PRATT
Henry Pratt Company

# Rubber Seated Ball Valve

# Operation and Maintenance Manual

Job Name: _____

Contractor: _____

Date: _____

Document #: RSBVOM

Revision Date: 07/08/09

## 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***

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## FUNCTIONAL DESCRIPTION

Ball valve rotors rotate 1/4 turns to provide tight shutoff in air or water pipelines. The valves can be used to regulate flow rate or pressure by positioning the rotor between 15 and 90 degrees open.

Manually operated ball valves are powered with gear actuators, which convert multiple handwheel, chainwheel or nut input turns into 1/4 turn valve operation. The travel of the valve rotor is limited by physical stops in the actuator housing.

### WARNING

***Forcing the handwheel, chainwheel or nut against the stops will not provide tighter shutoff of the valve and may damage the actuator. Only actuator adjustments will affect valve shutoff.***

Motor operated ball valves are powered with gear actuators, which convert multiple motor input turns into 1/4 turn valve operation. The travel of the valve rotor is limited by limit switches in the motor housing and physical stops in the actuator housing. Valve shutoff is affected by limit switch and physical stop settings.

### WARNING

***Improperly set limit switches and/or physical stops may damage the motor and/or actuator.***

Hydraulically operated ball valves are powered with a gear box and double acting cylinder. The linear stroke of the cylinder is converted to 1/4 turn operation by the gear box. Auxiliary controls are provided to direct hydraulic power to the cylinder and to control the operating speed of the cylinder.

## INSTALLATION

Installation of your ball valve should be accomplished by personnel well versed in piping installation and who are familiar with the end configuration used to join the components. The use of standard, good joining procedures are all that are normally required. The only notable precaution would be in regard to the direction of the fluid flow. In the case of the single seated valve, the seat must be oriented toward the down stream side of the valve.

Refer to the mechanical general arrangement drawings prepared for this specific valve during installation. The flow direction and actuator orientation are given on the drawing. The valve should be installed with the rotor in the closed or near closed position to prevent damage to the seating edge when lowered into the pipeline. Wrap the lifting sling around the base of the horizontal axis trunnions to lift the valve. Alternatively, bars or lifting eyes can be inserted through the flange holes for lifting. The valve should be bolted to the pipe with a rubber ring gasket suitable for the pipeline fluid and pressure.

### WARNING

***Do not remove the actuator with water in the pipe, or the valve may suddenly open and cause physical damage or personal injury.***

### WARNING

***Persons who will install, operate or adjust this equipment must read the instructions and drawings carefully. Injury and property damage may occur from improper use. It is understood that this equipment will be installed by individuals with knowledge and skills in the equipment.***

### WARNING

***Do not lift the valve by the actuator. The actuator and actuator bolting can not support the weight of the valve.***

## OPERATION

Flow control is achieved by rotating the rotor inside of the pipe line about its diametrical axis, hence changing the total free flow area of the valve. At full closed, a leak tight seal is achieved by the rotor mechanically compressing the rubber seat causing a seal between the rotor and the seat.

Positioning of the rotor is achieved by the valve actuator which has been mounted, adjusted, and tested at our Plant. Your valve may be motor, cylinder, or manually operated. Operation and maintenance of your specific type of actuator is discussed in another section of this manual.

The manually operated ball valves should be fully cycled from close to open and back to the closed position to verify operation. Do not force the valve in the closed position if tight shutoff is not achieved; make adjustments to the operator per the maintenance instructions.

For ball valves equipped with power cylinder actuators, connect the specified hydraulic pressure to the cylinder and controls. All hydraulic supplies must be filtered to prevent contamination and clogging of the controls. The valve can be cycled open and closed by powering the solenoid valves mounted on the cylinder.

## MAINTENANCE

Although the actuator may or may not require periodic maintenance (depending upon which actuator is used), the valve itself requires no periodic maintenance. Pratt rubber seat valves are supplied with self-lubricating teflon lined fiberglass back sleeve bearings. No maintenance attention to them is necessary.

However, after many years of continued service, the rubber components of your Pratt Ball Valve may show signs of wear. These parts are the valve stem packing and the rubber seat which are the only field replaceable components of your rubber seated Ball Valve. We do not recommend stocking spare seats. The seat and packing are designed for years of service. If repair or replacement of these parts becomes apparent (by leaking), please contact the Pratt's Parts Department who can provide estimates for parts and field service work.

