

PRATT

Henry Pratt Company

INSTALLATION, OPERATION, AND MAINTENANCE INSTRUCTIONS



CONE VALVES

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1.0 GENERAL INFORMATION

1.1 SAFETY-PARTS-WARRANTY

SAFETY MESSAGES

All safety messages in the instructions are flagged with an exclamation symbol and the word "Warning". These messages indicate procedures that must be followed exactly to avoid equipment damage, physical injury, or death. Safety labels on the product indicate hazards that can cause equipment damage, physical injury, or death.



WARNING

Personnel involved in the installation or maintenance of valves should be constantly alert to potential emission of pipeline material and take appropriate safety precautions. Always wear suitable protection when dealing with hazardous pipeline materials.

PARTS

Order parts from your local Henry Pratt sales representative or directly from Henry Pratt Company. When ordering parts, please include the serial number located on the valve tag.

WARRANTY ISSUE

Seller warrants that, at its option, it will repair, replace, or refund the unit purchase price of any products which are non-conforming due to Seller's material or workmanship during the warranty period. The warranty period shall be twelve (12) months for parts and eighteen (18) months for all other goods after date of shipment. This shall be Buyer's sole remedy. In order to maintain this product warranty, Buyer must give written notice to Seller's Field Service Supervisor prior to any work being performed.

IN CONSIDERATION OF THE FOREGOING, SELLER EXCLUDES ALL OTHER EXPRESS OR IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Seller does not warrant water operated metallic cylinders against damage caused by corrosion, electrolysis or mineral deposits. In no event shall warranty include valve removal or reinstallation.



WARNING

Read all applicable directions and instructions prior to any maintenance, troubleshooting or installation

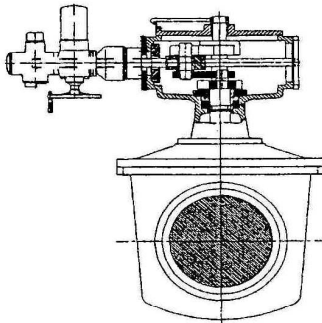
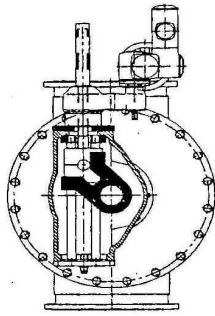
1.2 General Description of Metal Seated Rotary Cone Valves

The Henry Pratt Rotary Cone Valve is a rugged high performance valve. The body, plug and cover are made from Ductile Iron. The valve shaft is made from high strength Stainless Steel. The valve Seats are Monel welded to base metal, machined and ground to a matching taper fit to insure proper seating in both the open and closed positions.

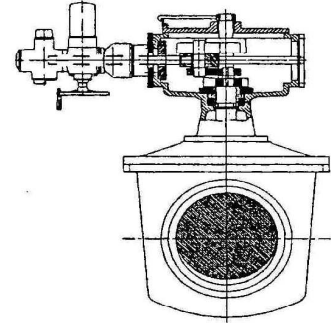
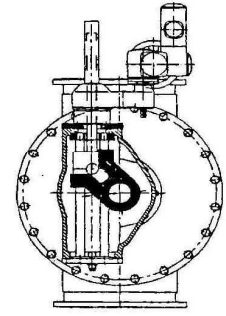
1.3 Cone Valve Operating Characteristics (See Operation Figures)

- Position 1** Valve is in closed position. Seats on the plug are in full contact with body seats.
- Position 2** The actuation mechanism starts to move the slider block forward. Slider block lower drive pin is connected to the lift nut by lower link and lower lift nut lever. Rotation of the lift nut will lift the plug prior to plug rotation to eliminate seat wear and decrease gasketing torque.
- Position 3** Slider block upper drive pin then makes contact with the upper rotator lever and starts to rotate the plug.
- Position 4** Slider block upper drive pin continues pushing rotation lever which continues to rotate the plug.
- Position 5** After the plug has reached the open position the slider block upper pin disengages from the rotator lever stopping rotation. As the slider block continues its motion, the lower linkage will turn the lift nut in the reverse direction lowering the plug.

