

KOSO HAMMEL DAHL

CONTROL VALVES

KOSO HAMMEL DAHL

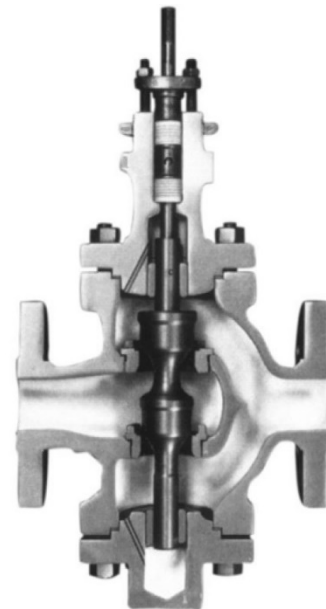
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Installation, Maintenance & Operating Instructions

IMO – V800/801

1-1/2" - 16" SERIES V800/801 Double Seated Globe and Angle Style ANSI CLASS 150 – 600



Read these instructions carefully before installation or servicing.

WARNING!

FOR YOUR SAFETY AND PROTECTION, IT IS IMPORTANT THAT THE FOLLOWING PRECAUTIONS BE TAKEN PRIOR TO REMOVING THE VALVE FROM SERVICE OR BEFORE ANY DISASSEMBLY OF THE VALVE:

1. At all times during this procedure, keep hands out of the valve. A remotely actuated valve could close at any time and result in serious injury.
2. Know what media is in the line. If there is any doubt, check with the proper authority.
3. Wear any protective clothing or equipment normally required when working with the media involved.
4. Depressurize the line and valves as follows:
 - a. Open the valve and drain the line.
 - b. Close and open the valve to relieve any residual pressure that may be in the valve prior to removing the valve from service.
 - c. After removal and prior to any disassembly, drain any remaining media by placing the valve in a vertical position and carefully opening and closing the valve several times.
5. The practical and safe use of this product is determined by the trim, packing, seal rings and body ratings. Read the name tags and check the maximum temperature and rating listed. This product is available with a variety of trim materials. Some of the trim materials have pressure ratings that are less than the body ratings. All of the body and trim ratings are dependent on valve type and size, packing, seal rings, trim material, bolting material, and temperature. Do not exceed these ratings.

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These instructions are subject to change without notice.

STORAGE

When a valve is to be stored for an extended period, remove the line connection covers and spray a light coating of corrosion inhibitor on the internals. Replace the covers to prevent foreign matter from entering the valve body. Exposed parts should also be sprayed with a protective film of corrosion inhibitor.

A packing list, containing a complete description of the valve and accessories (such as a valve positioner etc.), accompanies each valve when shipped. The list should be checked soon after the shipment has been received.

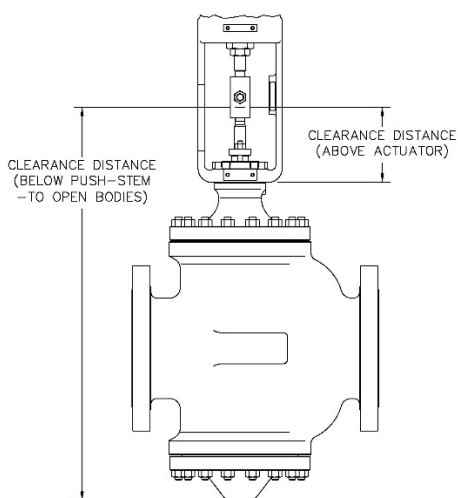
When hoisting the valve, make sure that the ropes or cables are of sufficient strength and are positioned so that any tubing or accessories will not be damaged.

INSTALLATION

The valve performs best when placed in a straight run of the pipeline away from pipe bends or sections of abnormal velocity. Although a vertical orientation is optimal, the valve may be installed in any position provided the correct direction of flow is maintained. An arrow on the valve body indicates the correct direction of flow. A raised metal pattern cast on the body indicates the location of the seat ring bridge.

Clearance should be provided above the actuator to permit its removal for servicing, or for inspection of the Pull-Stem-to-Open (V800) plug. Clearance should be provided beneath the valve for removal of the Push-Stem-to-Open (V801) plug from the bottom of the body. Distances determined from the specific valve, between the points indicated on the drawing below, would provide adequate clearance for these operations.

