GENERAL DESCRIPTION
The OCV Series 65 is a hydraulically-operated, dia-
phragm-actuated valve. It is available in either a globe
(Model 65) or angle (Model 65A) configuration. The
diaphragm is nylon-fabric bonded with synthetic rubber
and forms a sealed chamber in the upper portion of the
valve, separating operating pressure from line pressure.
An elastomeric seat disc forms a tight seal with the valve
seat when pressure is applied above the diaphragm.

FUNCTIONAL DESCRIPTION
Because the Series 65 is a hydraulically operated valve, it
requires a minimum line pressure of approximately 5 psig
in order to function. The valve functions on a simple
principle of pressure differential. The line pressure at the
inlet of the valve is bypassed through the pilot control
piping to the diaphragm chamber of the valve. This
pressure, together with the valve spring, works against the
pressure under the valve seat. Because the effective area of
the diaphragm is greater than that of the seat, the valve is
held tightly closed. As the controlling pilot(s) allow the
pressure to bleed off the diaphragm chamber, the two
opposing pressures begin to balance and the valve will
begin to open. The valve can be used to perform a simple
on-off function, or with the proper pilot system, a modu-
lat- ing, or regulating function.
In cases where the line fluid is unusually dirty, or is
otherwise unsuitable for operating the valve, an independ-
ent operating pressure source may be employed. The
pressure available from such a source must be equal to, or
greater than, line pressure.

INSTALLATION
In order to insure safe, accurate and efficient operation of
the OCV control valve, the following list of checkpoints
and procedures should be followed when installing the
valve.
1. Make a careful visual inspection of the valve to
insure that there has been no damage to the external
piping, fittings or controls. Check that all fittings are
tight.
2. Thoroughly flush all interconnecting piping of chips,
scale and foreign matter prior to mounting the valve.
3. Install the valve in the line according to the flow
arrow on the inlet flange. The arrow should point
downstream.
4. Allow sufficient room around the valve for ease of
adjustment and maintenance service.
In addition, it is highly recommended that:
1. Isolation valves (eg., gate or butterfly) be installed
on the inlet and discharge sides of the valve to
facilitate isolating the valve for maintenance.
2. Pressure gauges be installed at the inlet and outlet
sides of the valve to provide monitoring of the valve
during initial start-up and during operation. The
body side ports, if unused by the pilot system,
provide a convenient connection for the gauges.
3. All valves larger than 6" be installed horizontally,
i.e., with the bonnet pointed up, for ease of adjust-
ment and maintenance servicing.

MAINTENANCE
The OCV control valve requires no lubrication and a
minimum of maintenance. However, a periodic inspec-
tion should be established to determine how the fluid
being handled is affecting the efficiency of the valve. In
a water system, for example, the fluid velocity as well as
the substances occurring in natural waters, such as
dissolved minerals and suspended particles, vary in
every installation. The effect of these actions or sub-
stances must be determined by inspection. It is recom-
mended that an annual inspection, which includes ex-
amination of the valve interior, be conducted. Particular attention should be paid to the elastomeric parts, i.e., the diaphragm and seat disc. Any obviously worn parts should be replaced.

**REPAIR PROCEDURES**

In the event of malfunction of the OCV control valve, troubleshooting should be conducted according to the procedures outlined for the specific model of valve. Then, if those steps indicate a problem with the main valve, this section will outline the procedures necessary to correct the problem.

Problems with the main valve can be classed in three basic categories:

1. **VALVE FAILS TO OPEN**
   a. Diaphragm damaged* - See Procedure A
   b. Stem binding - See Procedure B

2. **VALVE FAILS TO CLOSE**
   a. Diaphragm damaged* - See Procedure A
   b. Stem binding - See Procedure B
   c. Object lodged in valve - See Procedure B

3. **VALVE OPENS AND CLOSES BUT LEAKS WHEN CLOSED**
   a. Seat disc damaged - See Procedure C
   b. Seat ring damaged - See Procedure D

*A diaphragm failure can prevent the valve from either opening or closing, depending on the flow direction. Most water service valves flow “under the seat”, in which case a diaphragm failure will keep the valve from closing. On the other hand, most fuel service valves flow “over the seat”, in which case a diaphragm failure will keep the valve from opening. To determine which you have, examine the bridge mark cast into the side of the valve body, then compare it with the figures below.

