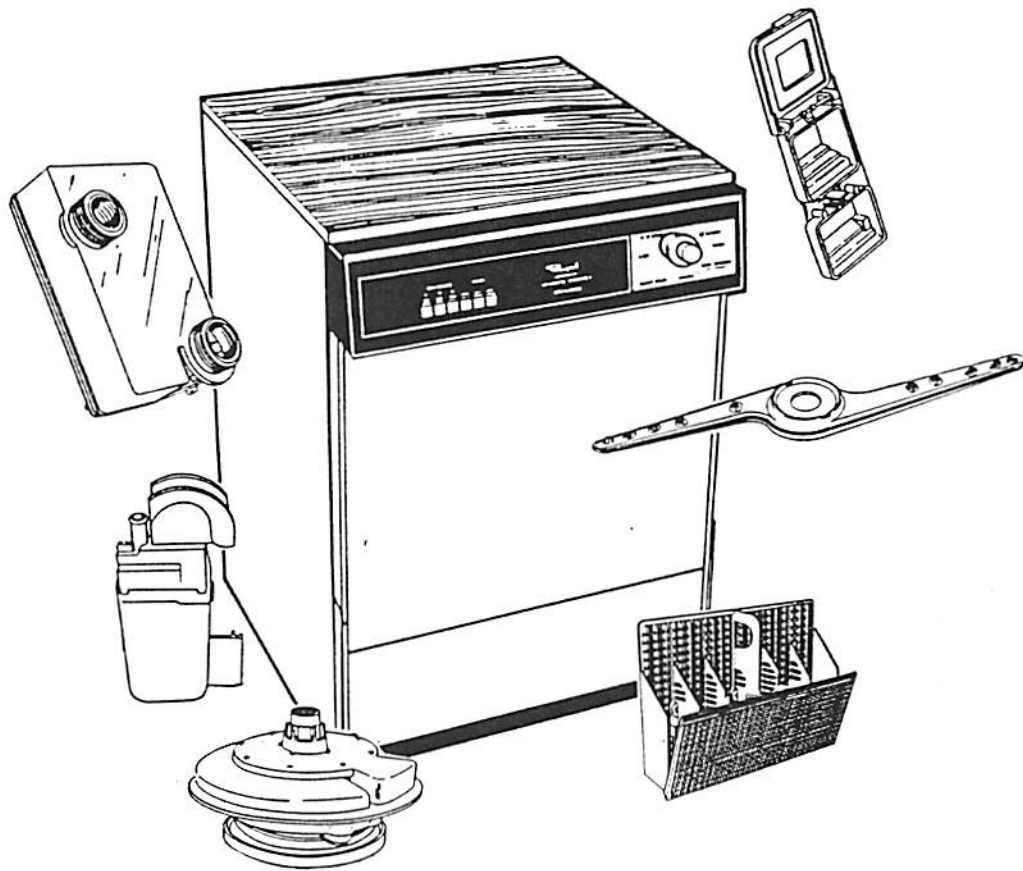


DISHWASHER & COMPACTOR

STUDY COURSE

UNDERSTANDING DISHWASHER:

- MECHANICAL COMPONENTS



MODULE 1

LIT4314189

INTRODUCTION

The material presented in this module is intended to provide you with an understanding of the fundamentals of dishwasher and trash masher® compactor servicing.

Major appliances have become more sophisticated, taking them out of the screwdriver and pliers category. Their electrical circuits include several different types of automatic controls, switches, heaters, valves, etc.. Semiconductors, solid-state controls, and other components usually associated with radio and television electronic circuits are being engineered into automatic washers, dryers, dishwashers and refrigerators.

The appliance technician is emerging into a professional status of his own. He must prepare himself now to be able to perform his duties today as well as to retain his professionalism in the future.

No longer is on-the-job training sufficient to prepare technicians for the complicated procedures required for todays sophisticated appliances. This training can best be obtained through organized classroom study and application. However, much of the knowledge necessary to service todays appliances can be obtained through study courses. Completion of this and other courses will provide you with sufficient understanding of appliances and their operation to enable you to do minor service. It will also serve as a valuable stepping stone to more advanced study and on-the-job training to improve your servicing skills.

Information contained in this module is used on WHIRLPOOL® appliances.

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***TEST.....See Test Book LIT4314204**

NOTE: *We recommend taking the TEST for MODULE 1, right after studying it.

CHAPTER 1

MECHANICAL COMPONENTS

CONSOLE ACCESS

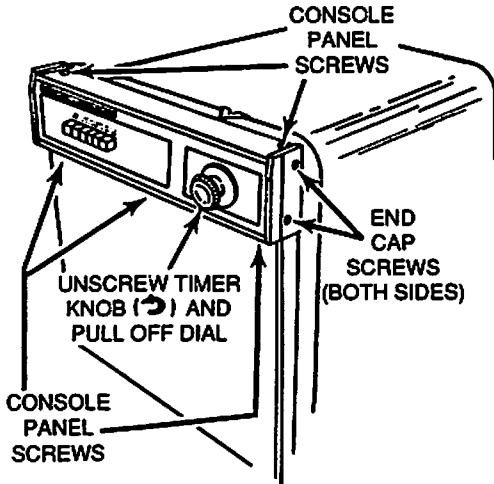


FIGURE 1

To get to parts behind the console panel, first; open the door. Remove the screws holding the end caps then the screws on top and underneath the panel. Remove the timer knob and dial, and possibly the handle (screwed on) if used in this area (fig. 1).

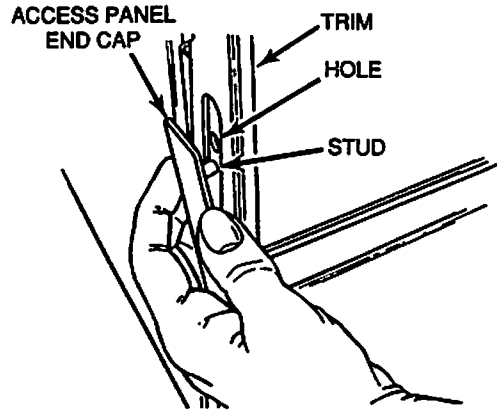


FIGURE 3

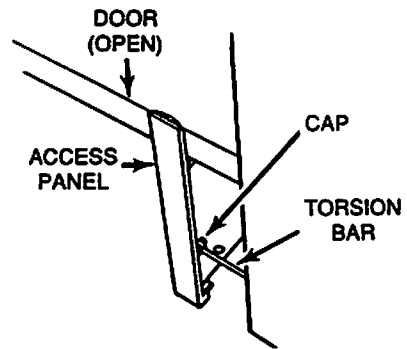


FIGURE 4

BELOW THE TUB ACCESS

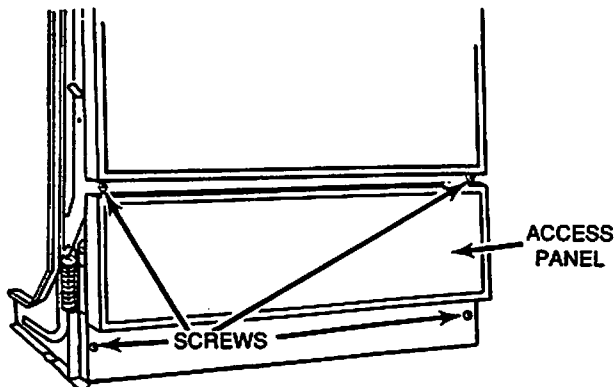


FIGURE 2

On built-in-models, lower parts are accessed by removing screws holding the access panel to the frame (fig. 2).

