PRATT
Henry Pratt Company

HP250II 3”-20” Bonded Seat Butterfly Valve

Operation and Maintenance Manual

Job Name: _____

Contractor: _____

Date: _____

Document #:320HP250IIBFV

Revision Date: 1/10/11

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

Table of Contents

FUNCTIONAL DESCRIPTION

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

Manually Operated Valve

Manually operated butterfly 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 disc 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 Valves

Motor operated butterfly valves are powered with gear actuators, which convert multiple motor input turns into 1/4 turn valve operation. The travel of the valve disc 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.

Cylinder Operated Valves

Hydraulically operated butterfly 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

GENERAL

Valves are a significant component of any piping system. Failure due to faulty installation, improper operation or maintenance in such systems could result in damage, down time and costly repairs. In buried underground installations, problems or malfunctions can result in extensive, costly unearthing operations to correct the problem. Many problems with valves can be traced to improper installation, operation, or maintenance procedures.

UNLOADING

Inspect valves on receipt for damage in shipment and conformance with quantity and description in the shipping notice and order. Carefully unload all valves to the ground without dropping using fork trucks or slings under skids. Do not lift valves with slings or chain around operating shaft, actuator, or through waterway. Instead, lift valves with eye bolts or rods through flange holes.

STORAGE

Whenever practical, store valves indoors. If not, protect valves and actuators from weather and accumulation of water, dirt, rocks and debris. When valves fitted with power actuators and controls are stored, energize electric actuator or otherwise protect electrical control equipment to prevent corrosion of electrical contacts due to condensation resulting from temperature variation. Do not expose rubber seats to sunlight or ozone for any extended period. Valves should be stored with the valve disc or closure member slightly open.

INSPECTION PRIOR TO INSTALLATION

Make sure flange faces and joint sealing surfaces, body seats and disc seats are clean. Check bolting attaching actuator to valve for loosening in transit and handling. If loose, tighten firmly. Open and close valve to make sure it operates properly and that stops or limit switches are correctly set so that the valve seats fully. Check that valve rotation direction is correct and close valve before installing.

INSTALLATION

The following items must be performed during installation to ensure proper function.

- Carefully place valves into position avoiding contact or impact with other equipment, vault walls or trench walls.

- Valves are to be installed in accordance with the General Arrangement Drawings furnished for the order.

- Foreign material in a valve can damage the rubber seat when valves are operated. Be sure valve interiors and adjacent piping are clear of foreign material prior to mating valve to pipe joint.

- Prepare pipe ends and install valves in accordance with the pipe manufacturer’s instructions for the joint used. Do not deflect pipe/valve joint. Do not use valve and jack to pull pipe into alignment.

- In plant piping, install so as to minimize bending of valve connection with pipe loading.

- In case of wafer type butterfly valves, concentrically center the valve disc between the mating flanges.

- Make sure valve disc, when opened, will not contact pipe port. This is especially necessary on pipe with linings and when wafer valves are used. Check manufacturer for minimum pipe I.D. required for clearance.

WARNING

It is recommended that valves be installed into piping system in accordance with AWWA M-11 in order to prevent any undue piping stress, deflection or bending that may affect the performance of the valve.

WARNING

Valve disc without actuator may open or close at any time and cause injury to persons or damage to valve and other property. The shaft/disc clamping device when furnished is intended for temporary use during shipping, handling and valve installation only. Do not subject valve to flow conditions before actuator is mounted and tested for performance and clamping device is removed.

Buried valves installed with valve boxes must be so installed that the valve box does not transmit shock or stress to the valve actuator as a result of shifting soil or traffic load.

When valves are installed in vaults, the vault design must provide space for purposes of repair. The valve opening nut should be accessible from the top opening of the vault with a tee wrench.

MECHANICAL JOINT INSTALLATION

The successful operation of the mechanical joint requires that the plain end be centrally located in the bell and that adequate anchorage be provided where abrupt changes in direction and dead ends occur. The rubber gasket will seal more effectively if the surfaces with which it comes in contact are thoroughly cleaned (for example, with a wire brush) just prior to assembly in order to remove all loose rust or foreign material.

Lubrication and additional cleaning should be performed by brushing both the gasket and the plain end with soapy water or pipe lubricant just prior to slipping the gasket into the plain end and assembling the joint.

TESTING

When rubber seated valves are used to isolate sections of line for test, it is important to realize that these valves are designed or factory adjusted to hold rated pressure only. Test pressure may cause leakage past the rubber seat or damage to the valve.

In order to prevent time lost in searching for leaks, it is recommended that excavations for buried valves not be back-filled until after hydrostatic pressure tests have been made.

Seat leakage can occur due to foreign material in the line. If this occurs, open valve 5 – 10 degrees to get high velocity flushing action. Close and repeat several times to clear seats for tight shutoff.

Seat leakage can occur due to rotational shift in position of the disc with relation to the body seat. Readjust closing stop in accordance with manufacturer’s instructions.

RECORDS

Upon completion of installation, valve location, size, make, type, date of installation, number of turns to open, direction of opening and any other information deemed pertinent should be entered on the owner’s permanent records.

OPERATION

Do not permit use and operation of any valve at pressure above the rated pressure of the valve.

Do not exceed 300 ft-lb input torque on actuators with wrench nuts, 200 lb. rim pull input torque for handwheels or chainwheels. If portable auxiliary actuators are used, size the actuator or use a torque limiting device to prevent application of torque exceeding 300 ft-lbs. If an oversize actuator with no means of limiting torque is used, stop the actuator before valve is fully opened or closed against stops and complete the operation manually. Be sure to check actuator directional switch against direction indicated on wrench nut, handwheel or records before applying opening and closing torque.

If a valve is stuck in some intermediate position between open and closed, check first for jamming in the actuator. If nothing is found, the interference is inside the valve. In this case, do not attempt to force the disc open or closed since excessive torque in this position can severely damage internal parts. Contact the Pratt Service Department.

