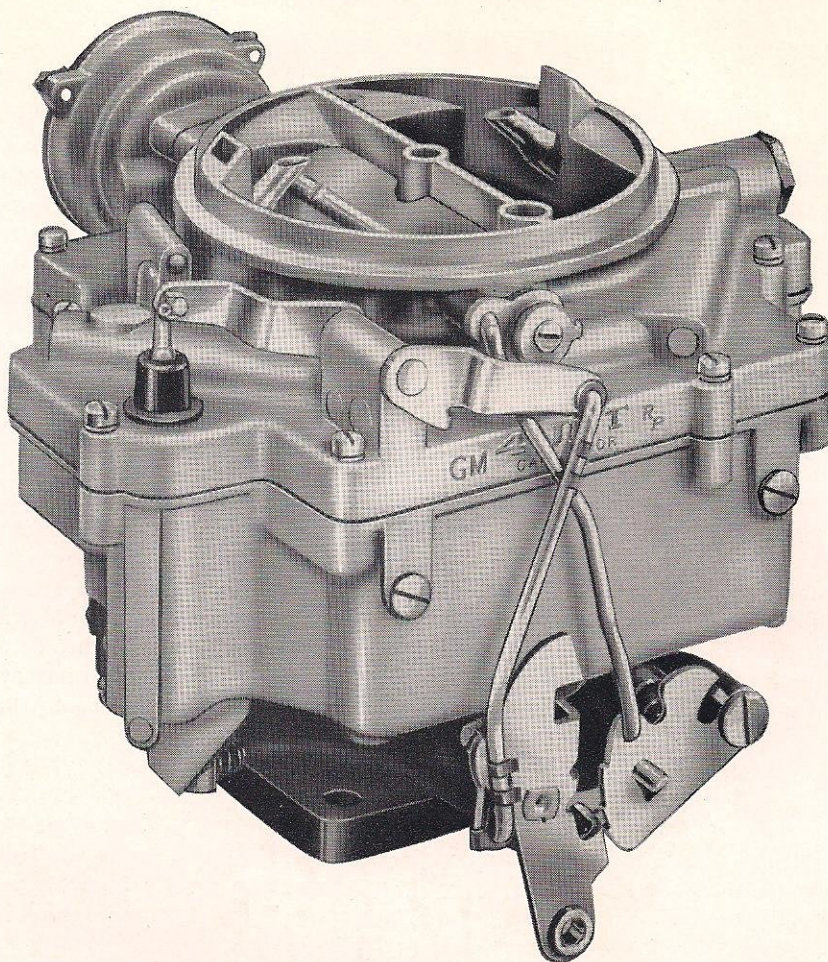


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MODEL 4GC ROCHESTER CARBURETOR

The Rochester Model 4GC Carburetor consists basically of two dual carburetors. The two carburetors will be referred to as the Primary or Pump Side and the Secondary or Fuel Inlet Side. The Primary Side completely controls the metering to the engine throughout the idle and part throttle range. The fuel from the Primary Side is supplemented by fuel from the Secondary Side throughout the power or wide open throttle range.

This design incorporates many new and distinctive features, as well as retaining many of the tested and

proven features basic to the design of previous model Rochester Carburetors.

The Model 4GC Carburetor still retains the six basic systems of carburetion: Idle, Part Throttle, Power, Accelerator Pump, Float, and Choke. The following discussion will trace and describe the operation of each of these systems. The recommended disassembly and assembly procedure is also given. For adjustment instructions and specifications, refer to Instruction Sheet for the particular car application concerned.



PERFORMANCE FEATURES

The float bowls in the Model 4GC Carburetor completely encompass the main bores of the carburetor. This, plus the fact that a direct passage connects the main discharge nozzle wells and idle tube wells, provides for smooth operation regardless of the angle of tilt the car may assume.

Another basic feature of all Rochester Carburetors also incorporated in the Model 4GC is the fixed type main metering jets. No wear takes place at the jet orifice.

This carburetor model employs the use of a vacuum operated power system. In this way proper power mixtures are readily available upon a drop in manifold vacuum, regardless of the degree of throttle opening. It is not necessary therefore, to open the throttle completely to enrich the mixture sufficiently for power operation.

As in previous units, the Model 4GC Carburetor employs the use of a vented type pump plunger. By

means of a vent valve ball, within the plunger head itself, fuel vapors are allowed to pass from the pump well to the float bowl under constant throttle conditions. This insures that the pump well will be primed with solid fuel at all times thereby being readily available for rapid acceleration.

This pump system, as in the Model BB, is also vented to the bore of the carburetor air horn. This is done to prevent pump pullover or fuel being discharged from the pump jets during high speed operation.

The chief feature, completely new to Rochester Carburetor design, is the secondary or fuel inlet side of the carburetor. This secondary side incorporates only three of the six basic systems of carburetion, those being Idle, Wide Open, and Float. The secondary throttle valves are controlled, through a series of linkages, by the primary or pump side throttle opening. The secondary side, by increasing air flow at high speeds, proportionately increases the engine's breathing capacity.

SERVICE FEATURES

The Model 4GC Carburetor, in keeping with all other Rochester designed carburetors, has been kept basically simple for ease of service.

A major portion of the calibrated metering parts is contained in the venturi clusters, located in the float bowl and may be readily serviced by removing the Air Horn Assembly.

The idle tubes and main discharge nozzles, being pressed into the venturi clusters, need not be serviced separately.

The power restrictions and pump jets are also pressed in at the factory, thereby making individual replacement unnecessary.

After the idling RPM has been set, no further adjustment of the idle, part throttle, power or targeting of the pump jets is necessary.

All field adjustments have been kept as simple as possible. For ease in servicing this unit, the special tools, gauges, and field adjustments required have been kept to a minimum.



● IDLE SYSTEM

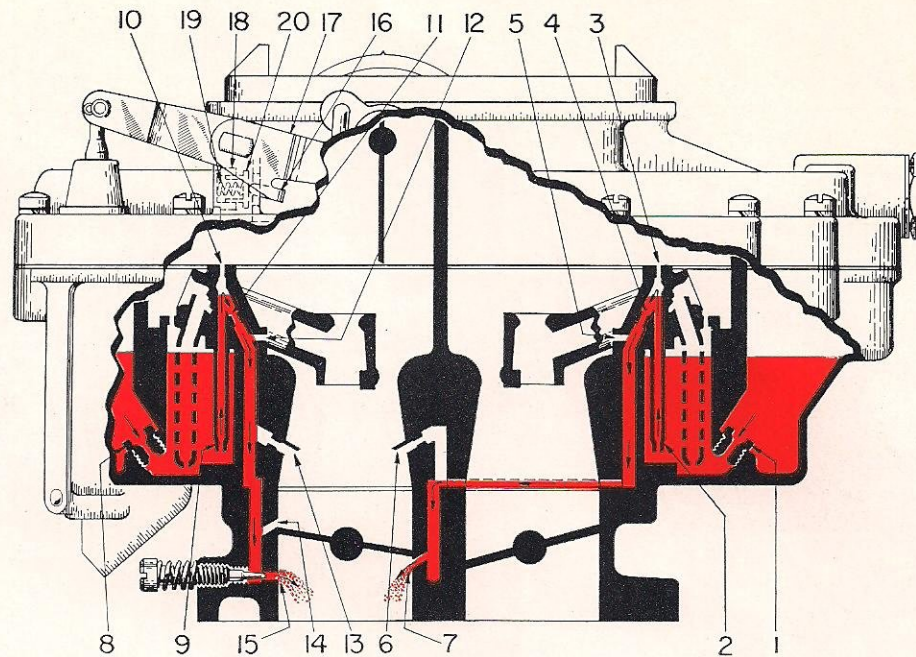


Figure 7-1

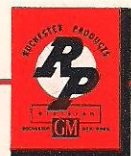
At small throttle openings, the vacuum created at the main discharge nozzles is not great enough to cause fuel to flow from the nozzles. Therefore, additional systems have been introduced to provide the proper mixture ratios required throughout the low speed range.

A fixed idle system is provided on the secondary or fuel inlet side of the carburetor. This system provides about half the required fuel for normal curb idle mixtures. As shown in figure 7-1, the secondary idle fuel is drawn from the float bowl through the main metering jets (1), into the fuel well in the bottom of the float bowl. It then passes through the calibrated restrictions in the ends of each idle tube (2). The fuel is then drawn up through the idle tube, is bled at the idle bleeds (3), passes through calibrated restrictions (4) and is again bled by the calibrated bleeds shown at (5). The mixture is then drawn through the channel in the float bowl around the secondary throttle body bores, is further bled by the lower idle air bleeds (6) and is discharged from the throttle body idle orifice (7). As the throttle is opened, the vacuum or suction on the idle discharge holes (7) decreases very rapidly. These discharge holes, therefore, stop feeding fuel in the off idle range.

In addition, an adjustable idle system is provided on the primary or pump side of the carburetor. This system provides the balance of fuel required for normal curb idle as well as that required for operation in the off idle, low speed range. Refer again to figure 7-1. The primary idle fuel is drawn from the float bowl through

the main metering jets (8) into the fuel well in the bottom of the float bowl. It then passes through the calibrated idle tube restrictions (9), and idle tubes. Air joins this fuel at the calibrated bleeds (10). This mixture then passes through the calibrated restrictions (11) and is bled further at the secondary idle bleeds shown at (12). The mixture then passes through the float bowl idle channel, is further bled at the lower idle air bleeds (13) and secondary idle holes (14), and is discharged from the throttle body idle needle holes (15). As the throttle valves are opened, the bleed effect of the secondary idle holes gradually diminishes. When these holes become exposed to manifold vacuum they then become fuel discharge holes to meet the increased demand of the engine.

To minimize difficult hot weather starting or rough idling due to fuel vapor formation the Model 4GC Carburetor incorporates an external vent when the throttle valves are in the closed position. This external idle vent consists of an actuating lever (16) attached to the pump shaft and lever assembly (17), idle vent valve guide (18), idle vent valve spring (19), and idle vent valve (20). When the throttle valves are closed, the actuating lever contacts the spring loaded vent valve and holds it open, permitting vapors from the float bowl to vent themselves to the atmosphere. As the throttle valves are opened, the idle vent spring closes the vent valve thus eliminating the atmospheric vent and returning the carburetor to an internal balance.



