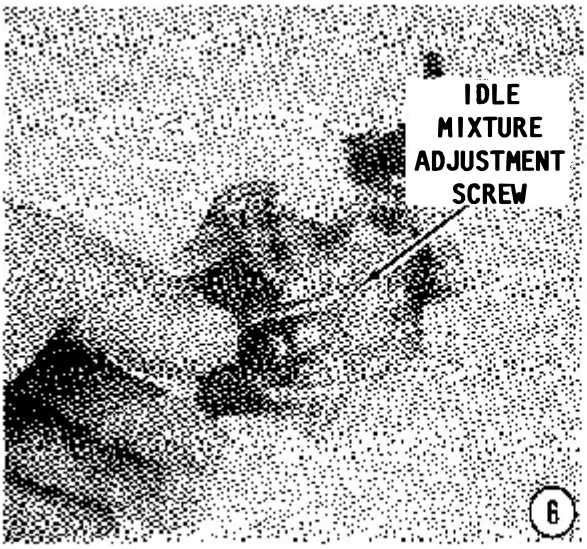
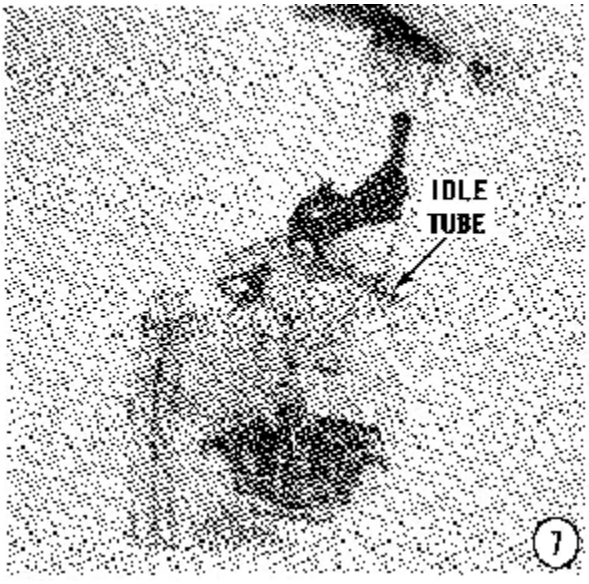


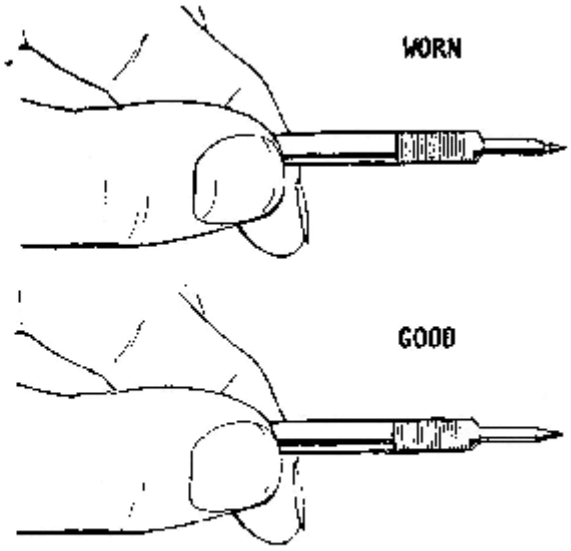
tank. Disconnect the choke cable from the choke lever. Remove the cap screw and spacer securing the choke cable to the carburetor. Remove the fuel line from the inlet cover. An alternative is to remove the screw securing the inlet cover to the carburetor and leave the fuel line attached.

2- Remove the two nuts attaching the carburetor to the manifold, and then remove the carburetor.

3- Remove the four screws holding the fuel pump strainer body to the carburetor. Remove the gaskets and diaphragm. Remove the fuel pump body and gaskets.

4- Remove the bolt securing the float bowl to the carburetor casting. **OBSERVE** and **REMEMBER** there is a gasket under the bolt and one between the float bowl and the casting. Withdraw the float retaining pin, and then lift off the float assembly. Lift out the inlet needle valve and spring. **DO**





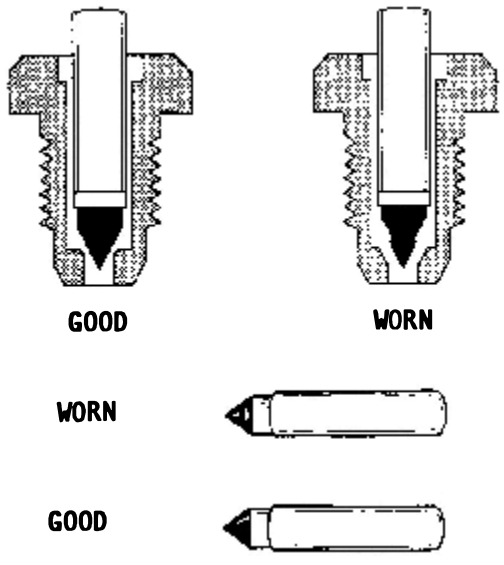
Carburetor idle mixture adjustment needles. The top needle is worn and unfit for service. The bottom needle is new.

NOT attempt to remove the needle valve seat. This seat is pressed into the carburetor body.

5- Remove the main fuel (high-speed) jet. A gasket is not used under this jet. **DO NOT** attempt to remove the main nozzle even though it has a screwdriver slot. The boost venturi is very difficult to install if the main nozzle has been removed.

6- Remove the idle mixture adjusting screw and spring.

7- Remove the plug screw, and then unscrew the idle tube. Slide the gasket free of the idle tube.



Needle and seat arrangement on the carburetor covered in this section, showing a worn and new needle for comparison.

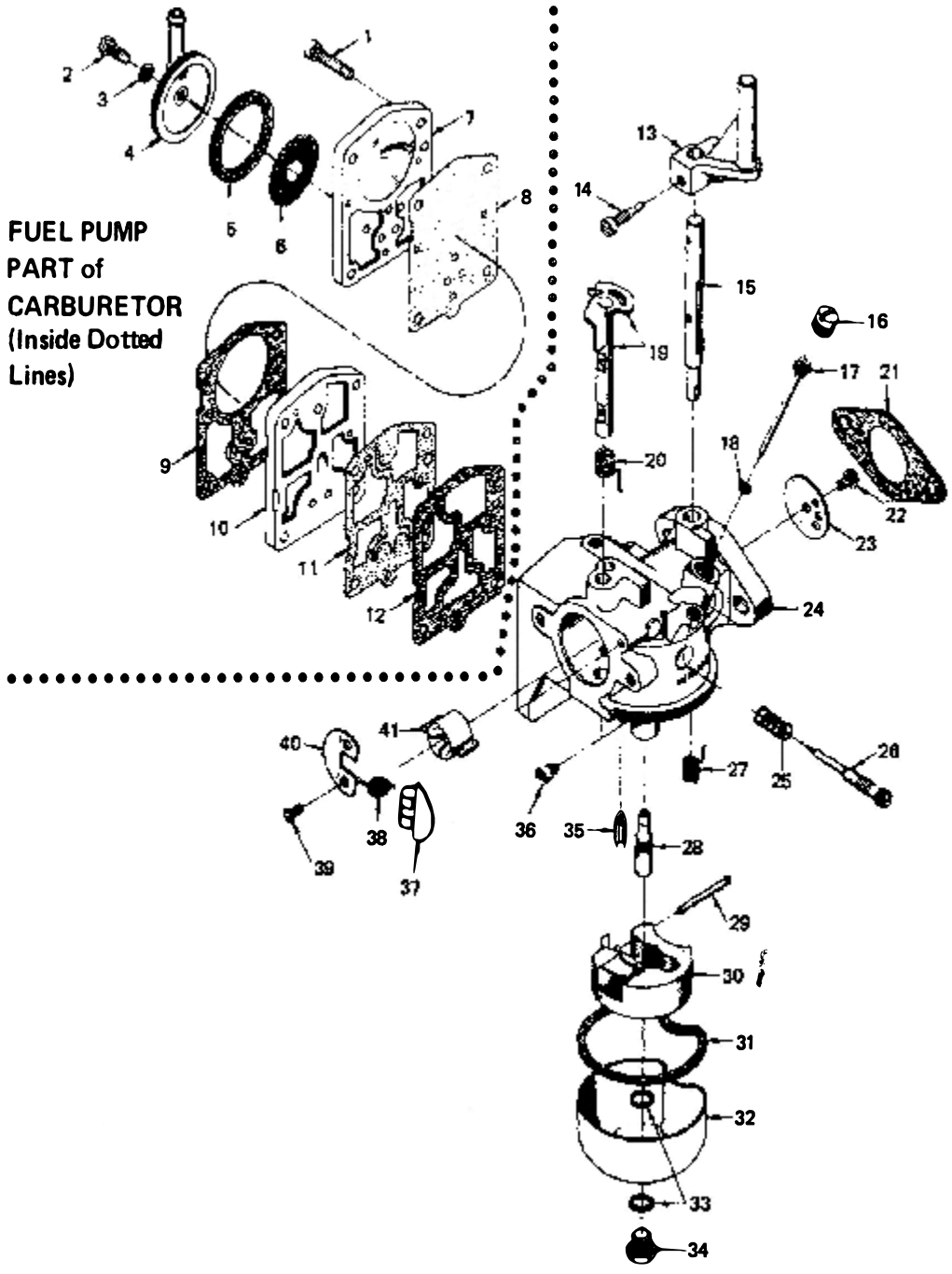
CLEANING AND INSPECTING

NEVER dip rubber parts, plastic parts, diaphragms, or pump plungers in carburetor cleaner. These parts should be cleaned **ONLY** in solvent, and then blown dry with compressed air.

Place all of the metal parts in a screen-type tray and dip them in carburetor cleaner until they appear completely clean, then blow them dry with compressed air.

Blow out all of the passages in the castings with compressed air. Check all of the parts and passages to be sure they are not clogged or contain any deposits. **NEVER** use a piece of wire or any type of pointed instrument to clean drilled passages or calibrated holes in a carburetor.

Move the throttle shaft back-and-forth to check for wear. If the shaft appears to be too loose, replace the complete throttle body because individual replacement parts are **NOT** available.



