

Fisher™ Large EH Design Supplement 24X20 Class 1500 Design EHT-2 Control Valve

This supplement provides information for serial numbers ME00124272 and ME00124273

Overview

This special instruction manual is a supplement to the Fisher EHD and EHT Sliding-Stem Control Valves (Large EH) Instruction Manual ([D100392X012](#)). Observe all warnings, cautions, and notes provided in the Large EH instruction manual. Contact your [Emerson sales office](#) or Local Business Partner for more information.

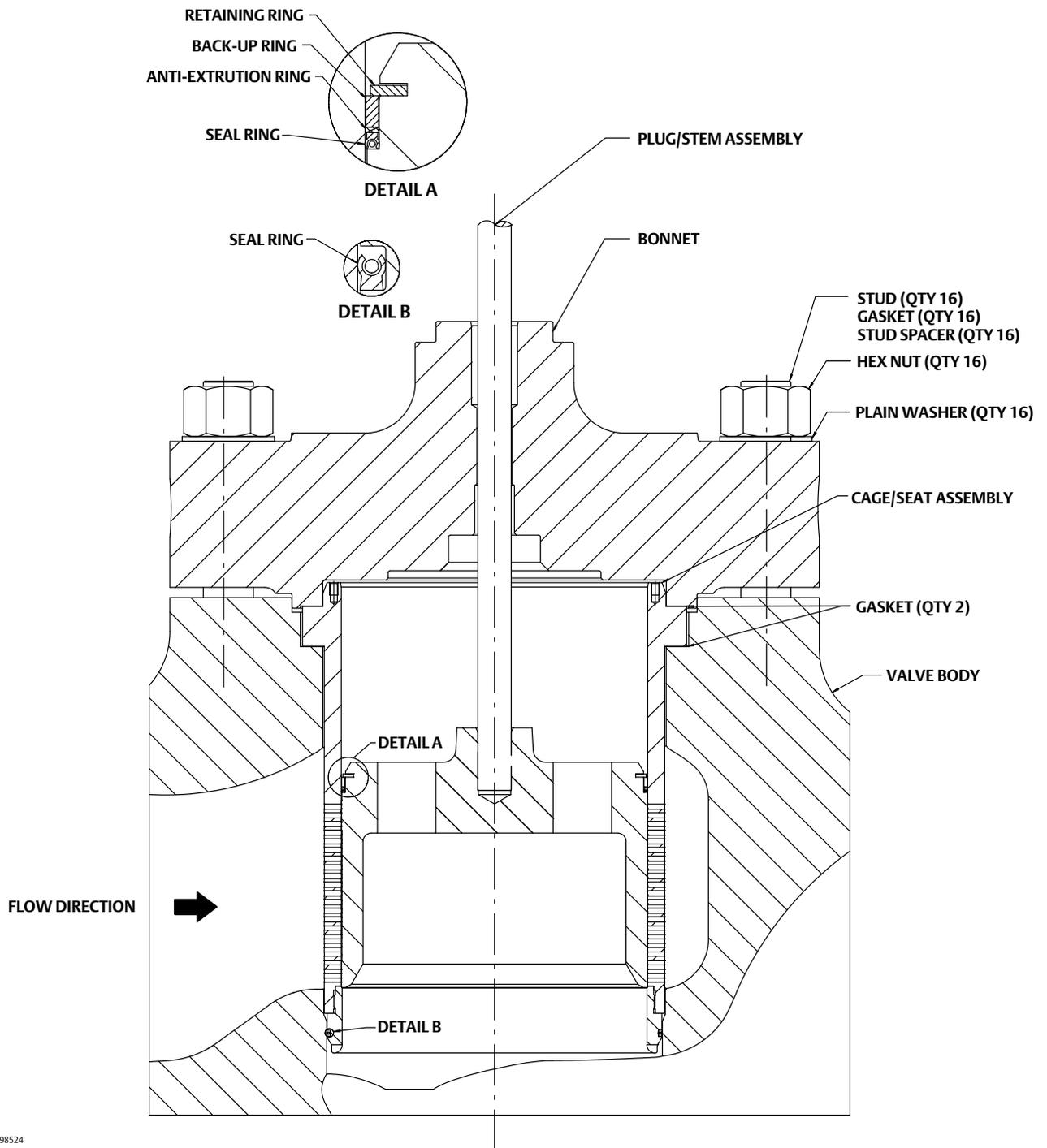
Scope

This special instruction sheet provides maintenance information for NPS 24X20 Class 1500 Design EHT-2 control valves. This information covers valve serial numbers ME00124272 and ME00124273. For other procedures, refer to the Fisher EHD and EHT Sliding-Stem Control Valve (Large EH) Instruction Manual (D100392X012).

Table 1. Fisher Large EH Specifications

Specifications	
Design Pressure	242 Barg (3510 Psig)
Design Temperature	88°C (190°F)
End Connections	NPS 24 CL1500 RTJ Flange
Shutoff Classification	ANSI Class IV
Flow Characteristic	Linear -- See figure 3
Flow Direction	Flow Down
Port Diameter	18 1/4 in
Valve Plug Travel	10 7/8 in
Valve Yoke Boss	7 in
Maximum Flowing Pressure Drop	103 bar (1500 psi)
Maximum Shutoff Pressure Drop	258 bar (3750 psi)