● PART THROTTLE SYSTEM

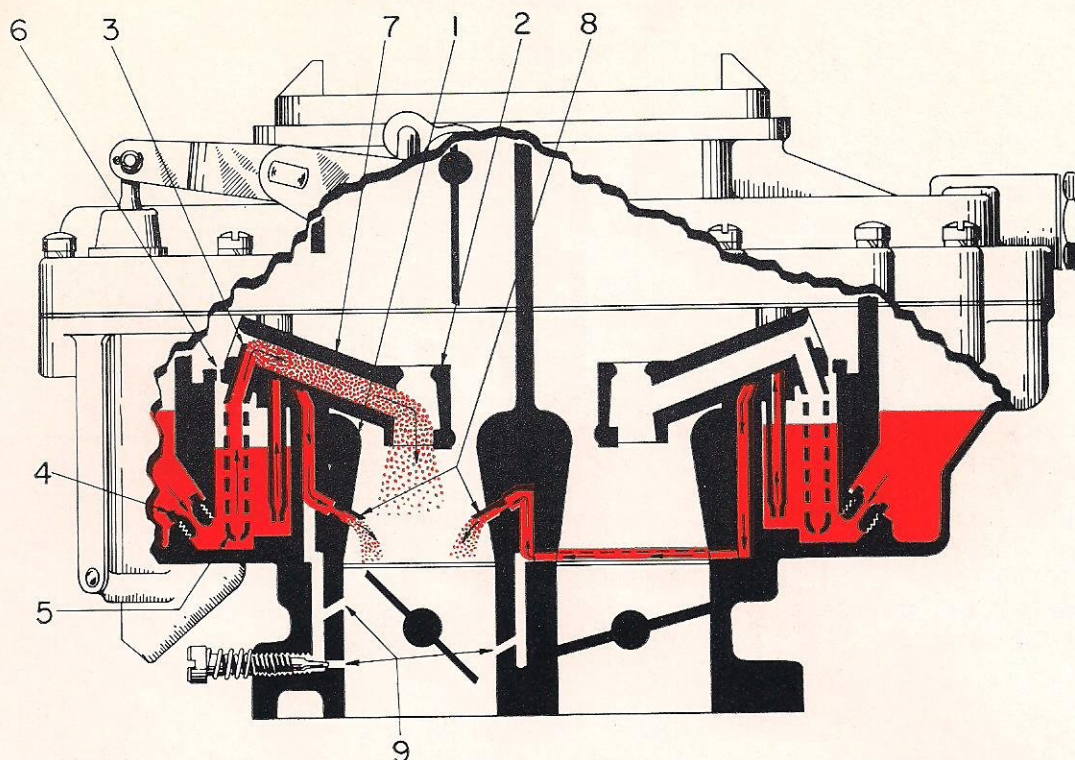


Figure 7-2

As the throttle valves are opened to a greater degree and more air is drawn through the carburetor, it is necessary to provide means, other than the idle systems, for supplying additional fuel to meet the engine requirements.

Use Figure 7-2 as a reference.

The primary or pump side of the carburetor meets this increased demand for fuel in the following manner: At a point of sufficient throttle opening, manifold vacuum or suction, multiplied several times in the primary (1) and secondary venturi (2), is transmitted to the tip of the main well tubes or main discharge nozzles (3). This suction draws fuel from the float bowl, through the calibrated main metering jets (4) and into the air bleed main well tubes (5). After passing through the main well tubes (5) air joins the mixture at the main well bleeds (6). The mixture then passes from the tip of the nozzle through the Mixture Passage (7), to the secondary venturi (2) and on into the intake manifold. As the throttle opening is progressively increased and more fuel is drawn through the main well tubes, the fuel level in the main wells drops. As this fuel level drops, the calibrated holes in the main well tubes become uncovered of fuel. When this occurs, they be-

come air bleeds, thus mixing progressively more air with the fuel passing through the main well tubes. Thus, although the nozzle suction is increased by increasing the throttle opening, the fuel mixture to the engine remains constant throughout the Part Throttle range.

As throttle opening increases, lower idle air bleeds (8) which now become part throttle feed nozzles, have been placed in the main air flow channels below the primary venturi (1). These nozzles, being exposed to manifold vacuum during part throttle operation, draw fuel through both the Primary and Secondary idle systems as described on the previous page. It will be noted that these nozzles acted as air bleeds during the operation of the idle system. Now they are acting as discharge nozzles.

The throttle valves on the secondary or fuel inlet side of the carburetor do not open until the primary linkages engage the secondary throttle shaft. They must then open fully during the remaining few degrees of primary throttle travel. The secondary side, therefore, only supplies fuel in the idle and power ranges. The part throttle or intermediate range is controlled completely on the primary side of the carburetor.



POWER SYSTEM

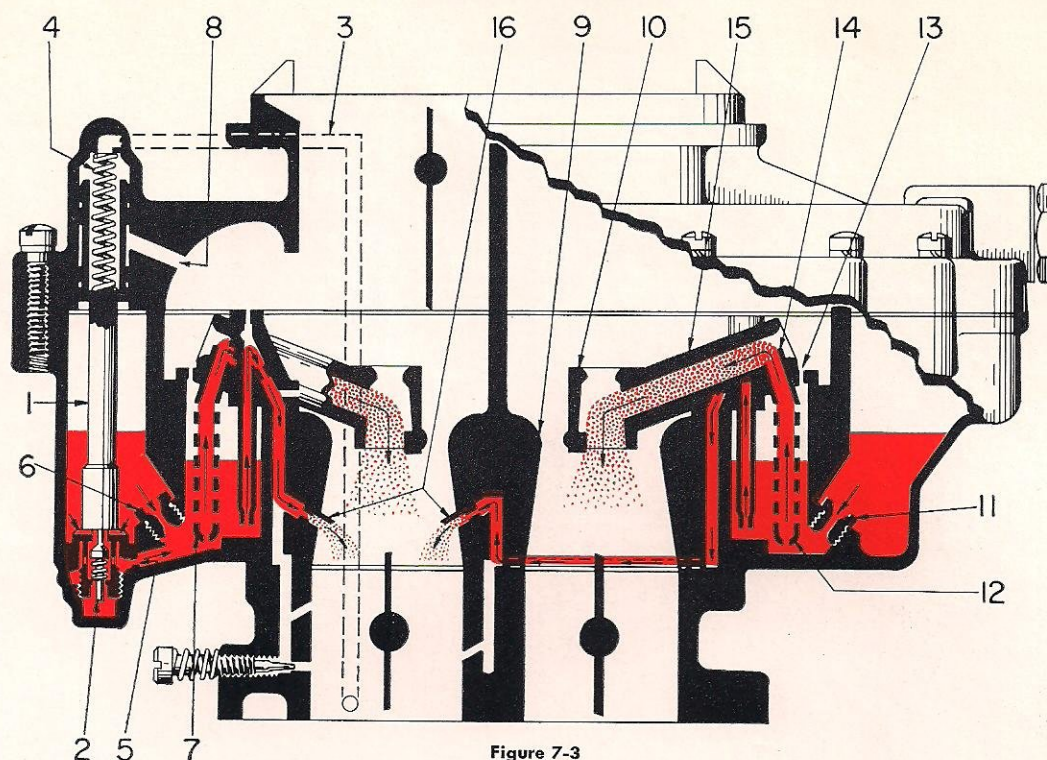


Figure 7-3

Use Figure 7-3 as a reference.

To achieve the proper mixtures required when more power is desirable or sustained high speed driving is to be maintained the Model 4GC Carburetor employs the use of a vacuum operated power piston (1) in the air horn and a power valve (2) in the float bowl. This power system is located on the primary or pump side of the carburetor.

The power piston vacuum channel (3) is exposed to manifold vacuum beneath the throttle valves. The vacuum in this channel varies directly with the manifold vacuum. In the idling and part throttle ranges, the manifold vacuum is normally quite high. This vacuum is sufficient to hold the power piston (1) in its extreme up position. However, as the throttle valves are progressively opened, the manifold vacuum drops. When the vacuum drops below approximately 7" Hg. the calibrated spring (4) beneath the power piston forces the piston down. This situation occurs at very high driving speeds or on rapid accelerations. When the piston drops down, it unseats the spring loaded power valve (2). This permits additional fuel to flow from the float bowl through the calibrated power restrictions (5) and into the main wells. This additional fuel supplements that already flowing through the main metering jets (6) and main well tubes (7), (on the Primary side) thus making the mixture being delivered to the manifold, considerably richer than normal Part Throttle mixtures. This power mixture continues to be supplied as long as the manifold vacuum remains below approximately 7" Hg. When the manifold vacuum again increases sufficiently, the force of the power piston spring (4) is overcome and the piston is drawn up, thus returning the carbure-

tor to the economical part throttle mixtures.

It will be noted that the power piston cavity in the carburetor air horn is connected to the main air flow passage by a vacuum break hole (8). It is the purpose of this hole to prevent the transfer of vacuum acting on the piston from acting also on the top of the fuel in the float bowl. Any leakage of air past the upper grooves of the piston will be compensated for by this vacuum break hole and will not affect carburetor calibration.

It is also in this range that the secondary side of the carburetor provides additional air and fuel to the engine for increased power. For high speed operation, beyond the part throttle range, the throttle linkages engage the secondary throttle valves and open them completely in the remaining few degrees of primary throttle travel.

In this range manifold vacuum or suction, acting on the secondary side of the carburetor, is multiplied at the primary (9) and secondary (10) venturi and draws fuel from the float bowl through the calibrated main metering jets (11) into the main wells. This fuel then passes through the main well tubes (12) and is bled in a manner similar to that discussed previously in the operation of the Primary main well air bleeds. This mixture is bled further at the main well bleeds (13) and is then drawn to the tips of the main well tubes (14). It then passes through the mixture passage (15) to the secondary venturi (10) and is discharged into the intake manifold.

The lower idle air bleeds (16) also supply fuel throughout the power range in a manner similar to that discussed under the Part Throttle System operation.



● **ACCELERATING PUMP SYSTEM**

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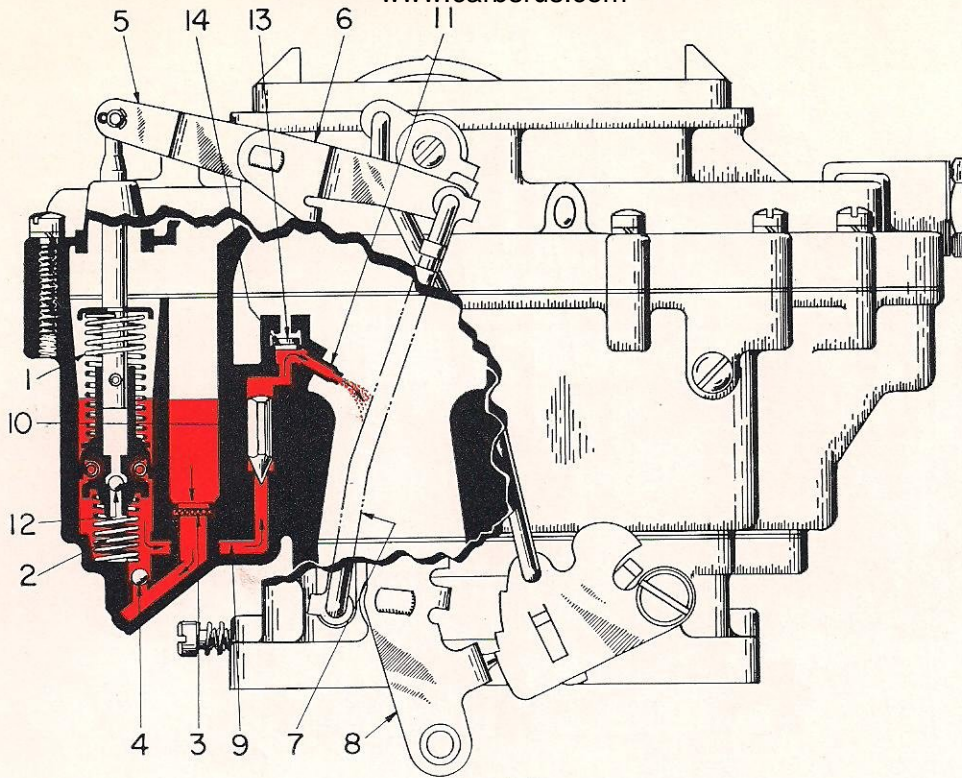


Figure 7-4

When the throttle is opened rapidly the air flow and manifold vacuum change almost instantaneously, while the heavier fuel tends to lag behind causing a momentary leanness. The accelerator pump provides the fuel necessary for smooth operation on rapid acceleration.

