SECTION 3-H
ROCHESTER 4-BARREL CARBURETOR

CONTENTS OF SECTION 3-H

NOTES

3-27 DESCRIPTION AND OPERATION OF ROCHESTER 4-BARREL CARBURETOR

a. General Description

The Rochester Model 4GC used on the *Series 50-60-70* engine is a 4-barrel downdraft type which provides the advantages of a compound installation of two 2-barrel carburetors in one compact unit. See figure 3-75. To aid description and the proper identification of parts the carburetor is considered to be divided into a *primary section* and a *secondary section.*

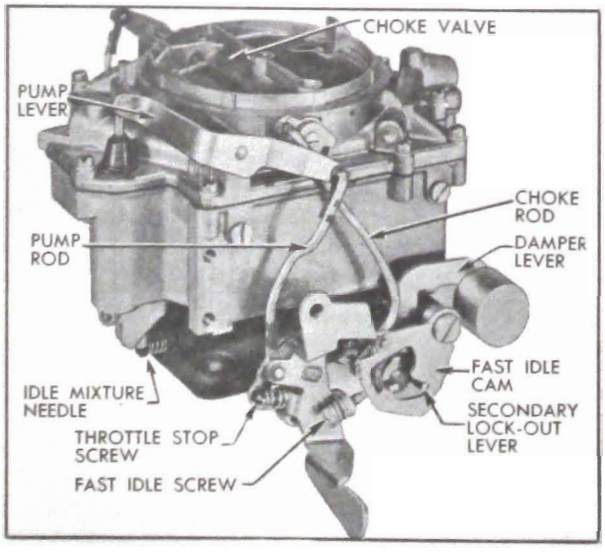


Figure 3-75—Rochester 4-Barrel Carburetor

The *primary section* covers the 2-barrelled forward half of the carburetor assembly. This section is essentially a complete 2-barrel carburetor containing a float system, idle system with adjustable needle valves, main metering system, power system, and accelerating system. This section also includes an accelerator vacuum switch for starting the engine, and the automatic choke mechanism.

The *secondary section* covers the 2-barrelled rearward half of the carburetor assembly. This section is essentially a supplementary 2-barrel carburetor which cuts in to assist the primary section when a pre-determined throttle opening and engine RPM are reached. This section contains a float system, a non-adjustable idle system, and a main metering system. It has a separate set of throttle valves and a set of auxiliary valves, which are located in the barrels above the throttle valves.

The *primary* throttle valves are operated by the accelerator pedal and the connecting throttle linkage. The *secondary* throttle valves are operated by the primary throttle valve shaft through

delayed action linkage which permits a predetermined opening of the primary valves before the secondary valves start to open. Action of the linkage then causes both sets of throttle valves to reach the wide open position at the same time.

The starter switch, which is operated by a lever on the *primary* throttle valve shaft, is fully described in paragraph 10-30. The other systems of the carburetor are described in the following subparagraphs.

b. Operation of Float Systems

Each section of the carburetor has a separate and independent float system, consisting of a float chamber formed by a partition in the main body, a 2-pontoon float, a needle valve seat and valve. Fuel enters the carburetor through a strainer in the inlet port in the secondary side of the air horn. From this point fuel flows to the separate float chambers through a horizontal passage in the air horn. See figure 3-76.

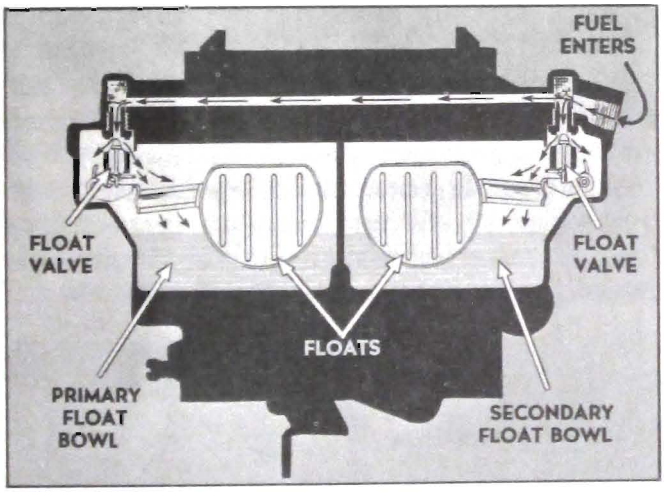


Figure 3-76—Primary and Secondary Float Systems

When the fuel reaches the prescribed level in each float chamber the float moves the needle valve against its seat to shut off the flow of fuel. The needle valves are connected to the float levers by clips.

The joint between the air horn and the main body is sealed by a gasket, and the float chambers are vented by passages which are calibrated to provide proper air pressure above the fuel under all operating conditions. These passages in the air horn lead into the throat of the air horn, and to outside atmosphere. The external vents permit fumes to escape from the float chambers when the engine is stopped after extremely hot operation.

c. Operation of Idle (Low Speed) Systems

Each barrel of the carburetor has a separate idle system but the general operation is identical in all barrels. The idle system in each barrel supplies fuel to the engine whenever the position of the throttle valve is such that suction is created at the idle discharge holes in the throttle body.

Suction on an idle discharge hole causes fuel in the float chamber to flow through the main metering jet and upward into the idle tube which meters the fuel. Bleed holes permit air to enter at the top and side of the idle passage in the cluster so that a mixture of fuel and air passes down the idle channel to the idle discharge holes. Additional air is drawn into the fuel-air mixture in the idle channel through an auxiliary air bleed which is in the main body. See figure 3-77.

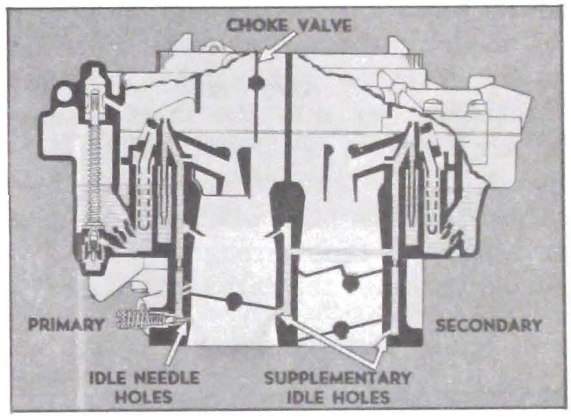


Figure 3-77—Primary and Secondary Idle Systems

When the throttle valve is closed, the fuel-air mixture is supplied through the lower idle discharge holes only, since the upper holes are above the valve and are not affected by suction. As the throttle valve is opened, suction is also placed on the upper idle discharge holes which then feed additional fuel-air mixture into the engine. With continued opening of the throttle valve the suction on the idle discharge holes tapers off until a point is reached where the idle system no longer supplies fuel-air mixture. Before this point is reached however, the main metering system has begun to supply fuel, as described later.

The auxiliary air bleeds discharge fuel after the idle systems cease to operate, thereby keeping fuel immediately available in the idle channels at a point very near the idle discharge holes and also enriching the mixture being delivered by the main metering system.

