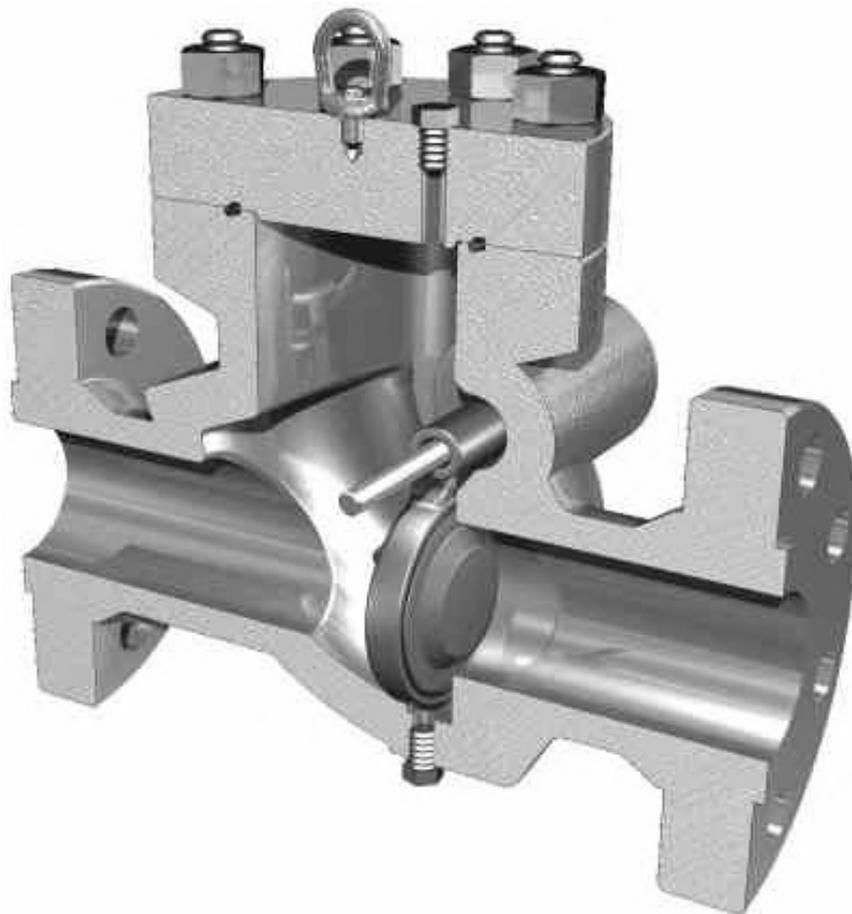


# WHEATLEY® Series 500 Swing Check Valve

## Installation, Operation, and Maintenance Manual



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The procedures included in this book are to be performed in conjunction with the requirements and recommendations outlined in API Specifications. Any repairs to the equipment covered by this book should be done by an authorized Cameron service representative. Cameron will not be responsible for loss or expense resulting from any failure of equipment or any damage to any property or death or injury to any person resulting in whole or in part from repairs performed by other than authorized Cameron personnel. Such unauthorized repairs shall also serve to terminate any contractual or other warranty, if any, on the equipment and may also result in equipment no longer meeting applicable requirements.

File copies of this manual are maintained. Revisions and/or additions will be made as deemed necessary by Cameron. The drawings in this book are not drawn to scale, but the dimensions shown are accurate.

