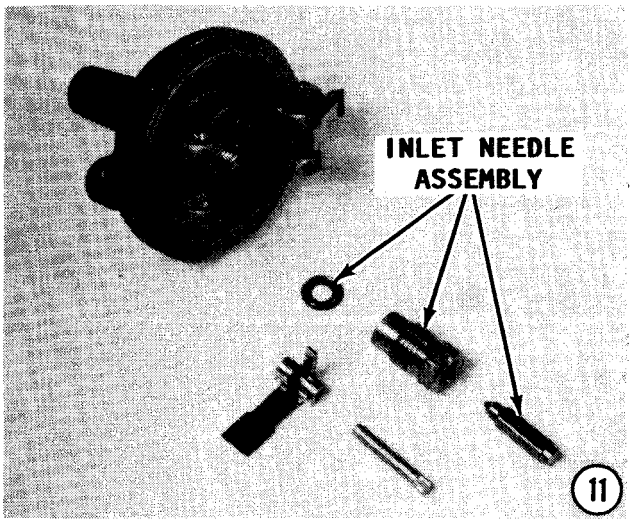
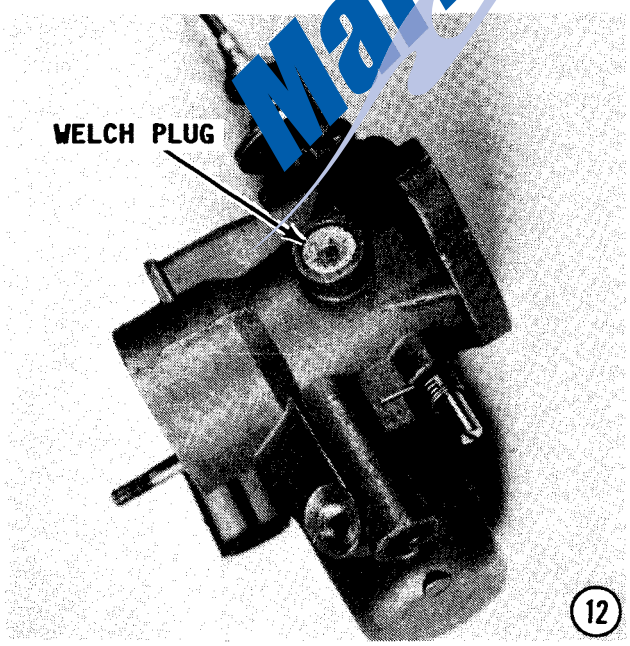
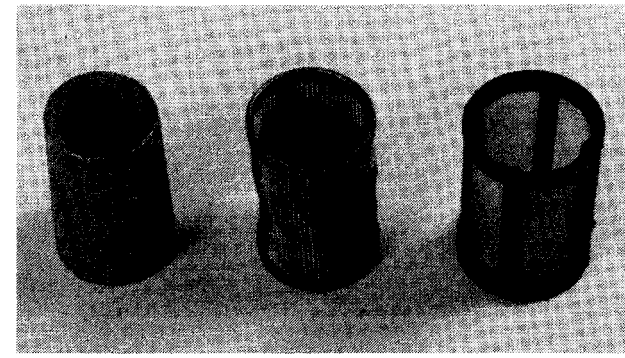


A fuel bowl vent jet is located on the exterior of the cover. This jet is not normally distrubed during carburetor overhaul. However, this jet together with the main jet must be changed when operating the powerhead at elevations higher than 2,500 feet above sea level. Consult the table in the Appendix for the correct main jet and vent sizes for various elevations.

11- Turn the float cover upside down and notice the assembly has two levers. Remove the top lever pin and hinge back the other lever. Now, remove the inlet needle from the needle seat. Use the proper size socket and remove the needle seat. The seat has a standard right-hand thread. Reach into the body with a small pick and gently remove the gasket.

12- To remove the Welch plug on the side of the carburetor, use a sharp punch to puncture the center of the plug, and then pry out the plug. A new Welch plug is **ONLY** available in a carburetor overhaul kit. The Welch plug covers the idle by-pass chamber.