In the *primary* section, the quantity of fuel-air mixture supplied through the lower idle discharge holes is controlled by the idle needles, which may be adjusted to provide smooth engine idle operation. In the *secondary* section, the quantity of idle fuel-air mixture is controlled by the fixed size of discharge holes located in the rear of both the primary and secondary throttle bores.

d. Operation of Main Metering Systems

Each barrel of the carburetor has a separate main metering system; however, the operation of all systems is identical. The main metering system in each barrel supplies fuel to the engine whenever the position of the throttle valve is such that the incoming air stream creates suction on the main discharge nozzle.

Air entering the barrel through the air horn passes through the venturi tubes which increase the velocity of the air and create a suction on the main discharge nozzle. This causes fuel to flow from the float chamber through the main metering jet into the main discharge nozzle. Air is drawn in through the high speed bleeder so that a mixture of fuel and air is discharged from the main discharge nozzle into the air stream passing through the small venturi in the barrel of the carburetor. See figure 3-78.

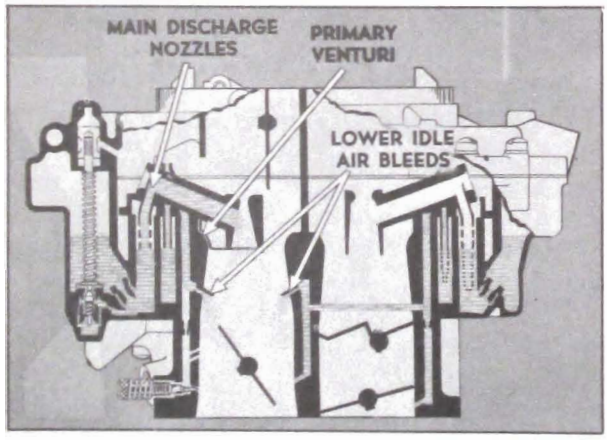


Figure 3-78—Primary Main Metering System

The main discharge nozzle is designed so that if any vapor bubbles are formed in the hot gasoline the vapors will follow the outside channel around the main discharge nozzle and escape through the high speed bleeder instead of passing through the main discharge jet.

The main metering systems in the *primary* section control the flow of fuel during the intermediate or part throttle range of operation and up to approximately 85 MPH when the car is accelerated gradually. The *secondary* throttle valves remain closed until the primary valves have opened approximately 40-44 degrees, after which they are opened proportionately so that all valves reach the wide open position at the same time. While the secondary throttle valves are closed, the auxiliary valves located above them are held closed by the counterweight on the auxiliary valve shaft lever (fig. 3-78); therefore, there is not sufficient air flow through the barrels to operate the main metering systems in the *secondary* section.

When the *secondary* throttle valves are open and engine speed is about 2000 RPM, the resulting air flow through the secondary barrels forces the auxiliary valves open because their supporting shaft is located off-center in the barrels. When the auxiliary valves are open the main metering systems in the *secondary* section also supply fuel to the engine. See figure 3-79.

e. Operation of the Power System

For maximum power under load or for all speeds above approximately 90 MPH, a richer mixture is required than that necessary for normal throttle opening. This additional fuel is provided by one power system connected to the main metering systems in the primary section of the carburetor. See figure 3-79.

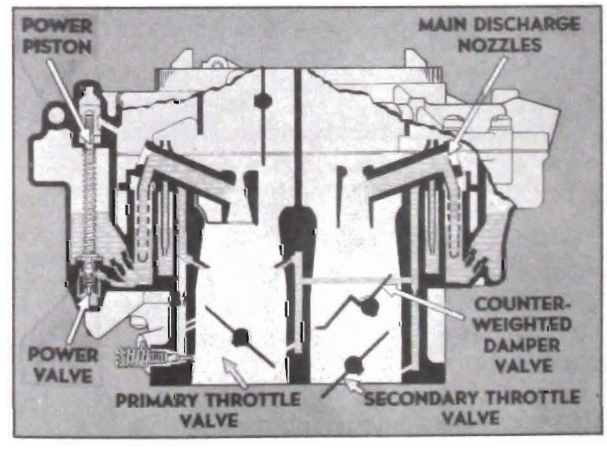


Figure 3-79—Main Metering and Power Systems

The power piston cylinder in the air horn of the carburetor is connected by a channel to the face of the mounting flange so it is subject to intake manifold vacuum. At part throttle position the vacuum is sufficient to hold the power piston in its "up" position against the tension

of the piston spring. When the throttle valves are opened to a point where manifold vacuum drops to approximately 9 to 7 inches of mercury and additional fuel is required for satisfactory operation, the piston spring moves the power piston down to open the power valve. This allows additional fuel to enter the main discharge nozzles in the primary section through calibrated restrictions located below the main metering jets. See figure 3-79.

f. Operation of the Accelerating System

For smooth and rapid acceleration it is necessary to supply an extra quantity of fuel momentarily when the throttle is opened suddenly. This is accomplished by one accelerating pump piston which is directly connected to the primary throttle shaft lever by means of a rod and pump lever.

When the throttle is closed, the pump piston moves up and draws a supply of fuel from the float chamber through the inlet strainer, past the inlet ball check valve and into the pump cylinder. When the throttle is opened, the piston on its downward stroke exerts pressure on the fuel which closes the inlet check ball and opens the outlet check ball. A metered quantity of fuel is then discharged through the pump discharge nozzles into each barrel in the primary section of the carburetor. This occurs only momentarily during the accelerating period. The pump duration spring which is compressed by the downward movement of the pump linkage against the resistance of the fuel provides a follow-up action so that the discharge carries out over a brief period of time. A ball check in the accelerator pump plunger acts as a vapor vent to prevent vapor pressure from forcing fuel from the pump discharge holes during extreme heat periods. Downward movement of the plunger, however, seats the ball and allows normal operation of the accelerating system. See figure 3-80.

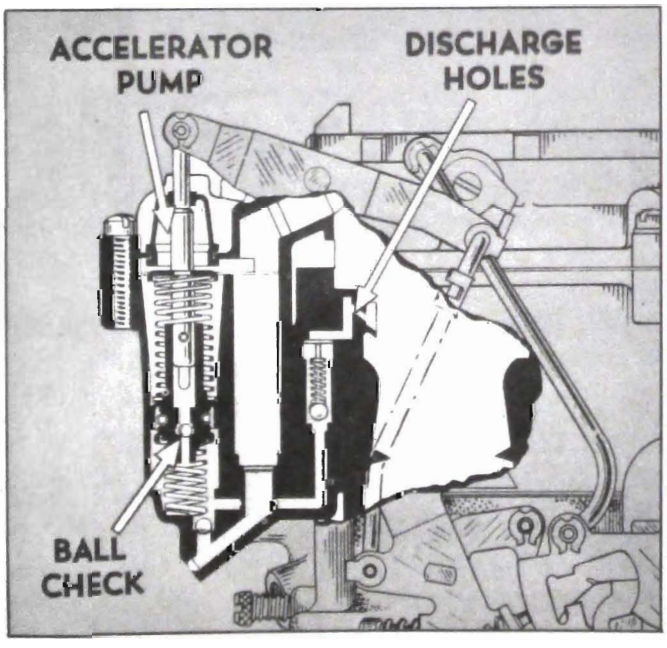


Figure 3-80—Accelerating System

When the desired speed is reached and the throttle is held in a fixed position, the pressure on the fuel decreases sufficiently so that the outlet check ball closes and fuel ceases to discharge from pump nozzles. Thus a quantity of fuel is maintained in the channel adjacent to the outlet check ball where it is immediately available for future requirements.