MANUAL ACTUATOR FUNCTION AND USE:
The manually operated butterfly valves are operated by rotating the handwheel, chainwheel, or nut. The actuator is equipped with gearing to convert the many turns into 1/4 turn operation. Inside actuator stops that limit the travel of the valve are pre-set at the factory. Forcing the handwheel, chainwheel, or nut will not cause the valve to shut off any tighter and may cause damage to the gearing.

CYLINDER ACTUATOR FUNCTION AND USE:
The cylinder operated butterfly valves are operated automatically by directing hydraulic pressure to either side of the power cylinder. Solenoid valves are used to direct the fluid to the cylinder ports based on electrical power signals. In cylinder actuators, the travel stops are in the cylinder so that full hydraulic pressure can be held on the cylinder at either end of travel.

MOTOR ACTUATOR FUNCTION AND USE:
The motor actuator is designed to open and close the valve through its one quarter turn of rotation. It contains gearing so that hundreds of turns of the motor or handwheel will slowly move the valve from open to close position or vice versa. Electrical controls are included in the motor actuator for local electrical control.

The output motion of the actuator is limited to about 100 degrees of output rotation by mechanical stops in the gearing. These are factory set and should not need adjustment. The actual positioning of the valve disc will be done by limit switches in the motor actuator. The switches are also set at the factory but adjustment is sometimes required if the motor unit is installed on a separate mounting base or floorstand. Detailed procedures are given in the motor manual if adjustment is needed for the mechanical stops or the limit switches. The wiring and power requirements are given on wiring diagrams included in this instruction manual.

MAINTENANCE

Maintenance of rubber-seated valves by owner is generally limited to actuators and shaft seals. In some instances, valve design permits field adjustment or replacement of rubber seats when leakage occurs. Unless the owner has skilled personnel and proper equipment, any major rework will require removal of the valve from the line. Depending on condition, valve may require return to the manufacturer.

ANNUAL MAINTENANCE

1. Cycle valve to verify operation and no interference in line.
2. Close valve and check for leakage. If leakage is detected, check actuator stops to verify that disc is fully closed. If leakage persists, remove valve to inspect seat. A damaged seat requires valve to be returned to the factory for repair.
3. Check flange connections for leakage. Tighten bolts accordingly.
4. Check top trunnion area for shaft leakage. If leakage is detected, replace valve packing.

NOTE: 10” and larger valves have top and bottom packing.

WARNING

Removal of actuator from valve shaft will cause disc to rotate, striking persons or objects in the disc path, causing injury to persons and damage to valve. Block or lock disc before removing actuator.

Typical maintenance would be shaft packing replacement and actuator adjustment. Seal leakage, broken parts and difficult operation should be discussed with Pratt’s Service Department before valve repairs are attempted. Pratt Service Engineers are available to perform or supervise valve repairs in the field.

Stop line flow and isolate from line pressure prior to performing any corrective maintenance.

After completing repair, cycle valve through one complete operating cycle and after line pressure has been restored, inspect for leakage.

TROUBLESHOOTING GUIDE

Problem	Causes	Remedies
Leakage between valve and actuator	•Packing Leak	•First, cycle the valve several times. This should adjust the packing. If this fails, clean packing bore and replace packing.
Bottom trunnion leaks	•Packing or gasket leak	•Replace bottom shaft packing, o-ring or gasket.
Valve leaks when closed	•Disc not fully closed or past fully closed •Disc edge wear or damage •Rubber seat wear or damage	•Adjust actuator closed position stop. •Clean and/or repair disc edge. •Replace valve seat (Bonded seat vavles 20” or below must be returned to factory for repair).
Chainwheel jams	•Poorly fitting chain	•Replace with correct chain.
Valve hard to operate	•Foreign material in valve •Corroded actuator parts •Loose actuator	•Remove obstructions •Clean and grease actuator •Apply Loctite or Omnifit locking compound and tighten bolts.
Automatic valve does not actuate	•No power source •Improper Signal •Burned out or impaired component	•Check incoming power source and replace fuses or rest pressure. •Check actuating signal sequence. •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

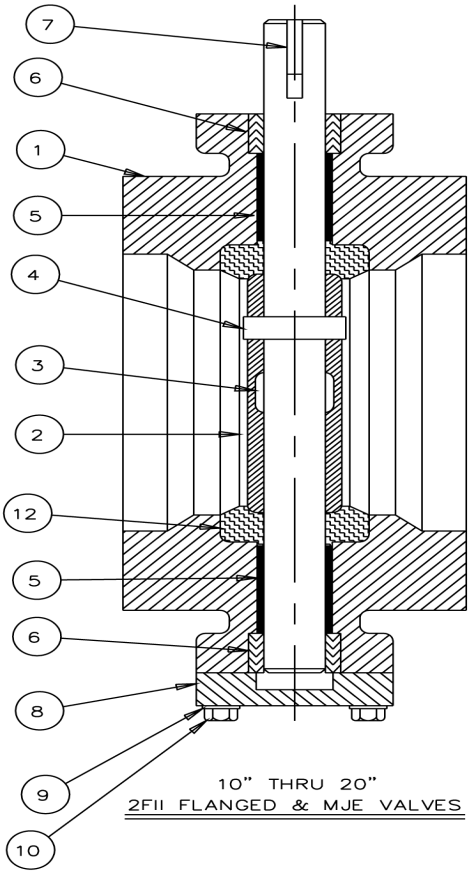
Fax - (630) 844-4160

Please include the following with your inquiry for service:

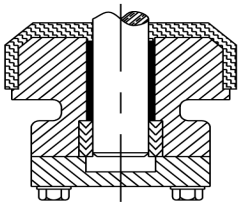
Henry Pratt Order Number:
Henry Pratt Item Number:
Valve Serial Number:
Type of Service Requested

