Installation, Operation and Maintenance Instructions

Delta-Type Special Trim 20

Used in Globe Valves

INDEX

1.1 - GENERAL INFORMATION

For application in gas services, Delta-type trim represents an effective solution for mitigating noise levels commonly associated with high pressure drops.

For applications with liquids, Delta-type trim is designed to prevent the occurrence of cavitation throughout the flow path inside the control valve.

Physically, the main component of this special valve trim is the Delta cartridge, which replaces the standard seat retainer of GL$\bar{S}$, GL$\bar{H}$ and GL$\bar{B}$ valves. This cartridge is comprised by a stack of well aligned discs, properly machined with highly engineered groves.

The following instructions are designed to assist in the disassembling, reassembling and troubleshooting of Delta-type special trim manufactured by Valtek Sulamericana.

Before the installation, operation or any maintenance, users and maintenance personnel must read this bulletin carefully, as well as the maintenance manual of the valve where the Delta-type trim is installed: GL$\bar{S}$ (IOM 01), GL$\bar{H}$ (IOM 03) or GL$\bar{B}$ (IOM 06).

WARNING

If it is necessary to store the products before field installation, Valtek Sulamericana recommends that valves be stored in dry, fresh, closed places. Do not store valves in places where relative humidity is higher than 85% or the room temperature is lower than 41°F or higher than 113°F (5 to 45°C). Environments containing excessive UV radiation, acid or alkaline mist or ozone source must be avoided.

Product storage in non-recommended places may void the manufacturer warranty.

1.2 - UNPACKING

Instructions for unpacking the equipment are contained in the maintenance bulletins of the valves where Delta-type special trims are mounted: GL$\bar{S}$ (IOM 01), GL$\bar{H}$ (IOM 03) or GL$\bar{B}$ (IOM 06).

1.3 - SAFETY WARNINGS

To avoid potential injury and/or damage to the valve parts, WARNING and CAUTION notes must be strictly observed.

Changing this product characteristics, using non-original spare parts or using maintenance procedures different from those presented herein may affect the performance of the valve, be hazardous to personnel and equipment and may void the manufacturer warranty.

MOUNTING IN PIPING

1.4 - INSTALLATION

Basic instructions for installation are provided in maintenance bulletins of the valves where Delta-type special trims are mounted: GL$\bar{S}$ (IOM 01), GL$\bar{H}$ (IOM 03) or GL$\bar{B}$ (IOM 06).

Regardless of the air-action, it is imperative that valves equipped with Delta-type trims be **installed in the piping always with the flow direction under the plug.**

CAUTION

Improper installation, with the flow direction over the plug, may cause damages to the equipment and injury to personnel.

DISASSEMBLY AND REASSEMBLY

1.5 - DISASSEMBLING UNBALANCED DELTA-TYPE TRIM

For disassembling globe valves equipped with unbalanced Delta-type trim, refer to Figure 1 and proceed as indicated in the following sections:

CAUTION

Removing valve for maintenance: piping must be completely depressurized and process fluid drained. In case of toxic, caustic or hazardous fluid services, the valve must be decontaminated to avoid accidents.