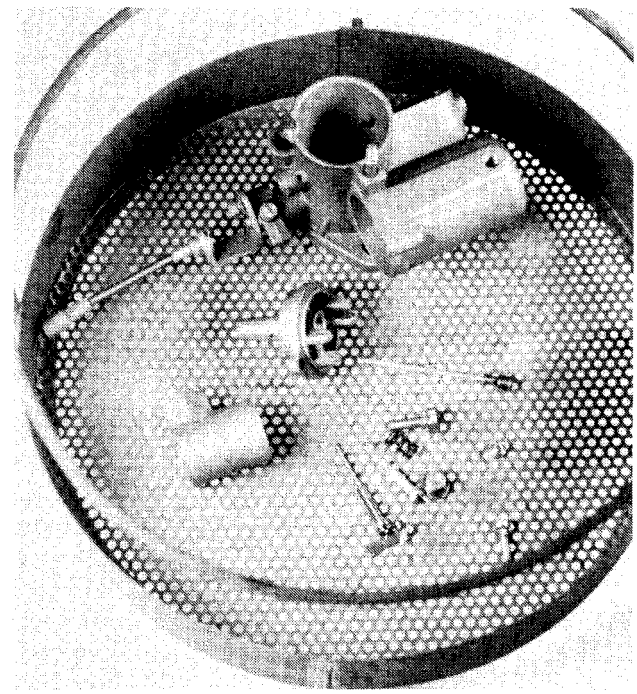
Fuel strainers used with the side bowl Carburetor "D". The two on the left are obsolete and should be replaced with the new type on the far right.

A GOOD BOARD: Further disassembly of the carburetor is not necessary.

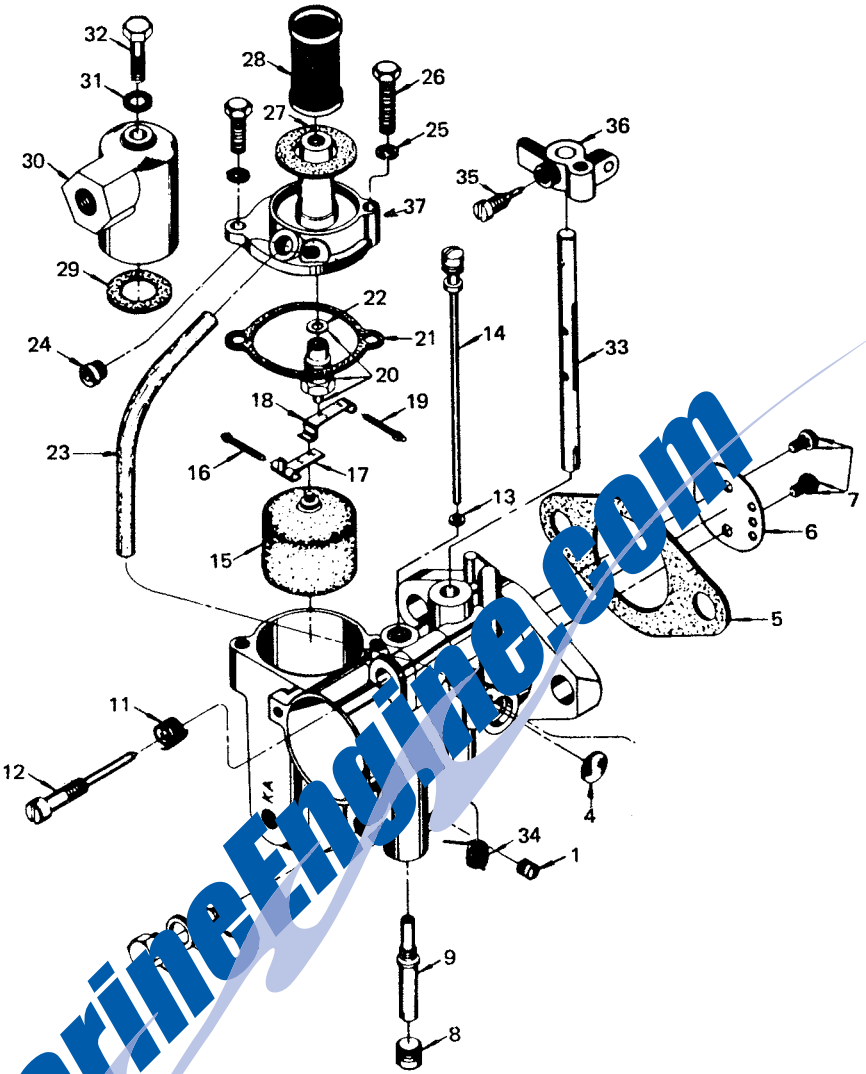
CLEANING AND INSPECTING

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 metal parts in a screen-type tray and dip them in carburetor cleaner

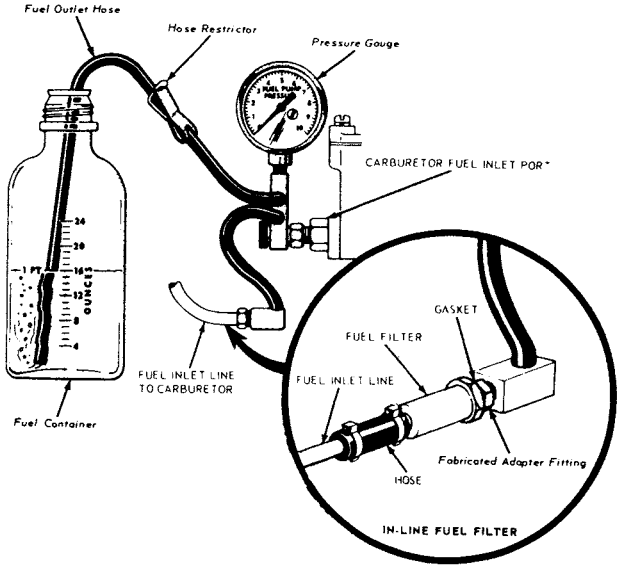


*All rubber and plastic parts **MUST** be removed before carburetor parts are placed in a basket to be submerged in carburetor cleaner.*



