

**Fig. 7—Removing or Installing Main Metering Jets**

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 REASSEMBLY

### Throttle Body

(1) Check 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 assembly. (Fig. 8).

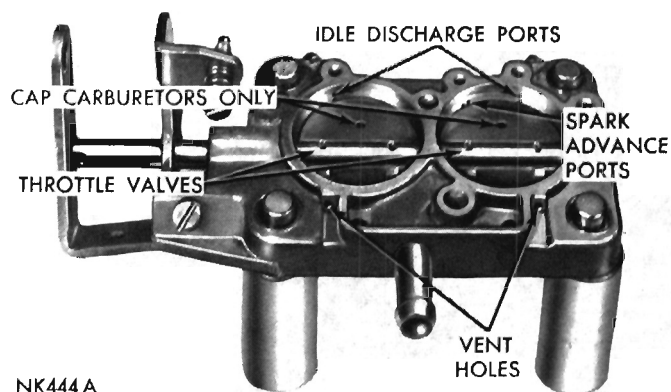
If a new shaft should be installed in an old work throttle body, it would be very unlikely that the original relationship of these ports to the valves would be obtained. Changing the port relationship would adversely affect normal car operation between the speeds of 15 and 30 miles per hour. However,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

(2) Mark valves to be sure each is replaced in same bore from whence removed.

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

(5) Install new throttle shaft and lever in throttle body. The fast idle lever should rest against idle



**Fig. 8—Ports in Relation to Throttle Valves**

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 top of the throttle body when valves are installed.

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

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

(8) Install two idle mixture adjusting screws and springs in throttle body. (The tapered portion must be straight and smooth.) If 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

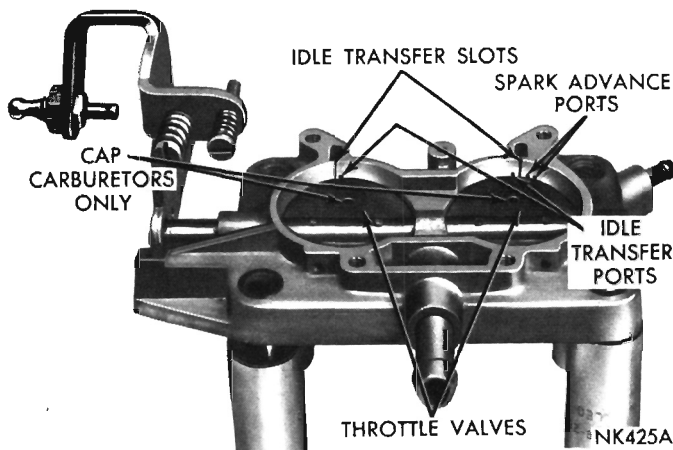
(1) Place main discharge jets (or tubes) firmly on Tool 73608, (Fig. 9). Now, slide into position in main body. Be sure opening in end of tube (diagonal cut ends) is facing opposite side of small venturi. **These two jets must be seated firmly in main body.**

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

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

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

(5) Invert carburetor and place on repair block C-



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

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 choke valve, so that when throttle valves are closed, fast idle adjusting screw will not contact fast idle cam.

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

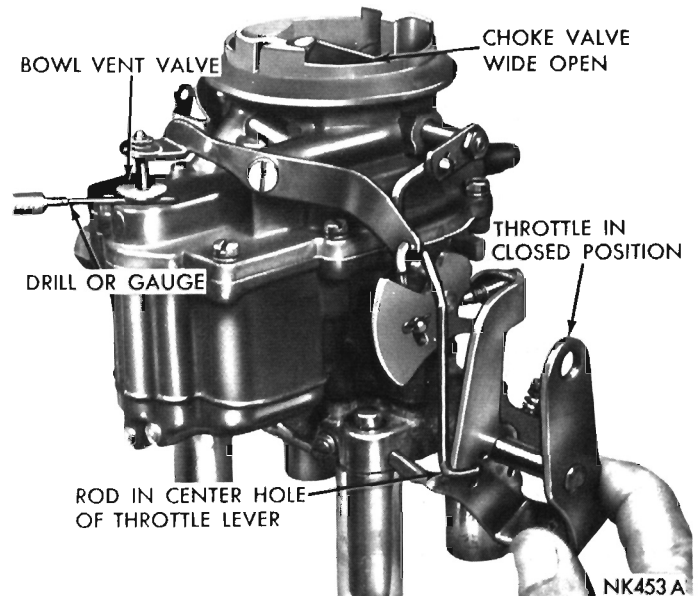
(3) Close throttle valves tightly. It should be just possible to insert a .060 inch drill or gauge (Standard Carburetors) or a .050 inch drill or gauge (CAP Carburetors), between bowl vent and vent seat (Fig. 20).