3-28 DESCRIPTION AND OPERATION OF ROCHESTER AUTOMATIC CHOKE

a. General Description

The automatic choke mechanism is contained in the *primary* section of the carburetor. It consists of a choke valve mounted on a shaft in the carburetor air horn connected through linkage to a thermostat mounted on the carburetor main body. The thermostat contains a bi-metal spring and a vacuum actuated piston. A fast idle rod connects the choke valve to a fast idle cam on the throttle body. A heat pipe connects the choke housing to a heat stove in the right exhaust manifold.

The choke valve is mounted off-center in the choke stem so that the force of the air stream passing through the air horn tends to move the valve to the open position. A short lever mounted on the choke stem in the choke housing is engaged by the free outer end of the thermostat which, when cold, tends to close the choke valve. The piston, which is actuated by intake manifold vacuum, is connected by a link to the short lever on the choke stem and tends to open the choke valve when the engine fires.

The heat stove in the exhaust manifold heats the air which is drawn through it and the heat pipe into the choke housing. Restrictions in the choke housing permit manifold vacuum to draw the air into the choke housing to heat the thermostat.

The fast idle cam is connected by the fast idle rod to a lever on the outer end of the choke

stem so that it is rotated as the choke valve moves. In closed throttle position, the fast idle screw bears against one edge of the fast idle cam which has a number of steps of different heights to give different amounts of throttle opening, depending on positions of the cam and choke valve.

b. Choke Operation—Cold Engine

When the engine becomes cold the choke thermostat also becomes cold and increases its spring tension sufficiently to close the choke valve. It is prevented from closing the valve, however, because the fast idle screw holds the fast idle cam in the slow idle position; consequently, the choke valve is held partially open.

When the accelerator pedal is depressed to start the engine, the throttle stop screw is lifted clear of the fast idle cam and the thermostat then closes the choke valve. When the engine starts, intake manifold vacuum causes the piston to partially open the choke valve against the spring tension of the thermostat, thereby admitting sufficient air to give a satisfactory running mixture.

When the accelerator pedal is released after starting the engine, the fast idle screw comes to rest against a step of fast idle cam which was rotated to the fast idle position by the closing of choke. This provides proper throttle opening to prevent stalling of the cold engine.

If the throttle is partially opened while the running engine is cold, the increased force of air flow against the off-set choke valve will open the valve against the spring tension of the thermostat. These opposing forces balance the choke valve at a position which provides the required choke action without causing loading or an excessively rich mixture.

c. Choke Operation—Warm-Up Period

As the engine and exhaust manifold warm up, warm air is drawn through the heat pipe into the choke housing by manifold vacuum. This warms the thermostat, causing it to reduce its spring tension on the choke valve in proportion to the increase in temperature. This, in turn, allows the choke valve to be opened by the combined forces of air velocity on the valve and vacuum on the choke piston.

When the throttle is opened and the fast idle screw is lifted from the fast idle cam, the fast idle rod and cam drop by their own weight to bring a lower step into position for the throttle stop screw. The engine will then run at a lower speed at closed throttle.

d. Choke Operation—Hot Engine

When the engine reached normal operating temperature, the choke thermostat is heated to the point where it no longer exerts any spring tension on the choke valve. The choke valve is in the wide open position and the fast idle cam is in the slow idle position so that the fast idle screw misses the cam completely. The throttle stop screw now takes over in determining curb idle speed.

e. Choke Unloader Operation

If the engine becomes flooded for any reason, the choke valve can be partially opened by depressing the accelerator pedal to the full extent of its travel. This causes a tongue or arm on the throttle lever to contact and rotate the fast idle cam, which forces the choke valve open.

f. Secondary Lock-out Operation

The *secondary* section does not have a choke valve in the air horn. In order to prevent air entering the carburetor through the secondary side during the engine warm-up period it is necessary to block the movement of the secondary throttle valves by means of the lock-out slot in the fast idle cam.

When the choke valve is in any position except wide open, it holds the fast idle cam up from its lowest position. This causes a lock-out slot in the fast idle cam to engage a tang on the secondary throttle shaft lever which prevents the secondary throttle valves from opening.

When the choke is wide open the fast idle cam and lock-out slot plate drops to its lowest position; the secondary throttle shaft tang is then free to move along a contour in the fast idle cam and the secondary valves can open.

3-29 ADJUSTMENT OF FAST IDLE CAM, CHOKE UNLOADER, AND SECONDARY THROTTLE LOCK-OUT

1. Close throttle so that fast idle screw contacts second step of fast idle cam with side of screw against high step of cam, then check clearance between choke valve and air horn dividing wall using (.140") end of Gauge J-6152. See figure 3-81.

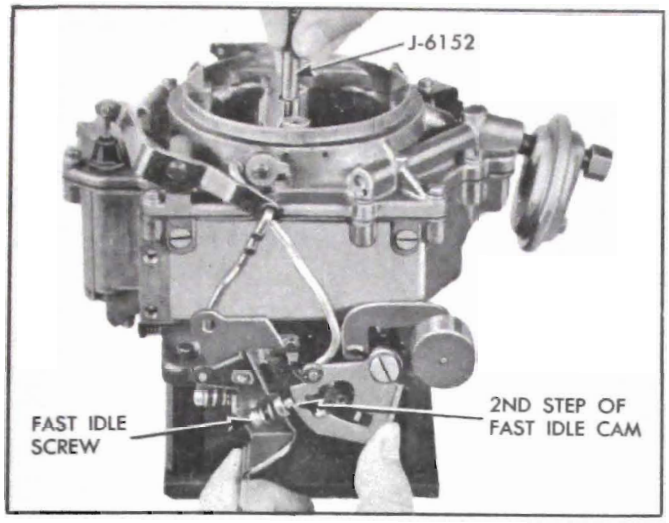


Figure 3-81—Checking Fast Idle Cam Adjustment

2. If choke valve clearance is not correct, bend choke rod as required to obtain this clearance using Tool J-4552. See figure 3-82.

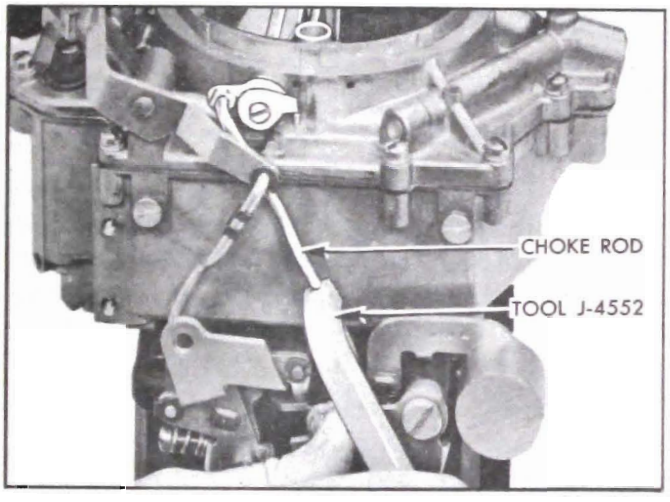


Figure 3-82—Adjusting Fast Idle Cam

3. Fully open throttle so that throttle arm contacts unloader tang on fast idle cam, then check clearance between choke valve and air horn dividing wall using .115" end of Gauge J-6152. See figure 3-83, (View A).

