SECTION E

ROCHESTER MV CARBURETOR

CONTENTS

DIVISION I—SPECIFICATIONS AND ADJUSTMENTS

64-24 ROCHESTER MV CARBURETOR CALIBRATIONS

NOTE: All carburetors have a color code paint mark and a part number stamped on the float bowl for identification.

	250 Eng. Man. Trans.	250 Eng. Auto. Trans.
Model Designation	MV	MV
Number of Barrels	1	1
Code Letters		
Part Number		7028014
Throttle Bore	1-11/16"	1-11/16"
Main Metering Jet		.103"
NOTE: No Changes Are Required For Altitude.		
Idle Tube Restriction		#60
Idle Needle Hole		#48
Spark Holes	.025" x .200"	.025" x .200"
Pump Discharge Holes		2-.069"
Fast Idle Cam Number	7034044	7034044

64-25 ROCHESTER MV CARBURETOR ADJUSTMENTS

	250 Eng. Man. Trans.	250 Eng. Auto. Trans.
Float Level Adjustment	3/8"	3/8"
Choke Rod Adjustment	.190"	.180"
Choke Unloader Adjustment	.350"	.350"
Initial Idle Speed	3 Turns In	3 Turns In
Initial Idle Mixture	2 Turns Out	2 Turns Out
Idle Speed (On Car)	700	500 In D.
Idle Vent Adjustment	.050"	.050"
Vacuum Break Adjustment	.275"	.245"
Choke Coil Rod Adjustment	Rod at Top of Hole	Rod at Top of Hole
Metering Rod Adjustment		.120"
Fast Idle Adjustment	Idle + 20	Idle + 20

DIVISION II

DESCRIPTION AND OPERATION

64-26 DESCRIPTION AND OPERATION OF ROCHESTER QUADRAJET

a. General Description

The Monojet carburetor is a single bore downdraft carburetor. It has triple venturi coupled with a refined metering system.

A plain tube nozzle is used in conjunction with the triple venturi. Fuel flow through the main metering system is controlled by a mechanically and vacuum operated variable orifice. This consists of a specially tapered rod which operates in the main metering jet and is connected directly by linkage to the throttle shaft. A vacuum operated enrichment system is used to provide good performance during moderate to heavy accelerations.

A separate and adjustable idle system is used to meet fuel mixture requirements during engine idle and low speed operation. The off-idle discharge port is of a vertical slot design which gives good transition between curb idle and main metering system operation.

The idle system incorporates a hot idle compensator on some models, where necessary, to maintain smooth engine idle during periods of extreme hot engine operation.

The main metering system has an adjustable flow feature which enables production to control the fuel mixtures more accurately than ever before.

On the Monojet carburetor, the vacuum diaphragm unit is part of the air horn. The automatic choke coil is intake manifold mounted and operates the choke valve shaft with connecting linkage.

The choke system has a feature to give added enrichment during a cold start. This feature greatly reduces starting time and yet allows the use of low torque thermostatic coils for increased economy.

A fuel inlet filter is mounted in the fuel bowl under the fuel inlet nut. This fibre filter will by-pass when plugged and is easily replaceable.

Other features of the Monojet include an aluminum throttle body for improved heat distribution and a thick throttle body to bowl insulator gasket to keep excessive engine heat from the float bowl. The carburetor has internally balanced venting through a vent hole in the air horn. An external idle vent valve is used for improved hot engine idle and starting.

There are six basic systems of operation used. They are float, idle, main metering, power, pump and choke. The following text describes the purpose and operation of each system.

b. Operation of Float System

The float system controls the level of the fuel in the carburetor float bowl. Higher than specified fuel levels can cause flooding, hard hot starting and rich fuel mixtures causing poor economy, nozzle drip at idle, turn cut-out, rough idle and stalling.

Too low fuel levels can cause hard cold starting, hesitation and flatness on acceleration, lean mixtures, rough idle and stalling. It is important that the float be set to the recommended specifications.

Figure 64-48—Rochester MV Monojet Carburetor

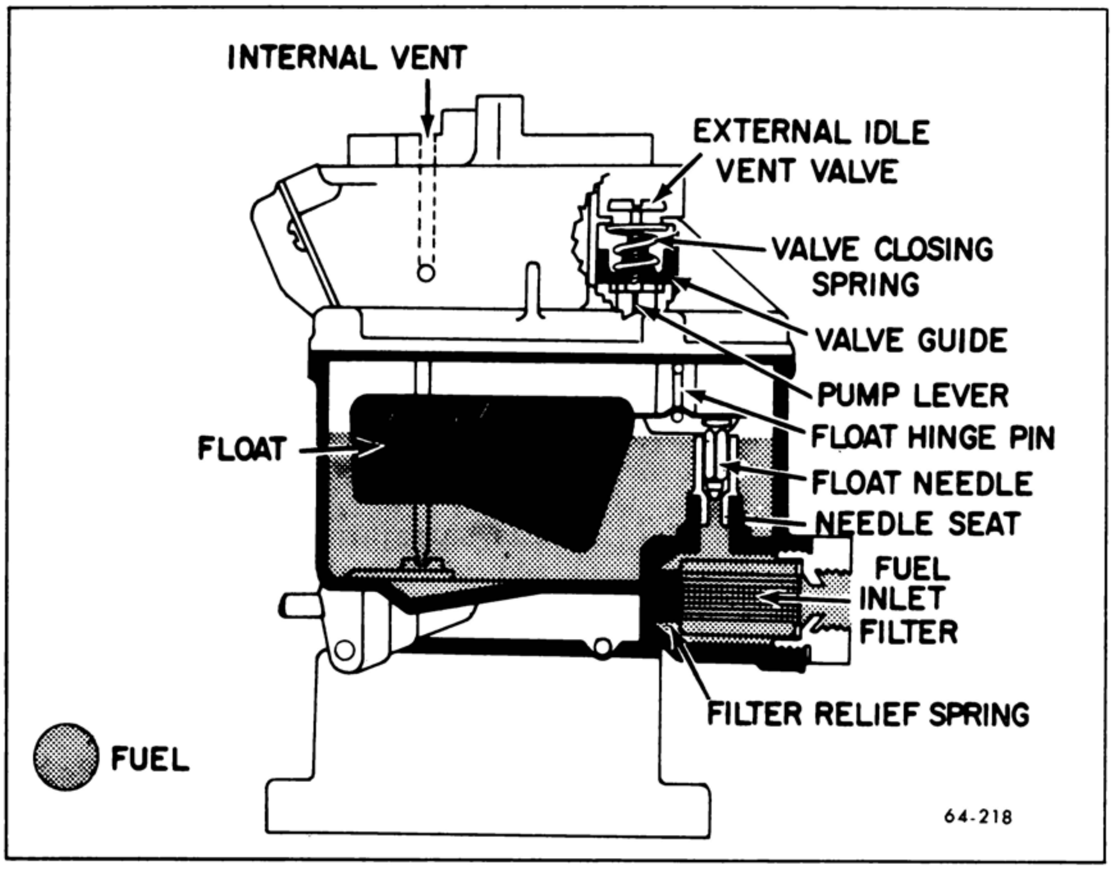


Figure 64-49—Float System

The float system on the Monojet carburetor is located adjacent to the main venturi. It is designed so that angular maneuvers such as steep hills and sharp turns will not affect proper operation by keeping an adequate supply of fuel in the bowl at all times. The float system consists of the following: a fuel inlet filter and pressure relief spring, a solid single pontoon float made of special lightweight plastic, a conventional needle and seat and a float hinge pin. The float hinge pin fits in dual slots cast in the float bowl and is held in place by compression of the air horn gasket against the upper loop of the hinge pin. See Figure 64-49.

The float operates as follows. Fuel from the fuel pump is forced through the fibre fuel inlet filter located behind the fuel inlet nut. It passes from the filter up through the float needle seat and spills into the float bowl. As the float bowl fills with fuel it lifts the float pontoon upward until the correct fuel level is reached in the float bowl. At this point, the float arm forces the float needle against the float needle seat, shutting off fuel flow. As fuel is used from the float bowl the float drops downward allowing the float needle to move off its seat and more fuel to enter the float bowl. This cycle continues throughout engine operation, keeping a nearly constant fuel level in the float bowl.