HP250II 3”-20” Bonded Seat Butterfly Valve

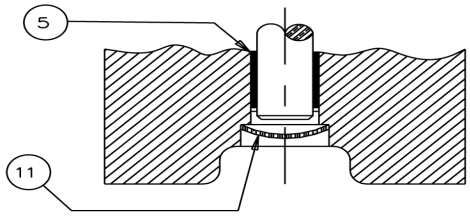
Henry Pratt Company



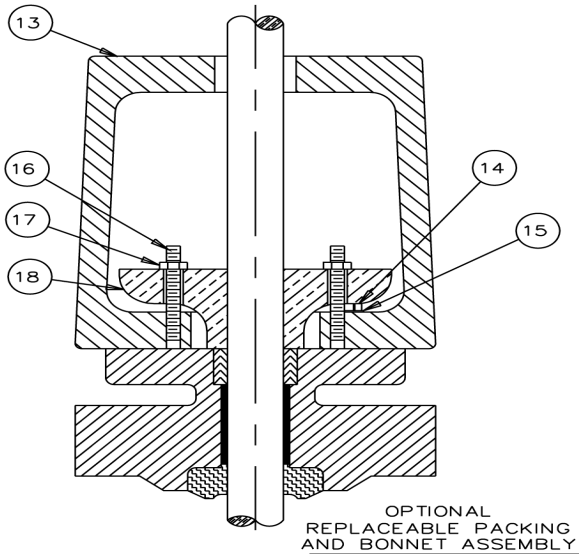
10” THRU 20”
2FII FLANGED & MJE VALVES



10” THRU 20”
MKII WAFER VALVES



3” THRU 8” VALVES



OPTIONAL
REPLACEABLE PACKING
AND BONNET ASSEMBLY

MATERIAL OPTIONS AS CHECKED

	ITEM NO.	DESCRIPTION	MATERIALS
	1	BODY	CAST IRON ASTM A-48 CLASS 40 (MKII ONLY)
			CAST IRON ASTM A-126 CLASS B * ⚠2
			DUCTILE IRON ASTM A-536 (65-45-12)
	2	DISC	CAST IRON ASTM A-126 CLASS B STAINLESS STEEL EDGE TYPE 316 (DUCTILE IRON MAY BE SUBSTITUTED)
			DUCTILE IRON ASTM A-536 (65-45-12) STAINLESS STEEL EDGE TYPE 316
			STAINLESS STEEL ASTM A-351 GRADE CF8M
	3	SHAFT	STAINLESS STEEL ASTM A-276 TYPE 304
⚠1			STAINLESS STEEL ASTM A-276 TYPE 316
			STN. STL. A-564 TYPE 630 COND. H-1150
	4	SQUEEZE PIN	STAINLESS STEEL ASTM A-276 TYPE 304
⚠1			STAINLESS STEEL ASTM A-276 TYPE 316
			STN. STL. A-564 TYPE 630 COND. H-1150
	5	BEARING	NYLATRON GS
			RULON LR (HIGH TEMPERATURE ONLY)
	6	PACKING	RUBBER BUNA-N
			RUBBER (EPDM)
	7	KEY	AISI C1045 COLD DRAWN STEEL
⚠3	8	COVER	CAST IRON ASTM A-48 CLASS 40
			CAST IRON ASTM A-126 CLASS B
	9	LOCKWASHER	STAINLESS STEEL TYPE 304
			STAINLESS STEEL TYPE 316
	10	CAP SCREW	STAINLESS STEEL TYPE 304
			STAINLESS STEEL TYPE 316
	11	EXP. PLUG	STAINLESS STEEL TYPE 304
			STAINLESS STEEL TYPE 316
	12	SEAT	RUBBER BUNA-N
			RUBBER (EPDM)
	13	BONNET	CAST IRON ASTM A-48 CLASS 40
	14	CAP SCREW	CARBON STEEL SAE GRADE 2 (ZINC PLATED)
	15	LOCKWASHER	CARBON STEEL
	16	THD. STUD	STAINLESS STEEL TYPE 304
	17	HEX NUT	STAINLESS STEEL TYPE 304
	18	GLAND	BRONZE ASTM B-584 ALLOY C86400

PRATT
Henry Pratt Company

24”-48” HP250II Butterfly Valve

Operation and Maintenance Manual

Job Name: _____

Contractor: _____

Date: _____

Document #: 2448HP250OOOM Revision Date: 1/10/11

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

Table of Contents

Functional Description

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

Manually Operated Valve

Manually operated butterfly 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 disc 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 Valve

Motor operated butterfly valves are powered with gear actuators, which convert multiple motor input turns into 1/4 turn valve operation. The travel of the valve disc 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.

Cylinder Operate Valve

Hydraulically operated butterfly 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

GENERAL

Valves are a significant component of any piping system. Failure due to faulty installation, improper operation or maintenance in such systems could result in damage, down time and costly repairs. In buried underground installations, problems or malfunctions can result in extensive, costly unearthing operations to correct the problem. Many problems with valves can be traced to improper installation, operation, or maintenance procedures.

UNLOADING

Inspect valves on receipt for damage in shipment and conformance with quantity and description in the shipping notice and order. Carefully unload all valves to the ground without dropping using fork trucks or slings under skids. Do not lift valves with slings or chain around operating shaft, actuator, or through waterway. Instead, lift valves with eye bolts or rods through flange holes.

STORAGE

Whenever practical, store valves indoors. If not, protect valves and actuators from weather and accumulation of water, dirt, rocks and debris. When valves fitted with power actuators and controls are stored, energize electric actuator or otherwise protect electrical control equipment to prevent corrosion of electrical contacts due to condensation resulting from temperature variation. Do not expose rubber seats to sunlight or ozone for any extended period. Valves should be stored with the valve disc or closure member slightly open.