**BILL OF MATERIALS**

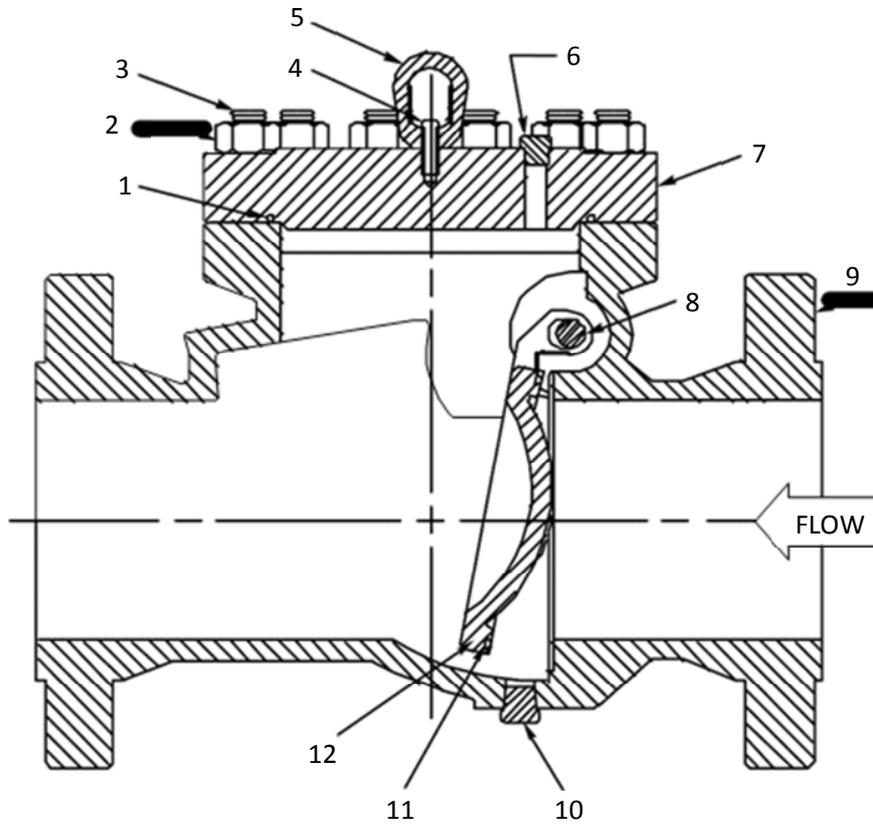


Figure 1 - Integral Seat Swing Check

Table 1 - Integral Seat Swing Check Parts List

Item	Description
1	Bonnet O-Ring
2	Nut
3	Stud
4	Stud
5	Eyebolt
6	Cover Plug
7	Bonnet
8	Pin
9	Body
10	Drain
11	Clapper O-Ring
12	Clapper

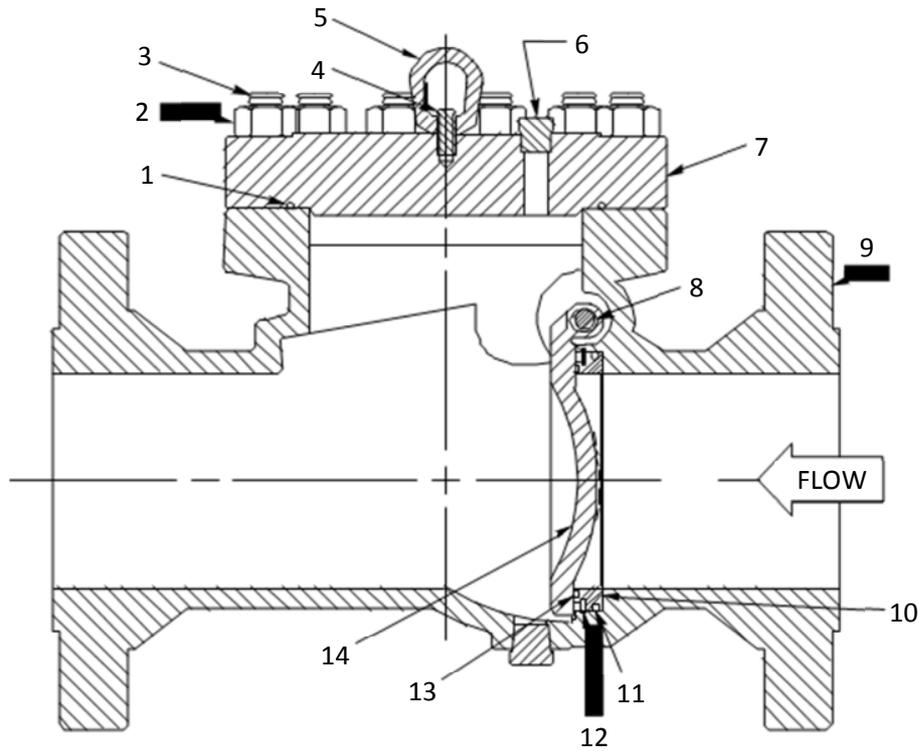


Figure 2 - Removable Seat Swing Check

Table 2 - Removable Seat Swing Check Parts List

Item	Description
1	Bonnet O-Ring
2	Nut
3	Stud
4	Stud
5	Eyebolt
6	Cover Plug
7	Bonnet
8	Pin
9	Body
10	Removable Seat
11	Seat O-Ring
12	Retaining Ring
13	Seat Face O-Ring
14	Clapper

## SCOPE

The flanged swing check valve (*Figure 1* & *Figure 2*) features a hinged stainless steel clapper with an O-ring seal. The design allows the clapper to swing freely from the fully closed position to the fully opened position and back. Two NPT plugs secure the hinge pin in a hole drilled through the body. The bonnet is bolted to the body and sealed with an O-ring. The bonnet includes a cover plug (NPT threads). The swing check valve is a full bore type that will pass a sphere with a nominal size not less than that specified in Table 1 of API 6D. An optional removable seat (*Figure 2*) is secured in the valve bore with a retaining ring.

