Chapter Eleven

Fuel System

This chapter includes service procedures for the flame arrestor, carburetor, fuel pump and connecting lines. Regular maintenance to the fuel system is limited to replacing the fuel filter, cleaning the flame arrestor and adjusting the carburetor, as described in Chapter Four.

FLAME ARRESTOR

Removal/Installation

1. Remove the engine cover and place to one side out of the way.

2. Disconnect the crankcase vent hose(s) at the flame arrestor or valve cover.

Remove the nut holding the flame arrestor/cover to the carburetor air horn (Figure 1).
 Remove the flame arrestor/cover from the carburetor.

5. Separate cover from flame arrestor, if used.

6. Installation is the reverse of removal.

Cleaning

Clean flame arrestor in kerosene, carburetor cleaner or other commercial solvent. Do not use gasoline as a solvent-it is an extreme fire hazard in an open container. 1. Remove flame arrestor as described in this chapter.

2. Submerge flame arrestor in a container of clean solvent for several minutes to let it penetrate dirt, dust and other contaminants.

3. Slosh flame arrestor in the solvent container and resubmerge for a few minutes.

4. Remove flame-arrestor from solvent and allow it to drain, then blow dry with compressed air.

FUEL QUALITY

The fuel used plays a large role in satisfactory engine performance. In most temperate climates, fuel will start to break down after it's been in the fuel tank about 4 months. When this happens, it forms a gum-like substance that settles at the bottom of the tank where it can clog the in-tank filter. If drawn out of the tank by the fuel pump, this substance will affect the fuel filter and start to clog the jets and small passages inside the carburetor. At the same time, the fuel gives off an odor similar to that of rotten eggs.

You should drain the fuel tank whenever the boat will not be used for a time. The gasoline can be used in an automobile without harm, since it will be burned within a few days. If it is not possible to drain the tank, Mercury recommends the use of Quicksilver gasoline stabilizer and conditioner (or equivalent) to prevent the fuel from spoiling.

Some gasolines sold for marine use may contain alcohol, although this fact may not be advertised. Using such fuels is not recommended, unless you can determine the nature of the blend. A mixture of 10 percent ethyl alcohol and 90 percent unleaded gasoline is called gasohol. While it will provide satisfactory service in engines built after 1974, Mercury Marine does not recommend its use.

Fuels with an alcohol content tend to slowly absorb moisture from the air. When the moisture content of the fuel reaches approximately one percent, it combines with the alcohol and separates from the fuel. This separation does not normally occur when gasohol is used in an automobile, as the tank is generally emptied within a few days after filling it.

The problem does occur in marine use, however, because boats often remain idle between start-ups for days or even weeks. This length of time permits separation to take place. The water/alcohol mixture settles at the bottom of the tank where the fuel pickup carries it into the fuel line. Since an engine will not run on this mixture, it is necessary to drain the fuel tank, flush out the fuel system with clean gasoline and then remove and clean the spark plugs before the engine can be started. If it is necessary to operate an engine on gasohol, do not store such fuel in the tank(s) for more than a few days, especially in climates with high humidity.

Other problems which have been identified with the use of misblended alcohol/gasoline fuels include:

- a. Corrosion formation on the inside of fuel tanks and steel fuel lines.
- b. Corrosion formation inside carburetors. Zinc alloys (Holley carburetors) and aluminum alloys (Carter carburetors) are especially susceptible.
- c. Deterioration and failure of synthetic rubber/plastic materials such as O-ring seals, diaphragms, accelerator pump cups and gaskets.
- d. Premature failure of fuel line hoses.

CARBURETOR FUNDAMENTALS

A gasoline engine must receive fuel and air mixed in a precise proportion in order to operate



efficiently at various speeds. At sea level, under normal conditions, the ratio is 14.7: 1 at high speed and 12: 1 at low speeds. Carburetors are designed to maintain these ratios while providing for sudden acceleration or increased loads.

A mixture with too much fuel is said to be "rich." One with to little fuel is said to be "lean." Incorrect mixture proportions can result from a variety of factors such as a dirty flame arrestor, defective choke, improperly adjusted idle mixture or speed screws, a leaking needle valve or a float that has absorbed fuel.

The choke valve in a carburetor provides a richer than normal mixture of fuel and air until the engine warms up. If the choke valve sticks in an open position, the engine will not start properly. A choke that sticks in a closed position will cause a flooding condition.

The throat of a carburetor is often called a "barrel." A single-barrel carburetor has only one throat. Two-barrel carburetors have 2 throats and 2 complete sets of metering devices, but only one float bowl and float. A 4-barrel carburetor has 4 throats, 4 complete sets of metering devices and 2 floats.

CARBURETORS

During the years covered by this manual, the following carburetors have been used:

- a. Rochester B and BC 1-bbl.
- b. Carter RBS 1-bbl.
- c. Mercury MD 1-bbl.
- d. Rochester 2GC and 2GV 2-bbl.
- e. MerCarb 2-bbl.
- f. Holley 2300 and 6317 2-bbl.



- g. Rochester 4GV 4-bbl.
- h. Rochester 4MV and 4MY 4-bbl.
- i. Holley 4160, 6407 and 6576 **4-bbl**.

Removal, overhaul and installation procedures are provided for all models.

WARNING

Carburetors used on *Mercruiser* engines are designed for marine use. Do not substitute an automotive carburetor. Fuel vapors escaping from such carburetors can create a fire or explosion hazard.

Carburetor specifications vary with type and model year. The necessary specifications are provided on instruction sheets accompanying overhaul kits, along with any specific procedures required for adjustment.

The carburetor model identification may be stamped on the carburetor main body/air horn casting, or on a tag attached to the carburetor by one of the air horn screws (**Figure** 2). This information is necessary to obtain the proper overhaul kit.

Troubleshooting

MerCarb Acceleration "Bog"

Owners of MCM 120R/ 140R/ 170MR/ 470R/ 200MR/ 898R models may experience engine "bog" on acceleration. The cause of the problem is the neoprene seal on the accelerator pump, which expands when gasoline blended with alcohol is used. To alleviate the problem, install accelerator pump kit part No. 3302-9046 and check the quality of fuel used. *See Fuel Quality* in this chapter.

Carburetors with a date code 4501 stamped on the body casting (built after May 1, 1984) have the kit installed in the carburetor and should not encounter this problem unless fuel with an excessive quantity of alcohol is used.

MerCarb Right Turn Lean-out

Owners of MCM 120R and 140R engines may experience hesitation during a hard right turn. The problem affects carburetors with a build date prior to 4801 (built before August 1, 1984). Such carburetors use a spring-loaded inlet needle. To solve the problem, install a new inlet seat kit (part No. 3302-9407). This contains a solid, 2-piece inlet needle. Reset the float level to 5/16 in. using the procedure which accompanies the kit.

No Idle Mixture Adjustment (MerCarb Carburetor)

Owners of MCM 120R/ 140R/ 170MR/ 470R/ 200MR/ 898R models may find that the carburetor does not respond to idle mixture screw adjustment. This can be caused by overadjustment of the idle speed screw to keep the engine running in forward gear. When this is done, the throttle plates have started to open and adjusting the idle mixture screw will have little or no effect on the engine. To determine whether the carburetor is misadjusted or defective, refer to *Idle Adjustments* in Chapter Four. Perform Steps 1- 10 of the adjustment procedure *exactly* as provided. If there is still little or no response to adjustment of the idle mixture screw, replace the carburetor.

Vapor Lock MCM 120/140/170MR/190MR Models

A high flow fuel pump kit (part No. 42725A5) is offered as a means of reducing the problem. This high flow fuel pump is factory installed on models manufactured after August 1986. However, the new pump may not completely solve it. Problems with vapor lock are increasing today due to the poor quality of fuel available. Mercury Marine offers the following pointers as steps in reducing the vapor lock problem.

1. Let the engine idle for several minutes before shutting it down after a hard run.

2. Let the engine idle 1-2 minutes after starting.

3. Operate the bilge blower at idle and during shutdown.

4. Make sure there are sufficient vents to provide a good flow of air through the engine compartment.

Carburetor Removal/Installgtion

1. Remove the flame arrestor as described in this chapter.

2. Place a container under the fuel line connection to catch any spillage. Disconnect the fuel line at the carburetor (**Figure 3**, typical). Plug the line to prevent leakage.

3. Disconnect the choke heat tube or electrical connection as appropriate.

4. Disconnect the crankcase ventilation hose at the carburetor.

5. Disconnect the throttle linkage (**Figure 4**, typical).

6. Disconnect the choke coil rod, if so equipped.

7. Remove the flange-to-manifold stud nuts and lift carburetor off the manifold.

8. Remove and discard the carburetor-to-manifold gasket.

9. Stuff a clean cloth into the intake manifold to prevent small parts and contaminants from falling inside.

NOTE

For ease in starting, fill the carburetor bowl with *fuel* before installing the carburetor. Operate the throttle lever several times and verify that fuel discharges from the pump jets prior to installation.