INSPECTION PRIOR TO INSTALLATION

Make sure flange faces and joint sealing surfaces, body seats and disc seats are clean. Check bolting attaching actuator to valve for loosening in transit and handling. If loose, tighten firmly. Open and close valve to make sure it operates properly and that stops or limit switches are correctly set so that the valve seats fully. Check that valve rotation direction is correct and close valve before installing.

INSTALLATION

The following items must be performed during installation to ensure proper function.

- Carefully place valves into position avoiding contact or impact with other equipment, vault walls or trench walls.

- Valves are to be installed in accordance with the General Arrangement Drawings furnished for the order.

- Foreign material in a valve can damage the rubber seat when valves are operated. Be sure valve interiors and adjacent piping are clear of foreign material prior to mating valve to pipe joint.

- Prepare pipe ends and install valves in accordance with the pipe manufacturer’s instructions for the joint used. Do not deflect pipe/valve joint. Do not use valve and jack to pull pipe into alignment.

- In plant piping, install so as to minimize bending of valve connection with pipe loading.

- Make sure valve disc, when opened, will not contact pipe port. This is especially necessary on pipe with linings. Check manufacturer for minimum pipe I.D. required for clearance.

WARNING

It is recommended that valves be installed into piping system in accordance with AWWA M-11 in order to prevent any undue piping stress, deflection or bending that may affect the performance of the valve.

WARNING

Valve disc without actuator may open or close at any time and cause injury to persons or damage to valve and other property. The shaft/disc clamping device when furnished is intended for temporary use during shipping, handling and valve installation only. Do not subject valve to flow conditions before actuator is mounted and tested for performance and clamping device is removed.

Buried valves installed with valve boxes must be so installed that the valve box does not transmit shock or stress to the valve actuator as a result of shifting soil or traffic load.

When valves are installed in vaults, the vault design must provide space for purposes of repair. The valve operating nut should be accessible from the top opening of the vault with a tee wrench.

TESTING

When rubber seated valves are used to isolate sections of line for test, it is important to realize that these valves are designed or factory adjusted to hold rated pressure only. Test pressure may cause leakage past the rubber seat or damage to the valve.

In order to prevent time lost in searching for leaks, it is recommended that excavations for buried valves not be back-filled until after hydrostatic pressure tests have been made.

Seat leakage can occur due to foreign material in the line. If this occurs, open valve 5 – 10 degrees to get high velocity flushing action. Close and repeat several times to clear seats for tight shutoff.

Seat leakage can occur due to rotational shift in position of the disc with relation to the body seat. Readjust closing stop in accordance with manufacturer’s instructions.

RECORDS

Upon completion of installation, valve location, size, make, type, date of installation, number of turns to open, direction of opening and any other information deemed pertinent should be entered on the owner’s permanent records.

OPERATION

Do not permit use and operation of any valve at pressure above the rated pressure of the valve.

Do not exceed 300 ft-lb input torque on actuators with wrench nuts, 200 lb. rim pull input torque for handwheels or chainwheels. If portable auxiliary actuators are used, size the actuator or use a torque limiting device to prevent application of torque exceeding 300 ft-lbs. If an oversize actuator with no means of limiting torque is used, stop the actuator before valve is fully opened or closed against stops and complete the operation manually. Be sure to check actuator directional switch against direction indicated on wrench nut, handwheel or records before applying opening and closing torque.

If a valve is stuck in some intermediate position between open and closed, check first for jamming in the actuator. If nothing is found, the interference is inside the valve. In this case, do not attempt to force the disc open or closed since excessive torque in this position can severely damage internal parts. Contact the Pratt Service Department.

MANUAL ACTUATOR FUNCTION AND USE:
The manually operated butterfly valves are operated by rotating the handwheel, chainwheel, or nut. The actuator is equipped with gearing to convert the many turns into 1/4 turn operation. Inside actuator stops that limit the travel of the valve are pre-set at the factory. Forcing the handwheel, chainwheel, or nut will not cause the valve to shut off any tighter and may cause damage to the gearing.

CYLINDER ACTUATOR FUNCTION AND USE:
The cylinder operated butterfly valves are operated automatically by directing hydraulic pressure to either side of the power cylinder. Solenoid valves are used to direct the fluid to the cylinder ports based on electrical power signals. In cylinder actuators, the travel stops are in the cylinder so that full hydraulic pressure can be held on the cylinder at either end of travel.

MOTOR ACTUATOR FUNCTION AND USE:
The motor actuator is designed to open and close the valve through its one quarter turn of rotation. It contains gearing so that hundreds of turns of the motor or handwheel will slowly move the valve from open to close position or vice versa. Electrical controls are included in the motor actuator for local electrical control.

The output motion of the actuator is limited to about 100 degrees of output rotation by mechanical stops in the gearing. These are factory set and should not need adjustment. The actual positioning of the valve disc will be done by limit switches in the motor actuator. The switches are also set at the factory but adjustment is sometimes required if the motor unit is installed on a separate mounting base or floorstand. Detailed procedures are given in the motor manual if adjustment is needed for the mechanical stops or the limit switches. The wiring and power requirements are given on wiring diagrams included in this instruction manual.

WARNING

Fluids exposed to freezing temperatures may cause valve to fail resulting in injury to persons or damage to valves and other property. Do not use in applications that are exposed to freezing temperatures unless sufficient flow is maintained through the valve to prevent freezing, or other protection is provided.

WARNING

IMPORTANT SAFETY NOTICE

All 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 electrical equipment. The manufacturer cannot be responsible for the misuse of this information or equipment, nor can it assume any resultant liability.

MAINTENANCE

Maintenance of valves by owner is generally limited to actuators and shaft seals. In some instances, valve design permits field adjustment seats when leakage occurs. Unless the owner has skilled personnel and proper equipment, any major rework will require removal of the valve from the line. Depending on condition, valve may require return to the manufacturer.