**PROCEDURE A: DIAPHRAGM REPLACEMENT**

1. Isolate the valve from the system by closing upstream and downstream block valves.
2. Loosen one of the tubing connections on the bonnet. Allow any residual pressure to bleed off.
3. Remove all tubing connected at the bonnet.
4. Remove the bonnet nuts.
5. Remove the bonnet. If the bonnet sticks in place, it may be loosened by rapping sharply around its edge with a rubber-headed mallet. **NOTE:** 8” and larger valves are equipped with eye bolts through which a chain can be fastened to aid in lifting the bonnet.
6. Remove the spring.
7. Remove the diaphragm plate capscrews and the diaphragm plate.
8. Remove the old diaphragm.
9. Making sure the dowel pin holes are in the proper location, place the new diaphragm over the studs and press down until it is flat against the body and spool.
10. Replace the diaphragm plate and the diaphragm plate capscrews.
11. Tighten all diaphragm plate capscrews snugly.
12. Replace the spring.
13. Replace the bonnet and reinstall the bonnet nuts.
14. Tighten the bonnet nuts snugly using a criss-cross tightening pattern.
15. Reinstall the control tubing.
16. Reopen the upstream and downstream block valves.
17. Before placing the valve back in service, perform the air bleed procedure described in the first section of this manual.

**PROCEDURE B: CORRECTION OF BINDING STEM**

1. Perform Steps 1 thru 6 of Procedure A, above.
2. Remove the spool assembly from the valve. **NOTE:**

On smaller valves, this can be accomplished simply by grasping the stem and pulling upward. Valves 6” and larger have the top of the stem threaded to accept an eyebolt to aid in lifting the spool out of the body. 6” thru 12” valves are threaded 3/8-16. 14” and 16” valves are threaded 5/8-11.

3. Carefully examine both ends of the stem for deep scratches, scoring or buildup of mineral deposits.
Polish the stem if necessary using a fine grade of emery cloth.

4. Similarly, examine and polish the upper bushing (in the bonnet) and the lower guide (in the seat ring).

5. Reinstall the spool assembly.

6. Reassemble the valve, following Steps 12 thru 17 in Procedure A.

PROCEDURE C: SEAT DISC REPLACEMENT

1. Perform Steps 1 and 2 of Procedure B, above.

2. With the spool assembly removed from the body, remove the seat retainer screws.

3. Slide the seat retainer off the lower end of the stem.

4. Remove the seat disc from its groove in the spool.

   NOTE: The seat disc may fit quite tightly in the groove. If necessary, it may be pried out using a thin-bladed screwdriver or similar tool.

5. Install the new seat disc in the groove.

6. Reinstall the seat retainer and tighten the seat retainer screws.

7. Reassemble the valve, following Steps 5 and 6 of Procedure B.

PROCEDURE D: SEAT RING REPLACEMENT

NOTE: It is rare for a seat ring to require replacement. Minor nicks and scratches in the seating surface can usually be smoothed out with emery cloth.

1. Perform Steps 1 and 2 of Procedure B, above.

2. If you are working on a 4" or smaller valve, follow Steps 3 thru 9, below.

3. If you are working on a 6" or larger valve, follow Steps 10 thru 16, below.

4. Seat rings in valves 4" and smaller are threaded into the valve body. To remove, you will need a special seat ring tool. You may fabricate one using standard pipe as shown in the sketch below, or one may be purchased from OCV.

5. Using the seat ring tool, unthread the seat ring from the body.

6. Remove the old o-ring from the counterbore in the body.

7. Install the new o-ring in the counterbore.

8. Using the seat ring tool, install the new seat ring.

9. Reassemble the valve, following Steps 5 & 6 of Procedure B.

10. Seat rings in valves 6" and larger are bolted into the body with socket head capscrews. In addition you will note that the seat ring is equipped with additional threaded holes that may be used for “jacking” the seat ring out of the body.

11. Remove the socket head capscrews.

12. Remove the old seat ring from the body by temporarily installing two or more of the capscrews in the “jacking” holes.

13. Install a new o-ring in the groove of the new seat ring. Lubricate the o-ring and outer seat ring wall with Vaseline® or similar lubricant.

14. Install the new seat ring in the body, making sure that the capscrew holes line up.

15. Replace and tighten all the capscrews.

16. Reassemble the valve, following Steps 5 and 6 of Procedure B.

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**Table**

<table>
<thead>
<tr>
<th>VALVE SIZE</th>
<th>&quot;A&quot; PIPE SIZE</th>
<th>&quot;B&quot; MIN LENGTH</th>
<th>&quot;C&quot; SLOT WIDTH</th>
<th>&quot;D&quot; SLOT DEPTH</th>
<th>NO. OF SLOTS</th>
<th>&quot;E&quot; SLOTS</th>
<th>&quot;F&quot; SLOT SPACING</th>
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