1 - Screw
2 - Screw
3 - Washer
4 - Inlet Cover
5 - Gasket
6 - Strainer
7 - Screen Strainer Body
8 - Pump Diaphragm
9 - Gasket
10 - Fuel Pump Body
11 - Check Valve Diaphragm
12 - Gasket
13 - Throttle Shaft Linkage
14 - Retaining Screw
15 - Throttle Shaft
16 - Screw (Plug)
17 - Idle Tube
18 - Gasket
19 - Choke Shaft
20 - Spring
21 - Gasket
22 - Screw
23 - Throttle Shutter
24 - Carburetor Body
25 - Spring
26 - Idle Mixture Screw
27 - Spring
28 - Main Nozzle
29 - Fulcrum Pin
30 - Float
31 - Gasket
32 - Fuel Bowl
33 - Gasket
34 - Screw
35 - Inlet Needle and Spring
36 - Main Fuel Jet
37 - Relief Valve
38 - Spring
39 - Screws (2)
40 - Choke Shutter
41 - Venturi

Exploded view of an integral fuel pump carburetor showing arrangement of major parts. Fuel pump parts are to the left of the dotted line. This carburetor is identified as a "B" carburetor in the text and Appendix.

Inspect the main body, airhorn, and venturi cluster gasket surfaces for cracks and burrs which might cause a leak. Check the float for deterioration. If a hollow float is used, check to be sure it does not contain any fluid. Check to be sure the float spring has not been stretched. If any part of the float is damaged, the unit must be replaced. Check the float arm needle contacting surface and replace the float if this surface has a groove worn in it.

Inspect the tapered section of the idle adjusting needles and replace any that have developed a groove.

Most of the parts that should be replaced during a carburetor overhaul are included in an overhaul kit available from your local marine dealer.

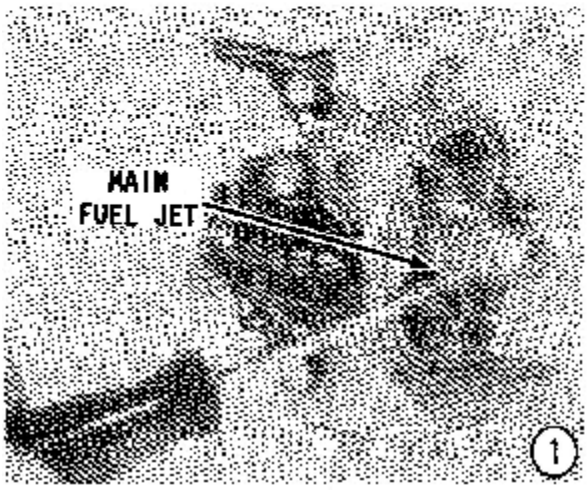
Check the jet sizes with a drill of the proper size. **ALWAYS** hold the drill in a pin vise to avoid enlarging the jet orifice. Refer to the Carburetor Jet Size/Elevation Chart in the Appendix for the proper size for your engine, carburetor, and anticipated elevation of operation.

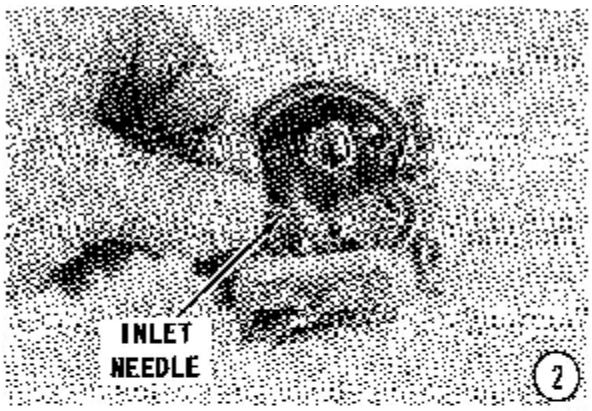
ASSEMBLING

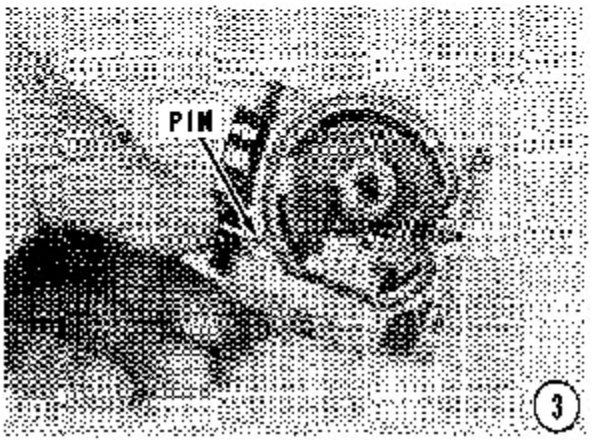
1- Install the main fuel (high-speed) jet. As mentioned during removal, a gasket is not used under this jet.

2- Install a **NEW** inlet valve needle and spring to reduce the chances of a leak. Install a **NEW** float bowl gasket.

3- Install the float, and then insert the float retaining pin to secure the float in place.

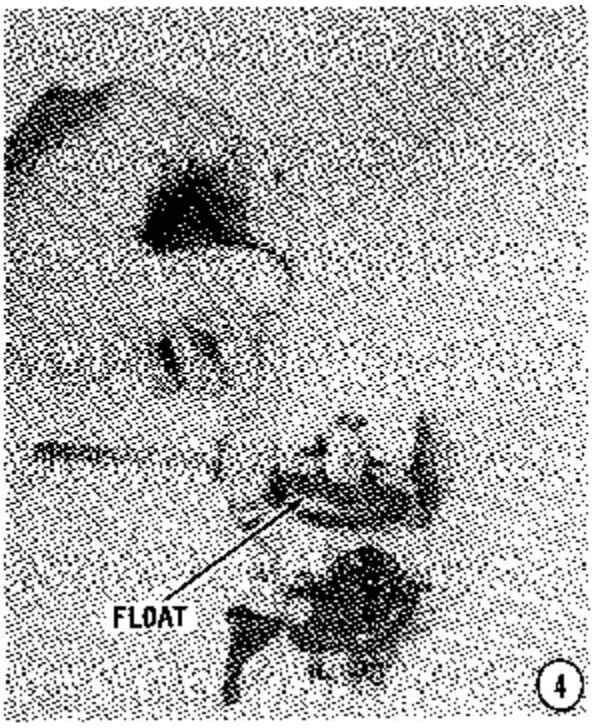


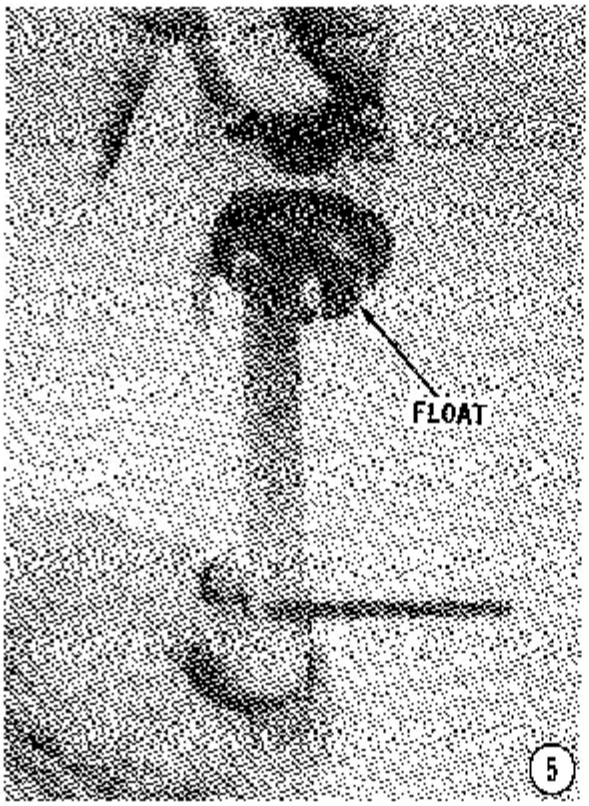


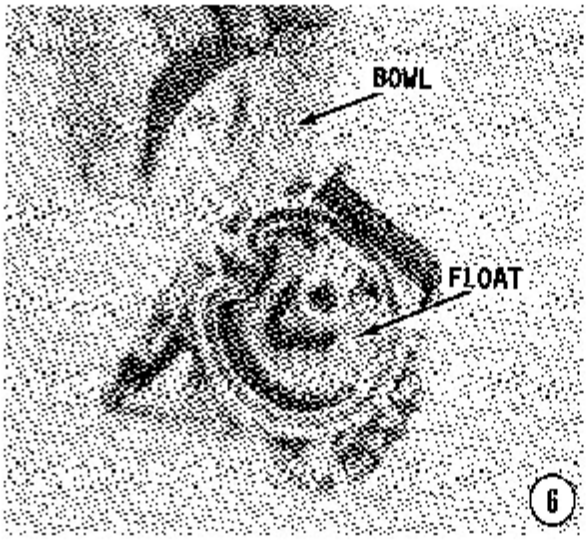


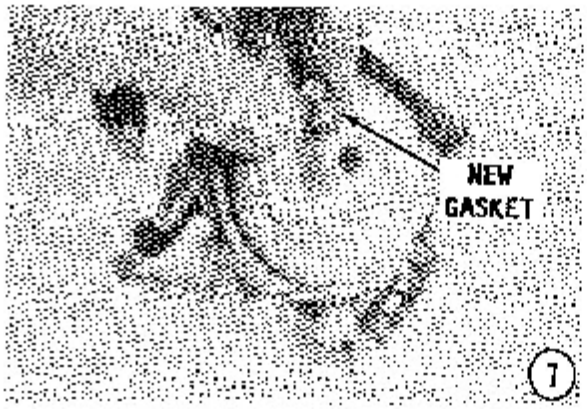
Float Level Adjustment

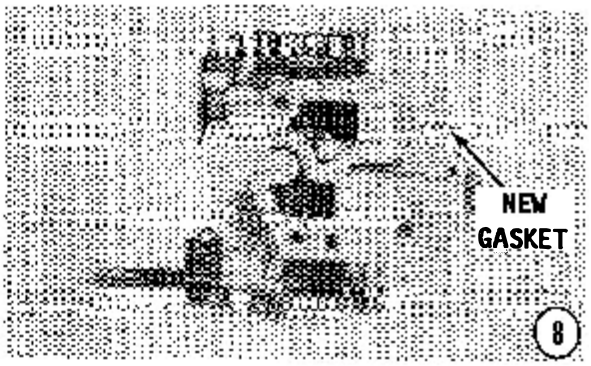
4- Hold the carburetor as shown, and measure the distance to the bottom edge of the float. This measurement should be 1/4" ± 1/64" (6.35 ± 0.40mm). **CAREFULLY** bend the float needle actuating lever to obtain the correct measurement.