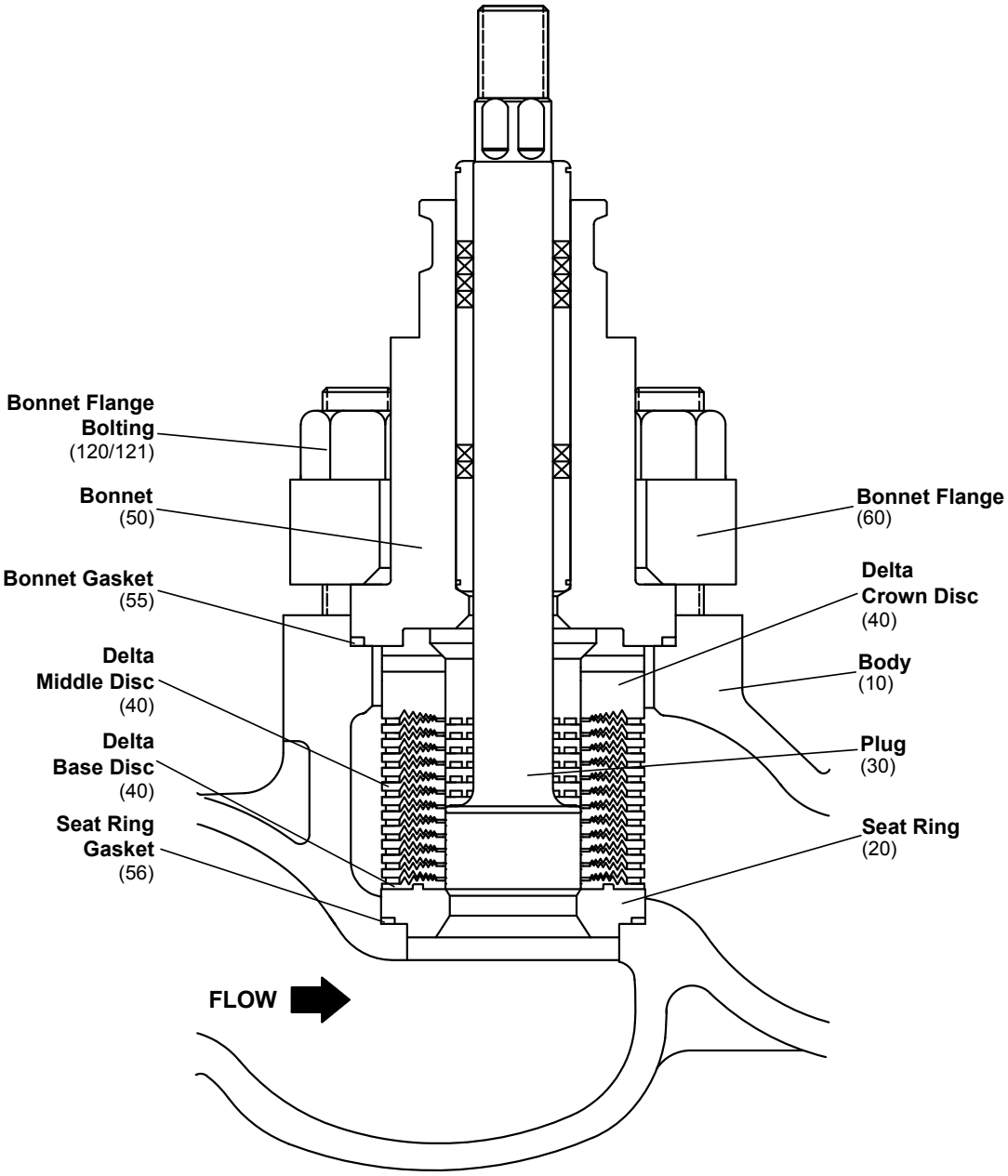

Figure 1 - Valve with Unbalanced Delta-type Trim

(1) Item numbers above correspond directly to the valve's BOM. Refer to it for specific part numbers.

CAUTION

When operating the valve, keep your hands, hair, clothes, etc. away from moving parts. Failure to follow this warning may result in serious injury.

- Apply air in the lower chamber of the actuator until the plug moves to the fully open position.
- Remove the bonnet flange nuts and lift the assembly comprised by the actuator, bonnet and plug, removing it from the valve. Remove also the bonnet gasket.

CAUTION

Heavy actuators (size 50 and larger) may require the use of a hoist for their removal. In case the actuator has a lifting ring, use it to lift the assembly, if this lifting ring has not been provided, use a hook or pass lifting straps through the yoke legs to raise the actuator.
When lifting the actuator using hooks or lifting straps passed through the yoke legs, take care when the center of gravity is located above the lifting point. In this case, an adequate support must be provided to prevent that the actuator turns and causes accidents.
The assembly comprised by the actuator, bonnet and plug must be always lifted upright to prevent damages to the valve trim.

- With the actuator, bonnet and plug removed, the Delta cartridge can now be removed from the valve body. Most cartridges have the discs welded together, although there are some exceptions to this rule. If the cartridge discs are not welded, remove each one of the discs separately. In larger sizes, the welded cartridge or the crown disc may be too heavy to be removed without the help of a hoist. In these cases, threaded holes are machined in the top of the cartridge or in the crown disc to allow the installation of lifting rings.