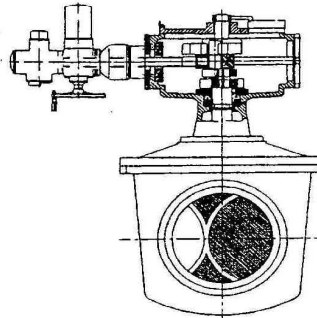
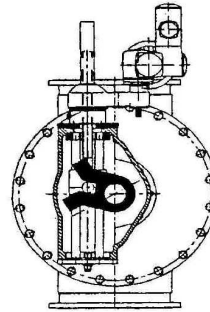
OPERATION OF THE CONE VALVE



Position 1
The valve is fully closed and the plug seats are in full contact with the seats of the body. This creates drop tight sealing of the valve.



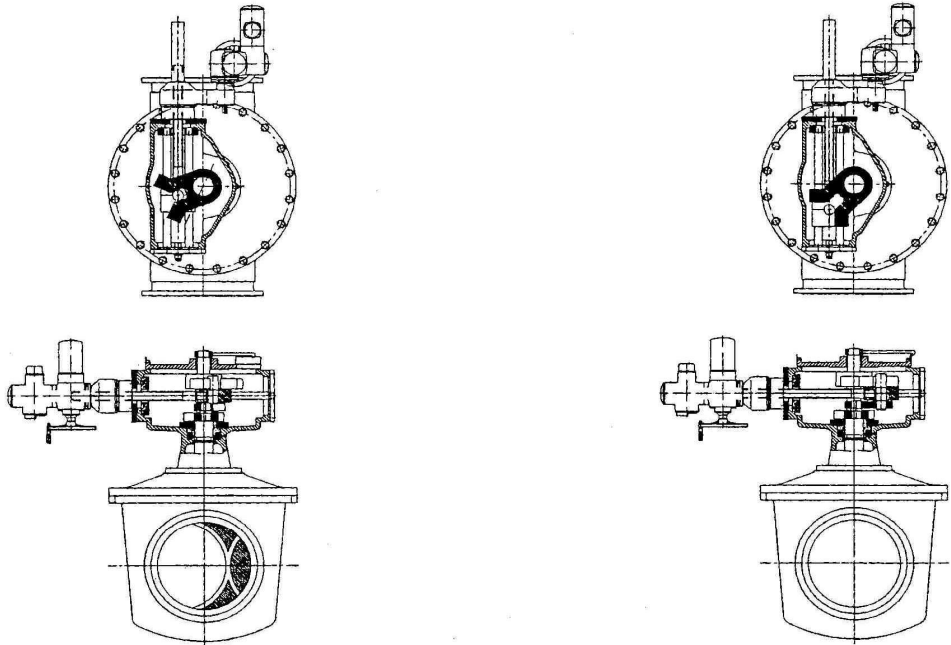
Position 2
By means of the lever the plug is lifted from its seats, to eliminate seat wear and decrease torque.



Position 3
By pushing against the rotator lever, the plug starts rotating, only in contact with the double bearing.

OperationFigure(Part1of2)

OPERATION OF THE CONE VALVE



Position 4
The plug is still rotating, causing the opening to become larger.

Position 5
After the plug has reached the open position the plug reseats into the body. In the full open position the cone valve has very low headloss which can be compared with the headloss of a straight pipe with the same length and diameter.

OperationFigure(Part2of2)

2.0 Handling, Storage and Installation

2.1 Handling of Valve Assembly

The valve assembly can be lifted by a capable crane and shackles attached to the valve in a way which supporting each section of the valve. When lifting should not make contact with any of the actuator components using sound hoisting practices.

or hoist using properly rated slings balances the load while equally the valve assembly, the slings used components. Keep angle of slings

2.2 Storage of Valve Assembly

The valves should be stored with adequate support on deflection of the valve components and tipping of the plug in a closed position.

an even, clean, dry surface to prevent the valve. Valve should be stored with

Short term storage of the valve prior to installation requires that flange protectors be placed on the inlet and outlet flange sections, and plastic sheeting covering the actuator is in place.

ion requires that flange protectors be and plastic sheeting covering the actuator