Float Drop Adjustment

5- Hold the carburetor upside down, as shown, to allow the float to drop to its lowest point. Measure the distance from the bottom of the float to the top of the main fuel (high-speed) jet. This distance should be from 1/64" to 1/32" (0.40 to 0.80mm). **CAREFULLY** bend the float tang to obtain the correct measurement.

6- Check to be sure the float bowl gasket is in place properly. Position the float bowl gasket on the carburetor casting. Install the float bowl.

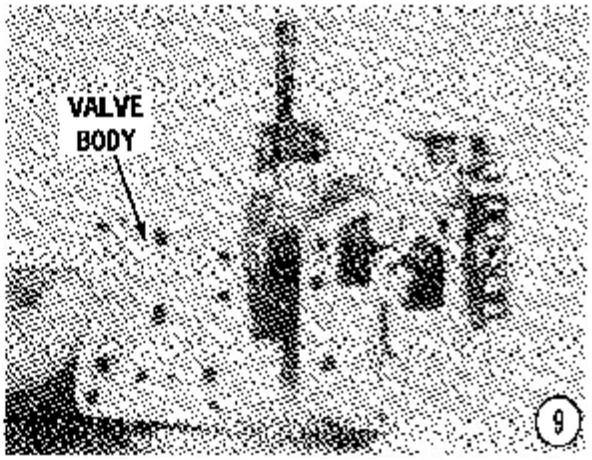
7- Slide a **NEW** gasket onto the retaining bolt, and then install the bolt onto the float bowl cover.

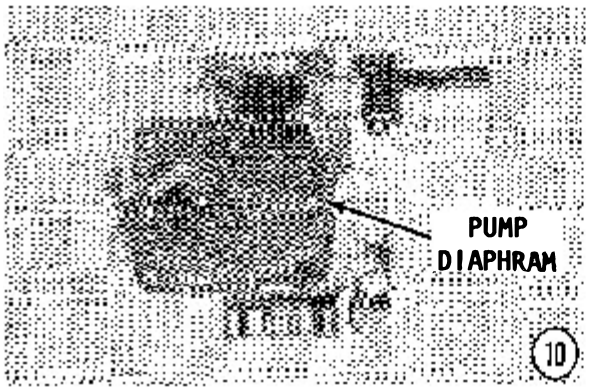
8- Position a **NEW** fuel pump gasket onto the carburetor casting taking care to index it over the alignment dowel. Install a **NEW** valve diaphragm. **OBSERVE** the three valve flaps, two for inlet control and one for outlet.

9- Install the valve body with the alignment dowel entering the hole in the casting properly.

10- Position a **NEW** gasket on the valve body. Install a **NEW** pump diaphragm.

11- Install the fuel pump strainer body and secure it in place with the four retaining screws. Tighten the screws **EVENLY** and





a little-at-a-time. Install the filter screen and a **NEW** gasket.

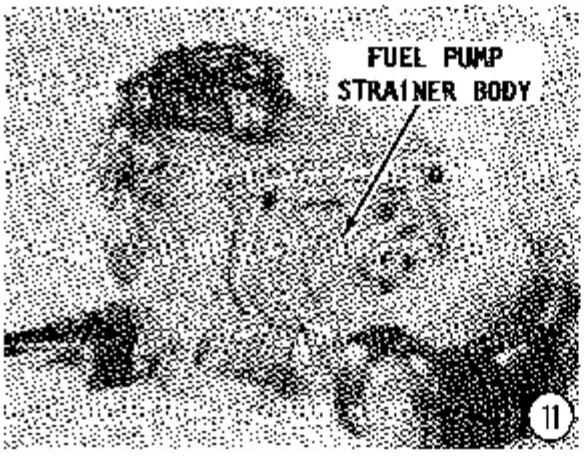
12- Slide a **NEW** gasket onto the idle tube and then thread it into place. Install the plug screw over the idle tube.

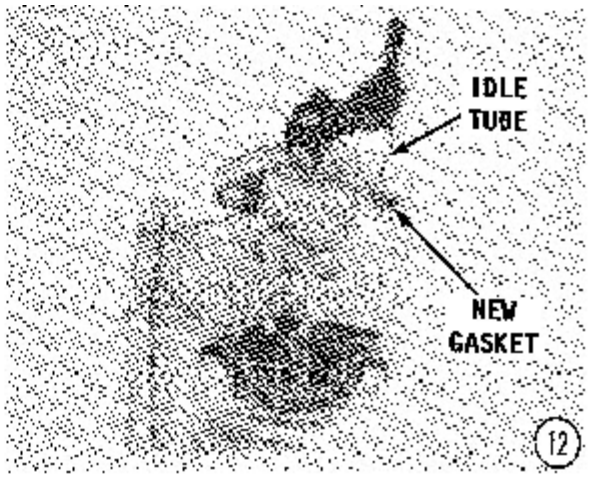
13- Slowly thread the idle mixture adjusting screw into the carburetor body until you can feel it seat. **DO NOT** tighten the screw or you will damage the tip. Now, as a preliminary adjustment, back it out 1-1/4 turns.

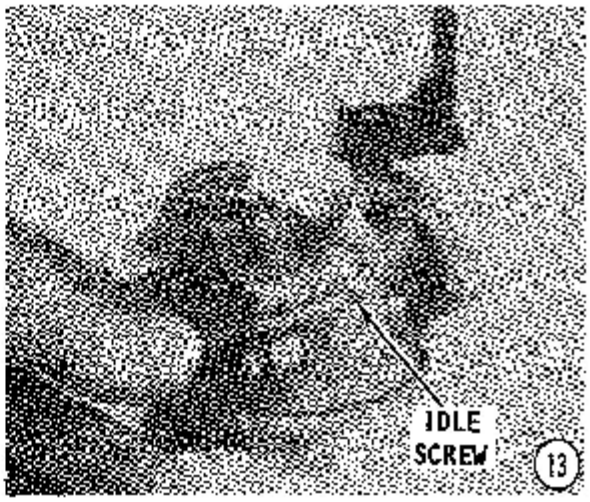
14- Place a **NEW** flange gasket in position on the intake manifold. Check to be sure the two crankcase vacuum port holes are aligned with the holes in the casting. If this gasket is not installed **PROPERLY**, the fuel pump will **NOT** function.

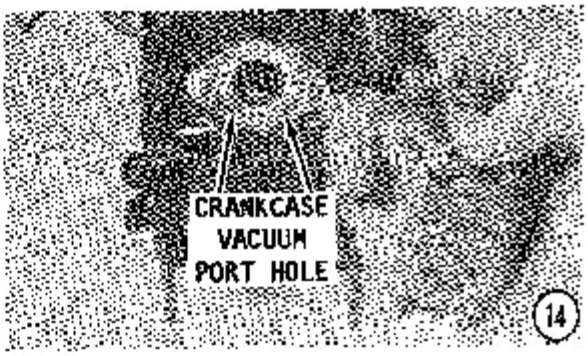
INSTALLATION

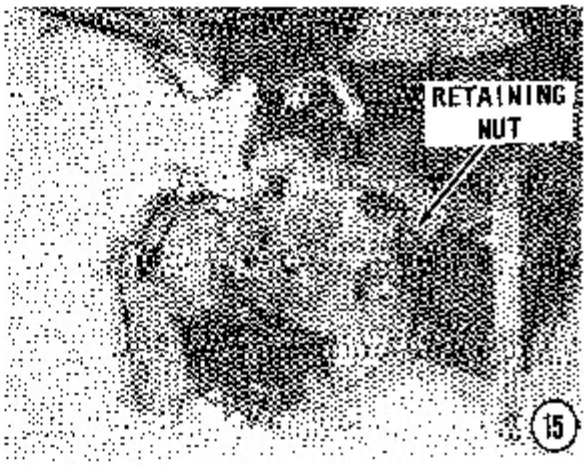
15- Place the carburetor in position on the intake manifold. Install and tighten the two carburetor retaining nuts alternately to a torque value of 100in lb (11Nm). Install the fuel pump inlet cover. Slide a **NEW** lockwasher onto the retaining screw, and then install and tighten the screw. If the fuel line was removed from the inlet cover, install the hose and tighten the hose clamps.











16- Install the cap screw and spacer securing the choke cable to the carburetor. Connect the choke cable to the lever. Connect the fuel line to the tank. Activate the fuel line squeeze bulb several times. Check delivery of fuel to the carburetor and the lines and their fittings for possible leaks. Connect the battery leads.

Synchronizing

To synchronize the fuel and ignition systems, see Chapter 6.

ADJUSTMENTS

FIRST A WORD: Before fine carburetor adjustments can be properly made, the following conditions must exist:

a. The correct engine-propeller combination must be used.

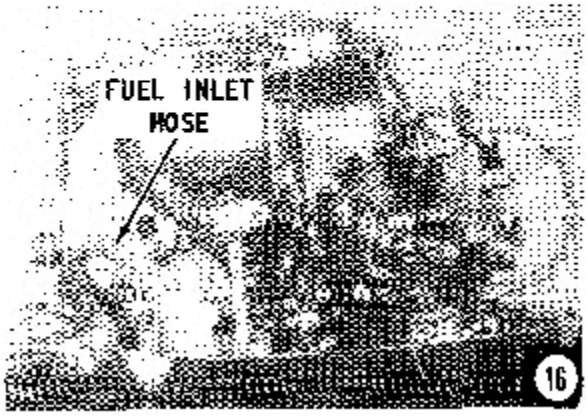
b. The power unit must be in forward gear.

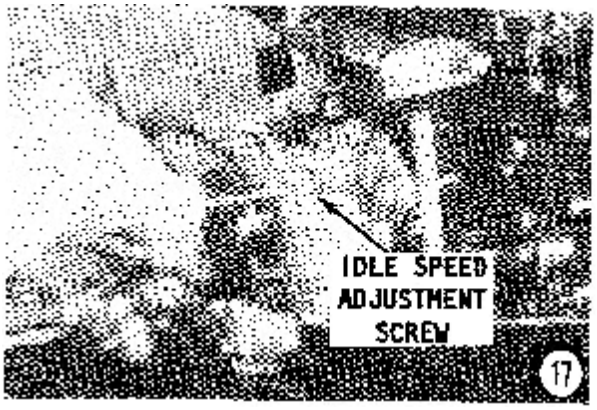
c. The lower unit must be in the water.

d. The engine must be warmed to normal operating temperature.