CAUTION

When removing a Delta cartridge which has a welded disc stack, there is the possibility that the tack welds holding the discs together may fail, allowing the discs to loosen and fall apart.
Keep people and equipment away from the disc stack and from other trim components that are being lifted and removed from the valve body. Failure to observe this warning may cause severe accidents.

- The Delta cartridge can be cleaned now according to established industrial methods. Contact the manufacturer if you have questions about the method to be used for cleaning a specific Delta cartridge.

WARNING

When cleaning a Delta cartridge with a welded disc stack, do not remove the tack welds for disassembling the cartridge. If this is done, it will be very difficult to reassemble, align and weld the stack correctly. If the cleaning could not be performed without disassembling the cartridge, contact the manufacturer.

- Inspect the hole in the Delta cartridge through which the plug slides, to make sure that there are no scratches or roughness.
- Remove the seat and the seat gasket.
- If necessary, the plug may be taken apart from the bonnet and the actuator according to the instructions contained in the maintenance bulletins No. 01, 03 or 06.

1.6 - REASSEMBLING UNBALANCED DELTA-TYPE TRIM

For reassembling the unbalanced Delta-type trim, see Figure1 and proceed as follows:

- Clean and inspect the seating surfaces of all gaskets to ensure that no leaks occur. The bonnet and the seat gaskets should be replaced whenever the valve is disassembled.
- Install a new seat gasket and reinstall the seat ring with the step side downward.

Preassembling: on larger valves it is better to mount the actuator, bonnet and plug above the valve body prior further assembling. Tighten the bonnet flange nuts until the bonnet is fully seated in the valve body and measure the distance between the lower face of the bonnet flange and the upper face of the body mounting flange (this measurement will be used during the final tightening of the bonnet flange nuts). Remove the actuator, bonnet and plug assembly and continue reassembling the valve in the correct sequence.
Important: during this pre-assembly, do not use the bonnet gasket.

- Install the Delta cartridge (clean) in the valve body: both welded and pinned stacks have an indexing groove machined into the base disc:
  For the welded stack, install the cartridge in the valve body, taking care to align the indexing groove machined on the bottom of the stack with the raised indexing step located on the top of the seat ring.

For the pinned stack, install the base disc over the valve seat, taking care to align the indexing groove machined on the bottom of the base disc with the raised indexing step located on the top of the seat ring. Place disc #2 over the base disc (see Figure 2) and so on successively, until the crown disc is installed. The alignment pin must be installed into the stack after the second disc has been mounted. This procedure will facilitate assembling discs.

WARNING

Make sure that the feet of the discs are correctly positioned one on top of another, forming a straight line from the base disc to the crown disc. Failure to observe this warning may cause damage to the seat gasket or to the Delta cartridge.

Note: small non-welded cartridges are manufactured with an alignment pin to ensure the proper alignment of discs.

Figure 2 - Feet Alignment and Assembly Sequence

- Install a new bonnet gasket.
- Retract completely the plug (the stem clamp will indicate the fully open position of the valve) and lower the actuator, bonnet and plug assembly squarely into the valve body and Delta cartridge.

WARNING

The correct seating of the bonnet in the body and the precise alignment of the plug with the Delta cartridge are critical for the correct operation of the valve, as the plug slides inside the cartridge with a small clearance. When lowering the actuator, bonnet and plug assembly downright over the valve body and the cartridge, special care should be taken to ensure that these components remain correctly positioned. Failure to follow this procedure may result in damage to the valve components.

CAUTION

When operating the valve, keep your hands, hair, clothes, etc. away from moving parts. Failure to follow this warning may result in serious injury.

- Once the bonnet is properly resting on the valve body, tighten the bonnet flange nuts with your fingers.
- Using a caliper, measure the clearance between the lower face of the bonnet flange and the top of the body flange, near four studs that are equidistant from each other. The total variation of the clearance should not exceed $\pm$0.010 inch ($\pm$0.25 mm). Tighten or loosen the bonnet flange nuts until this tolerance is reached.

WARNING

The above tolerance should be strictly observed or, otherwise, the plug will rub and gall the inner surface of the cartridge during the procedure below. Note also that the tightening of the bonnet flange nuts should not be greater than 1/6 turn past finger-tight.