Estimated Weight of Valve and Actuator Assembly	11500 kgf (25,500 lbf)

Figure 1. Assembly Drawing

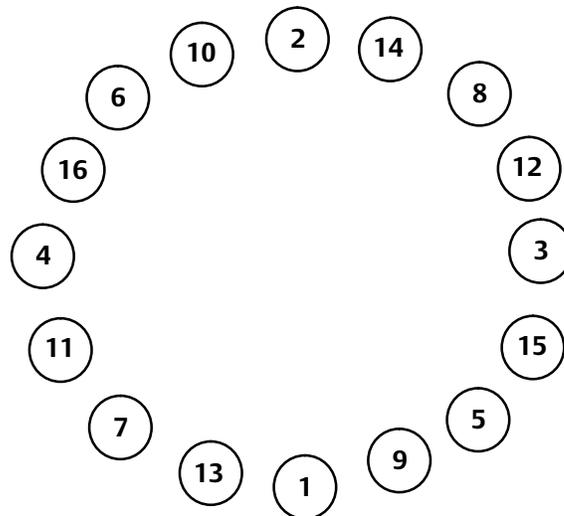


Trim Removal

Observe all warnings, cautions, and notes provided in the Large EH Instruction Manual ([D100392X012](#)). See figure 1 for assembly drawing.

1. Before removing actuator and disassembling valve, isolate the valve from all pressure and relieve trapped pressure from body and actuator.
2. Follow the instructions in D100392X012 to remove actuator and packing.
3. Loosen the bonnet bolting hex nuts one-fifth of one nut flat (1/30 of one revolution) to achieve initial breakout of the nuts while transferring minimal additional loading to the adjacent nuts.
4. When the hex nuts have been loosened one-fifth nut flat, use the bolt loosening sequence (figure 2) and turn the hex nuts an additional one-half nut flat.
5. Repeat the bolt loosening sequence, turning the hex nuts one-half nut flat each sequence until the hex nuts have turned a total of two nut flats (after initial breakout). Then loosen the body-to-bonnet joint gasketed joint by either rocking the bonnet or prying between the bonnet and body. Work the prying tool around the bonnet until the bonnet loosens. If no fluid leaks from the joint, repeat the bolt loosening sequence to completely remove the hex nuts.