4. If choke valve clearance is not correct, bend unloader tang as required to obtain specified clearance using Tool J-5197. See figure 3-83, (View B).

5. Close choke valve so that secondary throttle lock-out tang is in lock-out slot of fast idle cam. Check clearance between tang and upper edge of slot using .015" end of Gauge T-109-44. See figure 3-84, (View A).

6. If clearance between tang and lock-out slot is not correct, bend tang as required to obtain this clearance using Tool J-6058A. See figure 3-84, (View B).

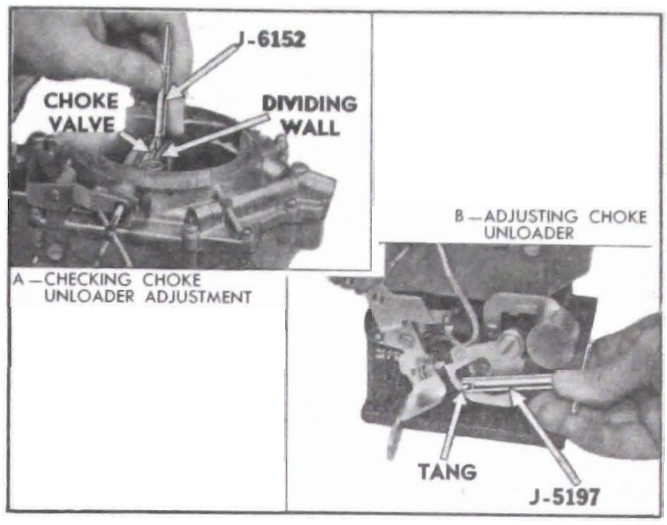


Figure 3-83—Choke Unloader Adjustment

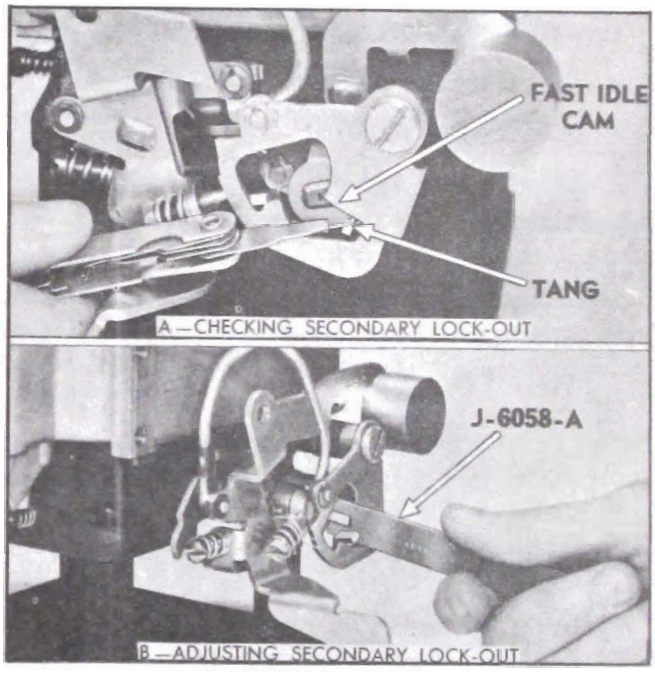


Figure 3-84—Secondary Lock-Out Adjustment

7. Fully open choke valve so that fast idle cam falls to its lowest position. Then open throttle so that secondary lock-out tang follows contour portion of fast idle cam. With choke held wide open, check clearance between lock-out tang and contour portion of cam using .030" end of Gauge J-1388. See figure 3-85.

8. If clearance between tang and contour is not correct, bend tang as required to obtain this clearance using Tool J-6058A.

9. If adjustment was necessary to correct lock-out tang to *contour clearance*, the tang to *lock-out slot clearance* should be rechecked (sub par. 6 & 7) to be sure it was not disturbed.

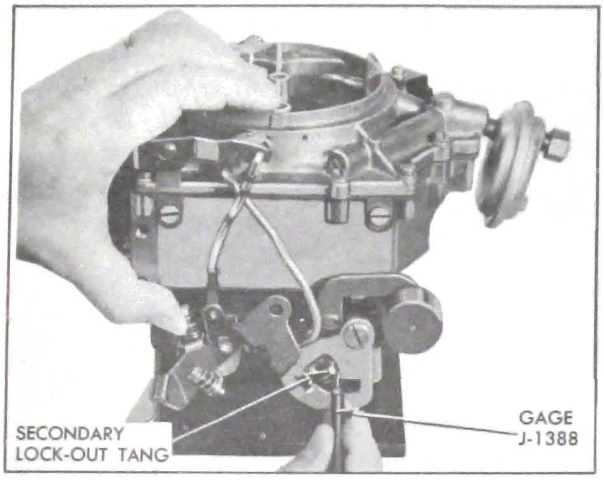


Figure 3-85—Secondary Contour Adjustment

3-30 DISASSEMBLY, CLEANING, AND INSPECTION OF ROCHESTER 4-BARREL CARBURETOR

a. Disassembly of Carburetor

1. Remove fuel filter.

2. Remove spring clip from upper end of intermediate choke rod. Then remove intermediate choke rod. See figure 3-86.

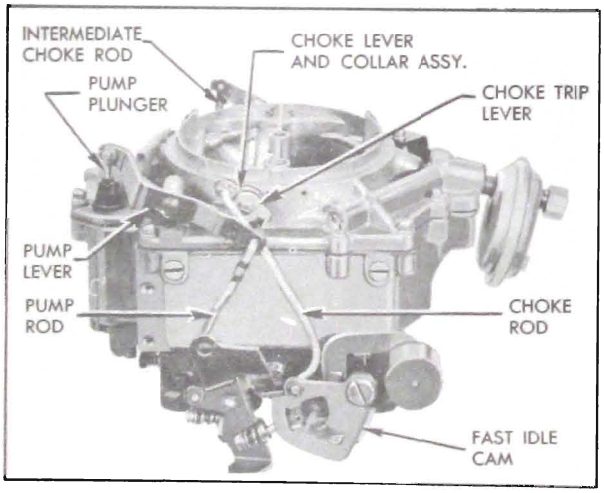


Figure 3-86—Exterior Linkage

3. Remove spring clip from lower end of pump rod. Remove horseshoe clips from pump lever shaft and pump plunger. Then remove pump lever and rod as an assembly.

4. Remove choke trip lever and attaching screw. Remove fast idle cam attaching screw. Then remove choke lever and collar assembly, choke rod, and fast idle cam as an assembly. See figure 3-86.

5. Remove two choke valve attaching screws. Remove choke valve from slot in shaft. Then remove choke shaft.

6. Remove all air horn screws, then carefully lift air horn straight up from main body to avoid damaging floats, pump plunger, and vacuum power piston which are attached to air horn. See figure 3-87.