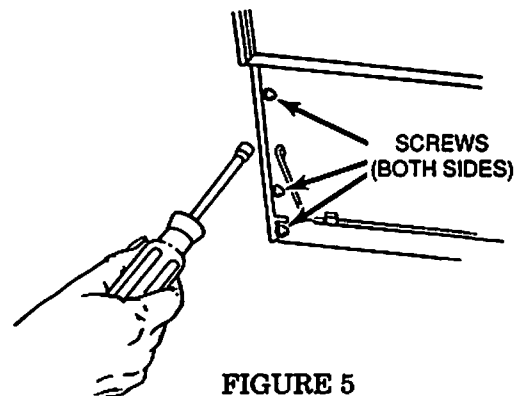


FIGURE 5

To get to some of the lower parts on portable models, first; remove the access panel end caps from the hole in the side trims (fig. 3). Next, remove the rubber caps and torsion bars from the access panel (fig. 4). Now remove the coverplate which is held on with screws (fig. 5) and once removed, parts will be exposed.

DOOR ACCESS

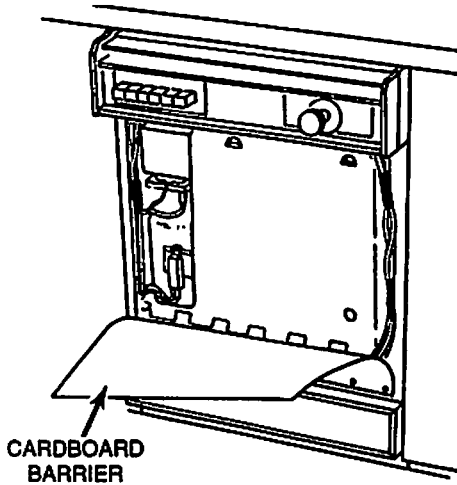


FIGURE 6

To get at some parts on the door, one end cap must be removed first, this is screwed in place. Next on the same side, remove the screws holding the door trim on. Slide the door panels (if used) out of the door frame. Remove the metal clips on each side then bend the cardboard door barrier down to expose the parts (fig. 6).

RELEASE LEVER / DOOR LATCH

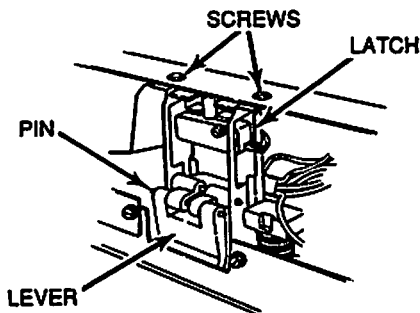


FIGURE 7

These parts are located in the middle under the console and can be removed through the console access procedure. To remove the lever, pull the pin (fig. 7) holding the lever to the door latch. The door latch is held on by screws.

FLOAT SWITCH

Located inside the tub in the right-front corner, this float (fig. 8) rises as the water rises and stops the water fill before it leaks onto the floor.

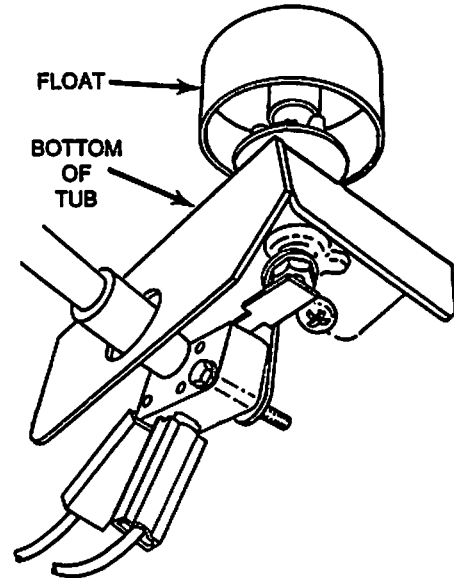


FIGURE 8

It can be removed through the access panel (see below the tub access procedure). This part is held to the tub by screws. Be sure the rubber gasket is in place when replacing.

RETAINER BUTTONS

This part (fig. 9) is located on the door and is used to hold the silverware and utensil baskets to the door. These parts can be reached through the door access procedure. These parts are held on by screws.

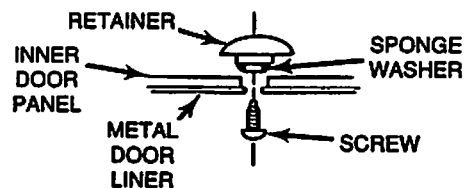
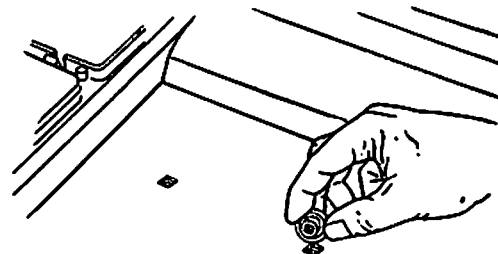


FIGURE 9

When replacing, make sure there is a clear sponge washer (fig. 9) glued to the back of the button to eliminate any leaking.

WETTING AGENT DISPENSER

This part is located on the left side (fig. 10) of the door. It dispenses a wetting agent just before the final rinse. This causes water breakdown during rinse. The water then runs off the dishes and silverware, leaving fewer or no spots. This part can be reached through the door access procedure. Then open the door and unscrew the nut and cap (fig. 11).

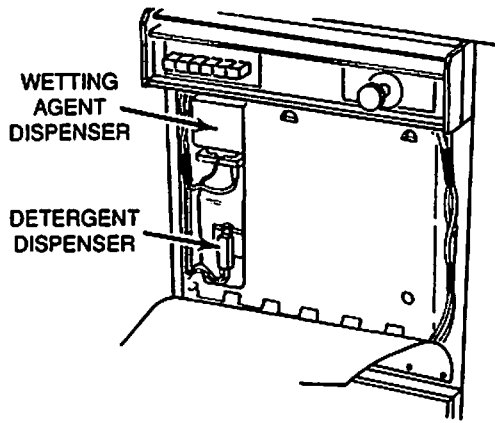


FIGURE 10

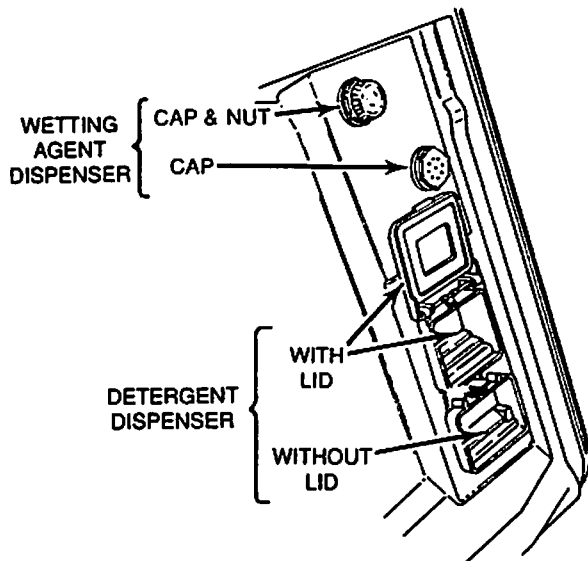


FIGURE 11

DETERGENT DISPENSER

Located on the left side (fig. 10) of the door, detergent is placed either in the open compartment, the compartment with a door or both (fig. 11). This part can be reached through the door access procedure. Then remove the screws holding the dispenser to the door.