Due to the critical nature of pressurized piping systems it is recommended that the compatibility to the service of the metallic and non-metallic components be confirmed prior to installation. This valve is not recommended for slurry service.

## INSTALLATION AND OPERATION INSTRUCTIONS

### BEFORE INSTALLATION SAFETY INSTRUCTIONS



#### READ CAREFULLY BEFORE INSTALLING OR OPERATING THE VALVE

Hazards are inherent with the construction, operation and maintenance of high pressure piping systems. The following information and precautions are provided to minimize these hazards:

1. The valve's nameplate indicates maximum operating pressure, as well as minimum and maximum operating temperatures. The valve may be safely operated within these limits.
2. The valve's end connections are provided in accordance with ASME flanged end requirements.
3. These check valves have been certified as fire tested to API 6FD requirements (except 1" (25mm) size). The user is responsible for the application of other devices to limit damages due to external fire, if required by local safety regulations.
4. The valve has been factory pressure tested based on the nameplate maximum operating pressure.
5. Valves 4" FP 900 ASME and larger may be provided with integral lifting lugs, otherwise the valves may be lifted using slings. Fittings and other devices, which may be attached to the valve, are not intended to be used as lifting points. Always follow local safety regulations when lifting heavy valves.
6. WHEATLEY valves are designed, manufactured, and tested under a certified quality system. Only quality parts and materials are used in the assembly of WHEATLEY valves. Pressure containing components are suitable for the minimum temperature marked on the nameplate. Factory certification is available.

7. If the valve, in service, is exposed to hazards such as traffic, wind or earthquake loading, contact the factory, if it is necessary, to confirm that the valve design is suitable for the application. The factory requires a complete description of the hazard before making any recommendations.
8. If the valve, in service, is exposed to hazards such as excessive piping system reaction forces and moments, contact the factory, if it is necessary, to confirm that the valve design is suitable for the application. The factory requires a complete description of the hazard before making any recommendations.
9. If the valve, in service, is exposed to hazards such as corrosive or abrasive fluids or atmospheric conditions, contact the factory, if it is necessary, to confirm that the valve design is suitable for the application. The factory requires a complete description of the hazard before making any recommendations.
10. The valve has been designed and manufactured so that under normal operation conditions hazards such as material fatigue, brittle fracture, creep rupture or buckling will not occur. Do not operate the valve beyond the pressures and temperatures marked on the nameplate. The factory requires a complete description of the hazard before making any recommendations.
11. The user is responsible for minimizing other hazards associated with the construction, operation, and maintenance of high pressure piping systems, such as:
  - a. Provisions for the release or blow off of pressure
  - b. Prevention of physical access to system under pressure
  - c. Prevention of physical access to surfaces at extreme temperature
  - d. Provisions for inspection
  - e. Provisions for draining and venting
  - f. Provisions for filling
  - g. Provision for equipment access
  - h. Prevention of over-pressurization, over-heating and over-filling
  - i. Provision for fault indication
12. The user is responsible for meeting applicable local safety regulations.

NOTE: If system hydrostatic tests are to be performed at pressures exceeding the rated working pressure of the valve, the valve should be pressurized from the upstream side. This prevents the clapper from experiencing these pressures while the body cavity can accept up to 150% rated working pressure. Care must be taken not to damage the seal faces and that they are clean for assembly. The end-user must provide gaskets and mating flanges of equal ratings to that of the valve for proper installation. When bolting the flanges together, threads of bolts should be lubricated to obtain the maximum loading on the bolts. The bolts should be tightened using a crisscross pattern for even loading. When ring type joints are supplied, the ring number is marked on the rim of the RTJ flange. After pressure tests, with all test pressure relieved, the body cavity should be completely drained via the attached piping system to prevent corrosion. The valve may then be placed in the required operating position.

## HORIZONTAL INSTALLATION

When installing the swing check valve in the horizontal position, install the valve with the arrow mark on the body pointing in the direction of flow and the bonnet side up.

Flow through the valve (in the direction of the arrow mark) forces the clapper to lift fully. The clapper seals the valve when the flow is reversed. Gravity causes the clapper to swing closed when no flow is present.

## VERTICAL INSTALLATION

When installing the swing check valve in vertical piping, only install the valve with the arrow mark on the body pointing in the upward direction. Flow upward through the valve will cause the clapper to swing open. This valve cannot be used with vertical downward flow.