## TROUBLESHOOTING

| PROBLEM | CAUSES | REMEDIES |
|---|---|---|
| Leakage between valve and actuator | • Packing Leak | • Clean packing bore and replace packing |
| Bottom trunnion leaks | • O-ring or gasket leak | • Replace bottom O-ring or gasket |
| Valve leaks when closed | • Rotor not fully closed or past fully closed<br>• Rotor edge wear or damage<br>• Body rubber seat wear or damage<br>• Loose debris in valve | • Adjust actuator closed position stop<br>•Clean and/or repair rotor edge<br>• Adjust or replace valve seat<br>• Cycle valve five times to flush out debris |
| Chain wheel jams | • Poorly fitting chain | • Replace with correct chain |
| Valve hard to operate | • Foreign material in valve<br>• Corroded actuator parts<br>• Loose actuator | • Remove obstructions<br>• Clean and grease actuator<br>• Apply loctite or Omni-fit locking compound and tighten bolts |
| Automatic valve does not actuate | • No power source<br>• Improper signal<br>• Burned out or impaired component | • Check incoming power source and replace fuses or reset pressure<br>• Check actuating signal sequence<br>• Check and repair or replace solenoids, motors and relay devices. |

## HOW TO CONTACT PRATT

### HOW TO ORDER PARTS:

To order parts, contact our Parts Department:

Write: - Henry Pratt Company
401 South Highland Avenue
Aurora, IL 60506-5563

Attn: Parts Manager

Call - (630) 844-4000

Fax - (630) 844-4191

Please include valve serial number and description of part requested.

### HOW TO OBTAIN SERVICE:

To obtain further information or secure field service, contact our Field Service Department:

Write: - Henry Pratt Company
401 South Highland Avenue
Aurora, IL 60506-5563

Attn: Field Service Manager

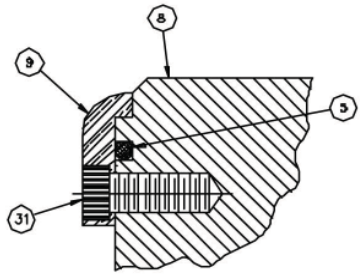
Call - (630) 844-4163

Fax - (630) 844-4160

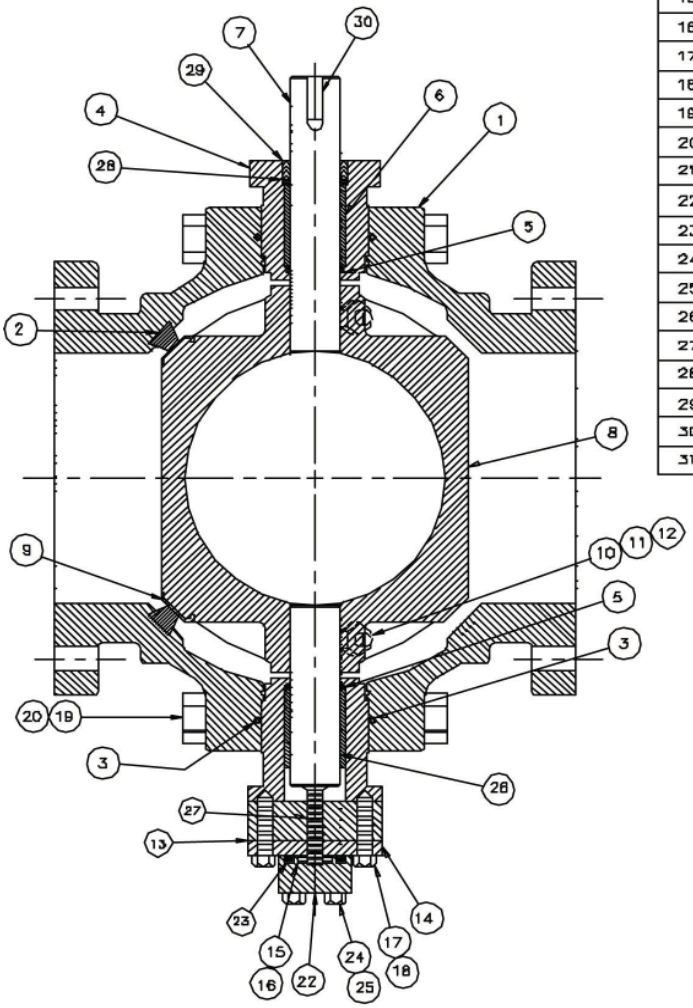
Please include the following with your inquiry for service:

Henry Pratt Order Number:
Henry Pratt Item Number:
Valve Serial Number:
Type of Service Requested