- Using the actuator, slowly move the plug, seating it in the seat ring for two or three times. This will allow centering the seat with the plug and also check the alignment of disc stack of the cartridge.

Note: the next step is applicable only to the valves equipped with pneumatic actuators. In case a hydraulic

or electric actuator is used, return the plug to the half stroke position and continue tightening the bonnet flange nuts.

WARNING

Failure to return the plug to the half--stroke position (for valves equipped with electric or hydraulic actuators) will cause damages to the actuator and/or to the valve during the bonnet tightening sequence. This is caused because the majority of electric and hydraulic actuators is unable to retract 1/8 in. (3.2 mm) during the tightening sequence of the bonnet flange.

- In case of valves equipped with pneumatic actuators, leave the plug seated on the seat ring and begin tightening the bonnet flange nuts in a criss-cross pattern to keep the bonnet flange parallel to the valve body (within a tolerance of $\pm$0.010 inch or $\pm$0.25 mm). Tighten the first nut 1/6 turn, and then tighten the opposite nut 1/6 turn and so on successively.
- Tighten securely all nuts in a uniform and complete way, using full force in the wrench to compress the gasket and to seat the bonnet properly. The correct tightening requires a considerable force, however, on valves with sizes up to 4 inches the touching of the bonnet to the body (metal-to-metal), can be easily felt through the tool. On larger valves or when a torque wrench is required, tighten the nuts until the clearance measured during preassembly (see page 4) is reached.

WARNING

Insufficient tightening of the bonnet flange nuts will result in an improper compression of the gaskets.

- Using the actuator, slowly stroke the plug up and down to check again the correct alignment of the plug with the cartridge. Observe the stem clamp of the actuator to detect possible irregularities in the movement of the valve stem.

WARNING

If an irregular movement of the stem clamp is observed or metallic noise is detected inside the valve, this may indicate an alignment problem of the plug to the Delta cartridge.
Retract the plug completely, disassemble the valve, remove the actuator and the bonnet, and realign the plug with the disc stack, as indicated previously (be sure to replace the gaskets when carrying out the reassembling).
If the plug or the cartridge were damaged during the cycling of the valve, contact the manufacturer.

- When reinstalling the valve in the piping, make sure that the flow is in the proper direction.

1.7 - DISASSEMBLING PRESSURE-BALANCED DELTA-TYPE TRIM

For disassembling globe valves equipped with pressure-balanced Delta-type trim, refer to Figure 3 and proceed as indicated in the following sections:

CAUTION

Removing valve for maintenance: piping must be completely depressurized and process fluid drained. In case of toxic, caustic or hazardous fluid services, the valve must be decontaminated to avoid accidents.

- Apply air in the lower chamber of the actuator until the plug moves to the fully open position.
- Remove the bonnet flange nuts and lift the assembly comprised by the actuator, bonnet and plug, removing it from the valve.

CAUTION

Heavy actuators (size 50 and larger) may require the use of a hoist for their removal. In case the actuator has a lifting ring, use it to lift the assembly, if this lifting ring has not been provided, use a hook or pass lifting straps through the yoke legs to raise the actuator.