1-	PLUG	14-	IDLE TUBE	26-	FLOAT COVER BOLT
2-	MAIN FUEL JET PLUG	15-	FLOAT	27-	GASKET
3-	GASKET	16-	LOWER FLOAT LEVER PIN	28-	FILTER SCREEN
4-	WELCH PLUG	17-	LOWER FLOAT LEVER	29-	GASKET
5-	GASKET	18-	UPPER FLOAT LEVER	30-	FUEL INLET COVER
6-	THROTTLE SHUTTER	19-	UPPER FLOAT LEVER PIN	31-	GASKET
7-	THROTTLE SHUTTER SCREW	20-	INLET NEEDLE & SEAT	32-	INLET COVER SCREW
8-	PLUG	21-	GASKET	33-	THROTTLE SHAFT
9-	MAIN FUEL NOZZLE	22-	GASKET	34-	SPRING
10-	MAIN FUEL JET	23-	BACK DRAG TUBE	35-	THROTTLE STOP LEVER
11-	SPRING	24-	BACK DRAG AIR JET	36-	THROTTLE STOP LEVER
12-	IDLE MIXTURE SCREW	25-	LOCKWASHER	37-	FLOAT BOWL COVER
13-	GASKET				

Exploded view of the side bowl "back drag" carburetor, identified as Carburetor "D" in the text and appendix. This carburetor has an additional circuit which lowers the atmospheric pressure in the float bowl to increase fuel economy at certain midrange rpm. Major parts are identified.



Test setup to check fuel pump pressure.

Fuel is then forced through the discharge valve into the carburetor.

The pump has the capacity to lift fuel two feet and deliver approximately five gallons per hour at 4 psi pressure.

Problems with the fuel pump are limited to possible leaks in the flexible neoprene suction lines; a punctured diaphragm; air leaks between sections of the pump assembly, or possibly from the disc valves not seating properly.

The pump is activated by one cylinder. If this cylinder indicates a wet fouled condition, as evidenced by a wet fouled spark plug, be sure to check the fuel pump diaphragm for possible puncture or damage.

PUMP PRESSURE CHECK

GOOD WORDS

Lack of an adequate fuel supply will cause the engine to run lean, lose rpm, or cause piston scoring. If an integral fuel pump carburetor is installed, the fuel pressure **cannot** be checked.

With a multiple carburetor installation, fuel pressure at the top carburetor should be checked whenever insufficient fuel is suspected.

Fuel pressure should be checked if a fuel tank, other than the one supplied by the outboard unit's manufacturer, is being used. When the tank is checked, be sure the fuel cap has an adequate air vent. Verify that the fuel line from the tank is of sufficient size to accommodate the engine demands. An adequate size line would be one measuring from 5/16" to 3/8" (7.94 to 9.52mm) ID (inside diameter). Check the fuel filter on the end of the pickup in the fuel tank, to be sure it is not too small and that it is not clogged. Check the fuel pickup tube. The tube must be large enough to accommodate the fuel demands of the engine under all conditions. Be sure to check the filter at the carburetor. Sufficient quantities of fuel cannot pass through into the carburetor to meet engine demands if this screen becomes clogged.

Fuel Pump Test

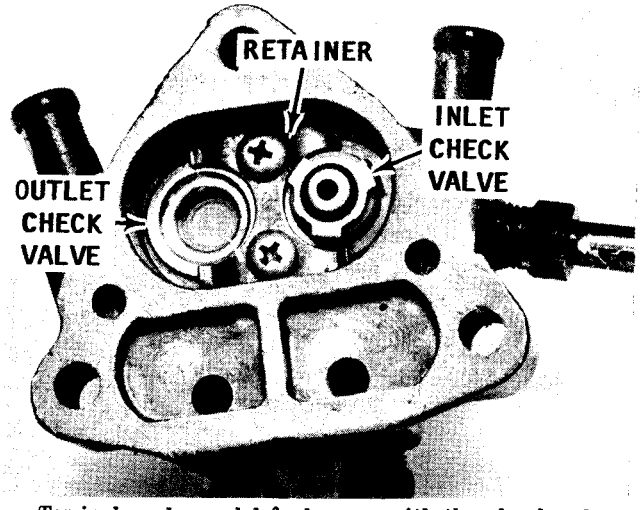
Install the fuel pressure gauge in the fuel line between the fuel pump and the carburetor. If multiple carburetors are installed, connect the gauge in the line to the top carburetor. Operate the engine at full throttle and check the pressure reading. The gauge should indicate at least 2 psi.