10. Installation is the reverse of removal. Clean all gasket residue from the intake manifold mating surface and install a new carburetor gasket. To prevent **warpage** of the carburetor base, snug the flange nuts, then tighten the nuts in a crisscross pattern until tight. If a torque wrench is available, tighten each nut to 15 ft.-lb. (20 N•m.)

Preparation For Overhaul

Before removing and disassembling **any** carburetor, be sure you have the proper overhaul kit, a sufficient quantity of fresh carburetor cleaner and the proper tools. Work slowly and carefully, follow the disassembly/assembly procedures, refer to the exploded drawing of your carburetor when necessary and do not apply excessive force at any time.





It is not necessary to disassemble carburetor linkage or remove linkage adjusting screws when overhauling a carburetor. Solenoids, **dashpots** and diaphragm-operated assist devices attached to the carburetor body should be removed, as carburetor cleaner will damage them. Wipe such parts with a cloth slightly moistened in solvent to remove film, grease and other contamination, then wipe with a clean, dry cloth to remove any traces of the solvent.

CA UTION

Do not use the carburetor-to-manifold gasket supplied in an overhaul, gasket or repair kit unless it is specifically designed for marine application. Current MerCruiser carburetor kits contain the correct gasket. When using kits provided by other manufacturers, it is necessary to order the correct mounting gasket from your MerCruiser dealer.

Inspection and Overhaul

Dirt, varnish, water or carbon contamination in or on the carburetor are often the cause of unsatisfactory performance. Gaskets and accelerating pump diaphragms may leak, resulting in carburetion problems. Efficient carburetion depends upon careful cleaning, inspection and proper installation of new parts.

The new gaskets and parts included in a carburetor overhaul kit should be installed when the carburetor is assembled and the old parts discarded.

Wash all parts except the choke cap, diaphragms, dashpots, solenoids and other vacuum/electrically operated assist devices in fresh commercial carburetor cleaning solvent. This can be obtained from any auto parts store.

Rinse all parts in kerosene to remove traces of the cleaning solvent, then dry with compressed air. Wipe all parts which cannot be immersed in solvent with a soft cloth slightly moistened with solvent, then with a clean, dry cloth.

Force compressed air through all passages of the carburetor.

CA UTION

Do not use a wire brush to clean any part. Do not use a drill or wire to clean out any opening or passage in the carburetor. A drill or wire may enlarge the hole or passage and change the calibration.

Check the choke shaft for grooves, wear or excessive looseness or binding. Inspect the choke plate for nicked edges and ease of operation. Make sure all carbon and foreign material has been removed from the automatic choke housing on integral choke models.

Check the throttle shafts in their bores for excessive looseness or binding. Check the throttle plates for burrs which prevent proper closure.

Inspect all components for cracks or **warpage**. Check floats for wear on lip and hinge pin. Check hinge pin holes in air horn, bowl cover or float bowl for wear.

Check brass floats for leaks by holding them under water which has been heated to 200" F. Bubbles will appear if there is a leak.

Check composition floats for fuel absorption by gently squeezing and applying fingernail pressure. If moisture appears, replace the float. Replace the float if the arm needle contact surface is grooved. If the floats are serviceable, gently polish the needle contact surface of the arm with crocus cloth or steel wool. Replace the float if the shaft is worn.

NOTE

Some gasolines contain additives that will cause the vitron tip on the fuel inlet needle to swell. If carburetor problems are traced to a deformed inlet needle tip, change brands of gasoline used.

Replace all screws and nuts that have stripped threads. Replace all distorted or broken springs. Inspect all gasket mating surfaces for nicks and burrs.

Reassemble all parts carefully. It should not be necessary to apply force to any parts. If force seems to be required, you are doing something wrong. Stop and refer to the exploded drawing for your carburetor included with the overhaul kit.

Rochester B and BC Disassembly

The Model B carburetor has a manual choke; the Model BC uses an automatic choke on the air horn. Refer to **Figure 5** as required for this procedure. Not all B or BC carburetors will use all the parts shown in **Figure 5**.

NOTE

Some BC models may not use a spring clip in Step 1. On such carburetors, it is necessary to remove the choke shaft screw.

1. Model BC only-remove choke rod retaining spring clip and rod from choke shaft lever. Disconnect vacuum tube from choke housing.

2. Remove inlet nut, gaskets, fuel filter and spring (Figure 6).

3. Remove 4 bowl cover screws and return spring bracket. Lift cover straight up and off bowl to prevent float damage.

4. Invert bowl cover on a clean workbench surface and remove the float hinge pin and float assembly (Figure 7).

5. Remove needle valve from valve seat (**Figure** 8). Remove valve seat and gasket with a wide-blade screwdriver.



ROCHESTER B/BC CARBURETOR

1. Air horn assembly 2. Air horn plug 3. Spring 4. Fuel filter 5. Large inlet gasket 9. Small inlet gasket 7. Inlet nut 8. Inlet needle seat gasket 9. inlet needle seat assembly 10. Main well support assembly 11. Main well support screw 12. Main jet 13. Power valve 14. Screw 15. Choke lever 18. Choke shaft assembly

- 17. Choke valve
- 19. Screw
- 19. Idle passage plug
- 20. idle passage plug

- 21. Power piston
- 22. Power piston spring 23. Float assembly
- 24. Hinge pin
- 25. Air horn gasket 26. Float bowl assembly
- 27. Pump discharge guide
- 29. Pump discharge spring
- 29. Pump discharge ball
- 30. Throttle body gasket 31. Pump assembly
- 32. Spring
- 33. Throttle body assembly
- 34. Spring
- 35. Idle adjusting needle
- 38. Upper choke rod clip
- 37. Choke rod
- 39. Lower choke rod clip
- 39. Fast idle cam
- 40. Screw

- 41. Choke tube assembly
- 42. Nut
- 43. Choke tube nut packing
- 44. Idle stop screw
- 45. Link
- 46. Hairpin retainer
- 47. Screw
- 49. Flange gasket49. Choke housing assembly
- 50. Welch plug
- 51. Screw
- 52. Lever assembly
- 53. Choke piston
- 54. Pin
- 55. Screw
- 56. Baffle plate
- 57. Gasket
- 58. Choke cover
- 59. Retainer
- 60. Screw







6. Remove choke cover screws and retainers. Remove choke cover and thermostatic coil assembly from choke housing.

 Remove choke cover gasket and baffle plate.
 Remove choke shaft lever retaining screw and levers.

9. Remove choke housing attaching screws and gasket. Remove housing from bowl cover.

NOTE Remaining steps apply to Model B and BC carburetors.

10. Remove and discard cover gasket.

11. Remove power valve plug from main well support. Look inside plug for tiny spring and check valve shown in Figure 9. Replace spring if broken. 12. Remove main metering jet from main well support with a wide-blade screwdriver (Figure 10). 13. Loosen main well support screw and remove well from bowl cover. Remove and discard gasket on bottom of support.

14. Remove power piston/spring assembly from bowl cover.

15. Depress accelerator pump plunger as far into bowl as possible and hold. Remove hairpin retainers and pump link from throttle lever and pump arm. Lift pump assembly from bowl (**Figure 11**).

16. Remove pump return spring from pump well.

17. Remove pump discharge guide with needlenose pliers. Invert bowl and catch the pump discharge spring and check ball.

18. With bowl inverted, remove throttle body attaching screws and gasket. Separate throttle body from bowl (Figure 12). Remove gasket from bowl and discard.

19. Turn mixture screw clockwise until it seats *lightly*, counting the number of turns required. Write this information down for reference during reassembly. Back out and remove idle mixture screw.

Rochester B and BC Assembly

Refer to **Figure 5** as required for this procedure. Check replacement gaskets for proper punching by comparing them with old gaskets. Shake new accelerator pump plunger to make sure bypass ball check inside the assembly is free.

1. Install idle mixture screw in throttle body. Turn screw clockwise until it seats *lightly*, then back it out the number of turns recorded during disassembly to provide a temporary idle adjustment setting.

2. Fit a new gasket between throttle body and bowl. Install throttle body attaching screws and lockwasher. Tighten screws evenly and snugly.

3. Install pump return spring in pump well. Depress spring with a finger to center it.

4. Install pump plunger assembly carefully (**Figure 13**). Connect pump link to throttle lever and pump arm, then install hairpin retainers at upper and lower ends of link.