TOP

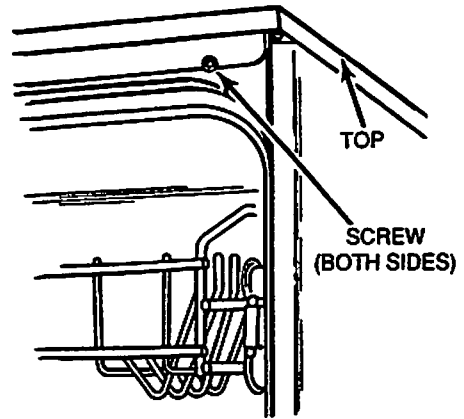


FIGURE 12

This top is made of hard maple and can be removed by opening the door and removing the screws (fig. 12) located on each side of the cabinet.

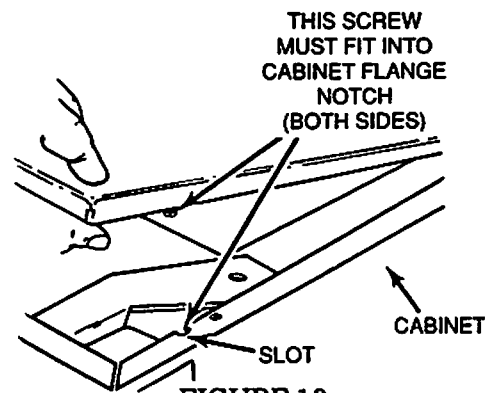


FIGURE 13

Lift and slide the top toward the front. This will release the special screws, in the back of the top, (fig. 13) from the slots in the cabinet.

END CAPS

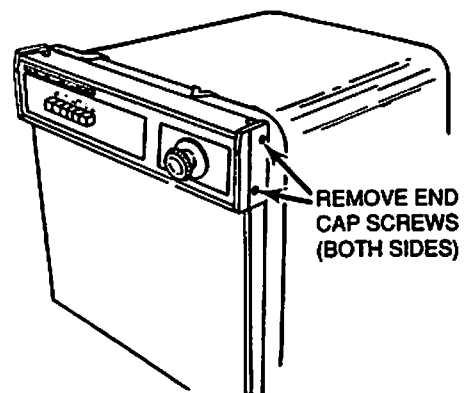


FIGURE 14

These plastic end caps (fig. 14) are located on each side of the console escutcheon and are held on by screws.

DOOR GASKET

This part is mounted on the tub between the front of the tub and behind the door. It acts as a seal to keep water from leaking out of the dishwasher. Pull the rubber down somewhat to expose the metal retainer and screws (fig. 15).

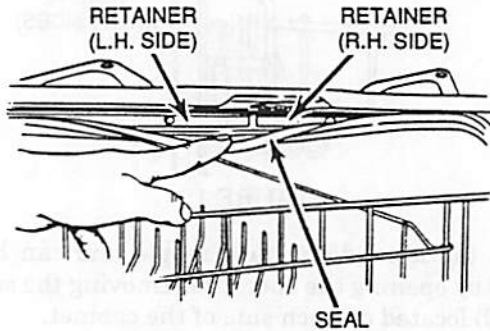


FIGURE 15

NOTE: On portable models the tub MUST be supported before removing the gasket. Remove the access panel (below the tub access procedure) and place a block of wood under the motor to keep the tub from falling.

DOOR TRIMS

These parts (fig. 16) are made of aluminum and are used on each side of the door.

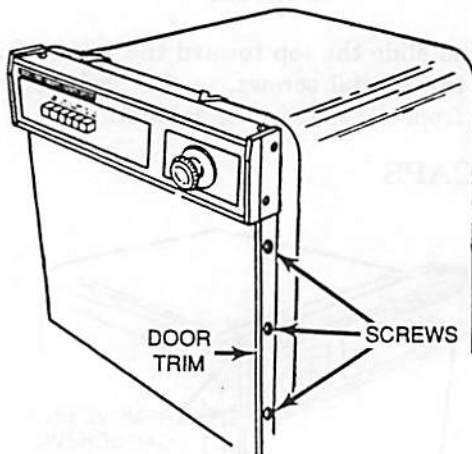


FIGURE 16

Not only used for decorative purposes it also holds the front panel on. They can be removed by removing the end caps, then remove the screws holding the door trims to the door frame.

NOZZLE CAP

The nozzle cap (fig. 17) is located below the lower dishrack and screws on, holding the lower spray arm to the pump and motor. It also expands from water pressure and seals to the bottom of the tower during the wash cycle. This causes a water stream upward, to the upper spray arm. This cap is hollow and is made from a flexible black rubber boot with a large center hole.

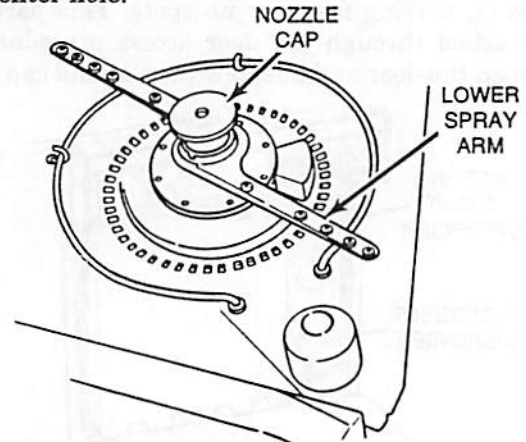


FIGURE 17

LOWER SPRAY ARM

This part (fig. 17), located under the lower dishrack, has domed jets that enable the nozzle openings to be aimed at wide angles in all directions. The jet streams from these nozzles give a balanced combination of water pressure and water volume to "chisel" the soil off and give a thorough washing action throughout the tub without abusing the dishes.

UPPER SPRAY ARM

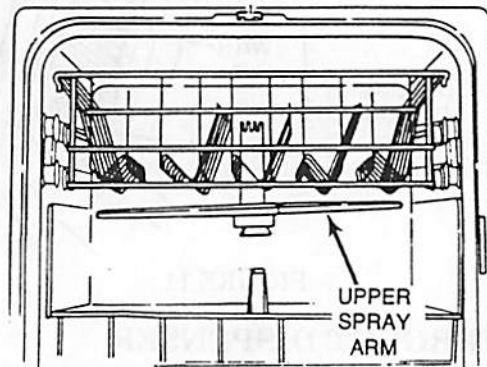


FIGURE 18

Located on the bottom of the upper dishrack (fig. 18), this upper spray arm helps eliminate dead spots caused by large bowls or pots in the bottom rack, blocking the water action to dishes in the upper rack.

SPRAY ARM ROTATION

A jet at each end of both spray arms causes the arms to revolve during wash and rinse. The lower arm turns clockwise and the upper arm turns counterclockwise.

LOWER DISHRACK / TOWER

The lower dishrack (fig. 19) rides in and out of the tub by wheels mounted in each corner. Dishes are placed in the rack for cleaning.