REMOVAL

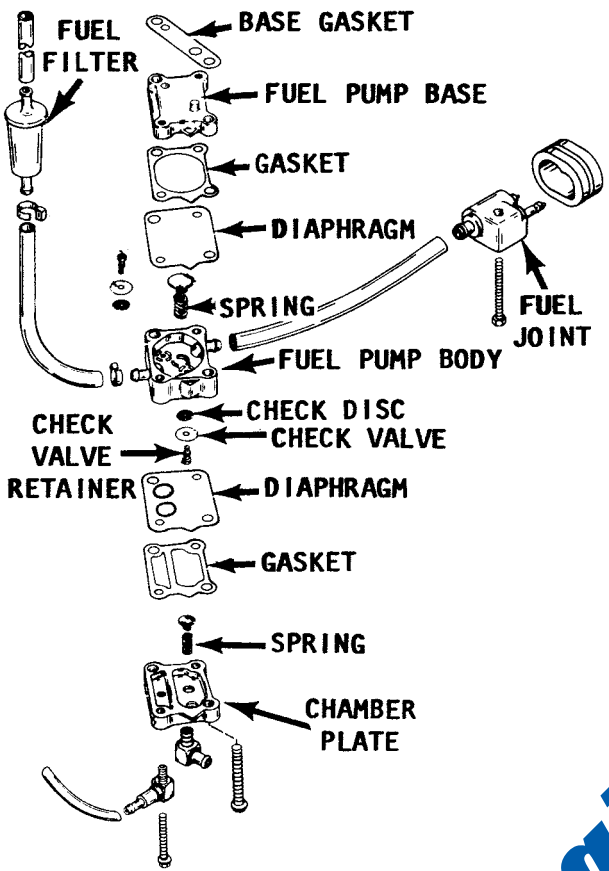
Turn the fuel shut-off valve to the **OFF** position and disconnect the fuel line either at the fuel tank or at the engine.

TAKE CARE: In most cases the bolts fastening the pump to the engine also secure the pump together. Therefore, hold the pump together with one hand and remove the attaching bolts with the other.

Remove the pump and lay it on a suitable work surface. Now **CAREFULLY** separate the parts and keep them in **ORDER** as an assist in assembling. As you remove the check valves **TAKE TIME** to **OBSERVE** and **REMEMBER** how each valve faces, because it **MUST** be installed in exactly the same manner, or the pump will not function.



Typical early model fuel pump with the check valves removed. Notice the valves face in opposite directions.



Exploded drawing of a late model fuel pump ... ed on smaller horsepower powerheads.

CLEANING AND INSPECTING

Wash all parts thoroughly in ... and then blow them dry with ... air. **USE CARE** when using ... ed air on the check valves. **DO** ... the nozzle too close because ... valve can be damaged from ... blast of air.

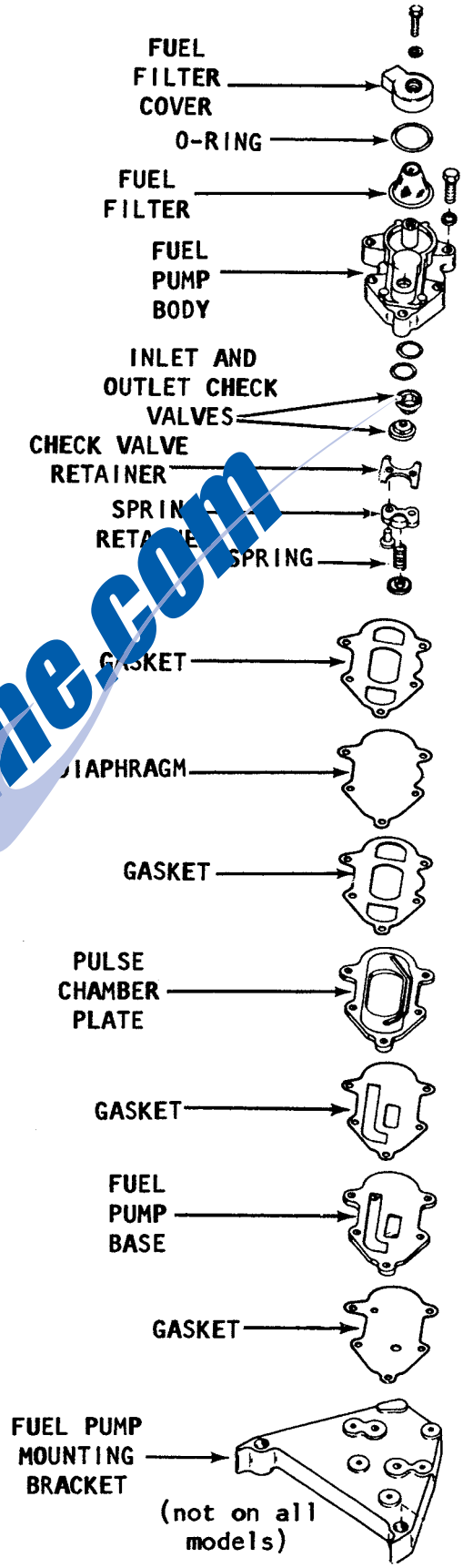
Inspect ea... ear and damage. Verify that ... seats provide a flat contact area f... valve disc. Tighten all elbows and che... valve connections firmly as they are replaced.

