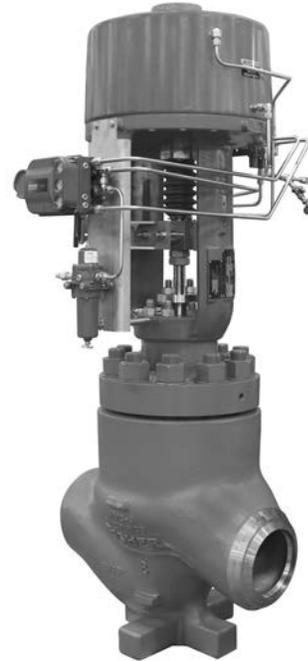


Fisher™ HP Control Valve Startup Trim for NPS 8 and Larger

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Figure 1. Fisher HP Control Valve with 585C Actuator and FIELDVUE™ DVC6200 Digital Valve Controller



Introduction

Scope of Manual

This instruction manual includes installation, maintenance, and parts information for the Fisher HP Control Valve Startup Trim for NPS 8 and larger.

Do not install, operate, or maintain HP valves without being fully trained and qualified in valve, actuator, and accessory installation, operation, and maintenance. To avoid personal injury or property damage, it is important to carefully read, understand, and follow all the contents of this manual, including all safety cautions and warnings. If you have any questions about these instructions, contact your [Emerson sales office](#) before proceeding.

Description

The Fisher HP Startup Trim kits are available for NPS 8 and larger sizes and include options for hydro testing, flushing, and chemical cleaning of the system. The hydro kit is intended to be used so that the upstream piping can be tested at the required pressure for body and inlet piping pressure class without over pressurizing any attached lower pressure class piping or equipment downstream. The flushing kit allows for pipes to be cleaned upstream and downstream of the valve by allowing dirt, scale, or debris to pass through the valve without causing damage to the valve trim used in normal operation. The chemical cleaning kit is used when cleaning the pipeline with a low velocity, chemical flush of the pipeline.

Educational Services

For information on available courses for Fisher HP and HPA valves, as well as a variety of other products, contact:

Emerson Automation Solutions
Educational Services - Registration
Phone: 1-641-754-3771 or 1-800-338-8158
E-mail: education@emerson.com
emerson.com/fishervalvetraining

Valve Installation

Observe all installation warnings, cautions and notes provided in the Fisher HP and HPA Control Valve Instruction Manual ([D101634X012](#)). Follow the instructions provided in the Fisher HP and HPA Control Valve Instruction Manual for valve assembly installation

Maintenance

⚠ WARNING

Avoid personal injury or property damage from sudden release of pressure or uncontrolled process fluid. Before performing any maintenance operations:

- Do not remove the actuator from the valve while the valve is still pressurized.
- Always wear protective gloves, clothing, and eyewear when performing any maintenance operations.
- Disconnect any operating lines providing air pressure, electric power, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.
- Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure on both sides of the valve. Drain the process media from both sides of the valve.
- Vent the power actuator loading pressure and relieve any spring precompression.
- Use lock-out procedures to be sure the above measures stay in effect while you work on the equipment.
- The valve packing box may contain process fluids that are pressurized, even when the valve has been removed from the pipeline. Process fluids may spray out when removing the packing hardware or packing rings, or when loosening the packing box pipe plug.
- Check with your process or safety engineer for any additional measures that must be taken to protect against process media.

Trim Removal

Observe all maintenance warnings, cautions and notes in the Fisher HP and HPA Control Valve Instruction Manual ([D101634X012](#)). Follow the Trim Removal instructions provided in the Fisher HP and HPA Control Valve Instruction Manual. See figure 5 for the HP assembly drawing

Installation of Startup Trim Kits

Inspect the valve to ensure all parts and gaskets have been removed and the valve body is free from foreign debris. Inspect all parts for defects and cleanliness; remove any burrs on metal valve components. Visually inspect the interior of the valve for abnormal wear, signs of erosion, or scoring if the valve has been in service. Inspect the gasket surfaces of the valve body, bonnet, and trim to verify they are not damaged and are free of imbedded gasket material.