2.2.1 Storage Procedure (6 months or longer)

1. If valves will be stored in a high humidity or corrosive environment, where bare iron or steel flanges may rust, then flanges should be coated with a rust preventative suitable for outdoor exposure such as Rust-Veto by E.F. Houghton. Clean surfaces and apply one uniform coat with a dry rag or brush.
2. Valve flanges should be covered with full circle panels of 1/4" exterior grade plywood or tempered hardboard. These covers shall be fastened to the valve flanges.
3. Valve and actuator assembly should be covered with black plastic sheeting having a minimum thickness of 4 mils.
4. All separate electric equipment must be stored off the ground and above any POSSIBLE water or snow level. In addition the equipment should be placed in a position similar to the final intended mounting position, and can be covered with plastic sheeting having a similar thickness of 4 mils.
5. If the average mean temperatures fall below 60°F and/or the relative humidity exceeds 50%, all electric control components and motor control compartments with internal heaters must have the heaters wired and operating. The wire entrance points must be sealed against moisture. Desiccant must be placed in those units that do not have internal heaters.
6. All conduit openings shall be sealed with metal threaded pipe plug to keep equipment free from moisture and to protect threads of conduit openings.

7. Any other openings that would be normally sealed or covered by a mating mounting surface must be covered and sealed.

2.3 Installation of Valve Assembly

REQUIREMENTS

Note that this metal seated cone valve was factory tested for leakage and the plug is set to the correct open and closed positions during this testing procedure. It has also been opened against its design pressure to check that no wedging or galling of these seats takes place. This leakage test is performed without the valve being subjected to any **extraneous pipeline stresses or load being transferred to the valve**, it is important to remember that when installing the valve in the line that **no piping loads are being transferred to the valve**, otherwise the valve performance and sealing may be affected.

The valve should never be used for pipeline support; in fact, care should be taken to see that this is not the case. It is advisable to make sure that the bolt holes at the connections between the valve flange face and the mating pipe flange face have enough clearance to enable the pipe and valve to be bolted together without any deformation.

The valve is designed to rest freely on a base plate. The base plate is typically grouted between the valve feet and a concrete pedestal after the correct distance from centerline of pipe to valve base has been attained.

FLANGE ALIGNMENT

Remove the flange protectors before aligning the flanges. There should be **no pipe strain between the piping and valve**. The valve flanges need to be precisely aligned to the piping flanges. This can be done by shimming the valve feet for vertical adjustment and moving the valve sideways for horizontal adjustment, or preferably fitting the piping flanges to the valve after the valve has been leveled.

CONNECTING TO ADJOINING FLANGE

After the flanges are aligned as described in the previous paragraph, install gaskets (not supplied), and bolt mating flanges together using properly sized bolts or studs (not supplied), typical each flange. Apply a light coat of anti-seize compound to each fastener.

3.0 Start-up Operations

3.1 Initial Start-up

The following steps are recommended to start up and test the operation of the inline cone valve.

1. Close the upstream & downstream isolation valves to isolate the cone valve.
2. Using electrical, hydraulic or manual control, open and close the cone valve several times to observe the operation of the valve.
3. With the cone valve in the closed position open the upstream isolation valve and pressurize the valve. Check for leaks and tighten any loose bolts.
4. Open the downstream isolation valve.
5. Repeat Step 2. If everything functions properly, then the test and start-up activities are complete.

3.2 Initial Electrical Start-up

Follow the recommendations in the actuator vendor's manual.

3.3 Initial Manual Start-up with Hydraulic Cylinder

Follow the recommendations in the hydraulics system manual.