Test each check valve by blowing through it with your mouth. In one direction the valve should allow air to pass through. In the other direction, air should not pass through.

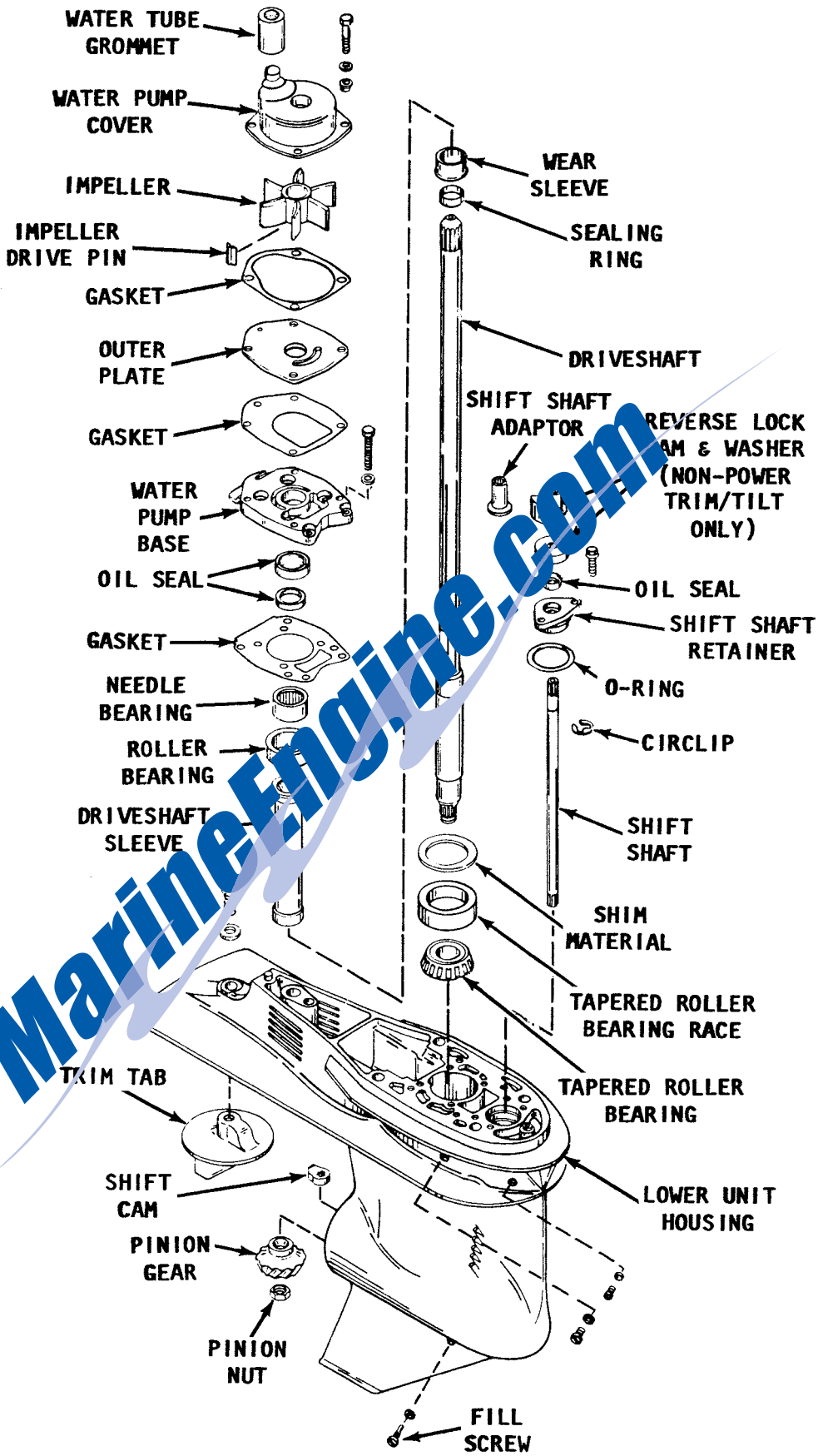
Check the diaphragm for pin holes by holding it up to the light. If pin holes are detected or if the diaphragm is not pliable, it **MUST** be replaced.

