VELAN

INSTALLATION AND OPERATION MANUAL

VELAN TRAP CONNECTOR STATION (VTCS)

SIZES: NPS ½" & ¾", (DN 15 & 20)

This operating manual contains important information and precautionary notes. It is imperative that the manual be read prior to installation and commissioning. The manual shall always be kept close to the valve's location of installation.

IOM-VTCS-05-16

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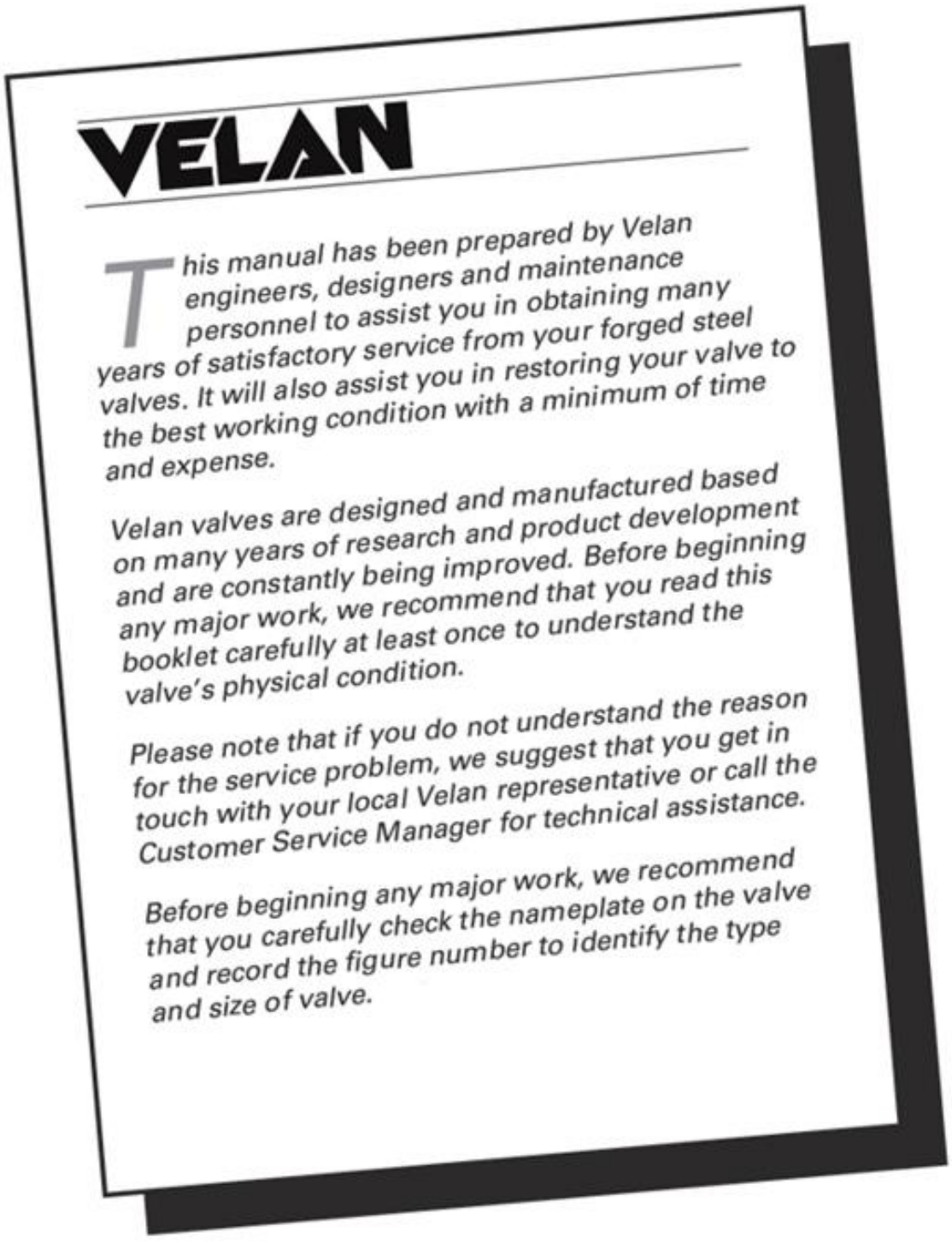
1.1 GENERAL INTRODUCTION



VELAN

This manual has been prepared by Velan engineers, designers and maintenance personnel to assist you in obtaining many years of satisfactory service from your forged steel valves. It will also assist you in restoring your valve to the best working condition with a minimum of time and expense.

Velan valves are designed and manufactured based on many years of research and product development and are constantly being improved. Before beginning any major work, we recommend that you read this booklet carefully at least once to understand the valve's physical condition.

Please note that if you do not understand the reason for the service problem, we suggest that you get in touch with your local Velan representative or call the Customer Service Manager for technical assistance.

Before beginning any major work, we recommend that you carefully check the nameplate on the valve and record the figure number to identify the type and size of valve.

2.1 RECEIVING INSPECTION

All valves must be examined for signs of damage that may have occurred during transportation. Any damage should by analyzed and a report should be issued. Serious damage should be reported to your local Velan representative or to the Customer Service Department so that a suitable arrangement for repairs can be made without delay.

2.1.1 Welding Of Valves In-Line

Personnel performing in-line welding of socket weld and butt weld end valves should use their in-house weld procedures. The interpass temperature should be monitored as not to overheat the valve body and cause possible seat deformation. The valve should be in a closed position during in-line welding.

2.1.2 Post Weld Heat Treatment

Valve post weld heat treatment (PWHT) can be a serious and complicated procedure and it is recommended to only do it when required by the piping code.