Use Figure 7-4 as a reference.

Since the throttle valves on the secondary or fuel inlet side of the carburetor remain fully closed throughout part throttle operation, it is only necessary to have one accelerator pump, that being located on the primary or pump side of the carburetor.

A double spring pump plunger is used on the Model 4GC Carburetor. The rates of compression of the top spring (1) versus the bottom spring (2) are carefully calibrated to insure a smooth, sustained charge of fuel for acceleration.

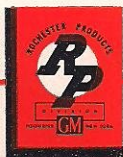
On the pump intake or up stroke, fuel from the float bowl passes through the pump filter screen (3), unseats the aluminum inlet ball (4), and fills the pump well.

The accelerator pump, being connected, through the inside pump lever (5), pump shaft, and lever assembly (6) and pump rod (7), to the throttle lever (8) moves at the slightest change in throttle opening. Upon acceleration or down stroke of the pump plunger, the force of fuel in the pump well seats the inlet ball (4). The fuel is then forced through the discharge channel (9) unseats the pump outlet needle (10), and discharges through the pump jets (11) into the main air stream. No targeting of these pump jets is required.

The Model 4GC Carburetor accelerator pump system is vented twice for peak operating efficiency.

The pump plunger head has been vented to minimize the effect of fuel percolation in the float bowl pump well. This has been accomplished by the design of a ball check and seat in the plunger head (12). In this manner any build up of fuel vapors in the pump cylinder will rise and by-pass the ball, thus venting themselves into the float bowl. There is, therefore, always a charge of solid fuel beneath the plunger head for rapid acceleration. Without this feature, any vapor pressure build up would evacuate the charge of fuel in the pump system, thus causing poor initial acceleration as well as difficult hot weather starting.

The atmospheric vent valve is located in the primary venturi cluster (13) in the channel above the pump discharge jets. Upon sudden acceleration, the force of fuel past the outlet needle seats the valve in its "up" position, thus preventing a discharge of fuel through the vent passage. Under constant throttle conditions, the weight of the valve causes it to rest against its spring retainer (14), thus permitting air to flow from the inside bore of the air horn, through the vent and into the chamber above the pump outlet needle. This vent valve utilizes the suction at the pump jets by progressively increasing the force tending to seat the outlet needle, with each increase in throttle opening. This prevents a condition known as pump pullover, or a discharge of fuel from the pump jets during high speed operation.



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 ● FLOAT SYSTEM

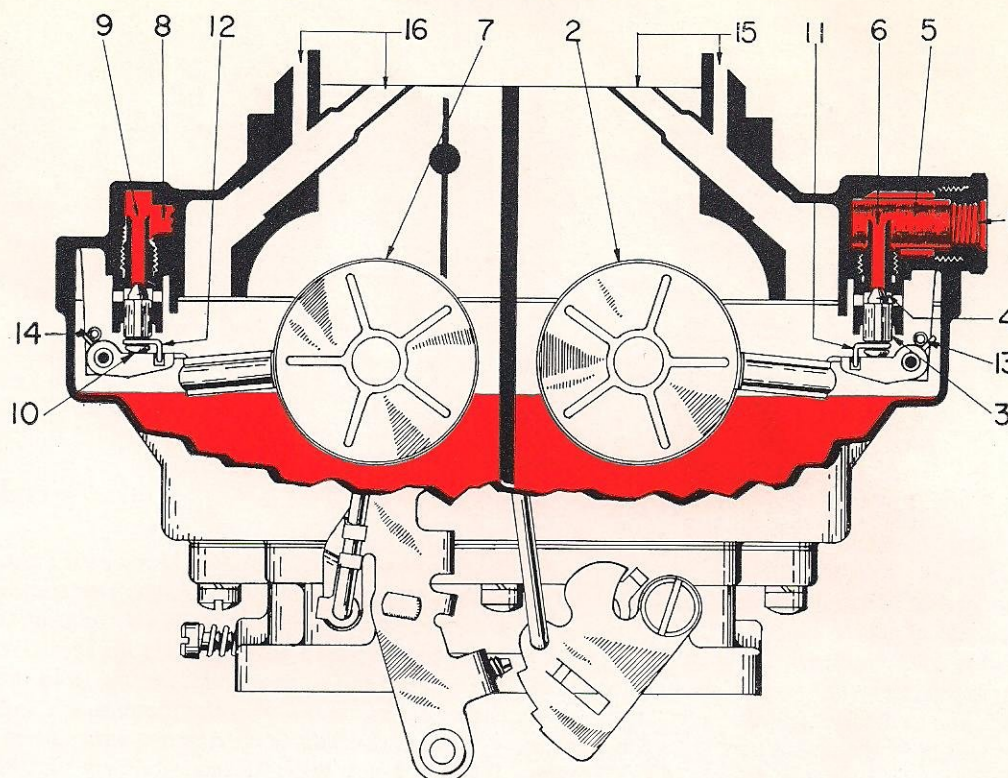


Figure 7-5

To aid in maintaining the correct fuel level under all conditions of operation, the Model 4GC Carburetor employs the use of two sets of twin floats.

Use Figure 7-5 as a reference.

Both sides of the carburetor incorporate individual float systems for maintaining the proper fuel level in each float bowl. All fuel enters the carburetor on the secondary or fuel inlet (1) side.

As the fuel level on the secondary side drops, the twin floats (2) also drop, thus moving the inlet needle (3) off its seat (4). Then pressure, from the fuel pump, forces fuel through the filter screen (5), into the inlet passage (6), and the float bowl. As the fuel level rises, the floats rise and once again close off the inlet needle.

As fuel is drawn from the float bowl on the primary or pump side of the carburetor, the float action is identical with that on the secondary side. As the twin floats drop (7), pressure from the fuel pump forces fuel through the fuel inlet (1) and filter screen (5). This fuel then passes through a channel cored in the air horn and enters the inlet passage on the primary side at (8). It then passes through the needle seat channel (9), past the now open inlet needle (10), and into the float bowl. As on the secondary side, when the fuel level rises, the floats rise and once again close off the inlet needle.

Both float systems are provided with float needle pull clips (11 & 12) (on some Model 4GC Carburetors only) and float balance springs (13 & 14). The float needle pull clips link together the twin floats and the inlet needles, thus causing the inlet needles to retract from their seats upon a drop in fuel level in the float bowls. This is to prevent the possibility of gum deposits causing a sticking condition. The balance springs act as vibration dampeners and enable the carburetor to maintain a more constant and accurate fuel level.

Both sides of the carburetor are individually and internally vented by the channels shown in (15 & 16). These vents transmit the pressure from beneath the air cleaner to the fuel in the float bowl. The amount of fuel metered by the carburetor is dependent upon the pressure in the float bowl causing fuel to flow. By locating the vents below the air cleaner, or internally, the carburetor automatically compensates for air cleaner restriction, since the same pressure causing air to flow will also be causing fuel to flow.

A cored passage in the float bowl, slightly above the normal fuel level, links the primary and secondary float bowls together. In this way any abnormal rise in level on one side will be absorbed by the other and should not seriously disrupt the operation of the engine.



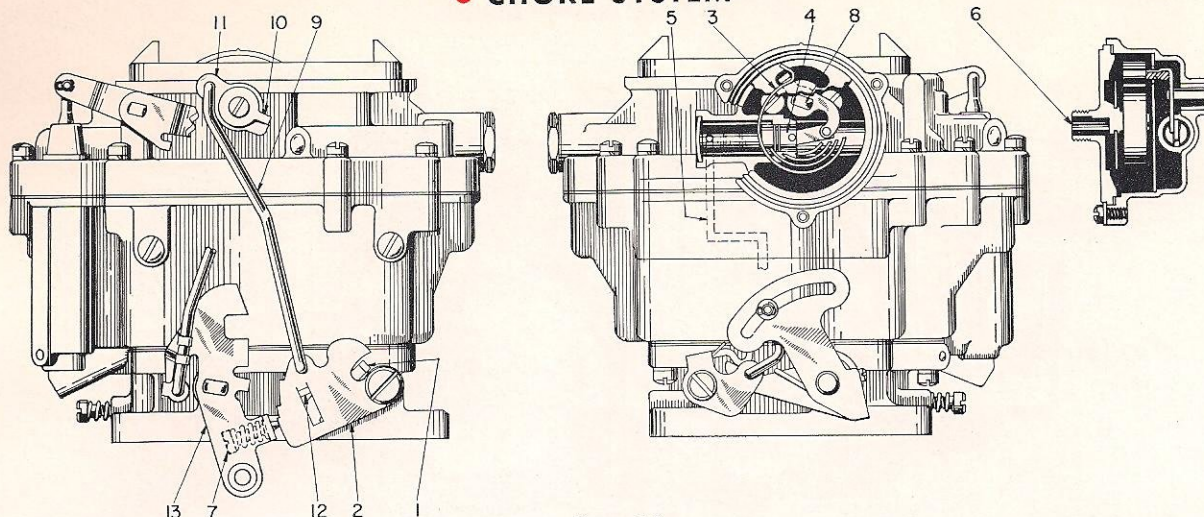


Figure 7-6

Use Figure 7-6 as a reference.

The Model 4GC Carburetor employs the use of a fully automatic choke to insure proper starting and driving during cold weather operation. Choking of the carburetor is necessary only on the primary or pump side. This is due to the fact that the secondary throttle valves are locked in the closed position whenever the choke valve is even partially closed. This is accomplished by a secondary throttle shaft lock out lever (1) and a slot in the fast idle cam (2). Whenever the choke valve is closed the lock out lever prevents opening of the secondary throttle valves. However, when the choke valve is wide open, the fast idle cam drops down so that the lock out lever clears the cam, thus permitting the secondary throttle valves to open.

The choke system is composed of a thermostatic coil (3), vacuum piston (4), offset choke valve, and fast idle cam (2). Its operation is controlled by a combination of intake manifold vacuum, the offset choke valve, atmospheric temperature, and exhaust manifold heat.

When the engine is cold the thermostatic coil is calibrated to hold the choke valve closed. As the engine is started, air velocity against the offset choke valve causes the valve to open slightly against the torque of the thermostatic coil. In addition, intake manifold vacuum is applied to the vacuum piston (4), through the vacuum channel (5) which also tends to open the choke valve. Therefore, the choke valve assumes a position where the torque of the thermostatic coil is balanced against vacuum pull upon the choke piston and air velocity against the offset choke valve, thereby causing a regulated air flow into the carburetor which provides a richer mixture during the warm-up period.

During warm-up, the vacuum piston (4) serves to modify the choking action to compensate for varying engine loads or acceleration. Any acceleration or in-

creased road load decreases the vacuum exerted on the choke piston. This allows the thermostatic coil torque to momentarily increase choke valve closure to provide the engine with a richer mixture for acceleration.