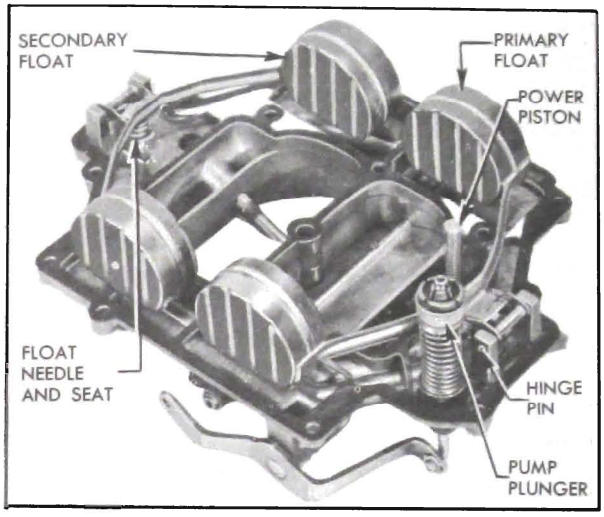


Figure 3-87—Air Horn Parts

7. Remove float hinge pin, float, and needle from inlet side (secondary). Then remove inlet needle seat and gasket. Remove fuel inlet strainer. NOTE: *Keep secondary float system parts separate from primary float system parts.*

8. Remove float hinge pin, float, needle, needle seat, and gasket from pump side (primary). Then remove fuel inlet strainer. See figure 3-87.

9. Remove power piston assembly by compressing spring and letting it snap repeatedly until hammering action of power piston drives staked retaining disc from air horn. NOTE: It may be necessary to remove burs if heavy staking is encountered.

10. Remove pump plunger assembly and rubber boot from air horn. Remove air horn gasket.

11. Remove thermostat cover screws and retainers. Remove thermostat cover assembly and gasket. Remove choke baffle plate. Remove choke piston lever screw and take choke piston, piston pin, connecting link, and lever from thermostat housing as an assembly. Then remove piston pin and piston.

12. Remove screws holding thermostat housing to main body. Remove thermostat housing and gasket. Then remove choke intermediate lever and shaft from choke housing.

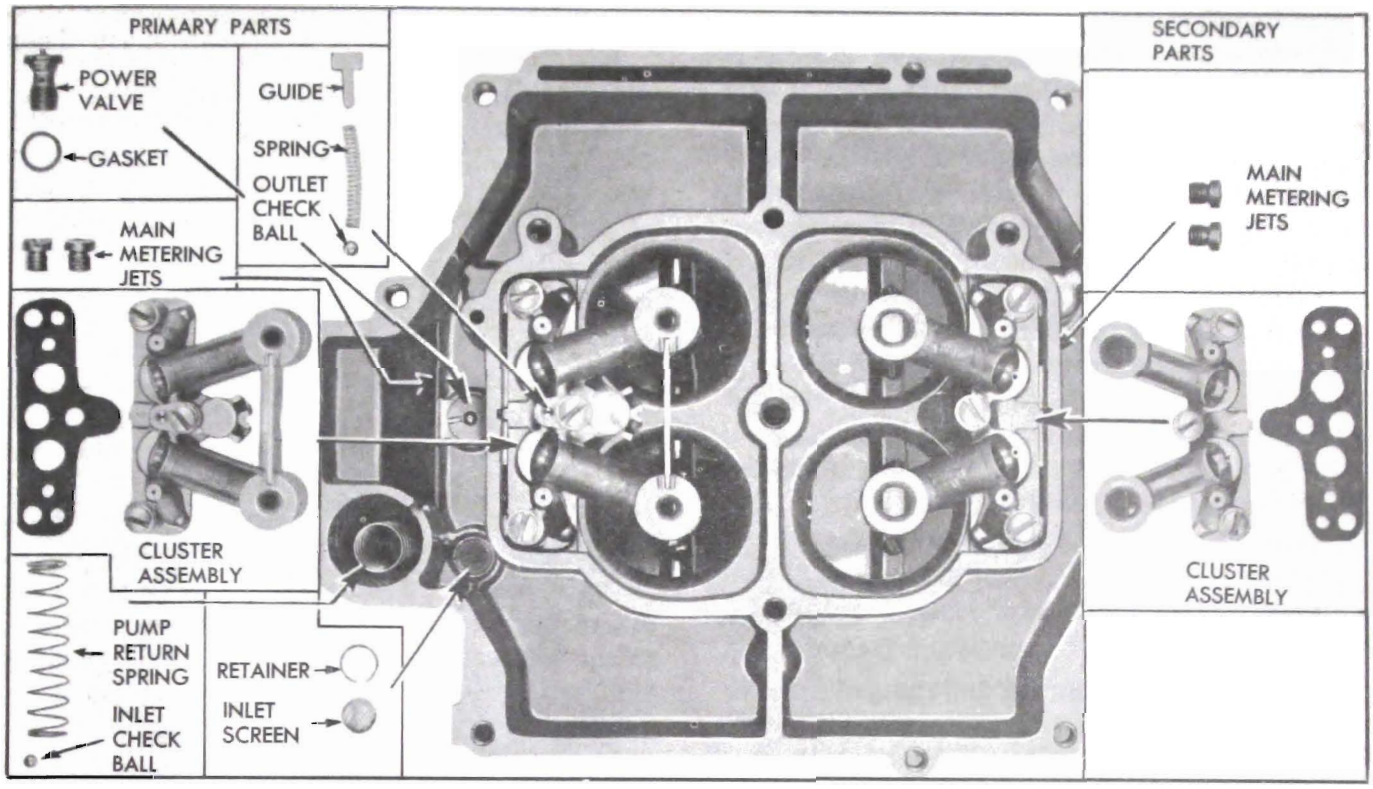


Figure 3-88—Main Body Parts

13. Remove attaching screws from cluster assembly on pump side of carburetor (primary). Then carefully remove cluster assembly and gasket. NOTE: *Keep primary main body parts separate from secondary main body parts as they are all different.*

14. Remove both main metering jets from pump side of main body. See figure 3-88.

15. Remove power valve and gasket from pump side.

16. Remove pump return spring from pump plunger well and outlet check ball spring guide from outlet well using needle-nosed pliers for both. Then lift out outlet check ball spring. Carefully invert carburetor main body and catch aluminum pump inlet check ball and larger steel pump outlet ball in hand.

17. If necessary, remove pump inlet screen and retainer from bottom of float bowl. NOTE: *If screen is not visibly damaged or plugged, it need not be removed.*

18. Remove secondary cluster assembly screws, cluster assembly and gasket. Remove both secondary main metering jets.

19. Invert carburetor. Remove starter switch screws and remove terminal cap, return spring, guide block assembly, plunger, and ball from throttle body. NOTE: If starter switch strainer is not visibly damaged or clogged, it need not be removed.

20. Remove idle mixture adjusting needles and springs. Remove vacuum line fitting. Remove throttle stop screw, fast idle screw and springs from throttle lever.

21. Remove throttle body to main body screws. Remove throttle body and gasket.

22. Turn throttle body right side up. Remove auxiliary throttle valve screws, throttle valves, and shaft. NOTE: *The throttle body assembly consisting of the body, primary and secondary throttle valves, shafts, levers, and springs is serviced as a unit. The throttle body should not be disassembled further for normal cleaning and inspection.*

b. Cleaning Carburetor Parts

Regardless of the number of new parts that are used in rebuilding a carburetor, the job in the end will not be satisfactory unless all metal parts are thoroughly cleaned. Because of the nature of carburetor parts, with numerous small passages subject to fouling due to tenacious carbon and gum deposits, ordinary cleaning processes are entirely inadequate. The correct procedure is to use a cleaning bath in which metal parts can be immersed and "soaked" for sufficient time after disassembly to thoroughly clean all surfaces and channels.