ASSEMBLING

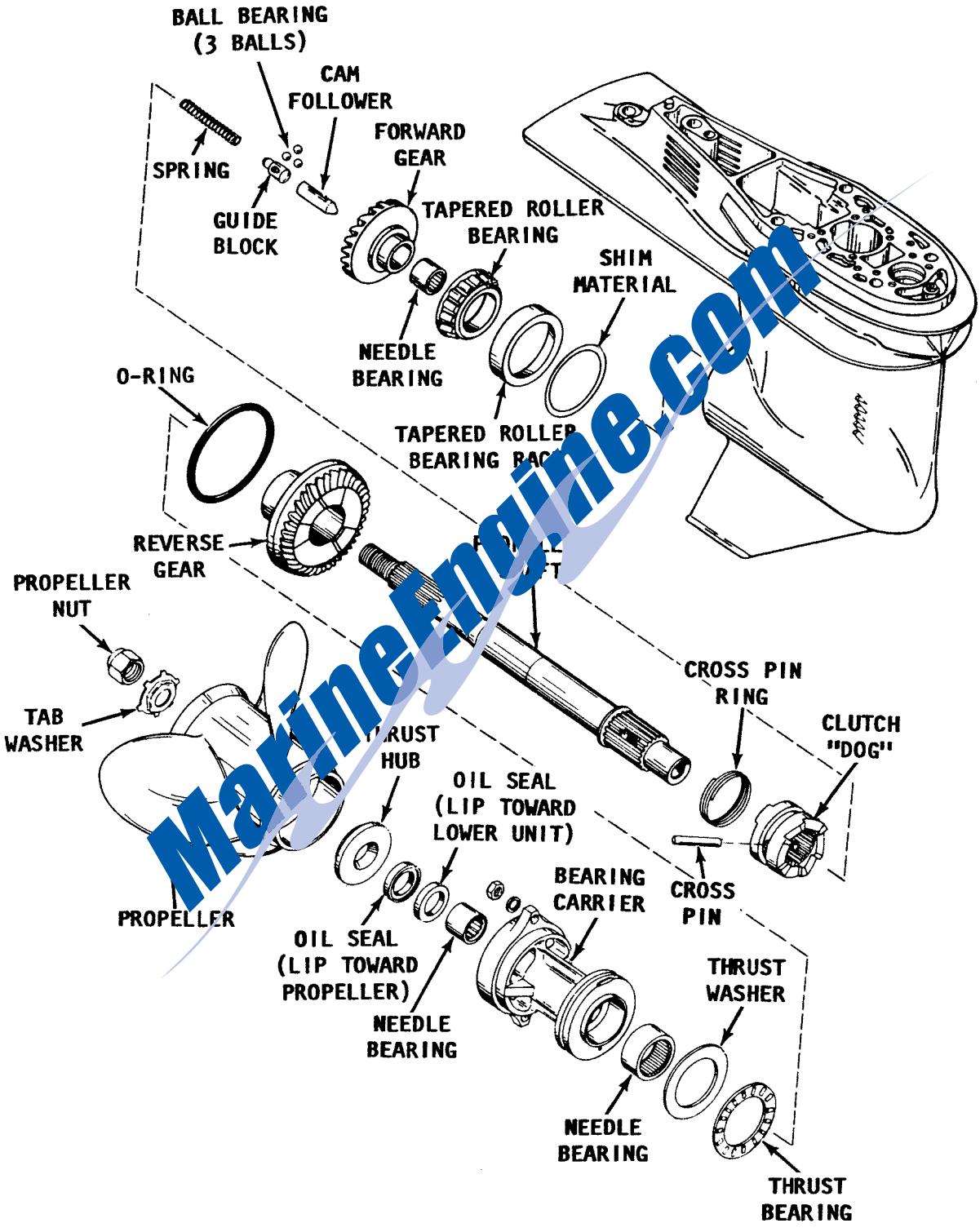
Proper operation of the fuel pump is essential for maximum performance of the