Installation of Flushing and Hydro Trim Kits

1. Install the seat ring flat sheet gasket (key 12) in the lower gasket groove in the valve body (key 1), making sure the gasket is centered in the groove and the bottom of the gasket is flush with the mating surface in the body. See figure 4.
2. For Flushing Trim: Install eyebolt (3/8-16 UNC-2B) in to the hole on the top of the cage (key 2), as shown in figure 2. Then proceed with step 3, lifting the cage using the eyebolt.

For Hydro Trim: Install threaded rods (1/4-20 UNC-2B) in to the holes on the top of the cage (key 2). Install hoist rings, nuts or eye bolt on to the threaded rod, as shown in figure 3. Then proceed with step 3, lifting the cage using the hoist rings on the threaded rods inserted in the top of the cage

Figure 2. Installation of Flushing Cage with Eyebolt

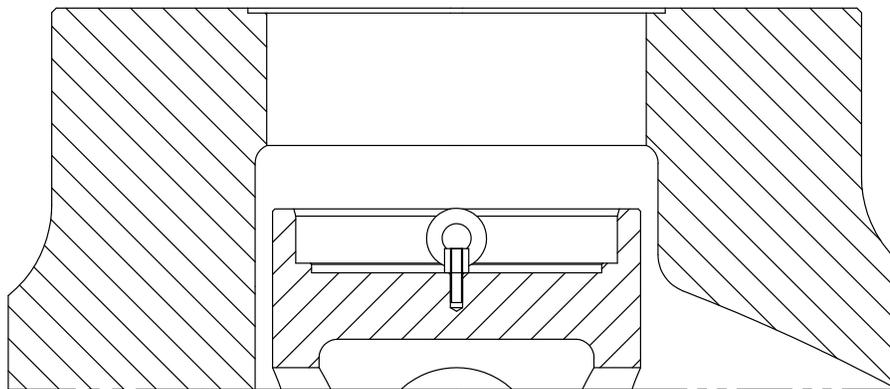
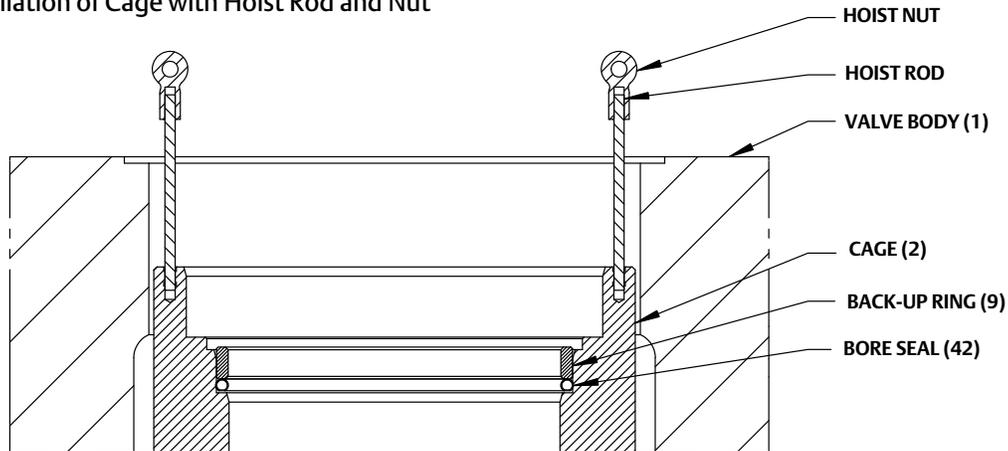