5. Install check ball in pump discharge cavity, then install spring on top of ball (Figure 14).

6. Fit index end of pump discharge guide into spring. Depress guide until flush with bowl surface. 7. Install new bowl cover gasket.

8. Fit power piston/spring assembly in cover cavity. Install a new gasket to the main well support and attach support to cover with screw and lockwasher.

9. Install main metering jet with wide-blade screwdriver. Tighten jet securely.

10. Depress and hold power piston stem down. Install ball, spring and plug. Tighten plug securely.







11. Install needle valve gasket and seat with a wide-blade screwdriver.

12. Drop float needle into needle valve. Position float with tang facing cover and install hinge pin.

13. Adjust float level and drop to specifications provided with adjustment procedure in overhaul kit.

14. Carefully lower bowl cover onto bowl. Install attaching screws, lockwashers and return spring bracket. Tighten screws snugly in a crisscross pattern to prevent warpage.

15. Install fuel filter spring and fuel filter in fuel inlet. Position inner and outer gaskets, then install fuel inlet nut. Tighten snugly.

16. Model BC only-reverse Steps 6-9 of *Disassembly* procedure to install choke assembly. Set housing index mark to position specified in overhaul kit instructions and tighten screws. Connect choke rod to choke shaft lever and install retaining spring clip or screw.

Carter **RBS** Disassembly

The RBS carburetor is used on the MerCruiser 80 marine engine. Some parts are necessarily









destroyed during disassembly. Make sure you have the proper replacement parts before proceeding.

Refer to Figure 15 as required for this procedure. Not all RBS carburetors will use all the parts shown in Figure 15.

NOTE

When the RBS is used in multiple carburetor installations, the thermostatic coil on the rear carburetor is subjected to excessive wear and should be routinely replaced during an overhaul.

1. Remove choke coil housing screws, retainers, housing and gasket.

2. Remove screw holding choke piston lever (Figure 16), then remove lever and slide piston from cylinder. Disconnect choke piston link.

3. Remove pump arm retainer screw and retainer (Figure 17). On early models, remove the connector arm nut.

4. Remove circlip from pump plunger, if so equipped. On early models, depress the pump plunger and remove spring, stop and washers from







pump shaft. On late models, simply slide slotted pump arm off shaft as shown in **Figure 18**.

NOTE

Do not try to remove connector link attached to pump arm in Step 5. Link removal requires throttle plate and lever assembly removal, which is unnecessary for cleaning purposes.

5. Remove pump arm, cupped washer and spring from connector link.

6. Invert the carburetor and remove the float bowl screws, float bowl and gasket. See Figure 19.

7. Remove the float pin attaching screws (Figure 20). Remove the float, pin and baffle.

8. Unscrew and remove the fuel inlet nut containing the inlet needle and valve seat (Figure 21).

CA UTION

The accelerating pump cover, plunger and spring may drop from the lower end of the casting in Step 9. Be sure to hold the casting over a clean surface covered with a dry cloth to prevent damage to the assembly. 9. Depress pump plunger shaft as far as possible and tap on the upper end of the shaft with a light hammer until pump assembly comes free.

10. Remove the pump plunger shaft and cover. Remove and discard the rubber end on the plunger shaft (Figure 22).

11. Pry the conical retaining washer from the step-up metering rod and diaphragm assembly cover (Figure 23). Discard the washer.

12. Pierce cover with screwdriver blade and pry from casting, using bowl vent as a fulcrum. Discard the cover.

13. Remove retainer cover, retainer and spring, then carefully withdraw the step-up metering rod and diaphragm with pliers to prevent rod damage. See Figure 24.

14. Remove idle jet with a wide-blade screwdriver.

NOTE

Removal of the slotted idle passage plug or metering jet is not recommended. They are precisely installed during factory assembly and any position change will affect idle quality.

15. Turn mixture screw clockwise until it seats *lightly*, counting the number of turns required. Write this information down for reference during reassembly. Back out and remove idle mixture screw.

Carter RBS Assembly

Refer to Figure 15 as required for this procedure. Check replacement gaskets for proper punching by comparing them with old gaskets.

1. Install idle mixture screw in throttle body. Turn screw clockwise until it seats *lightly*, then back it out the number of turns recorded during disassembly to provide a temporary idle adjustment setting.

2. Install the idle jet in the main body with a wide-blade screwdriver.

3. Install the step-up rod with diaphragm through the metering jet. Temporarily install retainer without the spring and use it to press the diaphragm and gasket into place. Remove retainer. 4. Position the spring in the diaphragm cup, then place the retainer over the spring. Install a new diaphragm cover using a 1/2 inch socket and hammer to seat it in place.

5. Install a new conical washer over the diaphragm cover with its cone end facing up. Use a 7/16 inch socket and tap washer until it is flat. This will spread it and lock the washer in place.







6. Place accelerating pump plunger with spring, spring seat and shims in pump housing. Depress plunger with one finger and install circlip in groove on shaft portion extending through casting.

7. Install pump intake disc and retainer in a new pump cover. Press pump cover assembly into end of housing and seat fully using a 5/8 inch socket and hammer.

8. Connect the pump arm with the connector link and engage other end of pump arm with pump plunger. Install pump arm return spring over plastic sleeve, then fit lower tang of spring into main body groove. Install the pump arm retainer and tighten the screw snugly. See Figure 25.

9. Fit a new gasket over the fuel inlet seat, then install inlet needle in seat. Screw inlet/needle assembly into casting and tighten securely.

10. Install float assembly with retaining pin in casting grooves. Install float pin attaching screws and check float operation.

11. Adjust float to specifications provided with adjustment procedure in overhaul kit.

12. Install a new gasket in the fuel bowl. Make sure it is securely seated in the bowl groove, then install bowl to main body and tighten attaching screws securely.









13. Install the choke piston, link and piston arm in the choke housing. Position choke lever on operating arm with the flats aligned, then install and tighten the attaching screw.

14. Position a new gasket in the choke housing, then connect the thermostatic spring loop to the choke lever.

15. Install choke housing retainers and screws lightly. Set housing index mark to position specified in overhaul kit instructions and tighten screws.



Mercury MD Disassembly

The MD carburetor is used on the MerCruiser 60 marine engine. Refer to Figure 26 as required for this procedure. Not all MD carburetors will use all the parts shown in Figure 26.

1. Remove the pump lever screw and lever (**Figure** 27) from the throttle shaft.

2. Remove the screws and lockwashers holding the float bowl to the upper body and separate into 2 units.

3. Remove the float lever pin and float from the float bowl. See Figure 28.

4. Remove the large plug screw (**Figure** 28) from the float bowl. Remove the inlet needle, seat and gasket.

5. Turn idle adjustment screw (Figure 29) clockwise until it seats *lightly*, counting the number of turns required. Write this information down for reference during reassembly. Back out and remove the screw.

6. Remove the idle tube and main nozzle plug screw from the upper body. See Figure 29.

7. Inspect the idle tube to make sure that the fuel delivery hole is open. See Figure 30.

CA UTION

Do not remove welch plug in Step 8 unless complete overhaul kit is used. Other kits do not contain a new plug.

8. Remove and discard welch plug (Figure 29). Inspect the bypass holes under the welch plug.

9. Remove the accelerating pump assembly (**Figure** 28) and pump return spring from the float bowl.

10. Remove the pump inlet check valve (Figure 31) with a wide-blade screwdriver.

11. Remove the pump outlet retainer cup (Figure **31**), then invert float bowl and catch the outlet spring and nylon ball.

Mercury MD Assembly

Refer to Figure 26 as required for this procedure. Check replacement gasket for proper punching by comparing it with old gasket.

1. Drop the nylon ball and spring in the fuel bowl pump outlet, then install the retainer cup. See Figure 31.

2. Install the pump inlet check valve (Figure 31) in the fuel bowl with a wide-blade screwdriver.

3. Place the pump return spring in the pump well with its small end facing up. See Figure 32.

4. Carefully fit the pump plunger into the pump well to prevent damage to the leather boot on the plunger.

5. Install the inlet seat, needle and large plug screw in the float bowl (Figure 28).

6. Insert the slotted end of the float assembly lever through the groove on the inlet needle so that the float will control needle movement. See Figure 33. Seat the float assembly and install the float lever pin.

7. Adjust float level to specifications provided with adjustment procedure in overhaul kit.

8. Install a new welch plug in the upper body assembly.

9. Install idle tube and gasket in upper body, then blow out with compressed air to remove any contamination.

10. Install the main nozzle plug screw (Figure 29). 11. Install idle adjustment screw in upper body. Turn screw clockwise until it seats *lightly*, then back it out the number of turns recorded during disassembly to provide a temporary idle adjustment setting.