Figure 2. Bolting Pattern



6. Thread eyebolts, or hoist rings, into the two holes (1-1/4 in X 7 UNB, 2-1/4 in deep) on the top of the bonnet. Attach rigging equipment capable of lifting 3600 lb to the eyebolts or hoist rings.
7. Carefully lift the bonnet off the body. If the plug/stem assembly starts to lift with the bonnet, use a brass or lead hammer on the end of the valve stem to move it back down. Set the bonnet on a protective surface to prevent damage to the cage gasket surface.
8. Carefully lift the valve plug/stem assembly out of the body, taking care not to damage the seal ring on the plug. Protect the valve plug stem and the valve seating surfaces to prevent damage.
9. Remove and discard the upper cage gasket.

10. Install two ½"-13 UNC-2A eye bolts or hoist rings with a minimum threaded length of ¾ inch into the tapped holes in the top of the cage and carefully lift it out of the valve body. Attach rigging equipment capable of lifting 800 lb to the eyebolts. The seat ring will be removed with the cage as an assembly due to the seat ring being screwed into the bottom of the cage and secured with tack welds. If the cage is stuck in the valve, use a rubber mallet to strike the exposed portion of the cage at several points around its circumference. Set the parts on a protective surface to prevent damage to gasket or seating surface.
11. Remove and discard the lower cage gasket.
12. Using the below procedure, disassemble the seat ring from the cage:
 - a. Carefully pry or cut out the seat ring seal ring from its groove in the seat ring. Discard the old seat ring seal ring.
 - b. Grind or file off the tack welds that prevent the seat ring from unscrewing from the cage.
 - c. There are 9/16 inch slots cut in the seat ring. Insert a bar through the slots and turn seat ring counter-clockwise to unscrew it from the cage.
 - d. Set the seat ring on a protective surface taking care not to damage the seat ring seal ring surface.
13. Inspect all parts for wear and damage that would prevent proper operation of the valve. All gasket surfaces on the trim parts and in the body must be cleaned of any residue and must be free from nicks and scratches. The seating surfaces of the valve plug and seat ring need to be free from nicks, scratches, or any other damage for proper shut off. Replace or repair trim parts as appropriate.

Valve Plug Maintenance

For information concerning the proper repair and maintenance of the valve plug/stem assembly please reference the section of EHD and EHT valve plug maintenance in the Large EH Instruction Manual ([D100392X012](#)).

Trim Replacement

After all trim maintenance has been completed; reassemble the valve by following the numbered steps below. Be certain that all gasket surfaces have been cleaned well.

1. All gaskets must be new to ensure proper valve operation. This valve assembly requires two flat sheet gaskets. Observe all warnings and cautions in the Large EH Instruction Manual (D100392X012).

CAUTION

This valve uses special fluorocarbon-coated bolting. The fluorocarbon coating on the bolting must be inspected for damage each time the body-to-bonnet bolting is loosened. If the fluorocarbon coating is damaged, it is recommended that the bolting be replaced or contact Emerson for the appropriate bolt torque value. Reassembling the body-to-bonnet bolting with damaged fluorocarbon-coating will require higher assembly torque to prevent leakage and to ensure proper valve operation.

2. Orient the cage and seat ring so the threads on each are facing one another for assembly. The bottom of the cage should be facing the top of the seat ring.
3. Using a bar inserted through the slots on the seat ring, turn the seat ring clockwise into the cage until tight.
4. Tack weld the seat ring to the cage using minimal heat. Two welds, ¼ inch long and 180 degrees apart are required.

CAUTION

To avoid damage to the seal ring, slowly and gently stretch it for the following procedure. Avoid pulling sharply on the ring.

5. Install the replacement seat ring seal with the open side facing up (toward the top of the seat ring). The open side of the seal ring should face down (toward the bottom of the valve body) in flow-up installations and up in flow down installations.

To install the seal ring on the seat ring, first lubricate with a general-purpose silicone-base lubricant. Then gently stretch the seal and work it over the bottom edge of the seat ring. The PTFE material in the seat ring must be permitted time to cold-flow during the stretching procedure, so avoid pulling sharply on the ring. Stretching the seal ring over the seat ring may make it seem unduly loose when in the groove, but it will contract to its original size after insertion in the valve body.