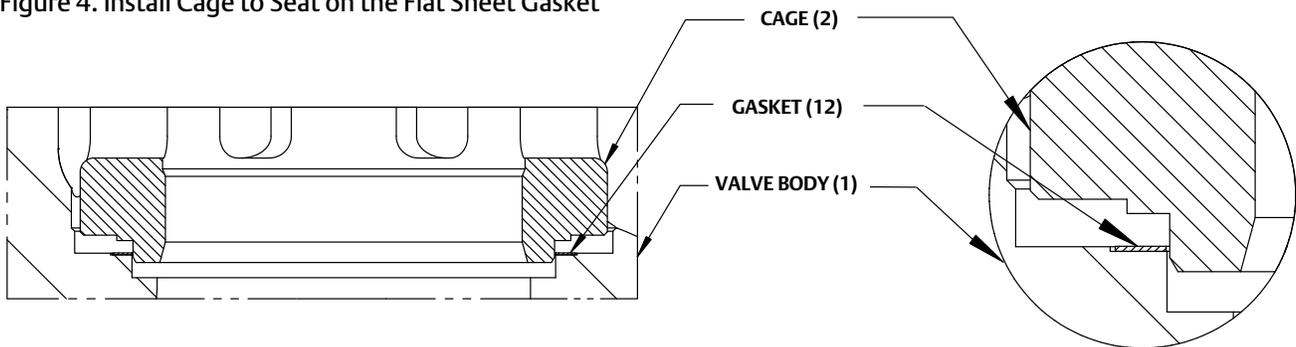
Figure 3. Installation of Cage with Hoist Rod and Nut



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3. Install the cage (key 2) into the valve body. When installing the cage (key 2), take care to lower the cage evenly and ensure that cage (key 2) will not damage the flat sheet gasket (key 12) during installation. See figures 4 and 5.

Figure 4. Install Cage to Seat on the Flat Sheet Gasket



4. Install three-cage spiral wound gasket (key 43) in the gasket groove on top of the cage (key 2), making sure the gaskets sit flush on the surface of the groove. See figure 5.
5. Install the bonnet spiral wound gasket (key 11) in the gasket groove on top of the body (key 1), making sure the gasket sits flush on the surface of the groove.
6. Threaded surfaces of the studs (key 13), faces of the nuts (key 14), washers (key 40) and nut seating surface on the bonnet (key 18) should be lubricated with nickel-based anti-seize lubricant prior to assembly.

Note

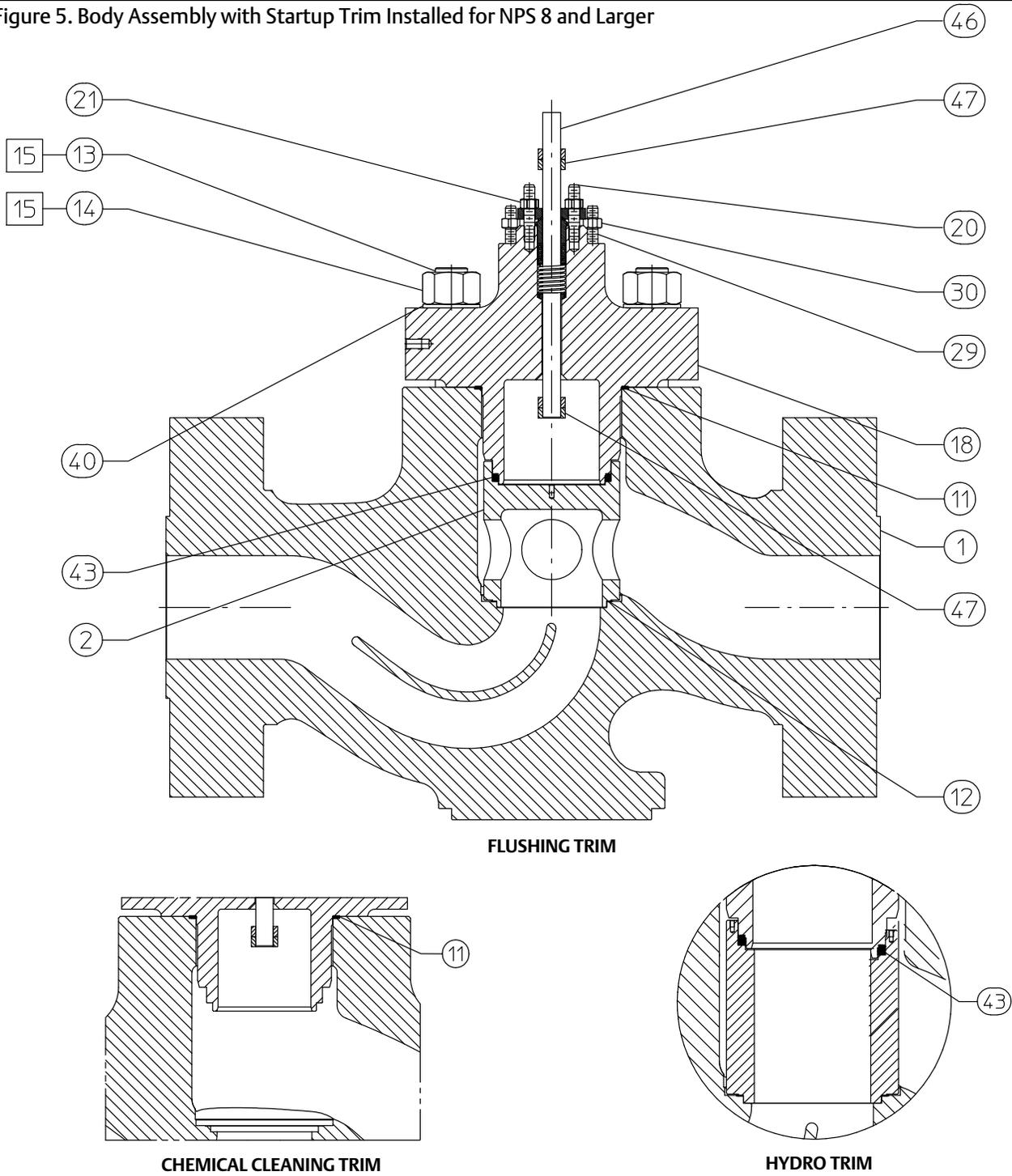
Take care not to introduce lubricant between the washer and the bonnet surface.

