ENGINE FUEL

CONTENTS OF THIS SECTION

GENERAL DESCRIPTION

HEAT CONTROL

All models have an automatically operated heat control, mounted in the right bank manifold, which utilizes the exhaust gases of the engine to heat the incoming fuel air charge during warm-up so as to improve vaporization and distribution. The heat control valve is regulated by a coiled thermostatic spring (Fig. 6B-1). A counterweight is mounted on the other end of the heat control valve shaft and this counterweight in conjunction with the thermostatic spring operates to close and open the heat control valve. The assembly is kept from rattling by an anti-rattle spring mounted next to the thermostatic spring.

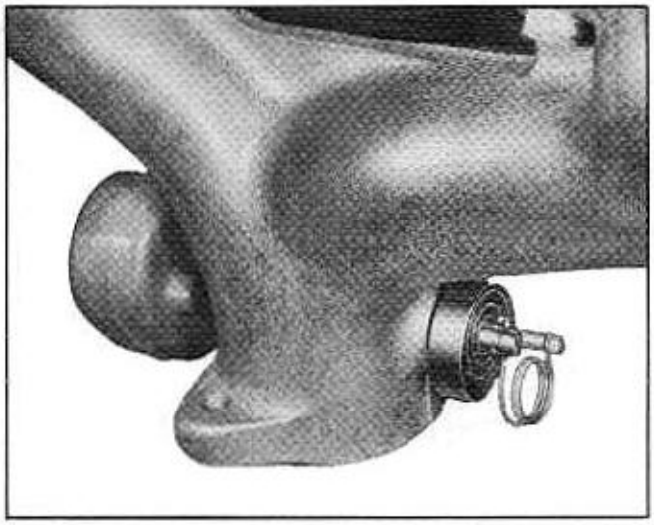


Fig. 6B-1 Heat Control Valve Thermostatic Spring and Counterweight

A detailed description of the operation of the heat control valve will be found on page 6-8.

CARBURETOR AIR CLEANER AND SILENCER

Combined air cleaners and silencers are used on all models. These units filter air entering the carburetor to keep abrasive dust from being carried into the engine, and silence the noise produced by air rushing into the carburetor.

In the standard air cleaner, filtering is done by passing air through an element which has been moistened in heavy oil. The heavy duty model is intended for dusty territories where the standard air cleaner is inadequate. The heavy duty model has an oil reservoir in its base so air entering the carburetor first impinges on the oil in the cleaner reservoir, thus losing all of the heavier dust particles. The high velocity of the air stream picks up some of the oil and carries it upward into the filter element through which the air next passes thus keeping the element continually washed and moistened with oil.

DESCRIPTION
CARTER WCFB FOUR-BARREL CLIMATIC (R) CONTROL CARBURETOR

NOTE: The following illustrations are used by permission of the copyright owner, Carter Carburetor Corporation, St. Louis, Missouri: Figs. 6B-2 thru 6B-10.

The Carter Model WCFB carburetor is basically two dual carburetors contained in one assembly. The section containing the metering rods, accelerating pump and choke is termed the primary side of the carburetor; the other section, the secondary side. It has five (5) conventional circuits, as have been used in previous carburetors. They are:

2—Float Circuits

1—Low Speed Circuit

2—High Speed Circuits

1—Pump Circuit

1—Climatic (R) Control (choke) Circuit

FLOAT CIRCUIT (FIG. 6B-2)

The float system controls the fuel level in the carburetor bowls under all operating conditions.

Both the primary and the secondary side of the Carter WCFB carburetors have individual float systems for maintaining the proper fuel level in each float bowl. All fuel enters the carburetor through a common inlet on the primary side of the carburetor bowl cover.

As the fuel level in the primary bowl drops, the twin floats also drop allowing the inlet needle to fall away from its seat. Pressure from the fuel pump will then force fuel through the inlet passage, through the strainer screens, past the needle and seat into the float bowl. As the fuel level in the bowl rises the floats also rise seating the needle valve and cutting off the flow of fuel.

Float action on the secondary side of the carburetor is identical with that on the primary side. As the secondary float drops and the needle falls from its seat, fuel is forced through the inlet passage across the bowl cover to the secondary bowl. A connecting passage in the float bowl slightly above normal fuel level keeps a balance of fuel level and pressures between the two bowls.

Both sides of the carburetor are vented externally and internally to allow even pressure of fuel and air at all times and allow the escape of fuel vapors during hot idle operation.

An idle vent valve is provided in the metering rod dust cover to bleed off excess fuel vapors on idle. A lever mounted on the countershaft moves the valve off its seat when the throttles are closed and allows it to return as soon as throttles begin to open.

LOW SPEED CIRCUIT (FIG. 6B-3)

Fuel for idle and early part throttle operation is metered through the low speed circuit on the primary side of the carburetor.

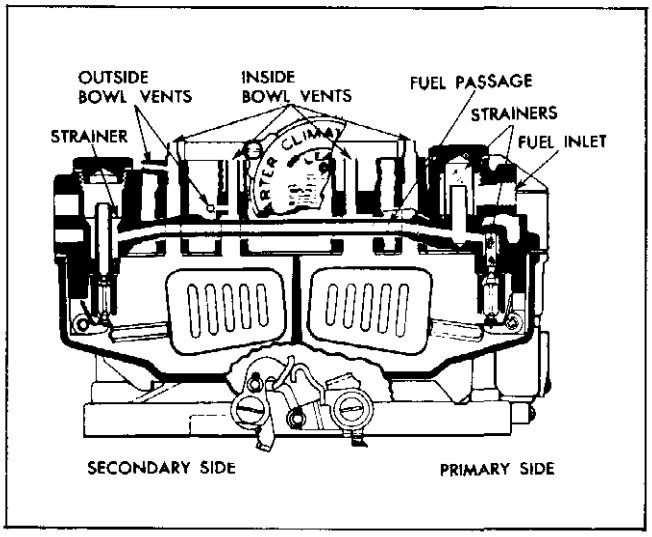


Fig. 6B-2 Float Circuit

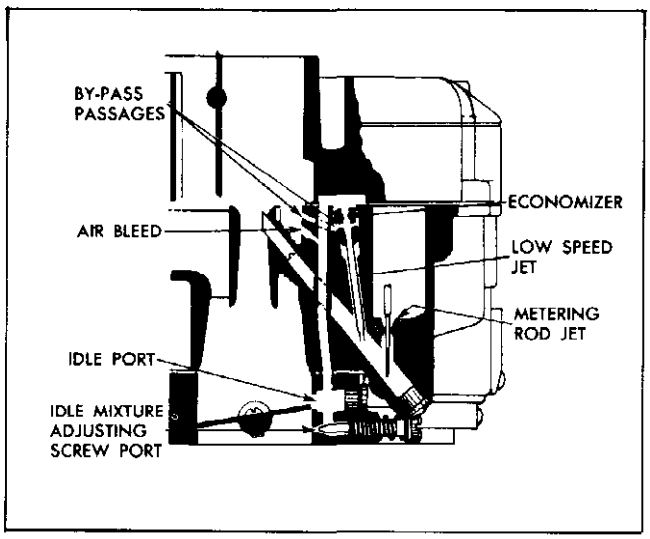


Fig. 6B-3 Low Speed Circuit

Fuel is drawn by manifold vacuum, from the primary bowl through the metering rod jets into the low speed wells. From there fuel passes through the calibrated low speed jet, past the economizer, by-pass and air bleed passages which are metered openings that serve to break up the liquid fuel and mix it with air. The fuel air mixture then passes down through the vertical passage to the idle port and the idle adjusting screw port where it is discharged into the carburetor throat.

The idle ports are slot shaped. As the throttle valves are opened more of the idle ports are uncovered allowing a greater quantity of fuel and air mixture to enter the carburetor throat. The secondary throttle valves remain seated at idle.

To combat engine stalling caused by icing during warm-up on cool humid days, exhaust gas is circulated through a passage in the base of the carburetor flange. The heat transferred is sufficient to eliminate ice formation at the throttle valve edges and idle ports.

HIGH SPEED CIRCUIT (FIG. 6B-4)

Fuel for late part throttle and full throttle operation is supplied through the high speed circuits.

PRIMARY SIDE

As the throttle valves are opened, manifold vacuum drops diminishing the amount of fuel flow through the idle system. However, air flow through the venturi has increased to the point that fuel is being picked up at the main nozzles.

The amount of fuel delivered is controlled by air flow or throttle valve opening and by the position of the metering rods in their respective jets.

The position of the metering rods is controlled both by mechanical action and by engine vacuum.

During part throttle operation, manifold vacuum pulls the vacumeter piston, link and metering rod assembly down holding the vacumeter link against the metering rod countershaft arm (Fig. 6B-5). Movement of the metering rods will then be controlled by the metering rod countershaft arm which is connected to the throttle shaft. This is true at all times that the vacuum under the piston is strong enough to overcome the tension of the vacumeter spring.

Under any operating condition (acceleration, hill climbing, etc.) when the tension of the vacumeter spring overcomes the pull of vacuum under the piston, the metering rods will move toward their wide open throttle or power position.

SECONDARY SIDE

Fuel flow in the secondary side of the carburetor is similiar to that in the primary side but is controlled only by air flow through the secondary venturi and the calibrated main metering jets. No metering rods are used in the secondary side.

When the primary throttle valves open a predetermined amount (approximately 40° of throttle opening), mechanical linkage between the primary and secondary throttle valves starts to open the second-

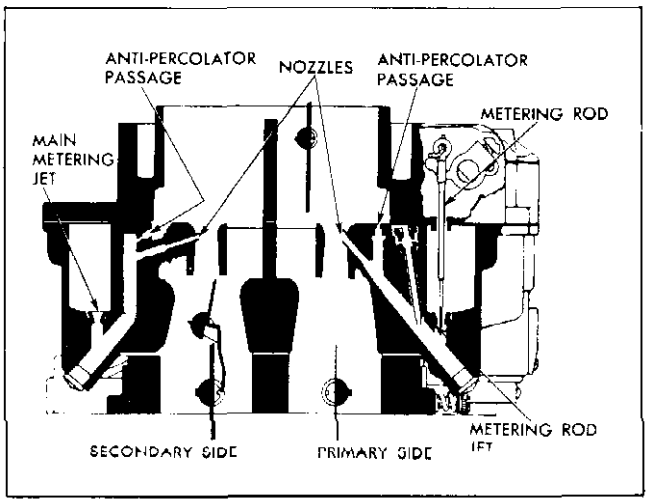


Fig. 6B-4 High Speed Circuits

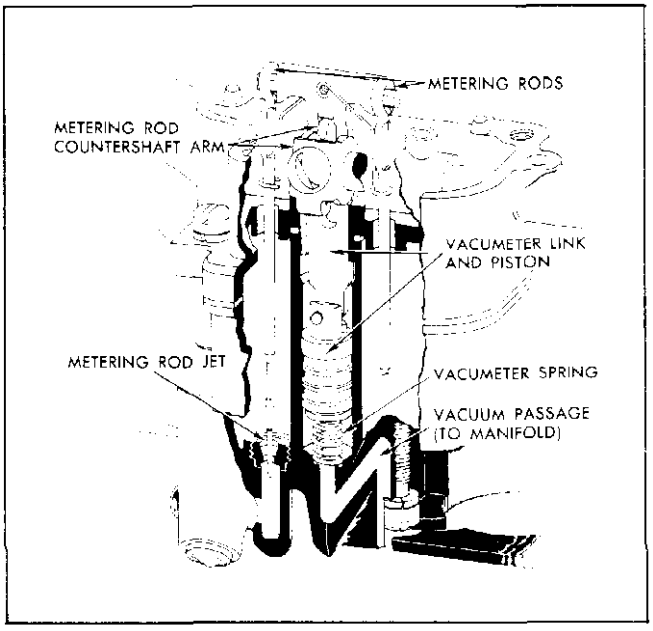


Fig. 6B-5 Metering Rods and Vacumeter Piston

ary valves. The ratio of motion is such that by the time the primary valves have reached the wide open position the secondary valves are also wide open.

