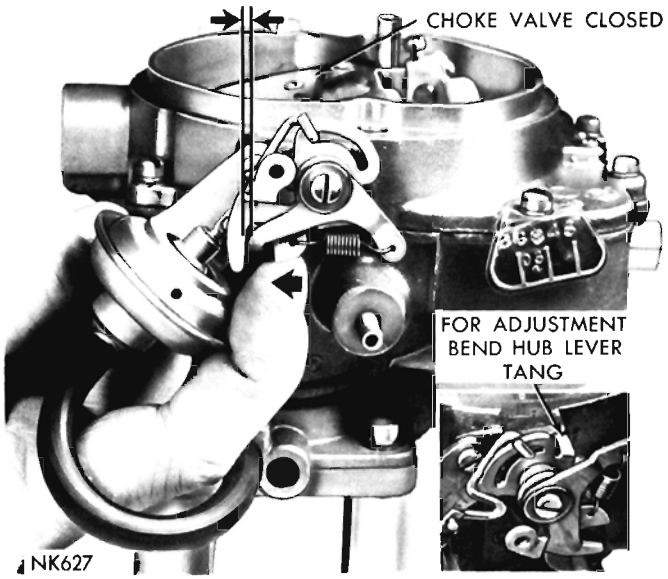

Fig. 17—Spring Staged Choke Adjustment

tacting 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.

To check the spring staged choke for correct operating clearance, refer to Figure 20, 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. 17).

(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 5

WW3 STROMBERG CARBURETORS

Description

There are two models of the WW3 series carburetor, depending on the type of transmission with which the vehicle is equipped. The same basic design applies to all models regardless of adaptions. Refer to Specifications for detailed information.

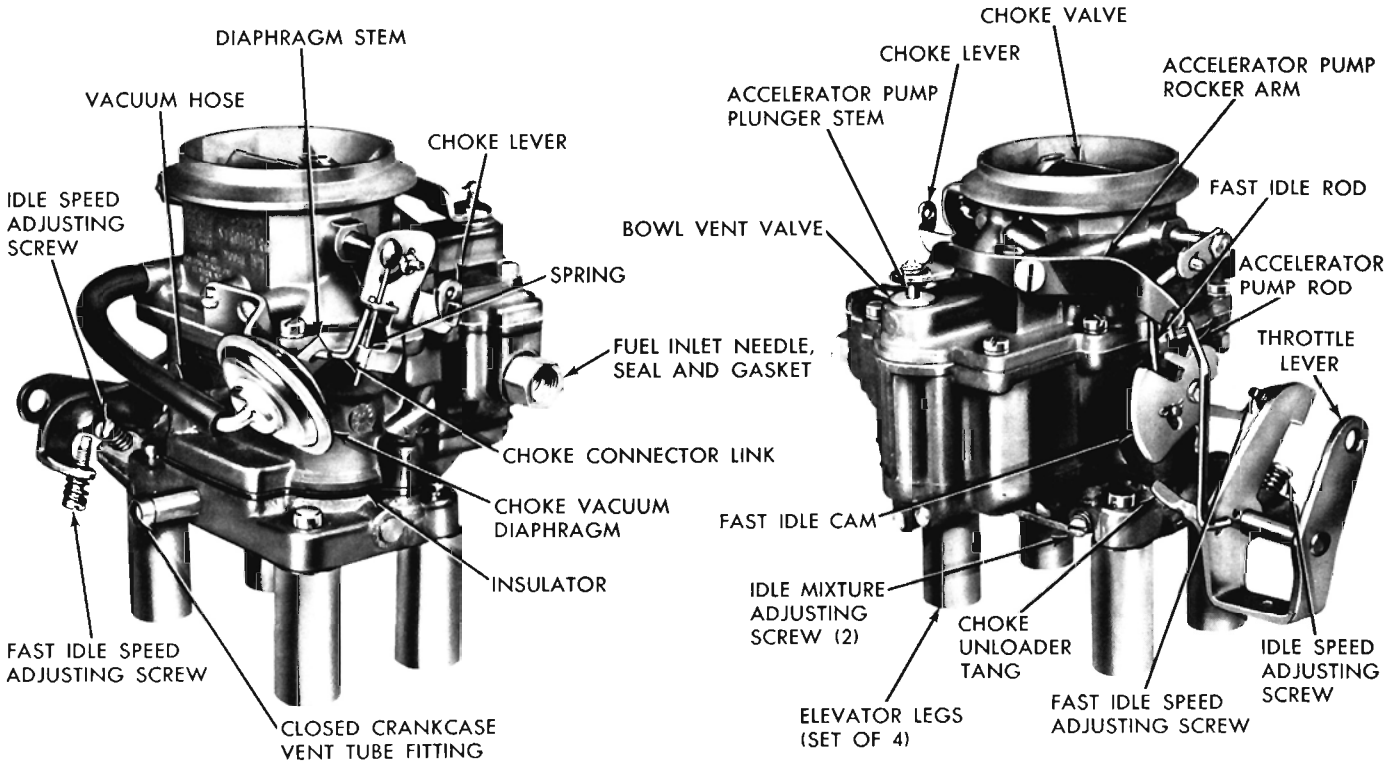

Fig. 1—Carburetor Assembly (WW3-248, 249, 250 and 251)

SERVICE PROCEDURES

DISASSEMBLY

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

(1) Place the carburetor assembly on repair block Tool C-3225. (This Tool is used to protect the throttle valves from damage and to provide a suitable base for working.)

(2) Remove the cotterpin that holds the pump operating rod in the center hole of the throttle lever. Disengage rod from lever.

(3) Remove the clip that retains the fast idle rod, then disconnect the rod.

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

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

(6) 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.**

(7) Remove the air horn attaching screws and remove the air horn.

(8) Disengage the accelerator pump plunger rod from the rocker arm by removing the clip; and the bowl vent valve. Slide the plunger and rod out of the air horn. Slide the compression spring off the rod.

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

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

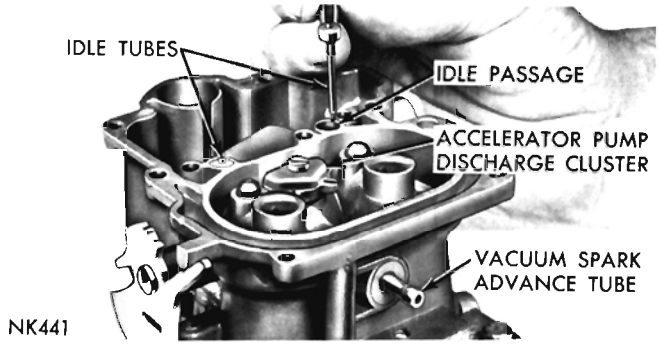

Fig. 3—Removing or Installing Idle Tubes

(10) Lift the idle tubes out of the main body, as shown in (Fig. 3). (The idle tubes are interchangeable.)

(11) Remove the screw and gasket from the accelerator pump discharge cluster, then lift off cluster and gasket, as shown in (Fig. 4).

(12) Invert the carburetor main body, and drop out the accelerator pump inlet and discharge check balls.

(13) **Do not attempt to remove the high-speed bleed-**

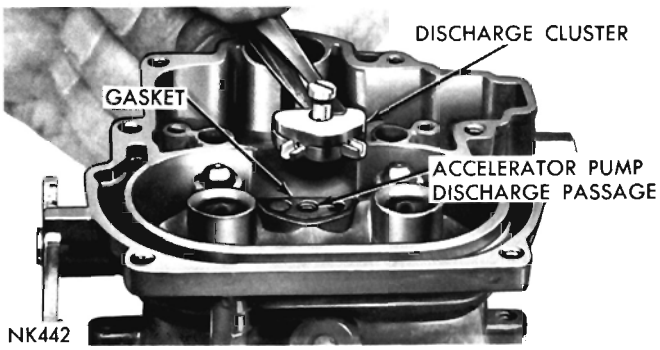

Fig. 4—Removing or Installing Discharge Cluster

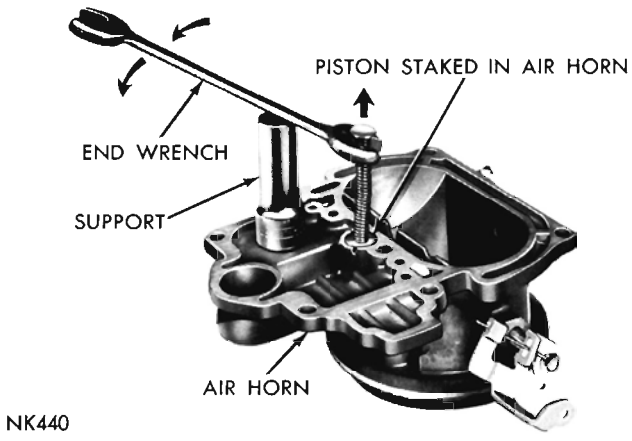

Fig. 2—Removing the Vacuum Power Piston

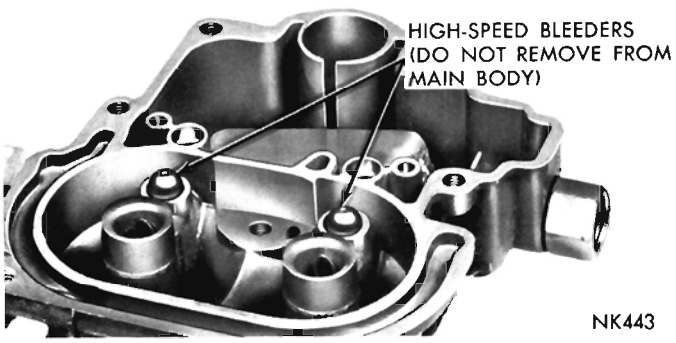

Fig. 5—High-Speed Bleeders

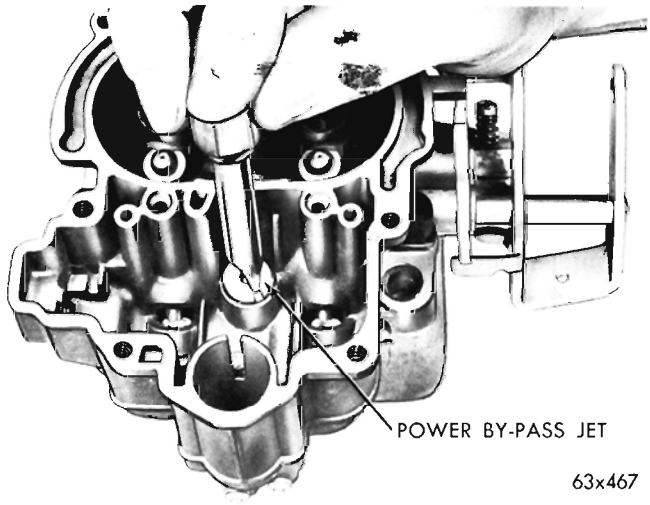

Fig. 6—Removing or Installing Power By-Pass Jet

ers located in the main discharge strut section of the carburetor main body. See (Fig. 5).

(14) Remove the fuel inlet needle valve seat and gasket assembly. Discard the gasket.

(15) Using a small screwdriver, pry out the float fulcrum pin retaining spring. (Cup the hand over the float chamber to prevent the spring from flying out.) Lift out the float and fulcrum pin.

(16) Remove the power by-pass jet and gasket, as shown in (Fig. 6).

(17) Remove the screws and lockwashers that hold the throttle body to the main body. Lift off the throttle body.

(18) With the main body in an inverted position, remove the main jet plugs; using Tool 73598 and 73609. Discard the plug gaskets.

(19) Using Tool 73606, remove the main metering jets, as shown in (Fig. 7). Do not substitute the main metering jets No. 388208 used in previous carburetors for No. 388539. (New type.)

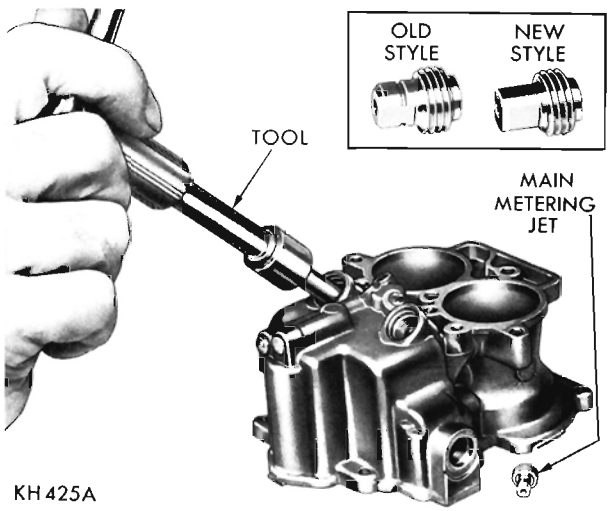

Fig. 7—Removing or Installing Main Metering Jets

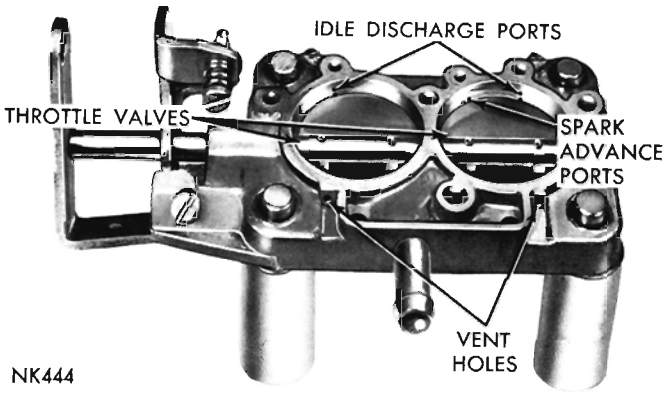

Fig. 8—Ports in Relation to Throttle Valves

(20) Remove the main discharge jets (or tubes), using Tool 73608. This Tool has tapered right hand thread and should be screwed into jet. The threads that are formed in the jet during removal, will not damage the jet.

(21) Unscrew and remove the idle mixture adjusting screws and springs, from the throttle body.

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

NOTE: 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.

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.

During manufacture, the location of the idle transfer port and the spark advance control ports to the valves is carefully established for one particular assmbly. See (Fig. 8).

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 is to be installed, adhere closely to the following instructions:

(2) Mark the valves to be sure each is replaced in

the same bore from whence removed.

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

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.

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

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

The "dash" stamped on the valves must be toward the idle port and visible from the top of the throttle body when valves are installed.

(6) Slide the valves in position through the throttle shaft, then insert **NEW** screws, but do not tighten. Hold the valves in place with the fingers. (Fingers pressing on the high side of valves.)