Idle Mixture Adjustment

17- After the above conditions have been met, including the engine run until it has reached operating temperature, set the idle mixture screw 1-1/2 turns open from a lightly seated position. Now, with the engine running, **SLOWLY** turn the idle mixture screw counterclockwise until the affected cylinders start to load up or begin to fire unevenly, due to an over-rich mixture. **SLOWLY** turn the idle mixture screw clockwise until the cylinders fire evenly and the engine rpm increase. Continue turning the screw clockwise until the engine rpm drop off and the engine begins to misfire. Now, turn the idle mixture screw **COUNTERCLOCKWISE** halfway between lean and rich position. Favor the rich side.



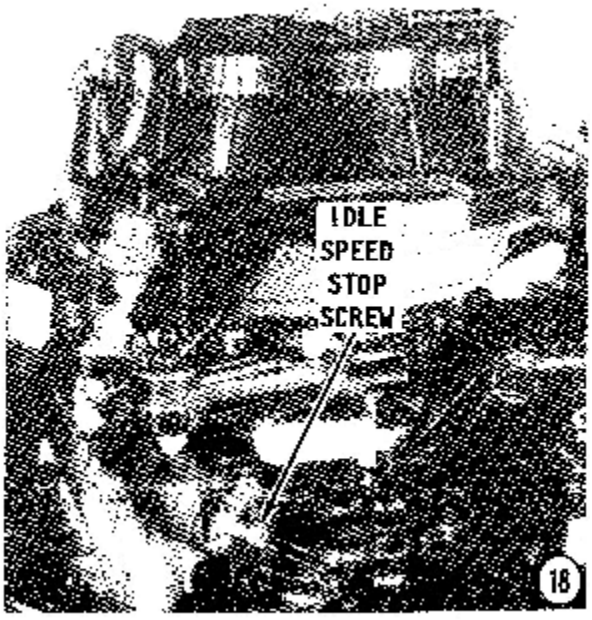


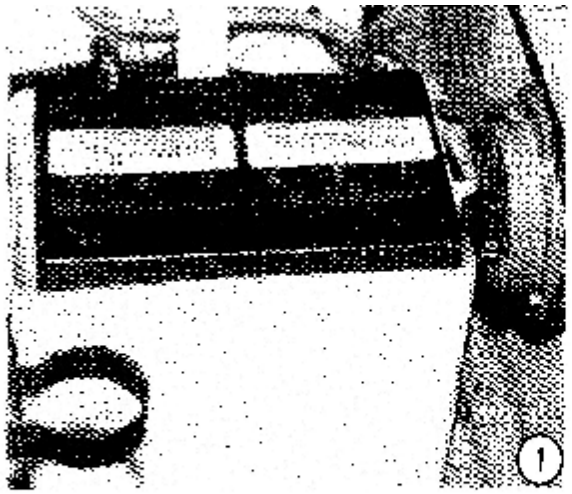
SOME ADVICE: Do not adjust to a leaner position than necessary. It is better to have the mixture set slightly on the rich side, rather than too lean. Too lean a mixture is often the cause of hard starting.

MORE ADVICE: If the engine hesitates during acceleration after adjusting the idle mixture, the mixture is set too lean and should be changed to the richer side until engine acceleration is smooth.

Idle Speed Adjustment

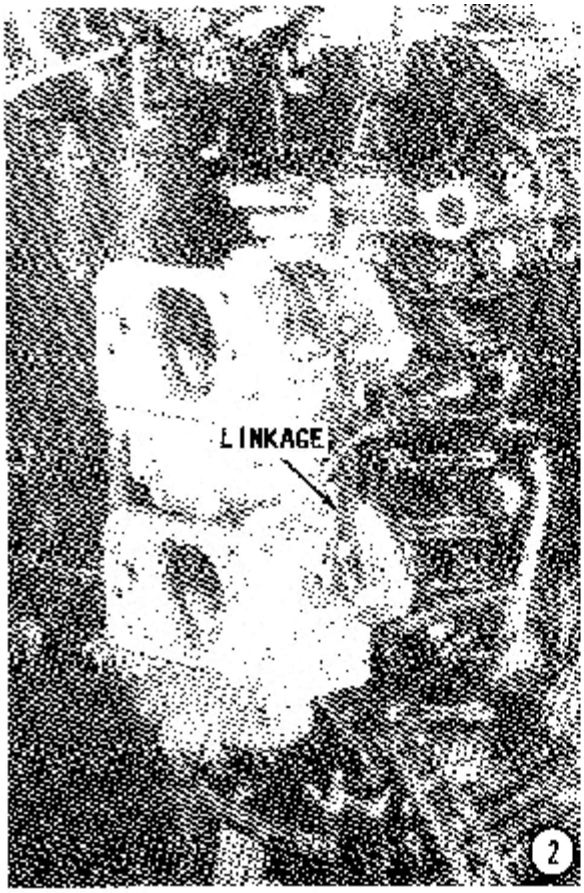
18- After the conditions listed at the beginning of this ADJUSTMENT section have been met, and the idle mixture adjustment has been properly made, as described in the previous step, then adjust the idle speed stop screw on the stop bracket until the engine idles at the recommended rpm given in the Tune-up Specifications in the Appendix. Continue running the engine in forward gear at the recommended wide open throttle range (WOT) to clear the engine, and then recheck the idle speed.

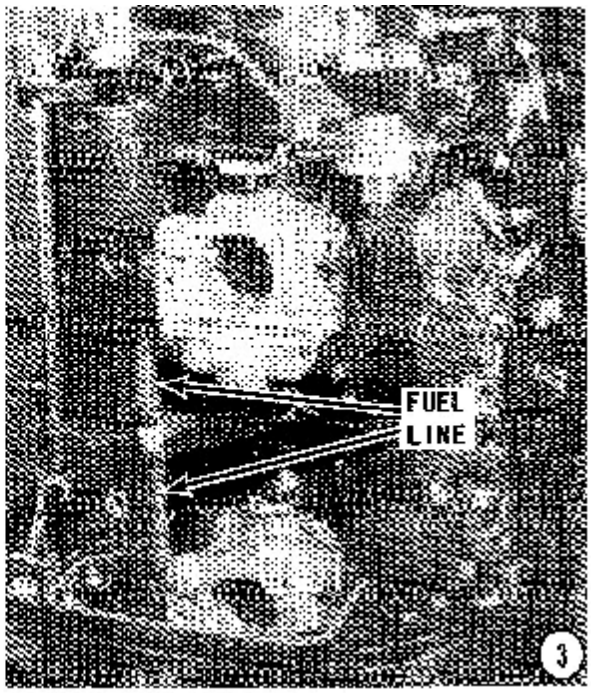




4-9 CENTER SQUARE BOWL CARBURETOR REFERENCED "C" IN APPENDIX

This section provides complete detailed procedures for removal, disassembly, cleaning and inspecting, assembling including bench adjustments, installation, and operating adjustments for the square bowl carburetor. To synchronize the fuel and ignition systems, see Chapter 6.

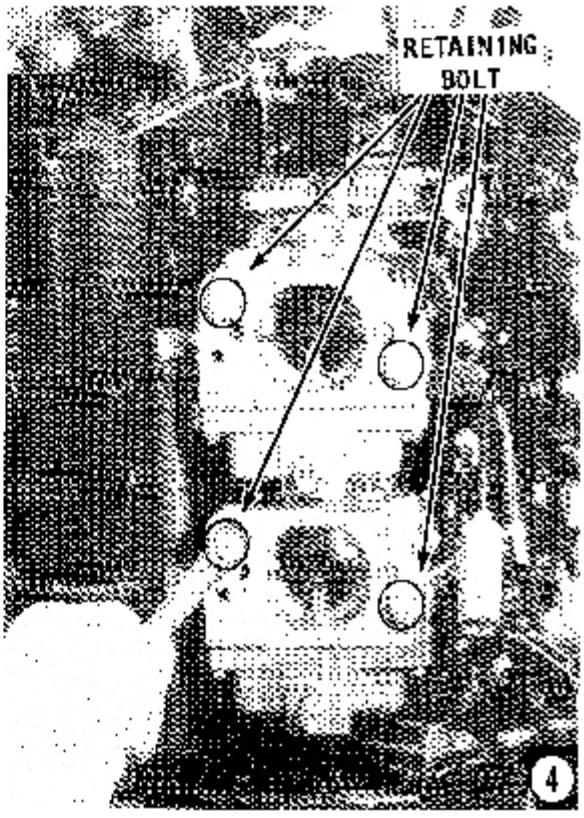


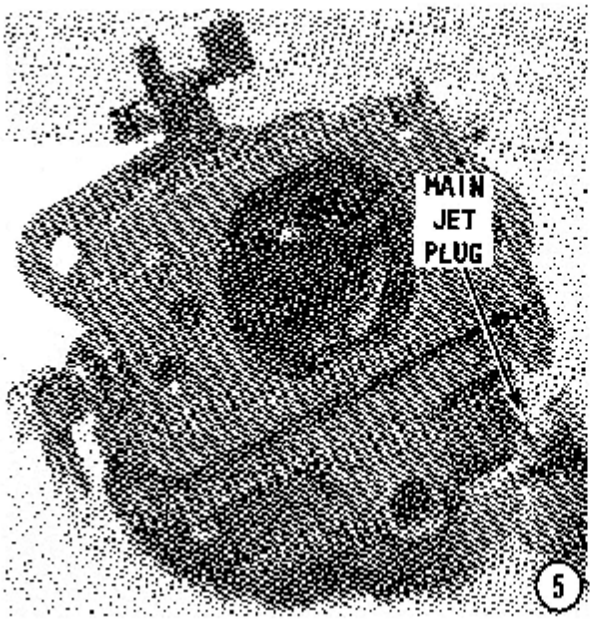


REMOVAL AND DISASSEMBLING

1- Remove the battery leads from the battery terminals. Remove the front engine cover. Take off the wrap around cowl cover.

2- Take time to identify each carburetor to ensure each will be installed back in its original position. Disconnect the throttle and choke linkage from each carburetor.