Mounted directly above the secondary throttle valves are air operated auxiliary throttle valves. These valves are normally held in the closed position by a counterweight and open only when air velocity through the secondary side is sufficient to permit efficient operation of both sides of the carburetor. This directs air through the primary side only during low speed wide open throttle operation permitting more efficient metering of air and fuel under these conditions.

The secondary throttle valves are locked closed at any time the choke is operating to assure proper cold engine starting and warm up.

ANTI-PERCOLATOR

To prevent vapor bubbles in the nozzle passages and low speed wells from forcing fuel out of the nozzles, anti-percolator passages with calibrated vents are used. Their purpose is to vent the vapors and relieve the pressure before it is sufficient to push the fuel out of the nozzles and into the intake manifold. Anti-percolator vent plugs and bushings are permanently installed and must not be removed in service.

PUMP CIRCUIT (FIG. 6B-6)

The pump circuit is located in the primary side of the carburetor.

The accelerating pump circuit provides the measured amount of fuel necessary to ensure smooth engine operation during acceleration at speeds below approximately 30 MPH.

When the throttle is closed the pump plunger moves upward in its cylinder and fuel is drawn into the pump cylinder through the inlet passage. The discharge needle is seated at this time to prevent air being drawn into the cylinder. When the throttle is opened the pump plunger shaft telescopes compressing the pump spring. The spring will then push the plunger down forcing fuel out through the discharge passage, past the discharge needle, and out of the pump jets. When the plunger moves downward the inlet valve is closed preventing fuel from being forced back into the bowl.

The pump discharge passage contains a check valve which acts as a vapor relief during heat conditions since the check is unseated when the plunger isn't moving. This valve also acts as an auxiliary intake check allowing the pump cylinder to fill up more rapidly.

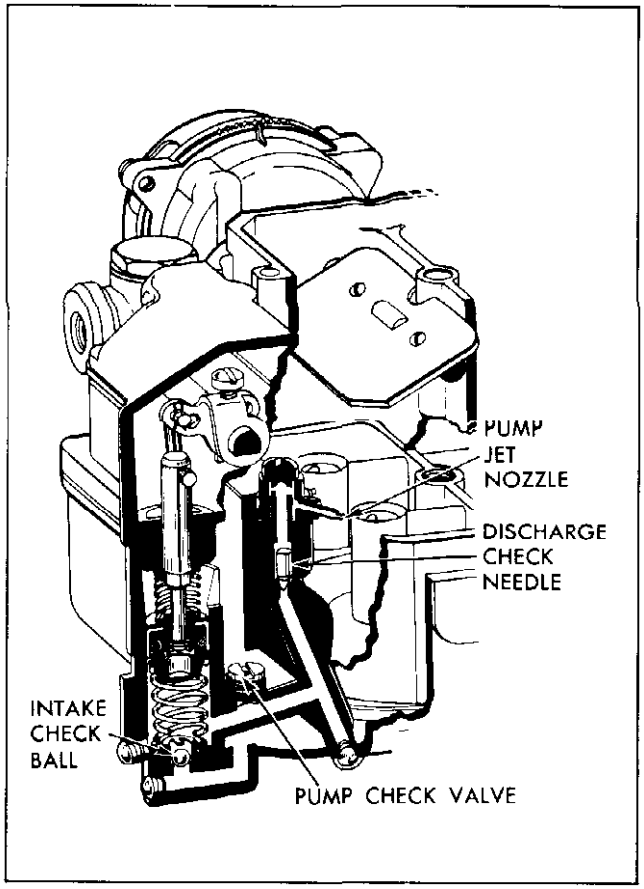


Fig. 6B-6 Pump Circuit

At speeds above approximately 30 MPH pump discharge is no longer necessary to ensure smooth acceleration. When the throttle valves are opened a predetermined amount, the pump plunger bottoms in the pump cylinder eliminating pump discharge.

CHOKE CIRCUIT (FIG. 6B-7)

The Climatic (R) control circuit provides a correct mixture necessary for quick cold engine starting and warm-up.

When the engine is cold, tension of the thermostatic coil holds the choke valve closed. When the engine is started, air velocity against the offset choke valve causes the valve to open slightly against the thermostatic coil tension. Intake manifold vacuum applied to the choke piston also tends to pull the choke valve open. The choke valve assumes a position where tension of the thermostatic coil is balanced by the pull of vacuum on the piston and air velocity on the offset choke valve.

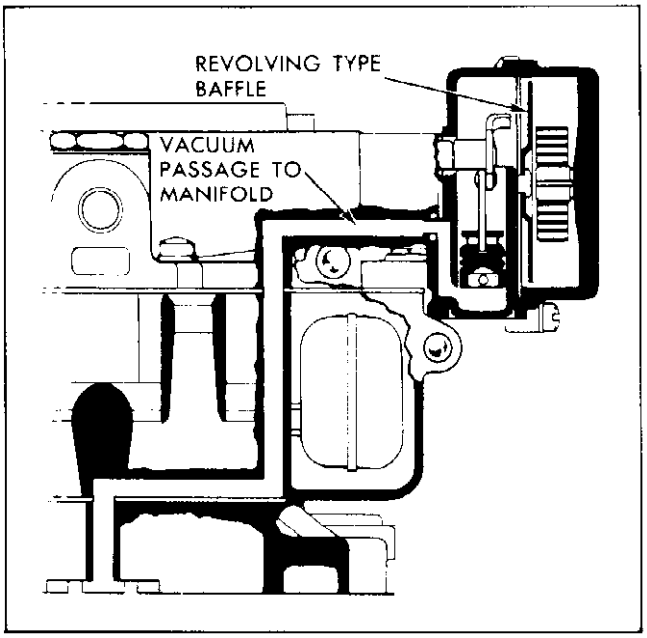


Fig. 6B-7 Choke Circuit

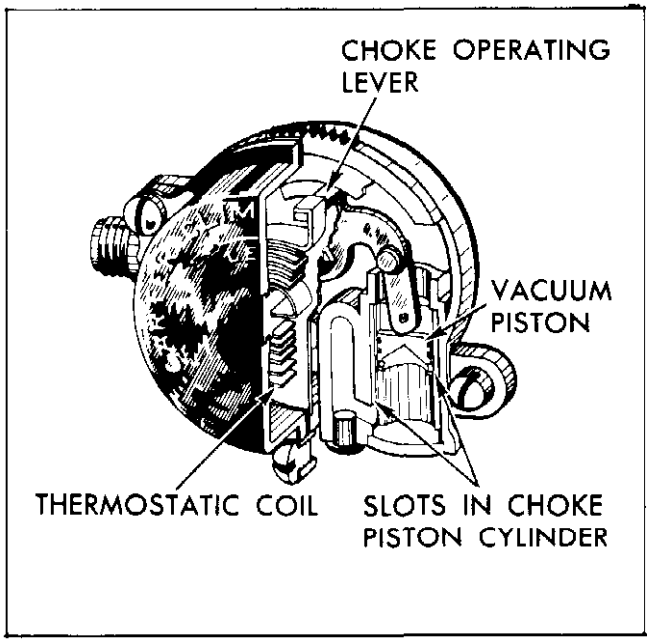


Fig. 6B-8 Choke Housing Detail

When the engine starts, slots located in the sides of the choke piston cylinder (Fig. 6B-8) are uncovered allowing intake manifold vacuum to draw warm air from the hot air tube, located in the exhaust crossover passage of the intake manifold, through the Climatic (R) control housing. The flow of warm air in turn heats the thermostatic coil and causes it to lose some of its tension. The thermostatic coil loses its tension gradually until the choke valve reaches wide open position.

A secondary baffle plate revolves with the choke valve. The revolving baffle prevents the warm air entering the housing from striking the thermostatic coil until the choke valve opens a predetermined amount. This serves to delay the opening of the choke.

When the engine is accelerated during the warm-up period, the corresponding drop in manifold vacuum applied to the choke piston allows the thermostatic coil to momentarily close the choke, providing a richer mixture.

During the warm-up period it is necessary to provide a fast idle speed to prevent engine stalling. This is accomplished by a fast idle cam which is rotated by a connector rod attached to the choke shaft (Fig. 6B-9). The fast idle cam prevents the primary throttle valves from returning to a normal warm engine idle position while the Climatic (R) control is in operation.

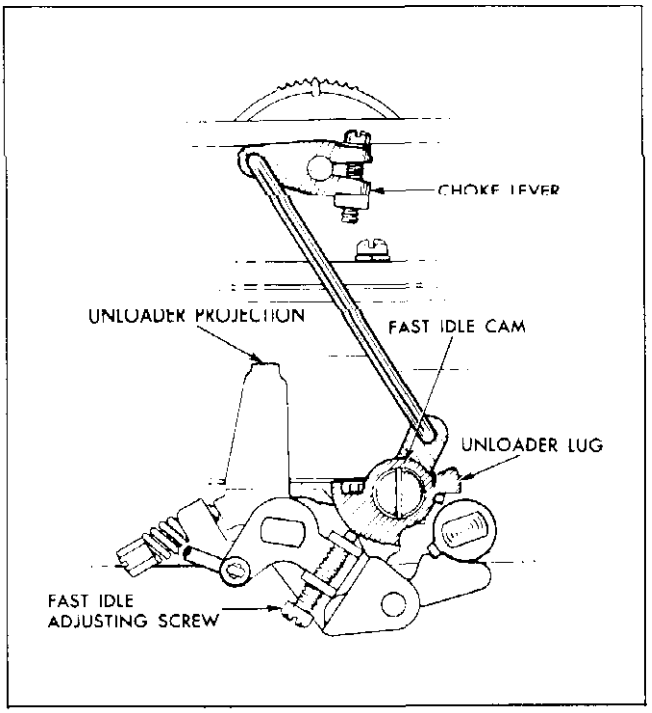


Fig. 6B-9 Choke Linkage

During the starting period if the engine becomes flooded the choke valve can be partially opened manually. This can be accomplished by forcibly depressing the accelerator pedal to the floor. The unloader projection on the throttle lever will rotate the fast idle cam and in turn partially open the choke valve.

ADJUSTMENTS ON CAR

All adjustments with the exception of Fast Idle Adjustment, are included in the "OVERHAUL AND ADJUSTMENTS" procedure and can be done with the carburetor on the car. The fast idle can be adjusted on the car as follows:

1. Start engine and run until engine reaches normal temperature.

2. Move fast idle cam so that highest step is under end of fast idle screw.

3. Observing tachometer, adjust fast idle screw to give an engine speed of 1900 RPM.

OVERHAUL AND ADJUSTMENTS

Flooding, stumble on acceleration and other performance complaints are, in many instances, caused by the presence of dirt, water or other foreign matter in the carburetor. To aid in diagnosing the cause of the complaint, the carburetor should be carefully removed from the engine without draining the fuel from the bowl. The contents of the fuel bowl may then be examined for contamination as the carburetor is disassembled. CAUTION: Whenever the carburetor is removed from the engine, care must be exercised to avoid damaging the throttle valves, as the lower edge of the valves project below the throttle flange when the valves are in the open position.