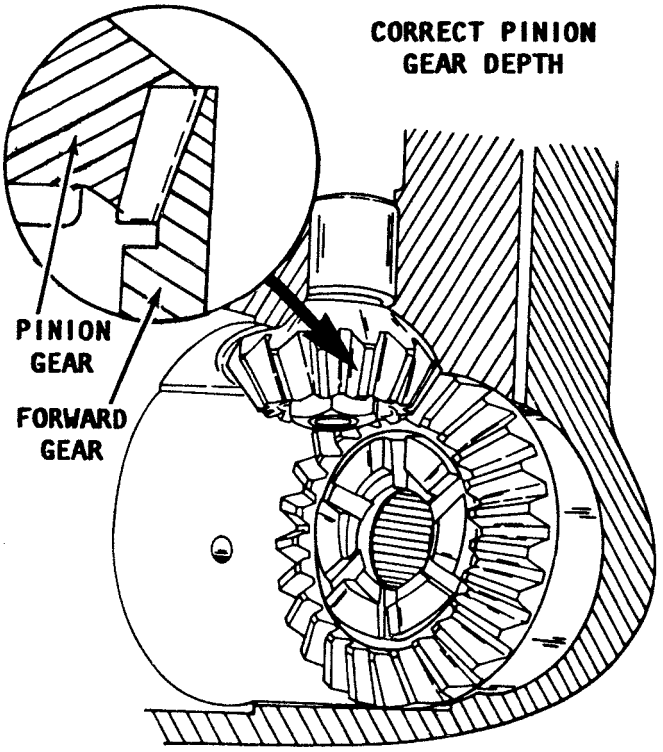
Exploded drawing of the fuel pump installed on late model L6 and V6 powerheads.

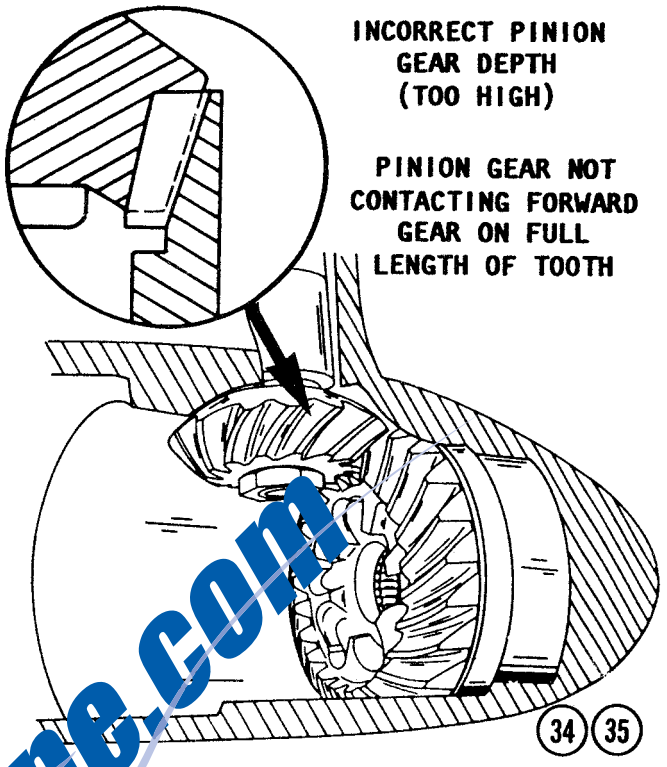


Exploded drawing of the driveshaft and water pump of a Cam-Shift Type II lower unit. Major parts are identified.



Exploded drawing of the propeller shaft and shifting mechanism of a Cam-Shift Type II. Major parts are identified.





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pinion gear tooth engagement with the forward gear teeth to be sure contact is made the full length of the tooth. This can be accomplished by using a flashlight and looking through the gear housing opening. If the pinion gear depth is incorrect, the following paragraphs list detailed steps to be followed for the correction of the condition detected.

Forward Gear Backlash

36- Push downward on the driveshaft (all models with preload pin -- Alpha One), or pull upward on the driveshaft (models without the preload pin -- Alpha One), hold it in this position and check the pinion gear tooth engagement with the forward gear teeth. In either case, contact should be made the full length of the teeth. Now, place your other hand into the bearing carrier cavity with a couple fingers hooked in the forward gear. Pull on the forward gear and rock it lightly back-and-forth. The amount of free play between the gear teeth is considered the gear backlash. Check the Specifications in the Appendix for the proper backlash allowed for the unit being serviced.

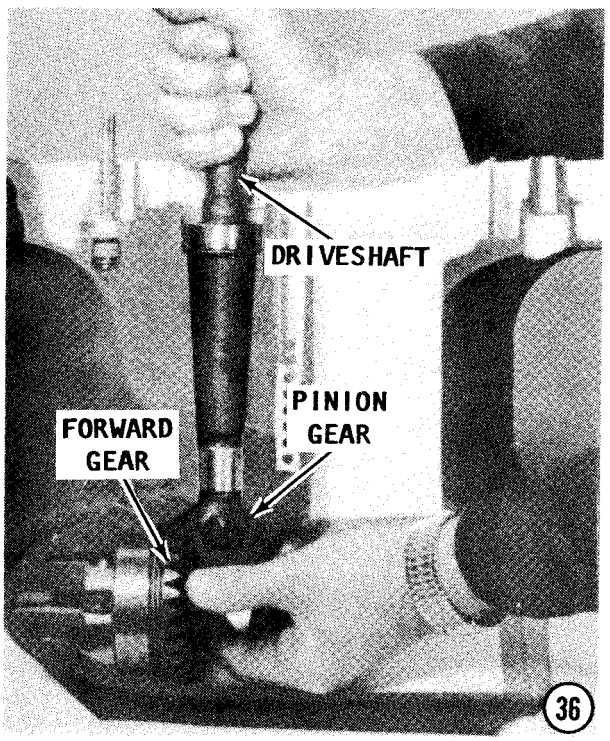
If the backlash appears to be correct, proceed directly to Step 41.