As the engine warms up, hot air from the exhaust manifold is drawn into the thermostatic coil housing through (6). This hot air causes a rise in temperature which in turn causes the coil to slowly relax its tension. Thus the choke valve is allowed to move gradually to the full open position.

To prevent stalling during the warm-up period, it is necessary to run the engine at a slightly higher idle speed than for a warm engine. This is accomplished by the fast idle screw (7) which rests on the steps of the fast idle cam (2). The fast idle cam is in turn linked to the choke valve shaft (8) by the choke rod (9), choke trip lever (10) and choke lever and collar assembly (11) and holds the throttle valves open sufficiently during the warm-up period to give the increased idle RPM, until the choke valve moves to the full open position.

While the automatic choke is in operation, the driver may wish to advance the throttle to the full wide open position. Since this would decrease pull upon the vacuum piston (4) thereby closing the choke valve, it is necessary to provide increased carburetor air flow by opening the choke valve mechanically. To accomplish this, a tang (12) on the fast idle cam (2) is made to contact the throttle lever (13) at wide open throttle position so as to sufficiently open the choke valve. This is also called a choke unloader and serves to dechoke a flooded carburetor during cold starting operation. This choke unloader will also relieve a flooded condition on starting by allowing more air to enter the carburetor and mix with the excess gasoline in the manifold whenever the engine is cranked with the accelerator held fully depressed.



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● CHOKE MODIFIER

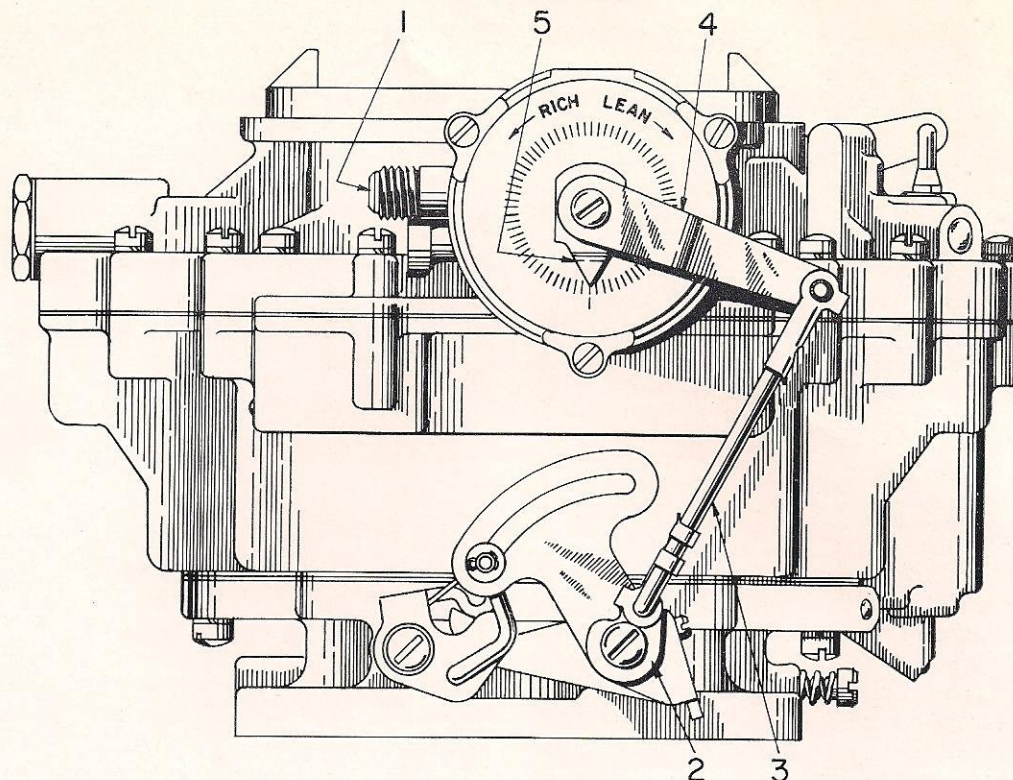


Figure 7-7

Use Figure 7-7 as a reference.

The choke system, as used on some Model 4GC Carburetors, also incorporates a choke modifier. The purpose of this choke modifier, as required by certain engines, is to prevent "loading up" or excessively rich mixtures during the warm-up period.

Under normal operating conditions, the automatic choke assumes a position where the torque of the thermostatic coil is balanced against the vacuum pull on the choke piston plus the air velocity against the offset choke valve. As the heat from the exhaust manifold relaxes the tension on the thermostatic coil, the choke valve gradually opens.

When the engine is started cold and the throttle is opened considerably (such as in going up a steep hill), vacuum drawing heat to the thermostatic coil housing through (1) may not be sufficient to heat and relax the coil before some "loading up" takes place. The choke modifier, being linked directly to the throttle by means of the throttle shaft modifier lever (2), choke modifier rod (3), thermostat modifier lever (4) and index plate (5) is actuated by the slightest throttle movement. Thus the choke modifier lever rotates the thermostatic coil, thereby relaxing the tension on the coil and allowing the choke valve to open sufficiently to prevent "loading up."



MODEL 4GC CARBURETOR DISASSEMBLY

● AIR HORN DISASSEMBLY

1. Remove fuel strainer nut and fiber gasket with a $\frac{3}{4}$ " wrench.
2. Remove fuel inlet strainer with a pair of long nosed pliers.
3. Remove three retainer screws and retainers from stat cover.
4. Remove stat cover, gasket, and coil assembly.
5. Remove choke baffle plate. (Figure 7-8.)
6. Remove clips from each end of pump rod and remove pump rod. (Figure 7-9.)
7. Remove pump lever attaching nut and lock washer. Then remove pump shaft and lever assembly.
8. Remove choke trip lever attaching screw.
9. Then remove choke trip lever, spacing washer, and choke lever and collar assembly from choke shaft.
10. Remove fast idle cam attaching screw. (Figure 7-10.) Then remove choke lever and collar assembly, choke rod, and fast idle cam as an assembly.
11. Remove two choke valve attaching screws.
12. Remove choke valve from slot in shaft.
13. Rotate choke shaft counter clockwise to free choke piston from housing. Then remove piston and choke shaft from air horn. Then remove piston and piston pin from choke shaft.