4.0 Maintenance

4.1 Preventative Maintenance

Maintenance Operation & Comments	Frequency	Materials
It is recommended that the Cone Valves should be cycled through a full open and close sequence. Valves shall be checked for any evidence of external leakage. If valve is hard to operate it should be checked for loose debris inside the valve and cleaned out. Results to be noted.	Minimum once every six months. Depends on operating conditions and can be adjusted accordingly.	N/A
Lubricate shaft's threads and Lift Nut. Grease fitting is located on actuator housing.	Every six months or as needed	Shell Alvania EP(LF)1 orequal.
Lubricate guide rods and Slider Block bearings. Open actuator cover inspection ports and brush grease on guide rods. Locate any other grease fittings that may also be located on actuator housing and lubricate.	Every six months or as needed	Shell Alvania EP(LF)1 orequal.
Packing shall be checked for any evidence of leakage. If leakage occurs, the valve packing can be replaced. Valves include a packing ring spacer follower which allows some adjustment. To adjust the packing retainer plate bolts in unison may be tightened (1/4) turn at a time to increase compression and minimize any leakage. See replacement procedure.	Every four months	New Packing set
Inspect condition of operator internal parts through the inspection glass covers.	Once a year	N/A
Check the hydraulic cylinder, hydraulic connections and fittings for leakage.	Every six months	N/A
Lubricate roller bearing. With valve in full open or closed position remove clear access cover to locate grease fitting.	Every six months	Shell Alvania EP(LF)1 orequal.
Lubricate OD of roller bearing and rotation lever flats. Remove actuator inspection cover for access and brush on.	Every six months	Shell Alvania EP(LF)1 orequal.

Recommended Grease and Typical Physical Characteristics:

ShellAlvaniaGreaseEP (LF)	1
NLGIConsistency	1
SoapType	Lithium
BaseOil	Mineral
KinematicViscosity@40° C _c St(IP71/ASTM-D445)	160 15.5
DroppingPoint°C(IP132)	180
ConePenetration Worked@25°C0.1mm (IP50/ASTM-D217)	310-340

Approximately 2 cubic inch of the grease is required for every point.

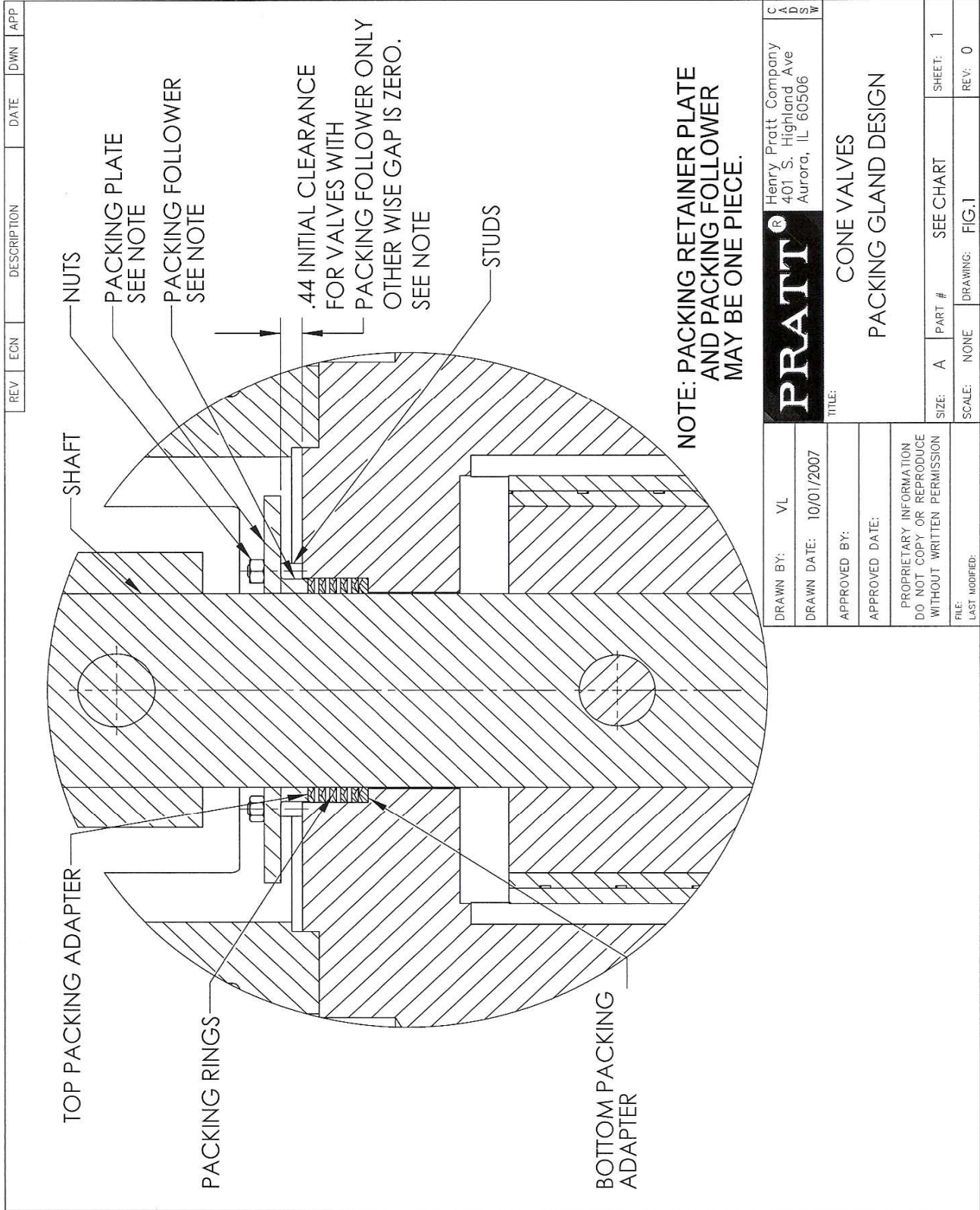
Cycle valve a minimum of five times with no flow to operate a minimum of five times during next 72 h waived.