If there is no flow through the piping, gravity will keep the clapper in the closed position. Flow through the piping in the upward direction will cause the clapper to swing open. When the flow is reversed, the flow and the weight of the clapper will automatically close the valve.

## MAINTENANCE PROCEDURES



**CAUTION:** Safety practices for pressurized equipment must be followed and address hazards inherent in pressurized systems. Extreme caution and safety procedures are to be exercised whenever valves, or fittings on a valve, are serviced or maintained.

The frequency of the maintenance depends on the service conditions. Please contact the factory regarding the maintenance schedule for particular service conditions.

## DISASSEMBLY

No special tools are required to disassemble the valve. **With all pressure removed from the associated piping system**, the valves can be serviced in-line or offline.

During in-line maintenance, the swing check valve should be isolated from and relieved of all pressure on both the upstream and downstream sides. **Exercise extreme caution** when removing the cover plug on the bonnet, as this will release any pressure in the valve. Drain the valve fully via the drain plug on sizes 4" and above, or via piping system otherwise. Remove the bonnet by loosening and removing the nuts. Removing the NPT plugs on both sides of the body allows for removal of the hinge pin from the body. Once the pin is removed, the clapper can be removed from inside the body.

If replacement of the optional removable seat is required, it is recommended that the valve be removed from the pipeline. The retaining ring can be snapped out from the groove with a flat head screwdriver before removing the seat from the seat pocket. Be careful not to damage the seat's sealing face and O-ring groove when removing the retaining ring.

For offline maintenance, the valve shall be removed from the pipeline.

Inspect the clapper, seat and O-ring seal for wear or possible damage. During the maintenance, replace the clapper O-ring (integral seat style) and seat O-rings (removable seat style) with new O-rings. Check the retaining ring (removable seat style) for any damage and change if necessary.

Thoroughly clean the clapper/seat sealing surfaces. Inspect both the clapper and body/seat sealing surfaces for possible scoring marks or damage. The seating surfaces must be smooth. Inspect the bonnet O-ring seal for damage. Replace the O-ring if it is damaged. Generally the bonnet O-ring will last longer than the clapper O-ring.

## REASSEMBLY

For the removable seat model, make sure the 2 O-rings are installed in the 2 grooves on the seat. Insert the seat into the bore with sealing surface facing the clapper as shown in *Figure 2* and lock this seat ring into position with the retaining ring snapped fully into the groove.

For all models, insert clapper with the machined sealing surface facing the inlet port. With the clapper arm positioned into the cavity provided in the body, insert the hinge pin through the clapper and body pin holes. Ensure that the clapper swings freely inside the body. Install and tighten the pin plugs on either side of the body.

The bonnet is installed on the body and secured to the body by installing and tightening the nuts to the recommended assembly torques in Table 3 below. Finally, tighten the cover plug on the bonnet and drain plug to the body (the drain plug is optional on the 1", 2" & 3" valve). The valve should be tested, as required, to the appropriate specifications.

Table 3 - Cover Bolting Torque Values

Stud Diameter. (in)	Threads Per Inch (TPI)	Torque (ft-lbf)
0.375	16	16 - 18
0.500	13	37 - 42
0.625	11	72 - 81
0.750	10	126 - 142
0.875	9	200 - 225
1.000	8	297 - 334
1.125	8	429 - 483
1.250	8	595 - 669
1.375	8	798 - 898
1.500	8	1043 - 1174
1.625	8	1334 - 1500
1.750	8	1673 - 1882
1.875	8	2066 - 2324
2.000	8	2515 - 2829
2.250	8	3600 - 4050
2.500	8	4958 - 5578

Based on the quantity of valves purchased, the following spare parts are recommended for valve maintenance purposes. Valve serial numbers must be specified when ordering spare parts/kits to ensure supply of correct parts.

Table 4 - Recommended Number of Spare Parts

Qty. of Valves	Qty. of Minor Kits	Qty. of Major Kits	Qty. of Comprehensive Kits
10	1	-	-
25	1	-	-
50	2	1	-
100	3	1	1

Table 5 - Repair Kit Contents

Part Name	Integral Seat		Removable Seat	
	Minor	Major	Minor	Major
Bonnet O-Ring	Yes	Yes	Yes	Yes
Clapper O-Ring	Yes	Yes	Yes	Yes
Seat O-Rings (Face & Piston)	N/A	N/A	Yes	Yes
Retaining Ring	N/A	N/A	Yes	Yes
Clapper Pin	No	Yes	No	Yes
Clapper	No	Yes	No	Yes
Seat	N/A	N/A	No	Yes

## CONTACT INFORMATION

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