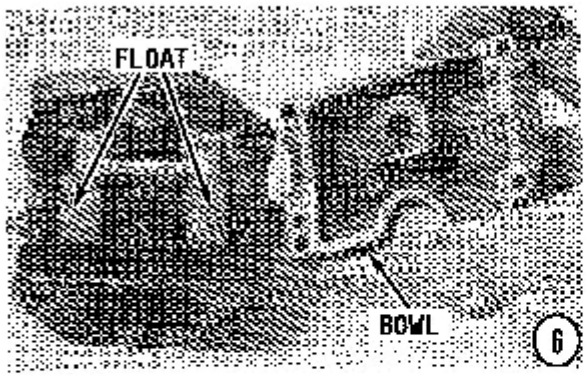


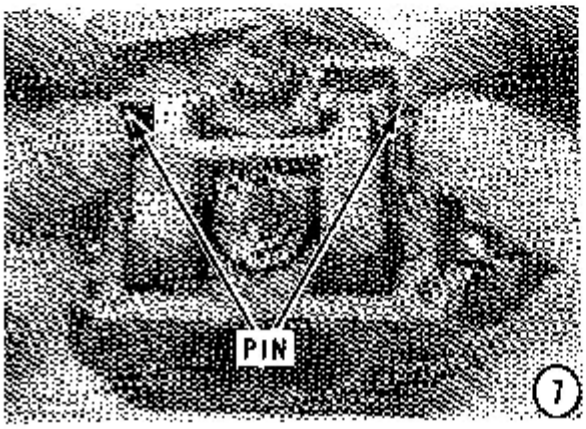


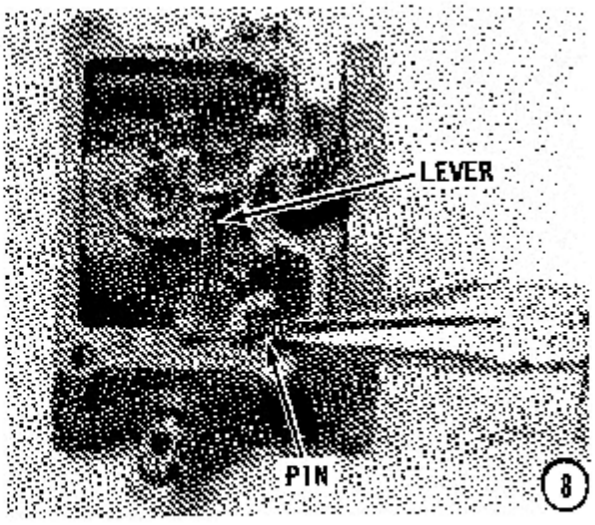
3- Disconnect the fuel line from the engine. Remove the hose clamps on each fuel line to each carburetor. Remove the fuel line from each carburetor.

4- Remove the attaching nuts securing each carburetor to the intake manifold. Remove each carburetor from the engine. Since the carburetors are identical, the following procedures are to be repeated for each carburetor.

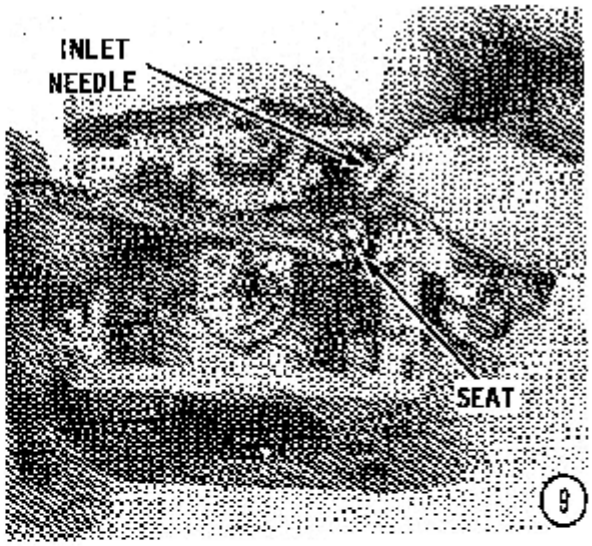
5- Remove the main jet plug located in the bottom of the carburetor bowl. **NOTE** that the main (high-speed) jet is located inside the plug. The jet may be removed, using the **PROPER** size screwdriver.

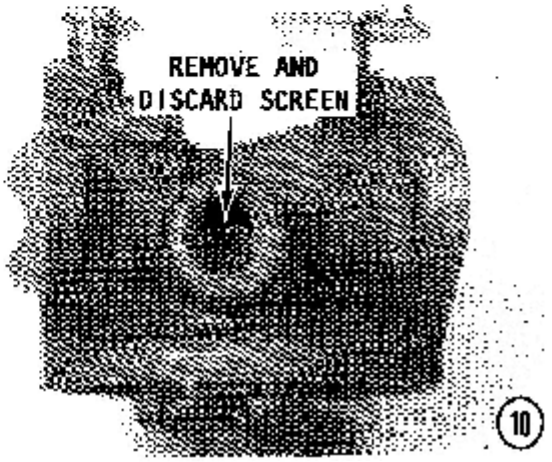


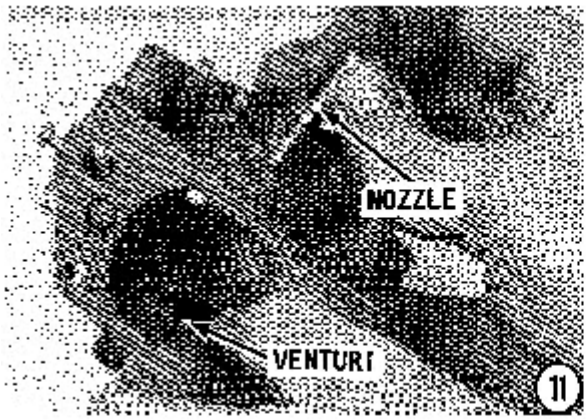




6- Turn the carburetor upside down and remove the four screws securing the bowl to the body. Remove the bowl, and then remove and **DISCARD** the bowl-to-body gasket.



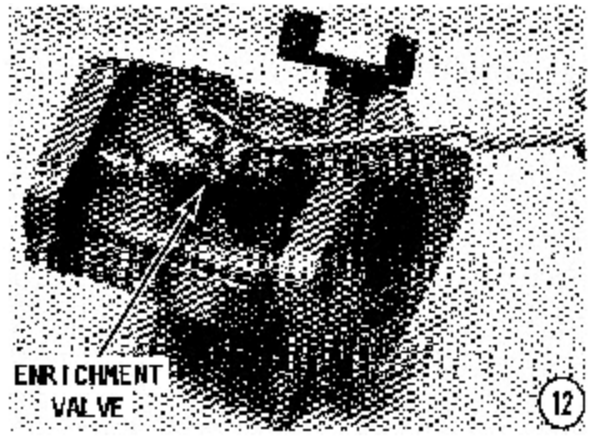


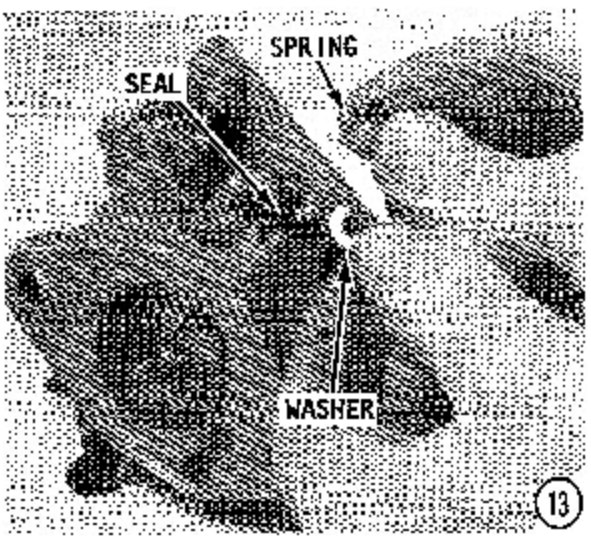


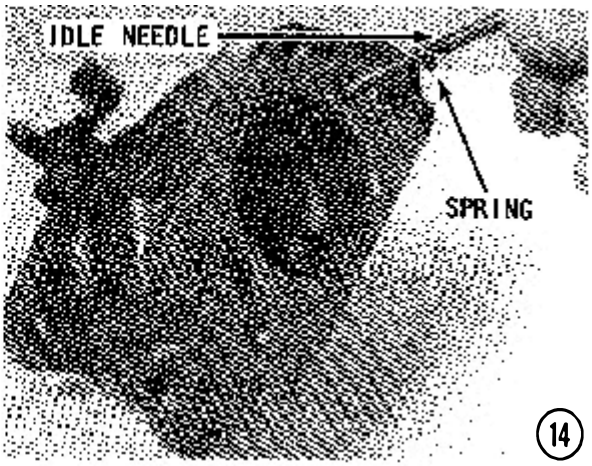
7- OBSERVE that the float is a double unit with two hinge pins. Withdraw both hinge pins by pushing each toward the **OUTER** edge of the carburetor. After the pins are free, lift the float from the carburetor body.

8- Remove the pin securing the float lever to the carburetor body by pushing the pin toward the backside of the carburetor. Remove the lever.

9- Withdraw the inlet needle from its seat. Remove the seat and the metal gasket installed below the seat.







10- Remove the fuel inlet hose fitting. Check the filter screen inside the hole. Remove the screen. The factory does not recommend using a filter in the carburetor.

11- Remove the nozzle in the center of the carburetor body and at the same time observe that the venturi in the bore will now be loose. After the nozzle is out, remove the venturi from the carburetor bore.

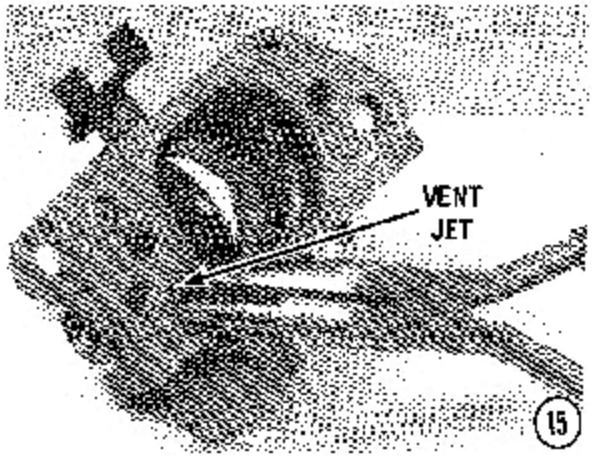
12- Remove the screw and lockwasher securing the enrichment valve assembly in the carburetor. This screw is located on the port side of the carburetor. Hold the enrichment valve and withdraw it straight out of the carburetor body.