ANNUAL MAINTENANCE

1. Cycle valve to verify operation and no interference in line.
2. Close valve and check for leakage. If leakage is detected, check actuator stops to verify that disc is fully closed. If leakage persists, remove valve to inspect seat. Contact Pratt’s Field Service Deparment for information regarding adjustment or replacement of seat.
3. Check flange connections for leakage. Tighten bolts accordingly.
4. Check top trunnion area for shaft leakage. If leakage is detected, replace valve packing.
5. If Access to the line is possible, then removal of scale that may interfere with disc travel is suggested. The seat should be inspected for wear and the taper pin nuts should be tight.

NOTE: LUBRICATION IS NOT REQUIRED.

WARNING

Removal of actuator from valve shaft will cause disc to rotate, striking persons or objects in the disc path, causing injury to persons and damage to valve. Block or lock disc before removing actuator.

Typical maintenance would be shaft packing replacement and actuator adjustment. Seal leakage, broken parts and difficult operation should be discussed with Pratt’s Service Department before valve repairs are attempted. Pratt Service Engineers are available to perform or supervise valve repairs in the field.

Stop line flow and isolate from line pressure prior to performing any corrective maintenance.

After completing repair, cycle valve through one complete operating cycle and after line pressure has been restored, inspect for leakage.

TROUBLESHOOTING GUIDE

Problem	Causes	Remedies
Leakage between valve and actuator	•Packing Leak	•First, cycle the valve several times. This should adjust the packing. If this fails, clean packing bore and replace packing.
Bottom trunnion leaks	•Packing or gasket leak	•Replace bottom shaft packing, o-ring or gasket.
Valve leaks when closed	•Disc not fully closed or past fully closed •Disc edge wear or damage •Rubber seat wear or damage	•Adjust actuator closed position stop. •Clean and/or repair disc edge. •Adjust or replace valve seat*
Chainwheel jams	•Poorly fitting chain	•Replace with correct chain.
Valve hard to operate	•Foreign material in valve •Corroded actuator parts •Loose actuator	•Remove obstructions •Clean and grease actuator •Apply Loctite or Omnifit locking compound and tighten bolts.
Automatic valve does not actuate	•No power source •Improper Signal •Burned out or impaired component	•Check incoming power source and replace fuses or reset pressure. •Check actuating signal sequence. •Check and repair or replace solenoids, motors and relay devices.

* Seat replacement should not be performed by untrained/unqualified personnel. In the event that seat replacement is needed, please contact Henry Pratt Field Service.

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

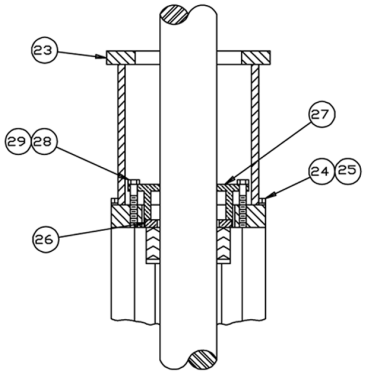
Fax - (630) 844-4160

Please include the following with your inquiry for service:

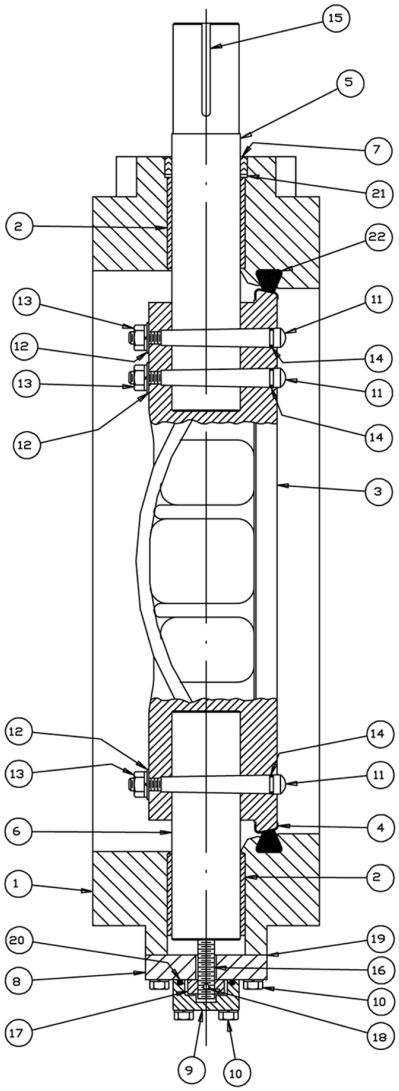
Henry Pratt Order Number:
Henry Pratt Item Number:
Valve Serial Number:
Type of Service Requested