The following is a step-by-step sequence by which the Carter model WCFB Carburetor may be completely disassembled and reassembled. Adjustments may be made and the various parts of the carburetor may be serviced without completely disassembling the entire unit.

DISASSEMBLY OF AIR HORN

1. Remove gasoline strainer nut and gasket assemblies from primary and secondary sides and screen from primary side.

2. Remove throttle connector rod (Fig. 6B-10).

3. Remove choke connector rod (Fig. 6B-10).

4. Remove 2 metering rod housing dust cover attaching screws, dust cover and gasket.

5. Loosen, but do not remove screw holding the pump operating lever to pump countershaft.

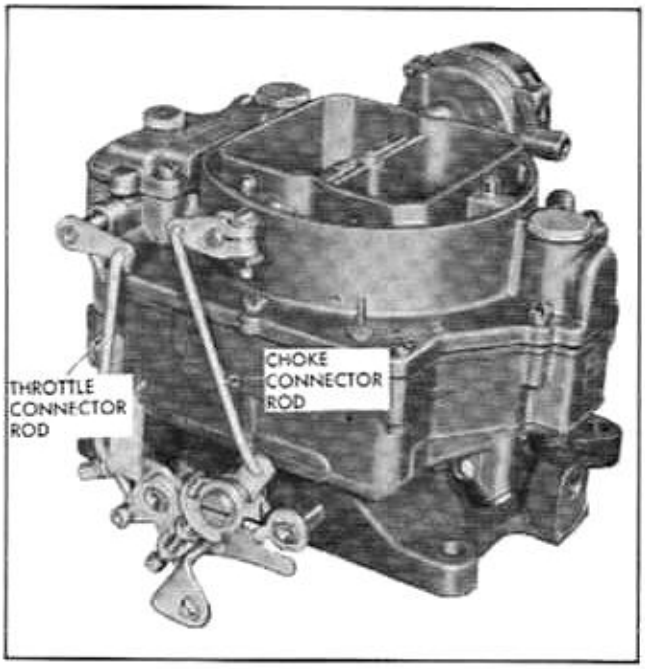


Fig. 6B-10 Throttle and Choke Connector Rods

6. Remove idle vent arm and screw (Fig. 6B-11).

7. Loosen, but do not remove metering rod arm screw (Fig. 6B-11).

8. Slide pump countershaft and lever assembly from air horn assembly.

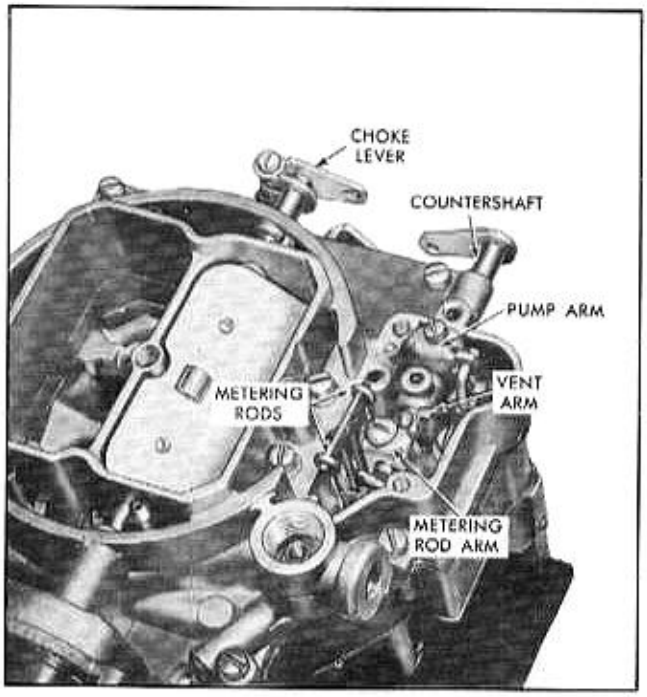


Fig. 6B-11 Metering Rod and Pump Linkage

9. Remove pump arm and link assembly, spacer bushing and metering rod arm from metering rod housing.

10. Remove both metering rods and metering rod discs.

11. Remove choke lever from choke shaft.

12. Remove 3 choke coil housing screws and retainers.

13. Remove choke coil housing, gasket and then baffle plate.

NOTE: Under normal service the carburetor air horn may be cleaned without further disassembly. If complete disassembly is necessary, perform operations a, b, and c.

a. File off staked end of choke valve screws. Remove screws and valve.

b. Rotate choke shaft counterclockwise, and remove shaft and piston assembly.

c. Remove 3 self-tapping screws, choke piston housing and gasket.

14. Remove 16 air horn attaching screws (Fig. 6B-12).

15. Carefully remove air horn assembly with gasket and attached parts by lifting straight up from carburetor body assembly (Fig. 6B-13).

NOTE: To avoid bending floats, be sure bowl cover gasket is not sticking to body casting.

16. Remove primary float hinge pin, float assembly, and intake needle. IMPORTANT: Group float assemblies with needle and needle seat together as units. Extreme care should be used to avoid mixing needles and seats.

17. Remove secondary float hinge pin, float assembly and intake needle in same manner.

18. Remove primary needle seat with strainer screen and gasket.

19. Remove secondary needle seat and gasket.

20. Remove vacumeter piston and vacumeter piston link.

21. Remove gasket from air horn.

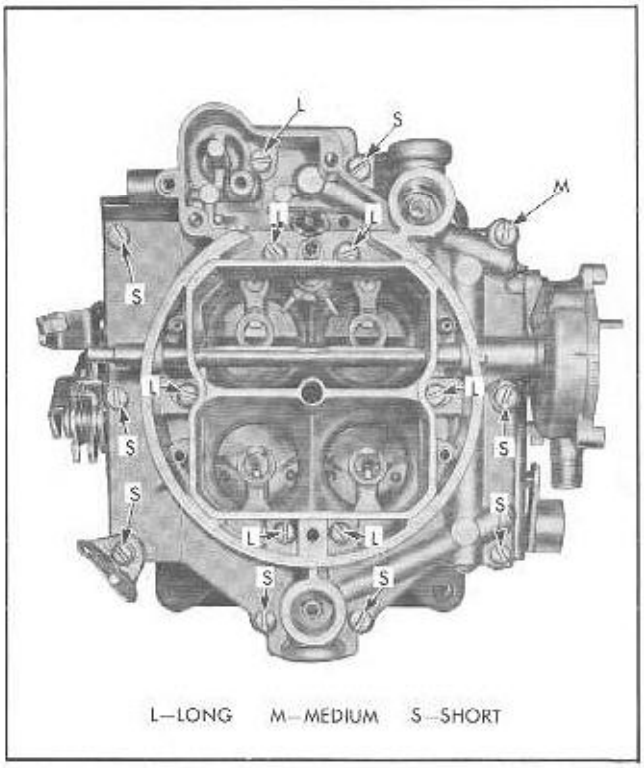


Fig. 6B-12 Location of Air Horn Attaching Screws

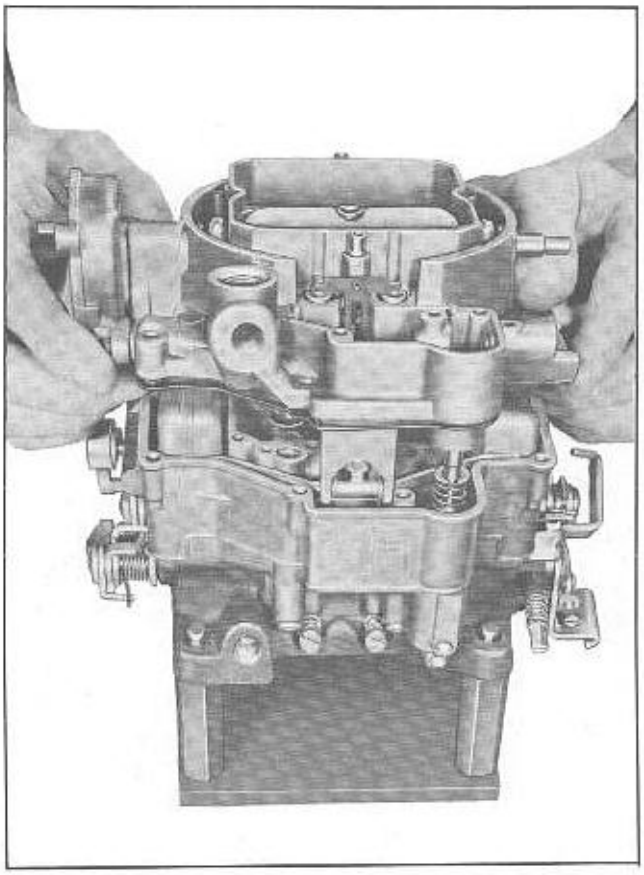


Fig. 6B-13 Removing Air Horn Assembly

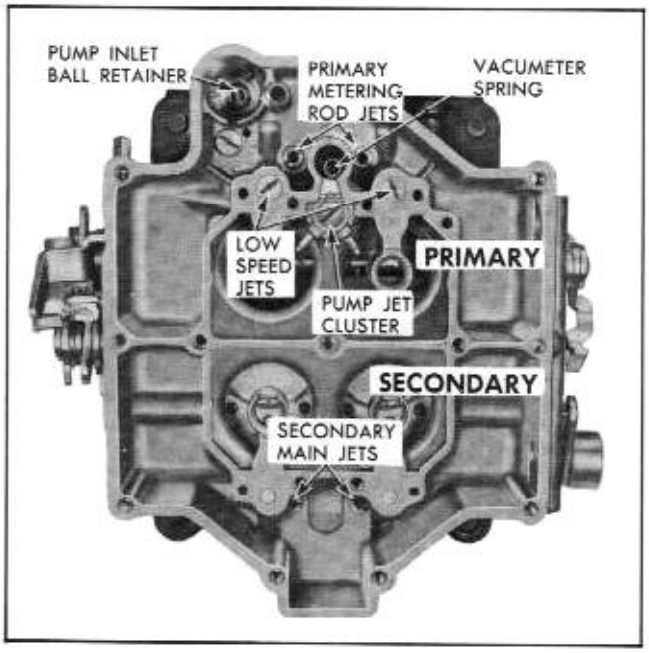


Fig. 6B-14 Carburetor Body—Top View

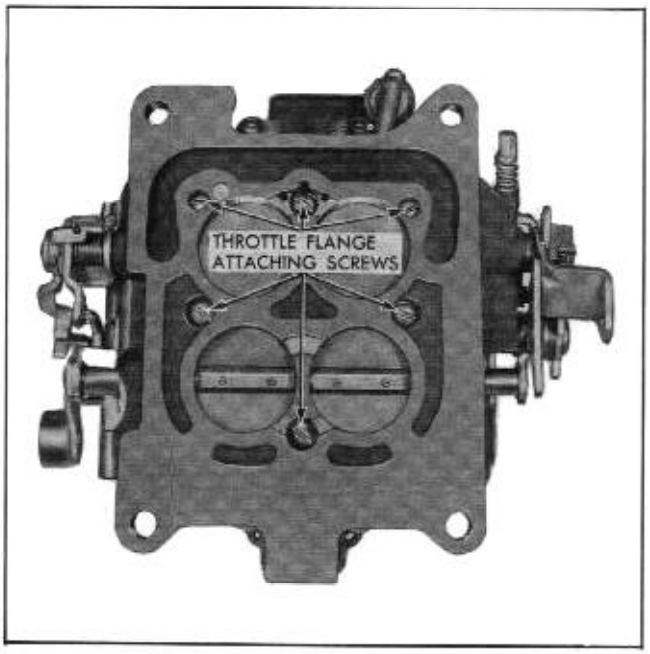


Fig. 6B-15 Location of Throttle Flange Attaching Screws

DISASSEMBLY OF CARBURETOR BODY

1. Remove pump plunger assembly and lower pump spring.

2. Remove vacumeter spring (Fig. 6B-14).

3. Check the fuel in the bowl for contamination by dirt, water, gum or other foreign matter, then drain fuel from bowl.

NOTE: Magnet swept around bottom of bowl while fuel is still present will pick up iron oxide dust which may have contributed to float needle leaks.