12. Install float bowl to upper body with a new gasket. Tighten attaching screws securely.

13. Install pump lever and screw (Figure 27) to throttle shaft.





Rochester 2GC, 2GV and MerCarb 2-bbl. Disassembly

The Rochester 2GC uses an integral cap-type choke; the 2GV is connected to a well-type or remote choke located on the engine manifold.

The MerCarb 2-bbl. is used on 1984-on engines and can be identified by a single idle mixture screw (the Rochester has 2 mixture screws), as well as the embossed tag stamped with the MerCarb part No. attached under one of the air horn screws.

The MerCarb 2-bbl. uses a separate fuel feed for each venturi. The removable venturi cluster





attached to the fuel bowl contains built-in calibrated main well tubes and pump jets. The venturi cluster is serviced as an assembly. The fixed orifice main metering jets work in conjunction with fixed air bleeds to meter the correct air-fuel mixture to the engine.

MerCarb **2-bbl**. carburetors installed on 1987 models have a larger accelerator pump to provide a 100 percent increase in fuel output. The oversize pump uses an alcohol-resistant viton seal to reduce

pump deterioration from misblended fuel. The new pump required slotting the fuel inlet system and use of a heavier pump/throttle return spring to assure a consistent idle speed. This new MerCarb version can be installed in place of the previous MerCarb model.

Refer to Figure 34 or Figure 35 as required for this procedure. Not all 2GC or 2GV carburetors will use all the parts shown in Figure 34. Not all MerCarb 2-bbl. carburetors will use all the parts shown in Figure 35.

1. Use carburetor legs to prevent throttle plate damage while working on the carburetor. If legs are not available, thread a nut on each of four 21/4 in. bolts. Install each bolt in a flange hole and thread another nut to the bolt. This will hold the **bolt** securely to the carburetor and serve the same purpose as legs.

2A. Model 2GC and MerCarb-remove choke cap retaining screws and retainers. Remove cap cover, gasket and baffle plate.

2B. Model 2GV—remove screw in end of choke shaft to remove choke vacuum break diaphragm. Unhook vacuum hose from throttle body and set diaphragm to one side.

3. Remove hairpin retainers from ends of pump rod. Rotate upper rod end out of pump lever hole and remove rod.

4. Remove fast idle cam screw from float bowl. See Figure 36.

5. Remove attaching screws and lift air horn straight up and off float bowl to prevent damage to main well tube.

6. Invert air horn and slide float hinge pin from retainer (**Figure** 37). Remove float assembly from air horn.

NOTE

Some models use a pull clip on the float assembly. This will automatically remove the needle from the inlet valve. If no pull clip is used, remove the needle from its seat.

Remove and discard the air horn gasket.
 Remove the inlet needle valve seat with a wide-blade screwdriver. Remove the gasket. On early models, remove the needle seat screen.

NOTE 2GC and 2GV carburetors used on the MerCruiser 120 have no power piston.





9. Depress and release the power piston stem-it will snap free. See A, Figure 38.

10. Remove accelerator pump plunger *only* if damaged. To do **so**, loosen setscrew (B, **Figure 38**) on plunger inner lever and break the **swaged** end (C, **Figure 38**).

11. Model 2GC and MerCarb-remove the screw holding the choke piston linkage to the choke shaft. Remove the piston and linkage. Remove the choke housing attaching screws, housing and gasket from the air horn.

12. Remove the accelerator pump plunger return spring from the pump well. On later models, invert the float bowl and catch the aluminum check ball as it falls out of the pump well.

NOTE

2GC and 2GV carburetors used on the MerCruiser 120 have no power piston check valve.

13. Remove the main metering jets and power piston check valve with a wide-blade screwdriver. 14. Remove the venturi cluster attaching screws. Remove the cluster and gasket (Figure 39). Discard the gasket.

15. Remove T-shaped retainer holding discharge spring and ball in float bowl. Invert float bowl and remove spring and ball.

16. Invert float bowl and remove throttle body attaching screws. Separate throttle body from float bowl and discard the gasket.

17. Turn mixture screw clockwise until it seats *lightly*, counting the number of turns required. Write this information down for reference during reassembly. Back out and remove idle mixture screw.

Rochester **2GC**, 2GV and **MerCarb** 2-bbl. Assembly

Refer to **Figure 34** or **Figure 35** as required for this procedure. Check replacement gaskets for proper punching by comparing them with old gaskets.

1. Install idle mixture screw in throttle body. Turn screw clockwise until it seats *lightly*, then back it out the number of turns recorded during disassembly to provide a temporary idle adjustment setting.

NOTE

Make sure a non-vented gasket is used in Step 2. An automotive-type gasket will vent fuel vapors to the atmosphere during hot engine operation.





2. Invert float bowl and install a new gasket, aligning gasket holes with those in the casting.

3. Install throttle body to float bowl and tighten attaching screws securely (Figure 40).

4. Drop pump discharge check ball into discharge hole in float bowl. Install spring and T-shaped retainer.

5. Fit a new gasket on the bottom of the venturi cluster and install cluster. A red fiber gasket goes on the center screw.





6. Use a wide-blade screwdriver to install the main metering jets. Fit a new gasket on the power piston check valve and install with the screwdriver (except **MerCruiser** 120).

7. Install pump inlet screen/check ball. Install pump return spring and center spring.

8. Model 2GC and MerCarb-install choke housing with a new gasket and tighten attaching screws securely. Assemble choke piston to shaft/link assembly..

9. If pump plunger assembly was removed, install outer pump lever and inner pump arm to bowl

cover. Tighten setscrew. Connect plunger assembly to inner arm with shaft pointing inward. Install *t* **11** horseshoe retainer.

10. Install screen (if used) on inlet needle seat. Install seat in air horn with new gasket (Figure 41). Tighten securely with wide-blade screwdriver.

11. Install a new gasket on the air horn.

12. Install the power piston assembly in the air horn (except MerCruiser 120) and stake housing slightly to hold piston in place.

NOTE

On models without a float assembly pull clip, insert needle in needle seat before installing float in Step 13.

13. Connect inlet needle to float assembly and carefully reinstall in air horn, then insert hinge pin. Check float operation.

14. Adjust float level and drop to specifications provided with adjustment procedure in overhaul kit.

15. Install air horn to float bowl, making sure that accelerator pump plunger fits into pump well properly. Hold air horn on float bowl and check pump operation to see that the plunger operates freely.





16. Install the air horn screws and lockwashers, tightening evenly and securely.

17. Attach accelerator pump rod and install hairpin retainers.

18. Model 2GC and MerCarb-position baffle plate and cover gasket on choke housing. Install cover and rotate until index marks are aligned as specified in overhaul kit instructions. Install retainers/screws and tighten securely.

Install choke rod in idle 19. cam and counterweight lever. Install idle cam to float bowl. Install choke lever to air horn.

2GV-connect 20. Model vacuum break diaphragm linkage and install diaphragm bracket screws.

Holley 2300-C and 6317-1 Disassembly

Refer to Figure 42 for this procedure. Not all 2300-C or 63 17-1 carburetors will use all the parts shown in Figure 42.

(4)

HOLLEY 23004 AND 6317-I CARBURETOR

- 1. Screw
- 2. Choke plate
- 3. Gasket
- 4. Accelerating pump discharge nozzle
- 5. Gasket
- 8. Choke shaft 7. Accelerating pump operating lever
- 8. Screw
- 9. Screw
- 10. Accelerating pump operating lever
- 11. Retainer
- 12. Spring
- 13. Sleeve nut
- 14. Choke housing
- 15. Choke rod
- 16. Gasket
- 17. Fast idle cam assembly
- 18. Choke rod seal 19. Choke housing shaft and lever
- 20. Retainer
- 21. Main body
- 22. Throttle body gasket
- 23. Screw
- 24. Diaphragm lever assembly
- 25. Throttle body
- 28. Screw
- 27. Spring
- 28. Screw
- 29. Primary throttle
- shaft assembly
- 30. Primary throttle plate
- 31. Screw
- 32. Screw
- 33. Accelerating pump cam
- 34. Gasket
- 35. Screw
- 38. Choke housing clamp
- 37. Choke housing
- and spring 38. Choke housing gasket
- 39. Nut
- 40. Lockwasher

- 41. Spacer
- 42. Choke lever
- 43. Choke link
- and piston
- 44. Screw and washer
- 45. Lockscrew
- 48. Gasket
- 47. Fuel level adjusting nut
- 48. Fuel inlet needle and seat
- 49. O-ring seal
- 50. Screw
- 51. Gasket
- 52. Primary fuel bowl
- 53. Gasket
- 54. Fuel inlet fitting
- 55. Diaphragm spring 58. Diaphragm assembly
- 57. Accelerating
- pump cover
- 58. Retaining screw/ lockwasher
- 59. Gasket
- 80. Fuel level
- sight plug
- 81. Baffle plate
- 82. Float
- 83. Retainer
- 84. Float spring 85. Primary fuel
- bowl gasket
- 88. Idle adjusting needle
- 87. Main jet 88. Seal
- 89. Baffle plate
- 78. Main jet
- 71. Primary
- metering block 72. Seal
- 73. Idle adjusting
- needle
 - 74. Primary metering block gasket
- 75. Power valve gasket
- 78. Power valve



1. Use carburetor legs to prevent throttle plate damage while working on the carburetor. If legs are not available, thread a nut on each of four 2 1/4 in. bolts. Install each bolt in a flange hole and thread another nut to the bolt. This will hold the bolt securely to the carburetor and serve the same purpose as legs.