Clearance determination for servicing valve in line:



Connections

Pipe threads should be clean and sharp. Use pipe compound on the male threads only.

When making flanged connections, tighten the bolts evenly to avoid placing a strain on the body or cracking a flange. (See pattern on page 9)

Instruments

An air supply pressure regulator with filter should be installed in the air line ahead of any valve-mounted instruments.

Excessive delay in response occurs when air control instruments are placed more than 100 feet from the valve.

Packing Adjustment

See Page 12 for packing materials.

Special Bonnets

The special valve bonnets shown on Page 7 are designed to protect the stem packing from extremes of line temperature. Normalizing bonnets dissipate heat and must not be wrapped with any form of insulation material.

Final Check

After the valve has been installed, make a final check of the following:

- (1) Valve travel – vary air supply to the actuator to ascertain that actual travel corresponds with the nameplate indication.
- (2) Air lines to the actuator – check for leaks.
- (3) Control instruments/valve action – check to be sure that the combined actions (direct or reverse) of controller, positioner (if any), and valve will provide the desired direction of valve movement and will ensure the required valve position in the event of air failure.

Under actual operating conditions, pressure drop across the valve may differ from the calculated figure.

MAINTENANCE

I. General

Maintenance such as diaphragm, packing or trim replacement can be done without removing the valve from the line. Since most valve locations are not suited for repair operations, however, these instructions assume that the valve is taken to a maintenance shop for servicing.

II. Removal of Actuator from Body Assembly

Read these instructions completely. For your safety, it is important that the following precautions be taken prior to removal of the unit from the line or before any disassembly.

1. Wear any protective equipment normally required when working with the fluid involved during removal and disassembly.
2. Depressurize and drain the pipeline with the valve open prior to disconnecting service lines.
3. Before removing the instrument connections from the actuator, shut off the air pressure and bleed the air lines.
4. Have adequate rigging transport means available at the valve before attempting to remove it from the pipeline or before breaking the body/bonnet joint for in-line service.

Removal from Pipeline

NOTE: Maintenance such as diaphragm, packing or trim replacement can be done without removing the valve from the line.

1. Disconnect all instrument air and electrical lines from the actuator.
2. Remove all inlet and outlet line flange studs and nuts and lift the valve out of the pipeline.
3. Secure the valve and actuator assembly firmly on a work bench in an upright position in a manner to prevent tipping or falling over.

Actuator Removal

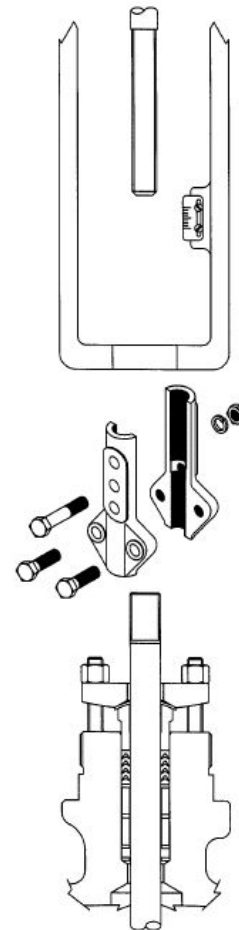
1. Connect a regulated air supply to the actuator and apply signal pressure sufficient to move the plug to a position only slightly off the seat. This will remove the spring force from the coupling before disassembly.
2. Disconnect the actuator coupling from the valve stem by disengaging the coupling screws (see figure on right). Disconnect air supply.
3. Unscrew the clamp nut from the bonnet by placing

a metal rod or blunt nosed chisel on the clamp nut lugs and striking with a mallet.

4. Unscrew the clamp nut from the threads and lift the nut over the plug stem. Lift or hoist the actuator unit off the valve, taking care to avoid damaging the plug stem, instruments or tubing.

NOTE: The actuator is removed from the body as a unit, without disturbing the packing box bolting. Clamp nut and actuator yoke will pass over the packing flange.