7. Apply nickel-based anti-seize lubricant to stem (key 46) and two jam nuts (key 47). Lock nuts together by threading in opposite directions. See table 1 for recommended jam nut (key 47) torque values.
8. Install the stem/nut assembly (key 46, key 47) into the bonnet (key 18) such that the side with the two locked nuts is opposite of the packing box bore and will be inside the body cavity when fully installed.

Table 1. Recommended Nut Torque for Hex Jam Nuts (Key 47)

VALVE SIZE, NPS	STEM SIZE	NOMINAL TORQUE	
		N • m	ft • lbf
All	1	380	280
	1-1/4	750	550
	2	3025	2230

Figure 5. Body Assembly with Startup Trim Installed for NPS 8 and Larger



9. Install packing per Fisher HP and HPA Control Valve Instruction Manual ([D101634X012](#)).
10. Apply nickel-based anti-seize lubricant and install two jam nuts (key 47) onto the side of the stem (key 46) extruding from the packing box. Snug the nuts together, see table 1 for recommended jam nut (key 47) torque values. These will be removed after flushing/hydro testing.
11. Lower the bonnet (key 18) and stem/nut assembly (key 46, key 47) over the bonnet studs (key 13) and onto the valve body (key 1), making sure the bonnet (key 18) skirt will not damage the bonnet spiral wound gasket (key 11), or the three-cage spiral wound gaskets (key 43). When lowering the bonnet (key 18) into the body (key 1), take care to ensure that the bottom diameter guides properly with the cage (key 2) and the outside diameter of bonnet guides properly with body (key 1).

Note

The bonnet might not sit flush on the bonnet gasket until the bolts are completely tightened. Once tightened properly, the bonnet will contact metal-to-metal with the valve body.

For bolt sizes larger than 1-1/2 inch, install washers (key 40) over the bonnet studs, taking care not to introduce lubricant between the washer and the bonnet surface. Lubricant should be present between the seating surface of the bonnet stud nut and the washer. Turn the nuts (key 14) onto the studs (key 13) until hand tight.