2. Remove the fuel bowl and gasket and the metering block and gasket. See **Figure** 43. Discard the gaskets.

3. Turn the idle adjusting needles clockwise until they seat *lightly*, counting the number of turns required. Write this information down for reference during reassembly. Back out and remove needles and gaskets. Discard gaskets.

4. Remove the main jets with a wide-blade screwdriver. **Figure 44** shows their location.

5. Loosen the power valve with a socket wrench. Remove the valve and discard the gasket. See Figure 45.

6. Remove the fuel level adjustment lockscrew and gasket.

7. Turn adjusting nut counterclockwise and remove locknut and gasket.

8. Remove but do *not* disassemble fuel inlet needle and seat. See **Figure** 46. This is a matched assembly and is replaced as a set.

9. Remove float shaft circlip with needlenose pliers.

10. Slide float off shaft with attached spring (Figure 47).















- 11. Remove the fuel bowl baffle plate.
- 12. Remove the fuel level sight plug and gasket.
- 13. Remove the fuel inlet fitting and gasket.

14. Invert fuel bowl. Remove accelerating pump cover, diaphragm and spring. Pump inlet check ball *is* not removable.

15. Invert carburetor. Remove throttle body attaching screws and lockwashers. Separate throttle body from main body and discard the gasket.

16. Remove choke rod retainer from choke housing shaft/lever assembly.

17. Remove thermostatic spring housing and gasket. Remove choke housing from main body. Remove and discard tiny O-ring gaskets (Figure 48).

18. Remove choke housing shaft nut, lockwasher and spacer. **See Figure** 49. Remove shaft and fast idle cam.

19. Remove choke piston/lever assembly. Remove choke rod and seal from main body.

20. Remove accelerating pump discharge nozzle screw. Lift pump discharge nozzle from main body with needlenose pliers (**Figure 50**). Remove and discard gaskets.

21. Invert main body and catch pump discharge needle as it falls out.

22. Remove accelerating pump operating lever from throttle body.

Holley 2300-C and 6317-1 Assembly

Refer to Figure 42 as required for this procedure. Check replacement gaskets for proper punching by comparing them with old gaskets.





CHAPTER ELEVEN

1. Install accelerating pump operating lever to throttle body.

2. Drop pump discharge needle into pump well in main body. Lightly seat needle with appropriate size brass drift. Position pump nozzle and new gaskets in main body. Install retaining screw snugly.

3. Install choke lever link/piston assembly in choke housing (**Figure 51**). Position on housing shaft and install spacer, lockwasher and nut.

4. Install new choke housing gaskets and position housing to main body, inserting choke rod in housing shaft lever. Projection on choke rod must be under fast idle cam to lift cam when choke is closed. Install choke rod cotter pin.

5. Fit thermostatic coil gasket to housing. Engage spring loop on spring lever, then install retainers/screws. Align index marks on housing/coil assembly to position specified in overhaul kit and tighten screws.

6. Invert main body. Install throttle body to main body with a new gasket. Fuel inlet fitting must be on same side as pump operating lever. Install and tighten attaching screws and lockwashers securely.

7. Position accelerating pump diaphragm spring and diaphragm in pump chamber with large end of lever disc against operating lever. Install cover and finger-tighten retaining screws.

8. Check to see that diaphragm is centered, then compress it with the pump operating lever and tighten the retaining screws snugly.

9. Install fuel inlet fitting with new gasket.

10. Install fuel level sight plug with new gasket.

11. Slide baffle plate over ridges in fuel bowl (Figure 52). Install spring on float and slide float over shaft with spring between ridges on boss on fuel bowl floor. Install float retainer circlip with needlenose pliers.

12. Wipe new O-ring seal with petroleum jelly and install on fuel inlet needle/seat assembly.

13. Install needle/seat assembly in fuel bowl through top of bowl. Position adjusting nut gasket and nut of inlet needle/seat assembly, then align flat on ID of nut with flat on OD of inlet needle/seat assembly. Install fuel level adjustment lockscrew with new gasket.

14. Adjust dry float level to specifications provided with adjustment procedure in overhaul kit.

15. Install power valve in metering block with new gasket. Tighten snugly with socket wrench.

16. Install jets in metering block with wide-blade screwdriver.





17. Install idle adjusting screws in metering block with new gaskets. Turn screws clockwise until they seat *lightly*, then back them out the number of turns recorded during disassembly to provide a temporary idle adjustment setting.

18. Install a new gasket to the metering block using the dowels on the back of the block for alignment. Fit metering block and gasket to main body.

19. Position baffle plate and gasket on metering block.

20. Install retaining screws and new compression gaskets in fuel bowl.

21. Install fuel bowl to main body (**Figure** 53) and tighten retaining screws snugly.

22. Adjust accelerating pump to specifications provided with adjustment procedure in overhaul **kit**.

Rochester 4GC Disassembly

The Model 4GC is quite similar to the Rochester 2GC in design; in fact, it's much like a pair of 2GC

carburetors bolted together. The majority of calibrated metering parts are located within the venturi clusters in the float bowl and can be serviced by removing the air horn.

Refer to **Figure** 54 as required for this procedure. Not all 4GC carburetors will use all the parts shown in **Figure 54**.

1. Use carburetor legs to prevent throttle plate damage while working on the carburetor. If legs are not available, thread a nut on each of four $2 \frac{1}{4}$ in. bolts. Install each bolt in a flange hole and thread another nut to the bolt. This will hold the bolt securely to the carburetor and serve the same purpose as legs.

2. Disconnect the intermediate choke rod at the upper end.

3. Remove the choke cover attaching screws/retainers. Remove the cover, gasket and thermostatic coil from the choke housing.

4. Lift baffle plate from choke housing: Remove housing attaching screws and housing from bowl.

5. Remove screw holding choke linkage to shaft, then remove piston and linkage.







41.	Choke	shaft	trip	leve
10	Trip L			

- 42. Trip lever screw
- 43. Throttle body
- 44. Screw
- 45. Lockwasher
- 48. Screw
- 47. Throttle body gasket 48. Secondary lever link
- 49. Clip
- 50. Bracket assembly
- 51. Screw
- 52. Lockwasher
- 53. Fast idle cam
- 54. Screw
- 55. Idle stop screw
- 58. Idle stop srew spring
- 57. Idle adjusting needle
- 58. Spring
- 59. Float bowl assembly
 80. Flange gasket
 81. Throttle valve

- 82. Inlet strainer
- 83. Retainer
- 84. Pump discharge ball
- 85. Pump discharge spring
- 88. Pump discharge guide
- 87. Primary jet
- 88. Secondary jet 89. Power piston
- 70. Power valve
- 71. Power valve gasket 72. Primary venturi cluster
- 73. Secondary venturi cluster 74. Venturi cluster gasket
- 75. Screw
- 78. Lockwasher
- 77. Ball
- 78. Spring
- 79. Float bowl pump assembly
- 80. Hairpin retainer

6. Unscrew and remove the fuel inlet fitting with screen.

 Disconnect the spring clip at the upper end of pump rod. Remove rod and clip from pump lever.
 Remove retainer screw holding trip lever to choke shaft. Remove trip lever.

9. Remove bowl cover attaching screws and carefully lift bowl straight up and off main body to prevent damage to the float assemblies.

10. Invert bowl cover on a clean workbench surface. Mark bowl cover casting and float assemblies for identification during reassembly to assure that primary and secondary floats are reinstalled in their proper position.

11. Remove the hinge pin and spring from one float. Remove the float and place to one side out of the way.

12. Remove the float needle seat with a wide-blade screwdriver. Remove seat gasket and strainer. Place to one side with the float removed in Step 11. 13. Repeat Step 11 and Step 12 to remove the other float, needle seat, gasket and strainer.

NOTE

Needle and seat are factory-matched and should not be mixed during cleaning. If replacement is necessary, replace needle and seat as a matched pair.