5. If maintenance is required on the actuator consult the appropriate actuator IMO.



III. Disassembly of Valve Body

A. Removing Packing

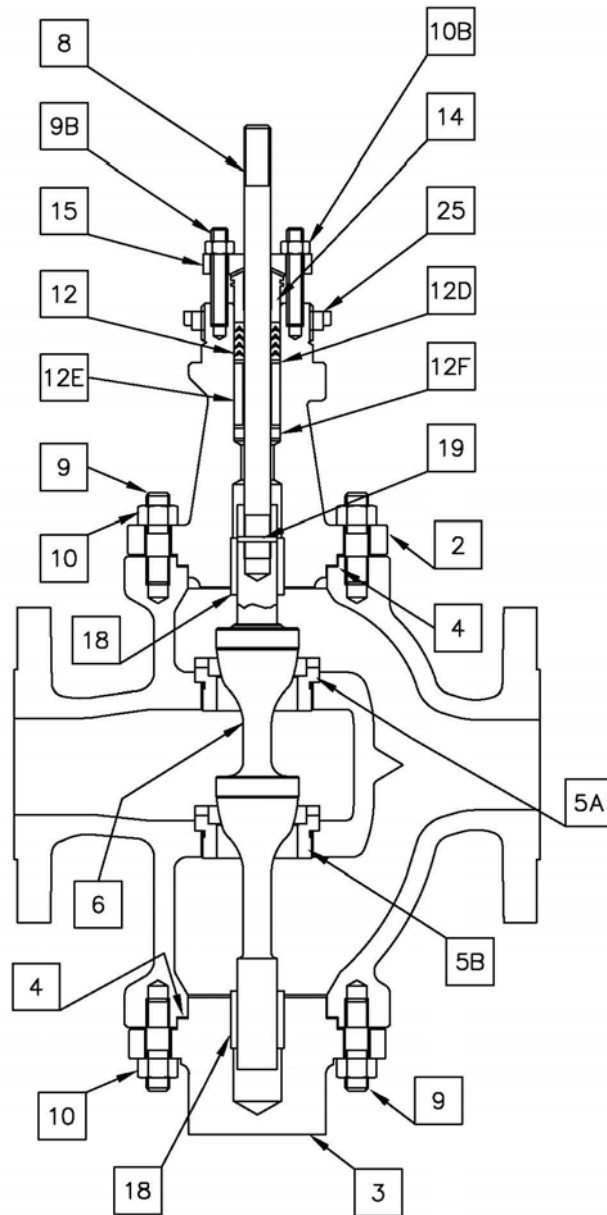
1. Unscrew the packing flange nuts (24) and remove packing flange (15) and packing follower (14).
2. Remove the upper body stud nuts (10) and lift the bonnet (2) carefully over the plug stem. Discard the body gasket (4).
3. Using a narrow hook or bent wire, remove the packing rings.
4. Clean the packing box thoroughly before

replacing packing as instructed on Page 12.
B. Remove Valve Trim (Complete Disassembly) After disassembling the bonnet as per the preceding Paragraph A, the body assembly of Push-Stem-to-Open valve should be inverted for convenient in following the next three Steps.

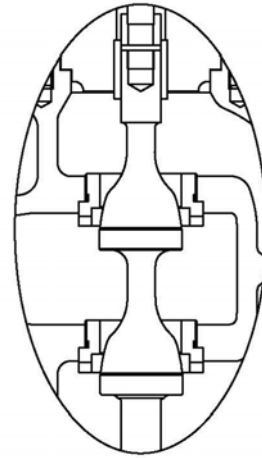
1. Remove the bottom flange (3) and discard the lower body gasket (4).
2. Remove the valve plug and stem assembly (6 & 8) from the body.
 - a. If plug or stem is to be remachined or replaced, drive out the plug stem pin (19) and unscrew the stem.
3. Unscrew and remove the seat ring(s).

NOTES:

- a. Seat rings should be removed only for remachining or replacement. They should not be removed for cleaning purposes.
 - b. For some application seat rings are tack-welded (to prevent spin-out) in addition to the threading. A visual check for evidence of welding should be made.
 - c. Special Hammel-Dahl tools are available for seat removal.
 - d. A lathe or boring mill can be used for unscrewing seat ring.
 - e. Heating the valve body or chilling the seat rings may be required to loosen extremely tight seats.
4. Upper and lower guide bushings (18) should be removed from bonnet (2) and bottom flange (3) only for replacement. A stud welded into the guide will serve as a jackscrew puller.