If an adjustment is necessary, bend pump rod, using Tool T109-213 at lower angle, until correct bowl vent opening has been obtained, (Fig. 21).

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

Remember that if 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.

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



**Fig. 20—Checking Bowl Vent Valve Opening**

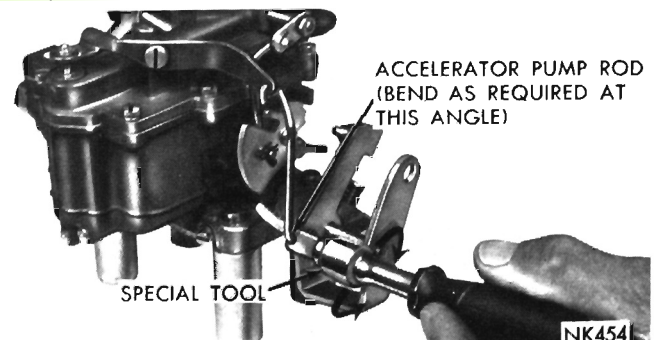
### Idle Speed Adjustment (Curb Idle)

To make the idle speed adjustment, the engine must be thoroughly warmed up. A much more reliable idle adjustment can usually be obtained if the car has been driven a minimum of five miles. For the best results, it is recommended that a tachometer be used in this adjustment. (Before making the idle speed adjustment observe the following precautions:) On vehicles equipped with the automatic transmission, check all linkages to insure reliable return to idle. The transmission linkage can be disconnected if desired.

To make the idle speed adjustment, proceed as follows:

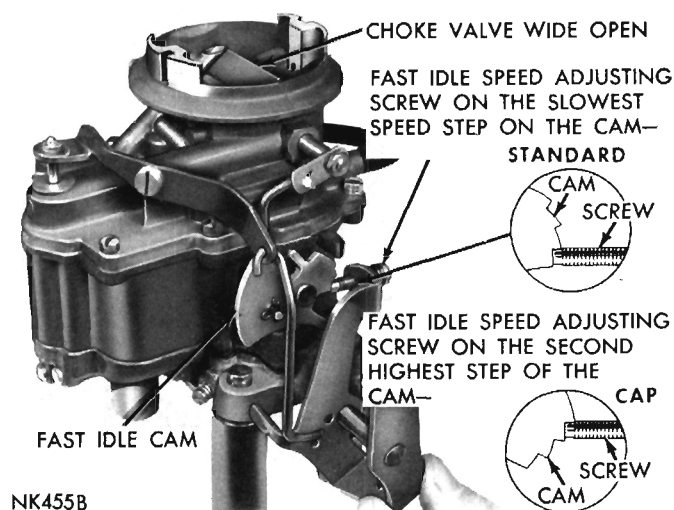
(1) Turn idle speed screw in or out to obtain 500 r.p.m. (With air conditioning **On**, set idle speed at 500 r.p.m.) Be sure choke valve is fully open and fast idle adjusting screw is not contacting fast idle cam.

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



**Fig. 21—Bending Accelerator Pump rod**





**Fig. 22—Fast Idle Speed Adjustment (on vehicle)**

gave highest r.p.m. reading.

(3) Readjust to 500 with idle speed screw.

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

This procedure will assure that idle has been set to 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 speed screw to obtain correct idle speed. Repeat steps 2 and 4 above if necessary.

After proper idle speed has been obtained, refer to (Fig. 3), in Throttle Linkage Section of this Group for procedure on adjusting transmission control rod.