The fuel inlet filter has a pressure relief spring located at the rear of the filter. Should the filter become clogged from improper servicing or excessive amounts of dirt in the system, the relief spring lets the filter move off its seat. This prevents complete stoppage of fuel flow to the carburetor until the filter can be replaced.

The carburetor float chamber is both internally and externally vented. The internal vent channel is located in the air horn above the float chamber. The purpose of the internal vent is to balance air pressure on the fuel in the float bowl with carburetor inlet air. With this feature a balanced air/fuel mixture ratio can be maintained during part throttle and power operation because the air pressure acting on the fuel in the float bowl will be balanced with the air flowing through the carburetor bore.

The internal vent tube also allows the escape of fuel vapors from the float chamber during very hot engine operation. This prevents fuel vapor pressurization in the float bowl from causing excessive pressure build-up resulting in overly rich mixtures and fuel spillage from the main discharge nozzle.

The Monojet carburetor has an external idle vent valve located at the top of the carburetor air horn. It is actuated by a tang located on the accelerator pump plunger shaft. See Figure 64-49.

When the throttle valve is returned to idle position, the tang on the pump plunger shaft pushes upward on the vent valve stem and opens the idle vent valve. This allows fuel vapors which may form in the float bowl during hot engine idle and hot "soak", to be vented outside, so they will not be drawn into the engine manifold. This feature helps maintain a smooth engine idle and reduces hard hot starting.

When the throttle valve is opened to the off-idle and part throttle position the idle vent valve closes, returning the carburetor to internal balanced venting.

c. Operation of Idle (Low Speed) System

The idle system consists of a removable idle tube, idle passages, idle channel restriction, idle air bleeds, slotted off-idle port, idle mixture adjusting needle and the idle mixture discharge hole. See Figure 64-50.

During curb idle the throttle valve is held slightly open by the idle speed adjusting screw. Since the

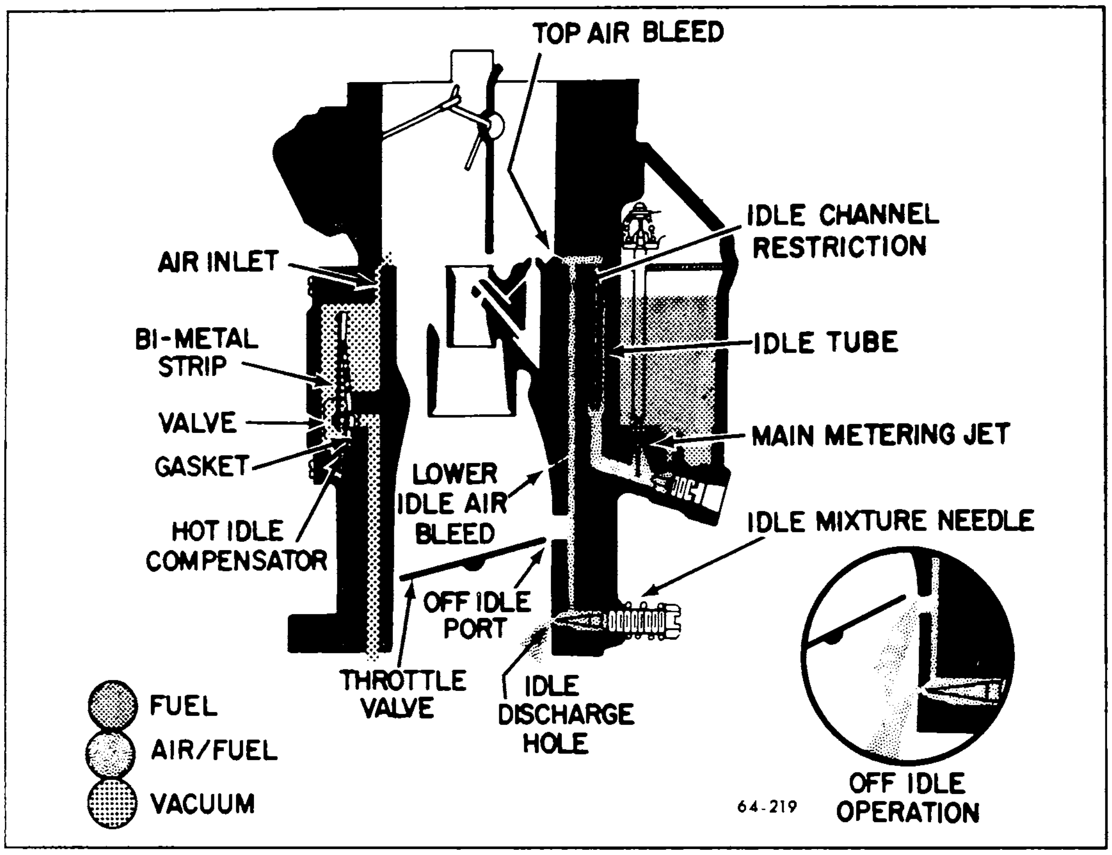


Figure 64-50—Idle (Low Speed) System

engine requires very little air and fuel for idle and low speed operation, fuel is mixed with the air to produce a combustible mixture by direct application of engine manifold vacuum (low pressure) to the idle discharge hole just below the throttle valve. Fuel flows through the idle system as follows.

Atmospheric pressure forces fuel from the float bowl down through the main metering jet into the main fuel well where it is picked up and metered at the lower tip of the idle tube. It passes up the idle tube and is mixed with air at the top of the idle channel through the idle air bleed hole. The air/fuel mixture passes over through the cross channel and then downward through the calibrated idle channel restriction where it is further metered. The mixture continues down the idle passage past the lower idle air bleed hole and off idle discharge port just above the throttle valve where it is again mixed with air. The air/fuel mixture then moves downward past the idle mixture needle and out through the idle discharge hole into the carburetor bore. Here it mixes with the air passing around the slightly open throttle valve to form a combustible mixture.

As the throttle valve is opened from curb idle to increase engine speed, additional fuel is needed to combine with the extra air entering the engine. This is accomplished by the slotted off idle port. As the throttle valve is opened, it passes the off idle port, gradually exposing it to high vacuum below the throttle valve. The additional fuel from the off idle port mixes with the increased air flow past the opening throttle valve to meet increased engine air and fuel demands. See Figure 64-50.

Further opening of the throttle valve causes increased air flow through the carburetor bore, which causes sufficient pressure drop in the multiple venturi to start fuel delivery from the main discharge nozzle. The off idle port fuel discharge does not cease at this transfer point, but diminishes as fuel flow from the main discharge nozzle increases. In this way, the systems are so designed that they combine to produce a smooth fuel flow at all engine speeds.

The lower idle air bleed is used strictly as an air bleed during idle operation. It supplies additional air to the idle circuit for improved atomization and fuel control at low engine speeds.

The same air bleed is used as an additional fuel feed at higher engine speeds, to supplement main discharge nozzle delivery, during operation of the main metering system.

The hot idle compensator is located in a chamber in the float bowl casting on the throttle lever side of the carburetor. Its purpose is to offset enrichening effects caused by changes in air density and fuel vapors generated during hot engine operation. See Figure 64-50.

The compensator consists of a thermostatically controlled valve which closes off an air channel which leads from a hole inside the air horn to a point below the throttle valve.

Normally the compensator valve is held closed by tension of the bi-metal strip and engine vacuum. During extreme hot engine operation, excessive fuel vapors in the carburetor can enter the engine manifold causing richer than normally required mixtures. This can result in rough engine idle and stalling. At a pre-determined temperature when extra air is needed to offset the enrichening effects of fuel vapors, the bi-metal strip bends and unseats the compensator valve. This uncovers the air channel leading from the compensator valve chamber to the throttle body bore. This allows enough air to be drawn into the engine manifold to offset the richer mixtures and maintain a smooth engine idle. When the engine cools and the extra air is not needed, the bi-metal strip closes the valve and operation returns to normal.