4. Remove pump jet cluster attaching screw, then remove cluster and gasket.

5. Invert carburetor and remove small brass pump discharge needle.

6. Remove pump inlet ball retainer and check ball from bottom of pump cylinder.

NOTE: Use 5/16" six point socket to pry sideways on dome of retainer to loosen it.

7. Remove pump passage screw plug and gasket.

8. Remove 2 primary metering rod jets (located on pump cylinder side of carburetor).

9. Remove 2 secondary main jets. NOTE: Primary metering rod jets have larger openings than the secondary main jets. Never mix these jets.

10. Remove two low speed jets (primary side).

NOTE: The anti-percolator vent plugs and bushings, and main discharge nozzles are pressed in place and should not be removed.

11. Remove the 6 throttle flange to carburetor body attaching screws (Fig. 6B-15).

12. Remove throttle flange.

13. Remove body flange gasket.

14. If necessary to remove auxiliary throttle valves, file staked ends of screws, remove screws and valves and pull out shaft.

DISASSEMBLY OF THROTTLE FLANGE

1. Remove idle mixture adjusting screws with springs. NOTE: Under normal service the carburetor flange may be cleaned without further disassembly. If complete disassembly is necessary, perform the remaining operations.

2. Remove fast idle cam screw, fast idle cam assembly, lower choke lever, lockout arm and lockout arm spring.

3. Remove primary to secondary connector rod pin springs and washers, then remove rod.

4. Unhook outer end of spring from primary throttle lever and remove primary throttle lever attaching screw and washer.

5. Remove primary throttle levers and spring.

6. Remove primary throttle shaft spring thrust washer.

7. Remove secondary throttle lever screw and washer.

8. Remove secondary throttle lever, and secondary throttle return spring.

9. File off staked ends of throttle valve attaching screws and remove screws and throttle valves from the four bores.

10. Remove primary and secondary throttle shafts.

11. Remove idle speed screw and spring.

CLEANING AND INSPECTION OF PARTS

Dirt, gum, water or carbon contamination in the carburetor or on the exterior moving parts of a carburetor are often responsible for unsatisfactory performance. For this reason, efficient carburetion depends upon careful cleaning and inspection while servicing.

1. Thoroughly clean carburetor castings and all metal parts in clean carburetor cleaning solution. CAUTION: Composition and plastic parts such as thermostatic coil housing and pump plunger should not be immersed in cleaner.

2. Blow out all passages (Figs. 6B-16 to 6B-18) in casting with compressed air and blow off all parts so they are free of cleaner (be sure to follow instructions furnished with cleaning solution). CAUTION: Do not use drills or wire to clean out jets or ports as this may enlarge the opening and affect carburetor operation.

3. Carefully inspect parts for wear and replace those which are worn. Check the following specific points:

a. If choke housing was disassembled in steps 13 a, b, and c for complete overhaul, remove Welch plug