V800
PULL STEM
TO OPEN

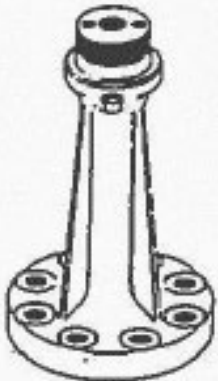


V801
PUSH STEM
TO OPEN

Parts List

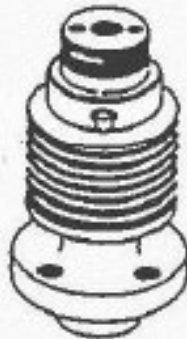
1	Body	9	Body Stud	18	Guide Bushing
2	Bonnet	10	Body Stud Nut	*19	Plug Stem Pin
3	Bottom Flange	*12	Packing Ring	23	Packing Stud
*4	Bonnet Gasket	*13	Lantern Ring	24	Packing Nut
*5A	Upper Seat Ring	14	Packing Follower	25	Clamp Nut
*5B	Lower Seat Ring	15	Packing Flange		
*6	Valve Plug	16	Bonnet Lub. Plug		
8	Plug Stem	17	Bonnet Flush. Conn. Plug	*	Recommended Spare Parts

— BONNETS —



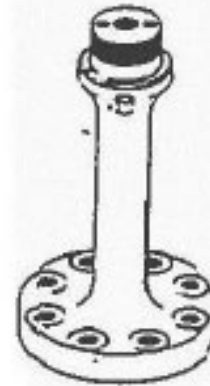
Radiation
Fin
1 1/4" — 8"

Note: Obsolete



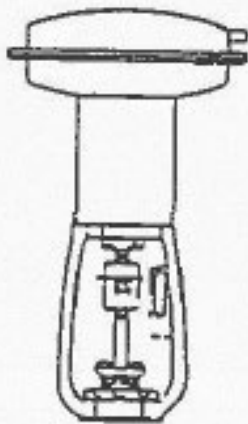
Radiation
Fin
1/2" — 1"

Note: Obsolete

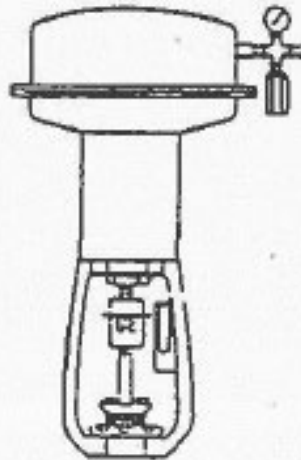


Extension
Neck
1/2" — 8"

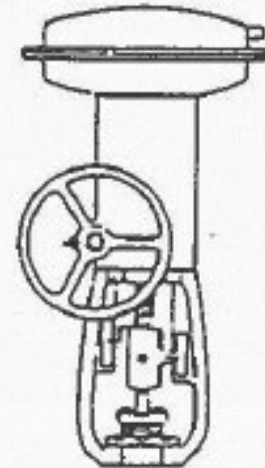
— ACTUATOR IDENTIFICATION —



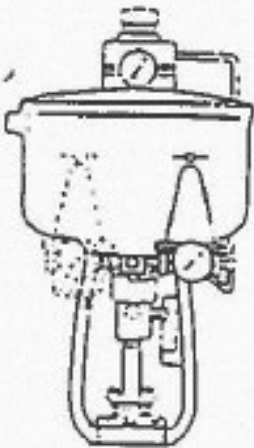
Diaphragm



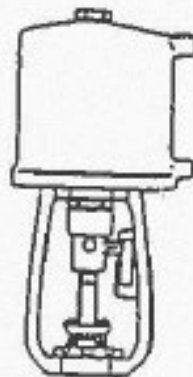
Preloaded



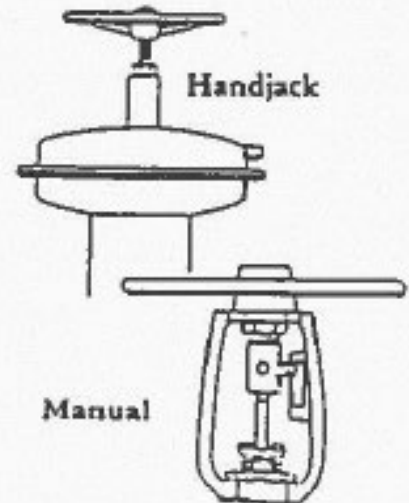
Diaphragm with
Side-Mounted Handwheel



Positioner Piston



On-Off Piston



Handjack

Manual

IV. Assembly of Valve Body

The body of Push-Stem-to-Open valve (V801) should be inverted for assembly convenience.