In order to insure proper idle adjustment, the compensator valve must be closed. To check this, place a finger over the compensator inlet hole inside the air horn bore. If no drop in engine RPM is noted on the tachometer, the valve is closed. If the valve is open, cool engine down to a point where the valve is closed for proper idle adjustment.

d. Operation of Main Metering (High Speed) System

The main metering system supplies fuel to the engine from off idle to wide open throttle operation. It feeds fuel at all times when air flow through the venturi is great enough to maintain fuel flow from the main discharge nozzle. See Figure 64-51.

The main metering system consists of a main metering jet, a mechanical and vacuum operated metering rod, main fuel well, main well air bleeds, fuel discharge nozzle and triple venturi.

The main metering system operates in the following manner. As the throttle valve is opened beyond the off idle range, air velocity increases in the carburetor venturi. This causes a drop in pressure in the main venturi which is increased many times in the smallest venturi.

Fuel in the float bowl is metered between the tapered metering rod and the main metering jet. It then flows on into the main fuel well where it is mixed with air from the air bleed at the top of the well and another air bleed which leads into the main well from the discharge nozzle cavity. After the fuel in the main well is mixed with air from the air bleeds it then passes up the discharge nozzle where it sprays into the small boost venturi. At the boost venturi the fuel mixture then combines with air entering the engine through the carburetor bore to provide the correct air/fuel mixtures to the engine cylinders for efficient combustion.

Fuel flow to the main discharge nozzle is controlled by a tapered metering rod which is actuated by linkage connected directly to the throttle shaft. As the throttle valve is opened from idle position, the tapered metering rod is gradually raised out of the main metering jet orifice. With the fuel metering mechanically controlled by the throttle valve angle, it is possible to maintain very accurate mixture ratios throughout part throttle to wide open throttle operation.

An initial metering rod adjustment is required to set the depth of the rod in the main metering jet.

CAUTION: It should be noted here that there is a supplementary fuel feed passage in the bottom of the float bowl adjacent to the main metering jet. Fuel is picked up from the float bowl and passes through a calibrated hole past a calibration screw and on into the same fuel passage which leads from the main metering jet to the main fuel well. The purpose of the adjustable fuel feed is to allow production to refine part throttle calibration to meet very accurate air/fuel mixture ratios. The factory adjustment is made using very sensitive instrumentation and the screw should not be readjusted in the field. If the adjustment is tampered with, it will require complete float bowl or unit replacement.

e. Operation of Power System

The vacuum operated enrichment system in the Monojet carburetor is used to slightly enrichen mixture ratios during operation with moderate to heavy loads. The necessary enrichment is obtained

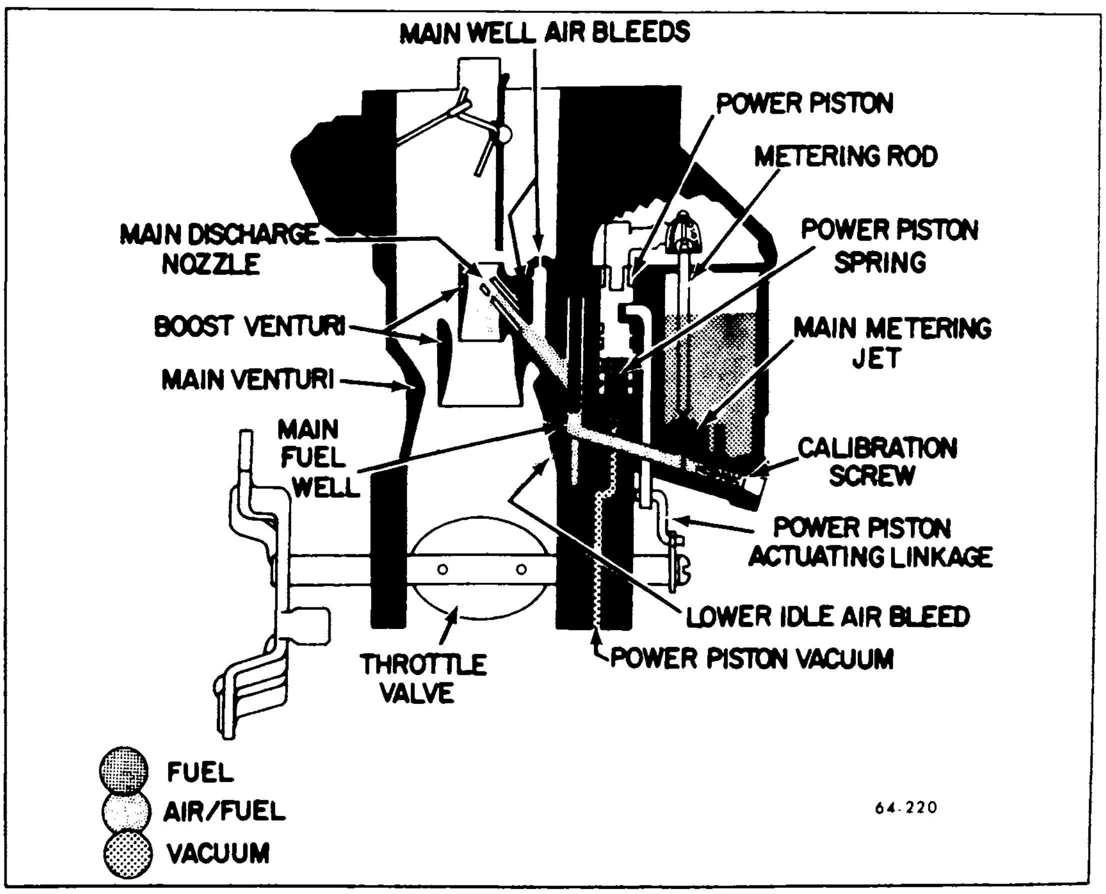


Figure 64-51—Main Metering (High Speed) System

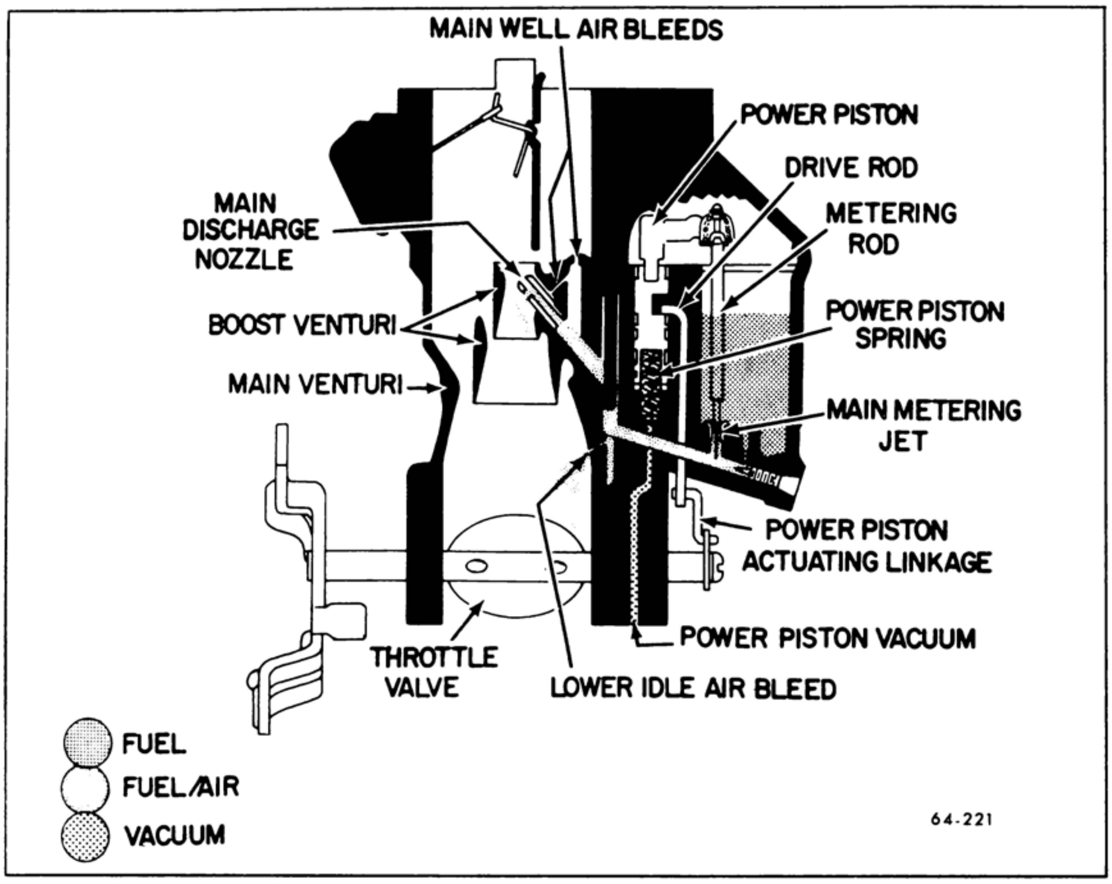


Figure 64-52—Power System

by movement of a spring loaded vacuum piston which senses changes in manifold vacuum. The amount of enrichment is controlled by the clearance between the groove in the power piston and the diameter of the power piston drive rod. See Figure 64-52.