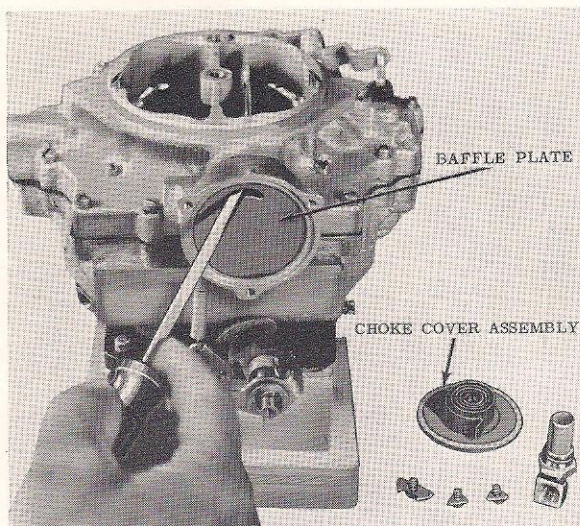


Figure 7-8

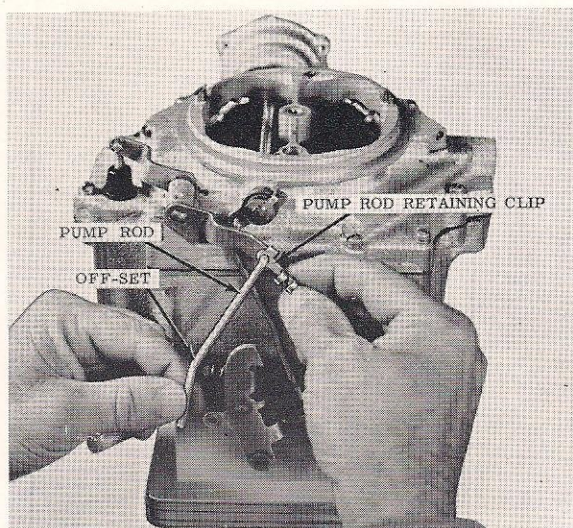


Figure 7-9

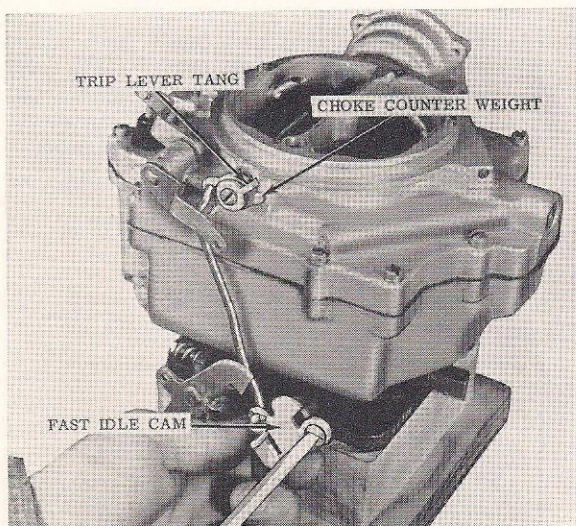


Figure 7-10

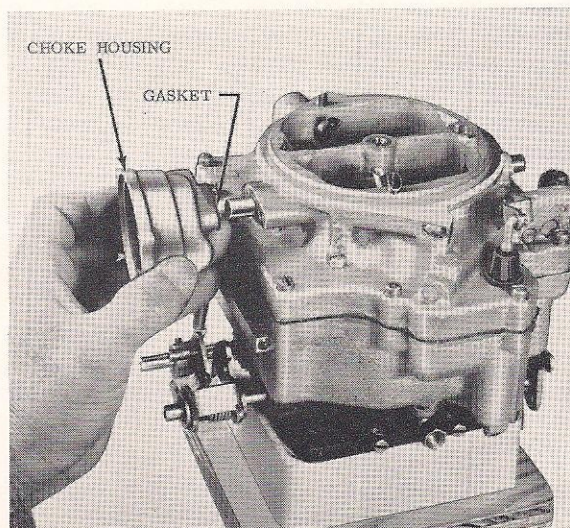


Figure 7-11



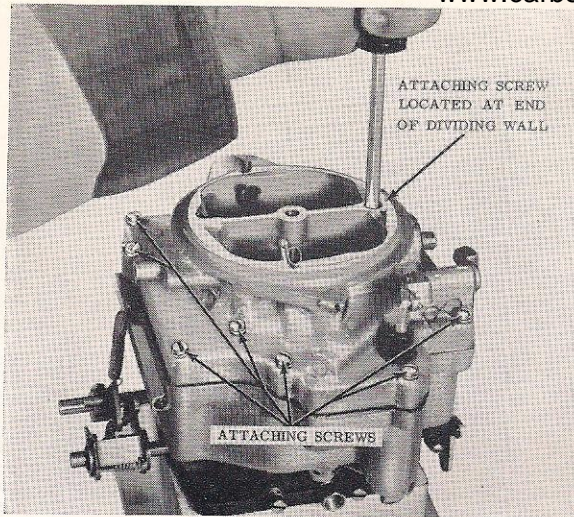


Figure 7-12

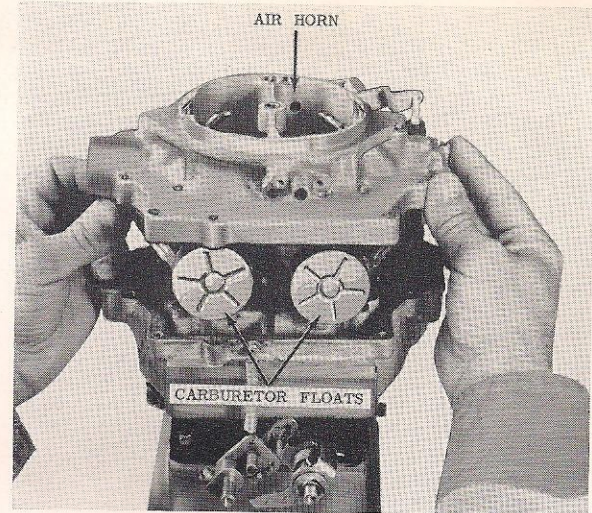


Figure 7-13

14. Remove two choke housing to air horn attaching screws. Then remove choke housing and gasket from air horn. (Figure 7-11.)
15. Remove cotter pin from pump plunger rod and remove inside pump lever.
16. Remove 13 air horn attaching screws and lock washers. (Figure 7-12.)
17. Carefully remove air horn from float bowl. Lift straight up until float assemblies clear carburetor bowl. (Figure 7-13.)
18. Remove float hinge pin and float and needle assembly from inlet side (secondary). Then remove float needle from float assembly.
NOTE: Group and keep floats, needle, needle seat, and gaskets together as units. NEVER MIX FLOAT NEEDLES AND SEATS.
19. Remove needle seat and gasket from inlet side of carburetor.
20. Remove balance spring and clips from inlet side of carburetor.
21. Remove float hinge pin and float and needle assembly from pump side (primary). Then remove float needle from float assembly.
22. Remove needle seat and gasket from pump side of carburetor.
23. Remove balance spring and clips from pump side of carburetor.
24. Rotate power piston retaining washer and remove

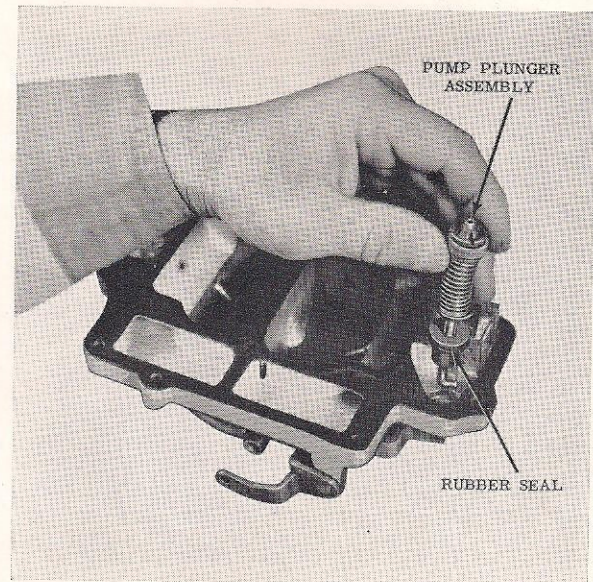


Figure 7-14

- power piston and actuating spring.
25. Remove rubber seal and plunger assembly from air horn. Then remove rubber seal from pump plunger assembly. (Figure 7-14.)
26. Remove air horn gasket.

● FLOAT BOWL DISASSEMBLY

1. Remove three attaching screws and lock washers from venturi cluster on pump side of carburetor. Then carefully remove cluster and gasket.
NOTE: The venturi cluster on the pump side contains the pump discharge nozzles and must always be installed on the pump side of the carburetor. The venturi clusters also carry the idle tubes and are serviced as complete as-

semblies. If necessary, remove the brass vent valve from the primary venturi cluster by tapping from the underside with a 1/16" punch or rod. If this valve is removed, be certain to replace it with a new one, as the original will be damaged during disassembly.

2. Remove both Main Metering Jets from the pump side of the carburetor bowl. As these jets differ in



● FLOAT BOWL DISASSEMBLY (Continued) www.carbsrus.com

size from the jets on the secondary side, they must always be installed on the pump side.

3. Remove the power valve and fiber gasket from the pump side.
4. Remove three attaching screws and lock washers from venturi cluster on inlet (secondary) side. Then carefully remove venturi cluster and gasket.
5. Remove both main metering jets from the inlet (secondary) side.
NOTE: These jets are also stamped with the last two digits of the jet part number and must always be installed on the inlet (secondary) side of the carburetor.
6. Remove the pump return spring from the pump well with a pair of long-nosed pliers.
7. Carefully invert the carburetor bowl and remove the aluminum pump inlet ball and the brass pump outlet needle. (Figure 7-15.)

NOTE: NEVER SUBSTITUTE A STEEL BALL FOR THE ALUMINUM BALL.

8. If necessary, remove the pump inlet filter screen and retainer from the bottom of the float bowl.

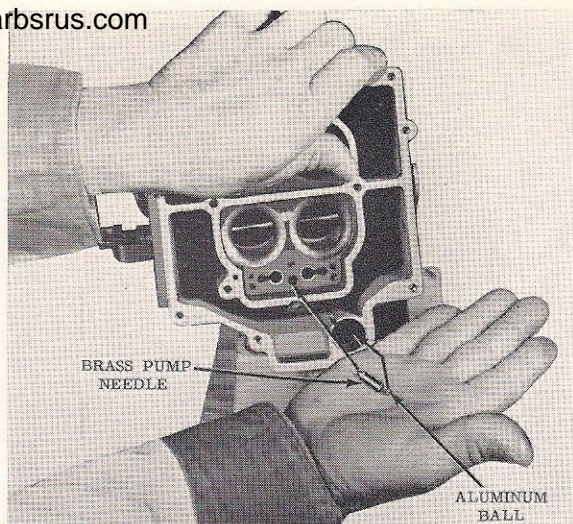


Figure 7-15

● THROTTLE BODY DISASSEMBLY

1. Place carburetor in inverted position.
2. Remove throttle body from carburetor bowl by removing three 10-32 attaching screws and lock washers and one large 3/8-24 attaching screw and lock washer from the center of the throttle body.
3. Carefully remove throttle body gasket.
4. Remove idle adjusting needles and springs.
5. Remove fast idle screw and spring from throttle lever.
6. Remove idle stop screw and spring from throttle body casting.

NOTE: THE THROTTLE BODY IS SERVICED AS A UNIT LESS THE THROTTLE LEVERS. TO REMOVE AND REPLACE THESE LEVERS PROCEED AS FOLLOWS:

7. Remove two cotter pins from secondary throttle lever link.

8. Remove washer from upper end of secondary throttle lever link.
9. Remove secondary throttle lever retaining screw and washer.
10. Unhook inner end of override shaft spring (heavy spring).
11. Remove shaft override spring retaining screw from primary throttle shaft.
12. Remove secondary throttle actuating lever and override spring.
13. Remove secondary throttle lever link assembly.
14. Unhook secondary throttle lever return spring from secondary lever.
15. Remove secondary throttle lever from secondary throttle shaft. Then remove secondary throttle lever return spring from secondary throttle shaft.

CLEANING AND INSPECTION OF PARTS

1. Inspect idle adjusting needles for burrs or ridges.
2. Thoroughly clean carburetor castings and metal parts in carburetor cleaning solvent.
CAUTION: Choke Coil, Primary venturi cluster (with pump discharge nozzles) and pump plunger should not be immersed in solvent. Clean these parts in clean gasoline only.
3. Blow all passages in castings dry with compressed air. Do not pass drills through jets or calibrated passages.
4. Clean filter screens of dirt or lint. If they are distorted or plugged, replace.
5. Check floats for dents or wear or burrs at hinge pin holes.
6. Shake floats to check for leaks.
7. Examine float needle and seat. If grooved, replace with a factory matched float needle, seat, and gasket assembly.
8. Check choke shaft for wear in the air horn bores. If worn excessively, replace.

9. Inspect holes in inside and outside pump levers, fast idle cam, and throttle lever. If holes are worn excessively or out of round to the extent of improper operation of the carburetor, the worn parts should be replaced.
10. If excessive wear is noted on the steps of the fast idle cam, it should be replaced to assure proper engine operation during the warm-up and choking periods.
11. Inspect pump plunger leather, replace the plunger as an assembly if leather is creased or cracked.
12. Inspect the gaskets for flexibility. If the gaskets appear hard or brittle, they should be replaced to assure a proper seal.

NOTE: Due to the close tolerance fit of the throttle valves, and the fact that the idle discharge holes are drilled in relation to a proper fitting valve, the throttle body and valve assembly should be replaced as a complete assembly when wear is noted at the throttle valves, or throttle body bores.



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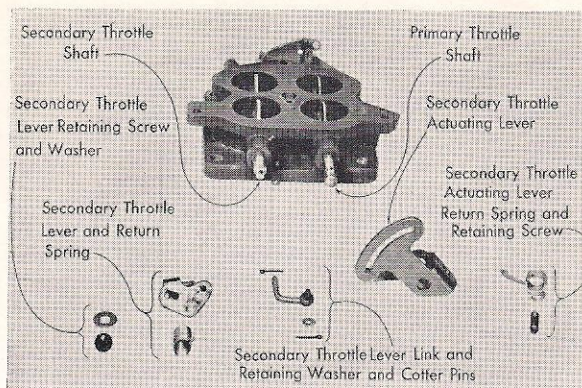
MODEL 4GC CARBURETOR ASSEMBLY**● THROTTLE BODY ASSEMBLY**

Figure 7-16

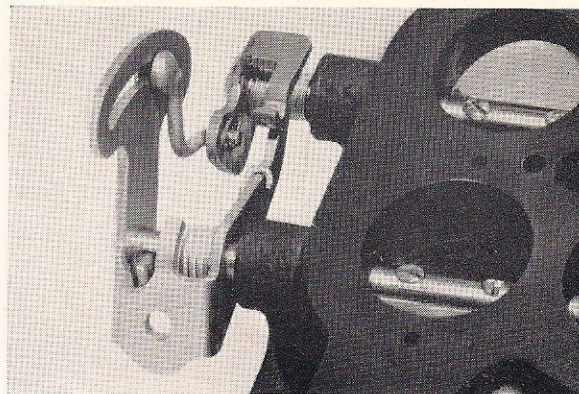


Figure 7-17

NOTE: Refer to Figure 7-16 for steps 1 through 7.

1. Install secondary throttle lever return spring on secondary throttle shaft so that end hooks into hole in throttle body casting.
2. Install secondary throttle lever on secondary throttle shaft. Then install secondary throttle lever retaining screw and washer.
3. With a piece of wire, wind up the secondary throttle lever return spring one complete turn.
4. Install the secondary throttle lever link assembly and cotter pin to the secondary throttle lever.
5. Install the secondary throttle actuating lever and override spring on the primary throttle shaft. Then install the secondary throttle lever link assembly into the secondary throttle actuating lever with a washer and cotter pin.
6. Install the shaft override spring retaining screw into the primary throttle shaft so that the hooked end of the spring stops against the retaining screw.
7. Hook the inner end of the override shaft spring onto the secondary throttle actuating lever. Refer to Figure 7-17 for proper assembly of throttle linkages.
8. Install the idle stop screw and spring into the throttle body casting.
9. Install the fast idle screw and spring into the throttle lever.
10. Install both idle adjusting needles and springs into the throttle body casting.
11. Place the throttle body gasket in position on the float bowl, with the bowl inverted on a flat surface. (Figure 7-18.) Be certain that all gasket holes are properly aligned.
12. Place Throttle Body in Position on float bowl. (Figure 7-19.) Attach with three 10-32 attaching screws and lock washers and one large $\frac{3}{8}$ -24 screw and lock washer.