### **Fast Idle Speed Adjustment (On Vehicle)**

Fast idle engine speed is used to overcome cold engine friction, stalls after cold starts and stalls because of carburetor icing. Set this adjustment after the vehicle odometer indicates over 500 miles to insure a normal engine friction level. Prepare engine by driving at least 5 miles. Connect a tachometer and set the curb idle speed and mixture, then proceed as follows:

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

(2) ON STANDARD CARBURETORS, close choke valve about 20° (degrees), then allow throttle to close. The fast idle speed screw should rest on the slowest-speed step of fast idle cam (Fig. 22).

(3) ON C.A.P. CARBURETORS, close choke valve until fast idle screw can be positioned on second highest-speed step of fast idle cam (Fig. 22.)

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

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

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

## **BBD SERIES CARBURETORS (1-1/4")**

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### **GENERAL INFORMATION**

The Ball and Ball Standard Carburetor models BBD-4113SA and BBD-4114SA are used on the 273 cu. in. engine when the vehicle is equipped with a manual or automatic transmission respectively.

Special (CAP-Air Package) Ball and Ball Carburetor models BBD-4115SA (with Dash pot) and BBD-4116SA are used on the 273 cu. in. engine when the vehicle is equipped with a manual or automatic transmission respectively. The dash pot (used on manual transmis-

sion equipped vehicles) is mounted on the carburetor and retards the return of the throttle to idle position. **The proper adjustment of the dash pot is very important.** (See Carburetor Adjustments.)

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

vehicle. Adjust as follows:

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

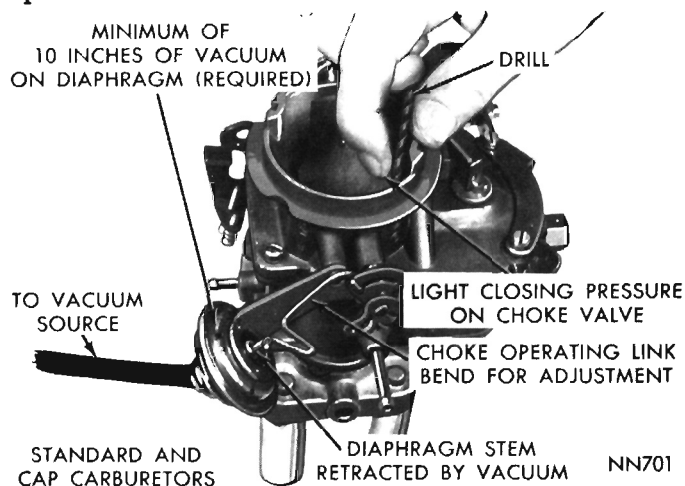
(2) When using an auxiliary vacuum source, disconnect vacuum hose from carburetor and connect it to hose from vacuum supply with a small length of tube to act as a fitting. Removal of hose from diaphragm may require forces which damage the system. Apply a vacuum of 10 or more inches of mercury.

(3) Insert specified drill (refer to Specifications) between choke valve and wall of air horn (Fig. 15). Apply sufficient closing pressure on lever to which choke rod attaches to provide a minimum choke valve opening without distortion of diaphragm link. Note that the cylindrical stem of diaphragm will extend as internal spring is compressed. This spring must be fully compressed for proper measurement of vacuum kick adjustment.

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

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

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



**Fig. 15—Checking Choke Vacuum Kick Setting**

### **Choke Unloader (Wide Open Kick)**

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

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

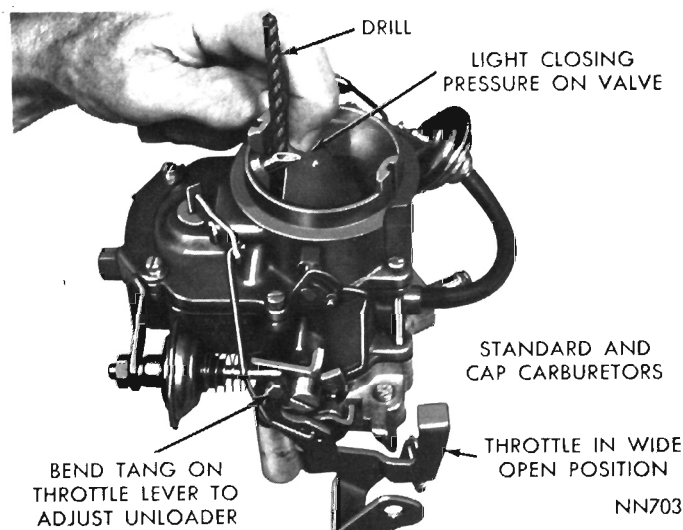
(2) With a finger lightly pressing against valve, a slight drag should be felt as drill is being withdrawn. If an adjustment is necessary, bend unloader tang on throttle lever until correct opening has been obtained. (Fig. 16.)