During part throttle and cruising ranges, manifold vacuum is sufficient to hold the power piston down against spring tension. The upper part of the groove in the power piston is held down against the top side of the drive rod. This places the main metering rod lower in the jet for maximum economy. On moderate to heavy accelerations, manifold vacuum drops and the power piston spring pushes the power piston up so that the lower edge of the slot in the power piston strikes the bottom side of the drive rod. This moves the tapered metering rod slightly upward in the jet. This allows more fuel to flow through the jet, enrichening the fuel mixture slightly.

The amount of enrichment is controlled by the amount of clearance between the groove in the side of the power piston and the diameter of the drive rod. This clearance is factory calibrated to match the fuel enrichment requirements of a given engine.

f. Operation of Accelerating Pump System

Rapid opening of the throttle valve, when accelerating from low speed, causes an immediate increase in air flow through the carburetor bore. Since fuel is heavier than air, it requires a short period of time for fuel flow through the main discharge nozzle to "catch up" with the air flow. To avoid leanness during this momentary lag in fuel flow, the accelerator pump furnishes a metered quantity of fuel which is sprayed into the air stream. This mixes with the increased air flow, to supply the extra fuel needed, until the main discharge nozzles can feed the fuel required.

The accelerating pump is located at the side of the main fuel bowl. It consists of a spring loaded pump plunger and pump return spring operating in a fuel well. The pump plunger is connected by linkage directly to a lever on the throttle shaft. See Figure 64-53.

When the pump plunger moves upward in the pump well, fuel from the float bowl enters the pump well through a slot in the side of the pump well. It flows past the synthetic pump cup seal into the bottom of the pump well. The pump cup is a floating type. (The cup moves up and down on the pump plunger head). When the pump plunger is moved upward the flat on the top of the cup unseats from the flat on the plunger head and allows free movement of fuel through the inside of the cup into the bottom of the pump well. This also vents any vapors which may be in the pump well so that a solid charge of fuel can be maintained in the fuel well beneath the plunger head.

When the throttle valve is opened, the connecting pump linkage forces the pump plunger downward. The pump cup seats instantly and fuel is forced through the pump discharge passage, where it unseats the pump discharge check ball and passes on to the pump jet, where it sprays into the boost venturi area.

It should be noted the pump plunger is spring loaded. The upper duration spring is balanced with the bottom pump return spring so that a smooth sustained charge of fuel is delivered during acceleration.

The pump discharge check ball prevents any "pull over" or discharge of fuel from the pump jet when the accelerator pump is not in operation. It also keeps the pump discharge passage filled with fuel to prevent pump discharge lag.

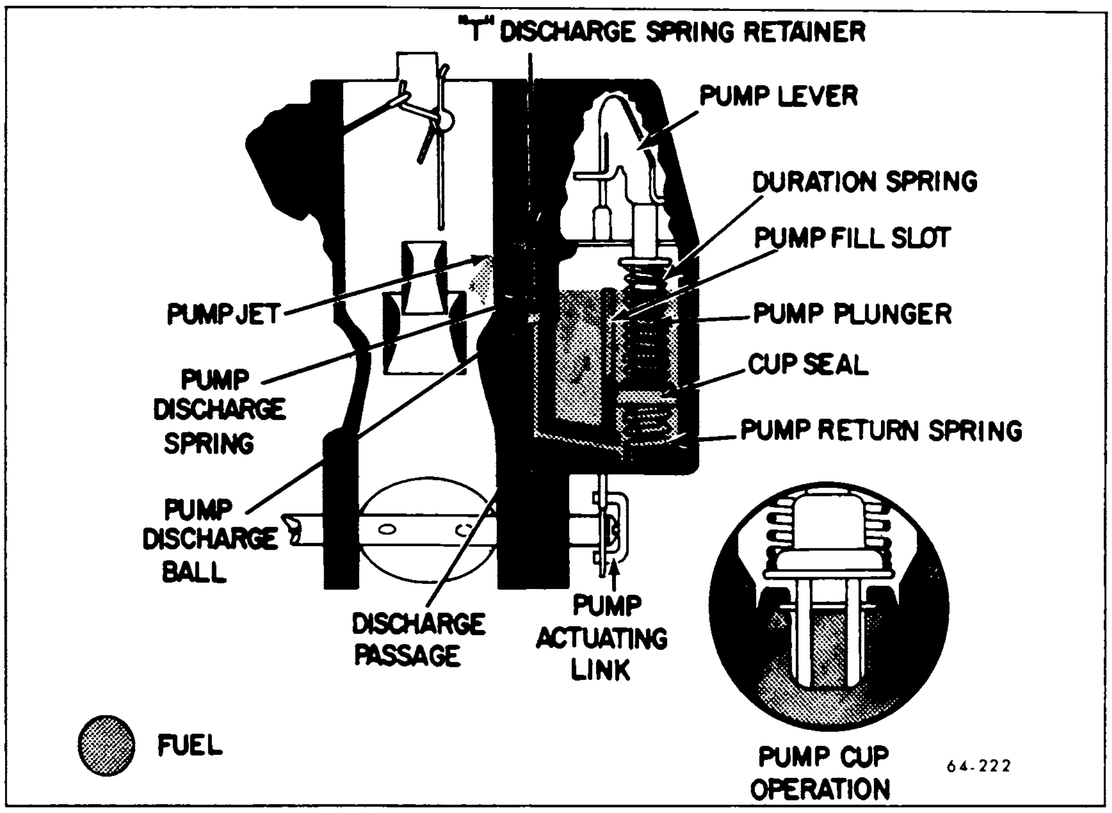


Figure 64-53—Accelerating Pump System

The pump plunger does not require adjustment in the field as it is preset during manufacture.

g. Operation of Choke System

The purpose of the choke system is to provide a richer mixture for cold engine starting and operation. Richer than normal mixtures are required because vaporized fuel has a tendency to condense on cold engine parts, thereby decreasing the amount of combustible mixture available in the engine cylinders.

The Model MV carburetor is equipped with a fully automatic choke control. The thermostatic coil is mounted on the engine manifold and is connected by a link to the lever on the choke valve shaft. The vacuum break unit is diaphragm operated and is part of the air horn casting. In addition, the choke system has an added feature called a cranking enrichment valve, to reduce engine cranking time during cold starts. See Figure 64-54.