A. Installing Seat Ring(s)

1. Clean the inside of the body thoroughly – particularly the seat ring bridge threads.
2. Apply compound to the threads of the seat ring(s) pipe or anti-seize. Compound must be compatible with valve materials and service fluid.
3. Screw the seat ring(s) tightly into the body – smaller seat first on double seat valves – then clean up the excess compound.

NOTE: Hammel Dahl tools are available for tightening seat rings.

B. Assembling Plug and Stem

Trim is usually renewed as a unit – plug, stem, and seat(s) – but any one of the parts may be replaced separately. A stem that has been previously drilled should not be reused.

1. A new plug and stem are pinned together at the factory. If only one of these parts is to be renewed or if either part has been remachined:
 - a. Screw the stem tightly into the plug.
 - b. Drill through the plug shank and stem, then countersink the hole at both ends.
 - c. Insert and peen the pin, then (if necessary) machine the pin flush with the plug shank surface.

NOTE: The new pin diameter should be the same as the original pin.

C. Lapping the Plug and Seat

1. If plug and/or seat has been remachined or replaced, the members must be lapped together as directed on Page 9 of this booklet.

D. Completing Body Assembly

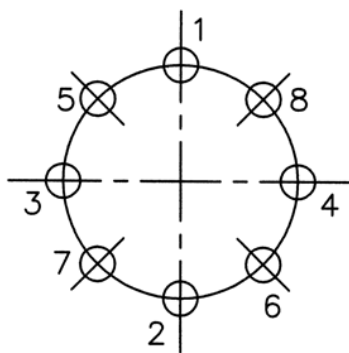
1. If worn guide bushings (18) have been removed, press new bushings into the bonnet (2) and bottom flange (3).
2. Pull-Stem-to-Open Assembly (V800)
 - a. Place a new body gasket (4) on the shoulder of the bottom flange (3), then bolt the bottom flange to the body. Tighten all nuts evenly. (See pattern on page 9)
 - b. Lower the plug and stem assembly into to the body, guiding the lower plug shank into the lower guide bushing (18).
3. Push-Stem-to-Open Assembly (V801)
 - a. With the body inverted, lower the plug and stem assembly into the body so that the plug rests on the seat.

- b. Place a new gasket (4) on the body shoulder, then bolt the bottom flange evenly and securely to the body
 - c. Turn the valve body upright for bonnet installation.
4. Place a new bonnet gasket (4) on the body and lower the bonnet carefully over the plug stem to its place on the body.
 5. Bolt the bonnet evenly and securely to the body. (See pattern on page 9).
 6. Install new packing as per the applicable instructions on Page 12.

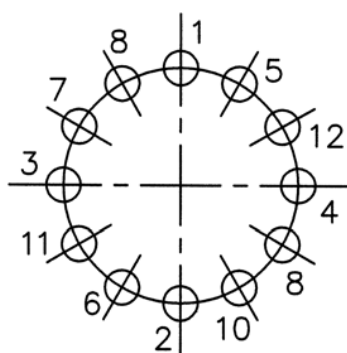
See Page 9 for Torque sequence.