Bendix Metalclene has been developed especially for cleaning carburetors, and is recommended for this purpose. Regardless of the cleaning material used, however, be sure to thoroughly rinse the parts in kerosene, distillate, or white gasoline to remove all gummy deposits that have been softened by the cleaner.

c. Inspection of Carburetor Parts

After cleaning, all parts should be carefully inspected for wear or damage as follows:

1. *Choke Parts.* It is very necessary for the vacuum piston and cylinder to be clean and free of burrs or scores. Do not use any abrasive material for cleaning these parts.

Check clearance of choke stem in bearings of air horn. If stem or bearings are worn so that excessive clearance exists, replace the worn parts. Make sure that bearings are free of gum.

If thermostat is distorted or damaged it must be replaced with a new thermostat cover with thermostat assembly. The thermostat is not furnished separately because the index mark is stamped on cover after installation of thermostat, to insure proper calibration.

2. *Float Needle Valve and Seat.* Because of the wear that normally occurs in these parts and the necessity of having a tight seating valve, it is advisable to replace these parts if the carburetor has been used for considerable mileage. Even if mileage is low, replace these parts if needle is grooved or seat is damaged.

3. *Vacuum Power Piston and Power Valve.* Make certain that the surface of the piston is thoroughly clean. Do not use any abrasive material for polishing the piston surface. Inspect for wear or damage. Replace if necessary. Test power valve for tight seating by sucking on the upper end. Replace if doubtful.

4. *Main Body.* Make certain the main body is thoroughly clean and that all passages are free of foreign material.

5. *Cluster Assemblies.* Inspect each main discharge nozzle and venturi for damage. Check idle jet tubes and upper idle air bleeds by looking through tubes toward a light. NOTE: *If any part of a cluster assembly is damaged, the whole cluster assembly must be replaced as a unit.*

6. *Pump Piston and Check Valve Balls.* Inspect pump piston leather for cracks, creases, turned edges, or other damage. Test relief valve in piston for tight seating by blowing on lower end of piston; if valve is seating tightly it will not be possible to blow through it.

It is advisable to replace pump inlet and discharge channel check valve balls since these parts are small and difficult to inspect.

Inspect check valve ball seats in main body with a good light. If a seat appears rough, place ball in seat and tap lightly to swage a good seat, then discard the ball.

7. *Idle Discharge Holes and Idle Needle Valves.* Be sure that the idle discharge holes, the air bleeders, and the barrels of the throttle valve body are clean of all carbon deposits. A comparatively smali amount of carbon in barrel may have the effect of decreasing the bore sufficiently to prevent the throttle valves from resting at the correct angle when closed. This can have serious effects on performance because the distance from the throttle valve, when closed, to the edge of the idle discharge hole must be kept within close limits to the established dimension.

Make sure that the holes drilled through each barrel of the throttle body are clear. These holes permit vapors to escape rather than rising into the air cleaner when engine is stopped.

Inspect seats for idle needle valves for scoring or other damage. If ends of needle valves are grooved or bent, replace the valves.

8. *Throttle Valves, Throttle Levers and Shafts.* See that throttle valves are not bent and do not have burrs or sharp edges.

Inspect throttle lever and shaft assemblies for wear on bearing surfaces. Check pump rod hole for wear and also see that levers are not loose on shafts.

Check action of throttle valves and shafts for free movement. Check for correct wide open position and for correct alignment in throttle bore when closed.

NOTE: *If throttle valves or shafts are damaged or worn excessively, the throttle body and valve assembly must be replaced as a unit.*

9. *Accelerator Vacuum Switch.* Disassemble, clean, inspect, and re-assemble vacuum switch as described in paragraph 10-30.

3-31 ASSEMBLY AND ADJUSTMENT OF ROCHESTER 4-BARREL CARBURETOR

a. Assembly of Carburetor

When assembling the carburetor use all new gaskets and any additional new parts found to be necessary during inspection. *Calibrated parts*

must be as specified for carburetor CODE number.

1. Install auxiliary throttle shaft. Install fast idle cam attaching screw without fast idle cam, then check vertical measurement from shoulder of screw to top edge of counterweight lever using number one (51/64) end of Gauge J-6153. See figure 3-89, (View B).

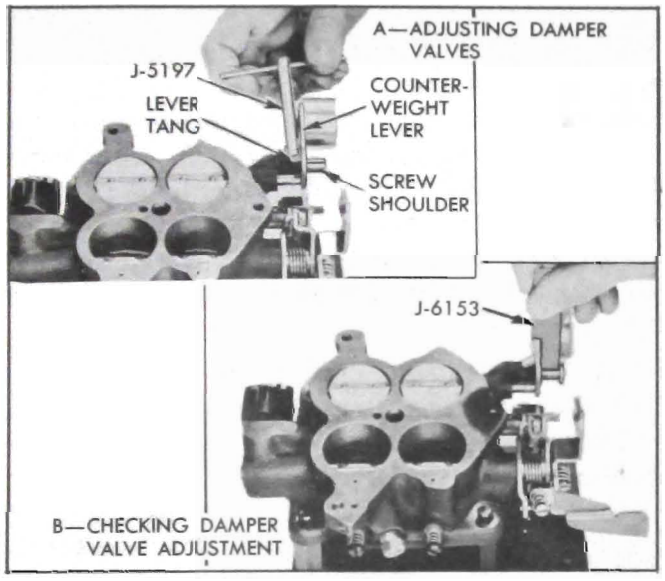


Figure 3-89—Damper Valve Adjustment

2. If counterweight lever position is not correct, bend lever tang as required to obtain this measurement using Tool J-5197. See figure 3-89, (View A).

3. With lever still in this position, install auxiliary (damper) valves and screws loosely. Then align valves, seat them against outside of bore, and tighten screws.

4. Measure from shoulder of screw to top edge of counterweight lever using number two (53/64) end of Gauge J-6153. See figure 3-89, (View B).

5. Re-bend lever tank to obtain this measurement using Tool J-5197. This adjustment is necessary to prevent auxiliary valves from striking throttle bores. *Valves must be free of binding throughout entire range of travel.*

6. Place *new* gasket on inverted main body and install throttle body assembly and screws.

7. Install fast idle screw (hex head screw) and spring. Install throttle stop screw (round head screw) and spring. Install vacuum line fitting. Install both idle mixture needles and springs. Seat both needles lightly and back out 1¼ turn, which will provide an average starting adjustment. *Forcing needles hard against seats will score them and ruin them for service.*

8. Install new starter switch strainer if old strainer was removed. Install starter switch ball, plunger guide block assembly, spring, terminal cap, and screws in throttle body. See figure 10-27. Check switch timing as described in paragraph 10-30.

9. Place throttle body and main body assembly in upright position on bench or mounting fixture. Install secondary cluster assembly with screws and lock washers using new gasket. *This cluster has no pump discharge nozzles or deflector plate.*

10. Install all four main metering jets. These jets have tapered seats and do not require gaskets. NOTE: The *primary* jets are the two having the *smaller* metering holes and are installed in the pump side of the main body.