Valves requiring PWHT by code should be subjected to local PWHT only. Valves requiring PWHT should be lightly closed and remain in the closed position throughout the entire PWHT procedure. After closing, the handwheel should be slightly backed-off to take the stress out of the stem to gate/disc and stem to drive nut contacts.

NOTE: This is not intended to pull the gate/disc out of the seated position.

2.2 STORAGE

Valves can be stored at any temperature in a sheltered area but must be protected from contamination by dirt or the elements. The valve is shipped with end protectors on the inlet and outlet which should stay in place until the valve is ready to be installed. Before installation, the end protectors must be removed and connections must be checked for cleanliness. Visible foreign matter must be removed from end connections of weld-end valves. The weld end must be cleaned with a suitable solvent, such as acetone or alcohol. Do not use bearing solvents containing fluoride or chloride.

Table 2.1 *Welding guidelines*

MATERIAL GROUP			MINIMUM PREHEAT TEMPERATURE ºF (ºC)		MAXIMUM INTERPASS TEMPERATURE ºF (ºC)	SOAKING TEMPERATURE FOR PWHT TIME: 1 HOUR/INCH (15 MINUTES MINIMUM)
Carbon Steels	P-No.1	A105, WCB, LF2, LCC, LCB, LF1	T < 1.00"	50 (10)	Variable, but shall be controlled when material and weld toughness is required.	1150±50 (620±30)
			T ≤1.00 <2.00"	175 (80)		
			T≥ 2.00"	250 (121)		
	P-No.4	F11, WC5, WC6, P11	300 (149)		600 (315)	1150±50 (620±30)
Low Alloy Steels (Chrome Moly.)	P-No. 5A	F22, WC9, P22	350 (177)		600 (315)	1300±50 (704±30)
Stainless Steels	P-No.8	Series 300	50 (10)		350 (177)	

NOTE:
1. *For preheating, ensure that the temperature reading is at least to a distance of 3 times the wall thickness.*
2. *The above guidelines are for recommendation purposes only. The actual welding procedures (WPS & PQR) used must be qualified to ASME code Section .*

2.3 GENERAL INFORMATION

The end user should ensure that installation, inspection & maintenance work is performed by authorized, qualified personnel who are thoroughly familiar with the manual. Responsibility for employing qualified maintenance / service personnel for positioning and installing the valve lies with the company/operator/user. Planning and installation errors may impair the reliable function of the valve and pose a substantial safety hazard.

2.3.1 Installation Steps:

1. Ensure the valves are in closed position before installation.
2. Blowout the piping and remove the dirt, oil and foreign particles if any present during installation.
3. Before installation ensure that the flow direction arrow is pointing towards the condensate flow direction.
4. Place the unit horizontally and install according to the type of connections as shown in Fig.2.3
5. Remove the end protectors or caps from the valves prior installation.
6. Refer the installation procedure of stem trap and install suitable steam trap with the VTCS.
7. The mating flange face of VTCS and the suitable steam trap must be clean and free of dent marks. The gaskets used for sealing on the mating flanges must be properly centered. The flow passage must be free from any dust or foreign particles.
8. Tighten the fasteners uniformly to prevent inadmissible stresses on the flange.
9. Clean the socket weld end with acetone solvent. Do not use chloride or fluoride solvents.
10. Provide sufficient weather protection to prevent corrosion and other damage caused by penetrating moisture. When painting the pipelines and installations, do not apply paint to the stem, plastic components and actuating elements (function will be impaired).
11. For safety reasons, valves and piping systems operated at high (> 50°C) or low (< 0°C) temperatures must have a warning sign to point out the risk of personal injury involved when touching the hot or cold components.

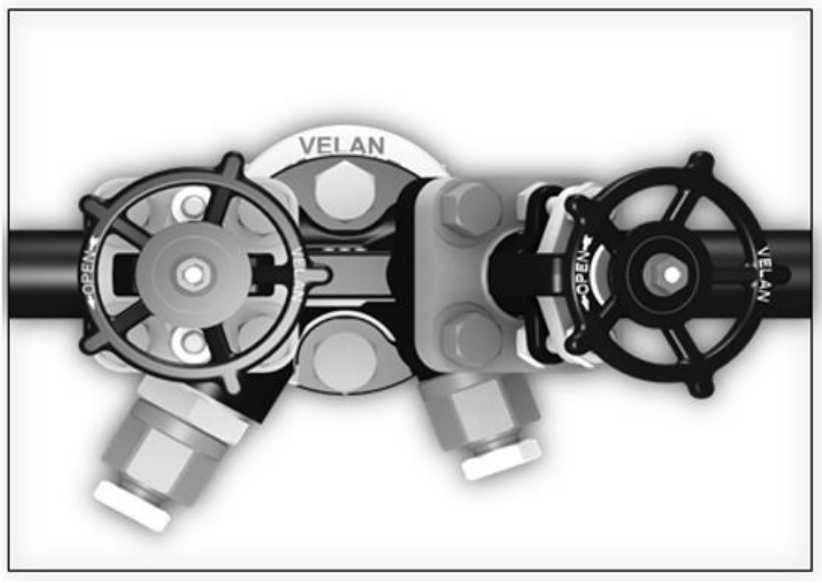


Figure 2.3 *VTCS Installed in Horizontal position*

FOR SAFETY REASONS

It is important to take these precautions before removing a valve from a line.