If the backlash is not within the Specification limits, proceed to make changes in the shim material, as follows.

PINION GEAR AND FORWARD GEAR BACKLASH ADJUSTMENT

The following procedures are to be performed for proper pinion gear and backlash adjustments.

If the pinion gear depth or the forward gear backlash is incorrect, follow the shim-



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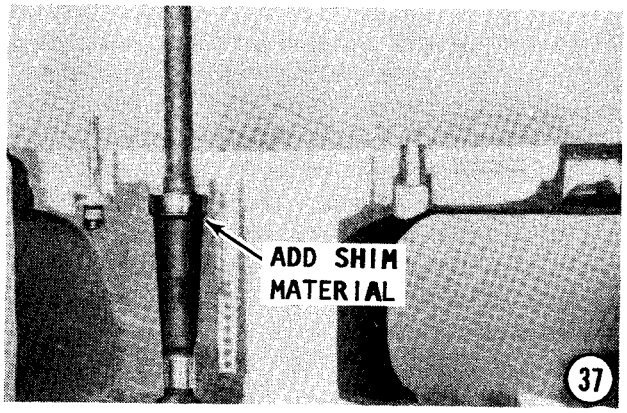


ming procedures under the heading for the specific condition discovered.

Shim Material and Backlash

Adding or removing shim material will affect the forward gear and the reverse gear as follows:

Forward gear -- adding shim material **DECREASES** backlash.

Forward gear -- removing shim material **INCREASES** backlash.

Reverse gear -- adding shim material **INCREASES** backlash.

Reverse gear -- removing shim material **DECREASES** backlash.

Pinion Gear Depth Too Deep but Backlash LESS than Specification

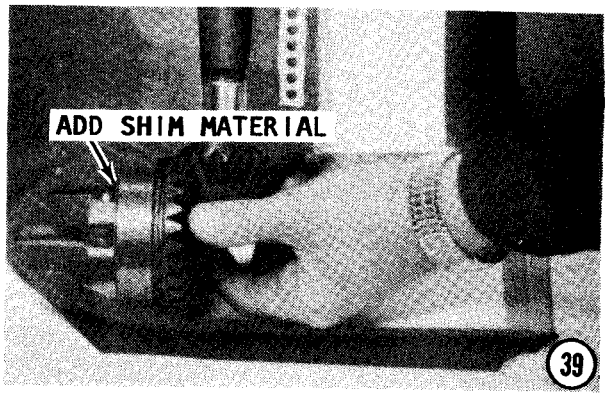
37- Remove the driveshaft, tapered bearing race if used, and the pinion gear. Add shim material to obtain the correct pinion gear depth. For each 0.001" (0.025 mm) of shim material added the forward gear backlash will increase approximately 0.0015" (0.038 mm).

Assemble the parts and again check the pinion depth and forward gear backlash.

Pinion Gear Depth Too Shallow and Backlash LESS than Specifications

38- Remove the driveshaft, tapered bearing race, if one is used, and the pinion gear. Remove shim material to correct the pinion gear depth. Remove the forward gear and the forward gear bearing race. Remove an **EQUAL** amount of shim material from the forward gear, plus an additional amount to increase the forwad gear backlash to the amount given in the Specifications. The forward gear backlash will increase approximately 0.0015" (0.038 mm) for each 0.001" (0.025 mm) of shim material removed from in front of the forward gear bearing.

Reassemble the parts and again check the pinion gear depth and the backlash.



Pinion Gear Depth Is Correct but Forward Gear Backlash is Excessive

39- Remove the driveshaft and the pinion gear. Remove the forward gear and the forward bearing race. Add shim material to reduce the forward gear backlash. Adding 0.001" (0.025 mm) shim material will decrease the gear backlash by approximately 0.0015" (0.038 mm). Assemble the parts and again check the forward gear backlash.

Pinion Gear Depth Is Correct but Backlash Less than Specifications

40- Remove the driveshaft and the pinion gear. Remove the forward gear and forward gear bearing race. Remove shim material to increase the gear backlash to specification. Removal of 0.001" (0.025 mm) shim material will increase the gear backlash approximately 0.0015" (0.038 mm).