14. Depress and release power piston, allowing it to snap free for removal. Remove power piston.15. Remove horseshoe clip from pump plunger shaft.

16. Slide pump plunger through rubber seal and remove from bowl cover. Remove rubber seal.

NOTE

Primary venturi can be identified by the pump discharge nozzles and idle tube as well as main well tubes. See Figure 55.

17. Remove the primary venturi cluster screws and lockwashers. Remove venturi and gasket assembly. Discard gasket.

18. Remove 2 main metering jets from primary side, then remove the power valve and gasket. See **Figure** 56. Place jets to one side out of the way.

19. Remove the secondary venturi cluster screws and lockwashers. Remove venturi and gasket assembly. Discard gasket.

20. Remove 2 secondary main metering jets and place to one side out of the way. Do not confuse or mix with primary jets.





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2 1. Remove the pump spring from the pump well (Figure 56), then invert main body and catch small aluminum check ball as it drops from the pump well.

22. Remove the T-shaped pump discharge spring guide with a pair of needlenose pliers. **See Figure** 57. Remove spring and check ball.

23. Invert carburetor body and remove throttle body attaching screws. Separate throttle body from main body and discard the gasket.

24. Turn idle mixture screws clockwise until they seat lightly, counting number of turns required. Write this information down for reference during reassembly. Back out and remove mixture screws.

This completes disassembly of the carburetor. Do *not* attempt further disassembly of the throttle body as spring tension is factory-calibrated. Throttle body and levers are serviced by replacement as an assembly. Do *not* immerse auxiliary throttle valves (**Figure 57**) in carburetor cleaner. Clean with warm water and a brush.

Rochester 4GC Assembly

Refer to Figure 54 as required for this procedure. Check replacement gaskets for proper punching by comparing them with old gaskets. 1. Thread idle mixture screws into throttle body and seat *lightly*. Back out same number of turns noted during disassembly.

2. Invert carburetor body and position a new gasket, then install the throttle body. Tighten attaching screws snugly.

3. Place carburetor upright. Install pump outlet check ball and spring. Install T-shaped discharge spring guide in pump bore and seat fully with needlenose pliers.

4. Insert aluminum check ball in pump plunger well. Install pump return spring in plunger well. Make sure it is fully seated.

5. Install pump inlet screen, if removed during disassembly.

6. Install the 2 primary metering jets, power valve and new gasket, and the 2 secondary metering jets with a wide-blade screwdriver.

7. Fit a new gasket on each venturi cluster. Install the primary cluster, then install the secondary cluster. Tighten attaching screws securely.

8. Install power piston in bowl cover and lightly stake casting to hold piston in place.

9. Fit the rubber seal on the pump plunger shaft, then insert small end of shaft through the bottom of the bowl cover. Position rubber seal so that its lips protrude on each side of bowl cover.

10. Use a new gasket and install the primary needle seat with a wide-blade screwdriver. Repeat step to install secondary needle seat and gasket.

11. Install primary and secondary needles in their respective seats, then position primary float assembly in bowl cover and install hinge pin. Repeat this step to install secondary float assembly. 12. Adjust float level and drop to specifications provided with adjustment procedure in overhaul kit.

13. Install a new bowl cover gasket. Carefully lower bowl cover onto main body, guiding pump plunger into pump well and making sure that floats and power piston shaft align with their respective positions as the cover is mated to the body.

14. Install bowl cover screws and finger-tighten. Tighten inner attaching screws securely, then tighten outer screws in an alternating pattern.

15. Install choke housing to bowl cover with a new gasket and tighten attaching screws snugly.

16. Install piston and linkage assembly in choke housing and tighten screw securely.

17. Install baffle plate and gasket to choke housing. Engage thermostatic coil loop to lever and align housing/coil cover index marks to position



1	Air born
2.	Air valve lockout lever
3.	Lockout lever roll pin
4.	Secondary metering rod hanger
5.	Secondary metering rod
6-8.	Screw
8.	Pump actuating lever
10.	Pump lever roll pin
11.	Pump assembly
12.	Pump return spring
13.	Needle and seat assembly
14.	Needle and seat gasket
15.	Float needle pull clip
18.	Air norn gasket
17.	Primary netering rod
10.	Choke shaft and lover
20	Choke lever screw
20.	Choke lever lockwasher
22	Choke lever nut
23.	Choke valve
24.	Choke valve screw
25.	Float assembly
28.	Hinge pin
27.	Intermediate choke lever
28.	Float bowl baffle
29.	Choke rod
30.	Choke rod clip
31.	Fast idle cam
32.	Vacuum diaphragm rod
33.	Vacuum diaphragm rod clip
34. 25	Procket corow
33.	Vacuum dianhragm
37.	Vacuum hose
38.	Power piston
39.	Primary metering rod spring
40.	Power piston retainer
41.	Pump discharge ball retainer
42.	Pump discharge ball
43.	Power piston spring
44.	Float bowl insert
45.	Float bowl assembly
48.	Idle stop screw
47.	Idle stop screw spring
40. / 0	Fuel filter
49. 50	Fuel inlet nut
50.	Fuel inlet gasket
52	Throttle body gasket
53.	Pump rod
54.	Pump rod clip
55.	Throttle body
58.	Idle mixture needle
57.	Idle needle spring
58.	Throttle body screw
59.	Cam lever
20	

- 80. Fast idle cam 81. Lever/cam screw





specified in overhaul kit instructions. Install and tighten cover attaching retainers/screws.

18. Install trip lever and connect intermediate choke rod.

19. Connect upper end of pump rod to pump lever with spring clip.

Rochester 4MV and 4MY Disassembly

The Models 4MV and 4MY are 2-stage carburetors. Primary fuel metering is controlled by tapered metering rods operated by engine vacuum. The secondaries are larger than the primaries, with secondary metering controlled by an air valve. A single float pontoon is used.

Refer to Figure 58 as required for this procedure. Not all 4MV or 4MY carburetors will use all the parts shown in Figure 58.

1. Use carburetor legs to prevent throttle plate damage while working on the carburetor. If legs are not available, thread a nut on each of four 2 1/4 in. bolts. Install each bolt in a flange hole and thread another nut to the bolt. This will hold the bolt securely to the carburetor and serve the same purpose as legs.

2. Remove retaining clip/screw from upper end of choke rod. Disconnect rod from upper choke shaft lever and remove from carburetor (Figure 59). If rod drops into main body, it can be removed later. 3. Remove spring clip from upper end of pump rod. Disconnect rod from pump lever.

4. Remove small screw from secondary metering rod hanger. Lift up on hanger and withdraw from air horn with metering rods attached (Figure 60). Leave rods on hanger unless they are to be replaced.

5. Disconnect and remove vacuum break diaphragm assembly.

6. Remove air horn attaching screws. Two of the screws are countersunk next to the venturi. See Figure 61.

7. Lift air horn straight up and off main body to prevent bending main well air bleed tubes pressed into the casting. Angle air horn slightly to disconnect pump rod.

8. Remove accelerating pump plunger and spring from pump well (Figure 62).

9. Remove and discard air horn-to-main body gasket.

10. Depress rear power piston/metering rod assembly and let it snap free. On some carburetors,

this may have to be done several times before the assembly will snap free. Remove assembly with needlenose pliers (Figure 63), then remove piston spring from well.

11. Remove plastic filler block installed over float assembly, if so equipped.

12. Pull up slightly on float retaining pin and slide it toward the pump well. Lift float and inlet needle from float bowl (Figure 64).

13. Remove inlet needle valve seat with a wide-blade screwdriver. Remove gasket from seat and discard.

14. Remove pump discharge check ball retainer with a wide-blade screwdriver. Tilt body to remove check ball. Remove baffle from side of pump well, if so equipped.

15. Remove primary metering jets from front of fuel bowl with a wide-blade screwdriver. Secondary jets at the rear of the fuel bowl cannot be removed.

16. If equipped with an integral cap-type choke, remove retaining screws and pull choke cap from housing.

17. Remove fuel inlet nut, gasket, filter and spring. 18. Invert main body and remove throttle body attaching screws. Leave throttle shaft linkage attached. Separate throttle body from main body and discard the gasket.

19. Turn mixture screws clockwise until they seat *lightly*, counting number of turns required. Write this information down for reference during reassembly. Back out and remove screws.

Rochester 4MV and 4MY Assembly

Refer to Figure 58 as required for this procedure. Check replacement gaskets for proper punching by comparing them with old gaskets.

1. Thread idle mixture screws into throttle body and seat *lightly*. Back out same number of turns noted during disassembly.

2. Position a new gasket over throttle body dowels, then invert carburetor body and install the throttle body. Tighten attaching screws snugly.