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

(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 Mixture Screw Adjustment

Do not use a screwdriver. The adjustment should be made with the fingers. Turn the idle mixture adjusting screw lightly against its seat, then back off one full turn for approximate adjustment.

Reassembling the Carburetor Main Body

(1) Place the main discharge jets (or tubes) firmly on Tool 73608, as shown in (Fig. 9). Slide them into position in the main body. Be sure the opening in the end of tube (diagonal cut end) is facing the opposite side of the small venturi. **These two jets must be seated firmly in the main body.**

(2) Insert the main metering jets in the body over the discharge jets (or tubes) just installed. Tighten securely, using Tool 73606. See (Fig. 7).

(3) Slide new copper gaskets in the main jet plug openings, then insert the plugs and tighten securely.

(4) Place the assembled throttle body on the inverted main body and position the insulator. Install screws and lockwashers, then tighten securely.

(5) Invert the carburetor and place on repair block C-3225, then install the power by-pass jet and new gaskets.

The change from the lean road load mixture to the richer wide open throttle maximum power mixture is made with an intermediate step. This is accomplished with a spring loaded two position power jet, actuated by vacuum on the power jet piston. The purpose of this two stage action is to secure best fuel economy in the lower road load speed range without sacrificing performance in the intermediate speed range.

During initial or part throttle operation, the vacuum above the piston is sufficient to overcome the compression spring and hold the piston in the up position. As the throttle valves are opened the manifold vacuum drops and the piston compression spring moves the piston down to open the first stage valve (upper) of the power by-pass jet, as shown in (Fig. 12). This meters additional fuel through the upper hole, into the main metering system.

With increased demand for power and a further drop in vacuum, the piston moves down an additional amount to open the second stage valve (lower) as shown in (Fig. 12), and meters an additional amount

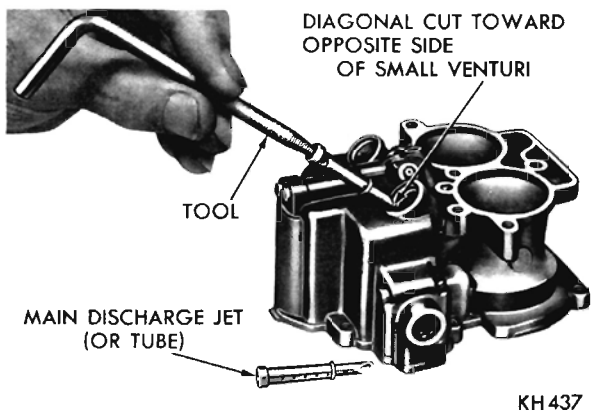

Fig. 9—Installing Main Discharge Jets (or tubes)

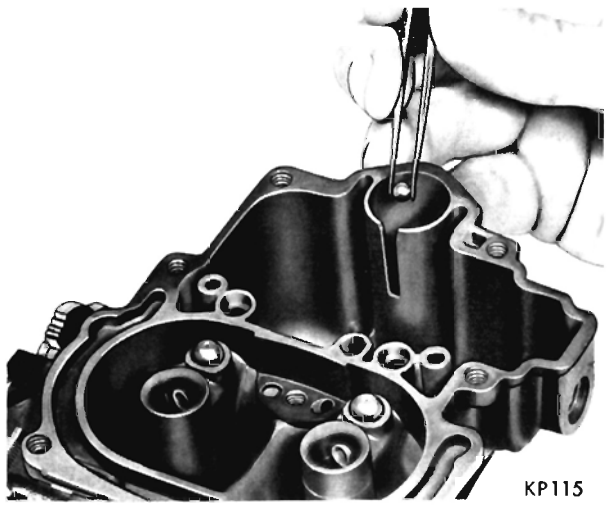

Fig. 10—Installing Accelerator Pump Check Ball

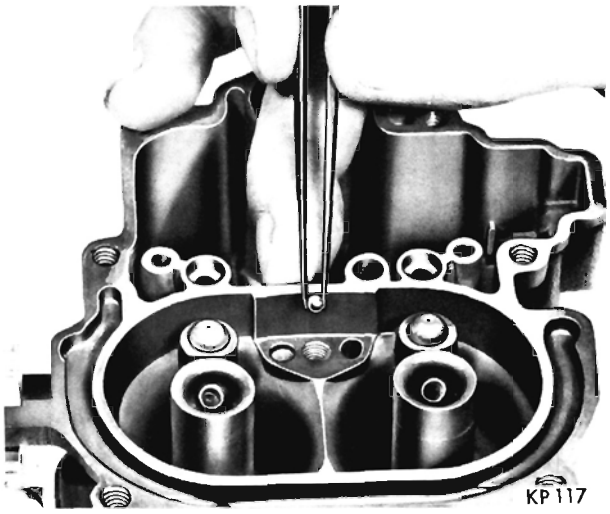

Fig. 11—Installing Discharge Check Ball

of fuel through the hole at the bottom of the power by-pass jet.

When the demand for power is satisfied and the throttle opening is decreased, the manifold vacuum builds up to raise the power piston and closes the 2nd stage valve (lower) cutting off the supply of fuel through the bottom hole of the jet. A further reduction of power closes the 1st stage valve (upper) cutting off the supply of fuel through the upper hole.

No changes in service procedures are required except to be sure the Power By-Pass Jet is clean.

(6) Install the accelerator pump inlet check ball ($^3/_{16}$ inch diameter) in the check ball seat at the bottom of the pump cylinder, as shown in (Fig. 10).

(7) Install the accelerator pump discharge check ball (⅛ inch diameter) in the orifice in the center passage of the discharge strut section of the main body, as shown in (Fig. 11).

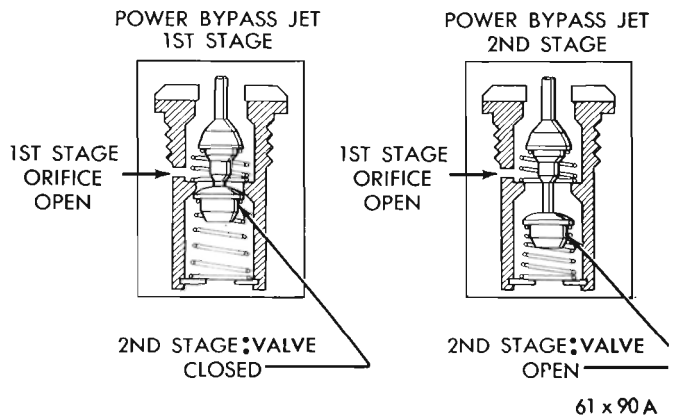

Fig. 12—Power By-Pass Jet (1st and 2nd Stage Operation)

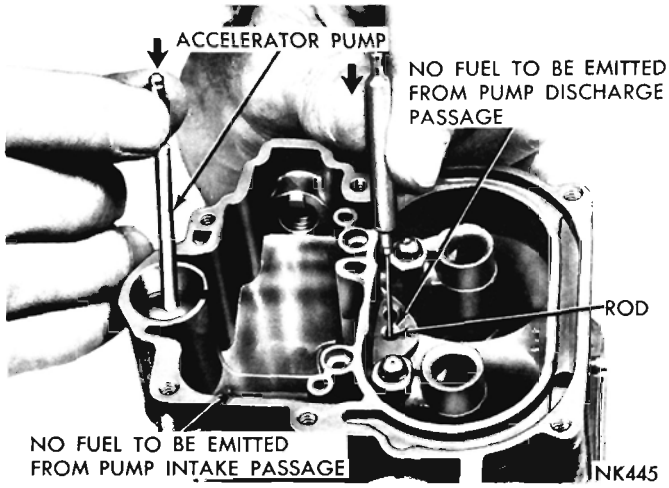

Fig. 13—Testing Accelerator Pump Intake and Discharge Check Balls

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 it down into the pump cylinder. Raise the plunger and press lightly on 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. Again raise the plunger and press downward. No fuel should be emitted from either the intake or discharge passage, as shown in (Fig. 13).

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

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

(5) Install the discharge cluster gasket, cluster and screw. Tighten securely. See (Fig. 4).

Again depress the accelerator pump plunger. A clear straight stream should emit from each cluster jet. If the streams are not identical (if either one is diverted or restricted), a new discharge cluster should be installed.

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

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

(7) Assemble the fuel inlet needle valve, seat and gasket, then insert in position in the main body. Tight-

en securely. (If the needle is ridged or badly worn, install a new needle valve and seat assembly.)

(8) Install the float fulcrum pin retaining spring in position and force under lip of boss to keep fulcrum pin in position.

Measuring the Float Height

The carburetors are equipped with a synthetic rubber tipped fuel inlet needle. 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 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.

To correctly set the float height when the carburetor is being overhauled proceed as follows:

(1) Install the float with the fulcrum pin and retaining spring in the main body.

(2) Install the 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.

(4) Using Tool 73725 or a "T" scale, check the float, as shown in (Fig. 14). There should be $^{7}/_{32}$ inch from the surface of the fuel 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 $^{7}/_{32}$ 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 synthetic rubber tip can be compressed sufficiently to cause a false setting which will affect correct level of fuel in the bowl.

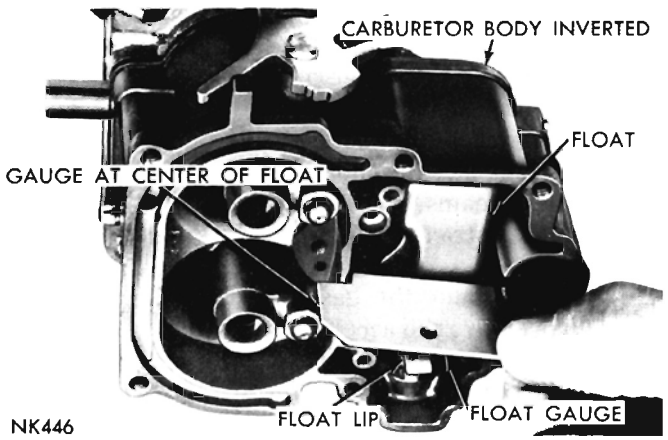

Fig. 14—Measuring the Float Setting

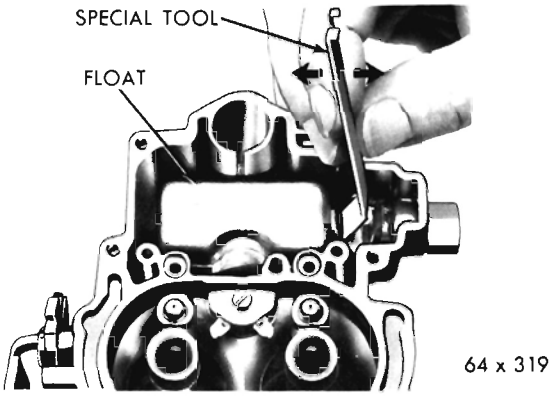

Fig. 15—Bending Float Lip

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

It is very important that the float lip be perpendicular to the needle or slant 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, as shown in (Fig. 15).

(5) To change the float setting, bend the float lip toward the needle to lower, and away from needle to raise the float.

Install the idle tubes in the main body. See (Fig. 3). **These tubes are interchangeable.**

Assembling Air Horn

To reassemble the air horn, refer to (Fig. 1), then proceed as follows:

(1) Remove the accelerator pump plunger from the jar of gasoline. If the leather is hard, cracked or worn, install a new plunger and shaft.

(2) Slide the compression spring over the plunger shaft. Insert the assembly through the air horn.

(3) Slide bowl vent valve over shaft and down

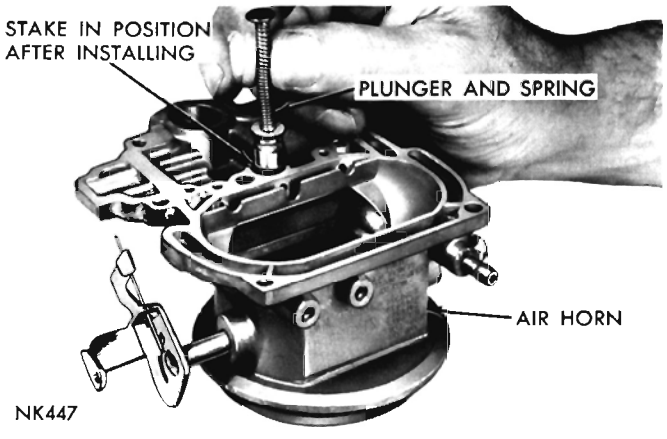

Fig. 16—Installing Vacuum Power Piston

against seat. Engage pump shaft with pump arm and secure with clip.

(4) Install the vacuum power piston and plunger in the air horn, as shown in (Fig. 16). Lock in position by prick punching on the retaining 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.

(5) Slide a new air horn gasket over accelerator pump plunger, and down against air horn. Now, lower air horn straight down on main body, with the accelerator pump plunger sliding into its well. (Be sure the leather on the pump does not curl or fold back.) Install air horn retaining screws and lockwashers, then tighten securely.

(6) Install the accelerator pump and fast idle connector rods, then work the accelerator pump plunger several times, to be sure it operates freely.

Choke Vacuum Diaphragm

Inspect the vacuum diaphragm fitting to insure 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 10 seconds, the leakage is excessive and the assembly must be replaced.

(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 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.)