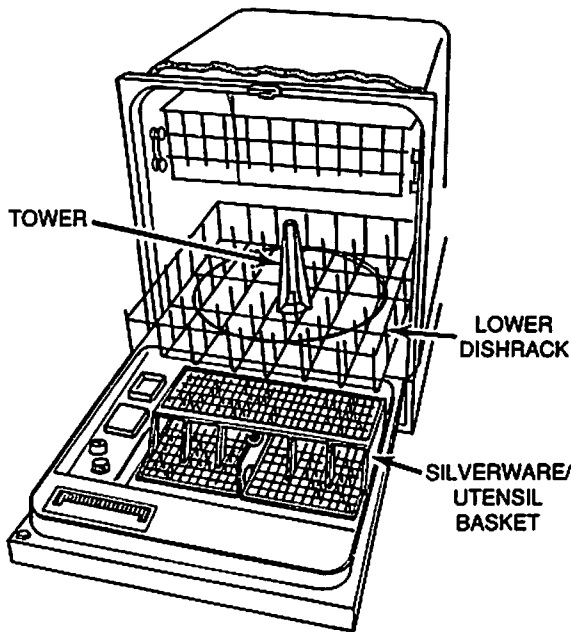


FIGURE 19

The tower is located in the middle of the rack and is used to keep water in a jet-like stream, forcing the water up into the upper spray arm.

SILVERWARE / UTENSIL BASKETS

These parts (fig. 19) are mounted to the door and can be removed by lifting them off the retainer buttons.

VENT GRILL / VENT SCREEN

The grill and screen are located in the upper left corner of the door.

The grill on the outside (fig. 20) and the screen on the inside (fig. 21).

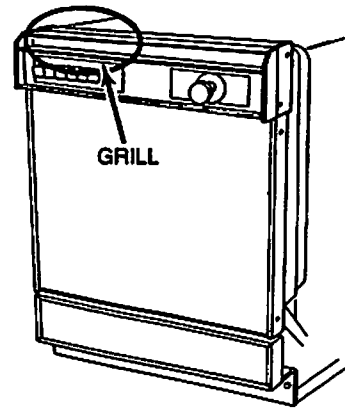


FIGURE 20

During the wash and dry cycles, hot air comes out this opening.

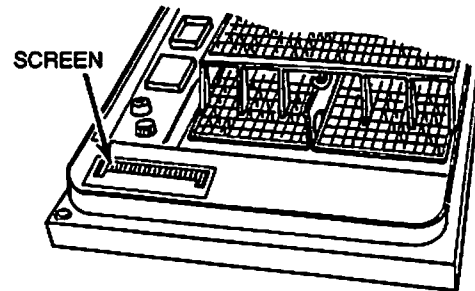


FIGURE 21

Remove by using a small blade screwdriver, inserting it between the upper part of the vent or screen and pry the tabs out the holes. To replace, place the bottom in the slot first, then push the top part back until it snaps into place.

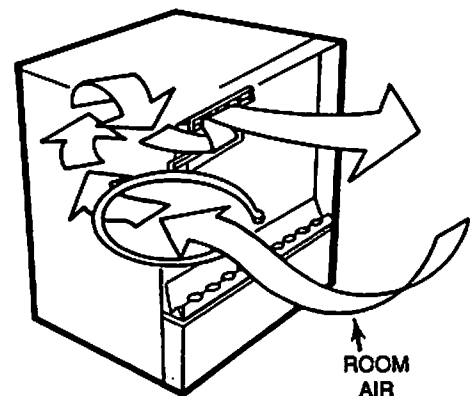


FIGURE 22

The vent and screen allows air to circulate. This is required to dry dishes. Dry room air (fig. 22) is pulled in at the bottom of the door. It flows upward by convection, picking up moisture from the wet dishes, and escapes through the vent and screen.

WATER INLET

This part is located on the outside of the tub, lower-left front corner (fig. 23) and creates an air gap for incoming water.

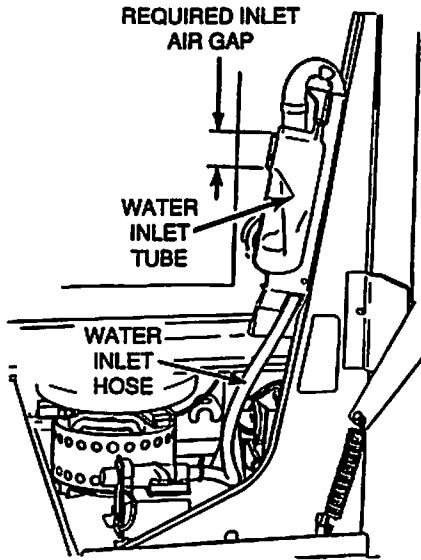


FIGURE 23

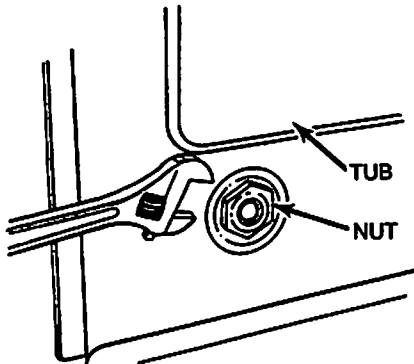


FIGURE 24

By removing the nut (fig. 24) inside the tub, it can be pulled down between the tub and cabinet to be replaced. Be sure the rubber gasket is on the replacement.

DOOR SPRINGS and ADJUSTMENT

This part is located behind the access panel (fig. 25) on Portable models and on the outside frame on Built-In models.

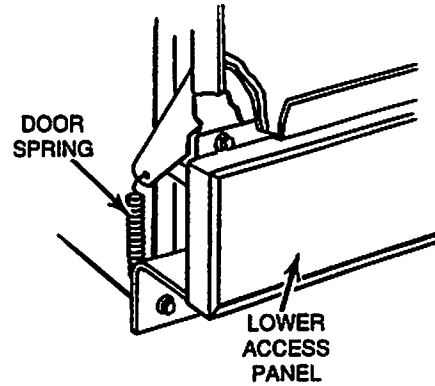


FIGURE 25

Adjust the door springs so the door closes easily without slamming and stays open with its own weight.

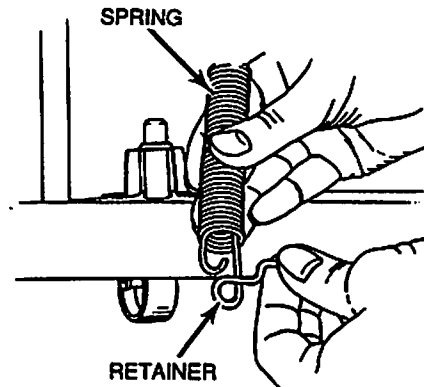


FIGURE 26

The retainer goes through the spring (fig. 26) and attaches to the door support at one end and the frame at the other end. This spring and retainer supply tension to the door.

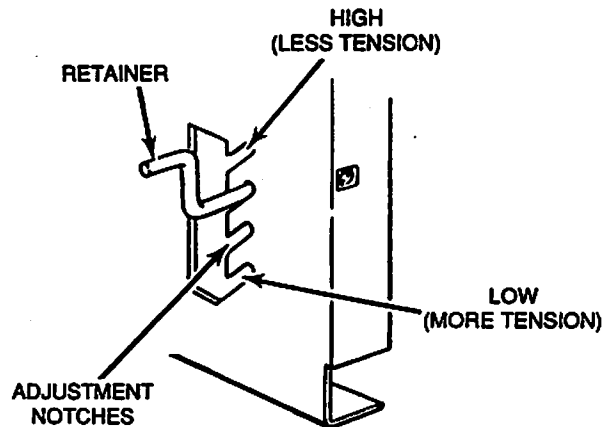


FIGURE 27

Move the spring down for more tension, up for less tension (fig. 27).