3. Install fuel filter spring, new filter and inlet nut with new gasket. Tighten inlet nut securely.

4. Install lower pump rod end in throttle lever.

5. Install needle seat and new gasket with a wide-blade screwdriver.

6. Drop pump discharge check ball in discharge well and install pump retainer screw with a wide-blade screwdriver.













7. Install primary metering jets with a wide-blade screwdriver, then install baffle plate (Figure 65) in pump well slot.

8. Clip fuel inlet needle over float lever arm and lower both into the fuel bowl (**Figure** 66). Make sure needle seats in valve, then press float retaining pin into casting cutouts.

9. Adjust float level to specifications provided with adjustment procedure in overhaul kit.

10. Press plastic filler block (if so equipped) over float assembly until it is fully seated.

11. Install rear metering rod assembly (Figure 67), then the power piston (Figure 68). If equipped with filler block, make sure the ends of the metering rods enter their jets. Slide piston and spring into place.

12. Install front power piston with spring attached. Depress power piston with needlenose pliers until the raised plastic retainer on the piston rests flush with the body casting.

13. Drop the pump return spring into the pump well.

14. Install a new air horn gasket on main body.

15. Install accelerating pump plunger in pump well.

16. Carefully position air horn over main body and lower into place, making sure that the vent tubes, well tubes and pump plunger fit properly through gasket.

17. Carefully install the 2 countersunk **airhorn** screws first. Use of a magnetic screwdriver or needlenose pliers is recommended to position these



screws. See Figure 69. If they are accidentally dropped inside the venturi, the air horn will have to be removed to retrieve them.

 Install and tighten remaining air horn screws.
 Install secondary metering rods. They should drop freely into place as the hanger is lowered into the air horn. Install hanger retaining screw snugly.
 Install and connect vacuum break diaphragm assembly.

21. Fit the choke rod into the bowl and connect its lower end to the lower choke lever inside. Fit upper end in choke shaft lever and install retaining clip/screw.

22. Connect pump rod to pump lever and install spring clip.

23. If equipped with integral cap-type choke, engage thermostatic coil loop over choke lever in choke housing and position cover against the housing. Align housing/cover index marks to position specified in overhaul kit instructions and install retainers/screws snugly.

Holley 4160, 6407 and 6576 Disassembly

These **4-bbl**. carburetors are quite similar in basic design to the Holley 2300-C and 6317-1 2 bbl. models. However, both the primary and secondary sides of the carburetor contain a fuel bowl, fuel inlet valve and metering block. The primary side also incorporates the accelerator **pump**.

Refer to **Figure 70** as required for this procedure. Not all carburetors will use all the parts shown in **Figure 70**.

1. Use carburetor legs to prevent throttle plate damage while working on the carburetor. If legs are not available, thread a nut on each of four $2 \frac{1}{4}$ in. bolts. Install each bolt in a flange hole and thread another nut to the bolt. This will hold the bolt securely to the carburetor and serve the same purpose as legs.

2. Invert fuel bowl and remove accelerating pump cover, diaphragm and spring (Figure 71). Inlet ball check is permanently installed.





3. Remove the primary fuel bowl and gasket and metering block and gasket (**Figure** 72). Discard the gaskets.

4. Remove the fuel line tube, fuel distribution tube, washer and O-ring seals. Discard the O-ring seals.

5. Turn the idle adjusting needles clockwise until they seat *lightly*, counting number of turns required. Write this information down for reference during reassembly. Back out and remove the idle adjusting needles and gaskets. Discard the gaskets.

6. Remove the main jets with a wide-blade screwdriver.

7. Loosen the power valve with a socket wrench. Unscrew valve and discard gasket.

8. Remove fuel level adjustment lockscrew and gasket. Turn adjusting nut counterclockwise and remove locknut and gasket.

9. Remove fuel inlet needle, seat and gasket (Figure 73). *Do not* disassemble needle/seat assembly. They are factory-matched; replace as a unit if necessary.







10. Remove circlip from float shaft with needlenose pliers. Slide float off shaft and remove spring.

11. Remove baffle plate from fuel bowl.

12. Remove fuel level sight plug and gasket and inlet fitting and gasket.

13. Remove secondary fuel bowl and gasket. Remove metering body, plate and gasket with a clutch-type screwdriver (**Figure 74**).

14. Repeat Steps 8-12 to disassemble secondary fuel bowl.

15. Invert carburetor. Remove throttle body retaining screws and lockwashers. Separate throttle body from main body and discard the gasket.

16. Remove choke rod retainer from choke housing shaft and lever assembly.

17. Remove choke cover screws, disengage thermostatic coil loop from choke lever and remove cover.

18. Remove choke housing and gaskets from main body. Discard gaskets.

19. Remove choke housing shaft nut, lockwasher and spacer. Lift out piston and choke link lever.

20. Remove choke rod and seal from main body.





Remove secondary diaphragm assembly and gasket from main body (Figure 75). Discard gasket.
 Remove diaphragm housing cover and remove spring/diaphragm from housing (Figure 76).
 Remove screw holding accelerating pump discharge nozzle in place. Remove nozzle and gaskets from main body. Discard gaskets.
 Invert main body and catch pump discharge

Holley 4160, 6407 and 6576 Assembly

needle as it drops out.

Refer to **Figure** 70 as required for this procedure. Check replacement gaskets for proper punching by comparing them with old gaskets.

1. Drop pump discharge needle into its well. Seat needle lightly with a brass drift. Fit a new gasket on each end of the discharge nozzle, insert discharge needle screw in nozzle and install assembly in discharge well.

2. Position secondary diaphragm in housing and put the spring in the cover. Install cover to housing and tighten retaining screws finger-tight. Pull



diaphragm rod downward as far as it will go and tighten the retaining screws snugly.

3. Fit a new gasket on the secondary vacuum passage opening in the main body. Install the diaphragm housing to the main body.

4. Fit the seal on the choke rod and install the rod with the seal fitting into the retaining grooves underneath the flame arrestor mounting flange.

No.



5. Install choke piston, link and arm in choke housing. Install choke lever and washers on shaft. Screw retaining nut over fast idle shaft and tighten in place. Move choke lever back and forth to check operation of piston.

6. Install new choke housing gaskets to main body, then tilt housing to connect choke valve rod in hole on fast idle cam. Once rod and cam are connected, install housing screws and tighten securely. Install hairpin clip to choke valve rod.

7. Install a new gasket on the choke housing. Connect thermostatic coil loop to choke lever and install choke cover on housing. Set cover/housing index marks to position specified in overhaul kit instructions and install cover screws tightly.

8. Invert main body and position a new gasket. Fit throttle body to main body with fuel inlet fitting on same side as accelerating pump lever, sliding the secondary diaphragm rod over the operating lever. Install throttle body attaching screws/lockwashers and tighten securely. Install retainer on secondary diaphragm rod (Figure 77).

NOTE

Reassemble primary fuel **bowl/metering block** assembly first.

9. Install fuel inlet fitting with a new gasket.10. Install fuel level sight plug with a new gasket.

11. Slide the baffle plate over the fuel bowl ridges and install the float/spring assembly on the shaft. Float spring should fit between the ridges on the fuel bowl floor boss. Install circlip to hold float assembly on shaft.

12. Wipe new O-ring seal with petroleum jelly and install on inlet needle/seat assembly. Install needle/seat assembly in fuel bowl through top of bowl. Fit adjusting nut/gasket to inlet needle/seat assembly with flat on nut ID aligned with needle/seat OD flat. Install adjustment lockscrew with a new gasket.

13. Adjust dry float level to specifications provided with adjustment procedure in overhaul kit.

14. Install the power valve with a new gasket in the metering block and tighten snugly with socket wrench.

15. Install the main jets in the metering block with a wide-blade screwdriver.

16. Install new gasket on idle adjusting needles. Thread needles into fuel bowl and seat *lightly*. Back out same number of turns noted during disassembly.

17. Install a new gasket on the back of the metering block. Fit metering block and gasket to main body. Install baffle plate and new gasket to metering block.

18. Install new compression gaskets on fuel bowl screws. Insert screws through fuel bowl, place bowl in position on metering block and tighten screws securely.

19. Wipe a new fuel distribution tube O-ring with petroleum jelly and install the O-ring on one end of the fuel line tube. Install this end of the tube in the primary fuel bowl recess.

20. Reassemble secondary fuel bowl by repeating Steps 10-13.

21. Install a new metering body gasket to the main body., Fit the metering plate gasket, plate, gasket and metering body on the main body. Install retaining screws and tighten securely.

22. Wipe a new fuel line tube O-ring seal with petroleum jelly and install O-ring on fuel distribution tube. Fit fuel bowl to main body, guiding the fuel line tube into the bowl recess.