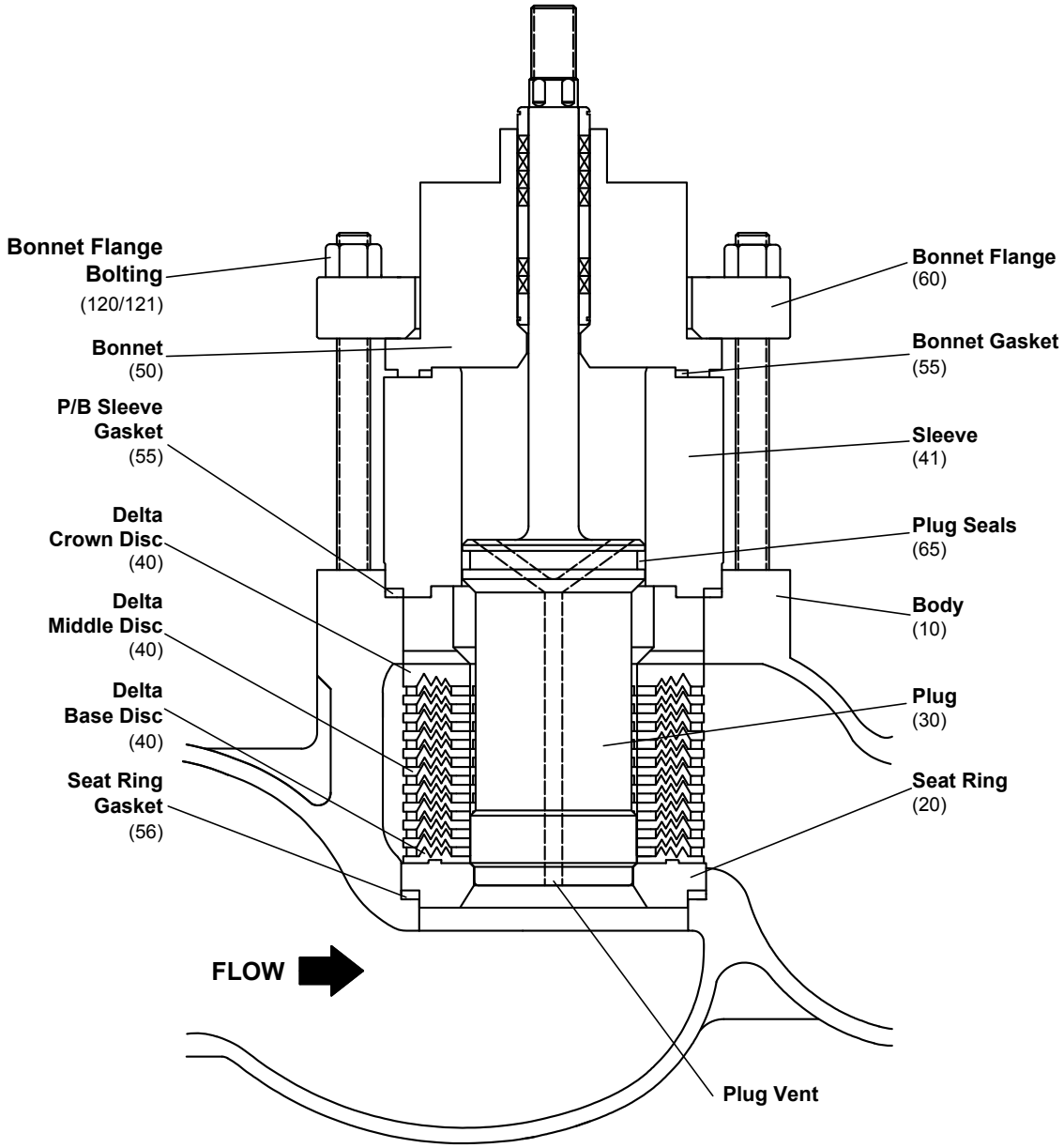

Figure 3: Valve with Pressure-balanced Delta-type Trim

(1) Item numbers above correspond directly to the valve's BOM. Refer to it for specific part numbers.

When lifting the actuator using hooks or lifting straps passed through the yoke legs, take care when the center of gravity is located above the lifting point. In this case, an adequate support must be provided to prevent that the actuator turns and causes accidents.
The assembly comprised by the actuator, bonnet and plug must be always lifted upright to prevent damages to the valve trim.

CAUTION

During the removal of the assembly comprised by the actuator, bonnet and plug of pressure-balanced valves, there is the risk of pressure-balanced sleeve getting stuck in the plug sealing and falling off during the disassembly (specially if PTFE plug seals are used), causing severe injuries, as well as damages

to the valve and to the equipment nearby. The steps below should be read and understood before attempting to separate the plug from the pressure-balanced sleeve.

- If it is found that the pressure-balanced sleeve was stuck in the plug during the disassembly, do not attempt to remove the plug and the sleeve from the valve body.
- Apply air in the upper chamber of the actuator and fully extend the plug, enabling the pressure-balanced sleeve to remain in the body and the bonnet to be lifted above the sleeve.
- In the gap between the upper portion of the pressure-balanced sleeve and the lower portion of the bonnet, place wood blocks with the same thickness in at least three places.
- Apply air underneath the piston and retract the actuator stem until the plug head is free from the pressure-balanced sleeve.