### **Idle Speed Adjustment (Curb Idle) (Standard Carburetors)**

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

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 carburetor lever 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:



**Fig. 16—Measuring Choke Unloader Setting**

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

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

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

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

This procedure will assure that idle has been set to leanest mixture possible for smooth idle. **This setting is very important.**

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

(5) Readjust speed screw to obtain correct idle speed. Repeat steps 2 and 4 above if necessary. After proper idle speed has been obtained, refer to Throttle Linkage Group in this Section, for procedure on adjusting transmission control rod.

### Fast Idle Speed Adjustment (On Vehicle)\*

Fast idle engine speed is used to overcome cold engine friction, stalls after cold starts and stalls because of carburetor icing. Set this adjustment after the vehicle odometer indicates over 500 miles to insure a normal engine friction level. Prepare engine by driving at least 5 miles. Connect a tachometer and set the curb idle speed and mixture, then proceed as follows:

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

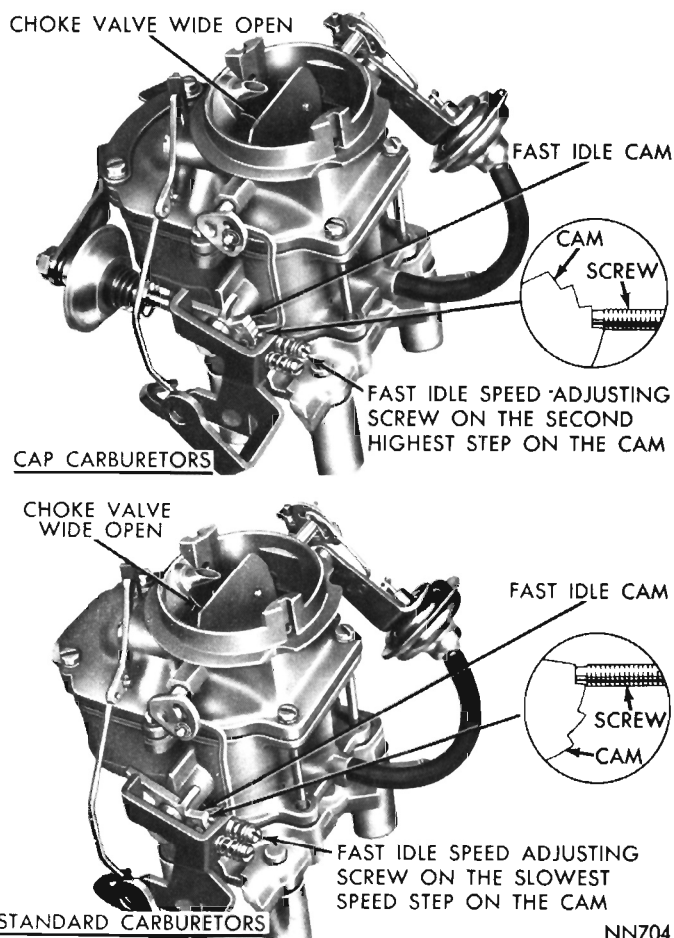
(2) ON STANDARD CARBURETORS, close choke valve about 20° (degrees), then allow throttle to close. The fast idle speed screw should rest on the slowest-speed step of fast idle cam (Fig. 17).

(3) ON C.A.P. CARBURETORS, close choke valve until fast idle screw can be positioned on second highest-speed step of fast idle cam. (Fig. 17.)

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

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

**\*Special Note: CAP equipped Vehicles**



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**Fig. 17—Fast Idle Speed Adjustment (On Vehicle)**

Before adjusting idle and/or fast idle speeds and mixtures, make sure that the basic timing and the distributor control valve are correctly adjusted as outlined under Idle Speed Adjustment (Curb Idle) CAP Carburetors.

### DASHPOT SETTING AND ADJUSTMENT—C.A.P. CARBURETOR

#### Manual Transmission Only

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

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