ADJUSTMENTS

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

Cam Position Adjustment
Vacuum Kick Adjustment
Unloader Adjustment (wide open kick)
Accelerator Pump Travel Adjustment
Fast Idle Speed

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:

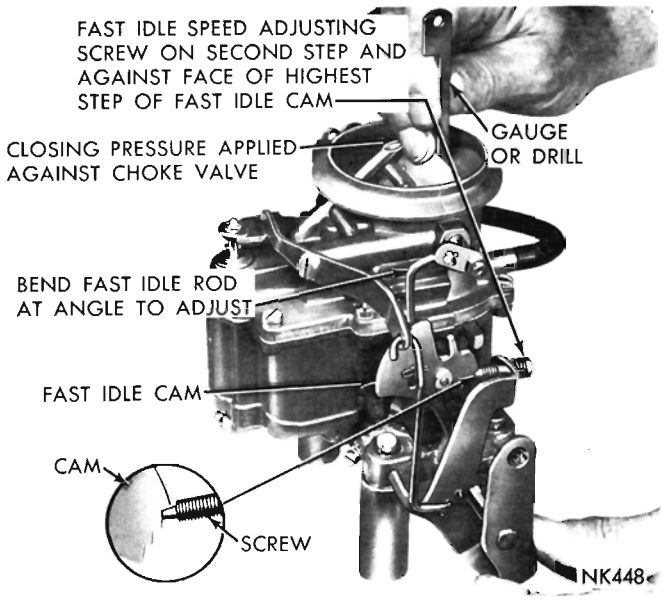

Fig. 17—Fast Idle Cam Position Adjustment

(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 $^{9}/_{64}$ inch drill or gauge 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

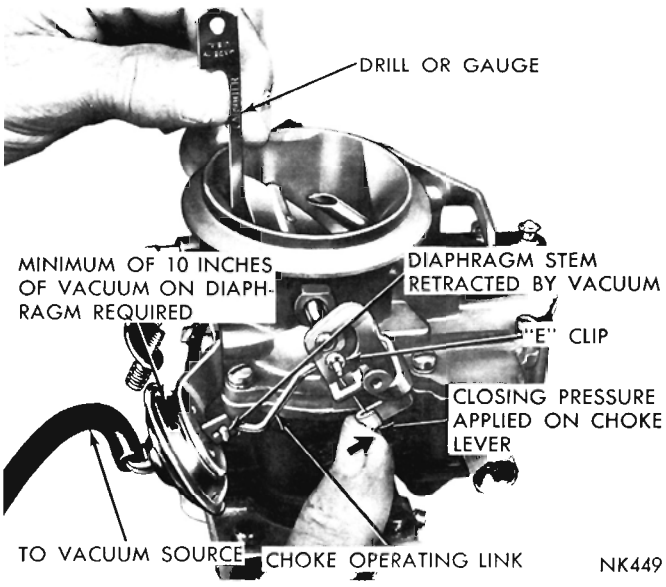

Fig. 18—Measuring the Choke Vacuum Kick Setting

rod at the upper angle, using Tool T109-213, until the correct valve opening has been obtained. Refer to (Fig. 17).

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 air horn by action of the linkage between the choke shaft and 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. Adjust as follows:

(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 the specified drill or gauge 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 choke valve 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.

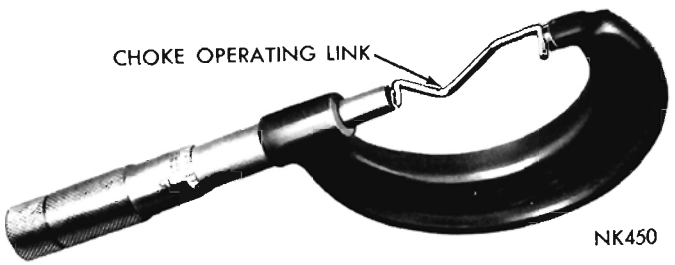

Fig. 19—Choke Operating Link Measurement

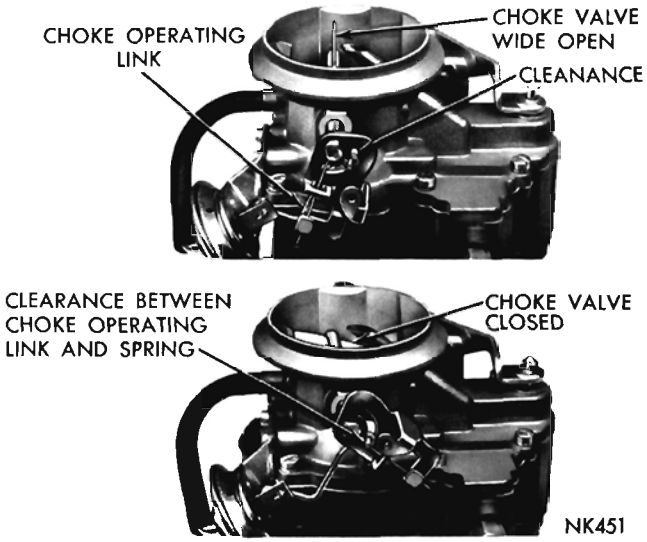

Fig. 20—Choke Operating Link Clearances

CAUTION: A correction in the length of the link of .010 inch, will result in a change of .020 inch in the choke valve opening.

As an example, if the choke valve opening is .020 inch in error, the correction in the link length would be .010 inch.

A "2" inch 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 drill or gauge. Refer to (Fig. 18).

(8) Reinstall the vacuum hose to the diaphragm and 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 positions, as shown in (Fig. 20). **This clearance is necessary to allow the choke valve to close for starting as well as fully open after the engine reaches 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.

Unloader Adjustment (Wide Open Kick)

(1) To make the unloader adjustment, lightly hold the choke valve closed, then open the throttle valves to wide open position. The choke valve should open sufficiently to allow a $^{5}/_{16}$" drill to be inserted be-

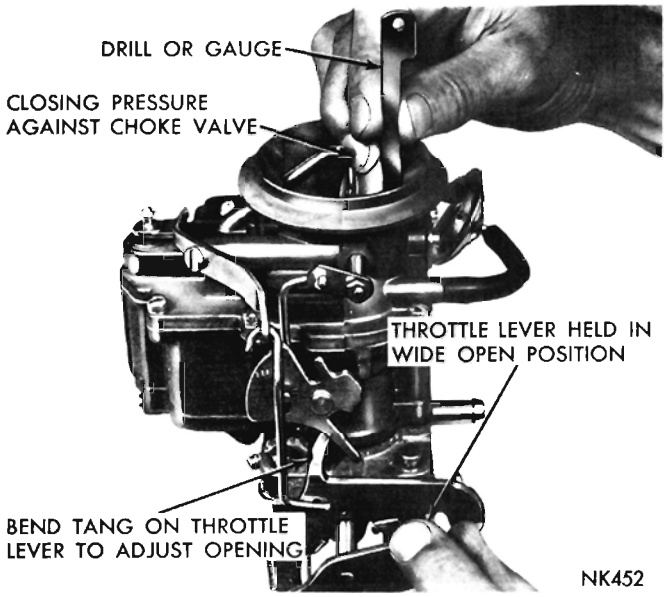

Fig. 21—Unloader Adjustment (wide open kick)

tween the choke valve and wall of air horn, as shown in (Fig. 21).

(2) To adjust, bend the tang on the throttle lever using Tool T109-214, as shown in (Fig. 21).

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

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

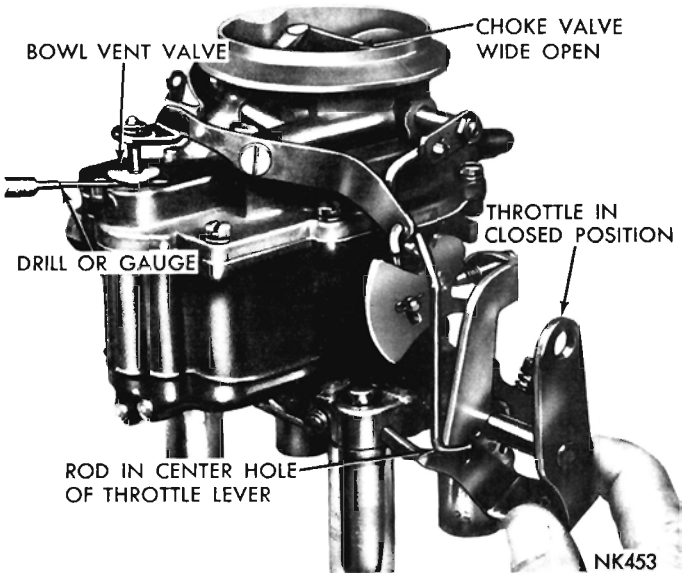

Fig. 22—Measuring Bowl Vent Valve Opening

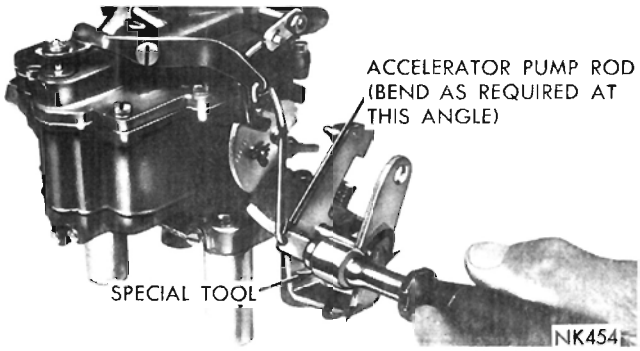

Fig. 23—Bending Accelerator Pump Rod

Accelerator Pump and Bowl Vent Adjustment

When assembling the accelerator pump to the air horn, note that the horseshoe clip (which opens the bowl vent) can be placed in any one of the three positioning notches. These notches correspond to the long, medium and short pump stroke holes in the throttle lever. Normally, the bowl vent clip on the pump stem will be at the middle notch and the pump rod in the medium stroke hole.

The proper procedure is to adjust the amount of bowl vent opening instead of measuring and setting the height of the pump plunger.

To check or set the adjustment, proceed as follows:

(1) Back off idle speed adjusting screw. Open the choke valve, so that when the throttle valves are closed, the fast idle adjusting screw will not contact the fast idle cam.

(2) Be sure the pump rod is in the medium stroke hole in the throttle lever, and that the bowl vent clip on the pump stem is in the center notch.

(3) Close the throttle valves tightly. It should be just possible to insert a $^{5}/_{64}$ inch drill between the bowl vent and the vent seat protruding through the air horn, as shown in (Fig. 22).

If an adjustment is necessary, bend the pump rod, using Tool T109-213 at the lower angle, until the correct bowl vent opening has been obtained, as shown in (Fig. 23).

This is an important adjustment, since too much lift at the bowl vent will result in considerable loss in low speed fuel economy.

Remember that if the pump rod is moved to either the short or long stroke position, a corresponding change must be made in the location of the bowl vent clip, and the amount of the lift of the bowl vent rechecked and adjusted.

NOTE: The accelerator pump travel is automatically taken care of when the bowl vent is properly adjusted.

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):

Because the alternator can change at idle speeds and impose a load on the engine, the headlights should be turned on (high beam). This will assure setting the idle to compensate for the alternator load. On vehicles equipped with the automatic transmission, disconnect the transmission control rod from the ball joint on the carburetor lever so that the stop in the transmission will not interfere with the free movement of the carburetor 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 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, 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 with the idler 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 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 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, refer to (Fig. 3), in the Throttle Linkage Section of this Group for the procedure on adjusting the transmission control rod.

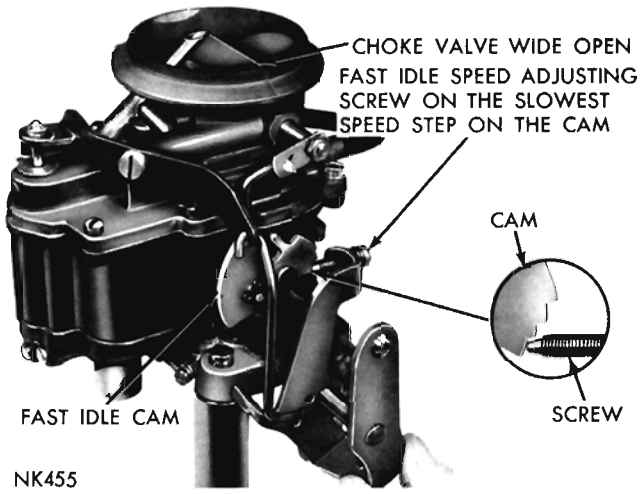

Fig. 24—Fast Idle Speed (on the Vehicle)

Fast Idle Speed (On the Vehicle After Approximately 500 miles if required)

To set the fast idle speed on the car, connect a tachometer, 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 slowest speed 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. **Reposition the cam and throttle after every screw adjustment, to apply normal throttle closing torque.**

PART 6

WWC3 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 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 rod from cam, then rotate 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 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

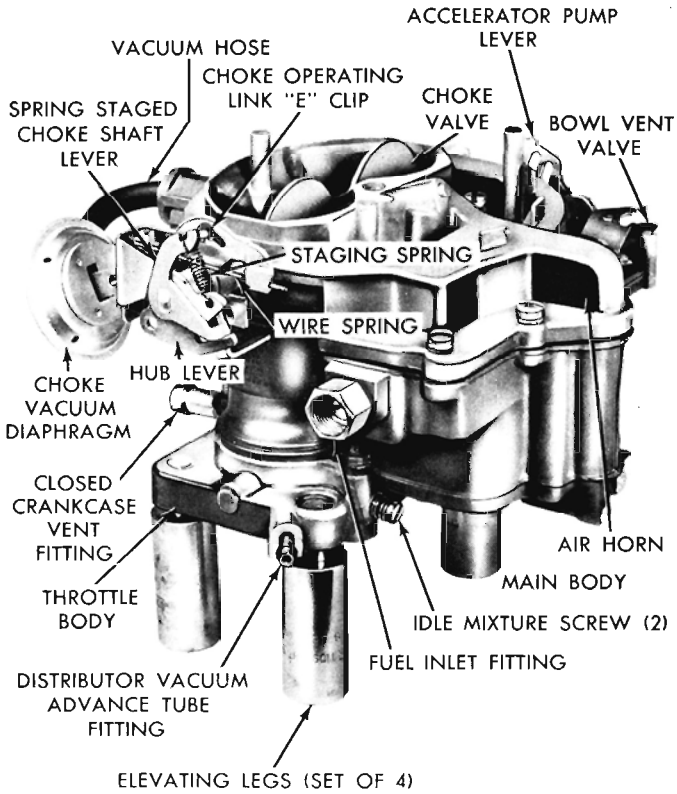

Fig. 1—Carburetor Assembly WWC-3-254 or WWC3-255 (Right Side)

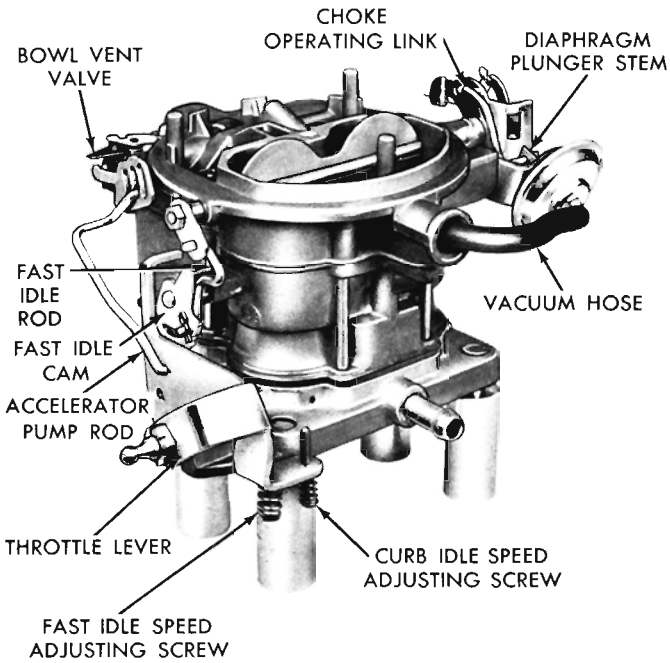

Fig. 2—Carburetor Assembly WWC3-254 or WWC3-255 (Left Side)