propagate lubrication. If valve is scheduled ours, no flow maintenance cycling can be

4.2 Replacement of Packing (See Figure 1)

Packing is self-adjusting “V” type. Increase in line pressure automatically increases packing tightness.

1. Before commencing any work on the valve, be sure that valve plug is in the closed position.
2. Depressurize the pipeline.
3. Remove bolt to the Packing Retainer plate, lift the plate up and hold it in this position.
4. Remove old packing. A bent steel hook rod will help you in this operation.
5. Clean the packing gland housing and apply silicone grease to O.D. of the shaft and housing.
6. Insert new packing (factory split) one ring at a time, in proper sequence seating each firmly against the adjacent ring or adapter. Make sure split lines are turned 45 degrees from each other.
7. Exercise extreme care in placing rings in the packing housing so as not to damage the inner or outer lips of the rings.
8. The V type packing should be installed with ID and OD sealing lips down toward the valve plug and the outer point facing up toward the packing retainer plate.
9. Install retainer plate while maintaining packing to allow initial gap of approximately 0.4 inches. DO NOT OVER TIGHTEN. The packing retainer plate is NOT to be tightened flush against the mounting surface. Over tightening will cause premature failure of the packing.



DRAWN BY:	VL	PRATT [®]	Henry Pratt Company 401 S. Highland Ave Aurora, IL 60506
DRAWN DATE:	10/01/2007		
APPROVED BY:		TITLE: CONE VALVES	
APPROVED DATE:		PACKING GLAND DESIGN	
PROPRIETARY INFORMATION DO NOT COPY OR REPRODUCE WITHOUT WRITTEN PERMISSION			
FILE:		SIZE: A	PART #
LAST MODIFIED:		SCALE: NONE	DRAWING: FIG.1
		SHEET: 1	REV: 0

Figure1

4.3 Seat Adjustment

The Pratt Cone Valve actuator open and closed position stops have been set at the factory to meet field conditions. Thus, the proper amount of wedging action required to seat the valve under working pressure should not need adjustment for the life of the valve. If the service is exceptionally harsh, slight wear on the seats may occur requiring SLIGHTLY more wedging action to help improve seating.

Closed Stop Adjustment

For motor actuator closed position stop adjustment, back off the closed stop bolt approximately 1/8" **ONLY** and retighten in that position. Then re-adjust motor closed position limit switch to add another 1/16" of linear slider block travel established by leaving 1/16" clearance between sliding block and end of closed stop bolt inside the actuator. The clear access cover above the closed stop can be used to visually see the 1/16" gap requirement. Do not ram the slider block into the closed stop bolt when using motor actuators. **Warning, one (1) adjustment of closed position is all that is recommended. Otherwise, overwedging of seats may occur damaging the valve or actuator.** For cylinder actuator or manual actuator back off the closed stop bolt approximately 1/16" **ONLY** and then retighten in that position.

Open Stop Adjustment

For motor actuator, use the motor open position limit switch to add 1/16" of slider block travel. For cylinders the top cover of the actuator must be removed and is not recommended. **Warning, one (1) adjustment of open position is all that is recommended. Otherwise, overwedging of seats may damage valve or actuator.**

5.0 Valve&AccessoryDrawings