PRATT
Henry Pratt Company

24”-48” HP250II Butterfly Valve



OPTIONAL
REPLACEABLE PACKING BONNET
ASSEMBLY



Cross Section and Parts List

ITEM NO.	DESCRIPTION	MATERIALS
1	BODY	CAST IRON ASTM A-48 CLASS 40
		CAST IRON ASTM A-126 CLASS B
		DUCTILE IRON ASTM A-536 (65-45-12)
2	BEARINGS	TEFLON LINED, FIBERGLASS BACKED
3	DISC	CAST IRON ASTM A-48 CLASS 40
		DUCTILE IRON ASTM A-536 (65-45-12)
4	DISC EDGE	STAINLESS STEEL ASTM A-240 TYPE 316
5	TOP STUB SHAFT	STAINLESS STEEL ASTM A-276 TYPE 304
		STAINLESS STEEL ASTM A-276 TYPE 316
		STAINLESS STEEL ASTM A-564 TYPE 630 COND. H-1150
6	BOTTOM STUB SHAFT	STAINLESS STEEL ASTM A-276 TYPE 304
		STAINLESS STEEL ASTM A-276 TYPE 316
		STAINLESS STEEL ASTM A-564 TYPE 630 COND. H-1150
7	PACKING	RUBBER (BUNA-N)
		RUBBER (EPDM)
1 8	BOTTOM COVER	CAST IRON ASTM A-126 CLASS B
		DUCTILE IRON ASTM A-536 (65-45-12)
1 9	BOTTOM COVER CAP	CAST IRON ASTM A-126 CLASS B
		DUCTILE IRON ASTM A-536 (65-45-12)
10	CAP SCREWS	CARBON STEEL
		STAINLESS STEEL TYPE 304
		STAINLESS STEEL TYPE 316
2 11	TAPER PINS	STAINLESS STEEL ASTM A-564 TYPE 630 COND. H-1150
12	LOCKWASHERS	STAINLESS STEEL TYPE 304
		STAINLESS STEEL TYPE 316
13	HEX NUTS	STAINLESS STEEL TYPE 304
		STAINLESS STEEL TYPE 316
14	O-RINGS	RUBBER BUNA-N
		RUBBER (EPDM)
15	KEY	CARBON STEEL AISI 1045
16	THRUST BEARING STUD	STAINLESS STEEL TYPE 304
		STAINLESS STEEL TYPE 316
		STAINLESS STEEL ASTM A-564 TYPE 630 COND. H-1150
17	THRUST COLLAR	BRONZE ASTM B-505 ALLOY C93200
18	GROOVE PIN	ALLOY STEEL
19	BOTTOM COVER GASKET	NON ASBESTOS MATERIAL ASTM F104
20	O-RING	RUBBER BUNA-N
		RUBBER (EPDM)
21	PACKING RETAINER	NYLON
22	RUBBER SEAT	RESILOSEAL R (BUNA-N)
		RESILOSEAL Z (EPDM)
23	BONNET	CAST IRON ASTM A-48 CLASS 40
24	LOCKWASHERS	CARBON STEEL
25	CAP SCREWS	ALLOY STEEL SAE GR 8
26	PACKING GLAND	BRONZE SAE 660
27	FOLLOWER	BRONZE ASTM B-504 ALLOY C93200
28	CAP SCREWS	CARBON STEEL SAE GR 2
29	LOCKWASHER	CARBON STEEL

PRATT
Henry Pratt Company

HP250 Butterfly Valve (6”-48”)

Operation and Maintenance Manual

Job Name: _____

Contractor: _____

Date: _____

Document #: HP250OM

Revision Date: 4/8/10

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

Table of Contents

Functional Description

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

Manually Operated Valve

Manually operated butterfly 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 disc 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 Valve

Motor operated butterfly valves are powered with gear actuators, which convert multiple motor input turns into 1/4 turn valve operation. The travel of the valve disc 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.

Cylinder Operate Valve

Hydraulically operated butterfly 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

GENERAL

Valves are a significant component of any piping system. Failure due to faulty installation, improper operation or maintenance in such systems could result in damage, down time and costly repairs. In buried underground installations, problems or malfunctions can result in extensive, costly unearthing operations to correct the problem. Many problems with valves can be traced to improper installation, operation, or maintenance procedures.

UNLOADING

Inspect valves on receipt for damage in shipment and conformance with quantity and description in the shipping notice and order. Carefully unload all valves to the ground without dropping using fork trucks or slings under skids. Do not lift valves with slings or chain around operating shaft, actuator, or through waterway. Instead, lift valves with eye bolts or rods through flange holes.

STORAGE

Whenever practical, store valves indoors. If not, protect valves and actuators from weather and accumulation of water, dirt, rocks and debris. When valves fitted with power actuators and controls are stored, energize electric actuator or otherwise protect electrical control equipment to prevent corrosion of electrical contacts due to condensation resulting from temperature variation. Do not expose rubber seats to sunlight or ozone for any extended period. Valves should be stored with the valve disc or closure member slightly open.

INSPECTION PRIOR TO INSTALLATION

Make sure flange faces and joint sealing surfaces, body seats and disc seats are clean. Check bolting attaching actuator to valve for loosening in transit and handling. If loose, tighten firmly. Open and close valve to make sure it operates properly and that stops or limit switches are correctly set so that the valve seats fully. Check that valve rotation direction is correct and close valve before installing.

INSTALLATION

The following items must be performed during installation to ensure proper function.

- Carefully place valves into position avoiding contact or impact with other equipment, vault walls or trench walls.

- Valves are to be installed in accordance with the General Arrangement Drawings furnished for the order.

- Foreign material in a valve can damage the rubber seat when valves are operated. Be sure valve interiors and adjacent piping are clear of foreign material prior to mating valve to pipe joint.

- Prepare pipe ends and install valves in accordance with the pipe manufacturer's instructions for the joint used. Do not deflect pipe/valve joint. Do not use valve and jack to pull pipe into alignment.

- In plant piping, install so as to minimize bending of valve connection with pipe loading.

- Make sure valve disc, when opened, will not contact pipe port. This is especially necessary on pipe with linings. Check manufacturer for minimum pipe I.D. required for clearance.

WARNING

It is recommended that valves be installed into piping system in accordance with AWWA M-11 in order to prevent any undue piping stress, deflection or bending that may affect the performance of the valve.

WARNING

Valve disc without actuator may open or close at any time and cause injury to persons or damage to valve and other property. The shaft/disc clamping device when furnished is intended for temporary use during shipping, handling and valve installation only. Do not subject valve to flow conditions before actuator is mounted and tested for performance and clamping device is removed.

Buried valves installed with valve boxes must be so installed that the valve box does not transmit shock or stress to the valve actuator as a result of shifting soil or traffic load.

When valves are installed in vaults, the vault design must provide space for purposes of repair. The valve operating nut should be accessible from the top opening of the vault with a tee wrench.

TESTING

When rubber seated valves are used to isolate sections of line for test, it is important to realize that these valves are designed or factory adjusted to hold rated pressure only. Test pressure may cause leakage past the rubber seat or damage to the valve.