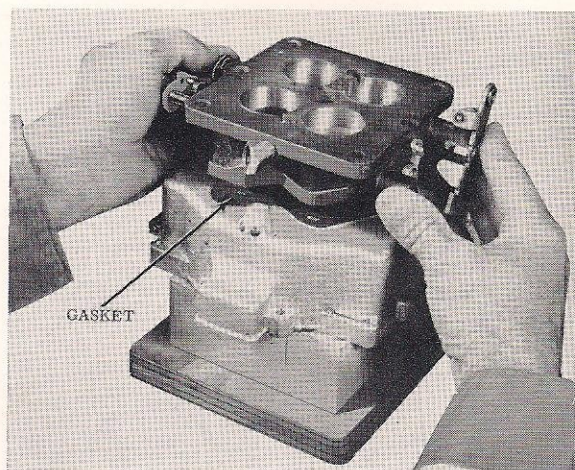


Figure 7-18

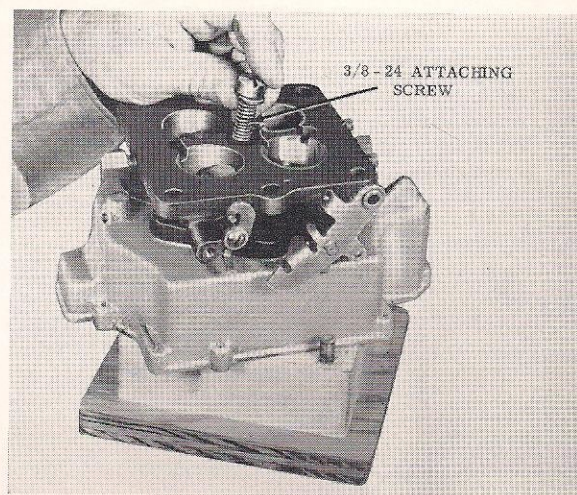


Figure 7-19



● FLOAT BOWL ASSEMBLY

1. Place bowl and throttle body assembly in an up-right position on bench or mounting block.
2. Install pump inlet filter screen and retainer in the bottom of the float bowl.
3. Install aluminum pump inlet ball in pump well and brass pump outlet needle in pump discharge passage, located beneath primary venturi cluster.

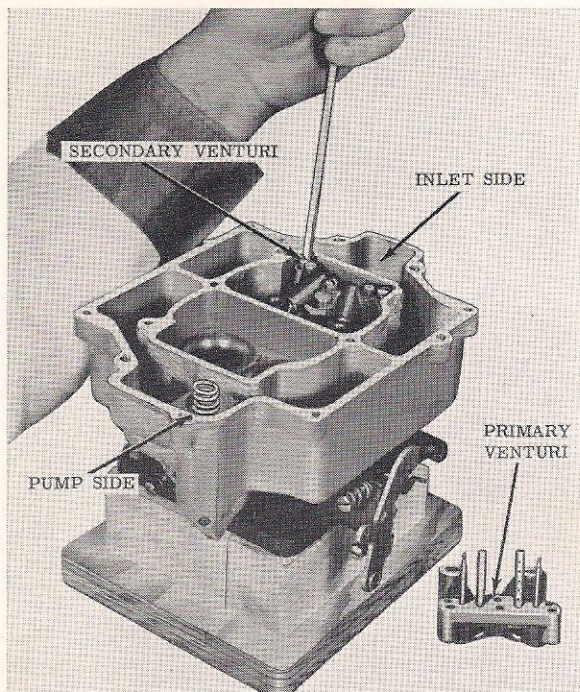


Figure 7-21

7. Install secondary venturi cluster on fuel inlet side of carburetor with three retaining screws and lock washers. (Figure 7-21.) This cluster has no pump discharge nozzles.
8. Install the fiber gasket and power valve assembly on the pump (Primary) side of the carburetor. (Figure 7-22.)
9. Install both main metering jets on the primary or pump side of the carburetor. Be certain the proper jets (last two digits of part number stamped on jet) are installed. (Figure 7-22.)

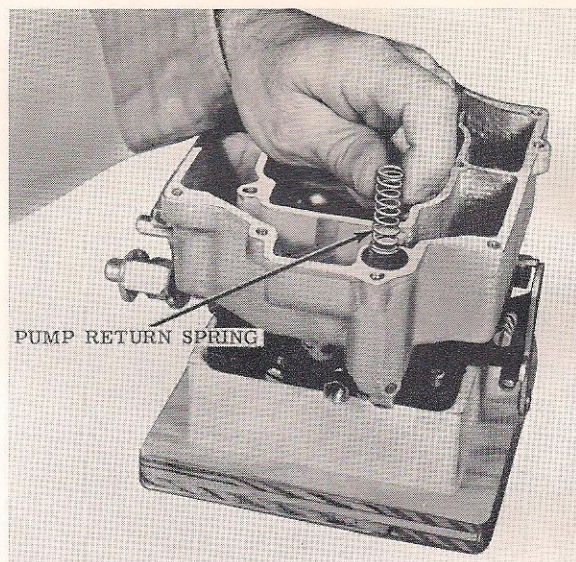


Figure 7-20

4. Install the pump return spring in pump well and position by compressing with finger. (Figure 7-20.)
5. Install both main metering jets on the secondary or fuel inlet side of the carburetor. Be certain the proper jets (last two digits of part number stamped on jet) are installed.
6. Place venturi cluster gasket in position on fuel inlet side of carburetor. Be certain all gasket holes are properly aligned.

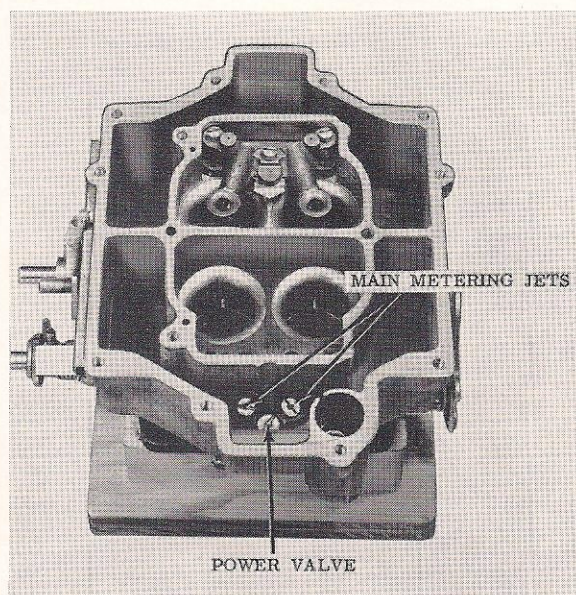


Figure 7-22



● **FLOAT BOWL ASSEMBLY** (Continued)

10. Place venturi cluster gasket in position on pump side of carburetor. Be certain all gasket holes are properly aligned.
11. Install primary venturi cluster on pump side of carburetor with three retaining screws and lock washers. (Figure 7-23.) This cluster contains the pump discharge nozzles.

● **AIR HORN ASSEMBLY**

1. Place air horn gasket in position on air horn. Be certain all gasket holes are properly aligned.
2. Assemble power piston and actuating spring into air horn cavity. Rotate retaining washer to hold piston in place. (Figure 7-24.)
3. Place rubber seal on pump plunger assembly. Then assemble plunger and seal in carburetor air horn so that casting positions in groove on seal. (Figure 7-25.)
4. Install float balance spring and clips on pump side of carburetor. (Figure 7-26.)
5. Install fiber gasket and needle seat on pump side of carburetor. (Figure 7-26.)

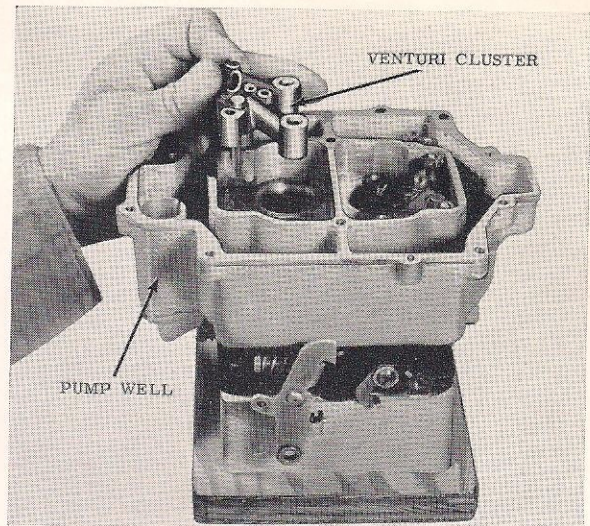


Figure 7-23

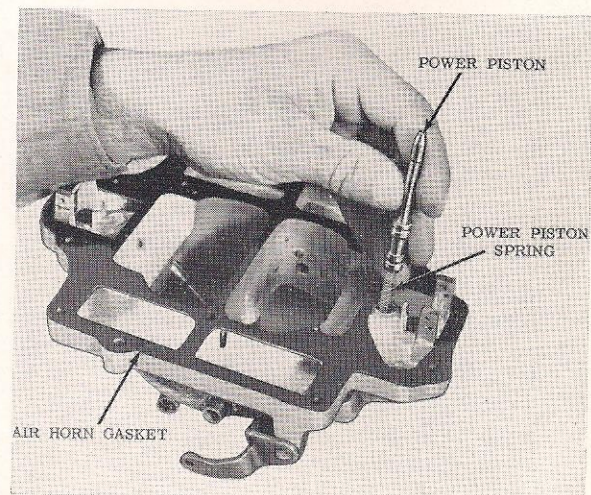


Figure 7-24



Figure 7-25

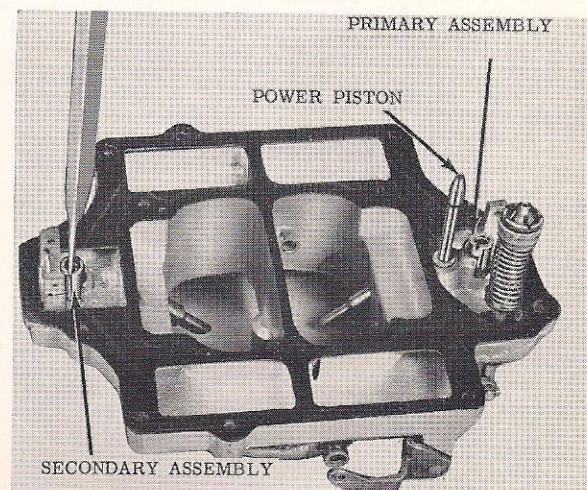


Figure 7-26



● AIR HORN ASSEMBLY (Continued)