13- Remove the throttle return spring, flat washer, and rubber seal from the bottom side of the carburetor.

14- Remove the idle needle from the starboard forward side of the carburetor. Notice how the needle comes out at an angle.

15- Remove the fuel bowl vent jet from the port side.

A GOOD WORD: Further disassembly of the carburetor is not neccessary in order to clean it properly.



CLEANING AND INSPECTING

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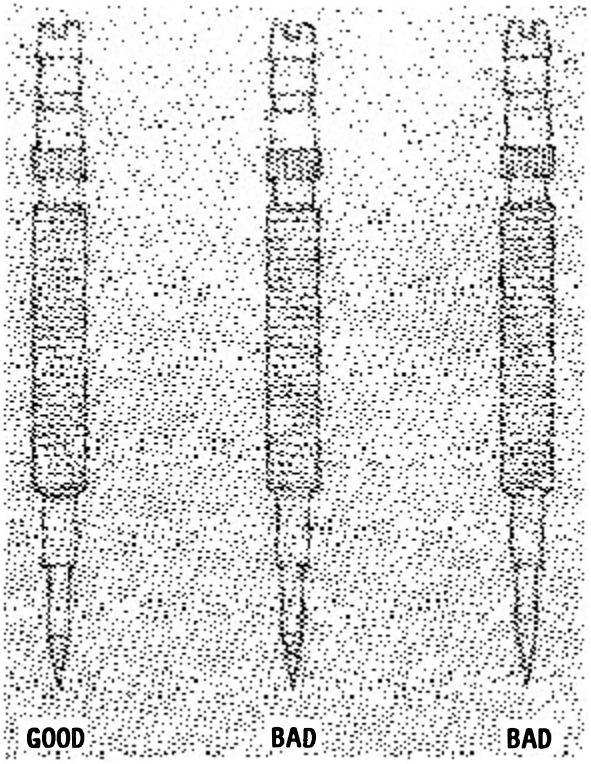
Place all of the metal parts in a screen-type tray and dip them in carburetor cleaner until they appear completely clean, then blow them dry with compressed air.

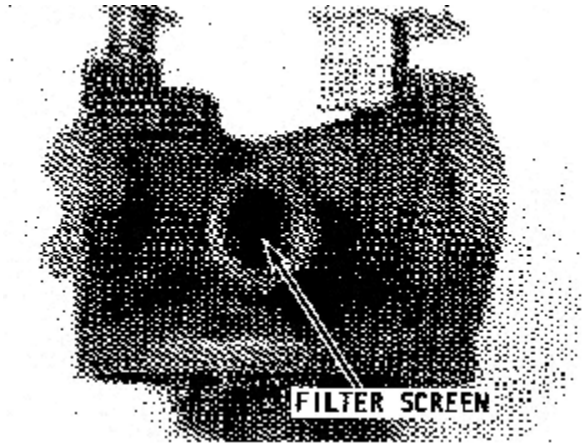
Blow out all of the passages in the castings with compressed air. Check all of the parts and passages to be sure they are not clogged or contain any deposits. **NEVER** use a piece of wire or any type of pointed instrument to clean drilled passages or calibrated holes in a carburetor.

Move the throttle shaft back-and-forth to check for wear. If the shaft appears to be too loose, replace the complete throttle body because individual replacement parts are **NOT** available.

Inspect the main body, airhorn, and venturi cluster gasket surfaces for cracks and burrs which might cause a leak. Check the float for deterioration. If hollow floats are used, check to be sure they do not contain any fluid. Check to be sure the float spring has not been stretched. If any part of the float is damaged, the unit must be replaced. Check the float arm needle contacting surface and replace the float if this surface has a groove worn in it.



Three carburetor idle adjustment needles lined-up for comparison. The far left needle is new, the other two are worn and unfit for further service.

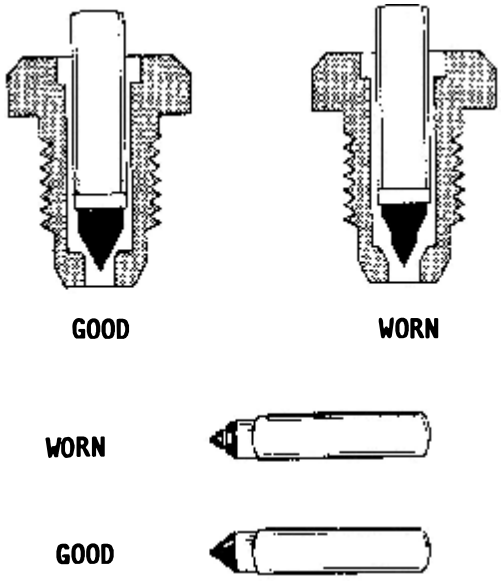


*Remove and **DO NOT** replace this filter screen. The manufacturer has determined the screen is too difficult to locate and actually it is not necessary.*

Inspect the tapered section of the idle adjusting needles and replace any that have developed a groove.

Most of the parts that should be replaced during a carburetor overhaul are included in an overhaul kit available from your local marine dealer. This kit will also contain a matched fuel inlet needle and seat. This combination should be replaced each time the carburetor is disassembled as a precaution against leakage.

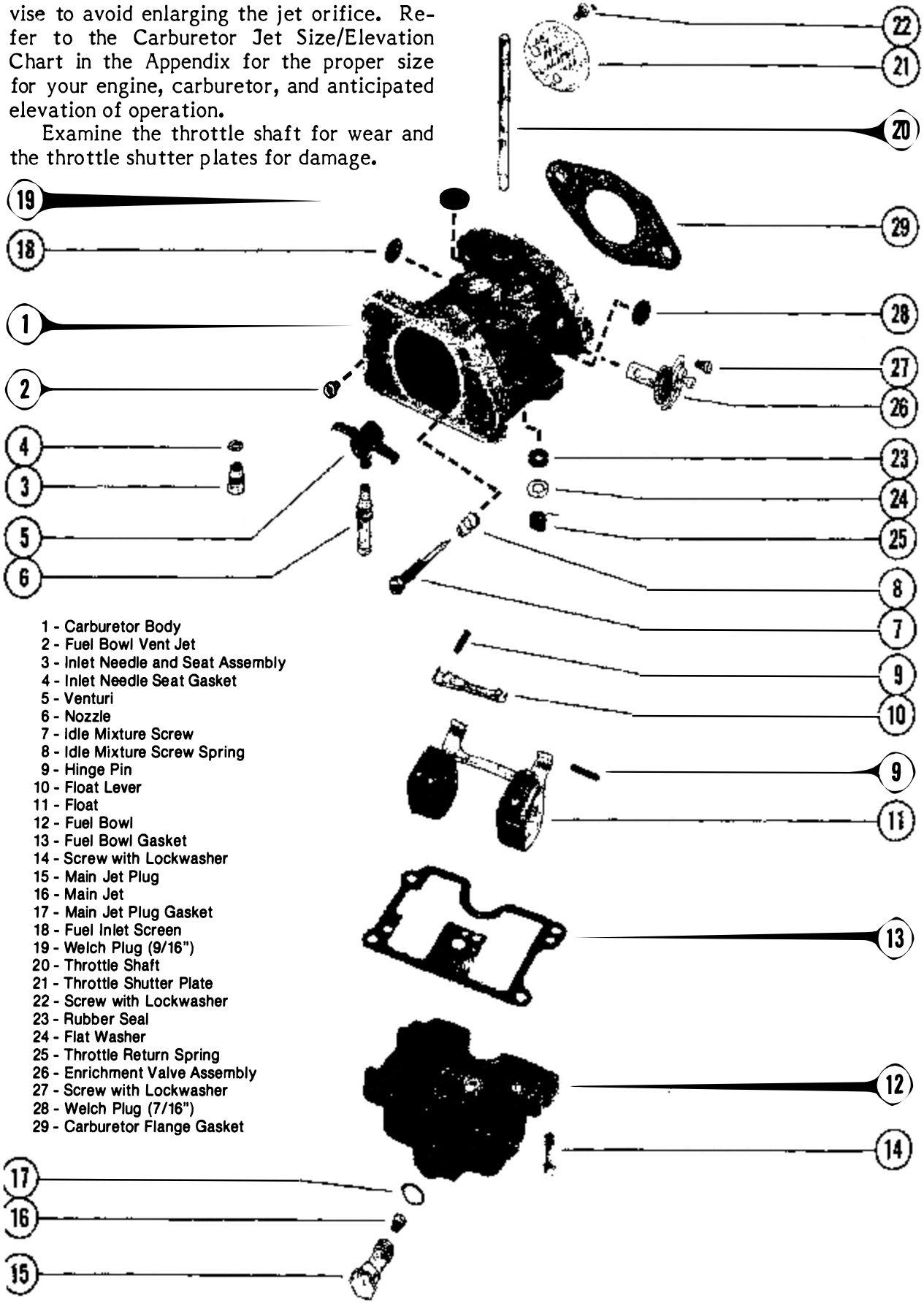
Check the jet sizes with a drill of the proper size. **ALWAYS** hold the drill in a pin



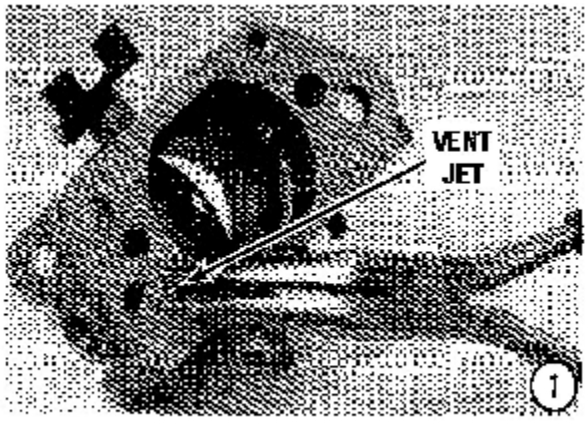
Needle and seat arrangement on the carburetor covered in this section, showing a worn and new needle for comparison.