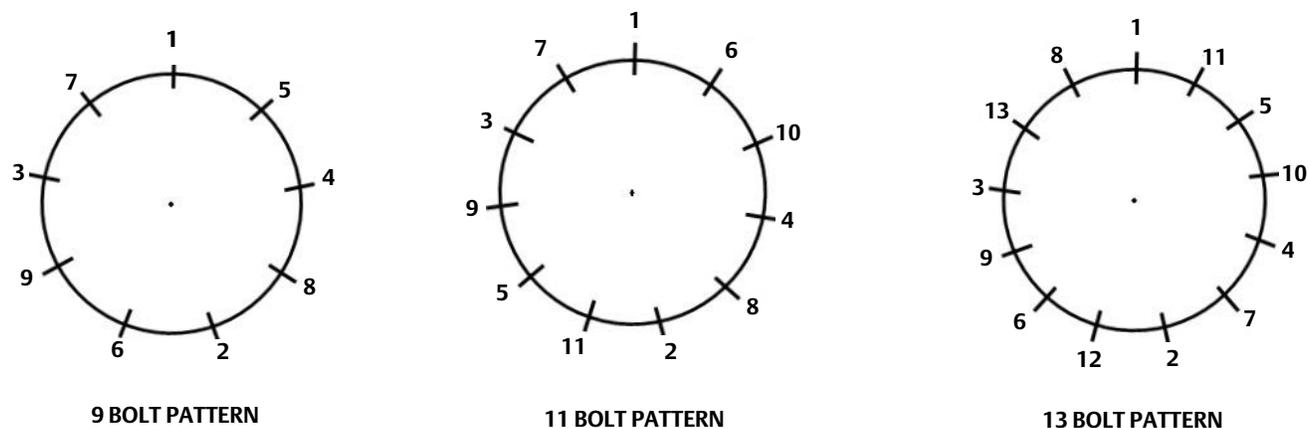
12. Torque bonnet nuts (key 14) in a crisscross pattern with no more than 1/4 of the nominal torque specified in table 2. When all nuts are tightened to that torque, increase the torque by 1/4 of the specified nominal torque and repeat the crisscross pattern. Repeat the above until all nuts are tightened to the specified nominal torque value. If any nut still turns at the final torque, tighten every nut to the final torque again. For odd number of bolts, tighten the bonnet nuts following the pattern shown in figure 6.

Table 2. Recommended Bolt Torque for Alloy Steel Bolting Using Anti-Seize Lubricant (Keys 13 and 14)⁽¹⁾

STUD SIZE	NOMINAL TORQUE	
	Bolting Materials	
	B7, B16, B8M2, BD, S20910, N07718, and 660 Studs	
	N • m	ft • lbf
1-3/8	1270	935
1-1/2	1650	1220
1-5/8	2130	1570
1-3/4	2670	1970
2	4030	2970
2-1/4	5780	4260
2-1/2	7990	5890

1. For other bolting materials or lubricants, contact your [Emerson sales office](#) for torque information.

Figure 6. Nut Tightening Pattern



Installation of Chemical Cleaning Trim Kit

1. Install the bonnet spiral wound gasket (key 11) in the gasket groove on top of the body (key 1), making sure the gasket sits flush on the surface of the groove.
2. Threaded surfaces of the studs (key 13), faces of the nuts (key 14), washers (key 40) and nut seating surfaces on the bonnet (key 18) should be lubricated with nickel-based anti-seize lubricant prior to assembly.

Note

Take care not to introduce lubricant between the washer and the bonnet surface.

3. Apply nickel-based anti-seize lubricant to stem (key 46) and two jam nuts (key 47). Lock nuts together by threading in opposite directions. See table 1 for recommended jam nut (key 47) torque values.
4. Install the stem/nut assembly (key 46, key 47) into the bonnet (key 18) such that the side with the two jam nuts (key 47) is opposite of the packing box bore and will be inside the body when fully assembled.
5. Install packing per Fisher HP and HPA Control Valve Instruction Manual ([D101634X012](#)).
6. Apply nickel-based anti-seize lubricant and install two jam nuts (key 47) onto the side of the stem (key 46) extruding from the packing box. Snug the nuts together, see table 1 for recommended jam nut (key 47) torque values. These will be removed after chemical cleaning operation.
7. Lower the bonnet (key 18) and stem/nut assembly (key 46, key 47) over the bonnet studs (key 13) and onto the valve body (key 1), making sure the bonnet (key 18) skirt will not damage the bonnet spiral wound gasket (key 11) during assembly. When lowering the bonnet (key 18) in to the body (key 1), take care to ensure that the outside diameter of the bonnet guides properly with body (key 1).

Note

The bonnet might not sit flush on the bonnet gasket until the bolts are completely tightened. Once tightened properly, the bonnet will contact metal-to-metal with the valve body.