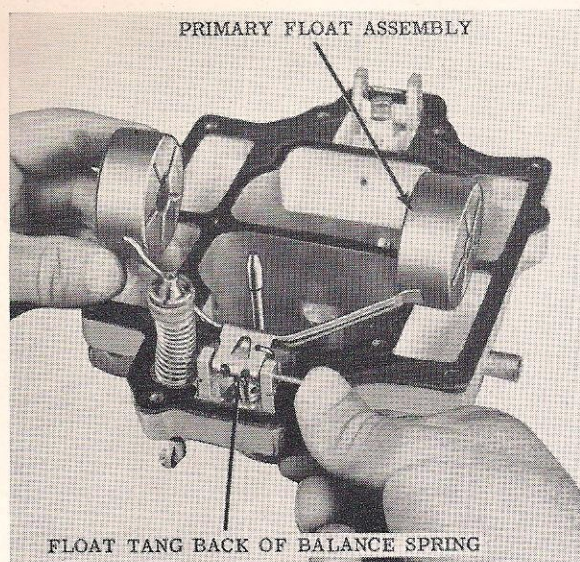


Figure 7-27

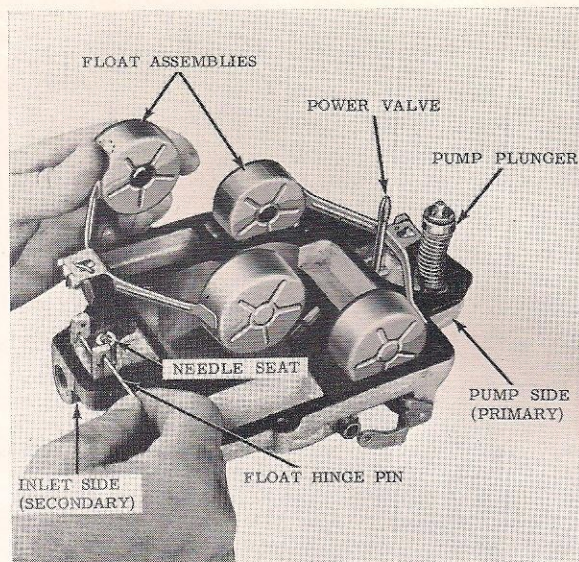


Figure 7-28

6. Assemble float needle to float assembly. Then install float, needle and hinge pin on pump side of carburetor. (Figure 7-27.)
7. Install float balance spring and clips on fuel inlet side of carburetor.
8. Install fiber gasket and needle seat on fuel inlet side of carburetor. (Figure 7-26.)
9. Assemble float needle to float assembly. Then install float, needle, and hinge pin on fuel inlet side of carburetor. (Figure 7-28.)
NOTE: The float level and tension adjustments should be made at this point. See adjustment bulletin for proper setting.
10. Install air horn assembly on float bowl, being careful to guide pump plunger in well and not to bend float assemblies. Align air horn and gasket to screw holes in float bowl.
11. First tighten the three inner attaching screws and lock washers evenly and securely. Then tighten the remaining ten air horn attaching screws and lock washers.
12. Assemble inside pump lever to pump plunger rod and install cotter pin.
13. Assemble choke housing gasket to air horn. Then install choke housing to air horn with two attaching screws and lock washers.
14. Assemble choke piston and piston pin to choke shaft, lever, and link assembly. Install choke shaft assembly, through choke housing, into the air horn. (Figure 7-29.) Rotate choke shaft clockwise to assemble piston into choke housing sleeve.

15. Slide choke valve through choke shaft so that letters "RP" are facing up when valve is closed.
16. Start, but do not tighten, two choke valve attaching screws.
17. Install the choke lever and collar assembly, choke rod, and fast idle cam and retaining screw (as an assembly) to the choke shaft on one end, and throttle body on the other.

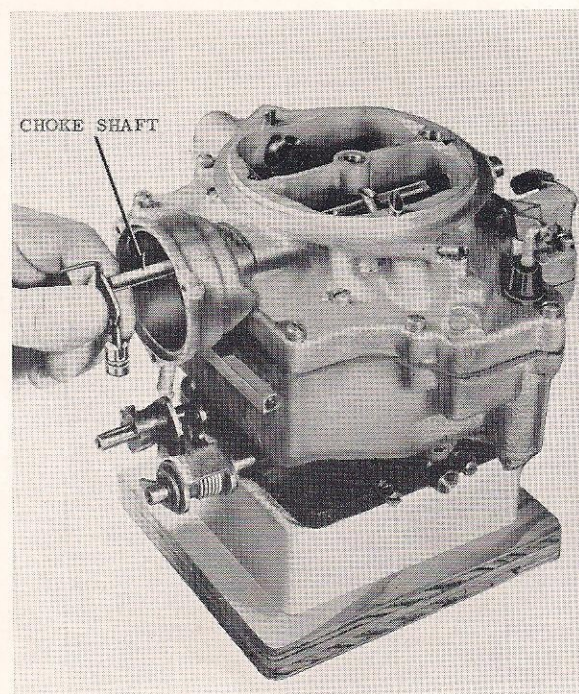


Figure 7-29



● AIR HORN ASSEMBLY (Continued)

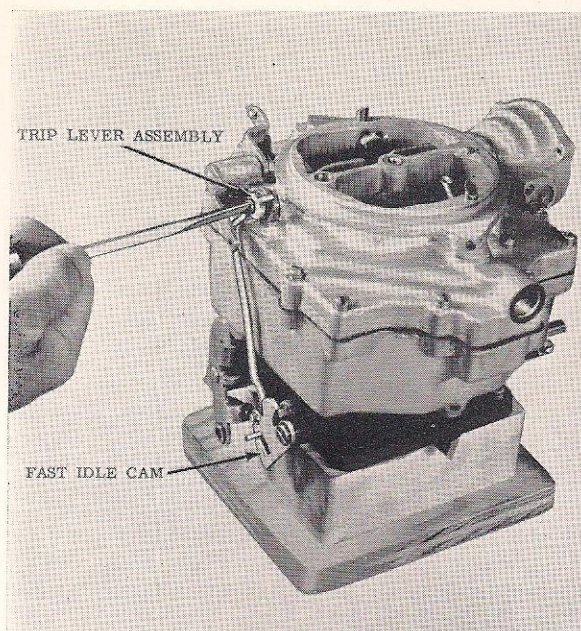


Figure 7-30

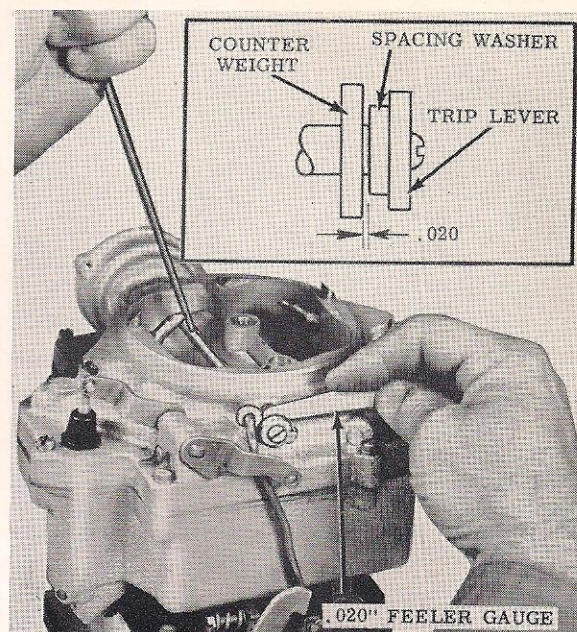


Figure 7-31

18. Then install the trip lever, spacing washer, and retaining screw on the end of the choke shaft. (Figure 7-30.)
19. To provide correct fit of choke valve in air horn, push lightly on choke shaft to obtain a minimum clearance of .020" between spacing washer and lever and collar assembly. (Figure 7-31.) While holding in this position tighten choke valve retaining screws.
20. Install pump shaft and lever assembly into air horn casting. Assemble shaft to inside pump lever with attaching nut and lock washer.
21. Assemble pump rod with two clips to pump lever on one end and throttle lever on the other. Dog leg of pump rod should be assembled nearest the throttle lever.
22. Assemble choke baffle plate into choke housing.
23. Assemble stat cover, gasket and coil assembly to choke housing so that coil contacts shaft link.
24. Rotate stat cover until the scribe line on the cover coincides with the index mark on the choke housing. Secure stat cover with three retaining screws and retainers.
25. Place fuel inlet strainer and fiber gasket on strainer nut. Then install this assembly in carburetor fuel inlet with a $\frac{3}{4}$ " wrench.

CHOKE MODIFIER DISASSEMBLY AND ASSEMBLY

● DISASSEMBLY

1. Remove clips from choke modifier rod and remove rod.
2. Remove screw from index lever and remove lever. Do not remove index plate.
3. Remove stat cover screws and retainers, then stat cover and coil assembly.
4. Remove primary throttle shaft modifier lever.

● ASSEMBLY

1. Assemble primary throttle shaft modifier lever

with letters RP facing outward and lever pointed up with throttle valves closed.

2. Assemble stat cover and coil assembly with screws and retainers.
3. Assemble stat modifier lever to stat cover. Leave retaining screw loose.
4. Assemble choke modifier rod with rod end clips. Stat modifier lever should point away from fuel inlet.
5. Tighten retaining screw.

Refer to Figure 7-7 for proper assembly.



MODEL 4GC CARBURETOR ADJUSTMENTS

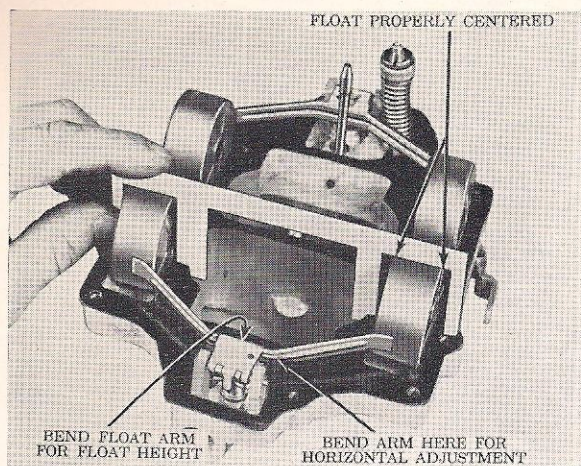


Figure 7-32

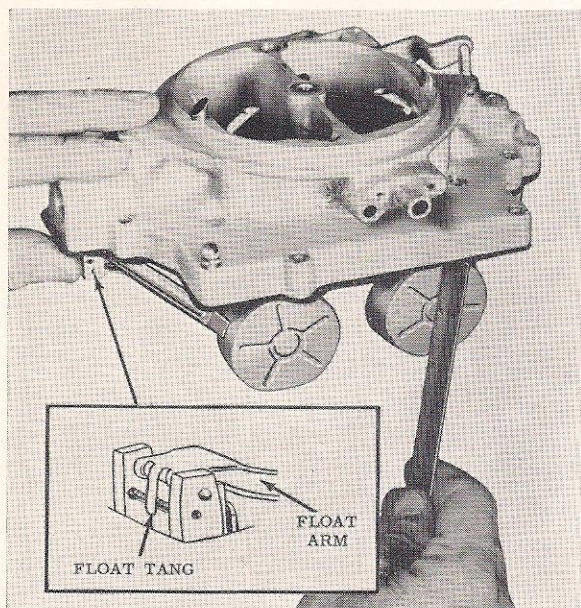


Figure 7-33

• PUMP ROD ADJUSTMENT

Back off the idle stop and fast idle screws so that the throttle valves are fully closed. (Figure 7-34.) With the throttle lever held in this position, carefully bend the pump rod until the dimension from the air horn surface to the bottom edge of the pump plunger rod is equivalent to the scaled distance specified in the adjustment bulletin.