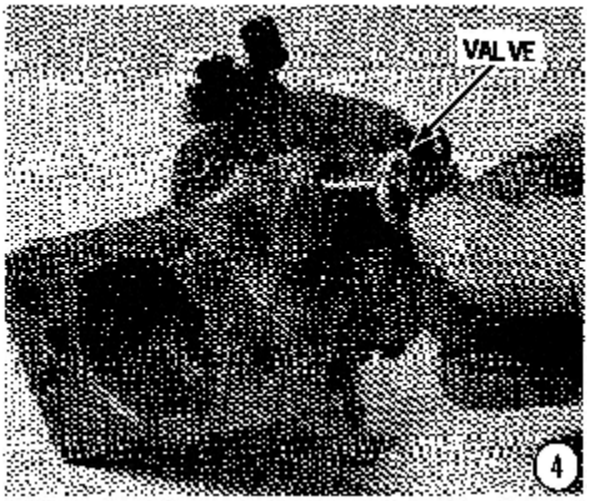
vise to avoid enlarging the jet orifice. Refer to the Carburetor Jet Size/Elevation Chart in the Appendix for the proper size for your engine, carburetor, and anticipated elevation of operation.

Examine the throttle shaft for wear and the throttle shutter plates for damage.



Exploded drawing of a center square bowl carburetor showing arrangement of major parts. This carburetor is identified as Carburetor "C" in the text and Appendix.

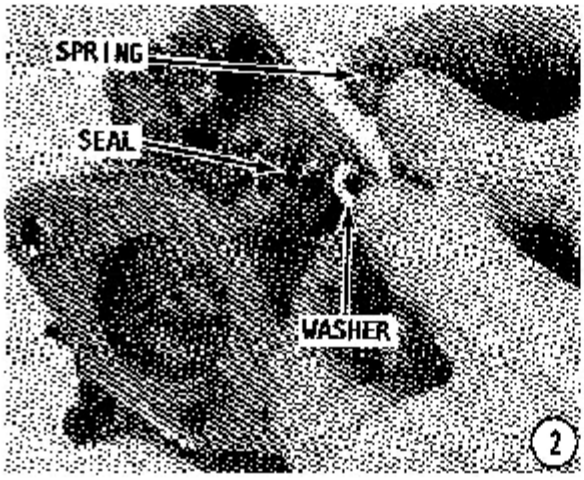


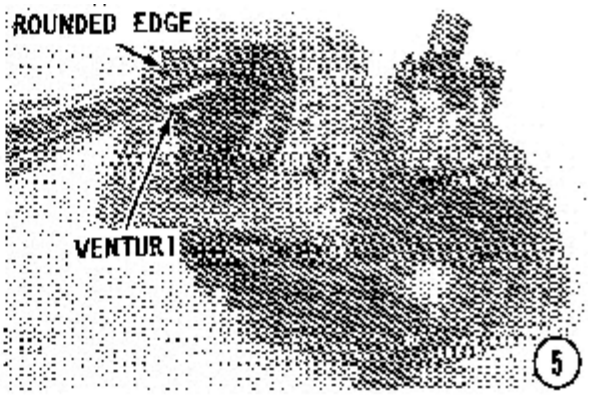


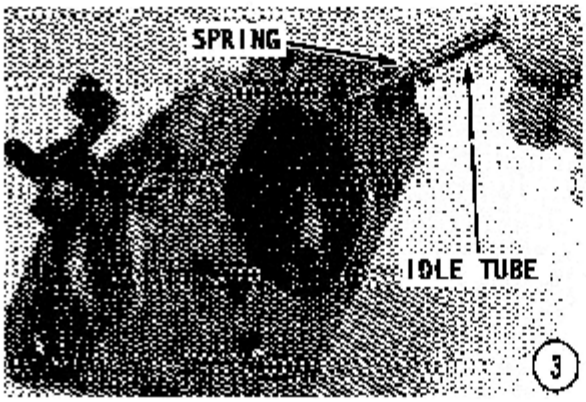
ASSEMBLING

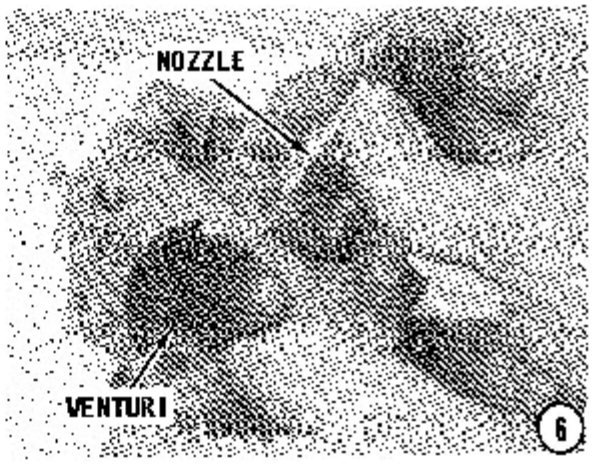
1- Install the fuel bowl vent jet into the port side of the carburetor and tighten it securely.

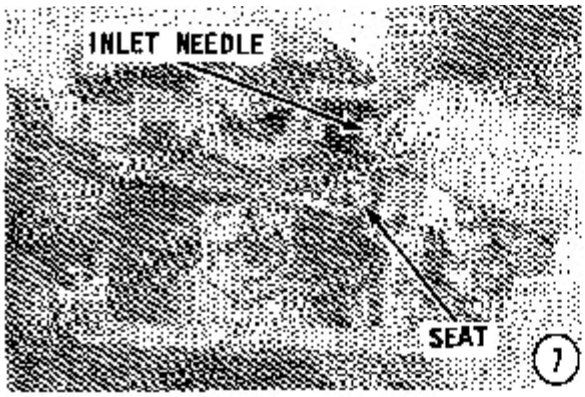
2- Turn the carburetor upside down. Slide the rubber seal onto the throttle shaft with the lip **TOWARD** the carburetor. **OBSERVE** there are two sizes of springs to be installed onto the throttle shaft of the carburetors. **ALWAYS** install the strongest spring, the one with the largest diameter wire, onto the top mounted carburetor on **ALL** model engines. Slide the flat washer and throttle return spring onto the shaft. Hold the shutter plate in the closed position, and attach the throttle return spring.

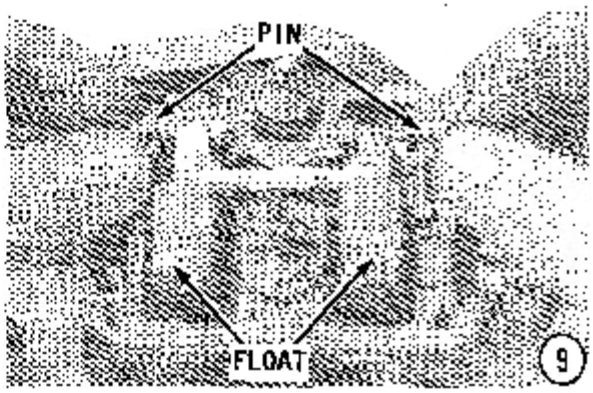












3- Slide the spring onto the idle tube. **CAREFULLY** thread the idle tube into place on the starboard side of the carburetor until you feel it just barely seat. Now, as a preliminary adjusment, back the screw on the end of the tube out one complete turn.

4- Install and position the enrichment valve assembly into the carburetor body. Secure the assembly in place with the screw and lockwasher. Make sure the spring arm is on the top of the square part of the carburetor.

5- Insert the venturi into the front of the carburetor and into the bore. The rounded edge must be installed into the carburetor towards the rear of the carburetor.

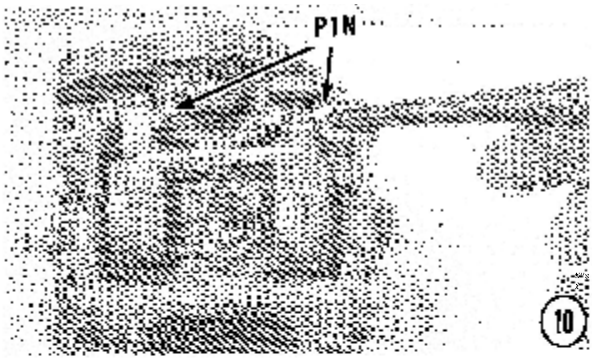
6- Install the nozzle through the top of the carburetor and into the venturi. The venturi is now held in place by the nozzle. Tighten the nozzle securely.

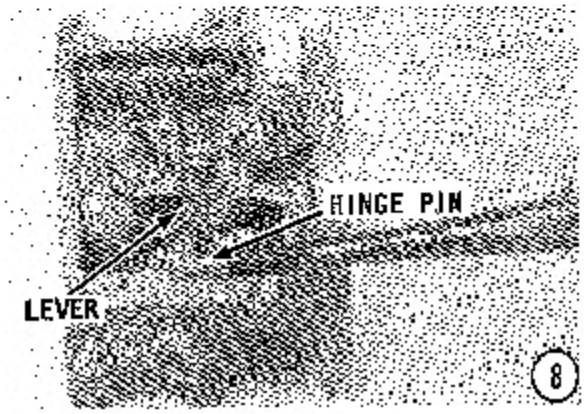
7- Position a **NEW** metal gasket onto the carburetor body at the inlet needle seat hole. Install the inlet needle seat, with rubber insert, into place and tighten the seat securely. Slide the needle into the seat.

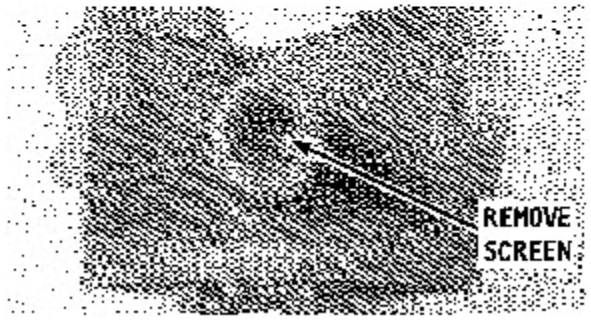
8- Position the float lever between the posts of the carburetor, and then slide the hinge pin into place from the rear of the carburetor. Use a flat end punch and seat the hinge pin until the knurled end of the pin is flush or within 1/32" (0.80mm) from the side of the post.

9- Slide the float into place between the posts of the carburetor. Insert both hinge pins through the posts from the outside edge.