- *Personnel making any adjustments on the valves should wear safety equipment normally used to work with fluid in the line where the valve is installed.*
- *Before removing the yoke nut under pressure, the valve should be in fully open position in order to prevent injuries.*
- *Before removing a valve from a line, line pressure must be relieved with no exception.*
- *A valve in the fully open position (backseated), should not be jammed-tight (over-torqued), to avoid thermal binding. It is our recommendation that the valve be removed1/4 turn of the handwheel from the fully open position. This will also ensure that packing tightness is verifiable.*
- *Valve standards, such as API and MSS, caution users that successful completion of a backseat test should not be construed as a recommendation by the manufacturer that a valve may be repacked while it is under pressure. The back-seat may be used as a means of stopping or reducing packing leakage until the packing can be replaced under no pressure. Removal of packing with the valve under pressure is at the owner's risk.*

4.1 OPERATION

4.1.1 General

All valves should be checked before being put into operation and should be inspected regularly during operation. Prompt attention should be paid when trouble arises. As a general rule, valves should be subjected to scheduled maintenance.

4.1.2 Smoothness of Operation

Stem threads, stem nuts and other working components outside the fluid area should be lubricated frequently (at least once every six months). Specific lubricants and frequency of application are shown in *Table 4.2.*

IMPORTANT: Excessive handwheel effort can indicate the following:

1. Improperly lubricated or damaged valve stem.
2. Valve packing compression too tight (see *Torque Table 4.1.2*).
3. Faulty or damaged valve parts.

4.1.3 Seat tightness and closing torques

Even a new valve with seating faces lapped to perfection and a full disc contact will be pressure-tight only if sufficient stem load is applied. The minimum stem load for each size of valve varies with operating pressure in order to seal the valve properly. Slight over-torquing will not damage the valve. *(See Torque Table 4.1.3)*

CAUTION: Do not use "cheaters" on the hand wheel.

Table 4.1.2 *Packing flange nut torques for VTCS (graphite packing)*

Valve Size		Class	Stud Size	Torque	
IN	(mm)			lb.in	N.m
1/2"	15	800	1/4 - 20 UNC	17.7	2
3/4"	20				

NOTE: *For other sizes and packing materials, contact the manufacturer.*

Table 4.1.3 *Closing Torque for VTCS*

Valve Size		Class – Testing Pressure (psig)	Torque (lb.ft)	
IN	(mm)		Min	Max
1/2"	15	800 – 2000 psig	10	13
3/4"	20			

4.2 RECOMMENDED LUBRICATION

Table 4.2 *Recommended lubrication*

PART	LUBRICATION	APPLICATION	FREQUENCY
Stem threads	Exxon: Ronex MP, Castrol MP or equivalent MP group (up to 650°F) Ronex Extra duty 2 (above 650°F)	Directly to threads	When threads appear dry
Yoke nut	Exxon: Ronex MP, Castrol MP or equivalent MP group (up to 650°F) Ronex Extra duty 2 (above 650°F)	Inject through grease fitting at hub of yoke	Concurrently with stem thread lubrication
All threaded parts except stem and yoke nut	- Anti-seize compound No. 425-A (Crane) or equivalent - Nickel Anti-Seize to MIL-A-90TE or MOLYKOTE P37 - Nuclear grade nickel base "Never-Seez" N-5000	Thin coat on threads	On valve assembly only

NOTE: *Recommended lubricant subject to change without notice.*

5.1 PACKING CHAMBER LEAKAGE

5.1.1 General *(Figure 5.1)*

If moisture or dripping occurs around the stem (04) or the gland bushing, the following points must be investigated before removing the packing rings (13).

CAUTION: For safety reasons, the valve must be depressurized before removing packing (13) or dismantling gland nuts (16).

1. Check if the packing flange bolting is torqued to the correct torque as shown in *Table 4.1.2.*
2. Make sure the gland bushing (12) is not binding against the packing chamber wall or stem (04). If so, open valve to backseat position and firmly tighten up on backseat. Loosen the gland nuts (16) and realign the gland bushing (12). Retighten the packing flange (11) with the gland nuts (16), a little at a time on each side, then torque down to the correct torque as shown in *Table 4.1.2.*
3. After retightening, cycle the valve three to five times and retighten gland nuts (16) after each cycle until fully consolidated to original torque value *(Table 4.1.2)*. Slacken the gland nuts (16) slightly if torque is too high. If steps 1 to 3 do not stop leakage, proceed with the removal and replacement of packing rings (13).

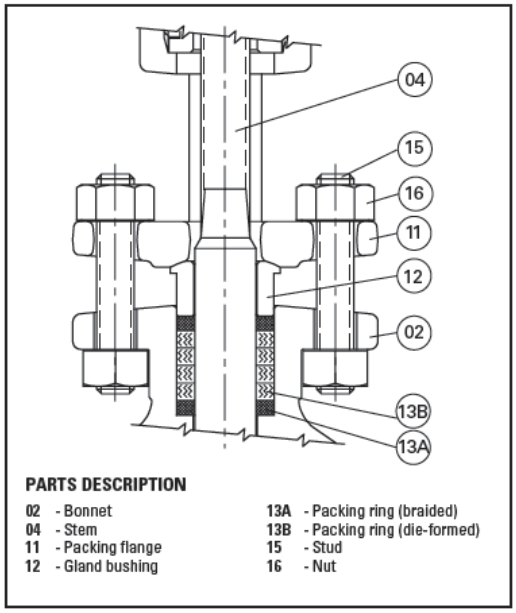


Figure 5.1 *Packings installed*

5.1.2 Packing Ring Removal on Line – Use of Backseat

For safety reasons, follow warning instructions in *Section III* before replacing packing rings on line. The valve must be depressurized.

