# Ford Figure #33 Pressure Reducing Valve Installation, Operating & Maintenance Manual

## Installation

- Direction of flow is indicated on valve.
- Valve can be installed vertically or horizontally.
- All lines must be thoroughly flushed out prior to installation.
- Position valve to allow easy view of bleed hole on valve bonnet.
- Allow easy access to valves for future servicing.
- Bleed hole must be kept free of obstruction.
- Pipe systems and fittings should be capable of withstanding full head pressure as stipulated by Water Authorities.
- Where two Pressure Reducing Valves per station are installed, rotate use periodically to allow spare valve to function.

## Operation

- Desired inlet and outlet pressure are set at factory.
- To adjust Ford Pressure Reducing Valve (PRV) outlet pressure you will need to establish the following Pressure Reducing Station conditions:

    1. Establish steady state conditions downstream of the PRV outlet by either keeping the downstream shut off valve closed (this is a viable option if your down stream pressure gage is located before the shut off valve) or maintain steady state conditions downstream of the PRV station by preventing any loads being drawn off the water supply line down stream of the pressure reducing station.

2. Open the upstream (inlet) shut off valve and allow water to fill the PRV.
3. Take the following steps and refer to Figure Number 33 Ford Pressure Reducing Valve:

a. Remove the acorn (component #1)
b. To increase outlet pressure: turn the pressure adjusting screw (component #2) into the valve (clockwise).
c. To decrease outlet pressure: turn the pressure adjusting screw out of the valve (counterclockwise).

4. Once the desired outlet pressure is attained reinstall and then lock the acorn back into place atop of the valve assembly.

- Once the PRV has been set to the desired pressure open the downstream (outlet) shut off valve (if applicable).
- To test that the PRV is working properly you can then draw a load on the downstream water supply system. Check and see if the downstream pressure gage reading drops below the set pressure and then quickly returns to the desired outlet pressure. If the downstream pressure returns to desired outlet pressure you have confirmed that the PRV is operating properly.

## Maintenance

- There are only two wearing parts: O-rings and a disc seat (component #10), which can be replaced without removing the valve from the line.
- The balanced construction of this valve assures positive seating and eliminates water or air hammer. In fact, this valve is noiseless in operation.
- The bonnet (component #3) is one complete unit which houses the spring (component #5) and the piston (component #8). The piston seats itself on the bottom of the bonnet. The spring is stainless steel. By unscrewing the bonnet from the body, all the internal parts of the valve are removable in one operation.
- Regular flushing with fresh water should keep the valve clear of any obstructions and operating without any other maintenance actions required.

# O-Ring and Disc Seat Replacement

1. Recommended materials and tools:
a. Adjustable Pipe Wrench
b. Adjustable Wrench
c. Locktite Thread Sealant with PTFE
d. Evinrude-Johnson Triple-Guard Grease

2. Disassembly:
a. The #33 PRV can either be worked on in-line or removed from the system (if removed from the system place the valve in a vice to hold it in place).
b. Using an adjustable wrench or appropriately sized open end wrench to loosen and remove the acorn (component #1). Then unscrew the pressure adjusting screw (component #2) until it no longer is in contact with the spring top (component #4) – so as to remove any pressure on the spring prior to opening the valve.
c. Place the adjustable pipe wrench around the hex fitting at the base of the bonnet (component #3) and turn counterclockwise to loosen the bonnet from the body (component #9).
d. Unscrew and remove the bonnet from the body. As you remove the bonnet the piston assembly (component #8), spring (component #5) and spring top (component #4) will come off with the bonnet.
e. Once the bonnet and piston assembly are removed you can check for debris in the valve cavity. If there is any debris in the valve cavity you can remove it by hand or rinse it out with clean water.
f. Remove the old Lower Bonnet Fiber Washer (component #3A for #33 PRVs sized ½" to 2") or the Lower Bonnet O-ring and Back-up Ring (component #6 for #33 PRVs sized 2 ½" to 3") from the inside base of the body.
g. Place the bonnet in a vice with the top of the bonnet facing down to the ground at an angle of 30 degrees from vertical (clamping down around the cylindrical portion of the bonnet) so you can slowly work the piston assembly, spring and spring top out by pulling and rotating the base of the piston assembly back and forth until all of the components slide out of the bonnet.
h. Remove the spring and spring top from the piston assembly and set it aside for new spring installation (if needed).
i. For #33 PRVs sized 2 ½" to 3" remove the old Upper Bonnet O-ring (component #3A) from the bonnet.

3. Rebuilding the piston assembly:

a. To replace the disc seat (component #10) secure the piston assembly in a vice by locking the piston in a vice by the round tip at the top of the piston. Using an adjustable wrench or appropriately sized open end wrench remove the disc seat and the bottom follower (component #11) from the piston assembly. The old disc seat can now be removed from the bottom follower and be replaced with the new disc seat – **to prevent water from getting in between the disc seat and bronze components of the piston assembly it is recommended that before you place the new disc seat on to the bottom follower you apply a thin coat of Locktite Thread Sealant with PTFE to the surface of the bottom follower in contact with the disc seat, as well as to the bottom surface of the piston that will also be in contact with the disc seat.** Once both surfaces have been coated with the Locktite use the adjustable wrench to lock the disc seat and bottom follower back onto the piston assembly.

b. To replace the piston O-ring (component #7) and Back-up Ring (for #33 PRVs sized 2 ½" and 3") simply pull off the old piston O-ring (and Back-up Ring if applicable) and replace it with a new piston O-ring.

c. Coat the inside of the bonnet and the outside of the piston O-ring (and Back-up Ring if applicable), as well as the piston surface above the O-ring with a light coat of Evinrude-Johnson Triple-Guard Grease.

4. Reinstalling the spring and piston assembly:

a. With the bonnet still secured in the vice as listed in step 2.g. complete steps 4.b-d below.

b. Attach the spring top to the new spring (if the valve's spring needed replacing).

c. Attach the spring and spring top to the rebuilt piston assembly.

d. Slide the spring top, spring and piston assembly back up into the bonnet by slowly rotating the components into bonnet cavity.

5. Closing up the valve:

a. For #33 PRVs sized 2 ½" to 3" install a new Upper Bonnet O-ring around the bonnet in the groove above the bonnet's male threads.

b. Install a new Lower Bonnet Fiber Washer (for #33 PRVs sized ½" to 2") or a Lower Bonnet O-ring and Back-up

Ring (for #33 PRVs sized 2 ½" to 3") at the inside base of the valve body.

c. Reinstall the valve bonnet to the valve body and lock it in place with the adjustable pipe wrench.

After these repairs have been completed and the valve is placed back on line it will be necessary to adjust the valves outlet pressure. This can be accomplished by doing the following:

1. Remove the acorn (component #1).
2. Change the outlet pressure by turning the pressure adjusting screwing (component #2):

a. Either screwing it in (turning clockwise) - which will increase outlet pressure/flow

b. Or, screwing it out (turning counter clockwise) – which will decrease outlet pressure/flow

3. Once the desired outlet pressure is attained reinstall the acorn washer and lock the acorn back into place atop of the valve assembly.