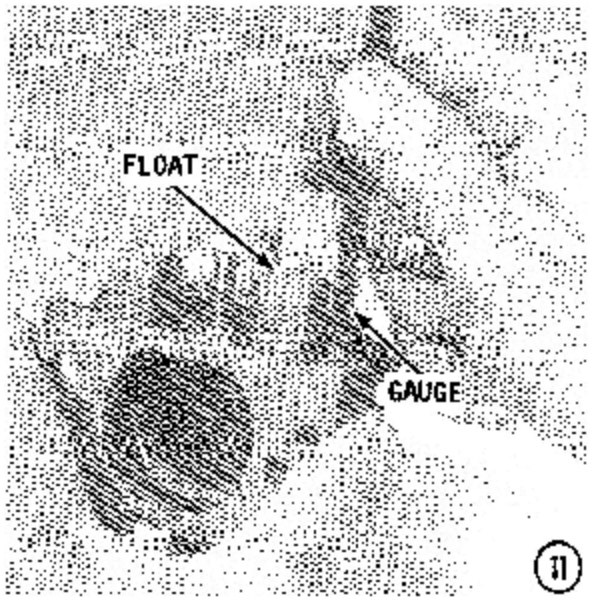
10- Use a flat end punch to push the pins into the posts until the knurled end of each pin is flush or with 1/32" (0.80mm) from the side of the post.







*Remove and **DO NOT** replace this filter screen. The manufacturer has determined the screen is too difficult to locate and actually it is not necessary.*



Float Level Bench Adjustment

11- Turn the carburetor upside down with the floats resting on the inlet needle. Measure the distance from the base of the carburetor to the bottom edge of the float. This measured distance must be 11/16" (17.46mm). **CAREFULLY** bend the float lever to obtain the correct measurement.

12- With the carburetor still upside down, position a **NEW** gasket onto the body.

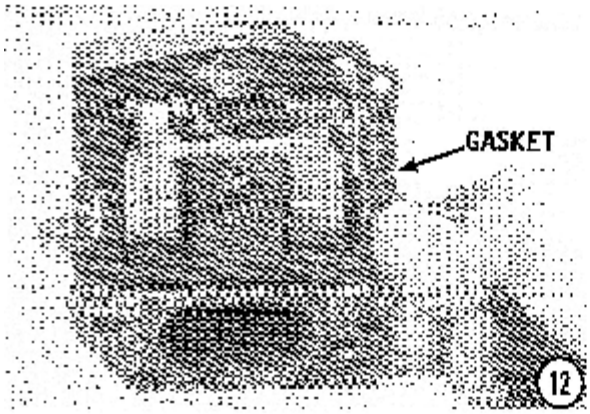
13- Place the fuel bowl in position and secure it with the four attaching screws.

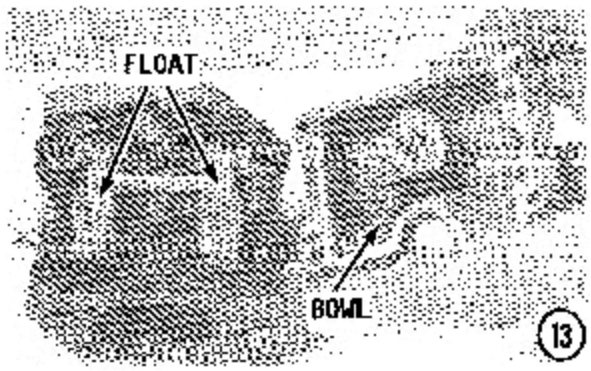
14- Install the main jet into the plug, if it was removed. Use a **NEW** gasket and install the plug into the carburetor bowl.

15- The factory does not recommend replacing the fuel filter. Install the fuel hose fitting.

INSTALLATION

16- Position a **NEW** gasket in place on the intake manifold. Install the carburetor onto



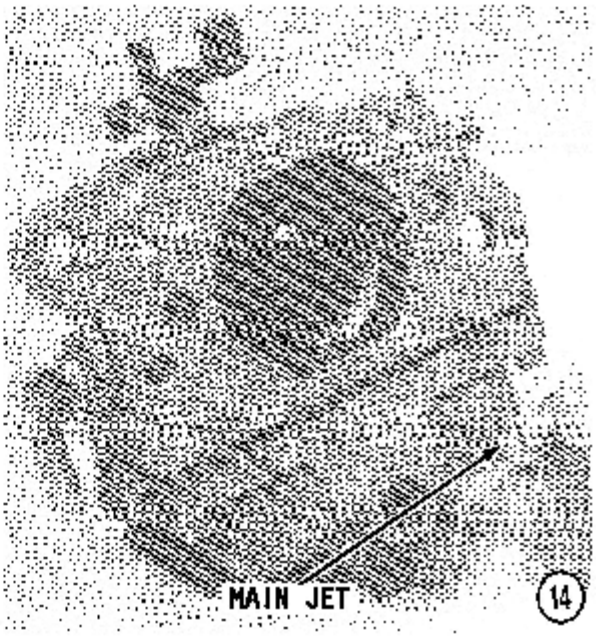


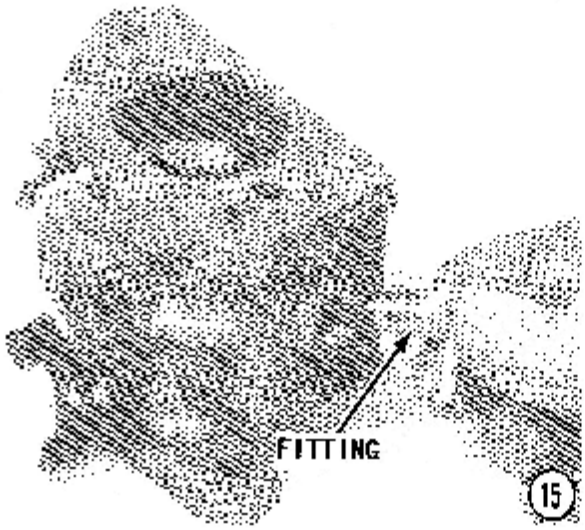
the manifold in the same position from which it was removed. Each carburetor should have been identified as instructed during the removal procedures. Secure the carburetor in place with the retaining nuts. Tighten the nuts alternately to a torque value of 100in lb (11Nm).

17- Assemble and install the other carburetors in a similar manner. Connect the manual choke to the choke rod. Connect all of the fuel lines to the carburetors and tighten the clamps securely. Connect the fuel line from the fuel tank. Activate the fuel line squeeze bulb several times and check the carburetors and fuel lines for leaks. Connect the throttle and choke linkage to and between the carburetors. Connect the battery leads to the battery.

Synchronizing

To synchronize the fuel and ignition systems, see Chapter 6.





OPERATING ADJUSTMENTS

FIRST A FEW WORDS Before fine carburetor adjustments can be properly made, the following conditions must exist:

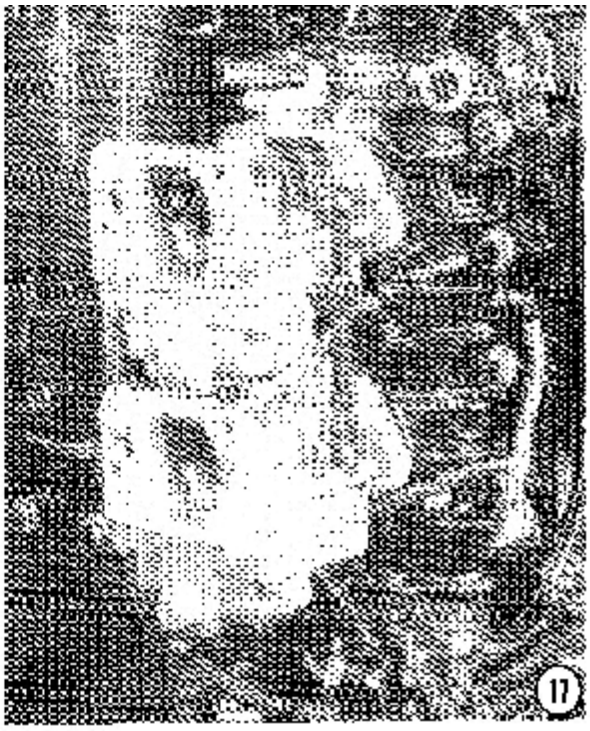
a. The correct engine-propeller combination must be used.

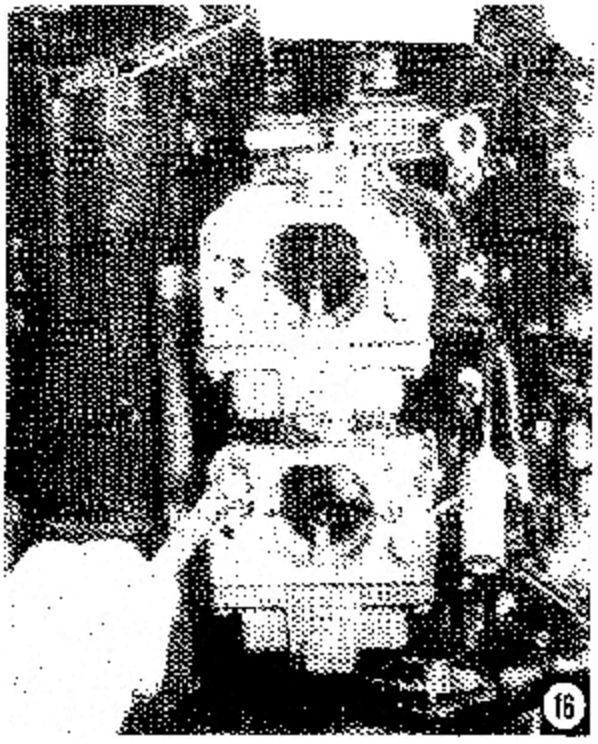
b. The power unit must be in forward gear.

c. The lower unit must be in the water.

d. The engine must be warmed to normal operating temperature.

e. Main fuel jet size recommendations are intended as a guide only. If in doubt, try a size larger or smaller. Refer to the Carburetor Jet Size/Elevation Chart in the Appendix. Spark advance change is **NOT** recommended for changes in elevation. In order to obtain proper engine rpm at higher elevation, a lower pitch propeller is suggested.





Location of principle carburetor adjustments. Detailed adjustment procedures are covered in Chapter 6.