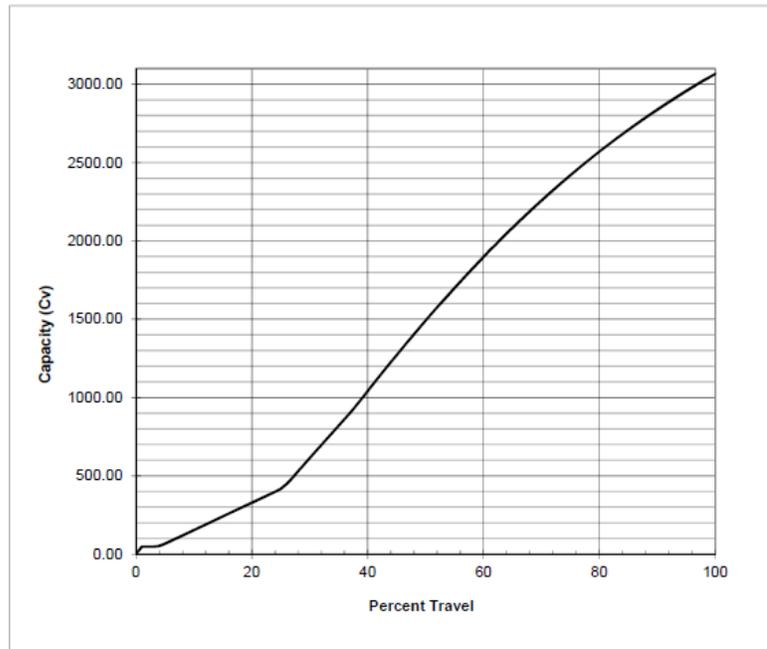
6. Install a new lower cage gasket into the valve body.
7. Make sure the eye bolts that were installed in the cage assembly during the disassembly procedure are still installed. Then using the eye bolts as lifting points, carefully lower the cage/seat ring assembly into the valve. Using care to avoid damaging the seat ring seal ring and cage seating surfaces while handling the heavy parts. To help insert the cage/seat ring assembly into the valve, lubricate the outside diameter of the seat ring seal ring with a general-purpose silicone-based lubricant.
8. Carefully lower the valve plug/stem assembly into the cage, being careful not to damage any surfaces of the cage, seat ring or plug. Make sure the seal ring is evenly engaged in the entrance chamfer at the top of the cage assembly to avoid damage to the ring.
9. Install a new upper cage gasket on top of the cage flange assembly.
10. Mount the bonnet on the valve body.
11. Divide the body-to-bonnet torque value into smaller, equal increments of torque. As the final torque is 6915 N•m (5100 ft•lb), divide into smaller equal increments of 1152 N•m (850 ft•lb) of torque. Then follow the torquing sequence (figure 2) and torque the hex nuts to the first increment of torque. When all the hex nuts are at this first torque value, follow the bolting torque sequence and torque the hex nuts to the second increment of torque. Repeat until the hex nuts are all tightened to the specific final torque value of 6915 N•m (5100 ft•lb). If any of the hex nut turns at the final torque, tighten all hex nuts to the final torque again.
12. Install the packing and actuator per the instructions in the manual ([D100392X012](#)), observe all warnings, cautions and notes.

Figure 3. Capacity Curve

VALVE CAPACITY INFORMATION
NPS 24X20 EHT-2 CL1500
LINEAR

PORT DIAMETER = 18.25 INCHES TRAVEL = 10.875 INCHES
MAXIMUM CV = 3067 MINIMUM CV = 80

% TRAVEL	10	20	30	40	50	60	70	80	90	100
CV	154	329	613	1041	1491	1898	2258	2570	2838	3067



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Emerson Automation Solutions
Marshalltown, Iowa 50158 USA
Sorocaba, 18087 Brazil
Cernay, 68700 France
Dubai, United Arab Emirates
Singapore 128461 Singapore

www.Fisher.com