In order to prevent time lost in searching for leaks, it is recommended that excavations for buried valves not be back-filled until after hydrostatic pressure tests have been made.

Seat leakage can occur due to foreign material in the line. If this occurs, open valve 5 – 10 degrees to get high velocity flushing action. Close and repeat several times to clear seats for tight shutoff.

Seat leakage can occur due to rotational shift in position of the disc with relation to the body seat. Readjust closing stop in accordance with manufacturer's instructions.

RECORDS

Upon completion of installation, valve location, size, make, type, date of installation, number of turns to open, direction of opening and any other information deemed pertinent should be entered on the owner's permanent records.

OPERATION

Do not permit use and operation of any valve at pressure above the rated pressure of the valve.

Do not exceed 300 ft-lb input torque on actuators with wrench nuts, 200 lb. rim pull input torque for handwheels or chainwheels. If portable auxiliary actuators are used, size the actuator or use a torque limiting device to prevent application of torque exceeding 300 ft-lbs. If an oversize actuator with no means of limiting torque is used, stop the actuator before valve is fully opened or closed against stops and complete the operation manually. Be sure to check actuator directional switch against direction indicated on wrench nut, handwheel or records before applying opening and closing torque.

If a valve is stuck in some intermediate position between open and closed, check first for jamming in the actuator. If nothing is found, the interference is inside the valve. In this case, do not attempt to force the disc open or closed since excessive torque in this position can severely damage internal parts. Contact the Pratt Service Department.

MANUAL ACTUATOR FUNCTION AND USE:
The manually operated butterfly valves are operated by rotating the handwheel, chainwheel, or nut. The actuator is equipped with gearing to convert the many turns into 1/4 turn operation. Inside actuator stops that limit the travel of the valve are pre-set at the factory. Forcing the handwheel, chainwheel, or nut will not cause the valve to shut off any tighter and may cause damage to the gearing.

CYLINDER ACTUATOR FUNCTION AND USE:
The cylinder operated butterfly valves are operated automatically by directing hydraulic pressure to either side of the power cylinder. Solenoid valves are used to direct the fluid to the cylinder ports based on electrical power signals. In cylinder actuators, the travel stops are in the cylinder so that full hydraulic pressure can be held on the cylinder at either end of travel.

MOTOR ACTUATOR FUNCTION AND USE:
The motor actuator is designed to open and close the valve through its one quarter turn of rotation. It contains gearing so that hundreds of turns of the motor or handwheel will slowly move the valve from open to close position or vice versa. Electrical controls are included in the motor actuator for local electrical control.

The output motion of the actuator is limited to about 100 degrees of output rotation by mechanical stops in the gearing. These are factory set and should not need adjustment. The actual positioning of the valve disc will be done by limit switches in the motor actuator. The switches are also set at the factory but adjustment is sometimes required if the motor unit is installed on a separate mounting base or floorstand. Detailed procedures are given in the motor manual if adjustment is needed for the mechanical stops or the limit switches. The wiring and power requirements are given on wiring diagrams included in this instruction manual.

WARNING

Fluids exposed to freezing temperatures may cause valve to fail resulting in injury to persons or damage to valves and other property. Do not use in applications that are exposed to freezing temperatures unless sufficient flow is maintained through the valve to prevent freezing, or other protection is provided.

WARNING

IMPORTANT SAFETY NOTICE

All 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 electrical equipment. The manufacturer cannot be responsible for the misuse of this information or equipment, nor can it assume any resultant liability.

MAINTENANCE

Maintenance of valves by owner is generally limited to actuators and shaft seals. In some instances, valve design permits field adjustment seats when leakage occurs. Unless the owner has skilled personnel and proper equipment, any major rework will require removal of the valve from the line. Depending on condition, valve may require return to the manufacturer.

ANNUAL MAINTENANCE

1. Cycle valve to verify operation and no interference in line.
2. Close valve and check for leakage. If leakage is detected, check actuator stops to verify that disc is fully closed. If leakage persists, remove valve to inspect seat. Contact Pratt's Field Service Deparment for information regarding adjustment or replacement of seat.
3. Check flange connections for leakage. Tighten bolts accordingly.
4. Check top trunnion area for shaft leakage. If leakage is detected, replace valve packing.
5. If Access to the line is possible, then removal of scale that may interfere with disc travel is suggested. The seat should be inspected for wear and the taper pin nuts should be tight.

NOTE: LUBRICATION IS NOT REQUIRED.

WARNING

Removal of actuator from valve shaft will cause disc to rotate, striking persons or objects in the disc path, causing injury to persons and damage to valve. Block or lock disc before removing actuator.

Typical maintenance would be shaft packing replacement and actuator adjustment. Seal leakage, broken parts and difficult operation should be discussed with Pratt's Service Department before valve repairs are attempted. Pratt Service Engineers are available to perform or supervise valve repairs in the field.

Stop line flow and isolate from line pressure prior to performing any corrective maintenance.

After completing repair, cycle valve through one complete operating cycle and after line pressure has been restored, inspect for leakage.

TROUBLESHOOTING GUIDE

Problem	Causes	Remedies
Leakage between valve and actuator	•Packing Leak	•First, cycle the valve several times. This should adjust the packing. If this fails, clean packing bore and replace packing.
Bottom trunnion leaks	•Packing or gasket leak	•Replace bottom shaft packing, o-ring or gasket.
Valve leaks when closed	•Disc not fully closed or past fully closed •Disc edge wear or damage •Rubber seat wear or damage	•Adjust actuator closed position stop. •Clean and/or repair disc edge. •Adjust or replace valve seat*
Chainwheel jams	•Poorly fitting chain	•Replace with correct chain.
Valve hard to operate	•Foreign material in valve •Corroded actuator parts •Loose actuator	•Remove obstructions •Clean and grease actuator •Apply Loctite or Omnifit locking compound and tighten bolts.
Automatic valve does not actuate	•No power source •Improper Signal •Burned out or impaired component	•Check incoming power source and replace fuses or reset pressure. •Check actuating signal sequence. •Check and repair or replace solenoids, motors and relay devices.