The Model MV choke system operates as follows. When the engine is cold, prior to starting, depressing the accelerator pedal opens the carburetor throttle valve. This allows tension from the thermostatic coil to close the choke valve. This also rotates the fast idle cam so the fast idle tang comes to rest on the high step of the fast idle cam. This provides enough throttle valve opening to keep the engine running after a cold start. When the choke valve closes, it also pushes downward on the cranking enrichment valve stem and opens the valve. During cranking, engine vacuum below the choke valve pulls fuel from the idle circuit and main

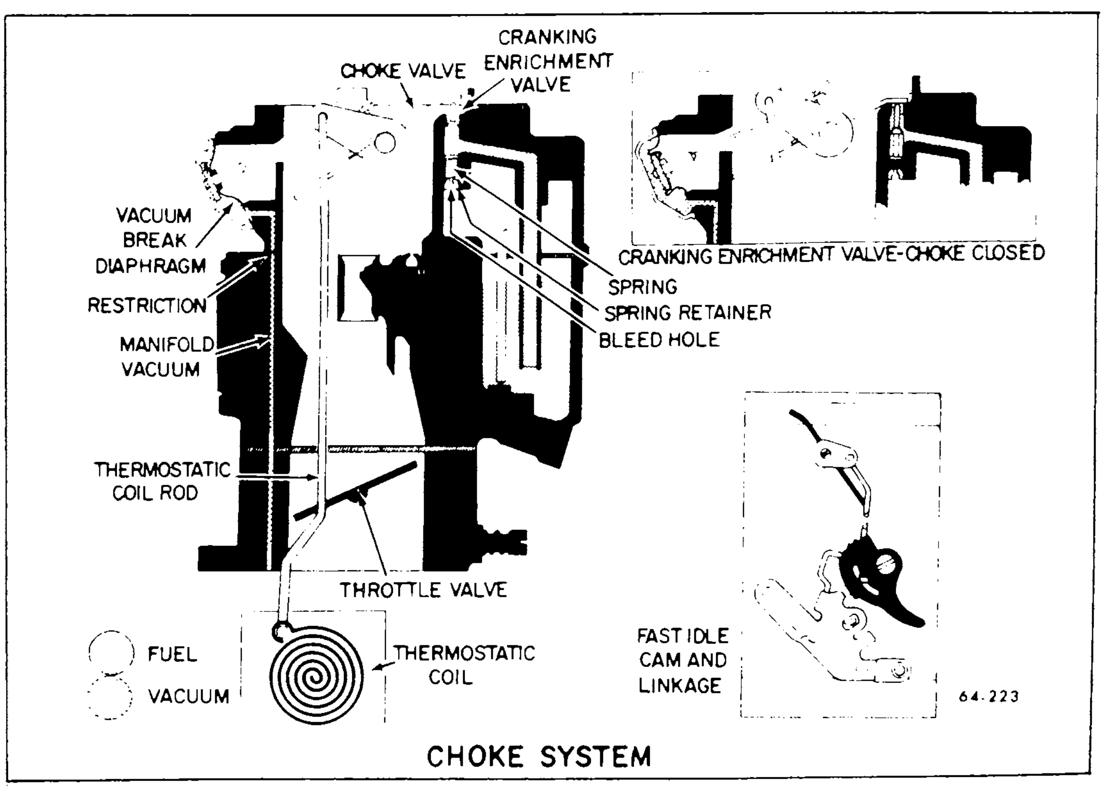


Figure 64-54—Choke System

pump well. Make sure spring is properly seated in bottom of well.

7. Install pump plunger assembly into pump well with actuating shaft protruding through bottom of bowl casting. Push downward on pump plunger and install pump drive link into hole in lower end of plunger shaft. Ends of drive link point towards carburetor bore. Squirt on upper end of link retains link to pump shaft.

8. Install pump actuating lever to lower end pump drive link by aligning squirt on rod with notch in lever. Projection on actuating lever points downward. Install power piston actuating link into opposite end of actuating lever. Lower end of link has retaining squirt and faces outward (away from throttle bore).

9. Install end of power piston actuating rod into groove on side of power piston. Then install power piston metering rod assembly and actuating rod into float bowl. <u>End of metering rod must enter jet.</u>

10. Hold complete assembly downward in bowl, then install power piston drive link into hole in lower end of power piston actuating rod (beneath bowl). Align "D" hole in actuating lever with flats on throttle shaft and install lever on end of throttle shaft. Install retaining screw in end of throttle shaft and tighten securely. Figure

11. Install idle tube into cavity in float bowl.

12. Install pump discharge ball, spring and spring retainer. Make sure spring retainer is flush with top of bowl casting.

13. Install fuel filter relief spring, filter, filter nut and gasket. Tighten securely.

NOTE: Open end of filter should face hole in fuel inlet nut.

14. Install float needle seat and gasket. Tighten securely using a tightly fitting screwdriver.

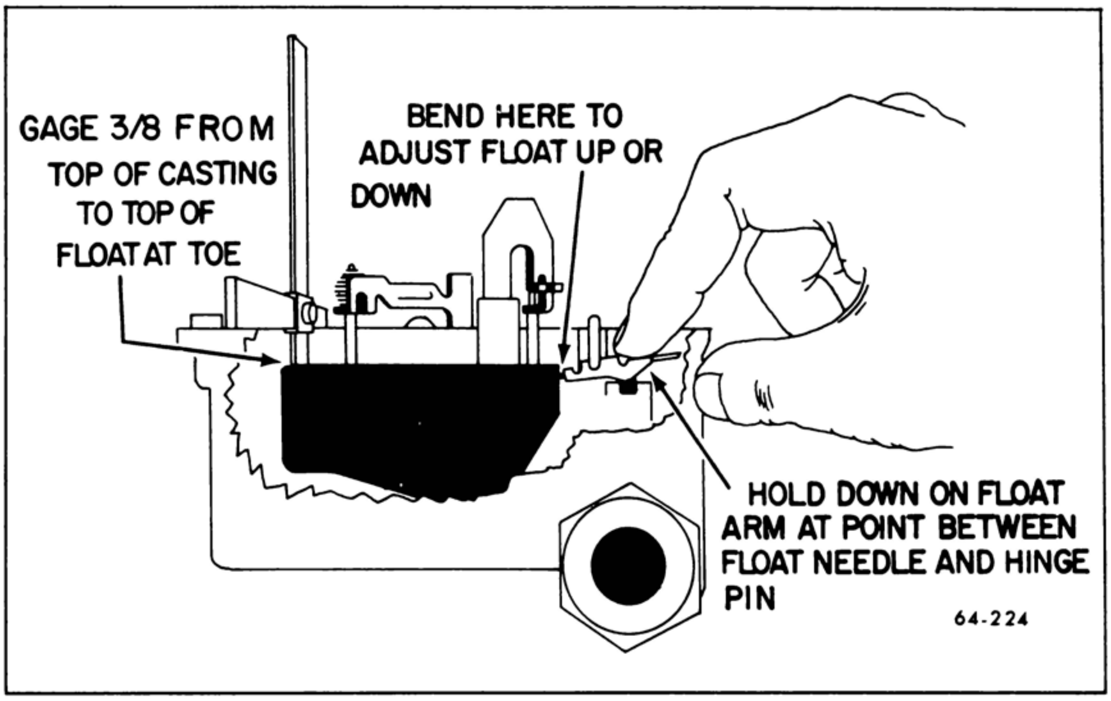


Figure 64-55—Float Level Adjustment

15. Install float needle valve into needle seat.

16. Insert float hinge pin into float arm. Then install float and hinge pin into float bowl.

17. <u>Float level adjustment.</u>

(a) Hold float retainer firmly in place and float arm against top of float needle, by pushing downward on float arm at point between needle seat and hinge pin. See Figure 64-55.

(b) With adjustable T-scale measure distance from top of float at toe to float bowl gasket surface (gasket removed). Measurement should be 3/8" at point 1/16" in from end of flat surface at float toe (not on radius).

18. <u>Metering rod adjustment.</u>

(a) Remove metering rod by holding throttle valve wide open. Push downward on metering rod against spring tension, then slide metering rod out of slot in holder and remove from main metering jet.