## Pratt Single Seat Rubber Seated Ball Valve Parts Drawing

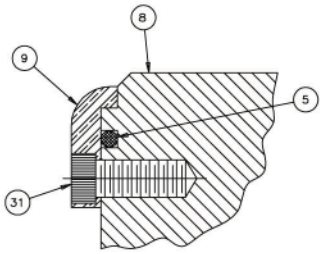



SEAT DETAIL
6", 8", AND 10"
BALL VALVES ONLY

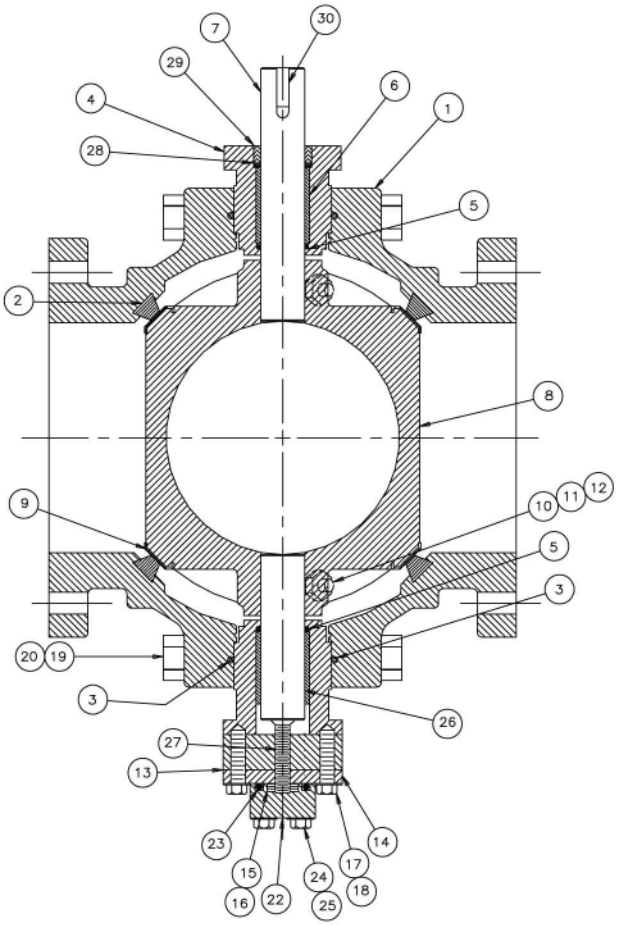



| ITEM NO. | DESCRIPTION | MATERIALS |
|---|---|---|
| 1 | END PIECE | CAST IRON ASTM A-126 CLASS B |
| 2 | RUBBER SEAT | RUBBER BUNA-N |
| 3 | O-RING | RUBBER BUNA-N |
| 4 | CENTERPIECE | CAST IRON ASTM A-126 CLASS B |
| 5 | O-RING | RUBBER BUNA-N |
| 6 | BEARINGS | DURALON |
| 7 | TOP STUB SHAFT | STAINLESS STEEL ASTM A-276 TYPE 304 |
| 8 | ROTOR | CAST IRON ASTM A-48 CLASS 40 |
| 9 | ROTOR EDGE | STAINLESS STEEL ASTM A-240 TYPE 316 |
| 10 | TAPER PINS | STAINLESS STEEL ASTM A-276 TYPE 304 |
| 11 | LOCKWASHERS | STAINLESS STEEL 18-8 TYPE 304 |
| 12 | HEX NUTS | STAINLESS STEEL 18-8 TYPE 304 |
| 13 | BOTTOM COVER GASKET | NON ASBESTOS MATERIAL ASTM F104 |
| 14 | BOTTOM COVER | CAST IRON ASTM A-126 CLASS B |
| 15 | THRUST COLLAR | BRONZE BAR ASTM B-505 ALLOY C-93200 |
| 16 | GROOVE PIN | ALLOY STEEL |
| 17 | CAP SCREWS | CARBON STEEL SAE GRADE 2 (ZINC PLATED) |
| 18 | LOCTITE | GRADE CV |
| 19 | STUD | CARBON STEEL AISI B12L14 |
| 20 | HEX NUT | CARBON STEEL SAE GRADE 2 (ZIINC PLATED) |
| 21 | LOCTITE | GRADE CV |
| 22 | BOTTOM COVER CAP | CAST IRON ASTM A-126 CLASS B |
| 23 | O-RING | RUBBER BUNA-N |
| 24 | CAP SCREW | CARBON STEEL SAE GRADE 2 (ZINC PLATED) |
| 25 | LOCTITE | GRADE CV |
| 26 | BOTTOM STUB SHAFT | STAINLESS STEEL ASTM A-276 TYPE 304 |
| 27 | THRUST BEARING STUD | STAINLESS STEEL TYPE 304 |
| 28 | BOTTOM PKG RTNR | NYLON 101 |
| 29 | PACKING | RUBBER BUNA-N |
| 30 | KEY | AISI C1045 COLD DRAWN STEEL |
| 31 | CAP SCREW | STAINLESS STEEL TYPE 304 |