1. Remove the packing flange nuts
2. Lift packing flange and gland bushing as high as possible and secure.
3. Use special tools to remove the packing rings
4. Blow out packing remains using instrument air or suck out with a vacuum cleaner. Care must be taken not to scratch the stem or the walls of the packing chamber during the removal of the packing rings.

5.1.3 Repacking With Uncompressed Packings

Velan generally uses two types of packings: pre-formed graphite ribbon continuous ring and braided graphite. The packing procedure is basically the same for both types of packing.

Before inserting the packing ring (13A), check the stem (4) and the packing chamber wall to make sure there is no damage. Scratches up to 0.005 in (0.13 mm) can be removed by polishing the surface with an extra fine emery cloth or by machining skim cut.

1. Insert one braided packing ring, followed by intermediate graphite packings and one last braided packing ring. Lower the gland bushing and check for bushing positive engagement.

   NOTE: As a rule of thumb ⅛" (3.2 mm) min. engagement of the gland bushing inside the packing chamber is required.

2. Torque down the gland bolts to torque values shown in *Table 4.1.2.*
3. Cycle the valve approximately the length of the packing chamber. First open then close and retighten the gland bolts to appropriate torque values. Repeat this step approximately four, five times until the packings become fully consolidated (no more loss of torque).

5.2 BODY-BONNET JOINT TIGHTNESS

5.2.1 General

To maintain the joint tightness of a factory-tested bolted bonnet valve, it is essential to exert sufficient bolt tension at all times by having the proper torque on the nuts. The original torque might be lessened due to vibration, relaxation of material caused by frequent temperature and pressure fluctuations, or by creep in high- temperature applications. It is recommended that the gasket joint be inspected for leakage periodically. The joint bolt tension should be checked at approximately one-year intervals.

5.2.2 Body-Bonnet Bolt torquing

The recommendations in this section are for ideal conditions. Due to the many interacting tolerances, some latitude must be allowed in the acceptance standards as follows:

The spiral wound gasket (19) may be fully compressed (zero gap between interfaces of the joint) at 110% of the torque given in *Table 5.2*. The following criteria should be used

The bolt torque is satisfactory if:

a) The spiral wound gasket is fully compressed at 90% of the recommended bolt torque, provided that 100% torque is finally applied.

b) The spiral wound gasket is fully compressed at 100% torque.

c) The gap between the interfaces of the joint is not more than 0.003" (0.08 mm) after 125% torque has been applied and the bolts have been slackened individually and retorqued at 100% torque.

Table 5.2 *Torque values (100%) for body-bonnet bolting*

Bolt Size	Bolting Material : B7, B8M2,8M
3/8 -16 UNC	20 (27)

NOTE: *1) All values lb·ft (Nm).*
Torque tolerance +10%.
2) For other sizes and bolting materials, please contact the manufacturer.

5.2.3 Torque Procedure

1. Clean all studs and nuts and inspect all threads to ensure removal of all foreign matter, rust, corrosion, burrs and previous lubricant.

2. Liberally cover the cap screw (stud) threads and surface under the nut head with anti-seize compound FEL-PRO C5-A or approved equivalent. Also lubricate the female threads of the nuts. Wipe-off, with approved solvent, any excess lubricant that may adhere to the steel parts. Approved solvents for this work are acetone, alcohol or Freon PCA.

NOTE: The use of other solvents is not recommended.

3. With bolts hand-tight, follow the bolt-tightening sequence shown in *Figure 5.2B*. The sequence depends upon the number of bolts employed and the sketch shows only one possible tightening sequence. The bolts must be torqued to the recommended values shown in *Table 5.2*.

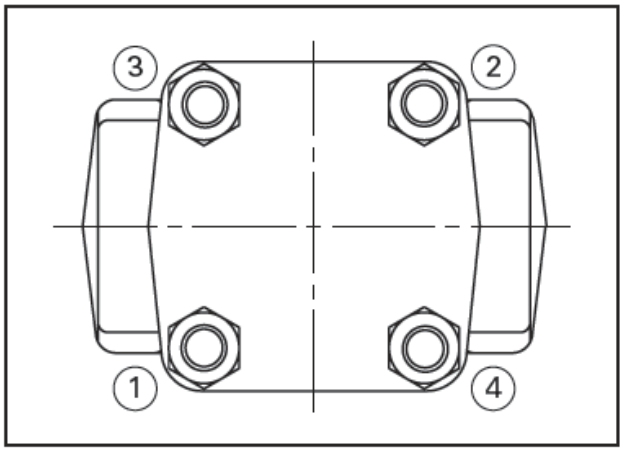


Figure 5.2B *Bolt tightening sequence*

CAUTION:

1. If tightening sequence is not followed, it is possible that the spiral wound gasket will not be compressed evenly, causing the body-bonnet joint to leak.
2. Over-torquing could deform the bonnet flange and cause joint leakage.
3. Do not use an impacting device to draw up the bolting on body and cover/bonnet closures.

5.3 SEAT LEAKAGE

5.3.1 General

An indication that a valve leakage exists after a valve has been properly closed may be found by observing the pressure loss in the line on the high pressure side of the valve. In the case of hot water or steam lines, note whether the downstream pipe remains hot beyond the usual length of time. This type of leak may be the result of a distorted seat, caused by improper welding of the valve into the pipeline, or by stress-relieving temperature that may have been used during installation.

Leaks can also be caused by failure to close the valve tightly, resulting in high-velocity flow through a small opening. In spite of the fact that the hard facing material (Stellite) is corrosion- and erosion-resistant, grooves, pit marks or other surface irregularities may still form on the mating faces. Valves which leak should be repaired as soon as possible to prevent greater damage caused by high-velocity flow.