11. Install pump outlet ball check. *This is a steel ball and is larger than the pump inlet ball.* Install pump outlet ball check spring and spring guide.

12. Install primary cluster assembly, screws, lock washers, and new gasket in pump side of the carburetor.

13. Install new pump inlet screen and retainer if old screen was removed.

14. Install pump inlet ball check (aluminum) and pump return spring. NOTE: *Never substitute a steel ball for the aluminum ball.*

15. Install power valve and gasket.

16. Assemble choke piston and pin to choke inner lever and connecting link, making sure that flat on piston is opposite from tang on lever. Then install in thermostat housing. Install thermostat outer lever and shaft and connect to inner lever with screw. *Do not use lubricant of any kind on piston or in cylinder.*

17. Install thermostat housing and new gasket with two screws.

18. Install choke baffle plate. Install choke cover and gasket. Rotate counterclockwise until index marks align and choke valve is just closed, then tighten screws and retainers. See paragraph 3-8.

19. Install pump plunger assembly and rubber boot in inverted air horn. Install power piston assembly and stake securely in air horn. *Power piston must be free in any position.*

20. Install new air horn gasket. Install fuel inlet strainers. Install float needle seats and gaskets. Install float needles, floats, and hinge pins. NOTE: *All primary and secondary float system parts should go back in their same positions.*

21. Adjust primary and secondary floats as follows:

(a) With air horn inverted and gasket in position, place Float Gauge J-6151 ($1\frac{35}{64}$" over highest part of each float. See figure 3-90.

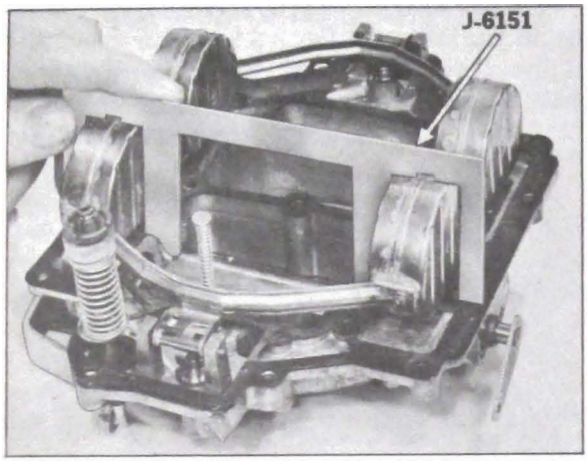


Figure 3-90—Float Adjustment

(b) Bend float arm near inner end until float just touches gauge. Then bend arm sideways until float is centered between gauge legs. *Centering adjustment must not change height setting.*

(c) Hold air horn *upright* and measure from gasket to bottom of float. Bend float arm tang as required to obtain $2\frac{1}{4}$" measurement. See figure 3-91.

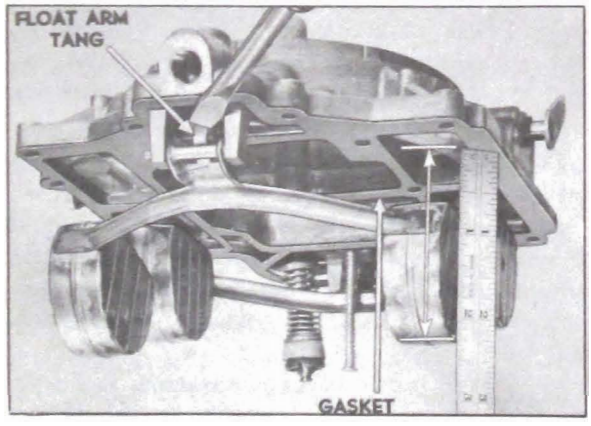


Figure 3-91—Float Drop Adjustment

22. Install air horn assembly on main body, using care to avoid distortion of float assemblies and making certain that pump piston leather washer does not have any creases or curled edges when it is inserted in cylinder. Install air horn screws and tighten evenly.

23. Install choke shaft and lever. Install choke valve with "RP" up and install screws loosely. Center choke valve by pushing up and in on choke shaft lever and tighten screws. Recheck for uniform clearance and freedom from sticking, as improper fit may cause hard starting.

24. Install fast idle cam and screw, choke rod, and choke lever and collar. Install choke trip lever on end of choke shaft with "RP" out and tighten attaching screw.

25. Install accelerator pump lever and rod. Install large horseshoe clip on pump lever shaft and small horseshoe clip on upper end of pump plunger. Install spring clip on lower end of pump rod. NOTE: *Horseshoe clips must be closed slightly after installing to prevent falling off.*

26. Push fast idle cam to full down position and back-out throttle stop screw until throttle valves can be completely closed. With throttle held closed, measure vertically from under side of pump plunger offset to air horn casting. Bend pump rod as required to obtain $1\frac{3}{32}$" measurement using Tool J-4552. See figure 3-92.

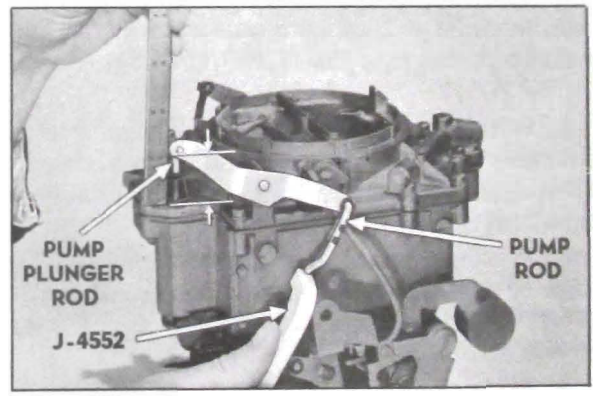


Figure 3-92—Pump Rod Adjustment

27. Turn throttle stop screw in (from fully closed throttle position) one turn which will provide a starting adjustment. For a more accurate preliminary adjustment, place .020" end of Gauge J-1388 between throttle valve and body. Install intermediate choke rod and spring clip.