PUMP (POWER CLEAN)

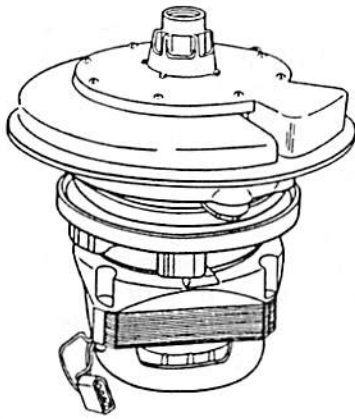


FIGURE 28

The new Power Clean Pump (fig. 28) washing system includes a newly designed pump and motor assembly that includes a "food grinder" and system for separating the food particles from the recirculating wash/rinse water. The food particles are "collected" by centrifugal force in a "settling" chamber. During pumpout (drain) the draining action of the power clean module flushes the food particles down the drain.

WASHING AND RINSING

Operation of the power clean module (fig. 29) is as follows: Water is drawn into the power clean module by the clockwise rotation of the wash impeller. This water is drawn up past the chopper blade, then through the perforated plate. Any large food particles are broken down by the food grinder. THIS PROCESS MAY RESULT IN A GRINDING SOUND BEING HEARD. Items like olive pits or egg shells can result in a grinding sound being heard for most of a cycle. If the grinding sound is heard for several cycles, an item that cannot be ground up may have gotten into the Power Clean Module.

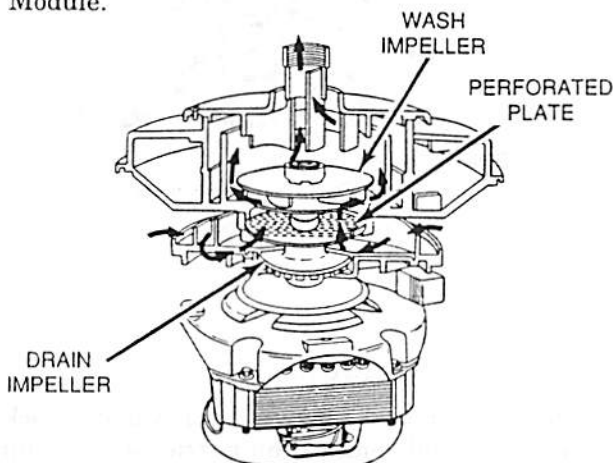


FIGURE 29

At the start of wash, the drain impeller rotation causes a small amount of pressure which resists the pressure being built up by the wash impeller. This allows the wash impeller to pressurize the separator. The pressure actuates the drain valve diaphragm (fig. 30), overcoming the resistance of the valve spring and closing the drain valve. The separator is now isolated from the drain pump.

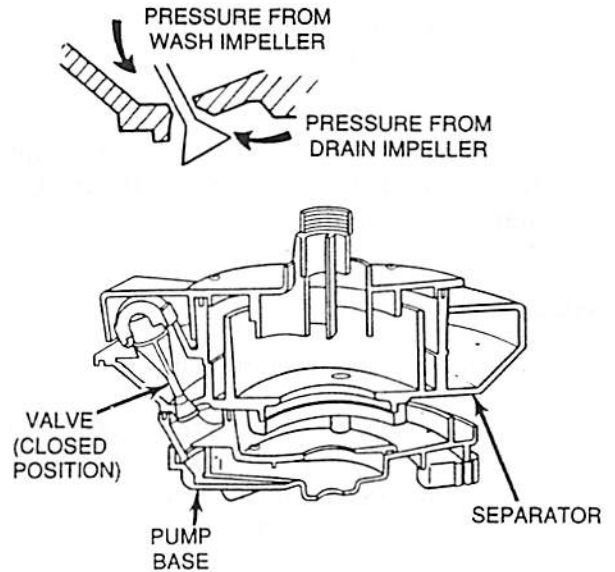


FIGURE 30

The pump automatically separates the soil from the water. This is how it's done.

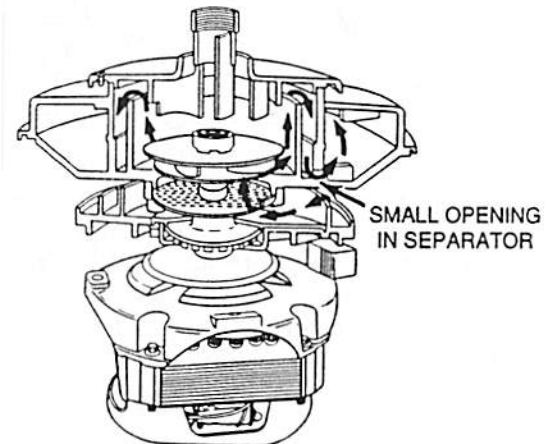


FIGURE 31

The centrifugal force caused by the wash impeller distributes the soil on the inside wall (fig. 31) and is concentrated in the annular chamber and forced through a small opening into the separator. The soil in the concentrate or "slurry" settles out in the separator. The water leaving the separator is pumped on through the spray arms. This system quickly removes the soil from the water charge.

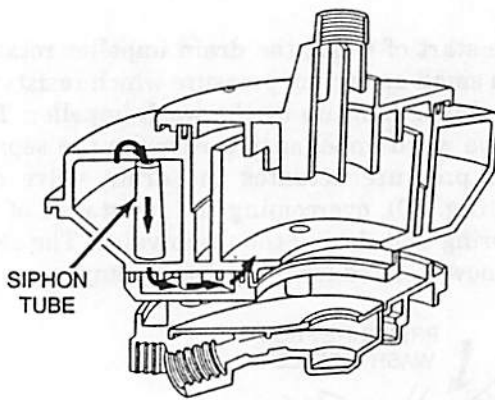


FIGURE 32

Water in the separator is fed down the siphon tube (fig. 32) and ball check, through the inlet base and enters the washer impeller chamber through a small bleed hole in its base.

DRAIN

As the motor pauses before going into counter-clockwise drain rotation, the wash impeller is no longer rotating and pressurizing the separator. The drain valve (which is normally open) opens (fig. 33) and the separator is now open to drain.

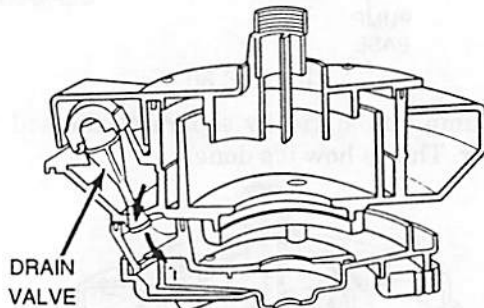


FIGURE 33

The pressure difference pulls the ball check closed. Even though the wash impeller is turning opposite its normal rotation, it still forces a water supply through the separator, which washes the soil past the open drain valve and out the drain (fig. 34).