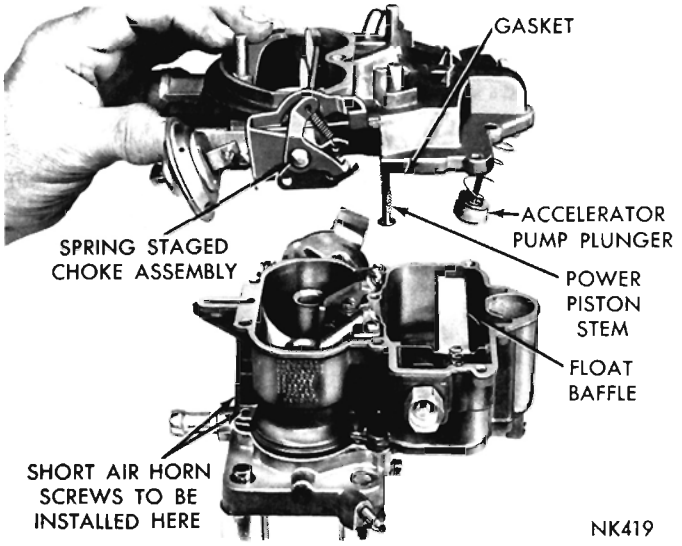

Fig. 3—Removing or Installing the Air Horn

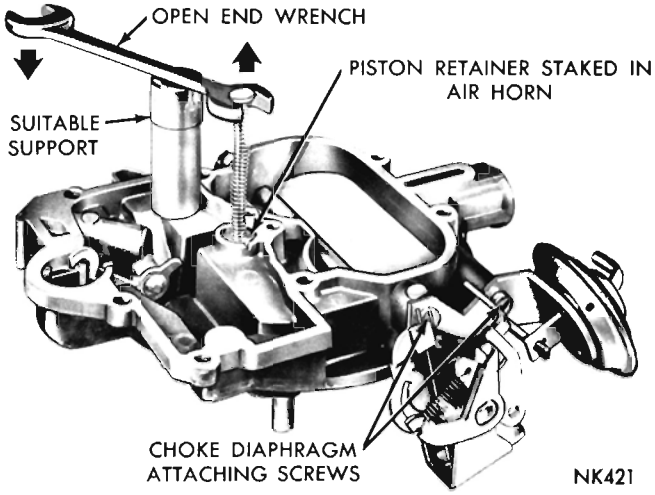

Fig. 5—Removing the Vacuum Power Piston

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 air horn straight up and away from main body, as shown in (Fig. 3).

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 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.

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.

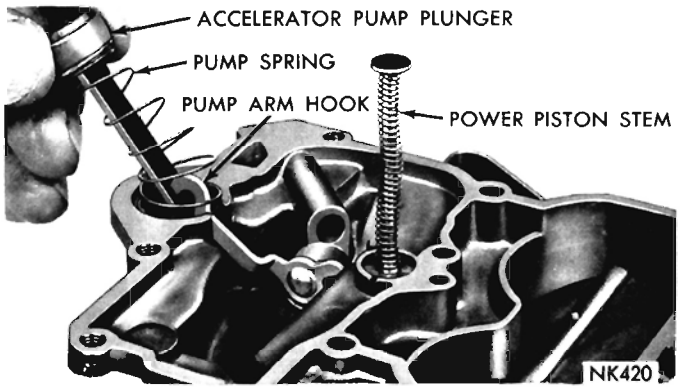

Fig. 4—Removing or Installing the Accelerator Pump Plunger

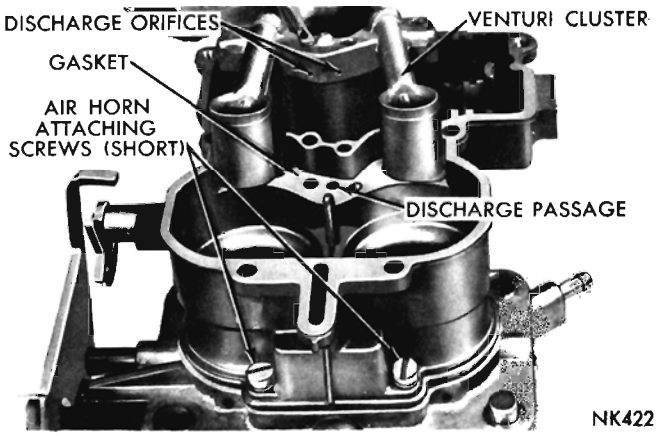

Fig. 6—Removing or Installing the Venturi Cluster

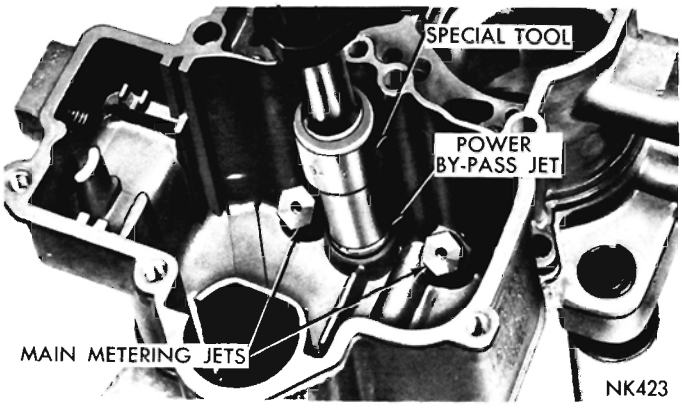

Fig. 7—Removing or Installing the Power By-Pass Jet

(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.

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

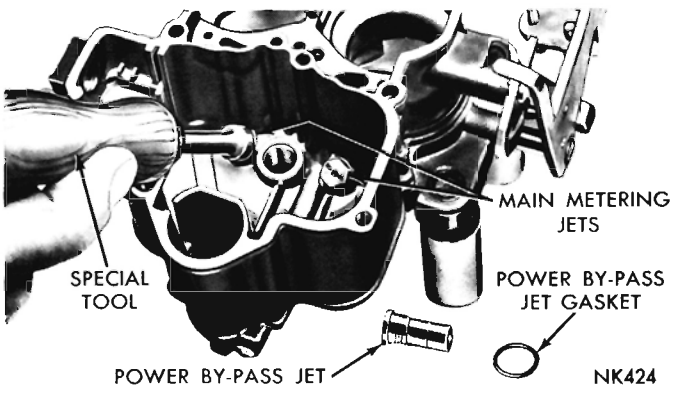

Fig. 8—Removing or Installing the Main Metering Jets

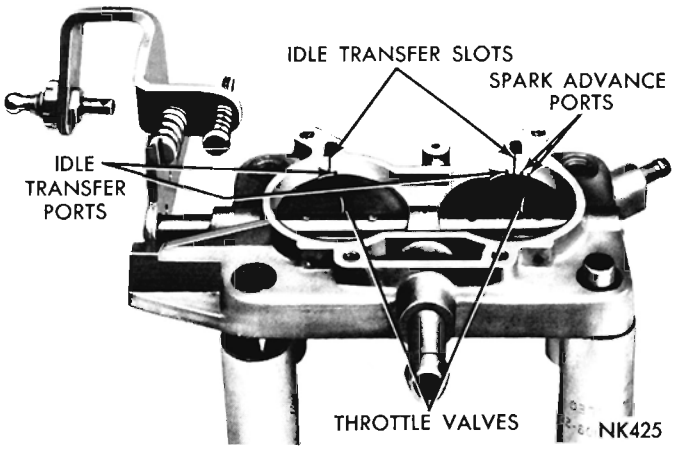

Fig. 9—Ports in Relation to Throttle Valves

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.

During manufacture, the location of the idle transfer ports and the spark advance control ports to the valves are carefully established for one particular as-

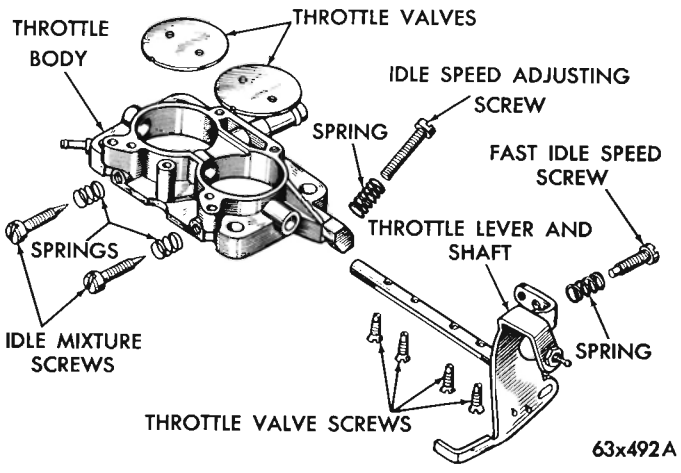

Fig. 10—Throttle Body (Exploded View)

sembly. 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 its original bore, 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.

(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.

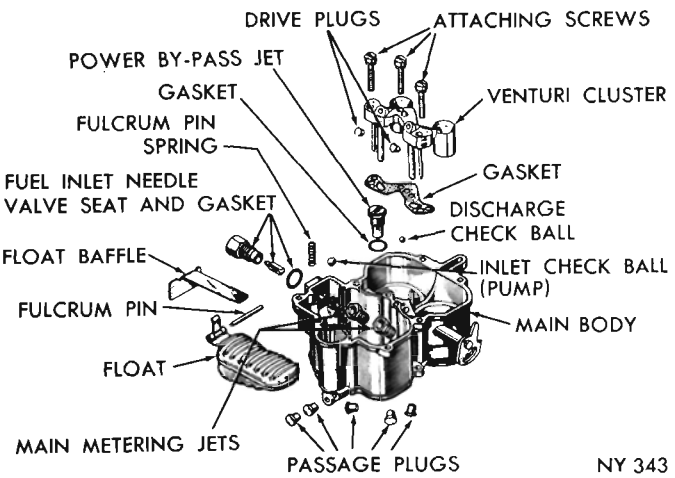

Fig. 11—Main Body (Exploded View)

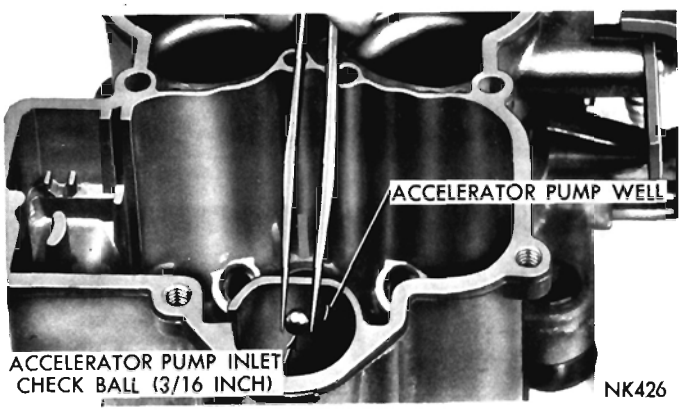

Fig. 12—Installing Accelerator Pump Inlet Check Ball

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 T109-173. Refer to (Fig. 8).

(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).

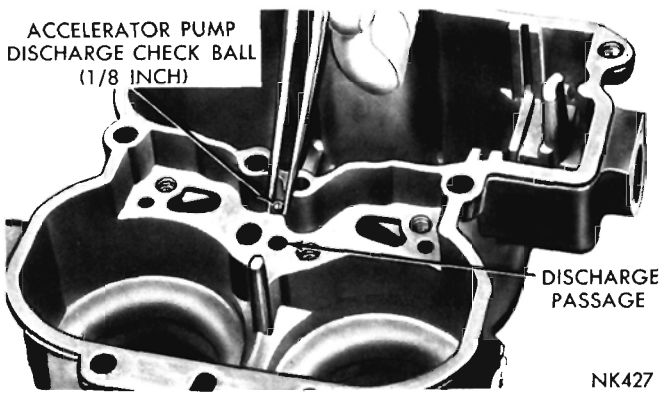

Fig. 13—Installing the Discharge Check Ball

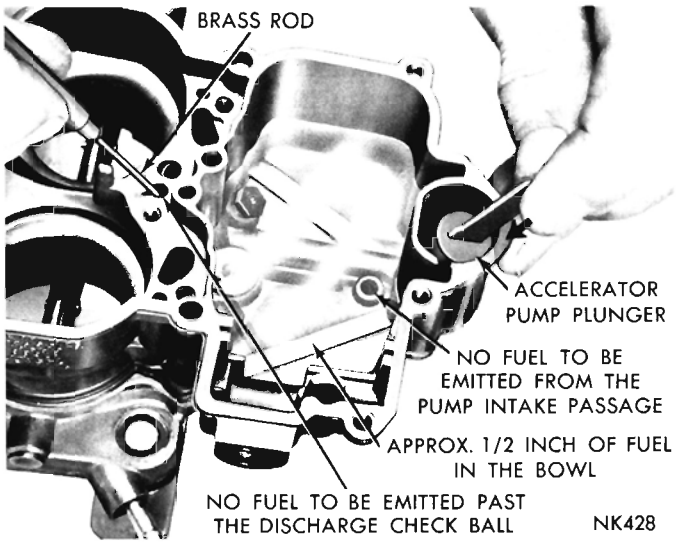

Fig. 14—Testing Accelerator Pump Discharge and Inlet Check Balls

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).

(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 recleaned 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.

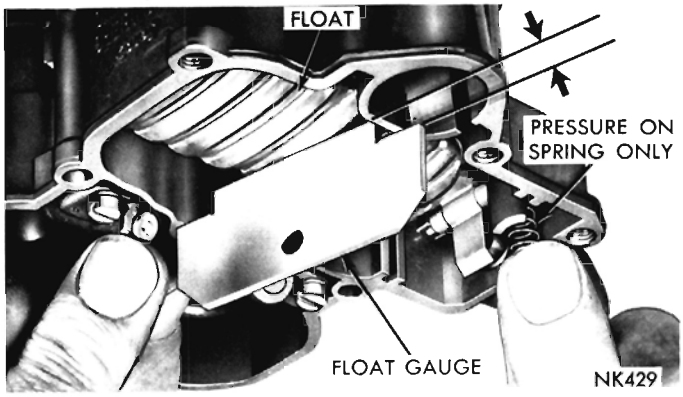

Fig. 15—Measuring the Float Setting

(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 the 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.

