

# Val-Matic® Extended Bonnet Assembly Instructions

## Operation, Maintenance and Installation Manual

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# VAL-MATIC EXTENDED BONNET ASSEMBLY INSTRUCTIONS

## DESCRIPTION OF ASSEMBLY

An extended bonnet assembly is bolted to the top of the valve and used to distance the actuator and the valve in cases where the valve is buried, submerged or below floor level. The extended bonnet assembly features a large diameter outer bonnet tube to support the actuator and restrain it from turning. Inside the outer bonnet tube is a one-piece inner tube which turns 90 degrees to operate the valve open and closed.

In this manual, (PV) refers to statements that apply only to plug valves. (BFV/BV) refers to butterfly and ball valves. (ALL) is meant to clarify points that refer to all valve types.

The closed position of the plug/disc/ball is determined by the stop bolts in the outer bonnet (Figure 1). Shorter bonnets may not be provided with stop bolts. In this case, the gear stop bolts control the closed position.



FIGURE 1. TYPICAL STOP BOLT

The standard outer bonnet tube is constructed of carbon steel pipe and steel flange connections. The standard inner bonnet is constructed of carbon steel pipe and upper and lower fabricated couplings. The details of construction are illustrated in Figure 2.

Table 1. Standard Parts List		
Item	Description	Material
1	Inner Tube	Carbon Steel
2	Outer Tube	Carbon Steel
3	Retaining Screw	Plated Steel
4	Key	Carbon Steel
5	Packing Retainer Plate (BFV/BV)	Carbon Steel
6	Stop Bolt	Plated Steel
7	Stop Nut	Plated Steel
8	Friction Bearing (BFV/BV)	PTFE
9	Mounting Hardware	Plated Steel

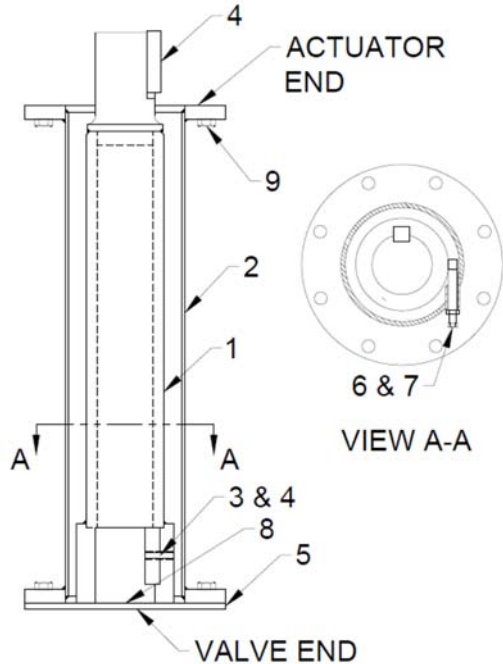


FIGURE 2. STANDARD BONNET CONSTRUCTION

## INSTALLATION INSTRUCTIONS

1. Put the actuator and valve in the same position. The keyways must be aligned. Typically valves are shipped at about 10 degrees open (Figure 3). If present, remove the key (4) and gear from the valve. (BFV/BV) Keep the packing retainer plate (5) in place. This is needed to secure the shaft seal and prevent leaking. (ALL) For torque tubes that do not have an outer bonnet (2), it may be provided with a special packing retainer plate (5) with welded end stops that can take the place of the standard packing retainer plate.



**FIGURE 3. VALVE PARTIALLY OPEN**

2. The inner shaft of the bonnet (1) has a top coupling, which engages with the gear and a bottom coupling, which engages with the valve. Secure the tapped square key (4) to the bottom coupling with the screw provided (3). (BFV/BV) Place the PTFE friction bearing (8) over the shaft on the packing retainer plate. (ALL) Slide the inner tube (1) over the valve shaft taking care to engage the square key bolted to the pipe coupling (4) (Figure 4). The bottom coupling is machined to a tight tolerance on the valve shaft, so it is important to support the weight of the inner bonnet and keep it straight when placing it on the shaft. Bonnets in excess of 10 feet may have multiple sections with similar keyed couplings.##

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### **WARNING**

Assemble inner shaft first. Assemble outer bonnet body second. Failure to do so could cause injury or even death.



**FIGURE 4. INSTALLING INNER SHAFT**

3. Install the outer pipe over the inner tube (Figure 5). If pin holes are provided, insert the spring pins into the connecting flanges. The bonnet assembly may have end stops near the valve end to control the closed and open position. If this is the case, unthread or remove the stop bolts prior to assembly to prevent interference. Orient the outer bonnet so that when the inner bonnet rotates 90 degrees, the welded block near the bottom coupling will interact with the outer bonnet stop bolts (Figure 6). Fasten it to the valve body with the screws and nuts provided.