23. Install new compression gaskets on the retaining screws. Install screws and tighten in several stages to 50 in.-lb. (6 N•m).

24. Install accelerating **pump** diaphragm spring/diaphragm in pump chamber with large end of lever disc against the operating lever.

25. Install cover and finger-tighten retaining screws. Check diaphragm to see that it is centered, then compress diaphragm with pump operating lever-and tighten screws securely (Figure 78).

26. Adjust accelerating pump to specifications provided with adjustment procedures in overhaul kit.

FUEL PUMP

The fuel pump may be either a single-action or dual-diaphragm design. On both types, the fuel pump rocker arm is operated by the camshaft and provides fuel under pressure to the carburetor.

The dual-diaphragm pump can be identified by a sight gauge attached to the outside of the pump housing. The housing contains 2 differently shaped diaphragms manufactured of different materials. The extra diaphragm serves as a back-up in case the primary diaphragm should fail. The pump requires no maintenance and cannot be serviced. If fuel is noted in the sight gauge, the pump is defective and must be replaced.

The single-action pump has a sight bowl containing a filter element mounted on the pump housing and held in place by a screw-pressure swing yoke. See **Figure** 79. Early pumps of this type can be disassembled and repaired, late models are non-serviceable and must be replaced if defective. Considering the time and cost involved, it is not

practical to overhaul early pumps. Their replacement with a new Coast Guard-approved marine-type pump is recommended.

The 2 most common fuel pump problems are incorrect pressure and low volume. Low pressure results in a too-lean mixture and too little fuel at high speeds. High pressure will cause carburetor flooding and result in poor economy. Low volume also results in too little fuel at high speeds.

If a fuel system problem is suspected, check the fuel filter first. See Chapter Four. If the filter is not clogged or dirty, test the fuel pump for pressure and flow.

Pressure Test

1. Connect a tachometer according to manufacturer's instructions.

Install a tee fitting in the fuel line between the fuel pump and carburetor. Connect a fuel pressure gauge to the fitting with a short hose (Figure SO).
 Start the engine and run at idle. Record the pressure and compare to specifications in Table 1.
 Gradually increase engine speed to 1,000 rpm while observing pressure gauge. Pressure should





remain constant and within specifications at all speeds from idle to 1,000 rpm.

5. If pressure is too low, check fuel lines for kinks, leaks or restrictions. Correct as required.

6. If pressure varies from specifications or changes at a higher engine speed, replace the fuel pump.

7. Shut the engine **off.** The pressure should drop off very slowly. If it drops off rapidly, the outlet valve in the pump is leaking and the pump should be replaced.

8. Remove tachometer and pressure gauge. Reconnect fuel line to carburetor. Start engine and check for leaks.

Flow Test

1. Disconnect the fuel inlet line at the carburetor and connect a length of flexible hose to the disconnected line.

2. Place the end of the flexible hose in a clean quart-size container.

3. Start the engine and let it idle for 30 seconds, then shut it off.

4. Check the container. It should be approximately 1/2 full. If not, check fuel line for kinks or clogging by removing the fuel tank filler cap, disconnecting both inlet and outlet lines from the pump and blowing compressed air through the lines.

5. Reconnect lines and repeat procedure. If pump volume is still too low, replace the pump.

Removal/Installation

1. Disconnect the negative battery cable.

2. Place a container under the fuel pump to catch any spillage.

3. Disconnect the inlet and outlet lines at the pump (**Figure 81**). Use one wrench to hold the pump fitting and the other to loosen the line nut. Plug the lines to prevent leakage.

4. Loosen the 2 pump attaching bolts and lockwashers. See Figure 82.

5. Connect a remote start button to the starter terminals and crank the engine over while holding the pump in place. When you feel a reduction in tension against the pump, the low point of the camshaft eccentric is resting against the pump. Remove the pump bolts and discard the gasket.

6. Chevrolet V8 engines use a **pushrod** between the pump rocker arm and camshaft eccentric. Remove **pushrod** and check it for wear or bending.

7. Clean the pump mounting pad on the engine to remove all gasket residue.

8. Coat both sides of a new pump gasket with water-resistant sealer and install it to the pump flange.

9. If the pump uses a **pushrod**, apply a heavy coat of bearing grease to one end of the **pushrod** and insert it in the engine.

10. Install the pump and new gasket to the engine. Make sure the pump rocker arm rides on the



camshaft eccentric or **pushrod**, then tighten the attaching bolts as follows:

- a. Inline engines-13-14 ft.-lb. (17-19 N•m).
- b. GM V6 and V8 engines-30 ft.-lb. (41 N•m).
- c. Ford V8 engines-22 ft.-lb. (30 N•m).

11. Unplug and reconnect the fuel inlet/outlet lines to the pump.

12. Connect the negative battery cable. Start the engine and check for leaks.

FUEL LINES

Fuel lines are usually a combination of rigid steel lines and flexible hoses. Hoses are subject to extreme temperature changes and chemical deterioration from the fuel. In areas where fuel quality is poor or gasohol is used, even the rigid steel lines will gradually deteriorate.

Damaged or leaking fuel lines and hoses must be replaced. While it is tempting to cut out a bad section of fuel line and insert a short piece to replace it, this is not recommended. Other portions of the line may be just as weak and will fail sooner or later. Since the dangers of fire or explosion are present when a fuel line fails, it is safer, more economical and less time-consuming to do the job right in the beginning.

Double-wrap brazed steel tubing should always be used to replace steel fuel lines. This is available from marine dealers. **Do** not use copper or







aluminum tubing as neither will withstand normal engine and boat vibration. Rubber hose made specifically for fuel systems should be used. Other hose materials are not formulated to withstand chemical deterioration from gasoline.

To temporarily replace a fuel line, carry a length of fuel line hose, several worm-screw clamps and a tubing cutter with you. If it is necessary to make on-the-spot repairs, the damaged section of line can be cut out and replaced by a piece of fuel hose secured at each end with a clamp. This temporary repair should be replaced at the first available opportunity.

1. Obtain a suitable length of steel fuel line of the correct diameter.

- 2. Disconnect the negative battery cable.
- 3. Remove the damaged or deteriorated fuel line.

4. Slip a spring-type tubing bender over the tubing and carefully bend to match the old line. See Figure 83.

5. Remove the fittings, if any, from the old line and install on the new line.

6. Use a flaring tool to make a double lap flare on each end of the line. **See Figure** 84. This will provide a good seal and prevent the flare from cracking.

7. Install the new line and tighten the fittings securely.

8. Reconnect the negative battery cable. Start the engine and check for leaks.



Model	Serial No.	cid	psi
60	A11	67.66	1.75-3.5
60	All	69.70	1. 75-3. 5
90	All	95.50	1. 75-3. 5
110	, Al 1	153	3. 5-4. 5
120	l o3825578	153	3. 5-4. 5
120, 120R, 120MR	3825579-up	153	3.6
140 (4-cyl .)	To3826282	181	3.6
140 (4-cyl.), 140R, 140MR	3826283-up	181	3.8
140 (6-cyl.)	All	194	1. 75-3. 5
150	All	230	1. 75-3. 5
160	All	250	1. 75-3. 5
165	To 2771483	250	1. 75-3. 5
165	2771484-up	250	3.8
185, 185R	All	229	3.7
185MR, 205MR	Al 1	262	3. 0-7. 0
470	to 6218036	224	3.6
470, 470R	6218037-up	224	3.6
485	All	224	3.6
488, 488R	All	224	3.6
888	To 4169596	302	3.7
888	4169597-up	302	5. 25-8. 6
190	All	283	3.7
898, 898R, 200MR	All	305	3.5
200	All	292	3.7
215	All	302	3.7
225	To2278646	327	3.7
225	2278647to	327	3.7
	3385720		
225	3385721-up	302	3.7
228, 228R	All	305	3.7
228 II-TR	All	305	3.7
230MR. 23011-TR	All	305	5.5-7.0
233	All	351	3.7
250	To 4707999	327	3.7
250	4708000-up	350	3.7
255 II-TR, 255 II-TRS	To 4175499	351	3.7
255 II-TRS	4175500-up	350	5. 25-6. 5
260. 260R. 260MR. 260 II-TI	R All	350	5.5-7.0
270	All	350	3.7
280 II-TRS	Al 1	350	3.7
310	Al 1	409	5. 25-6. 6
325	To 2761141	427	3. 7
325	3043030-up	427	3.7
330. 330 II-TR. 330 II-TRS	All	454	6. 25-6. 5
370 II-TRS. 400 II-TRS	All	454	5. 25-6. 5
390	A11	482	3.7
		108	

Table 1 FUEL PUMP PRESSURE SPECIFICATIONS