Note: for removing the pressure-balanced sleeve from valves with long strokes, it may be necessary to repeat the above steps several times with wooden blocks of different heights.

- Lift and remove from the valve body the assembly comprised by the actuator, bonnet and plug. Take care to avoid damaging the inner surface of the pressure-balanced sleeve or the plug head. Remove the plug seals installed in the plug head.
- Remove the bonnet gasket.
- Lift the pressure-balanced sleeve and the Delta disc stack, removing these components from the valve body. Most cartridges have the discs welded together, although there are some exceptions to this rule. If the cartridge discs are not welded, remove each one of the discs separately. In larger sizes, the sleeve, the welded cartridge or the crown disc may be too heavy to be removed without the help of a hoist. In these cases, threaded holes are machined in the top of these components to allow the installation of lifting rings.

CAUTION

When removing a Delta cartridge which has a welded disc stack, there is the possibility that the tack welds holding the discs together may fail, allowing the discs to loosen and fall apart.
Keep people and equipment away from the disc stack and from other trim components that are being lifted and removed from the valve body. Failure to observe this warning may cause severe accidents.

- The pressure-balanced sleeve and the Delta cartridge can be cleaned now according to established industrial methods. Contact the manufacturer if you have questions about the method to be used for cleaning a specific Delta cartridge.

WARNING

When cleaning a Delta cartridge with a welded disc stack, do not remove the tack welds for disassembling the cartridge. If this is done, it will be very difficult to reassemble, align and weld the stack correctly. If the cleaning could not be performed without disassembling the cartridge, contact the manufacturer.

- Inspect the hole in the Delta cartridge through which the plug slides and the internal surface of the pressure-balanced sleeve to make sure that there are no scratches or roughness. Superficial scratches can be removed using a fine emery cloth. If there are deeper scratches, contact the manufacturer.

WARNING

Trim components are machined to close tolerances which are essential for correct functioning of the valve. Trying to remove deep scratches could result in high leakage rates or improper functioning of the valve.

- Remove the seat ring, the seat gasket and the sleeve gasket.
- Dismantle the plug apart from the bonnet and from the actuator according to the instructions contained in the maintenance bulletins No. 01, 03 or 06.

1.8 - REASSEMBLING PRESSURE-BALANCED DELTA-TYPE TRIM

For reassembling the pressure-balanced Delta-type trim, see Figure 3 and proceed as follows:

- Clean and inspect the seating surfaces of all gaskets to ensure that no leaks occur. All gaskets should be replaced whenever the valve is disassembled.
- Install a new seat gasket and reinstall the seat ring with the step side downward.

Preassembling: on larger valves, it is better to mount the pressure-balanced sleeve and the assembly comprised by the actuator and bonnet (without the plug) above the valve body prior further assembling. Tighten the bonnet flange nuts until the bonnet is fully seated in the pressure-balance sleeve, and the sleeve by its turn, is fully seated on the body. Measure the distance between the lower face of the bonnet flange and the upper face of the body mounting flange (this measurement will be used during the final tightening of the bonnet flange nuts). Remove the pressure-balanced sleeve and the assembly comprised by the actuator and bonnet and continue reassembling the valve in the correct sequence.
Important: during this pre-assembly, do not use the bonnet gasket and nor the sleeve gasket.

- Install the Delta cartridge (clean) in the valve body: both welded and pinned stacks have an indexing groove machined into the base disc:
  For the welded stack, install the cartridge in the valve body, taking care to align the indexing groove machined on the bottom of the stack with the raised indexing step located on the top of the seat ring.
  For the pinned stack, install the base disc over the valve seat, taking care to align the indexing groove machined on the bottom of the base disc with the raised indexing step located on the top of the seat ring. Place disc #2 over the base disc (see Figure 2) and so on successively, until the crown disc is installed. The alignment pin must be installed into the stack after the second disc has been mounted. This procedure will facilitate assembling discs.

WARNING

Make sure that the feet of the discs are correctly positioned one on top of another, forming a straight line from the base disc to the crown disc. Failure to observe this warning may cause damage to the seat gasket or to the Delta cartridge.