• FLOAT LEVEL ADJUSTMENTS

Both sets of floats are adjusted in the same manner, with the air horn gasket in position and the air horn inverted on a flat surface. (Figure 7-32.)

1. Carefully bend float arms vertically until floats appear level in relation to each other.
2. Place float level gauge in position as shown, so that gauge is located against the curvature in the bore of the carburetor air horn.
3. Bend the float arms at the rear of the float assembly. They should be bent until the floats just touch the top portion of the gauge between gauge legs.
4. Now bend arms horizontally until each float is centered between the gauge legs. Tilt the air horn assembly 90° each side and check that floats do not touch gauge legs. This insures that floats will not rub sides of float bowl.

• FLOAT TENSION ADJUSTMENTS

Both sets of floats should be adjusted in the following manner. (Figure 7-33.)

Bend the float tang, at the rear of the float, against the balance spring to lessen the drop and away from the balance spring to increase the drop. The tension is correct when the distance from the bottom of the air horn gasket to the bottom of the floats, with the air horn held in an upright position, is equivalent to the scaled distance specified in the adjustment bulletin.

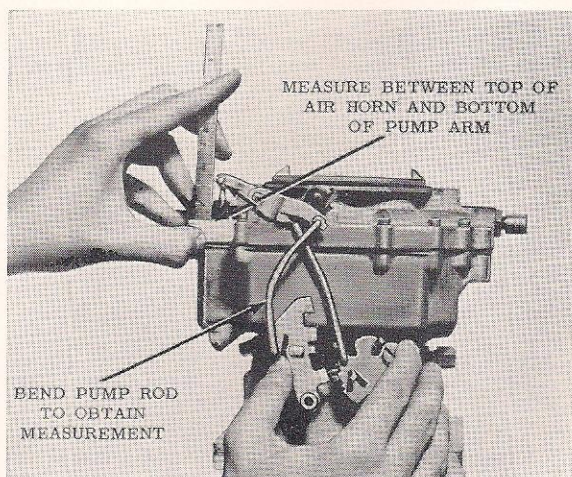


Figure 7-34



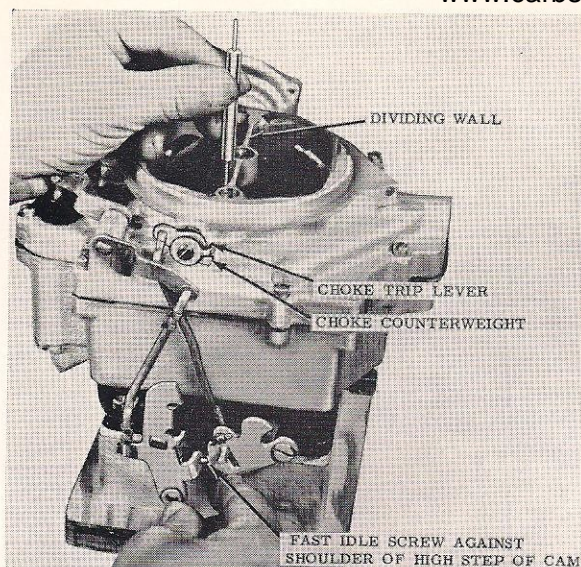


Figure 7-35

● CHOKE ROD ADJUSTMENT

With the thermostat cover set, turn the fast idle screw until it contacts the second step of the fast idle cam, against the shoulder of the highest step. Be certain choke trip lever is in contact with the choke counterweight. With the fast idle screw and fast idle cam in this position, carefully bend the choke rod to obtain the specified clearance between the top edge of the choke valve and the dividing wall between the two carburetor air horns. (Figure 7-35.)

● FAST IDLE ADJUSTMENT

With the thermostat cover set, move the fast idle cam so that the choke valve is fully closed. Hold the throttle lever in the closed position so that the fast idle screw rests on the highest step of the fast idle cam. Then adjust the fast idle screw to obtain the specified clearance between the throttle valves and the primary bores of the throttle body on the side opposite the idle adjusting needles. (Figure 7-37.)

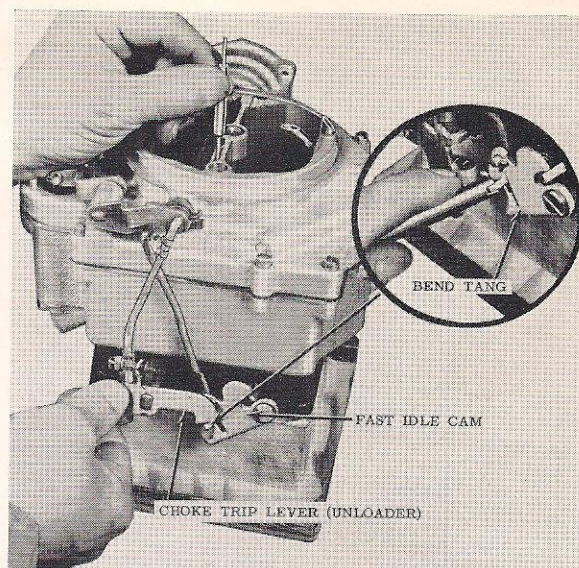


Figure 7-36

● UNLOADER ADJUSTMENT

With thermostat cover set and choke trip lever in contact with choke counterweight, move the throttle to full open position. Hold the throttle lever in this position and carefully bend the tang of the fast idle cam to obtain the specified clearance between the top edge of the choke valve and the dividing wall between the two carburetor air horns. (Figure 7-36.)

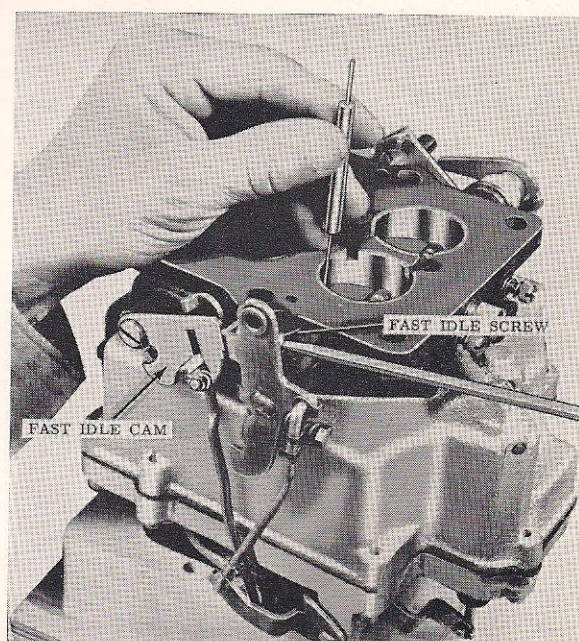


Figure 7-37

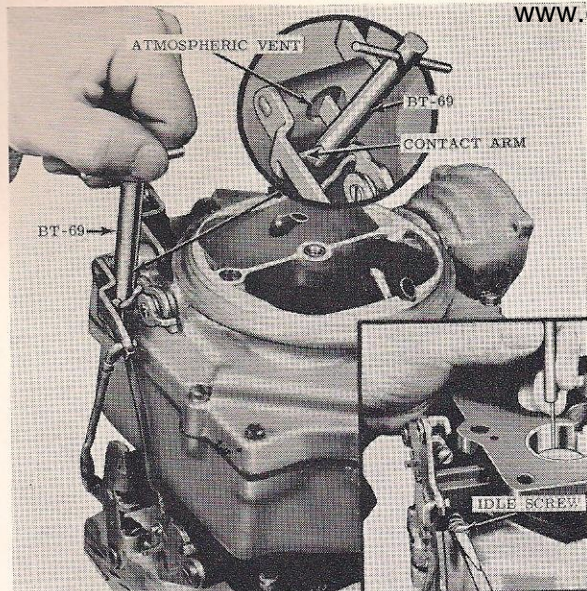


Figure 7-38

● ATMOSPHERIC IDLE VENT ADJUSTMENT

Insert the specified gauge between the throttle valves and the primary bores of the throttle body on the sides opposite the idle adjusting needles. With the throttle valves closed against this wire gauge, bend the atmospheric vent contact arm until it contacts the atmospheric vent valve in the carburetor air horn. This adjustment insures proper vent opening at various throttle positions. (Figure 7-38.)

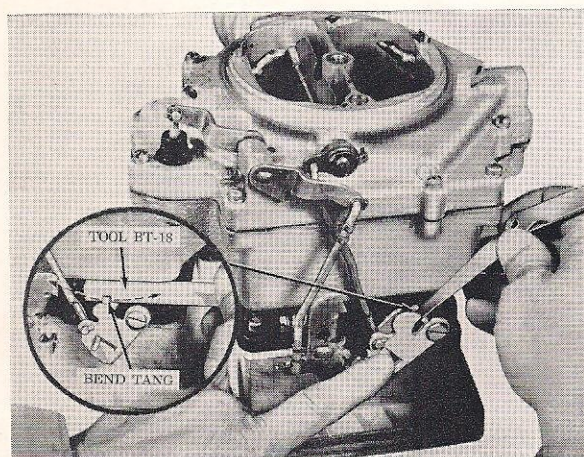


Figure 7-39

● SECONDARY THROTTLE LOCK OUT ADJUSTMENT

With the choke valve partially closed and the fast idle cam and secondary lock out lever in position as shown, bend the lever to obtain the specified clearance between the lever and the fast idle cam. (Figure 7-39.)

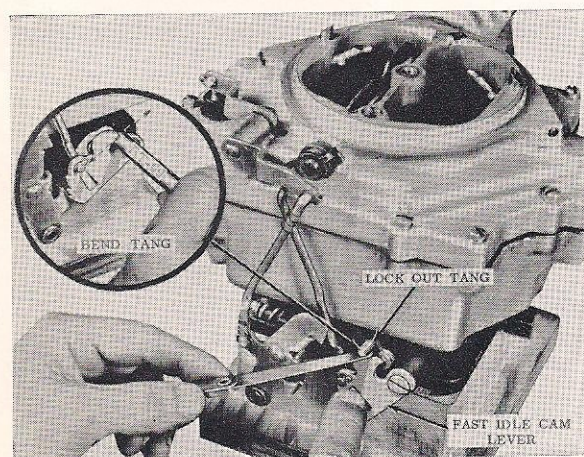


Figure 7-40

● SECONDARY THROTTLE CLEARANCE ADJUSTMENT

With the choke valve wide open and the fast idle cam and secondary lock out lever in position as shown, bend the lever to obtain the specified clearance between the lever and the fast idle cam. (Figure 7-40.)

NOTE: ALWAYS RECHECK THE SECONDARY THROTTLE LOCK OUT ADJUSTMENT AFTER MAKING THIS ADJUSTMENT, TO BE CERTAIN THAT IT HAS NOT BEEN CHANGED.

NOTE: FOR SPECIFIC ADJUSTMENT DIMENSIONS, REFER TO THE ADJUSTMENT BULLETIN FOR THE PARTICULAR CAR APPLICATION CONCERNED.