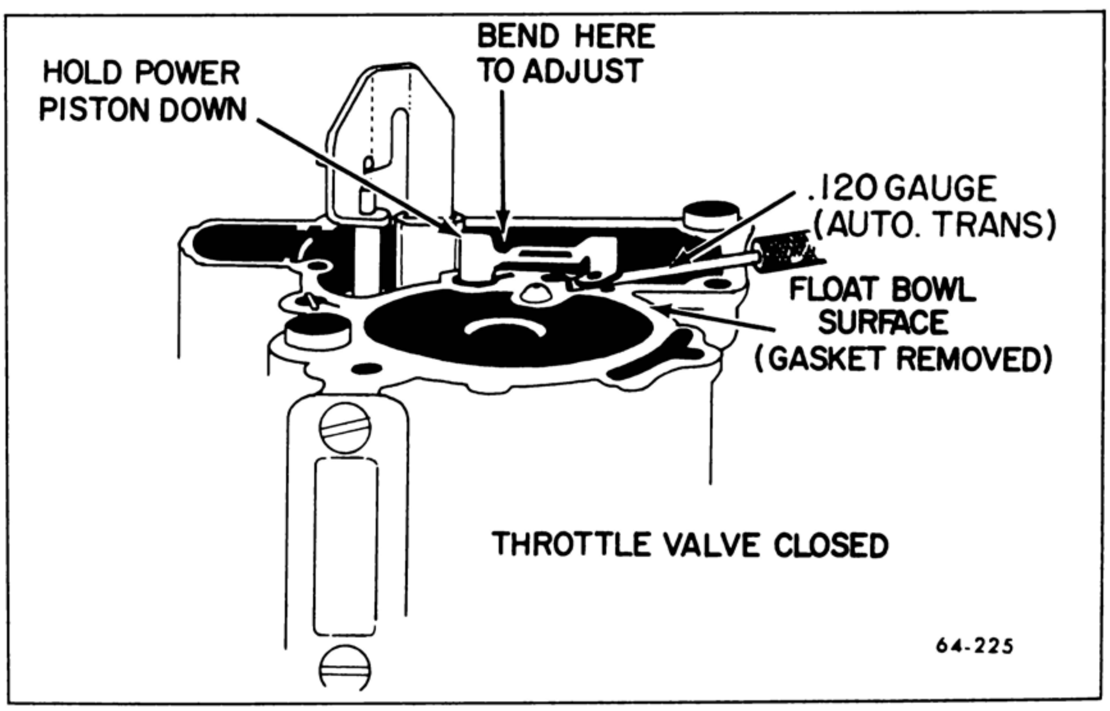


Figure 64-56—Metering Rod Adjustment

(b) With throttle valve completely closed, hold power piston down against its stop.

(c) Holding downward pressure on power piston, swing metering rod holder over flat surface of bowl casting next to carburetor bore.

(d) Use specified plug gage and insert between bowl casting sealing bead and lower surface of metering rod holder. Gage should have a slide fit between both surfaces, as shown in Figure 64-56.

(e) To adjust, carefully bend metering rod holder up or down at point shown.

(f) After adjustment install metering rod, tension spring and retaining clip.

19. Install air horn gasket on float bowl by carefully sliding slit portion of gasket over metering rod holder. Then align gasket with dowels provided on top of bowl casting and press gasket firmly in place.

c. Assembly of Air Horn

1. Install idle vent valve assembly, if removed.

2. Install choke shaft, choke valve and vacuum break lever, if removed. Align choke valve, tighten two retaining screws and stake securely.

3. Install vacuum break diaphragm and plunger into cavity at side of air horn. With choke valve in the open position, slide eyelet of plunger rod over end of vacuum break lever on choke valve.

4. Seat vacuum break diaphragm over sealing bead on air horn casting. With diaphragm held in place, carefully install diaphragm cover and two retaining screws. Tighten screws securely.

5. Install air horn on float bowl, lowering gently until seated. Install (3) long and (3) short air horn to float bowl attaching screws. Tighten securely using tightening sequence.

6. Assemble choke rod in the choke shaft lever. End of rod points away from air horn casting when installed properly. (Lower end of rod has 45 degree bend).

7. Install lower end of choke rod into curved slot in fast idle cam. Steps on fast idle cam should face fast idle tang on throttle lever.

8. Install upper choke lever on choke shaft. End of lever faces towards vacuum break diaphragm. Install choke lever screw. Tighten securely.

69-29 EXTERNAL ADJUSTMENT OF ROCHESTER 1-BARREL CARBURETOR

a. Idle Vent Adjustment

Set engine hot idle RPM to specification. Idle vent valve should now be open .050 inch. To measure, insert plug gage between top of air horn casting and bottom surface of vent valve. See Figure 64-57. To adjust, turn vent valve head with screwdriver as required.

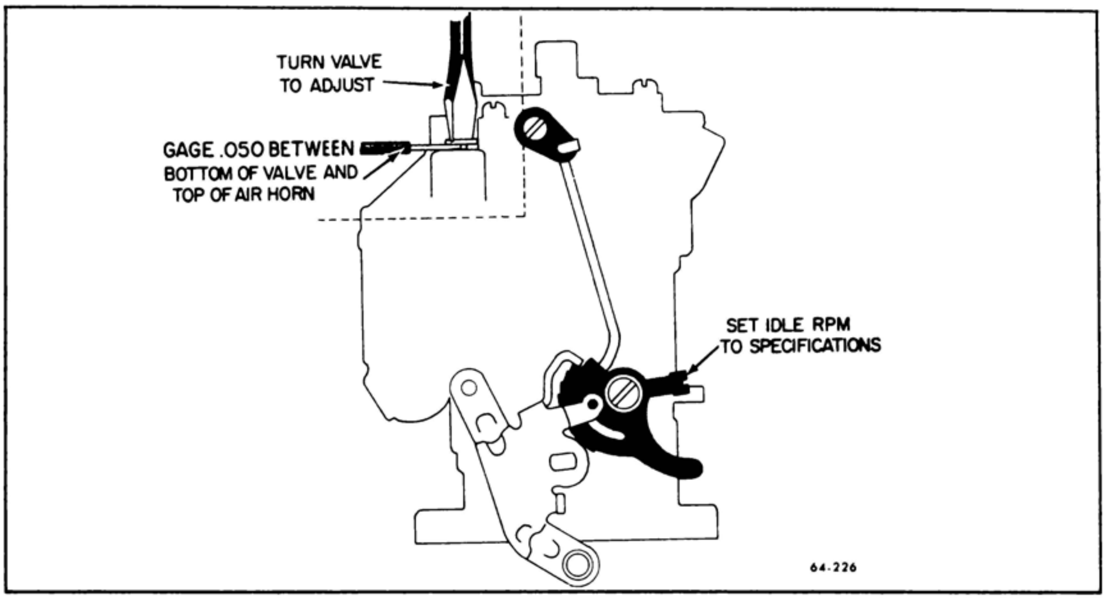


Figure 64-57—Idle Vent Adjustment

b. Fast Idle Adjustment

1. Make slow idle speed and mixture adjustments with engine at normal temperature and transmission in drive.

2. Place fast idle cam so that cam follower tang is resting on low step of cam.

3. Fast idle speed should now be approximately 20 RPM above slow idle speed setting. If not, insert a screwdriver in slot of cam follower tang and bend tang as required to obtain 20 RPM above slow idle speed.