**FIGURE 5. INSTALLING OUTER SHAFT**

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**FIGURE 6. STOP BOLTS**



**FIGURE 8. ALIGNING KEYWAYS**

4. Install the gear on the top of the outer bonnet (Figure 7). It is necessary to engage the inner bonnet with the spline of the gear. If necessary, rotate the handwheel until the keyways in the actuator and the inner bonnet coupling are aligned (Figure 8). Depending on the gear supplier, the square key is installed after the gear (4) is attached by removing the indicator cover. Otherwise, the key must be installed from the bottom with the square key placed in the inner bonnet top coupling. Some gears arrangements also require a mounting plate in order to install on the bonnet. First, secure the mounting plate to the gear with the socket head cap screws, and then mount the sub-assembly to the outer bonnet with the hardware provided (9). If pin holes are provided, insert the spring pins into the connecting flanges.



**FIGURE 7. ATTACHING GEAR**

5. Tighten bolts per the table below.

<b>TABLE 2. MOUNTING BOLT TORQUE</b>	
<b>Bolt Size</b>	<b>Torque (ft-lb)</b>
3/8"-16	19-31
7/16"-14	30-50
1/2"-13	45-75
5/8"-11	100-150
3/4"-10	150-250
7/8"-9	200-350
1"-8	300-500
1 1/8"-7	450-700
1 1/4"-7	650-1000
1 1/2"-6	900-1400

6. Rotate the actuator to the closed position with the handwheel. The block(s) near the inner bonnet bottom coupling (1) should strike the stop bolt (6) on the outer (2), ensuring tight closure. If needed, adjust the stop bolt (6) in the side of the outer bonnet tube (2) (Figure 1). (BFV/BV) Level the disc/ball with a machinist's square, or measure down from the valve flange to the top of the stainless steel seat segments at opposite sides of the disc to verify. (PV) close valve until tight. The indicator should point to the closed position or up to 5 degrees past closed. Input torque should not exceed 150 ft-lbs.
7. Whenever possible, the valve, bonnet, and actuator were fully tested and adjusted in the factory before disassembly. Once power is provided to the actuator, it should properly open and close the valve to the correct positions. If the gear stop bolts need adjustment, the closed stop is typically backed off about 2-3 degrees of valve travel to account for torsional deflection in bonnet.

## TROUBLESHOOT

Several problems and solutions are presented below to assist you in troubleshooting the bonnet assembly in an efficient manner.

- Leakage at valve shaft: Tighten bonnet mounting bolts to secure packing (BFV/BV)
- Outer shaft won't fit over inner shaft: Check interference between stops, stop bolts, and welds. Grind down excessive welds if needed.
- Valve won't close: Adjust stop bolts. Make sure to account for torsional deflection and motor wind-down when setting motor limits.

## PARTS AND SERVICE

Parts and service are available from your local representative or the factory. Make note of the valve Size, Model No., and Serial No. located on the valve nameplate and contact:

Val-Matic Valve and Mfg. Corp.  
905 Riverside Drive  
Elmhurst, IL 60126  
Phone: (630) 941-7600  
Fax: (630) 941-8042  
[www.valmatic.com](http://www.valmatic.com)

A sales representative will quote prices for parts or arrange for service as needed.

### LIMITED WARRANTY

All products are warranted to be free of defects in material and workmanship for a period of one year from the date of shipment, subject to the limitations below.

If the purchaser believes a product is defective, the purchaser shall: (a) Notify the manufacturer, state the alleged defect and request permission to return the product; (b) if permission is given, return the product with transportation prepaid. If the product is accepted for return and found to be defective, the manufacturer will, at his discretion, either repair or replace the product, f.o.b. factory, within 60 days of receipt, or refund the purchase price. Other than to repair, replace or refund as described above, purchaser agrees that manufacturer shall not be liable for any loss, costs, expenses or damages of any kind arising out of the product, its use, installation or replacement, labeling, instructions, information or technical data of any kind, description of product use, sample or model, warnings or lack of any of the foregoing. NO OTHER WARRANTIES, WRITTEN OR ORAL, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY, ARE MADE OR AUTHORIZED. NO AFFIRMATION OF FACT, PROMISE, DESCRIPTION OF PRODUCT OF USE OR SAMPLE OR MODEL SHALL CREATE ANY WARRANTY FROM MANUFACTURER, UNLESS SIGNED BY THE PRESIDENT OF THE MANUFACTURER. These products are not manufactured, sold or intended for personal, family or household purposes.#



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