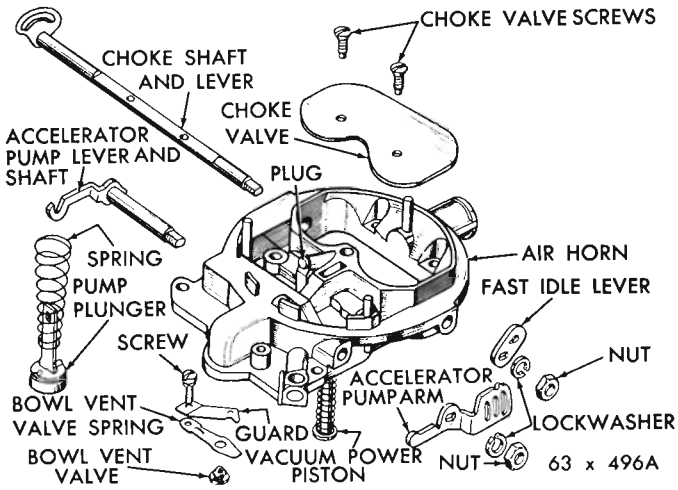

Fig. 16—Air Horn (Exploded View)

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.

NOTE: 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.

(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.)

(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.

(1) Install the diaphragm assembly on 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.)

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

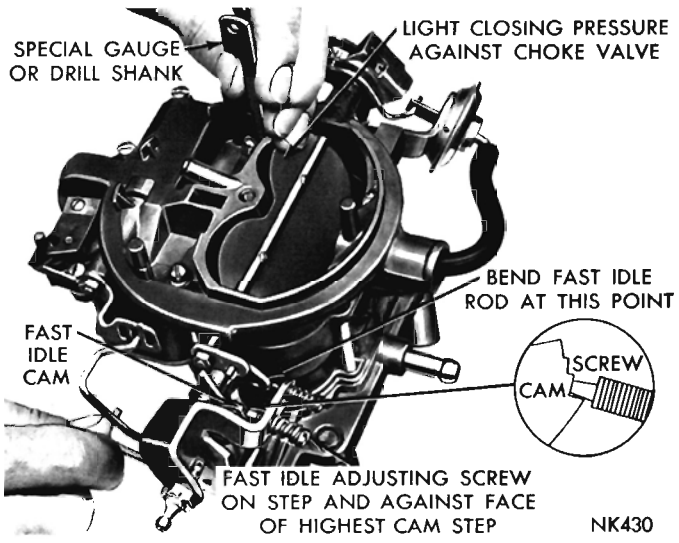

Fig. 17—Fast Idle Cam Position Adjustment

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 air horn by action of the linkage between the choke shaft and the diaphragm. The diaphragm must be energized to measure the vacuum kick adjustment. 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. 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

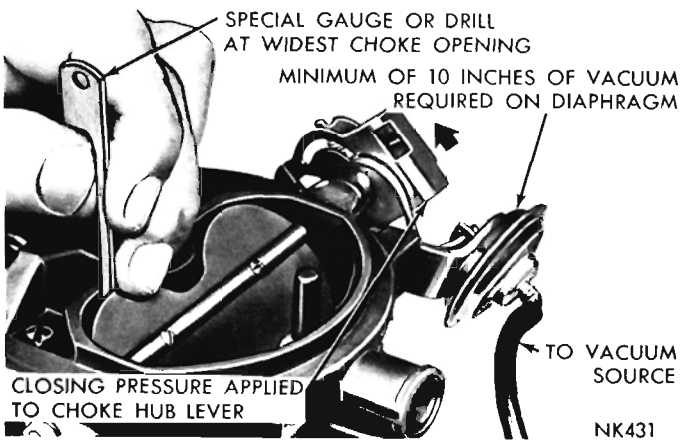

Fig. 18—Measuring the Vacuum Kick Setting

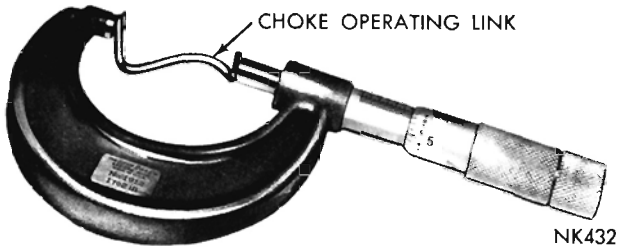

Fig. 19—Choke Operating Link Measurement

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.

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

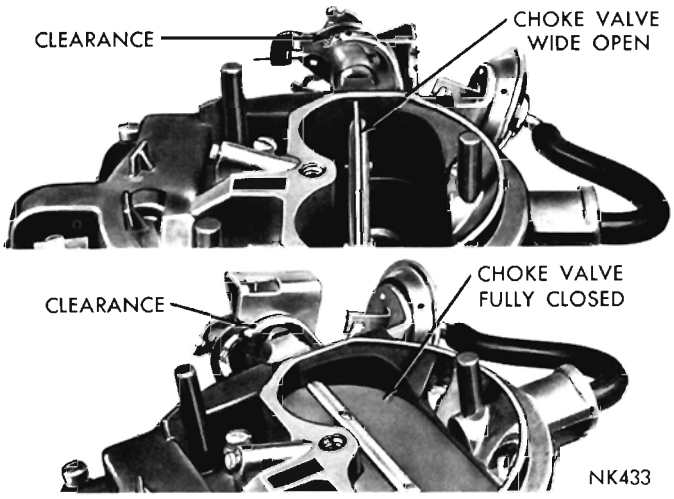

Fig. 20—Choke Operating Link Clearances

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.

Unloaded Adjustment (Wide Open Kick)

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

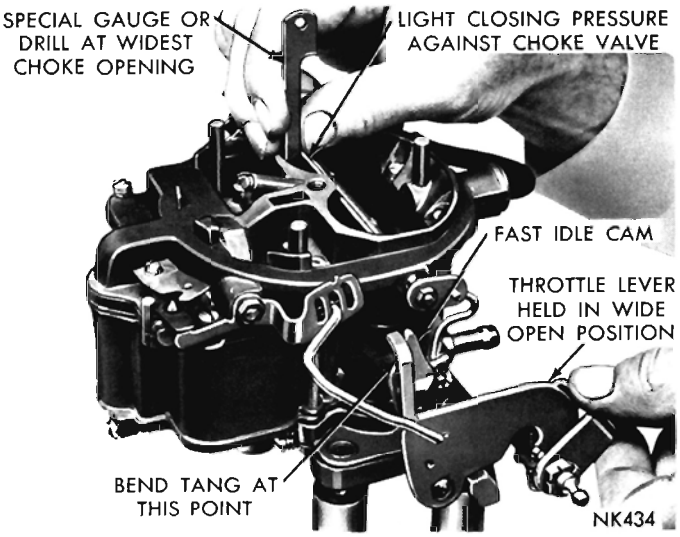

Fig. 21—Choke Unloader Adjustment (Wide Open Kick)

(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.

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.

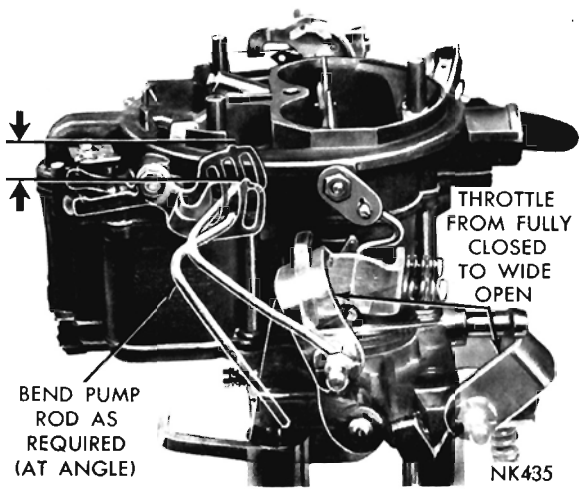

Fig. 22—Accelerator Pump Travel

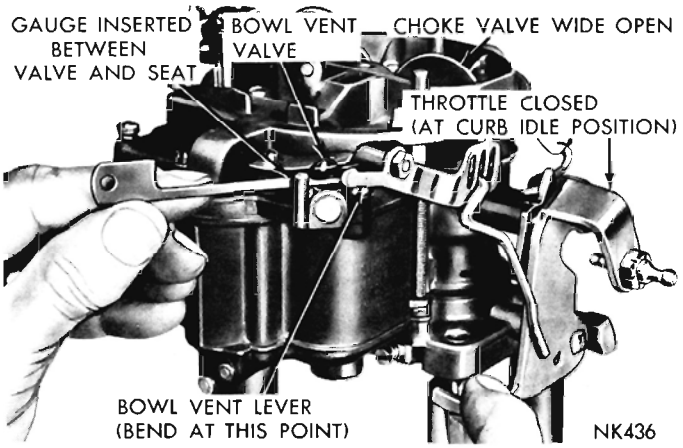

Fig. 23—Measuring the Bowl Vent Valve Opening

(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 (On the Vehicle)**

To set the fast idle speed on the car, 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

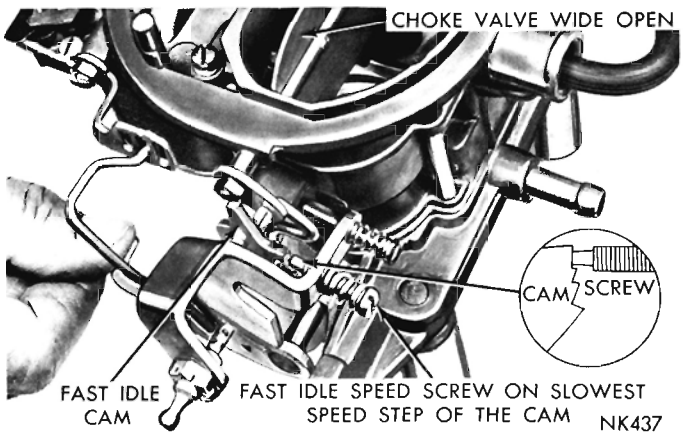

Fig. 24—Fast Idle Speed Adjustment (on the Engine)

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 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.

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

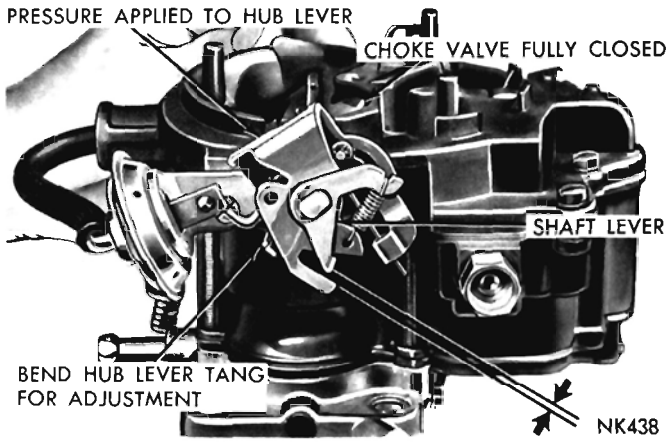

Fig. 25—Spring Staged Choke Clearance

(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 gage, measure the opening. The opening should be from .010 to .040 inch.

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

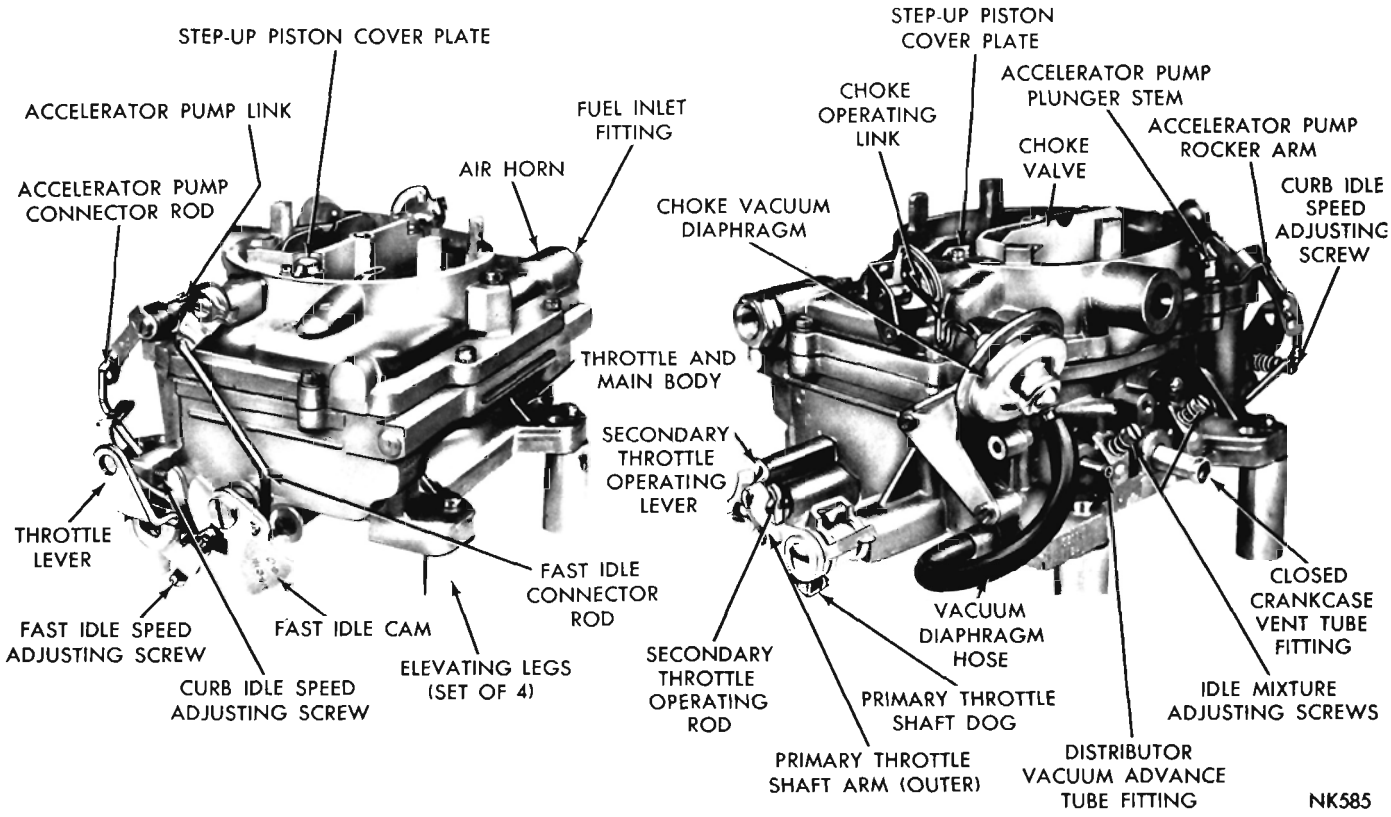

Fig. 1—Carburetor Assembly (AFB)

PART 7

AFB CARTER CABURETORS

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.