# Pratt Double Seat Rubber Seated Ball Valve Parts Drawing




SEAT DETAIL
6", 8", AND 10"
BALL VALVES ONLY




| ITEM NO. | DESCRIPTION | MATERIALS |
|---|---|---|
| 1 | END PIECE | DUCTILE IRON ASTM A-536 (65-45-12) |
| | | CAST IRON ASTM A-126 CLASS B |
| 2 | RUBBER SEAT | RUBBER BUNA-N |
| 3 | O-RING | RUBBER BUNA-N |
| 4 | CENTERPIECE | DUCTILE IRON ASTM A-536 (65-45-12) |
| | | CAST IRON ASTM A-126 CLASS B |
| 5 | O-RING | RUBBER BUNA-N |
| 6 | BEARINGS | DURALON |
| 7 | TOP STUB SHAFT | STAINLESS STEEL ASTM A-276 TYPE 304 |
| | | STAINLESS STEEL ASTM A-276 TYPE 316 |
| | | STAINLESS STEEL ASTM A-564 TYPE 630 17-4 PH COND. H-1150 |
| 8 | ROTOR | CAST IRON ASTM A-48 CLASS 40 |
| | | DUCTILE IRON ASTM A-536 (65-45-12) |
| 9 | ROTOR EDGE | STAINLESS STEEL ASTM A-240 TYPE 316 |
| 10 | TAPER PINS | STAINLESS STEEL ASTM A-276 TYPE 304 |
| | | STAINLESS STEEL ASTM A-276 TYPE 316 |
| | | STAINLESS STEEL ASTM A-564 TYPE 630 17-4 PH COND. H-1150 |
| 11 | LOCKWASHERS | STAINLESS STEEL TYPE 304 |
| 12 | HEX NUTS | STAINLESS STEEL TYPE 304 |
| 13 | BOTTOM COVER GASKET | NON ASBESTOS MATERIAL ASTM F104 |
| 14 | BOTTOM COVER | CAST IRON ASTM A-126 CLASS B |
| | | DUCTILE IRON ASTM A-536 (65-45-12) |
| 15 | THRUST COLLAR | BRONZE BAR ASTM B-505 ALLOY C-93200 |
| 16 | GROOVE PIN | ALLOY STEEL |
| 17 | CAP SCREW | CARBON STEEL SAE GRADE 2 (ZINC PLATED) |
| | | STAINLESS STEEL TYPE 304 |
| | | STAINLESS STEEL TYPE 316 |
| 18 | LOCTITE | GRADE CV |
| 19 | STUD | CARBON STEEL AISI B12L14 |
| 20 | HEX NUT | CARBON STEEL SAE GRADE 2 (ZINC PLATED) |
| 21 | LOCTITE | GRADE CV |
| 22 | BOTTOM COVER CAP | CAST IRON ASTM A-126 CLASS B |
| | | DUCTILE IRON ASTM A-536 (65-45-12) |
| 23 | O-RING | RUBBER BUNA-N |
| 24 | CAP SCREW | CARBON STEEL SAE GRADE 2 (ZINC PLATED) |
| | | STAINLESS STEEL TYPE 304 |
| | | STAINLESS STEEL TYPE 316 |
| 25 | LOCTITE | GRADE CV |
| 26 | BOTTOM STUB SHAFT | STAINLESS STEEL ASTM A-276 TYPE 304 |
| | | STAINLESS STEEL ASTM A-276 TYPE 316 |
| | | STAINLESS STEEL ASTM A-564 TYPE 630 17-4 PH COND. H-1150 |
| 27 | THRUST BEARING STUD | STAINLESS STEEL TYPE 304 |
| 28 | BOTTOM PKG RTNR | NYLON 101 |
| 29 | PACKING | RUBBER BUNA-N |
| 30 | KEY | AISI C1045 COLD DRAWN STEEL |
| 31 | CAP SCREW | STAINLESS STEEL TYPE 304 |