5.3.1 Seat Repairs:

1. Disassemble the valve as described in *Disassembly of VTCS, Section 8.4,* and inspect the disc and seat for scratches, pitting marks or other damage.

2. If there are deep pitting marks, use a cast iron lapping disc with the proper seat angle and a suitable lapping compound to roughen the surface first. With the use of a new, or already refinished original disc, you can use a finer lapping compound to finish lapping the disc and seat together.

3. a) Use a guiding plate for the stem to maintain alignment during the lapping operation. It can be made from wood or any other suitable material, to the dimensions of the gasket and the bonnet spigot. The section of the plate where the stem extends through must be 1⁄64" (0.4 mm) larger than the outside diameter of the stem.

b) If the valve has a soft-seated disc, all body lapping must be done with a lapping disc and not with a soft-seated disc

4. Evenly distribute a small quantity of lapping compound mixed with olive oil on the two mating surfaces.

5. It is important to apply only light, even pressure when lapping seats and to rotate reciprocally. For best results, use an air or electric hand tool with adjustable speed and reciprocal movement. The lapping tool should be lifted frequently and turned to a new starting position.

5.3.2 Fitting of repaired parts:

1. After the seating faces of the disc and seat have been relapped and cleaned with a suitable cleaning fluid, such as acetone or alcohol, the results of the lapping must be verified by a blueing test to check for full circumferential contact. A blueing ink should be distributed smoothly and equally over the seating diameter of the disc. Slowly lower the part into the body and find the correct mating point of the faces.

2. When fitting the disc, it is important that the inside diameter of the body be checked for sufficient clearance to allow the disc to move freely up and down. A visual examination of the body wall is recommended. Any grooves or scratches should be polished with a fine emery cloth. It is also important to verify that the disc cannot be forced sideways against the outlet side of the waterway bore and become jammed in that position.

3. Verification of contact between the valve disc and the stem is made by a radius on the end of the valve stem and is designed to give center loading for the disc as closely as possible. If particles get caught between the end of the valve stem and the disc, the center of the stem could be destroyed and the disc will not seat tightly.
The contact surfaces of the stem and the disc must be checked first in leaky valves in order to ensure that the disc-stem contact is in proper condition.

NOTE: A quick test is to take the stem-disc assembly and check if the disc can be rocked. The rocking will allow the disc to self-align to the seat.

6.1 VTCS VALVE ASSEMBLY

1. The VTCS consists of two Isolation valves (Globe type), strainer and two blowdown valves. The VTCS designed to interface with Velan UST. Out of two blowdown, one is placed between the Inlet Isolation valve and trap. Second blow down valve, placed between the UST and the outlet isolation valve which also generally named as test port.
2. The built in strainer between the Inlet valve and steam trap is used to filter the steam stream. The steam line frequently contains the solid residual generated from corrosion and other impurities. The strainer prevents the material from lodging in the steam trap and the valve internals which would cause premature failure.
3. A blowdown valve is installed on the strainer port to relieve the pressure in case of pressure buildup during the disassembly. Another blowdown is installed on the test port which is located between the team trap and outlet valve.
4. Two bolt holes are provided on the flange to connect the universal steam trap. The inlet valve can be identified as straight one where as the outlet valve is inclined.