The AFB-3853S and AFB-3854S carburetors used on vehicles with 273 cubic inch engines are equipped with a pair of velocity valves, which control the secondary valve operation.

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

SERVICE PROCEDURES

DISASSEMBLY

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

Air Horn Removal

(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.

(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).

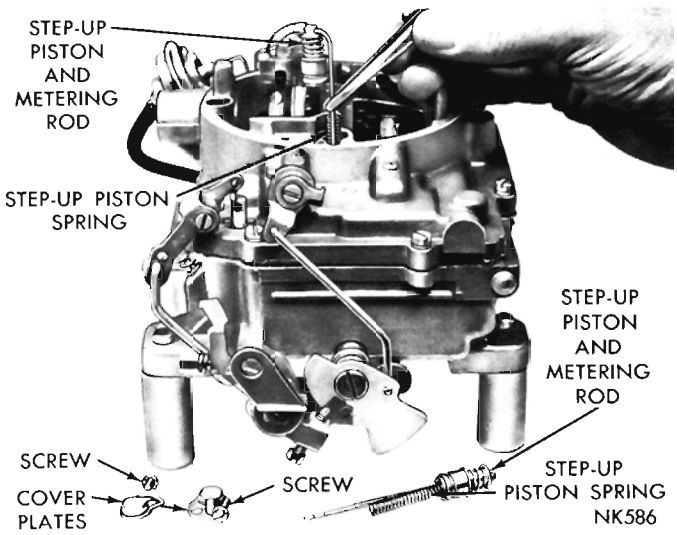

Fig. 2—Removing or Installing Step-Up Pistons and Rods

(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 and 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.

(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.

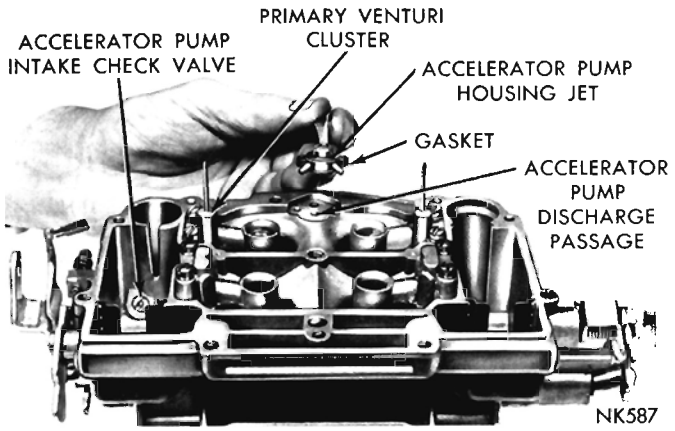

Fig. 3—Removing or Installing Accelerator Pump Jet Housing

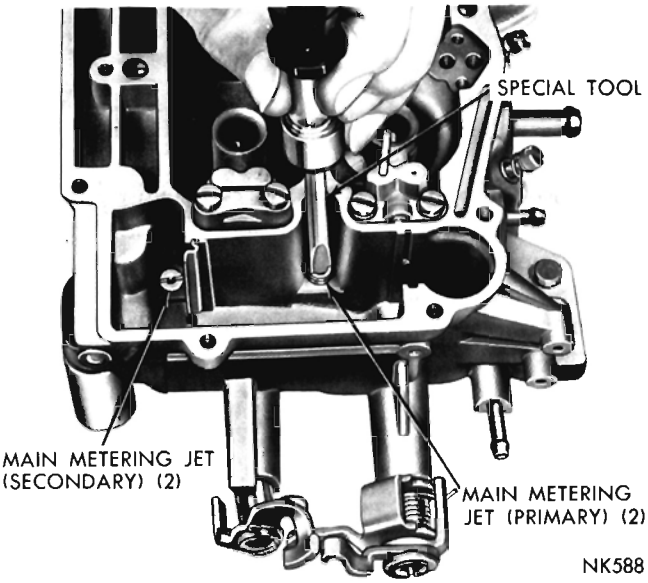

Fig. 4—Removing or Installing Main Metering Jet

(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). **The primary and secondary main metering jets are not inter-**

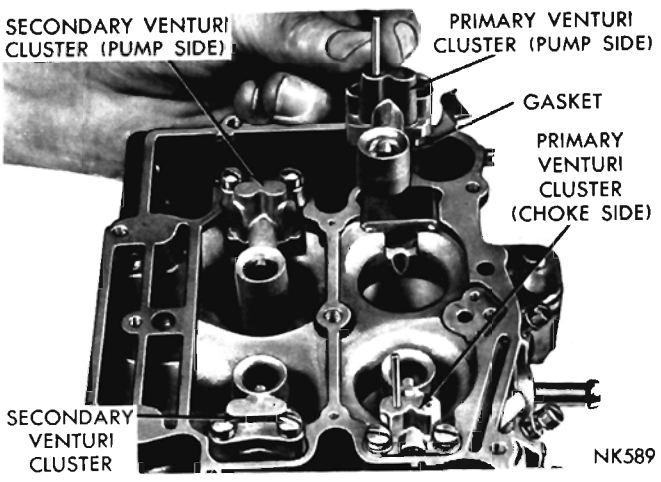

Fig. 5—Removing or Installing Primary Venturi Cluster

changeable. 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.

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) Lift the velocity valves and counterweights out of the secondary throttle bores.

(7) 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.

(8) 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.

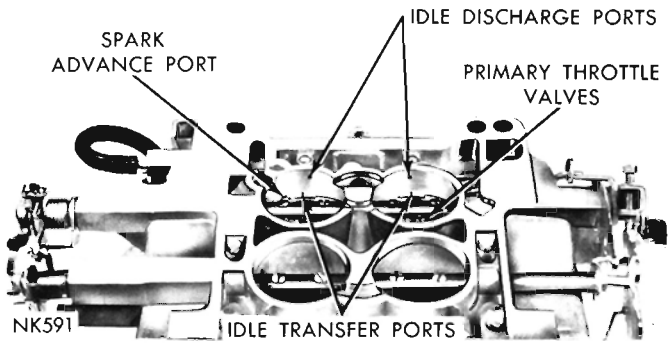

Fig. 7—Ports in Relation to Throttle Valves

If new throttle shafts should be installed in an old worn body, it would be very unlikely that the original relationship of these ports to the valves would be obtained. A very slight change in the port relationship to the valves would adversely affect normal carburetor operation, between the speeds of 15 and 30 miles per hour.

It is recommended that if the throttle shafts are excessively worn, that a new carburetor be installed. However, if the throttle valves have become nicked, burred or damaged, new valves may be installed, providing the following instructions are carefully followed.

CAUTION: 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 throt-

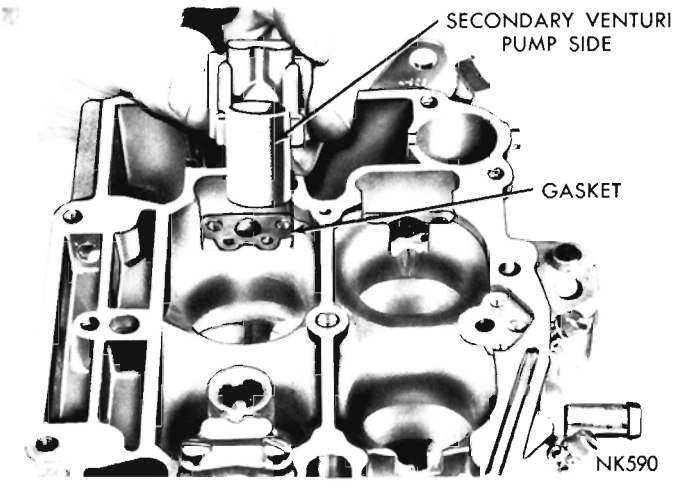

Fig. 6—Removing or Installing Secondary Venturi Cluster

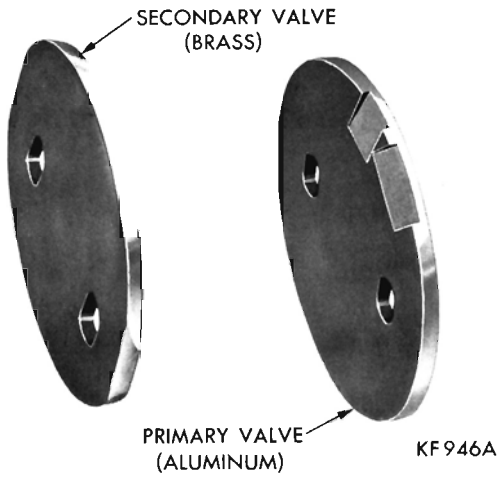

Fig. 8—Throttle Valve Identification

tle 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.

(4) Install the velocity valves and counterweights in position in the secondary throttle bores. (Be sure that the valve shaft is free and does not bind after installing the secondary venturis.)

(5) 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.

(6) 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.

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

(8) 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

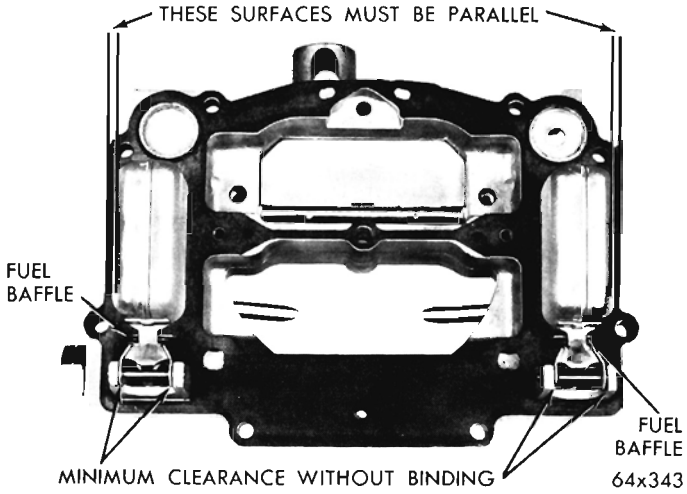

Fig. 9—Measuring Float Alignment

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

(4) Place a new air horn to main body gasket in position on 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 with the edge of casting, bend the float lever by applying pressure to the end of the float shell with the thumb. **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).

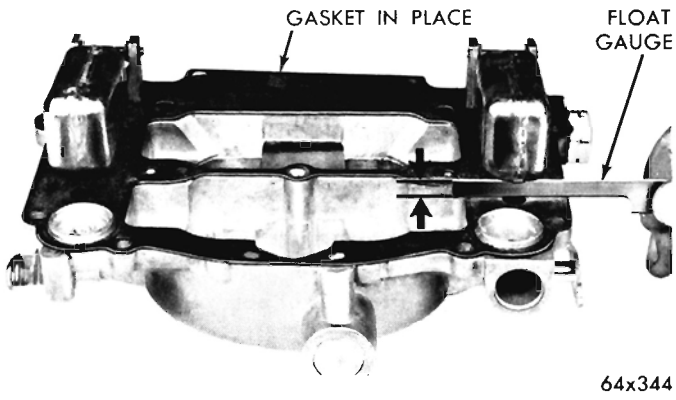

Fig. 10—Measuring Float Height

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

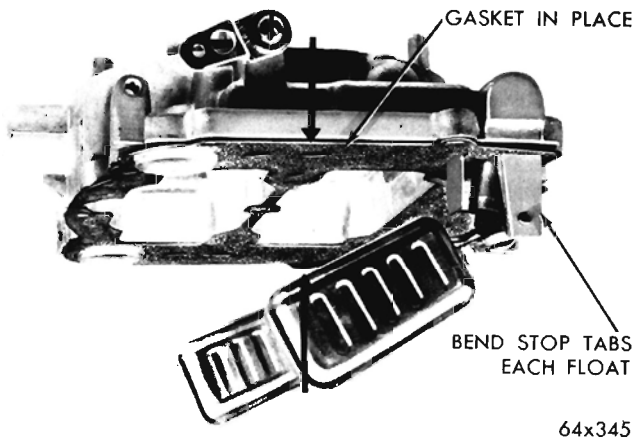

Fig. 11—Measuring Float Drop

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) Slide the choke piston into its cylinder in the air horn, guiding the link into the slot in the choke valve lever. Align hole, then install attaching cotter pin. Place a new welch plug over cylinder opening and secure with a ball peen hammer. 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.

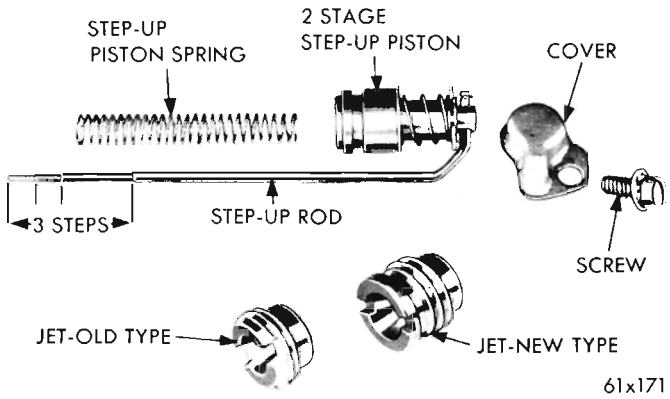

Fig. 12—Step-Up Piston, Rod and Jet

(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.

(1) Install the diaphragm assembly on 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.)