28. Install fuel filter, using a suitable thread sealer on the nipple threads.

29. Adjust fast idle cam, choke unloader, and secondary throttle lock-out as described in paragraph 3-29.

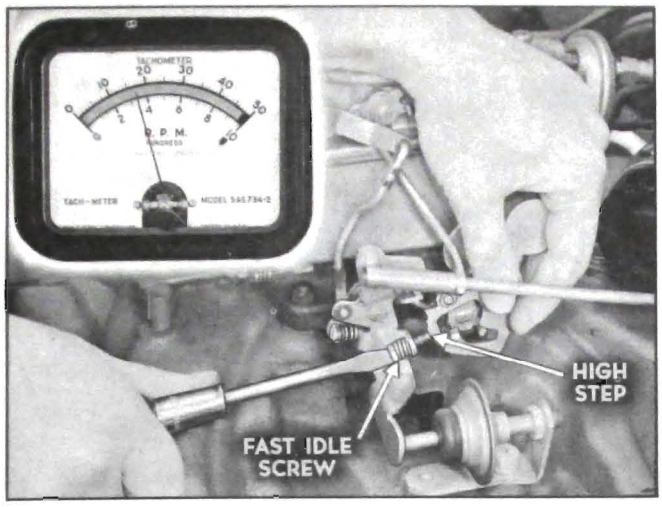


Figure 3-93—Adjusting Fast Idle

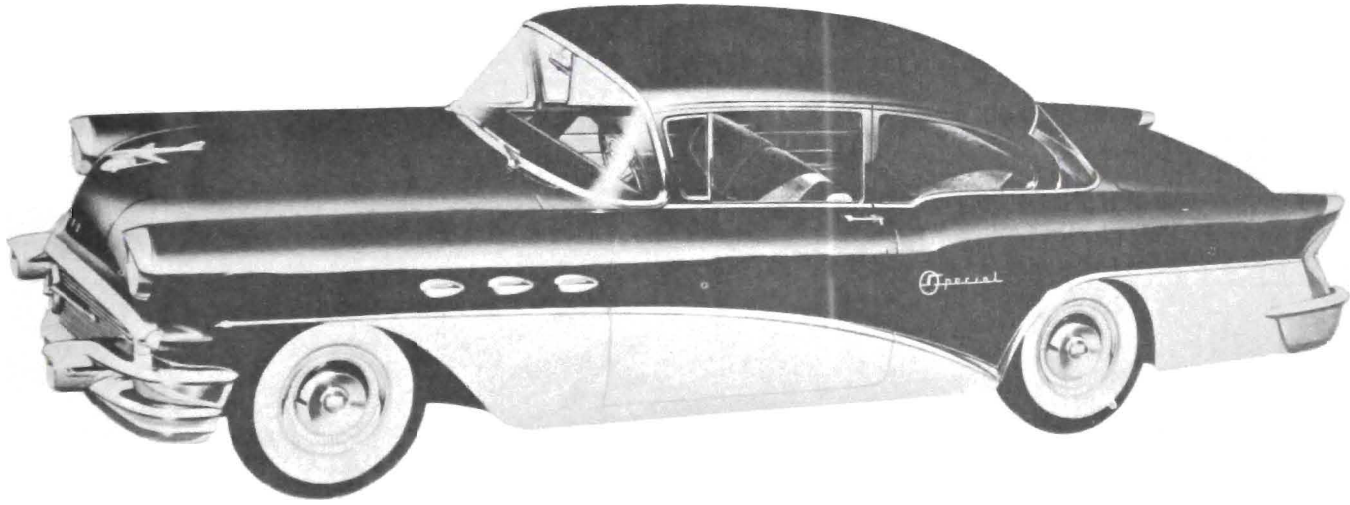
30. Make fast idle adjustment on car with engine at normal operating temperature as follows:

a. Push fast idle cam to full up position so that fast idle screw contacts high step of cam. See figure 3-93.

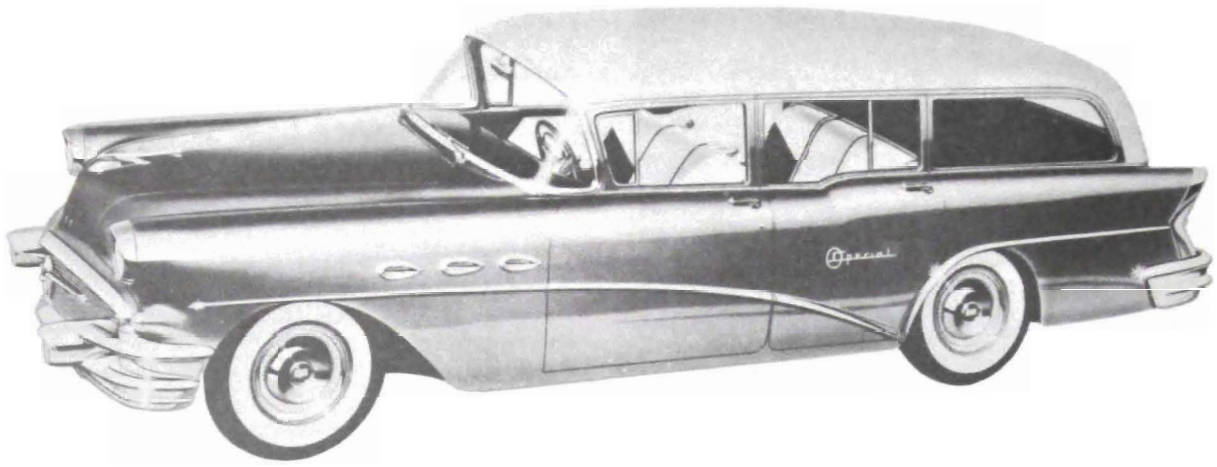
b. Adjust fast idle screw until engine is running 1700 RPM.

31. Make final idle speed and mixture adjustments on car in the normal manner. See paragraph 3-8.

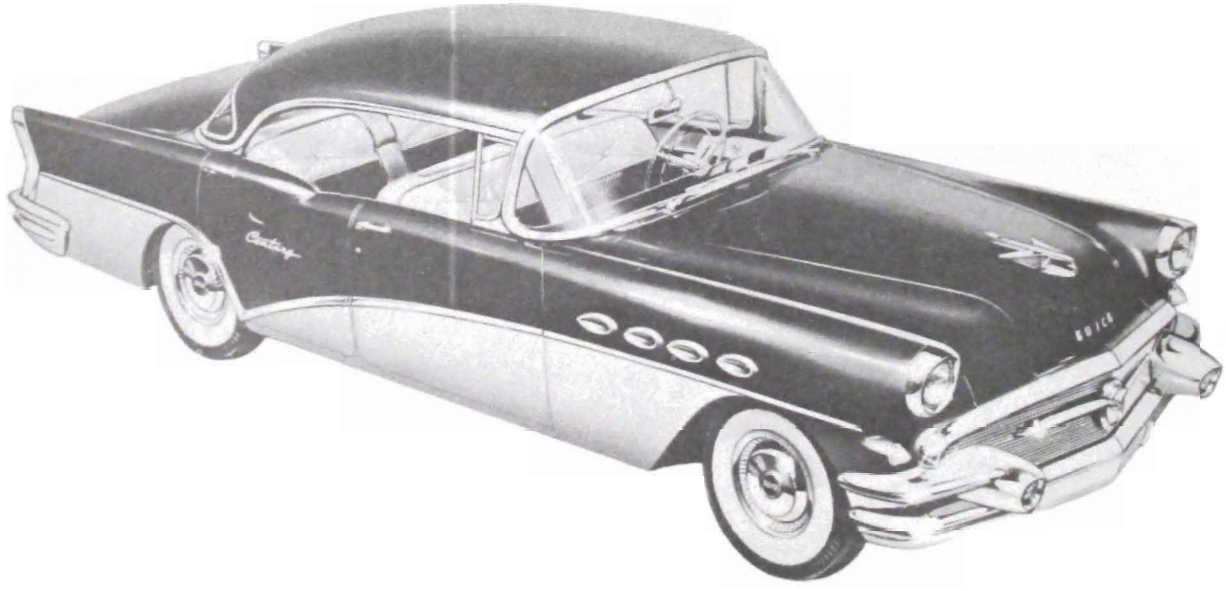
32. Check for proper fuel level in both bowls by removing sight plugs with engine idling. Fuel level should be just in the lower threads at bottom of holes.



Model 48



Model 49



Model 63