Note: small non-welded cartridges are manufactured with an alignment pin to ensure the proper alignment of discs.

- Install a new sleeve gasket.
- Reinstall the plug in the assembly comprised by the actuator and bonnet, in according to the instructions presented in the maintenance bulletins No. 01, 03 or 06.
- Install new plug seals in the plug head (see maintenance bulletin 11 for mounting the plug seals).
- Reinstall the pressure-balanced sleeve above the Delta cartridge. Use a hoist and lifting rings whenever the sleeve has threaded holes machined in the top.
- Install a new bonnet gasket.
- Retract completely the plug (the stem clamp will indicate the fully open position of the valve) and lower the actuator, bonnet and plug assembly squarely into the valve body and pressure-balanced sleeve.

WARNING

If PTFE plug seals or O-rings are used, the plug may remain retracted when it is inserted into the pressure-balanced sleeve.
If the sealing of the plug is carried out with metal piston rings, the plug must be extended a few inches to allow the use of a ring compressor on the metal rings. A suitably sized screw-type hose clamp may also be used to compress the rings during reassembly.
Special care must be taken with the sealing surfaces (inner surface of P/B sleeve and plug seals) to prevent risks or scratches on these components as the plug starts to slide through the bore of the P/B sleeve.

- Once the bonnet is properly resting on the pressure-balanced sleeve, tighten the bonnet flange nuts with your fingers.
- Using a caliper, measure the clearance between the lower face of the bonnet flange and the top of the body flange, near four studs that are equidistant from each other. The total variation of the clearance should not exceed ±0.010 inch (±0.25 mm).

Tighten or loosen the bonnet flange nuts until this tolerance is reached.

WARNING

The above tolerance should be strictly observed or, otherwise, the plug will rub and gall the inner surface of the cartridge during the procedure below. Note also that the tightening of the bonnet flange nuts should not be greater than 1/6 turn past finger-tight.

- Using the actuator, slowly move the plug, seating it in the seat ring for two or three times. This will allow centering the seat with the plug and also check the alignment of disc stack of the cartridge.

Note: the next step is applicable only to the valves equipped with pneumatic actuators. In case a hydraulic or electric actuator is used, return the plug to the half stroke position and continue tightening the bonnet flange nuts.

WARNING

Failure to return the plug to the half--stroke position (for valves equipped with electric or hydraulic actuators) will cause damages to the actuator and/or to the valve during the bonnet tightening sequence. This is caused because the majority of electric and hydraulic actuators is unable to retract 1/8 in. (3.2 mm) during the tightening sequence of the bonnet flange.

- In case of valves equipped with pneumatic actuators, leave the plug seated on the seat ring and begin tightening the bonnet flange nuts in a criss-cross pattern to keep the bonnet flange parallel to the valve body (within a tolerance of $\pm$0.010 inch or $\pm$0.25 mm). Tighten the first nut 1/6 turn, and then tighten the opposite nut 1/6 turn and so on successively.

- Continue tightening the nuts until the bonnet is firmly seated (metal-to-metal) on the P/B sleeve and that the P/B sleeve, by its turn, is firmly seated (metal-to-metal) on the body. On valves with sizes up to 4 inches, the touching of the bonnet to the P/B sleeve (metal-to-metal) and the touching of the P/B sleeve to the body (metal-to-metal) can be easily felt through the tool. On larger valves or when a torque wrench is required, tighten the nuts until the clearance measured during preassembly (see page 9) is reached.

WARNING

Insufficient tightening of the bonnet flange nuts will result in an improper compression of the gaskets.

- Using the actuator, slowly stroke the plug up and down to check again the correct alignment of the plug with the cartridge. Observe the stem clamp of the actuator to detect possible irregularities in the movement of the valve stem.

WARNING

If an irregular movement of the stem clamp is observed or metallic noise is detected inside the valve, this may indicate an alignment problem of the plug to the Delta cartridge.
Retract the plug completely, disassemble the valve, remove the actuator and the bonnet, and realign the plug with the disc stack, as indicated previously (be sure to replace the gaskets when carrying out the reassembling).
If the plug, the cartridge or the pressure--balanced sleeve were damaged during the cycling of the valve, contact the manufacturer.