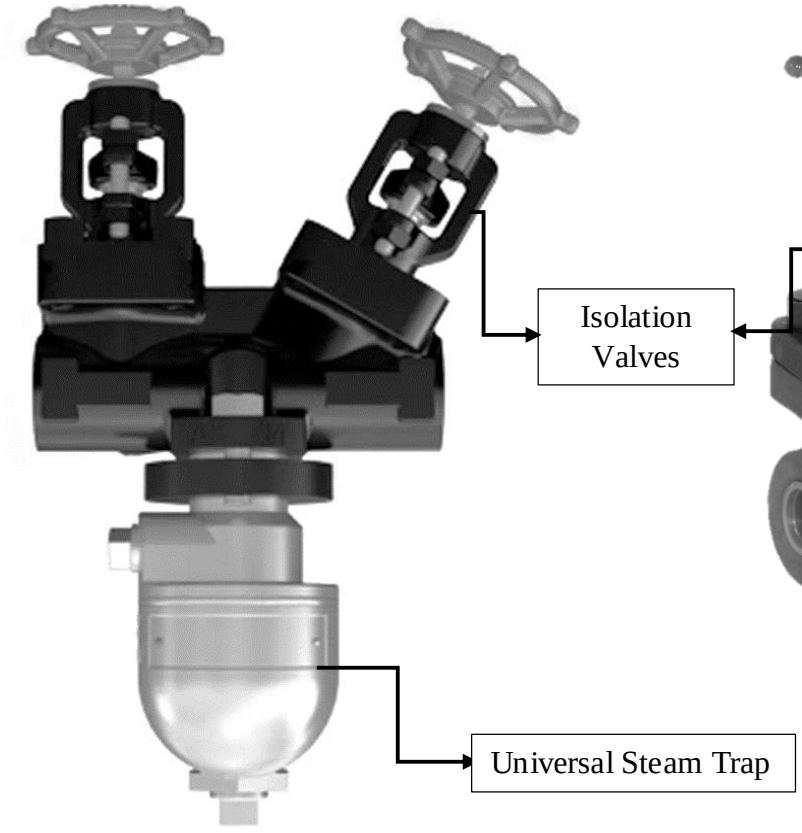


Fig 6.1A: VTCS valve assembly with UST

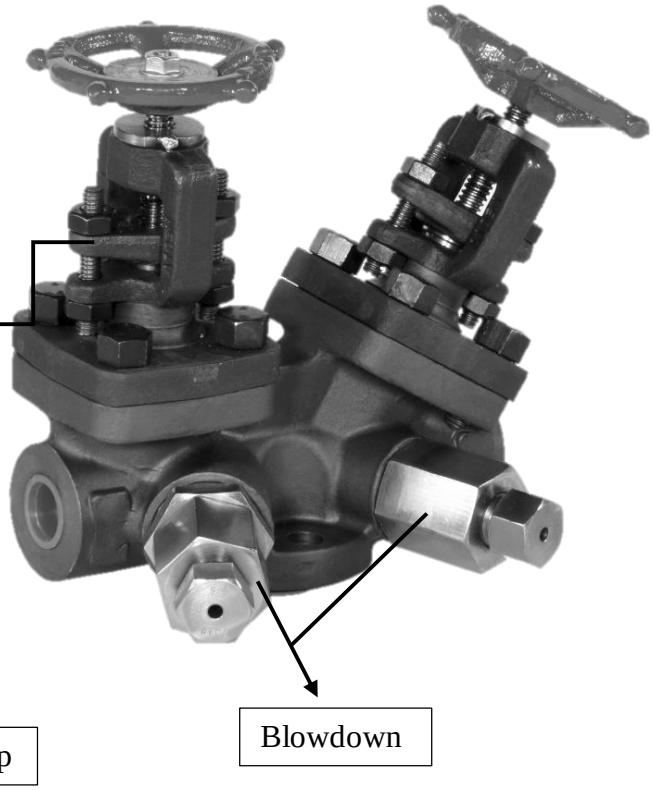


Fig 6.1B: VTCS Construction

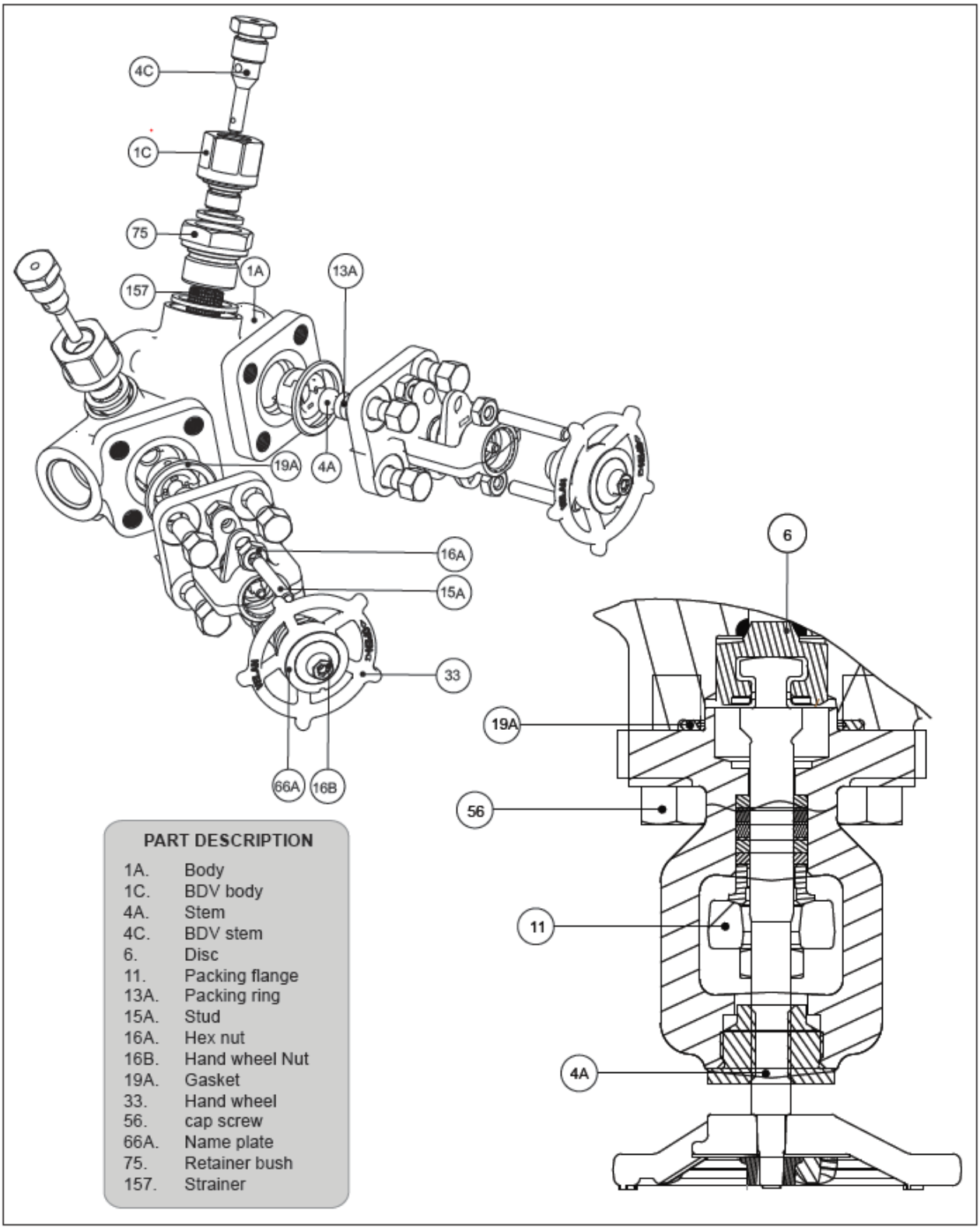


Fig: 6.1 C: Exploded View of VTCS Assembly

6.2 BLOWDOWN CONSTRUCTION

1. Blow down consist of three main components Viz. BDV Body (1C), Stem (4C) and retention pin as shown in figure 6.2.
2. The body outer thread is fastened with the retainer bush (75), which in-turn mates with the main valve body (1A).
3. The stem moves in and out to achieve valve opening and closing.
4. The retention pin is a grooved pin which acts as a stopper and prevents the stem coming out of the body while opening.