Model V800/V801

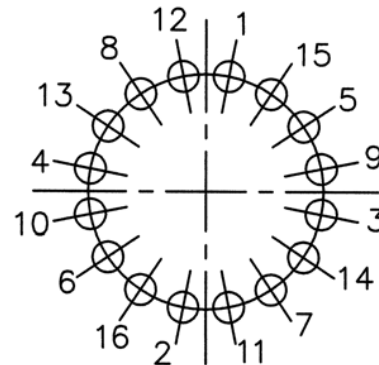
Valve Size	Press Class	Valve Travel	Stud Size	Qty.	Req'd Torque lb·ft		Torque Sequence
					B7	B8M, CL2	
1-1/2"	Up to 600 CL.	1.12"	1/2 - 13	8	50 - 60	50 - 60	SEQ. 8
2"	Up to 600 CL.	1.12"	1/2 - 13	8	50 - 60	50 - 60	SEQ. 8
3"	Up to 600 CL.	1.50"	5/8 - 11	8	80 - 90	80 - 90	SEQ. 8
4"	Up to 600 CL.	1.50"	3/4 - 10	8	125 - 150	125 - 150	SEQ. 8
6"	Up to 600 CL.	2.25"	3/4 - 10	12	125 - 150	125 - 150	SEQ. 12
8"	150 - 300 CL.	3.50"	3/4 - 10	16	80 - 90	80 - 90	SEQ. 16
8"	600 CL.	3.50"	7/8 - 9	16	200 - 240	200 - 240	SEQ. 16
10"	Up to 600 CL.	3.50"	1 - 8	16	285 - 325	285 - 325	SEQ. 16
12"	150 - 300 CL.	3.50"	1 - 8	16	285 - 325	285 - 325	SEQ. 16
12"	600 CL.	3.50"	1 1/4 - 8	16	500 - 540	500 - 540	SEQ. 16
16"	300 CL.	10"	1 - 8	16	285 - 325	285 - 325	SEQ. 16



8 BOLT PATTERN
SEQUENCE 8



12 BOLT PATTERN
SEQUENCE 12



16 BOLT PATTERN
SEQUENCE 16

V. Mounting the Actuator

Assemble and adjust the actuator as instructed in the appropriate Actuator Instructions.

- A. Lower the actuator over the plug stem and packing flange to seat squarely on the bonnet shoulder.
- B. Rotate the actuator to a convenient position, then screw the hammer lug clamp nut (25) onto the valve bonnet threads and tighten it securely.
- C. Connecting Actuator Stem to Valve Plug Stem
The valve plug must be on its seat while the actuator stem is being connected.

On Pull-Stem-to-Open valves (V800), the actuator stem must be at its lowest position of travel.

On Push-Stem-to-Open valves (V801), the actuator stem must be at its highest position, and the valve plug must be raised and held against the seat.

1. Lower the actuator over the plug stem and packing flange to seat squarely on the bonnet shoulder.
2. Rotate the actuator to a convenient position, then screw the clamp nut onto the valve bonnet threads and tighten it securely.
3. Connect a regulated air supply to the actuator diaphragm connection. The supply should be at least 5 psig greater than the pressure needed to stroke the actuator.
4. The actuator must be in the down position on the down travel stop.

NOTE: For "R" series actuators, the spring will maintain the actuator on the down travel stop and no air pressure is required. For "D" series actuators, regulate the supply pressure to the actuator to move the actuator stem downward until the downward motion is the same as the travel listed in Table 1.

5. The valve plug must be on its seat while the actuator stem is being connected.
6. Press half of the actuator coupling against the actuator stem and valve plug stem so that each stem is engaged in the coupling half at least one stem diameter.

NOTE: It may be necessary to move the valve plug off its seat a slight distance in order to mesh the valve plug stem threads with the coupling threads.

7. Apply the other half of the coupling, carefully engaging threads, then insert the coupling cap screw and tighten it by hand (Refer to Figure on page 4).

VI. Reversal of Valve Action in the Field

NOTE: Bellows Seal Valves are not reversible – A new actuator is required if the valve action must be changed.

1. Disassemble the valve as directed under Section III.
2. Drive out the plug stem pin (19) and unscrew the stem.
3. Screw the stem into the other end of the valve plug, then drill a hole through the plug and stem and pin them together. (See Section IV, Paragraph B).
4. Invert the body so that in reassembling the valve, the bonnet will be fastened to the body flange where the bottom flange was originally.
5. Assemble the valve as directed in Section IV.
6. Invert the travel indicator scale, so that its reading of valve travel is in accordance with the change in action that has been affected.

LAPPING INSTRUCTIONS

I. General

- A. Soft seating material, retained in the valve plug head, provides dead tight shutoff as the soft material is pressed onto the metal seat edge. Soft materials should be replaced when worn and should never be lapped.
- B. Metal-to-metal trim should be lapped to ensure minimum leakage when valve is shut. Lapping can correct shallow scratches or slight roughness only. Excessive lapping produces a groove in the valve plug, therefore, plugs and seat having relatively deep scratches must be remachined.