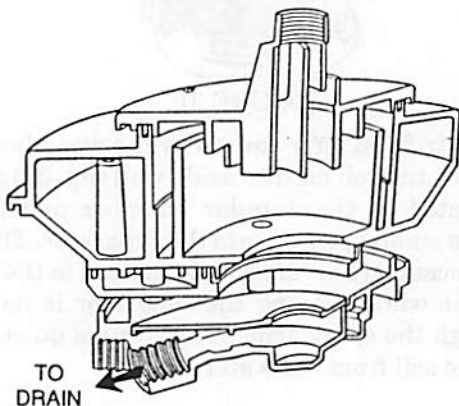


FIGURE 34

TEAR DOWN

IMPORTANT: All seals and/or gaskets that are exposed during partial or complete teardown **SHOULD** be replaced.

See **BELOW THE TUB ACCESS PROCEDURE** to disassemble some of the parts.

There are four rubber grommets (fig. 35) securing the pump and motor assembly to the underside of the tub. Rotate these inward 90°.

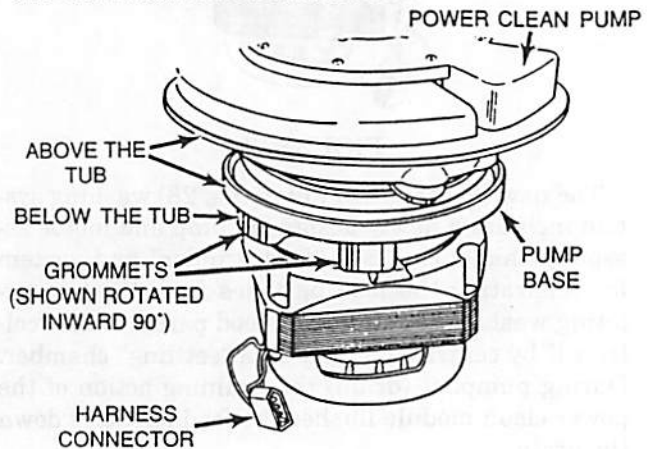


FIGURE 35

Disconnect the motor harness connectors and the green ground wire.

Remove the clamp and drain hose off the check valve, then remove the check valve. **NOTE:** There should be a round rubber "O" ring on the check valve when it's removed from the pump. If not, it could be stuck in the hole in the pump. It will have to be removed and put on the check valve.

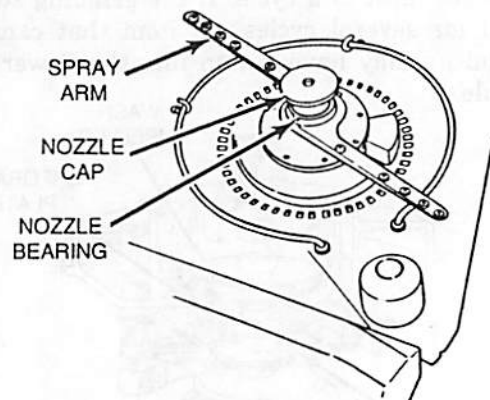


FIGURE 36

Open the door and remove the lower dishrack, then unscrew and remove the nozzle cap, bearing and the spray arm (fig. 36).

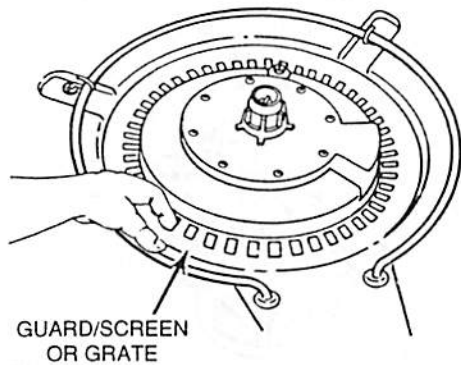


FIGURE 37

Remove the sump guard, sump screen or grate (fig. 37) whichever is used on your model, then remove the pump and motor by pulling up (fig. 38) through the inside of the tub.

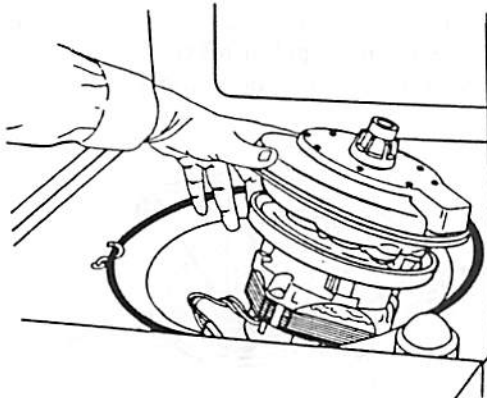


FIGURE 38

Remove the screws holding the pump outlet (fig. 39) to the separator. Then remove the pump outlet.

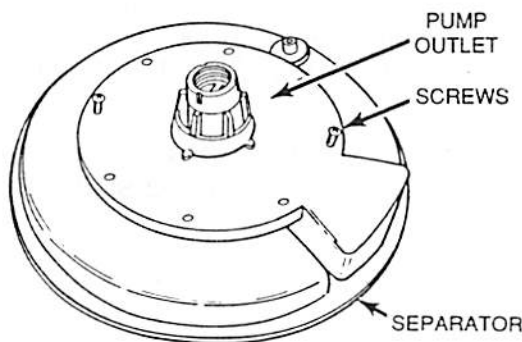


FIGURE 39

Remove the impeller screw (fig. 40). Use a wrench on the hexagon flats molded on the impeller to keep it from turning when the screw is removed. Then remove the wash impeller.

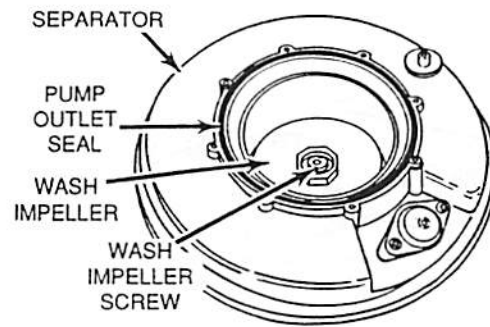


FIGURE 40

Remove the screws holding the separator (fig. 41) to the base.

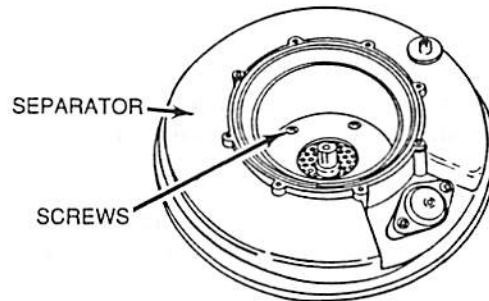


FIGURE 41

A leaking drain valve diaphragm and/or a damaged stopper requires replacing the drain valve stopper, stem & diaphragm, and spring (fig. 42).

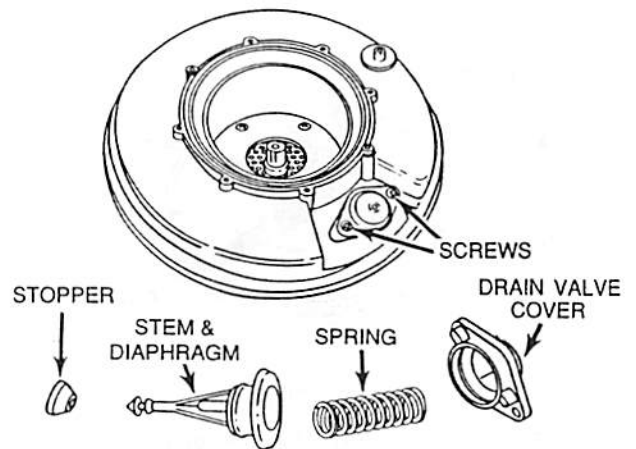


FIGURE 42

To test, push the drain valve stopper in (fig. 43) to seal the vent hole.