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

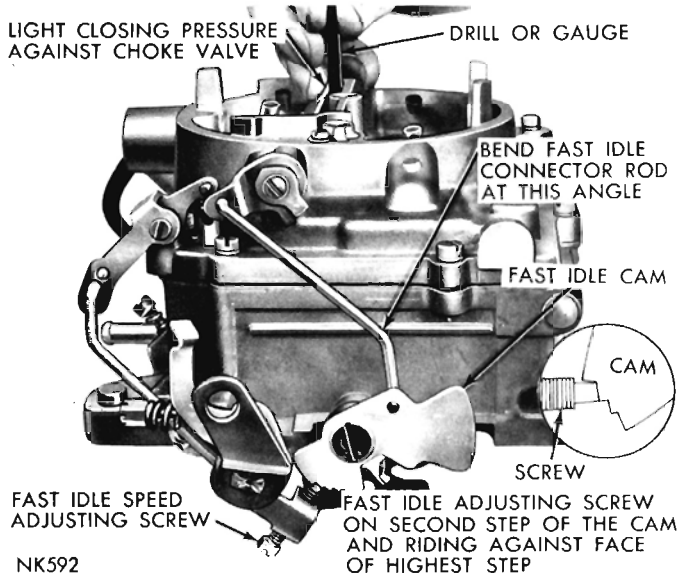

Fig. 13—Fast Idle Cam Position Adjustment

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 air horn.

(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 air horn by action of the linkage between the choke shaft and the diaphragm. The diaphragm must be energized to measure the vacuum kick adjustment. 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 mercury (HG) will be required.

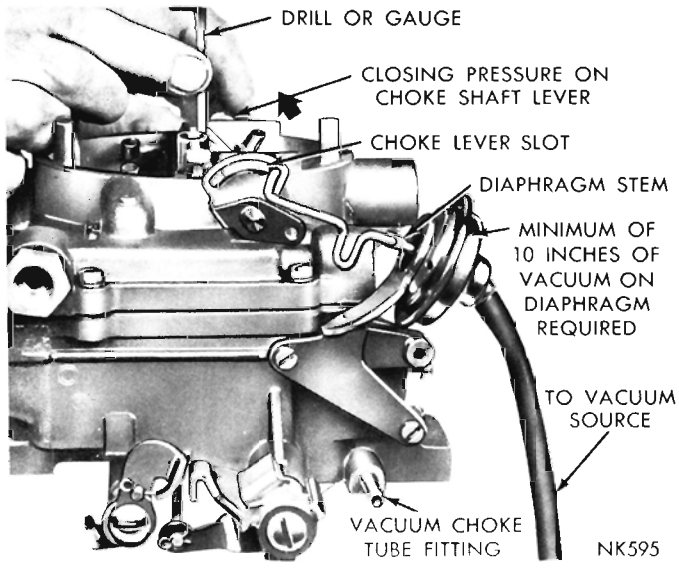

Fig. 14—Measuring the Choke Vacuum Kick Setting

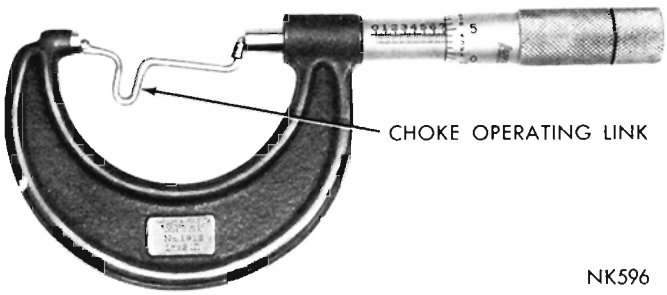

Fig. 15—Choke Operating Link Measurement

(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.

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,

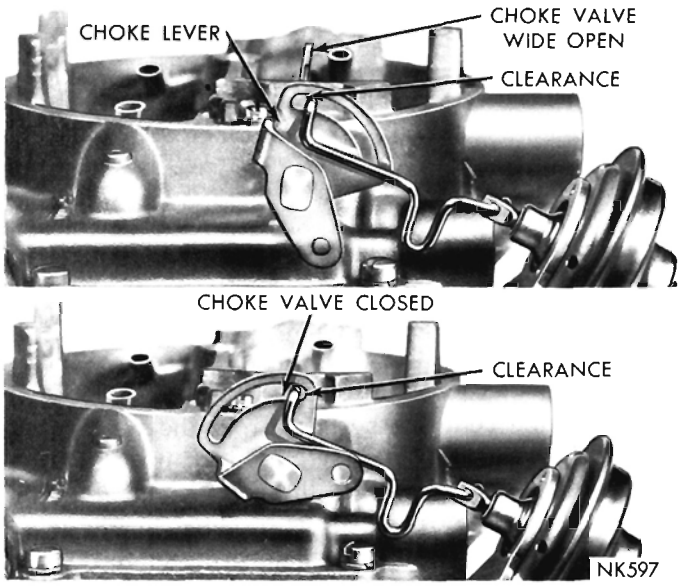

Fig. 16—Choke Operating Link Clearances

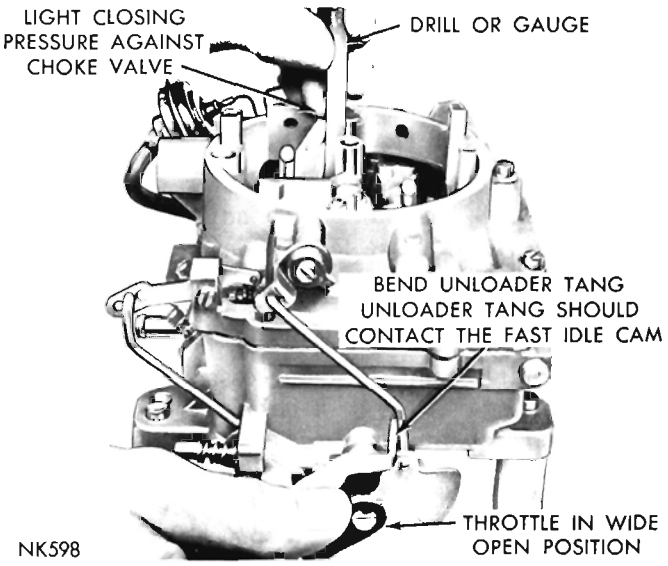

Fig. 17—Measuring Choke Unloader (wide open Kick)

some clearance should exist between the choke operating link and the choke lever slot, in both the open and closed choke valve positions, as should 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.

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.

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 valve until it is possible to measure $^{21}/_{24}$ 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 sec-

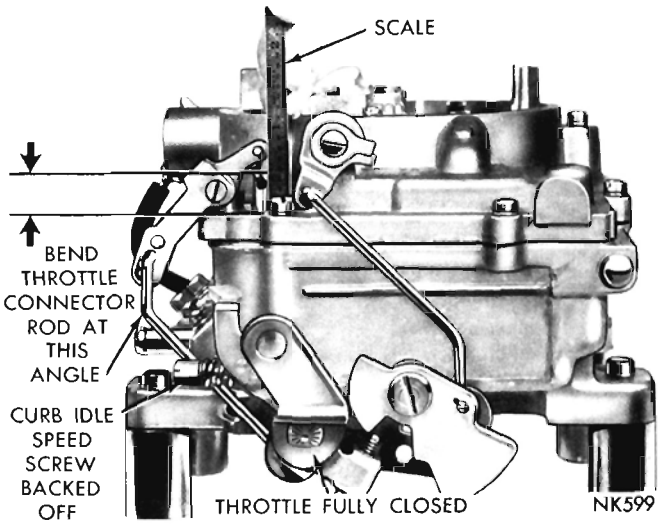

Fig. 18—Measuring the Accelerator Pump Adjustment

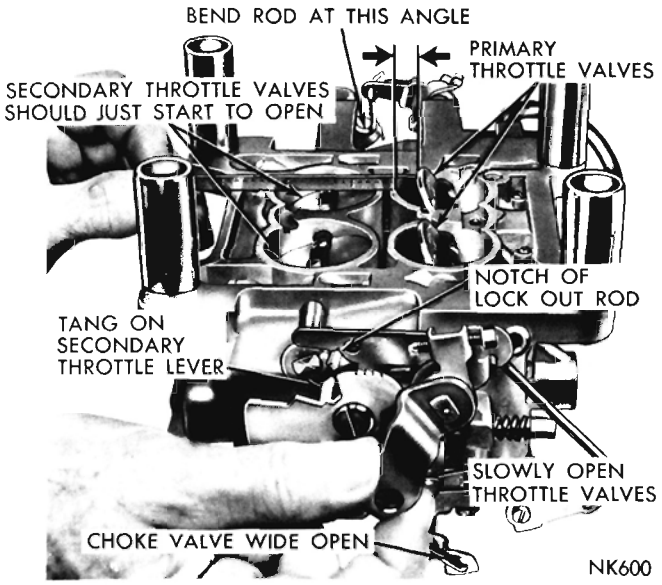

Fig. 19—Measuring the Secondary Throttle Adjustment

ondary throttle operating rod at the angle, using Tool T109-213, until correct adjustment has been obtained.

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

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

Secondary Throttle Lock-Out Adjustment

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

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

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

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

Idle Speed Adjustment—(Curb Idle)

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. Carburetors used on 273 cubic inch engines are equipped with a by-pass air bleed for setting the idle speed, other Models use idle speed

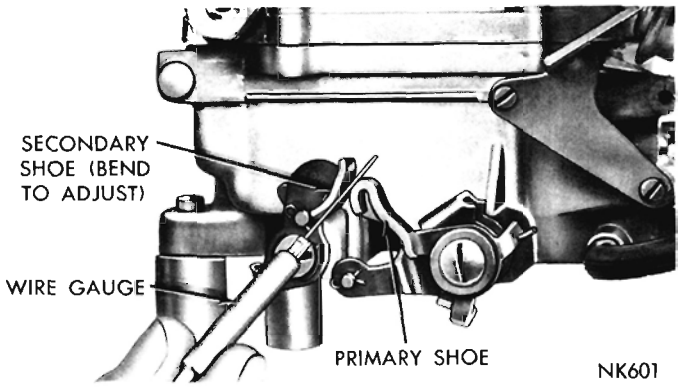

Fig. 20—Measuring Clearance Between Closing Shoes

screws. (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.

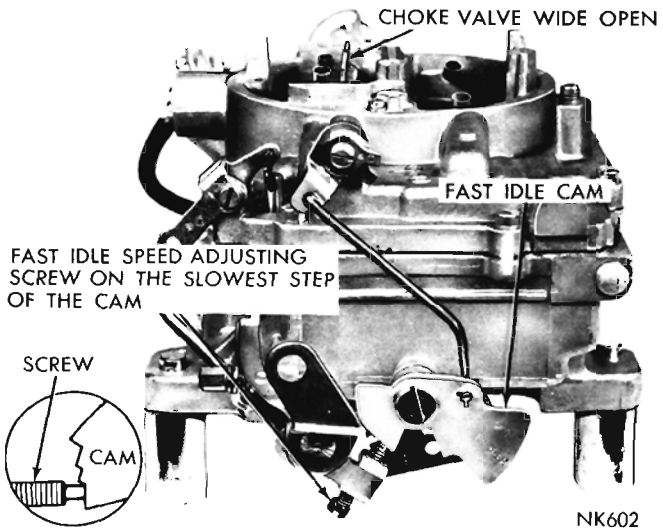

Fig. 21—Fast Idle Speed Adjustment (on the vehicle)

(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, or by-pass idle air bleed screw, the speed obtained after finding the leanest smooth idle setting will probably be too fast.

(5) Readjust the speed screw or by-pass idle air bleed screw to obtain the correct idle speed. Repeat steps 2 and 4 above if necessary.

NOTE: After the proper idle speed has been obtained refer to Figure in the Throttle Linkage Section of this Group for the procedure on adjusting the transmission control rod.

Fast Idle Speed (On the vehicle)*

To set the fast idle speed on the car, 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.

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

*After Approx. 500 Miles (Minimum Break In Period).

FUEL SYSTEM

HOLLEY MODEL NO. 1920 SERIES CARBURETORS

	Manual Trans.	Automatic Trans.	Manual Trans.	Automatic Trans.	Manual Trans.	Automatic Trans.
TYPE			Single Throat Down Draft			
MODEL			Holley—#1920			
	R-3053A	R-3054A	R-3057A	R-3058A	R-3059A	R-3060A
With Air Conditioning	R-3149A	R-3150A	R-3151A	R-3152A	—	—
ENGINE DISPLACEMENT (Cu. In.)	170	170	225 H.P.	225 H.P.	225	225
Bore	$1^{9}/_{16}$"	$1^{11}/_{16}$"	$1^{11}/_{16}$"	$1^{11}/_{16}$"	$1^{11}/_{16}$"	$1^{11}/_{16}$"
Venturi	$1^{1}/_{4}$"	$1^{5}/_{16}$"	$1^{5}/_{16}$"	$1^{5}/_{16}$"	$1^{5}/_{16}$"	$1^{5}/_{16}$"
Main Metering Jet						
Standard	53	56	58	56	58	56
One Step Lean	51	54	56	54	56	54
2 Steps Lean	49	52	54	52	54	52
ADJUSTMENTS						
Float Setting	Use Gauge		Use Gauge		Use Gauge	
Fuel Level Height (Wet)	$^{27}/_{32}$"	$^{27}/_{32}$"	$^{27}/_{32}$"	$^{27}/_{32}$"	$^{27}/_{32}$"	$^{27}/_{32}$"
Vacuum Kick (Drill Size)	#32	$^{3}/_{32}$"	#32	#46	#32	#46
Cam Position Adjustment (Drill Size)	$^{5}/_{64}$"	$^{5}/_{64}$"	$^{5}/_{64}$"	$^{5}/_{64}$"	$^{5}/_{64}$"	$^{5}/_{64}$"
Choke Unloader (See Fast Idle Cam Pos. Adj.)	—	—	—	—	—	—
Bowl Vent Valve	$^{1}/_{16}$"	$^{1}/_{16}$"	$^{1}/_{16}$"	$^{1}/_{16}$"	$^{1}/_{16}$"	$^{1}/_{16}$"
Idle Mixture Screw (turns open) Approx.	1	1	1	1	1	1
Idle Speed (Curb Idle rpm)**	550	550	550	550	550	550
Fast Idle Speed (Engine Hot and Screw on Slowest Step of Cam, rpm)						
Manual Trans.	700*	—	700*	—	700*	—
Automatic Trans.	—	700*	—	700*	—	700*
CHOKE						
Control	Thermostatic Coil Spring					
Type	Well	Well	Well	Well	Well	Well
Setting	2 Notches Rich		2 Notches Rich		2 Notches Rich	

*After Approx. 500 Miles (If Necessary)