For bolt size larger than 1-1/2 inch, install washers (key 40) over the bonnet studs, taking care not to introduce lubricant between the washer and the bonnet surface. Lubricant should be present between the seating surface of the bonnet stud nut and the washer. Turn the nuts (key 14) onto the studs (key 13) until hand tight.

8. Torque bonnet nuts (key 14) in a crisscross pattern with no more than 1/4 of the nominal torque specified in table 2. When all nuts are tightened to that torque, increase the torque by 1/4 of the specified nominal torque and repeat the crisscross pattern. Repeat the above until all nuts are tightened to the specified nominal torque value. If any nut still turns at the final torque, tighten every nut to the final torque again. For odd number of bolts, tighten the bonnet nuts following the pattern shown in figure 6.

Disassembly of Startup Trim Kits

Disassembly of Flushing and Hydro Trim Kits

1. Loosen the bonnet nuts (key 14), using an even and opposing pattern, as specified in figure 6. This will prevent uneven loading of the bonnet flange studs which may cause binding.

Individual nuts should not be completely loosened while the remaining nuts are tight. It is suggested that at least two stages of loosening be used to avoid overloading the last few remaining studs.

2. Remove the bonnet from the valve by pulling straight up. If the bonnet seems to bind in the valve body, check the alignment of the hoist or rigging equipment. Ensure that the bonnet is lifted straight off the body to prevent parts damage.
3. Remove two jam nuts (key 47) from the side of the stem (key 46) extruding from the packing box.
4. Remove packing per Fisher HP and HPA Control Valve Instruction Manual ([D101634X012](#)).
5. Remove the stem/nut assembly (key 46, key 47).
6. Remove and discard the bonnet spiral wound gasket (key 11).
7. Remove and discard the three-cage spiral wound gaskets (key 43).
8. **For Flushing Trim:** Install eyebolt (3/8-16 UNC-2B) in to the hole on the top of the cage (key 2), as shown in figure 2. Then proceed with step 8.
For Hydro Trim: Install threaded rods (1/4-20 UNC-2B) in to the holes on the top of the cage (key 2). Install hoist rings, nuts or eye bolts on to the threaded rod, as shown in figure 3. Then proceed with step 8.
9. Remove the cage (key 2) from the valve body cavity.
10. Remove and discard the seat ring flat sheet gasket (key 12).

Disassembly of Chemical Cleaning Trim Kits

1. Loosen the bonnet nuts (key 14), using an even and opposing pattern, as specified in figure 6. This will prevent uneven loading of the bonnet flange studs which may cause binding.

Individual nuts should not be completely loosened while the remaining nuts are tight. It is suggested that at least two stages of loosening be used to avoid overloading the last few remaining studs.

2. Remove the bonnet from the valve by pulling straight up. If the bonnet seems to bind in the valve body, check the alignment of the hoist or rigging equipment. Ensure that the bonnet is lifted straight off the body to prevent parts damage.
3. Remove two jam nuts (key 47) from the side of the stem (key 46) extruding from the packing box.
4. Remove packing per Fisher HP and HPA Control Valve Instruction Manual ([D101634X012](#)).
5. Remove the stem/nut assembly (key 46, key 47).
6. Remove and discard the bonnet spiral wound gasket (key 11).

Cleaning

After removal of the chemical trim, the interior of the valve body and all internal parts should be properly cleaned prior to reassembly.

Trim Replacement and Valve Reassembly

After removal of the Startup Trim and proper cleaning, reassemble the valve by following the Trim Replacement instructions provided in the Fisher HP and HPA Control Valve Instruction Manual (D101634X012).

Parts Ordering

A serial number is assigned to each valve and stamped on the nameplate. Always refer to the valve serial number when corresponding with your [Emerson sales office](#) regarding spare parts or technical information. When ordering replacement parts, also specify the part name and desired material.

⚠ WARNING

Use only genuine Fisher replacement parts. Components that are not supplied by Emerson Automation Solutions should not, under any circumstances, be used in any Fisher valve, because they may void your warranty, might adversely affect the performance of the valve, and could cause personal injury and property damage.

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