* Seat replacement should not be performed by untrained/unqualified personnel. In the event that seat replacement is needed, please contact Henry Pratt Field Service.

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) 844-4144

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

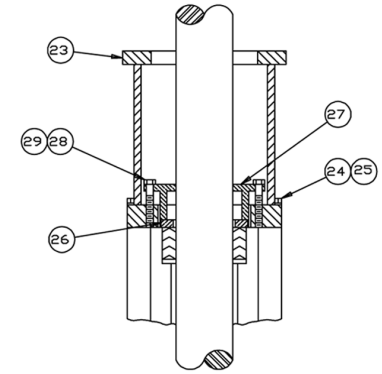
Fax - (630) 844-4160

Please include the following with your inquiry for service:

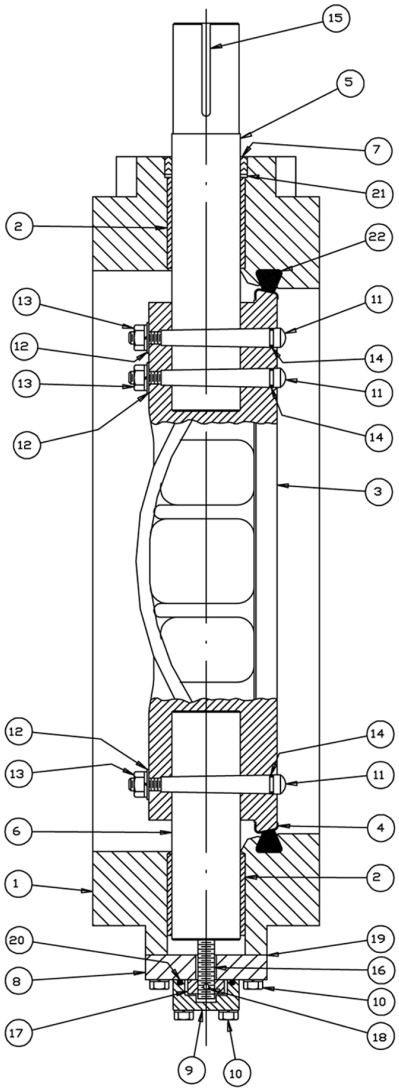
Henry Pratt Order Number:
Henry Pratt Item Number:
Valve Serial Number:
Type of Service Requested

HP250 Butterfly Valve

Henry Pratt Company



OPTIONAL
REPLACEABLE PACKING BONNET
ASSEMBLY



Cross Section and Parts List

ITEM NO.	DESCRIPTION	MATERIALS
1	BODY	CAST IRON ASTM A-48 CLASS 40
		CAST IRON ASTM A-126 CLASS B
		DUCTILE IRON ASTM A-536 (65-45-12)
2	BEARINGS	TEFLON LINED, FIBERGLASS BACKED
3	DISC	CAST IRON ASTM A-48 CLASS 40
		DUCTILE IRON ASTM A-536 (65-45-12)
4	DISC EDGE	STAINLESS STEEL ASTM A-240 TYPE 316
5	TOP STUB SHAFT	STAINLESS STEEL ASTM A-276 TYPE 304
		STAINLESS STEEL ASTM A-276 TYPE 316
		STAINLESS STEEL ASTM A-564 TYPE 630 COND. H-1150
6	BOTTOM STUB SHAFT	STAINLESS STEEL ASTM A-276 TYPE 304
		STAINLESS STEEL ASTM A-276 TYPE 316
		STAINLESS STEEL ASTM A-564 TYPE 630 COND. H-1150
7	PACKING	RUBBER (BUNA-N)
		RUBBER (EPDM)
1 8	BOTTOM COVER	CAST IRON ASTM A-126 CLASS B
		DUCTILE IRON ASTM A-536 (65-45-12)
1 9	BOTTOM COVER CAP	CAST IRON ASTM A-126 CLASS B
		DUCTILE IRON ASTM A-536 (65-45-12)
10	CAP SCREWS	CARBON STEEL
		STAINLESS STEEL TYPE 304
		STAINLESS STEEL TYPE 316
2 11	TAPER PINS	STAINLESS STEEL ASTM A-564 TYPE 630 COND. H-1150
12	LOCKWASHERS	STAINLESS STEEL TYPE 304
		STAINLESS STEEL TYPE 316
13	HEX NUTS	STAINLESS STEEL TYPE 304
		STAINLESS STEEL TYPE 316
14	O-RINGS	RUBBER BUNA-N
		RUBBER (EPDM)
15	KEY	CARBON STEEL AISI 1045
16	THRUST BEARING STUD	STAINLESS STEEL TYPE 304
		STAINLESS STEEL TYPE 316
		STAINLESS STEEL ASTM A-564 TYPE 630 COND. H-1150
17	THRUST COLLAR	BRONZE ASTM B-505 ALLOY C93200
18	GROOVE PIN	ALLOY STEEL
19	BOTTOM COVER GASKET	NON ASBESTOS MATERIAL ASTM F104
20	O-RING	RUBBER BUNA-N
		RUBBER (EPDM)
21	PACKING RETAINER	NYLON
22	RUBBER SEAT	RESILOSEAL R (BUNA-N)
		RESILOSEAL Z (EPDM)
23	BONNET	CAST IRON ASTM A-48 CLASS 40
24	LOCKWASHERS	CARBON STEEL
25	CAP SCREWS	ALLOY STEEL SAE GR 8
26	PACKING GLAND	BRONZE SAE 660
27	FOLLOWER	BRONZE ASTM B-504 ALLOY C93200
28	CAP SCREWS	CARBON STEEL SAE GR 2
29	LOCKWASHER	CARBON STEEL