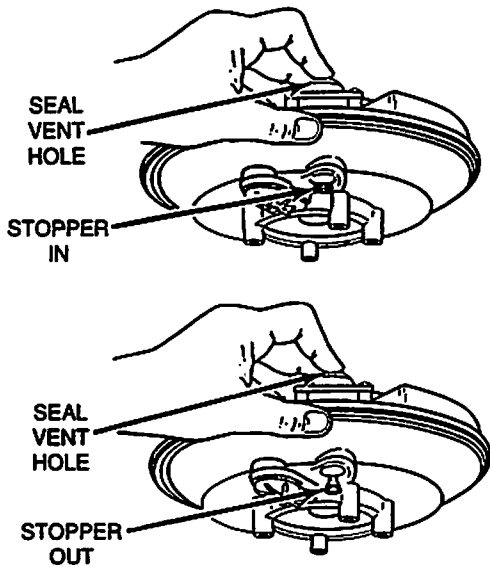


FIGURE 43

If stopper stays in, the diaphragm is good. If it comes back out (fig. 43), it is leaking and must be replaced.

This assembly is held to the separator by screws. To get at these parts, remove the screws (fig. 42) holding the cover to the separator.

If the perforated plate is damaged, it must be replaced. Remove the screws holding the inlet base to the bottom of the separator. Remove the gasket (fig. 44) located in the groove in the inlet base and throw away.

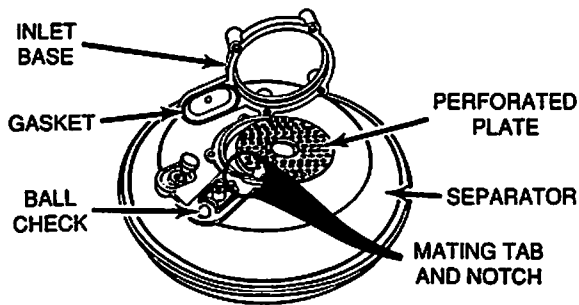


FIGURE 44

NOTE: Do not lose the ball check (fig. 44).

A damaged bushing, chopper blade and/or spring can be lifted off the drain impeller shaft (fig. 45).

If the spring retaining holes in the drain impeller are damaged, the impeller must be replaced.

NOTE: The drain impeller and its mating seal head assembly, must be replaced in pairs.

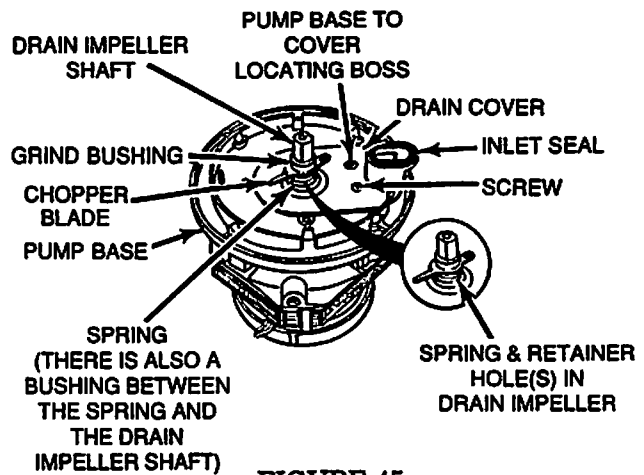


FIGURE 45

To replace the drain impeller and seal head assembly, first remove the screw (fig. 45) holding the drain cover to the pump base. Remove the cover then lift the drain impeller off the motor shaft. Next pry the seal (fig. 46) off the motor shaft.

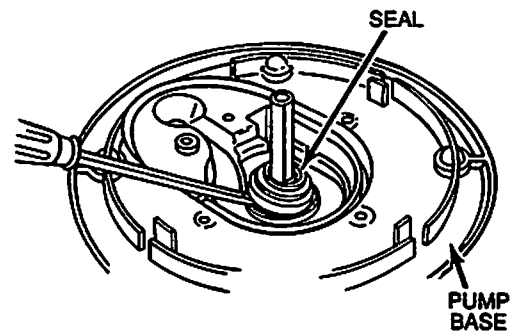


FIGURE 46

Check the pump base (fig. 46), if its cracked or damaged in any way, the base must be replaced. Remove the screws (fig. 47) holding the base to the motor.

A SPECIAL CENTERING TOOL IS REQUIRED TO REBUILD THIS PUMP ASSEMBLY

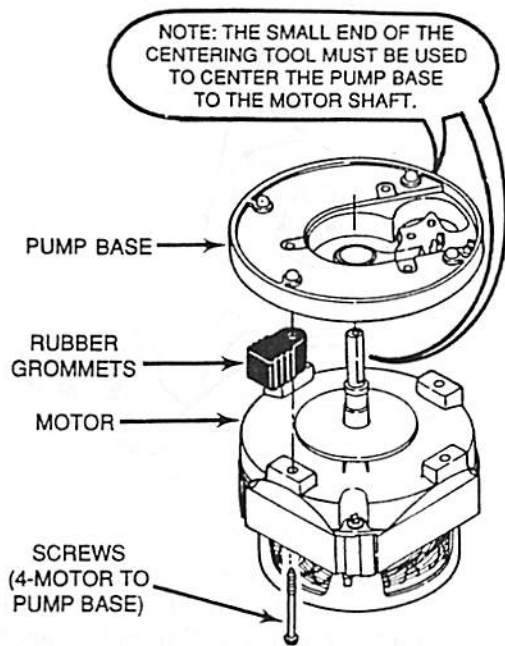


FIGURE 47

Reassemble the pump base (fig. 47) to the motor.

Lubricate the seal head with a non-detergent soap (DO NOT USE DETERGENT OR PETROLEUM PRODUCTS) before installing, then using the large end on the special centering tool (fig. 48), press the seal down (turning the tool approximately 1/4 turn) firmly over the motor shaft.

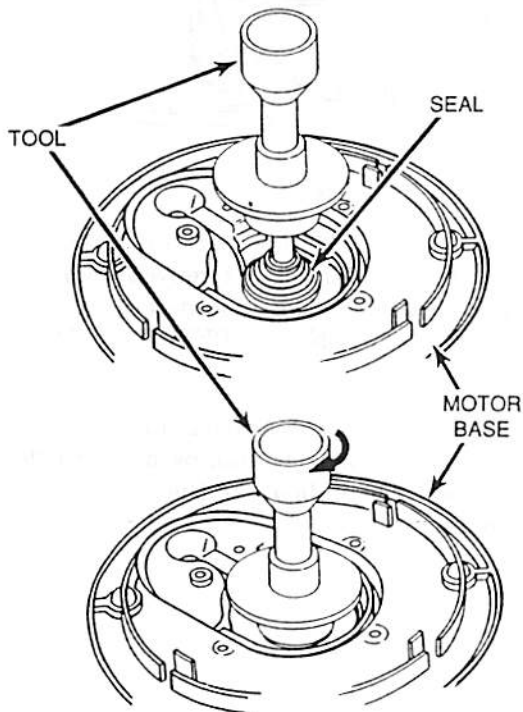


FIGURE 48

Replace the drain impeller, then screw the drain cover on the base (fig. 49).