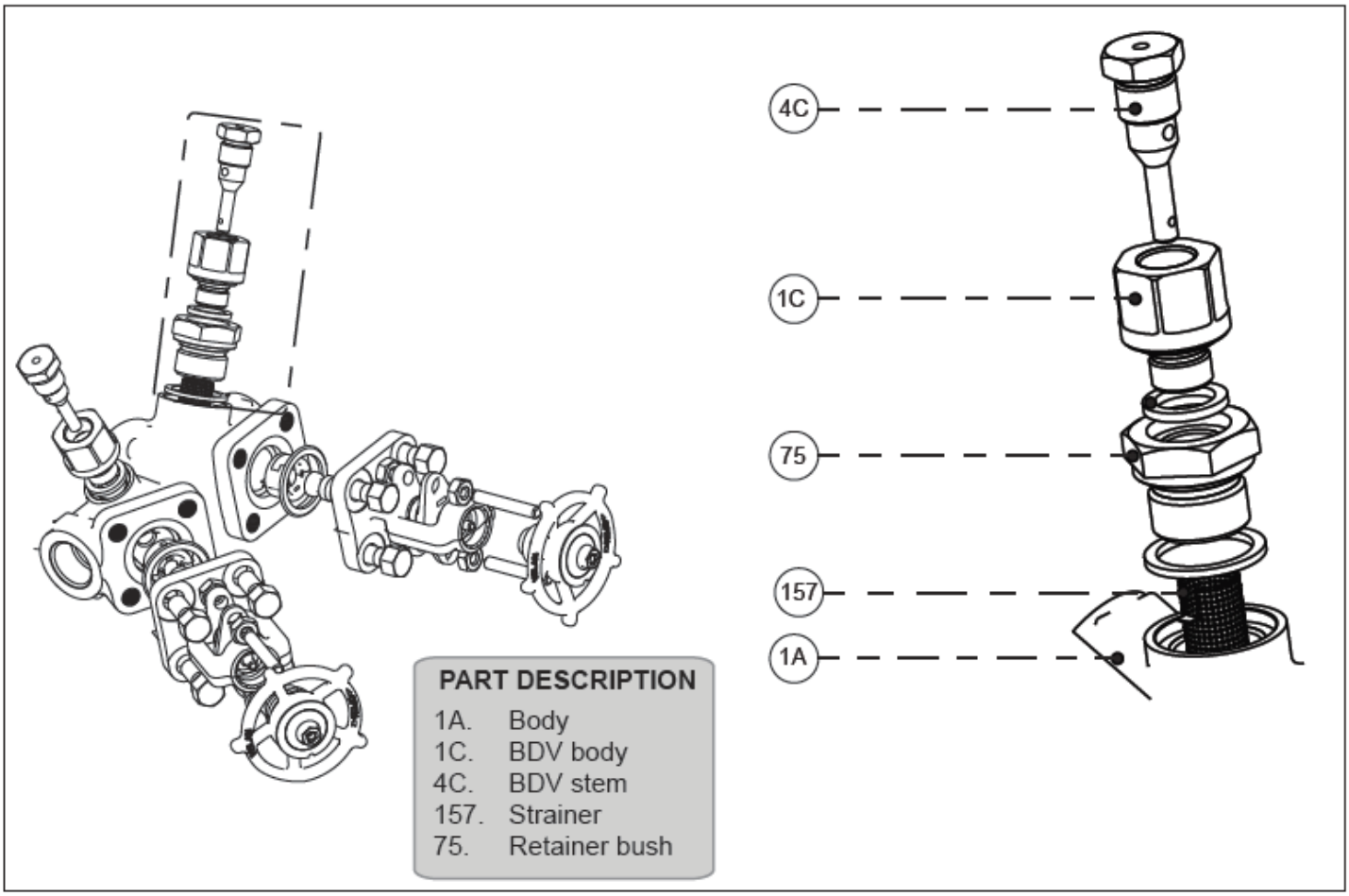


Fig 6.2: Blowdown Valve Construction

7.1 NORMAL OPERATION

During the normal operation, both Isolation valves remain in open condition. The steam flows through the inlet valve and reach up to steam trap. Based on the steam working condition, the trap lets out the condensate through the outlet valve.

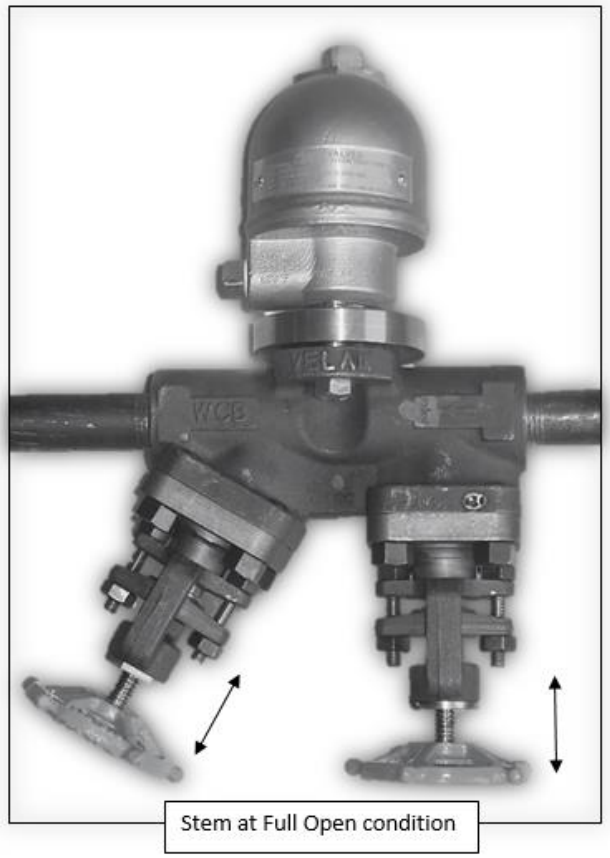


Fig: Isolation Valves at Open position (During Normal Operation)