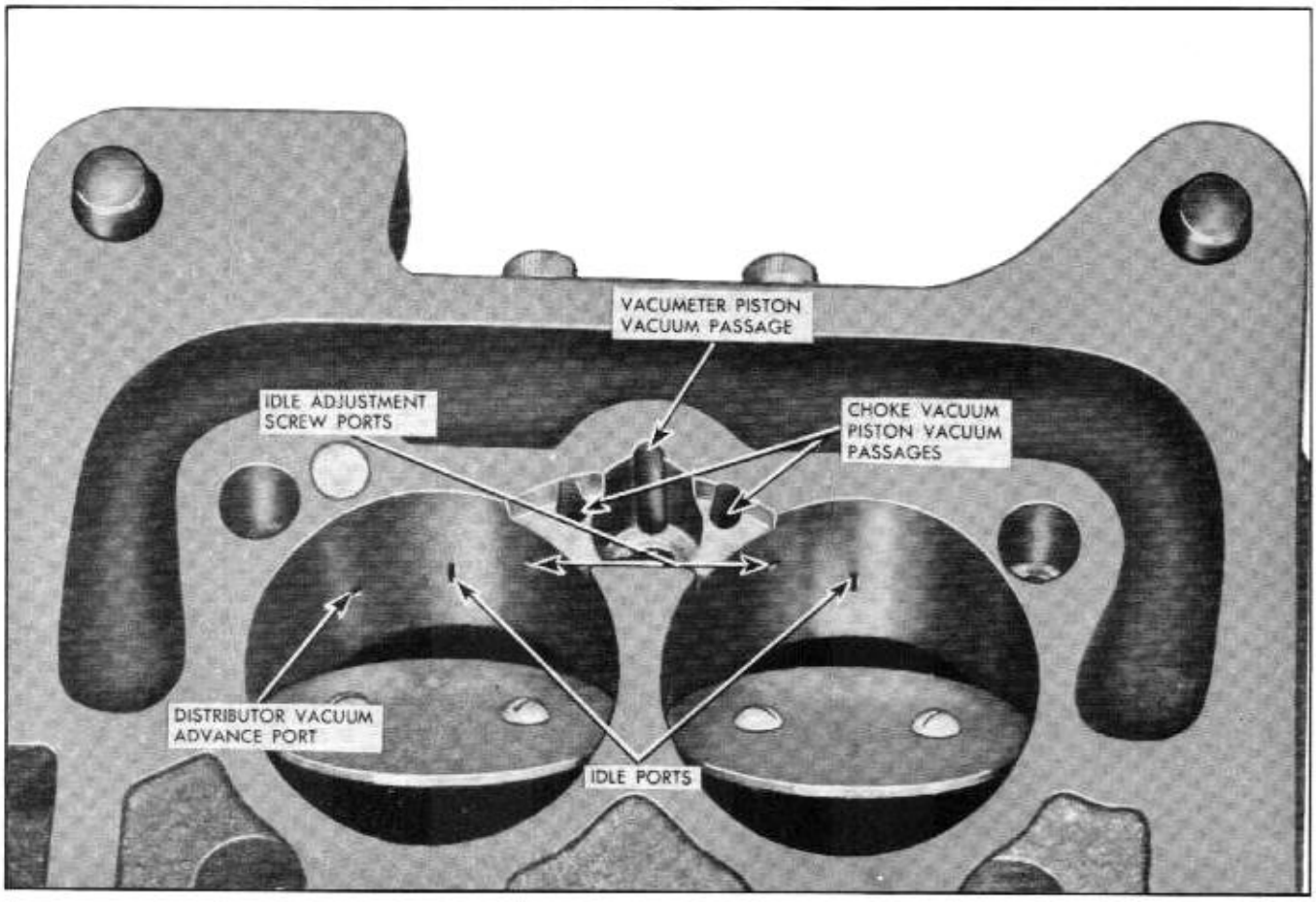


Fig. 6B-16 Passage at Manifold Side of Throttle Flange

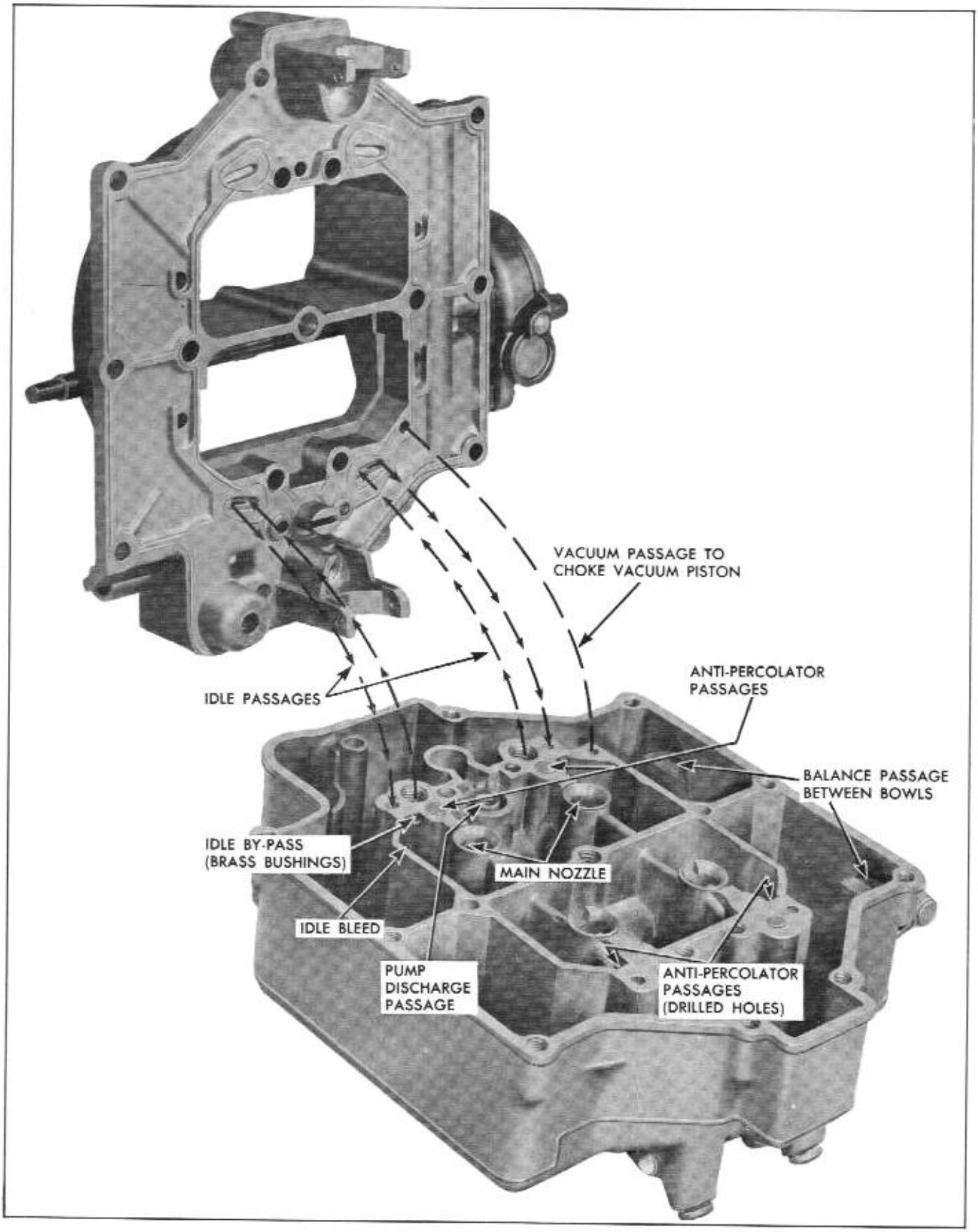


Fig. 6B-17 Passage Indentification—Body to Air Horn

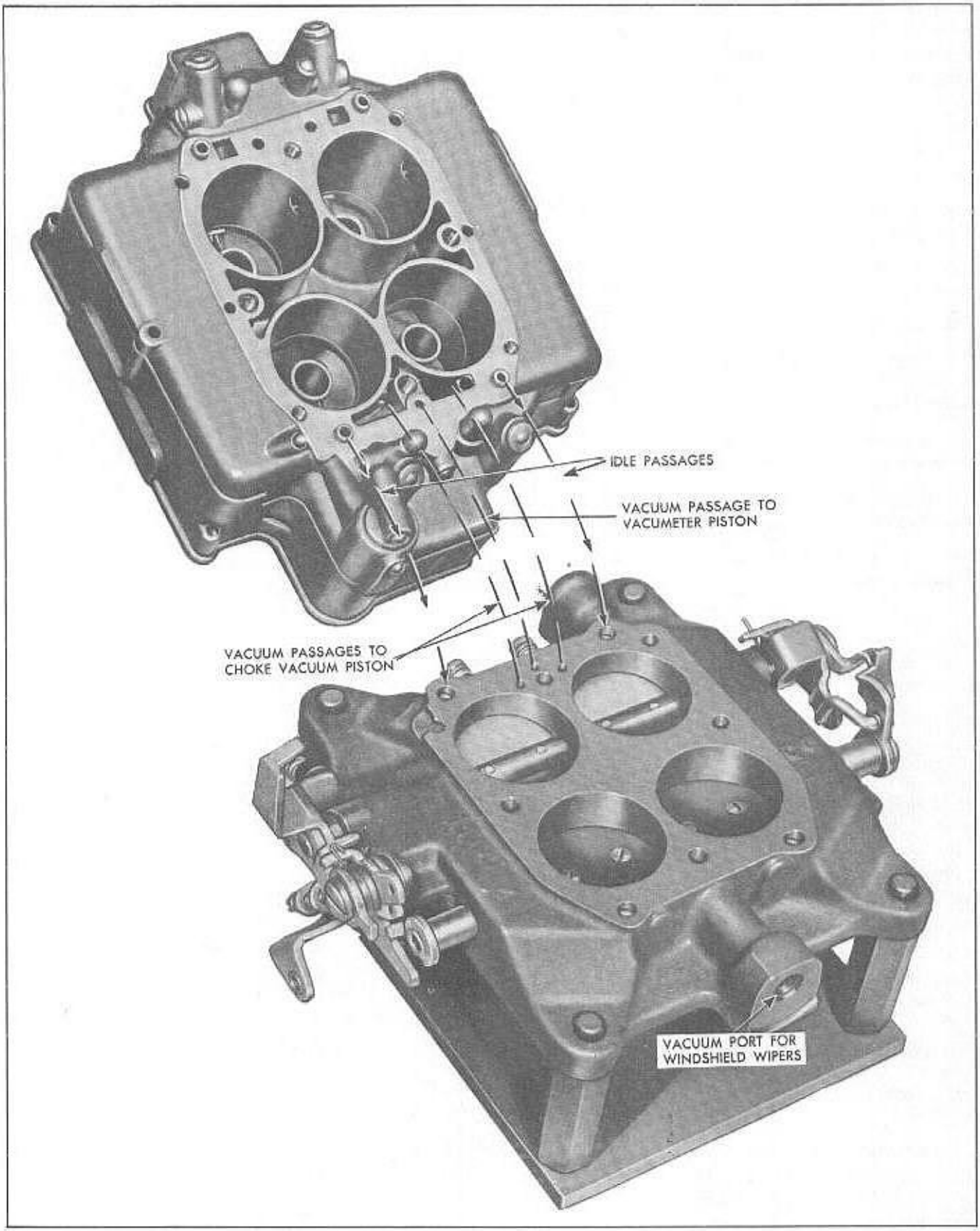


Fig. 6B-18 Passage Identification—Body to Throttle Flange

in the bottom of the choke piston housing. Plug can be removed by piercing center with a small pointed instrument and prying outward. Care should be exercised so that damage will not result to the casting when removing this plug. Before installing new plug, carbon present in piston cylinder slots should be removed and the Welch plug seat should be carefully cleaned.

b. Remove carbon from bores of throttle flange with sandpaper; never use emery cloth.

c. Inspect needle or seat for wear; if worn, both must be replaced.

d. Inspect float pin for excessive wear.

e. Inspect float for dents and excessive wear on lip. Check for fluid inside float by shaking. Replace float if any of above are present.

f. Inspect air horn for wear in countershaft hole (hole worn egg shaped).

g. Inspect throttle shafts for excessive wear (looseness or rattle in body flange casting).

h. Inspect idle mixture adjusting screws for burrs. Replace if burred.

i. Inspect metering rods and jets for bent rods and signs of wear, and replace if bent rods or wear are noted. Always replace both metering rod and jet; do not install new rod in old jet or vice versa.

j. Inspect pump plunger assembly. If leather is not in good condition, replace plunger.

k. Inspect gasketed surfaces between body and air horn, and between body and flange. Small nicks or burrs should be smoothed down to eliminate air or fuel leakage. Be especially particular when inspecting choke vacuum passages and the top surface of the inner wall of the bowl.

4. Check part numbers of jets, metering rods, etc. (where stamped with Carter part number), against Master Parts Catalog to make sure correct parts will be installed.

ASSEMBLY OF THROTTLE FLANGE

If throttle flange was fully disassembled, reassemble as follows:

1. Install idle mixture adjusting screws and springs finger tight, then back out 1 turn. CAUTION: Do not tighten idle mixture adjusting screws more than finger tight.

2. Install primary and secondary throttle shafts.

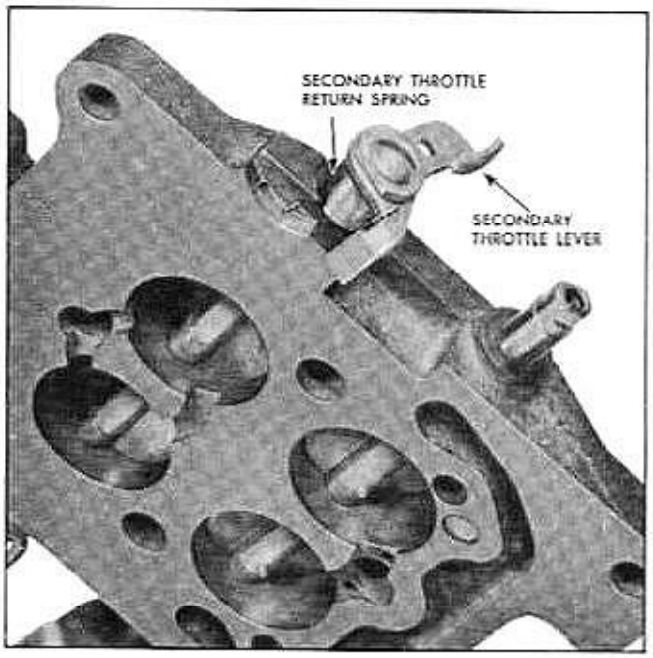


Fig. 6B-19 Proper Assembly of Secondary Throttle Lever

3. Install primary throttle valves from bottom or manifold side, with trade mark (C in circle) toward idle ports when viewing flange from manifold side. Use NEW screws. Install secondary throttle valves from top with trade mark (C in circle) away from center of carburetor when viewing flange from manifold side.

4. Install secondary throttle return spring and secondary throttle lever (Fig. 6B-19).

5. Install secondary throttle washer and screw (Fig. 6B-19).

6. Wind spring 1½ turns with tag wire and hook over secondary throttle lever (Fig. 6B-19).

7. Install primary shaft thrust washer and inner throttle shaft arm and flex spring (Fig. 6B-20).

8. Install throttle shaft dog (Fig. 6B-21).

9. Install outer throttle lever, washer and screw. Using needle nose pliers, hook outer end of flex spring over notch on outer throttle shaft arm (Fig. 6B-22). NOTE: A groove filed across ends of needle nose pliers will facilitate holding spring.

10. Using a flat washer on each side of the levers, install connector rod (Fig. 6B-22). Retain with pin springs.

11. Install fast idle cam assembly, consisting of secondary lockout lever spring, secondary lockout

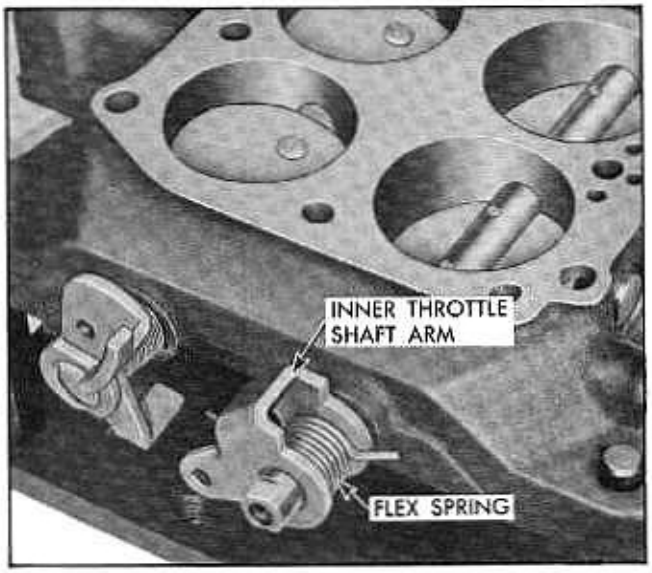


Fig. 6B-20 Inner Throttle Shaft Arm Installed

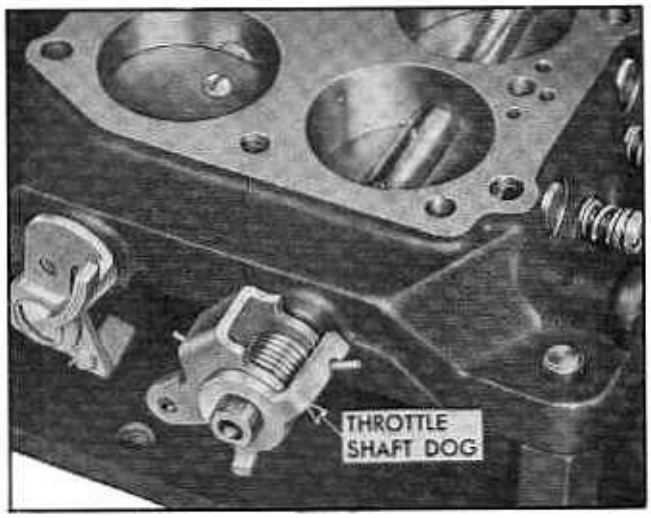


Fig. 6B-21 Throttle Shaft Dog

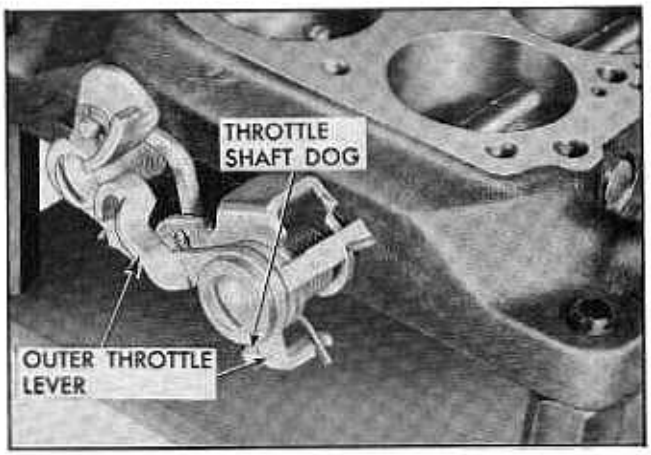


Fig. 6B-22 Primary and Secondary Throttle Levers

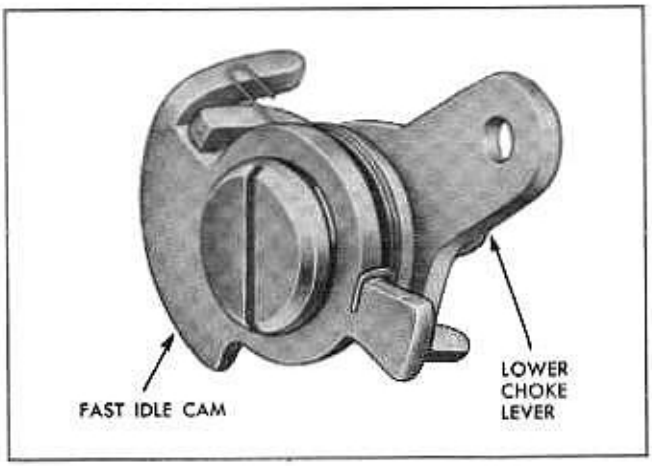


Fig. 6B-23 Fast Idle Cam and Lower Choke Lever

lever, lower choke lever, fast idle cam and spring and attaching screw as follows:

a. Assemble fast idle cam and spring assembly and lower choke lever and place over attaching screw and set aside (Fig. 6B-23).

b. Hook secondary lockout lever spring in lockout lever and place lever against boss with spring hooked on casting (Fig. 6B-24).