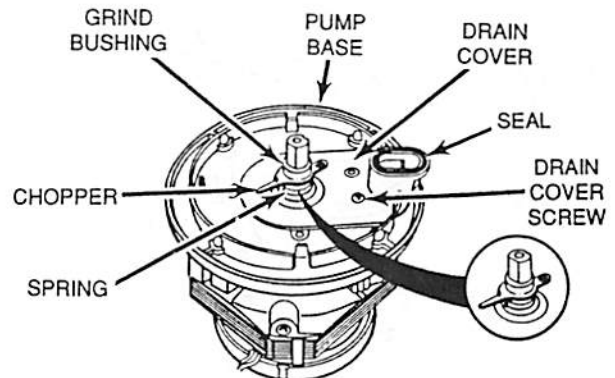


FIGURE 49

Assemble the sleeve, spring, chopper and grind bushing (fig. 49), also make sure the spring is properly assembled to the chopper blade and seated in one of two retaining holes in drain impeller. Insert new drain cover seal (fig. 49).

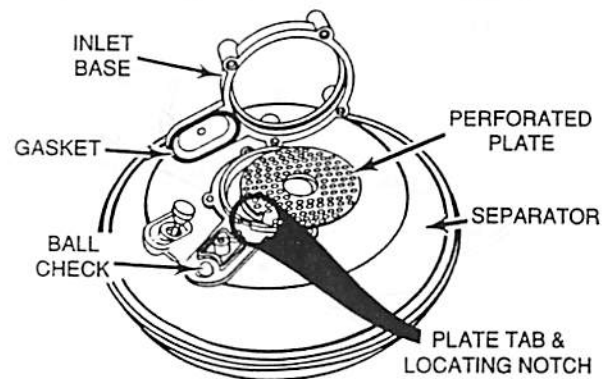


FIGURE 50

Assemble new gasket (fig. 50) to the inlet base, make sure the ball check is in its proper place, then reassemble the perforated plate making sure the tabs are in locating notches. Assemble the inlet base to the separator with the two screws by carefully starting the screws to avoid stripping. The recommended way is to turn the screw counterclockwise until you can feel the threads backing off or "bumping", then turn clockwise to tighten.

Reassemble the separator to the base by using screws, carefully starting the screws to avoid stripping. The recommended way is to turn the screw counterclockwise until you can feel the threads backing off or "bumping", then turn clockwise but, DO NOT TIGHTEN yet.

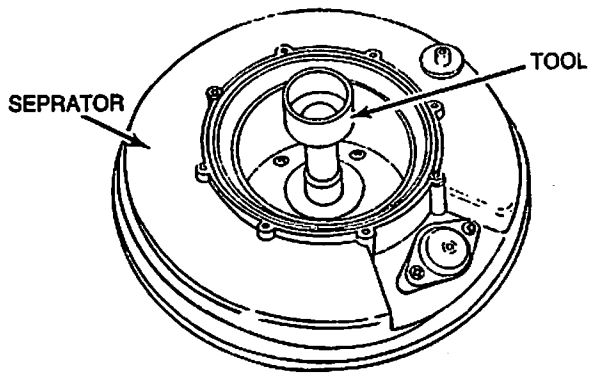


FIGURE 51

Place the large end of the special centering tool (fig. 51) down over the drain impeller shaft so that flange of tool fits into opening of accumulator. This centers accumulator to the rest of assembly. Now **TIGHTEN** the screws.

Reassemble the drain valve parts (fig. 52) to the separator.

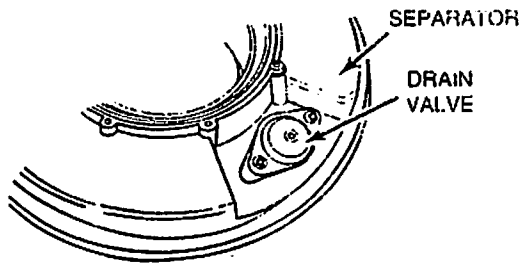


FIGURE 52

Reassemble the wash impeller, then the impeller screw (fig. 53). Rotate impeller and listen for rubbing noise, also check to see if impeller can be moved up and down. If either occurs, parts have been left out or not tightened during reassembly.

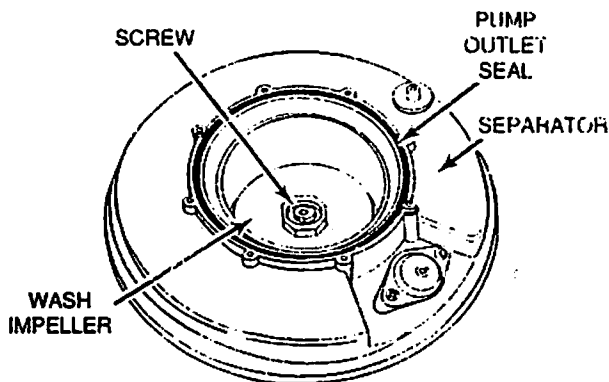


FIGURE 53

Insert a new pump outlet seal (fig. 53) into the separator retaining groove.

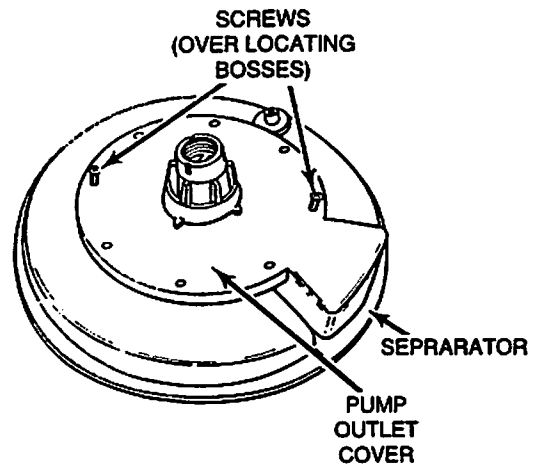


FIGURE 54

Place the pump outlet cover over the separator making sure it is seated over the two locating bosses (fig. 54) on the separator. Carefully start the screws to avoid stripping. The recommended way is to turn the screw counterclockwise until you can feel the threads backing off or "bumping", then turn clockwise to tighten.

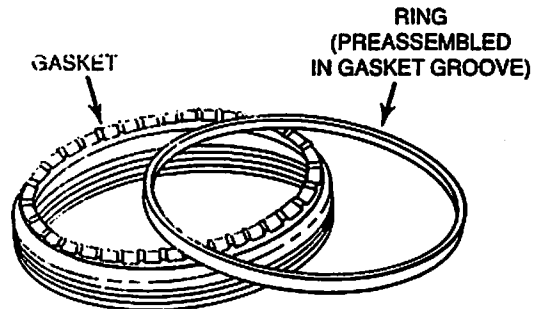


FIGURE 55

Replace the pump gasket (fig. 55) whenever the pump and motor assembly is removed from the tub. Lubricate the gasket with a non-detergent soap. **DO NOT USE DETERGENT OR PETROLEUM PRODUCTS.**

Place the pump and motor back into the tub, don't forget to turn the rubber clamps outward 90° replace the check valve, hook up the wiring and hose connections.