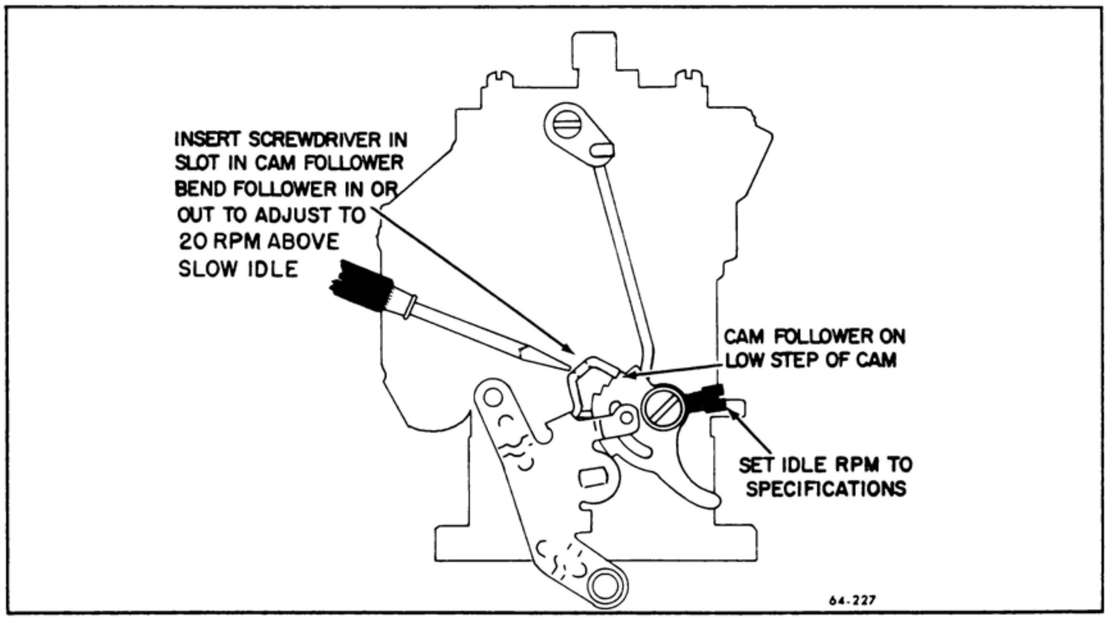


Figure 64-58—Fast Idle Adjustment

c. Choke Rod Adjustment

With fast idle adjustment made first:

1. Place fast idle cam follower on second highest step of fast idle cam and hold firmly against rise to high step. See Figure 64-59.

2. Rotate choke valve toward direction of closed choke by applying force to choke coil lever.

3. Bend choke rod at point shown to give specified opening between the lower edge of choke valve (at center of valve) and air horn wall: .180"-automatic transmission or .190" - manual transmission.

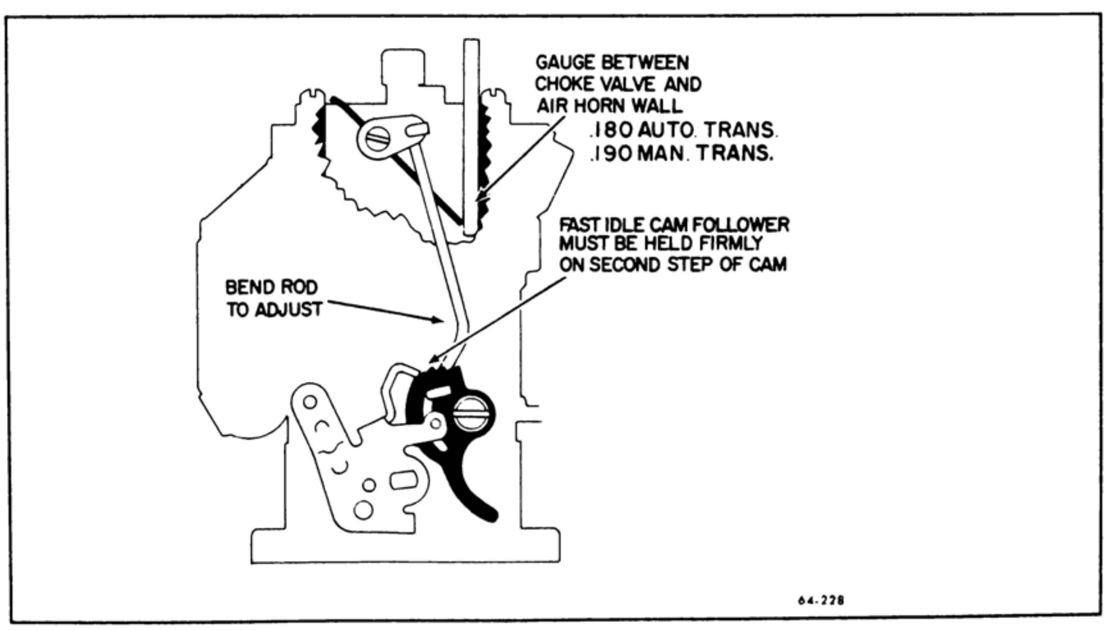


Figure 64-59—Choke Rod Adjustment

d. Choke Unloader Adjustment

1. Hold choke valve toward closed position by applying a light force to choke coil lever.

2. Rotate throttle lever to wide open throttle valve position.

3. Bend unloader tang on throttle lever to obtain .350 inch dimension between lower edge of choke valve and air horn wall. See Figure 64-60.