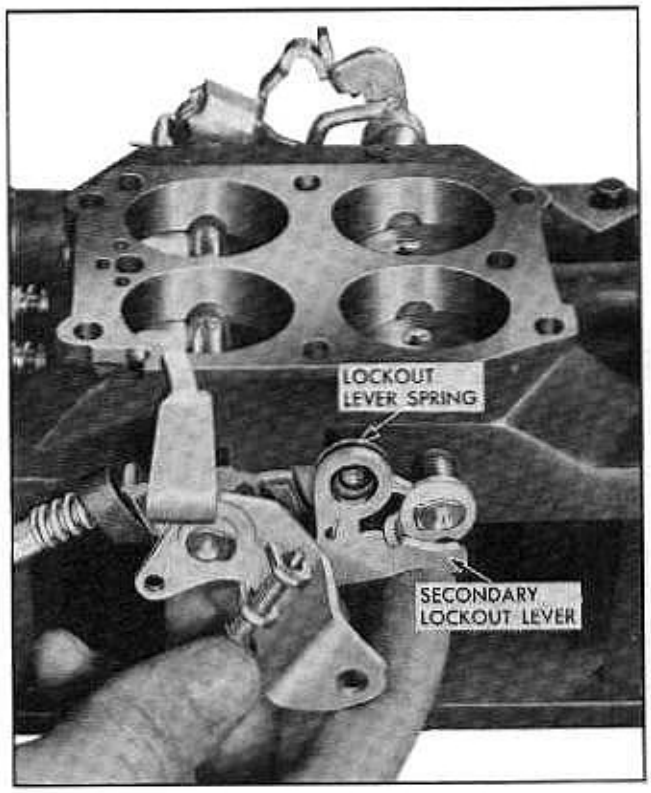


Fig. 6B-24 Positioning Secondary Lockout Lever

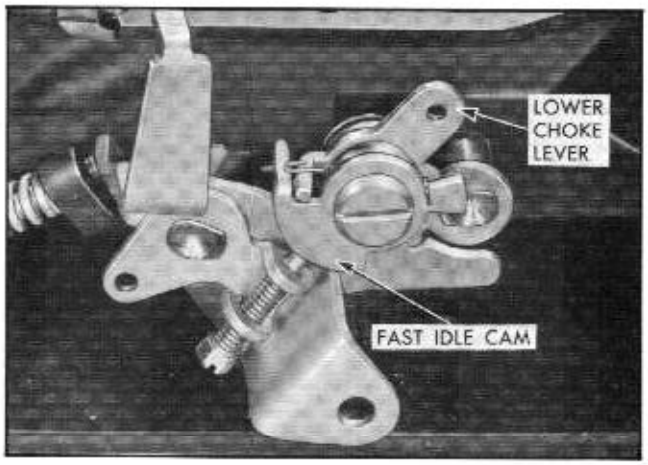


Fig. 6B-25 Fast Idle Cam and Secondary Lockout Assembly

c. Install fast idle cam assembly with screw (assembled in step a) in position on boss (Fig. 6B-25). Make sure cam and levers operate freely.

12. Install idle speed screw and spring.

ASSEMBLY OF CARBURETOR BODY

1. If disassembled, insert auxiliary throttle valve shaft through bowl and install auxiliary throttle valve (Fig. 6B-26).

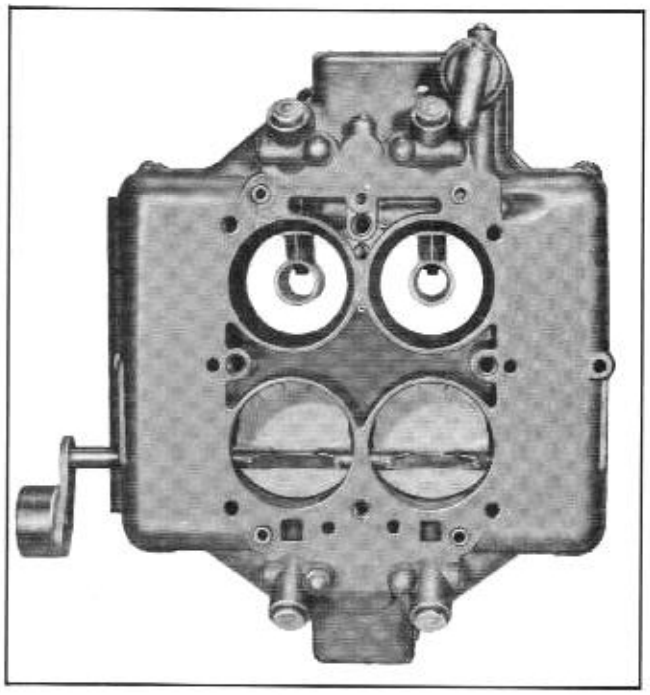


Fig. 6B-26 Auxiliary Throttle Valves

2. Place NEW body to flange gasket on carburetor body.

3. Install throttle flange on carburetor body with 6 attaching screws and lock washers.

4. Install primary metering rod jets. NOTE: The primary metering rod jets have the large holes and must be installed in the primary side of the carburetor. This is the pump cylinder side of the carburetor body.

5. Install secondary main jets.

6. Install 2 low speed jets on primary side of body. NOTE: Low speed jets are mounted at a slight angle.

7. Install steel pump inlet ball check and retainer (Fig. 6B-14). Press retainer into place with a 5/16" six-point socket.

8. Install pump passage screw plug and gasket.

9. Install brass pump discharge check needle (Fig. 6B-27). Be sure needle is installed point down.

10. Install pump discharge cluster gasket, cluster assembly and attaching screw.

11. Install vacumeter spring in vacumeter bore.

NOTE: The vacumeter spring affects both economy and performance. If vacumeter piston spring appears to be damaged or distorted, it should be replaced. If any doubt exists, use a new spring for comparison.

12. Install lower pump spring in pump cylinder.

ASSEMBLY OF AIR HORN

1. Install strainer screen in primary intake under needle seat. Then install primary needle and seat with new gasket. IMPORTANT: Intake needles and seats are factory matched and must never be mixed.

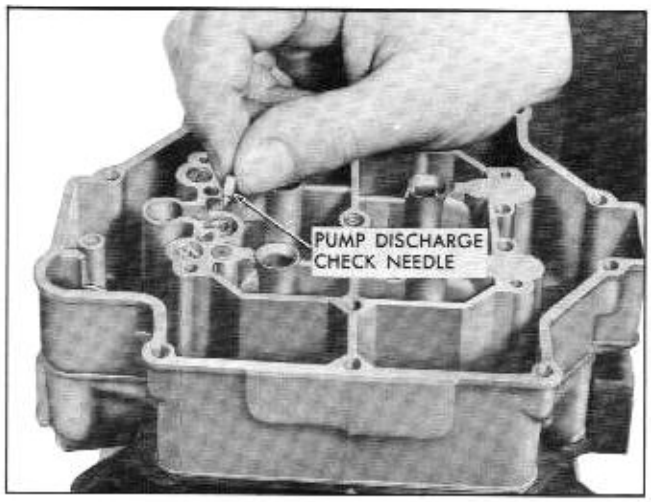


Fig. 6B-27 Installing Pump Discharge Check Needle

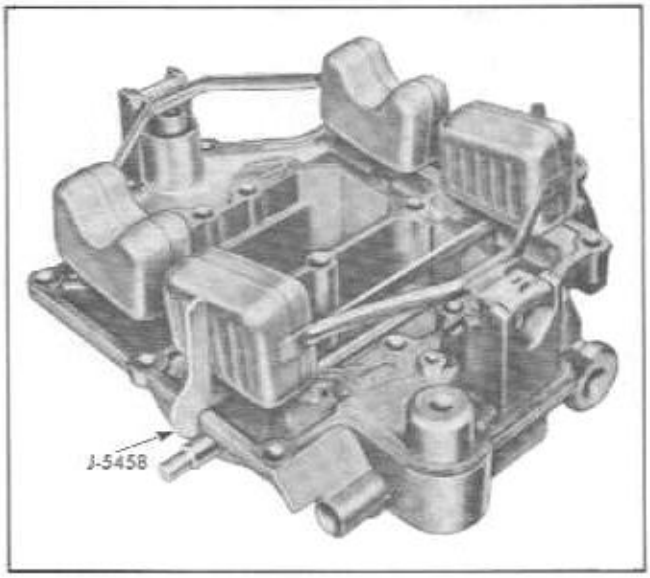


Fig. 6B-28 Float Gauge in Position for Checking Floats

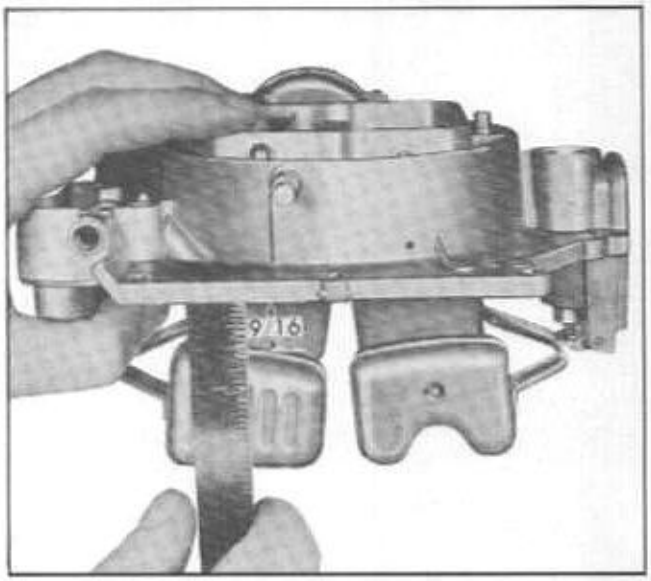


Fig. 6B-29 Measuring Float Drop

2. Install secondary intake needle and seat with new gasket.

3. Temporarily install both the primary and secondary float assemblies. NOTE: Float adjustments must be measured with air horn gasket removed.