- When reinstalling the valve in the piping, make sure that the flow is in the proper direction.

1.9 - TROUBLESHOOTING OF VALVES EQUIPPED WITH DELTA TRIM

Problem	Probable Cause	Corrective Action
Jerky Stem Motion	• Overtightened graphite packing	• Graphite packing is usually associated to the stem jerky movement. Therefore, tighten the packing nuts only as enough to prevent leakage
	• Scratches or marks on surfaces between the plug and the Delta cartridge or between the plug and the pressure-balanced sleeve	• Surface scratches can be removed using fine emery cloth with soft application. If there are any damage more severe, contact factory. **WARNING: components comprising valve trim are machined with precise tolerances, which are essential for the proper operation of the valve. Attempting to remove deeper scratches may result in larger leakage rates or in improper operation of the valve**
	• Overtightened packing	• Adjust the packing nuts with a torque slightly over finger-tight (excessive tightening may cause premature wear of the packing, and will increase the friction with the valve stem)
	• Service temperature is above the operating limits of trim design	• Reconfirm service conditions and contact the manufacturer
	• Insufficient air supply	• Check for leaks in air supply or instrument signal system; tighten loose fittings and replace the leaking ferrules
	• Malfunctioning positioner	• See positioner IOM
Excessive Leakage	• Insufficient tightness on the bonnet flange nuts	• See steps on “Reassembling the Trim” sections for the correct tightening procedures
	• Worn or damaged seat ring	• Disassemble valve and change or repair seat ring
	• Worn or damaged plug seals	• Disassemble valve and replace plug seals
	• Worn or damaged plug seating surface	• Disassemble valve and replace plug
	• Gaskets of the seat, of the bonnet or of the P/B sleeve are worn or damaged	• Disassemble the valve and replace the gaskets
	• Insufficient actuator thrust	• Verify air supply pressure to actuator; if pressure is adequate, double check service conditions and contact manufacturer
	• Improper plug adjustment	• Use the correct procedure for adjusting the plug, indicated in the GL$\bar{S}$, GL$\bar{H}$ and GL$\bar{B}$ valves maintenance bulletins
	• Gasket or seat materials incorret for service conditions	• Check service conditions and contact factory
Excessive Noise Level	• Incorrect flow direction	• Correct the flow direction, which must be always from underneath of the plug
	• Loose parts	• Check the tightening of all external bolts and nuts; if the noise is internal, disassemble the valve and check if there are damaged parts or if the seat gasket is missing
	• Irregular or jerky stem movement	• See corrective actions described in the first item of this table
	• Excessive pressure drop (ΔP)	• Check service conditions and contact factory
	• Throttling too close to seat ring	• The minimum recommended opening percentage for throttling control is 5%
Inadequate Flow	• Incorrect plug adjustment, limiting the stroke	• Use the correct procedure for adjusting the plug, indicated in the GL$\bar{S}$, GL$\bar{H}$ and GL$\bar{B}$ valves maintenance bulletins
	• Incorrect adjustment of the stroke limiter or the manual handwheel	• Use the correct procedure for adjusting the stroke limiter or the manual handwheel in the associated maintenance bulletin
	• Malfunctioning positioner	• See positioner IOM
	• Dirty disc stack	• Disassemble the valve and clean the disc stack according to established industrial methods
	• Service conditions exceed the trim nominal capacity	• Check service conditions and contact the manufacturer

Although Valtek Sulamericana provides precise and detailed installation, operation and maintenance instructions, in accordance with their design reviews, the customer/user shall be responsible for the information provided to generate product specifications, shall understand precisely the operation and maintenance instructions provided with the products and shall provide training for their employees and contracted personnel regarding the safe use of Valtek Sulamericana products, in accordance with the specific applications they were designed for. The information herein shall not be considered as a certificate for assurance of satisfactory results. Valtek Sulamericana products are continuously improved and upgraded and the specification, dimensions and information contained herein are subject to change without notice. For further information or to confirm these presented here, consult Valtek Sulamericana at Rua Goiás, 345, Diadema, São Paulo, Brasil, CEP 09941-690, Phone: 55-11 4072-8600, Fax: 55-11 4075-2477.

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