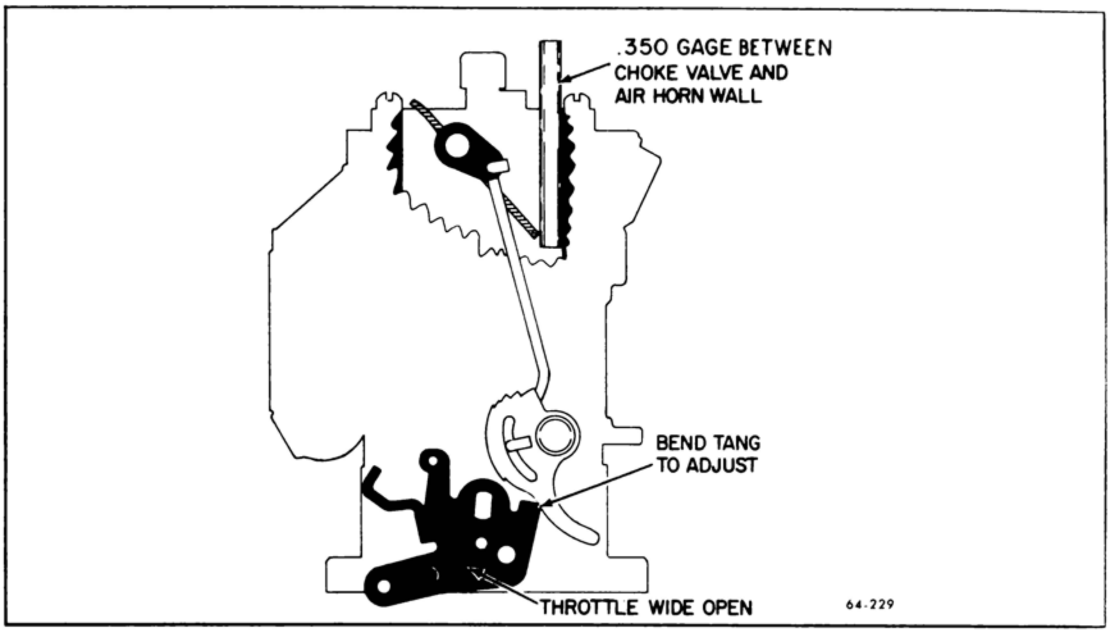


Figure 64-60—Choke Unloader Adjustment

e. Choke Coil Rod Adjustment

1. Remove retaining clip from upper end of choke coil rod.

2. Hold choke valve closed.

3. Pull upward on coil rod to end of travel.

4. Bottom of rod end which slides into hole in choke lever should be even with top of hole.

5. Bend choke coil rod at point shown to adjust. See Figure 64-61.

6. Connect coil rod to choke lever and install retaining clip.

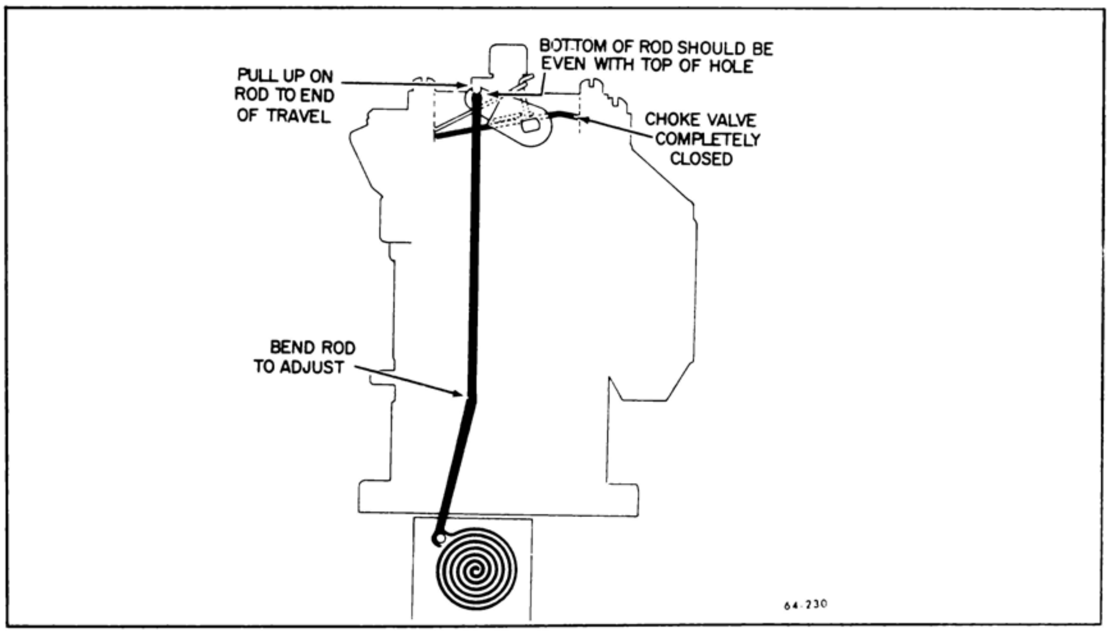


Figure 64-61—Choke Coil Rod Adjustment

f. Vacuum Break Adjustment

1. Rotate choke valve to closed position.

2. Hold choke valve closed with rubber band attached between choke shaft lever and stationery part of carburetor as shown.

3. Grasp vacuum break plunger rod with needle nose pliers and push straight inward until diaphragm seats. See Figure 64-62.

4. With specified plug gage, measure clearance between lower edge of choke valve and inside air horn wall: .245 automatic transmission or .275 manual transmission.

5. Bend end of vacuum break lever at point shown to adjust.

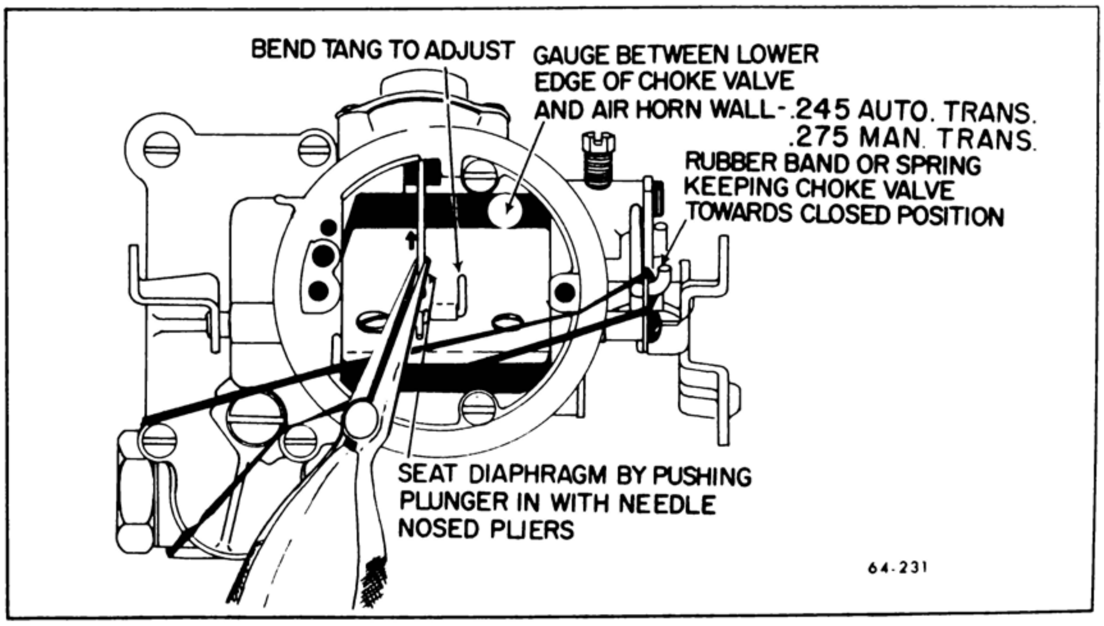
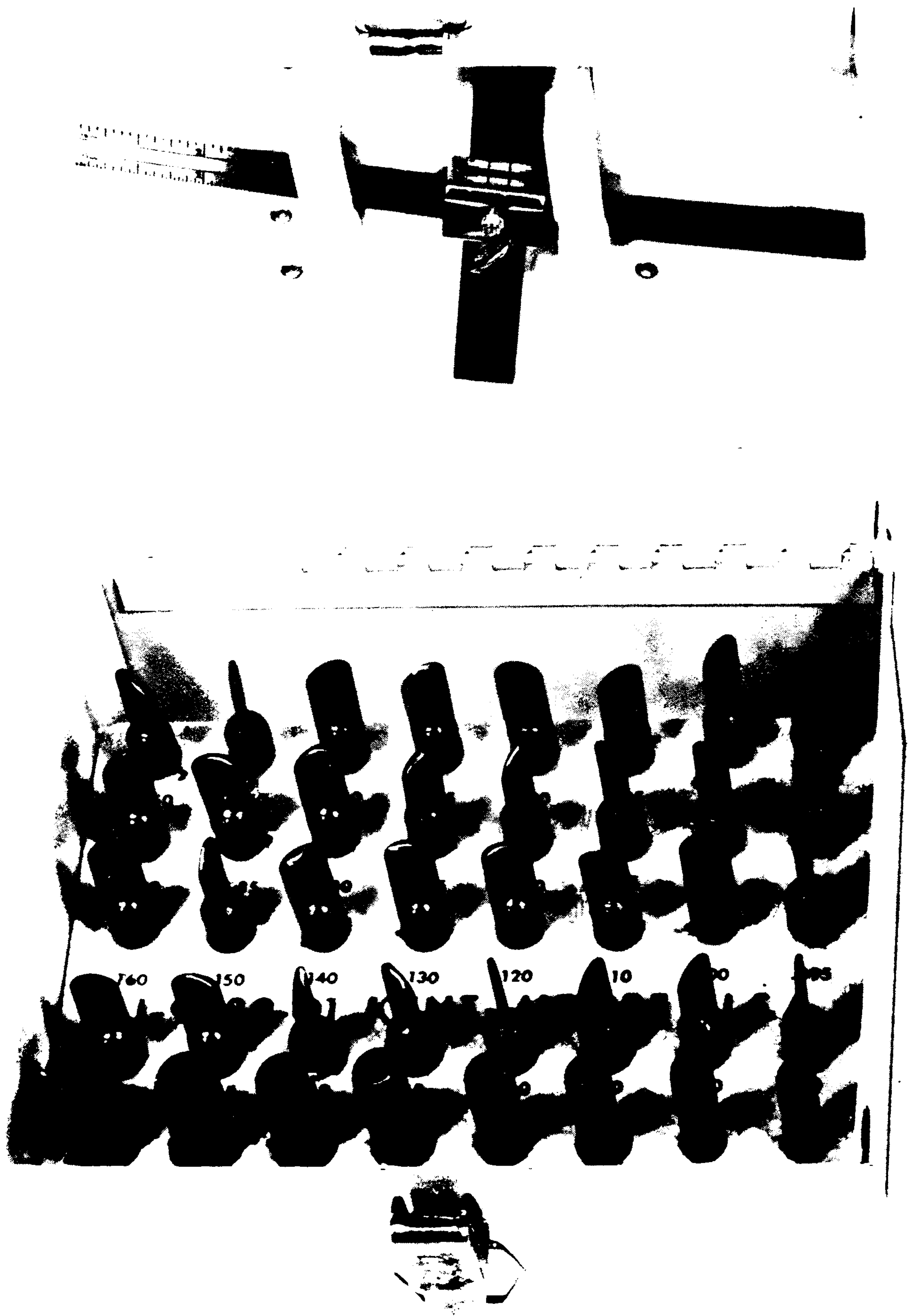


Figure 64-62—Vacuum Break Adjustment



64-117A

J-9789-01
UNIVERSAL CARBURETOR GAUGE SET

Figure 64-63—Engine Fuel System Special Tools