4. Three separate float adjustments must be made—lateral, vertical, and float drop.

a. Lateral Adjustment: Place float gauge J-5458 under center of float with notched portion of gauge fitted over edge of casting (Fig. 6B-28). Sides of float should just clear the vertical uprights of float gauge. Adjustment should be made by bending arms of float.

b. Vertical Adjustment: With float gauge in position (Fig. 6B-28) floats should just clear the horizontal portion of gauge. Vertical distance between top of float (at center) and machined surface of casting is 3/16" (gauge J-5458) for both primary and secondary floats. Adjust by bending at center portion of float arms. Remove gauge.

c. Float Drop Adjustment: With bowl cover held in upright position and measuring from center of float, the distance between top of floats and bowl cover should be 9/16" for both primary and secondary floats (Fig. 6B-29). Adjust by bending stop tabs on float brackets.

5. Remove floats and install new air horn gasket.

6. Install vacumeter link and vacumeter piston with lip on link toward center of air horn.

7. Reinstall the primary and secondary float assemblies.

8. Insert pump plunger shaft through air horn and retain in position with link and pump arm assembly.

9. Carefully position the air horn assembly on the carburetor body, being sure the vacumeter piston and pump plunger are aligned so they enter their respective bores.

10. Install 16 air horn attaching screws. See Fig. 6B-12 for proper location of different length screws.

11. Tighten all screws evenly and securely.

12. Install metering rod discs and metering rods. Disc with the larger hole goes next to the air horn, disc with smaller hole on top. Install both metering rods as follows: Catch metering rod spring loop with lower end of rod before rod is inserted, then twist "eye" of rod onto vacumeter piston link assembly.

13. Install pump countershaft by sliding shaft through pump operating arm and metering rod arm (Fig. 6B-11). CAUTION: Be certain metering rod operating arm is positioned in slot in vacumeter piston link.

14. Install idle vent lever and screw.

15. Tighten pump arm screw.

16. Place washer on lower end of throttle connector rod, install rod into throttle lever and retain with spring and retainer.

17. Install throttle connector rod in pump countershaft lever and retain with pin spring.

18. Install choke piston housing and NEW gasket, using three self-tapping screws if removed.

19. Assemble choke piston on link and install choke shaft and piston assembly through air horn while guiding piston into cylinder if removed.

20. If removed, place choke valve in position on choke shaft with the "C" (in circle) on valve visible from the top of carburetor. Center choke valve and install screws. Use new screws. IMPORTANT: Make sure that neither valve nor shaft binds in any position and that valve drops free by its own weight.

21. Position baffle plate into choke housing with choke operating lever extending through slot in stationary baffle and small hole in rotating baffle.

22. Install choke coil housing and new gasket on choke housing with index mark on plastic housing at the bottom. Revolve coil housing in direction opposite to arrow (counterclockwise) until set at center index. Retain with 3 screws and retainers.

23. Install choke operating lever on shaft and tighten screw only enough to permit lever to be moved.

24. Install choke connector rod in choke operating lever and choke lower lever, and retain lower end of rod with pin spring.

25. Install strainer plug, gasket, and strainer in primary side.

26. Install strainer plug and gasket on secondary side.

ADJUSTMENTS

The float adjustments have been described and made during assembly of the air horn. The remaining adjustments should be made in the following sequence:

1. Pump Adjustment
2. Metering Rod Adjustment
3. Fast Idle Cam Clearance Adjustment
4. Unloader Adjustment
5. Secondary Throttle Lever Adjustment
6. Secondary Throttle Lockout Adjustment

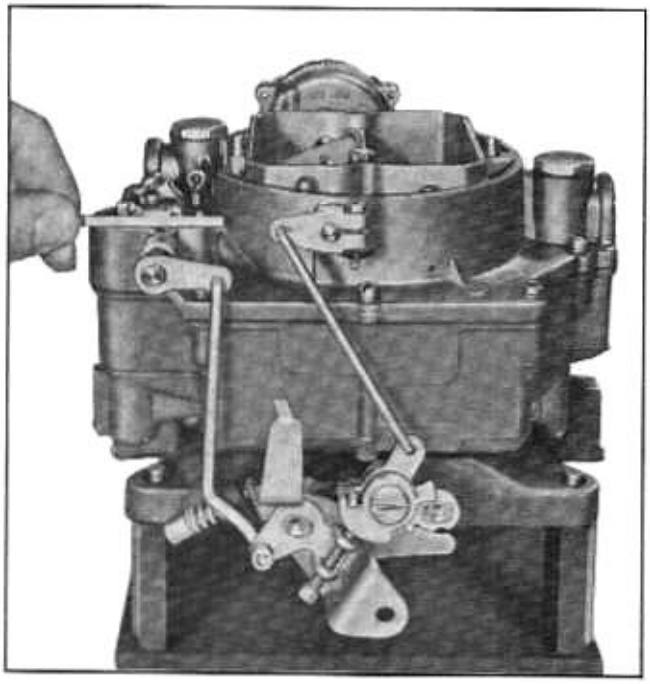


Fig. 6B-30 Accelerating Pump Arm Adjustment

PUMP ADJUSTMENT

1. Back out idle speed screw and fast idle speed screw until throttle valves seat in bores of carburetor.

2. Hold straight edge across top of dust cover boss at pump arm (Fig. 6B-30). Bend throttle connector rod at lower angle (use tool J-5496) until flat on top of pump arm is parallel with straight edge while throttle valves are seated.

METERING ROD ADJUSTMENT

1. Back out idle speed screw and fast idle speed screw until throttle valves seat.

2. Press down on vacumeter piston link until metering rods bottom in carburetor body (Fig. 6B-31).

3. Holding rods in this downward position and with throttle valves seated, revolve metering rod arm until finger on arm contacts lip of vacumeter link. Hold in place and carefully tighten clamp screw (Fig. 6B-31).

4. Lubricate countershaft by dropping engine oil in 2 oil holes and install dust cover.

FAST IDLE CAM CLEARANCE ADJUSTMENT

1. Make sure choke lever clamp screw is still loose.

2. Hold choke valve closed.

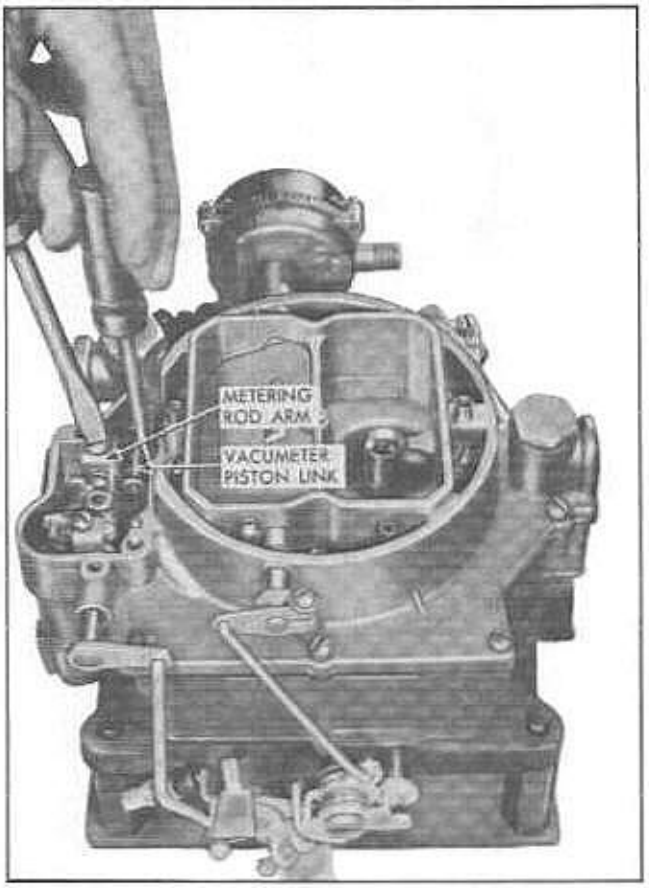


Fig. 6B-31 Metering Rod Arm Adjustment

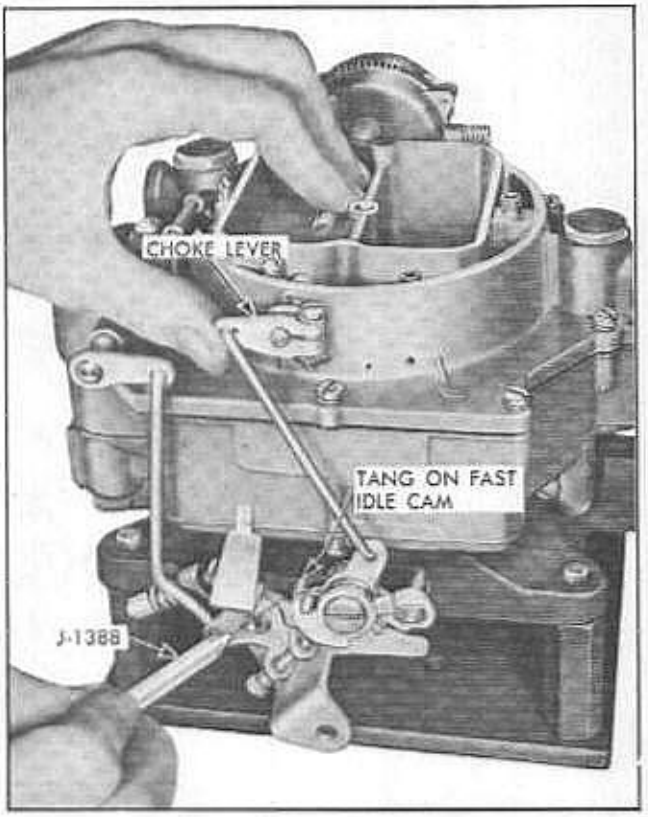


Fig. 6B-32 Fast Idle Cam Clearance Adjustment

3. Place .020" wire gauge (J-1388) on boss, rotate choke lever on shaft until tang on fast idle cam contacts wire gauge and all slack in linkage is removed (Fig. 6B-32). While holding in this position, tighten choke lever clamp screw.

UNLOADER ADJUSTMENT

1. Hold throttle lever wide open.

2. There should be 1/8" (gauge J-818-5) between top edge of choke valve and inner wall of air horn (Fig. 6B-33). If necessary, adjust by bending unloader projection on throttle lever.

SECONDARY THROTTLE LEVER ADJUSTMENT

1. Open choke valve to unlock secondary throttle valves.

2. Open primary throttle lever to wide open position.

3. Secondary throttle valves should reach wide open position at the same time as primary valves. If necessary, bend throttle operating rod at upper angle (Fig. 6B-34) (use bending tool J-5496).