II. Machining of Trim

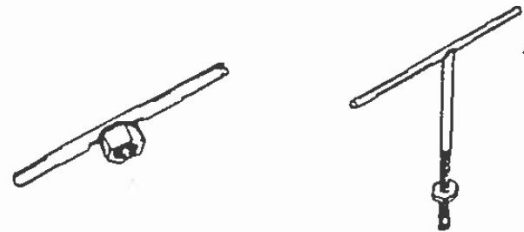
- A. Plugs or seats having a hard facing such as Stellite can be remachined before being lapped, but care should be taken to leave sufficient hard facing material intact.
- B. Plugs should be machined on their seating surfaces only. Machining of the contours or V-Ports will alter the characteristic and rangeability of the trim.
 1. Whenever one plug head is machined to restore a seating surface, the other plug head must be machined correspondingly in order to preserve the distance between seating surfaces. Similarly, machining of one seat ring requires machining the other.
 2. Changing line temperatures can alter the original distance between seats, therefore, new or remachined trim should be tested for the simultaneous seating of both plug heads:
 - a. Apply template dye to both plug heads, the seat the plug and turn it gently to mark seat contact in the building.
 - b. If one plug head is not contacting its seat, machine the opposite plug head to repeat the dye test.

III. Lapping

- A. General
 1. Grinding compound should be Grade "A" or finer.
 2. Apply grinding compound to the seating surfaces of the valve plug only. Compound on the characterized portion of the plug could increase the clearance between plug and seat, thus changing the flow characteristic and rangeability of the valve.

Install temporary packing so that the valve plug stem will be aligned during the lapping operation. Any rope packing may be used for this purpose.

3. Thoroughly clean seat rings and plugs before and after lapping.



Lapping tool for Pull-Stem-to-Open valves

Lapping tool for Push-Stem-to-Open valves

B. Fabricating Lapping Tools

1. For Pull-Stem-to-Open Valves (V800), a "T" handle for the valve plug seat can be made by welding a nut (With threading to match the plug stem threads) to the center of a rod.
2. For Push-Stem-to-Open Valves (V801), a stem with a "T" handle can be made, with the stem threads to match the tapped axial hole in the valve plug shank.
3. Use a coil spring to support the excessive weight of the valve plugs (in valves 8" and larger) during the lapping operation.

C. Lapping Procedure

1. After checking for an approximate fit (and machining the trim if necessary) as outlined in Section II, Paragraph C above: Hold the plug on its seats by hand and apply compressed air to the inlet side of the valve to determine which seat leaks more.
2. Prepare the valve for lapping as described in Section II, Paragraph B, above, but apply lapping compound to the plug head which permitted less air leakage. Apply a light machine oil to the other plug head.
3. Lap the one plug head until both heads are equally seated, then apply compound to both plug heads and lap them simultaneously until a satisfactory fit is obtained.
4. Disassemble the valve and clean all parts thoroughly to remove traces of grinding compound. Remove the temporary bonnet packing and clean the packing box.

PACKING INSTRUCTIONS

Before proceeding with the appropriate packing operation below, clean the valve packing box thoroughly and assemble the valve body as per Maintenance Section IV. PTFE packing normally does not require periodic lubrication.

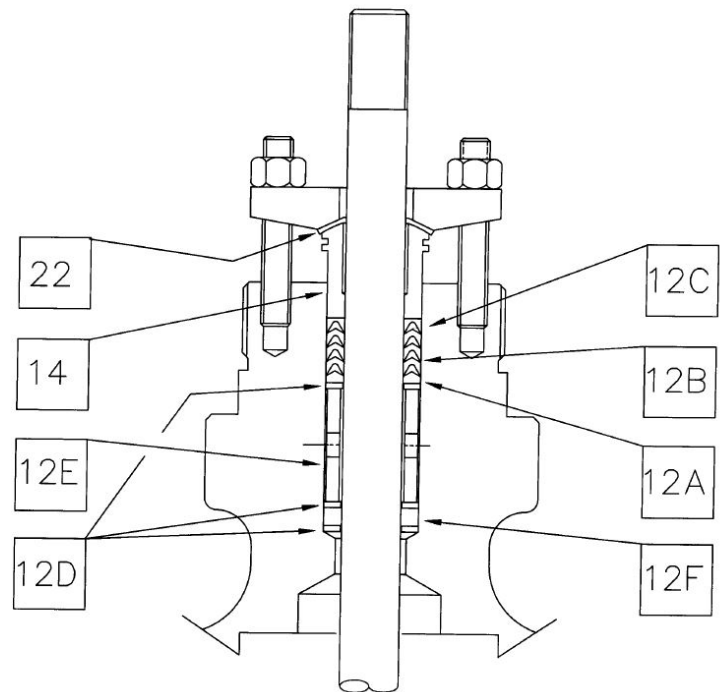
CAUTION: ALL PACKINGS WITHOUT SPRING LOADING – Finger tightening of the packing flange nuts (24) should provide ample sealing pressure to the packing rings. When the valve is placed in service this adjustment should be checked, and the nuts tightened just enough to prevent any leakage. Excessive tightening will bind the valve stem and prevent sensitive response.