**With Headlights ON and Air Conditioning ON (if so equipped)

BBS SERIES CARBURETORS

	Manual Trans.	Auto. Trans.	Manual Trans.	Auto. Trans.	Manual Trans. High Perf.	Auto. Trans. High Perf.	Taxi
TYPE			Ball and Ball Single Throat				
MODEL	BBS-3833S BBS-3835S*	BBS-3834S BBS-3836S*	BBS-3839S —	— BBS-3840S	BBS-3837S BBS-3839S*	BBS-3838S BBS-3840S*	BBS-3841S BBS-3841S
ENGINE DISPLACEMENT (Cu. In.)	170	170	225	225	225	225	170/225
Bore	$1^{9}/_{16}$"	$1^{11}/_{16}$"	$1^{11}/_{16}$"	$1^{11}/_{16}$"	$1^{11}/_{16}$"	$1^{11}/_{16}$"	$1^{9}/_{16}$"
Venturi	1¼"	$1^{11}/_{32}$"	$1^{11}/_{32}$"	$1^{11}/_{32}$"	$1^{11}/_{32}$"	$1^{11}/_{32}$"	1¼"
Main Metering Jet							
Standard	#120-267S	#120-263S	#120-263S	#120-263S	#120-263S	#120-263S	#120-209S
One Step Lean	#120-264S	#120-267S	#120-267S	#120-267S	#120-267S	#120-267S	#120-211S
Two Steps Lean	#120-265S	#120-268S	#120-268S	#120-268S	#120-268S	#120-268S	#120-210S
Step-Up Wire (Standard)	75-1593	75-1592	75-159	75-1592	75-159	75-1592	75-1208
Diameter	(.026")	(.028")	(.022")	(.028")	(.022")	(.028")	(.023")
ADJUSTMENTS							
Float Setting	¼"	¼"	¼"	¼"	¼"	¼"	$^{9}/_{32}$"
Choke Unloader	$^{3}/_{16}$"	$^{3}/_{16}$"	$^{3}/_{16}$"	$^{3}/_{16}$"	$^{3}/_{16}$"	$^{3}/_{16}$"	$^{3}/_{16}$"
Fast Idle Cam Position	$^{5}/_{64}$"	$^{5}/_{64}$"	$^{5}/_{64}$"	$^{5}/_{64}$"	$^{5}/_{64}$"	$^{5}/_{64}$"	$^{5}/_{64}$"
Vacuum Kick (drill size)	$^{5}/_{32}$"	#41	⅛"	#41	⅛"	#41	$^{5}/_{32}$"
Bowl Vent Valve Setting (from under side of valve to air horn)	.060"	.060"	.060"	.060"	.060"	.060"	.060"
Idle Mixture Screw (turns open)	1	1	1	1	1	1	1
Idle Speed R.P.M. (curb idle)**	550	550	550	550	550	550	550
Fast Idle Speed (r.p.m.)	700†	700†	700†	700†	700†	700†	700†
CHOKE							
Control				Thermostatic Coil Spring			
Type	Well		Well		Well		Well
Setting	2 Notches Rich		2 Notches Rich		2 Notches Rich		2 Notches Rich

*When equipped with Air Conditioning
**With Headlights ON and Air Conditioning ON (if so equipped)
†After Approx. 500 Miles (If Necessary)

FUEL SYSTEM—(Continued)

BBD SERIES CARBURETORS

CARBURETOR				
Type	Ball and Ball Dual Downdraft		Ball and Ball Dual Downdraft	
Model	273 Cu. In. Engine		318 Cu. In. Engine	
Manual Transmission	BBD-3843S	—	BBD-3847S	—
Automatic Transmission	—	BBD-3844S	—	BBD-3848S
Bore	$1^{7}/_{16}$"	$1^{7}/_{16}$"	$1^{7}/_{16}$"	$1^{7}/_{16}$"
Venturi	$1^{1}/_{16}$"	$1^{1}/_{16}$"	$1^{3}/_{16}$"	$1^{3}/_{16}$"
Main Metering Jet				
Standard	#120-294S	#120-294S	#120-299S	#120-299S
One Step Lean	#120-297S	#120-297S	#120-300S	#120-300S
Two Steps Lean	#120-298S	#120-298S	#120-301S	#120-301S
Step-Up Wire	75-1642	75-1645	75-1645	75-1641
Diameters (2 stage)	.025 x .022"	.026 x .022"	.026 x .022"	.028 x .025"
ADJUSTMENTS				
Float Setting (at center of floats)	¼"	¼"	¼"	¼"
Bowl Vent Valve (throttle closed)	$^{1}/_{16}$"	$^{1}/_{16}$"	$^{1}/_{16}$"	$^{1}/_{16}$"
Choke Unloader	¼"	¼"	¼"	¼"
Idle Mixture Screws (turns open)	1	1	1	1
Idle Speed R.P.M. (curb idle)	500	500	500	500
(Air Conditioning ON)	500	500	500	500
Vacuum Kick Adjustment (Drill Size)	#16	#30	#16	#25
Fast Idle Cam Position	$^{7}/_{64}$"	$^{7}/_{64}$"	$^{7}/_{64}$"	$^{7}/_{64}$"
Fast Idle Speed R.P.M.	700*	700*	700*	700*
CHOKE				
Control	Thermostatic Coil Spring		Thermostatic Coil Spring	
Type	Well	Well	Well	Well
Setting	On Index	On Index	On Index	On Index

CARBURETOR	Manual Transmission	Automatic Transmission
Type	Dual Throat Downdraft	Dual Throat Downdraft
Model	BBD-3849S	BBD-3850S
Engine Displacement (cu. in.)	361-383	361-383
Bore	$1^{9}/_{16}$"	$1^{9}/_{16}$"
Venturi	$1^{5}/_{16}$"	$1^{5}/_{16}$"
Main Metering Jet		
Standard	120-304S	120-304S
One Step Lean	120-296S	120-296S
Two Steps Lean	120-302S	120-302S
One Step Rich	120-306S	120-306S
Step-Up Wire (Standard)	75-1651	75-1652
Diameter (2 Stage)	.033 x .027"	.035 x .027"
ADJUSTMENTS		
Accelerator Pump Setting	1" ± $^{1}/_{64}$"	1" ± $^{1}/_{64}$"
Float Setting (at Center of Floats)	$^{5}/_{16}$"	$^{5}/_{16}$"
Vacuum Kick Adjustment (drill size)	#11	#22
Fast Idle Cam Position Adjustment (drill size)	#35	#35
Bowl Vent Valve (at curb idle)	$^{1}/_{16}$"	$^{1}/_{16}$"
Choke Unloader	¼"	¼"
Idle Mixture Screws (Turns Open)	¾"	¾"

FUEL SYSTEM—(Continued)

	Manual Transmission	Automatic Transmission
CARBURETOR		
Type	Dual Throat Downdraft	Dual Throat Downdraft
Model	BBD-3849S	BBD-3850S
Idle Speed RPM (Curb Idle)	500	500
(Air Conditioning ON)	500	500
Fast Idle Speed RPM	600*	700*
CHOKE		
Type	Well	Well
Control	Thermostatic Coil Spring	Thermostatic Coil Spring
Setting	2 Notches Rich	2 Notches Rich

*After Approv. 500 Miles (If Necessary)

STROMBERG WW3 SERIES CARBURETORS

CARBURETOR				
Type	Dual Throat Downdraft			
Engine Displacement (Cu. In.)	273		318	
Model				
Manual Transmission	WW3-248	—	WW3-250	—
Automatic Transmission	—	WW3-249	—	WW3-251
Bore	$1^{7}/_{16}$"	$1^{7}/_{16}$"	$1^{7}/_{16}$"	$1^{7}/_{16}$"
Venturi	1⅛"	1⅛"	$1^{3}/_{16}$"	$1^{3}/_{16}$"
Main Metering Jet				
Standard (388539)*	.053"	.052"	.055"	.054"
1 Size Lean (388539)*	.051"	.050"	.053"	.052"
2 Sizes Lean (388539)*	.049"	.048"	.051"	.050"
Power Jet (2 Stage)	.028 x .052"	.028 x .055"	.028 x .047"	.031 x .055"
ADJUSTMENTS				
Idle Mixture Screws (turns open)	1¼	1¼	1¼	1¼
Idle Speed (curb idle)	500	500	500	500
(Air Conditioning ON)	500	500	500	500
Fast Idle Speed	700*	700*	700*	700*
Fast Idle Cam Position	$^{9}/_{64}$"	$^{9}/_{64}$"	$^{9}/_{64}$"	$^{9}/_{64}$"
Bowl Vent (closed throttle)	$^{5}/_{64}$"	$^{5}/_{64}$"	$^{5}/_{64}$"	$^{5}/_{64}$"
Vacuum Kick	$^{17}/_{64}$"	#4	$^{17}/_{64}$"	$^{15}/_{64}$"
Float Setting	$^{7}/_{32}$"	$^{7}/_{32}$"	$^{7}/_{32}$"	$^{7}/_{32}$"
Choke Unloader	$^{5}/_{16}$"	$^{5}/_{16}$"	$^{5}/_{16}$"	$^{5}/_{16}$"
CHOKE				
Control	Thermostatic Coil Spring			
Type	Well	Well	Well	Well
Setting	On Index	On Index	On Index	On Index

*After Approx. 500 Miles (If Necessary)

FUEL SYSTEM—(Continued)

STROMBERG WWC3 SERIES CARBURETORS

CARBURETOR	Manual Transmission	Automatic Transmission
Type	Dual Throat Downdraft	Dual Throat Downdraft
Model	WWC3-254	WWC3-255
Engine Displacement (cu. in.)	361-383	361-383
Bore	$1^{9}/_{16}$"	$1^{9}/_{16}$"
Venturi	$1^{5}/_{16}$"	$1^{5}/_{16}$"
Main Metering Jet (Standard)..(#389323)	.068"	.067"
(One Step Lean) (#389323)	.066"	.065"
(Two Steps Lean) (#389323)	.064"	.063"
Power Jet	.045 x .075"	.040 x .075"
ADJUSTMENTS		
Idle Mixture (Both Screws)	1½ Turns Open	1½ Turns Open
Idle Speed (rpm)	500	500
(with Air Conditioning ON)	500	500
Fast Idle Speed (rpm)	700*	700*
Fast Idle Cam Position Adjustment (drill size)	#41	#41
Accelerator Pump Travel (throttle fully closed)	$^{11}/_{32}$"	$^{7}/_{16}$"
Bowl Vent Valve (throttle at curb idle)	$^{1}/_{16}$"-$^{3}/_{32}$"	$^{1}/_{16}$"-$^{3}/_{32}$"
Vacuum Kick (drill size)	#17	#35
Float Setting	$^{5}/_{32}$"	$^{5}/_{32}$"
Unloader Adjustment (wide open kick)	$^{15}/_{64}$"	$^{15}/_{64}$"
CHOKE		
Type	Well Type	Well Type
Control	Thermostatic Coil Spring	Thermostatic Coil Spring
Setting	1 Notch Rich	1 Notch Rich

* After Approx. 500 Miles (If Necessary)

FUEL SYSTEM—(Continued)

AFB SERIES CARBURETORS

CARBURETOR	Manual Transmission	Automatic Transmission	Manual Transmission	Automatic Transmission	Manual Transmission	Automatic Transmission
Type			4 Barrel Downdraft			
Model	AFB-3853S	AFB-3854S	AFB-3855S	AFB-3856S	AFB-3859S	AFB-3860S
Engine Displacement (Cu. In.)	273	273	383	383	383, 413, 426	383, 413, 426
Car Model					High Performance	
THROTTLE BORE						
Primary	1 7/16"	1 7/16"	1 7/16"	1 7/16"	1 7/16"	1 7/16"
Secondary	1 9/16"	1 9/16"	1 9/16"	1 9/16"	1 9/16"	1 9/16"
MAIN VENTURI						
Primary	1 1/16"	1 1/16"	1 3/16"	1 3/16"	1 3/16"	1 3/16"
Secondary	1¼"	1¼"	1 5/16"	1 5/16"	1 5/16"	1 5/16"
MAIN JET						
Primary	.089"	.089"	.089"	.089"	.089"	.089"
Secondary	.073"	.073"	.067"	.065"	.0689"	.0689"
LOW SPEED JET						
Primary	#65-.035"	#65-.035"	#65-.035"	#65-.035"	#65-.035"	#65-.035"
STEP-UP ROD (2 Stage)						
Standard	16-367	16-176	16-217	16-165	16-217	16-217
1 Size Lean	16-369	16-371	16-165	16-160	16-165	16-165
2 Sizes Lean	16-370	16-372	16-159	16-173	16-159	16-159
ADJUSTMENTS						
Accelerator Pump (top of plunger to air horn)	7/16"	7/16"	7/16"	7/16"	7/16"	7/16"
Fast Idle Cam Position (drill size)	#50	#50	#50	#50	#50	#50
Choke Unloader	7/32"	7/32"	3/8"	3/8"	3/8"	3/8"
Vacuum Kick (drill size)	1/8"	#42	1/8"	#35	1/8"	#35
Fast Idle Speed (r.p.m.)	625*	700*	700*	700*	700*	700*
Idle Speed (r.p.m.)	600	600	500	500	550	550
(with air conditioning ON)	600	600	500	500	550	550
Secondary Throttle Lever Adjustment	21/64"	21/64"	21/64"	21/64"	21/64"	21/64"
Secondary Throttle Lockout Adjustment	.020"	.020"	.020"	.020"	.020"	.020"
Float Setting	7/32"	7/32"	7/32"	7/32"	7/32"	7/32"
Float Drop	¾"	¾"	¾"	¾"	¾"	¾"
Idle Mixture (both screws open)	1-2 Turns	1-2 Turns	1-2 Turns	1-2 Turns	1-2 Turns	1-2 Turns
CHOKE						
Control	Well	Well	Well	Well	Well	Well
Type	Coil Spring	Coil Spring	Coil Spring	Coil Spring	Coil Spring	Coil Spring
Setting	On Index	On Index	2 Notches Rich	2 Notches Rich	On Index	On Index

*After Approx. 500 Miles (If Necessary)

FUEL SYSTEM—(Continued)

FUEL PUMP

FUEL PUMP	6	V-8	V-8
ENGINE DISPLACEMENT	170 Cu. In.	273 Cu. In.	
	225 Cu. In.	318 Cu. In.	361, 383, 426 Cu. In.
Make	Carter	Carter	Carter
Model	MS-3674S	MS-3673S	MS-3672S
Type	Diaphragm	Diaphragm	Diaphragm
Number of Valves	2	2	2
Driven by	Camshaft	Camshaft	Camshaft
Pump Pressure (pounds)	3½ to 5	5 to 7	3½ to 5