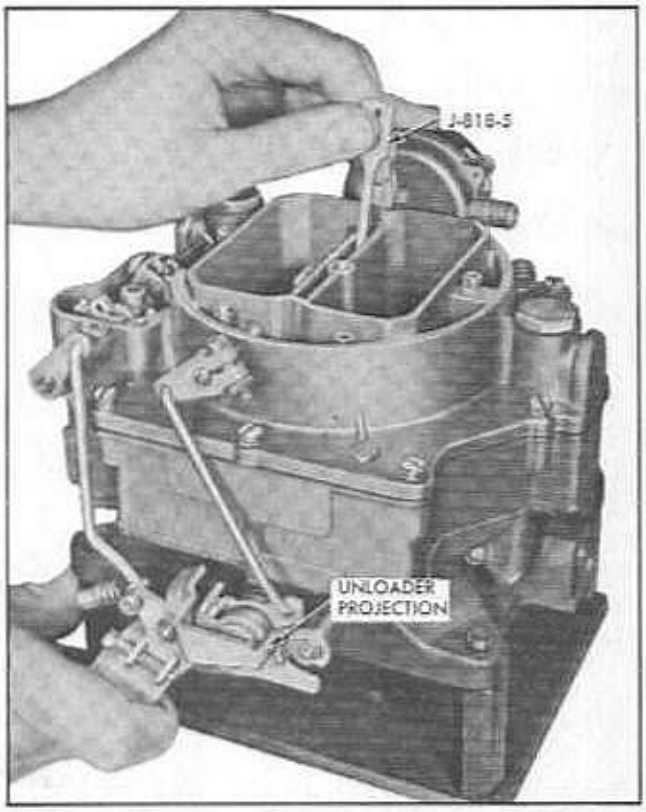


Fig. 6B-33 Unloader Adjustment

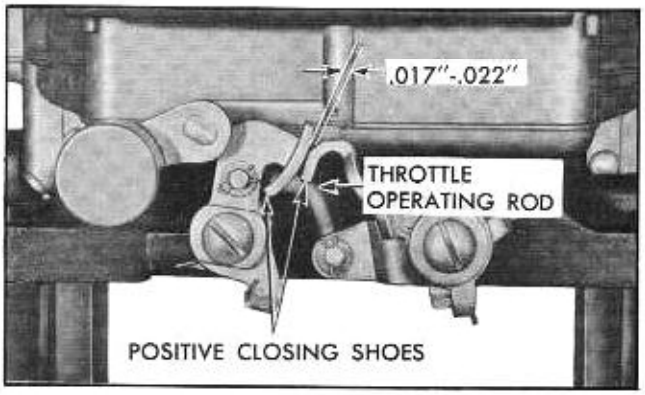


Fig. 6B-34 Primary and Secondary Throttle Levers

4. Check to see that there is .017" to .022" clearance between primary and secondary throttle positive closing shoes with throttle valves closed (Fig. 6B-34). If not, bend closing shoes as necessary.

LOCKOUT ADJUSTMENT

1. Hold choke valve wide open.

2. Hold throttle lever closed.

3. Allow choke valve to close slowly. Lockout step on secondary lockout lever should freely engage tang on secondary throttle lever (Fig. 6B-35). If adjustment is necessary, bend tang (Fig. 6B-35).

IDLE VENT VALVE ADJUSTMENT

With the throttle valves closed the idle vent should be $\frac{1}{32}$" off its seat. Bend tang shown in Fig. 6B-36 to adjust.

TEST BEFORE INSTALLATION ON ENGINE

It is good shop practice to fill the carburetor bowl before installing the carburetor. This reduces the strain on the starting motor and battery and reduces the possibility of backfiring while attempting to start the engine. A fuel pump clamped on the bench, a small supply of fuel and the necessary fittings enable the carburetor to be filled and the operation of the float and intake needle and seat to be checked. Operate the throttle several times and check the discharge from the pump jets.

Before installing the carburetor, hold choke valve open and turn the idle speed screw until it just contacts the throttle lever, then $\frac{3}{4}$ of a turn more to open the throttle valves enough to keep the engine

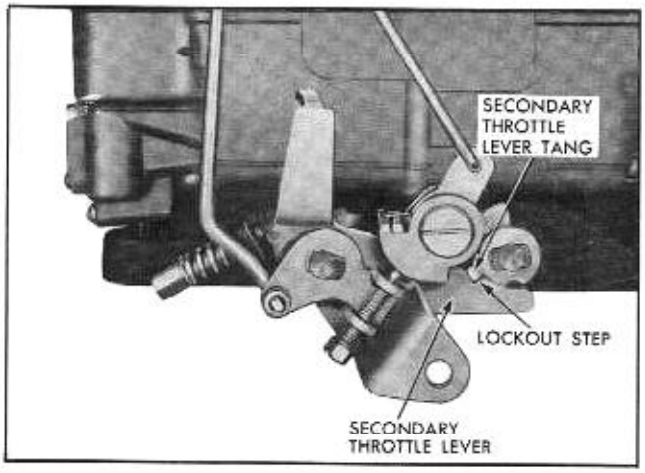


Fig. 6B-35 Lockout Adjustment

running until the idle mixture and final RPM adjustment can be made.

TROUBLE DIAGNOSIS AND TESTING

When carburetor troubles are encountered they can usually be corrected by making the adjustments outlined under "Adjustments on Car". The following list of common troubles and their causes will frequently save considerable time in locating the cause of the difficulty. NOTE: Before any work is performed on the carburetor, make sure trouble is not due to poor compression, or in the ignition system

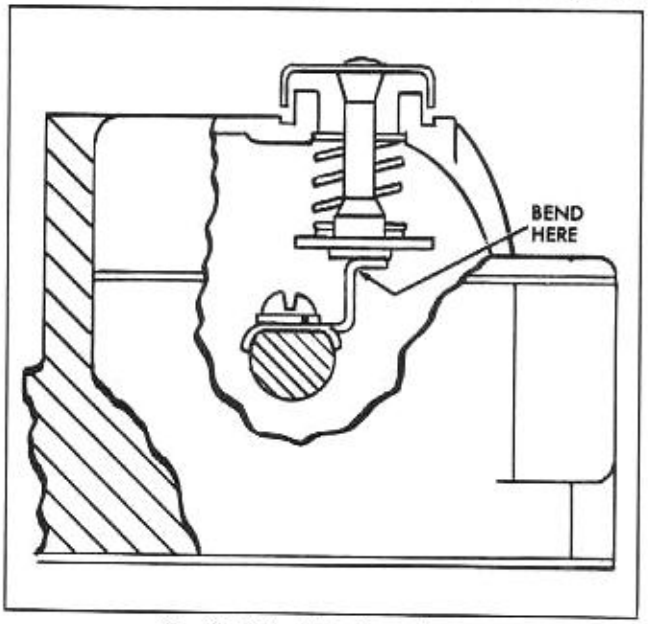


Fig. 6B-36 Idle Vent Valve

due to improper timing, defective spark plugs, burned ignition points, etc. Always diagnose performance trouble by using the Pontiac Tune-N-Test Guide before adjusting or repairing the carburetor.

When the cause of trouble is not located by the Tune-N-Test, check for trouble in the carburetion system as follows:

POOR FUEL ECONOMY

NOTE: Before any attempt is made to improve fuel economy the actual gasoline mileage should be determined using a tenth of a gallon tester. If the mileage obtained during this test compares favorably with that found on other normal cars, the poor mileage must be attributed to the driving conditions or driving habits of the owner. Also consider factors such as dragging brakes, soft tires, improper tire size, and improper speedometer driven gear.

1. Check automatic choke to see that it operates properly and that it is correctly indexed.

2. Inspect manifold heat valve to see that it operates freely.

3. Check for leaks in fuel line fittings, at fuel tank, or at fuel pump bowl.

4. Check for dirty or restricted air cleaner.

5. Test for high fuel pump pressure.

6. Check metering rod adjustment.

7. Disassemble carburetor and inspect throttle body to bowl gasket and air horn gasket for evidence of leaks in vacuum passages to metering rod vacuum piston and automatic choke vacuum piston. Check float level.

8. Check for worn metering rods and jets.

SURGING CONDITION AFTER SHORT STOP WITH HOT ENGINE

1. Lean carburetor adjustment. Check float level and metering rod adjustment. Also make sure correct metering rods are installed.

2. Weak fuel pump. Check fuel pump pressure and output as outlined on page 6B–59.

FLAT SPOT OR POOR ACCELERATION

1. See that manifold heat valve operates freely and that thermostat is properly installed.

2. Check accelerator pump action. Remove air horn and open throttle to observe stream from nozzles. If pump is not functioning properly check pump adjustment.

3. Check pump for defective plunger leather, opstructed passages, or leaking intake check valve.

ROUGH IDLE WHICH CANNOT BE CORRECTED BY MIXTURE AND SPEED ADJUSTMENT

1. Check manifold gaskets for evidence of air leak into intake manifold. When kerosene is used ensure that no liquid or fumes enter choke stove by disconnecting heat tubes.

2. Check float level.

3. Check idle jets for obstructions.

4. Check idle passages in carburetor castings for obstructions.

5. Check for leak between exhaust gas passage and throttle bore.

IMPROPER HIGH SPEED PERFORMANCE

1. Check spark plug gap.

2. Check distributor points.

3. Test fuel pump output and pressure as outlined on page 6B–59.

4. Check throttle body to bowl gasket and air horn gasket for evidence of air leaks into vacuum passage to metering rod vacuum piston.

5. Check metering rod and float level adjustments.

6. Check for worn or incorrect metering rods or jets.

7. Check for restriction in bowl vent.

8. Inspect high speed passages and nozzles for obstructions.

FLOODING OR LEAKING

1. Test fuel pump for excessive pressure.

2. Clean intake strainer and check for dirt on intake needle or seat.

3. Check float adjustment (make sure float is centered so it does not rub side of bowl).

4. Check for leaking or collapsed float.

5. Check for worn intake needle and seat.

6. Inspect bowl casting for cracks or loose passage plugs.

STALLING DURING WARM-UP, DUE TO ICING

Check exhaust gas passage for carbon build up. Clean hole to manifold and manifold flange surface. Always use new manifold to carburetor gaskets to ensure against leak.

CARTER CARBURETOR WCFB—SPECIFICATIONS

ADJUSTMENT SPECIFICATIONS

Float Adjustment—Vertical distance between center of float and surface of air horn $\frac{3}{16}$" (gauge J-5458) for both primary and secondary.

Float Drop—Casting in operating position distance between center of floats and air horn is $\frac{9}{16}$" (no gauge necessary; use an ordinary scale).

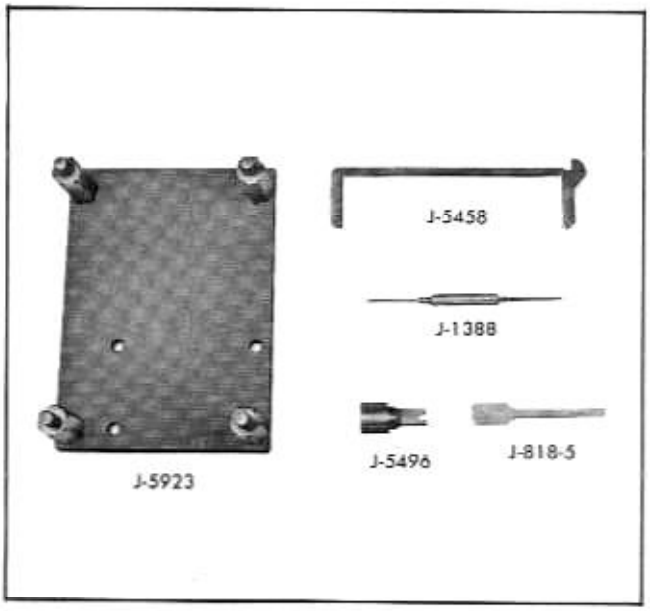
Fast Idle—Cam to machined boss clearance minimum of .020" (gauge J-1388).

Unloader—Distance between upper edges of choke valve and wall of air horn $\frac{1}{8}$" (gauge J-818-5).

Clearance Between Positive Closing Shoes—is .017" to .022" with both valves seated (hold choke valve open to revolve fast idle cam and be sure idle speed screw is backed out so valves seat in bore).

Fast Idle Speed	1900 RPM
Hot Idle Speed	450-470 RPM

Choke — Carter Climatic (R) Control — Butterfly Type, Set on index Offset choke valve on primary side only.



CARTER 4-BARREL SPECIAL TOOLS

J-818-5	Choke Unloader Gauge
J-1388	Fast Idle Cam Clearance Gauge
J-5458	Float Level Gauge
J-5496	Bending Tool
J-5923	Holding Stand