Chevron PTFE

1. Lubricate the five PTFE rings lightly with silicon lubricant for ease in assembly (one male adapter, one female adapter, and three chevron rings).
2. Slide the packing spacer (12E) over the valve plug stem to the bottom of the packing box.
3. Drop the packing washer (12D) over the stem to rest on the spacer.
4. Place the PTFE male adapter (12A) flat side down, against the packing washer (12D), then fit the three chevron rings (12B) into the packing box, with grooved side down. Seat the female adapter (12C), flat side up) on the topmost chevron ring.

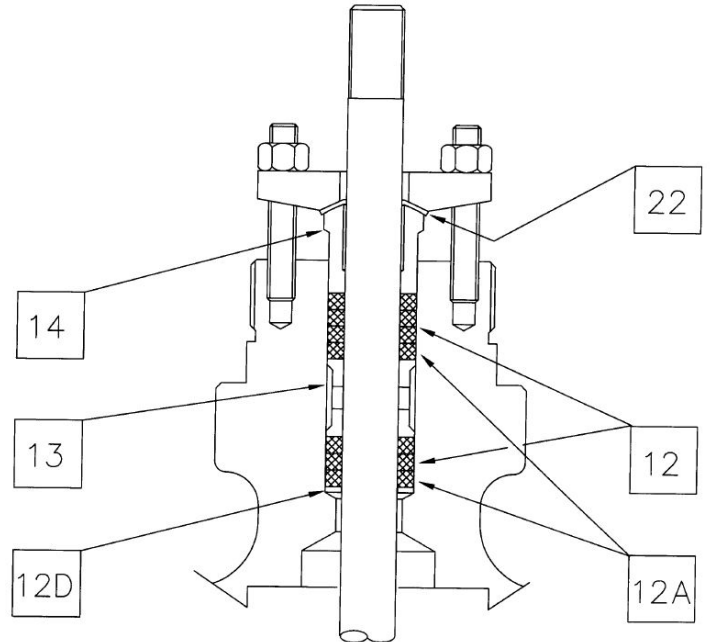
NOTE: Avoid damage to the PTFE rings when slipping them over the stem threads and be sure each ring is pushed firmly into the packing box.

5. Slide the packing follower (14) over the stem to rest on the female adapter.
6. Place the packing flange, flat side up, over the stem and flange studs to rest on the packing follower.
7. Screw the packing flange nuts onto the studs and tighten them evenly to avoid cocking the flange. Finger tightening is sufficient for initial assembly (see note above).



Braided PTFE (Square Rings)

1. For the purpose of assembly only, lubricate the seven packing rings (12) lightly with silicone lubricant.
2. Slide three packing rings over the valve plug stem to the bottom of the packing box.
3. Place the lantern ring (12D) on top of the packing. Check to be sure that the channel in the lantern ring is opposite the lubricator hole in the valve bonnet.
4. Insert the remaining four packing rings above the lantern ring (13)
5. Slide the packing follower (14) over the stem and guide it into the packing box at least 1/8".
6. Place the packing flange, flat side up, over the stem and flange studs to rest on the packing follower.
7. Screw the packing flange nuts onto the studs and tighten them evenly to avoid cocking the flange. Finger tightening is sufficient for initial assembly (see notes on page 12).





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KOSO VECTOR kentintrol™

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