7.2 BLOWDOWN OPERATION

7.2.1 Closing of Blowdown Valve

1. Hold the body/housing of the Blowdown valve rigidly using a suitable open end spanner.
2. Close the stem in clockwise direction by using a suitable open end spanner to avoid any leakages during operation.

⚠ CAUTION!

! Do not apply excessive load to open the stem. It may damage the retention pin which acts as a positive stopper. Pressure can be relieved by single turn of stem

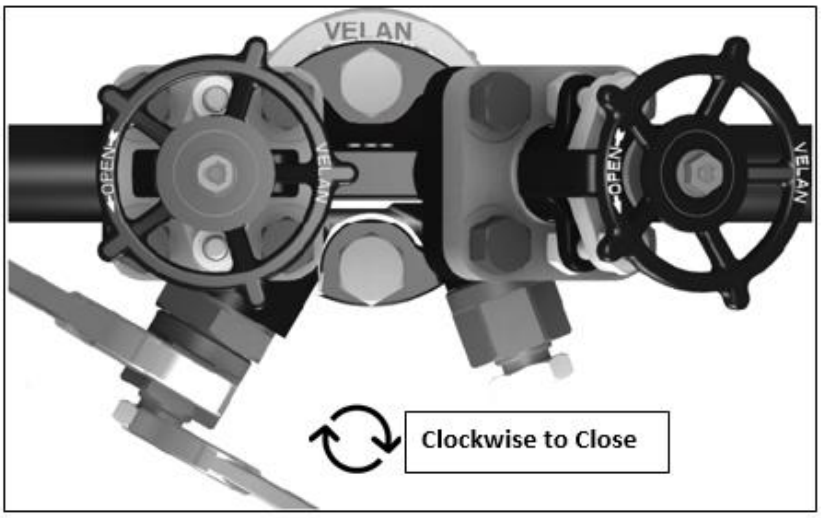


Fig 7.2 a: Closing of Blowdown Valve

7.2.2 Opening of Blowdown Valve

3. Hold the body/housing of the blowdown valve rigidly using a suitable open end spanner.
4. Open the stem in counter - clockwise direction by using a suitable open end spanner to relieve the entrapped steam.

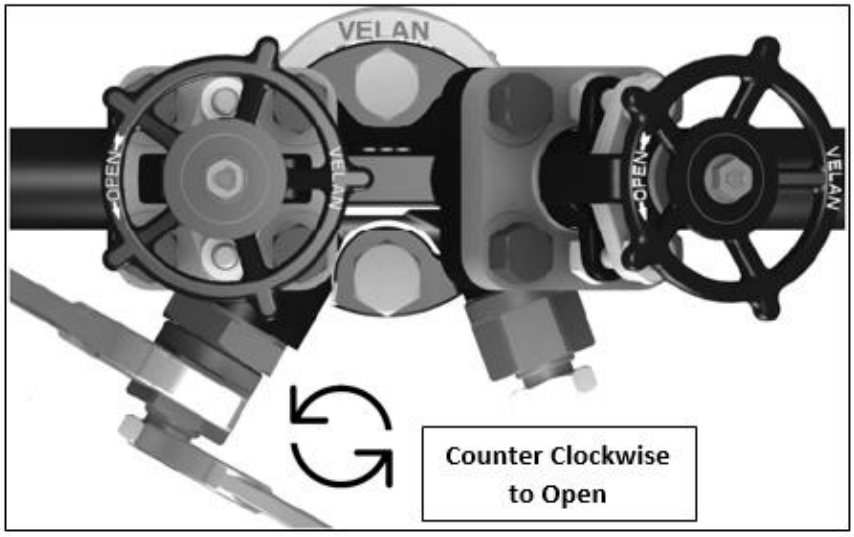


Fig 7.2 B: Opening of Blowdown Valve

⚠ CAUTION!

! Ensure the BDV body is held using suitable open end spanner while the BDV is operated.

! Avoid full opening of BDV stem and excessive torque while loosening of BDV.

8.1 CHECKING TRAP FUNCTION

The BDV screwed on the test port at outlet is used to check the performance of trap. The BDV stem is opened to check the steam and condensate let out to ascertain the trap performance.

8.2 TRAP CHANGEOVER

If the steam trap is found malfunctioning, the following sequence of operation is to be carried out:

1. Close both the inlet and outlet Isolation valves.
2. Open the test valve to release the pressure between the trap and outlet isolation valve.
3. Open the blowdown at inlet to depressurize the system between the inlet and Trap.
4. Once ascertained pressure is completely released, slowly unscrew the trap from VTCS.
5. Install new trap using two bolts. Ensure gaskets are changed without damage.
6. Open the inlet Isolation valve. Check if any leakage between the VTCS and trap.
7. Open the test valve to check the performance of the trap.
8. After ascertaining the performance of the trap, close the test valve and open the outlet Isolation.

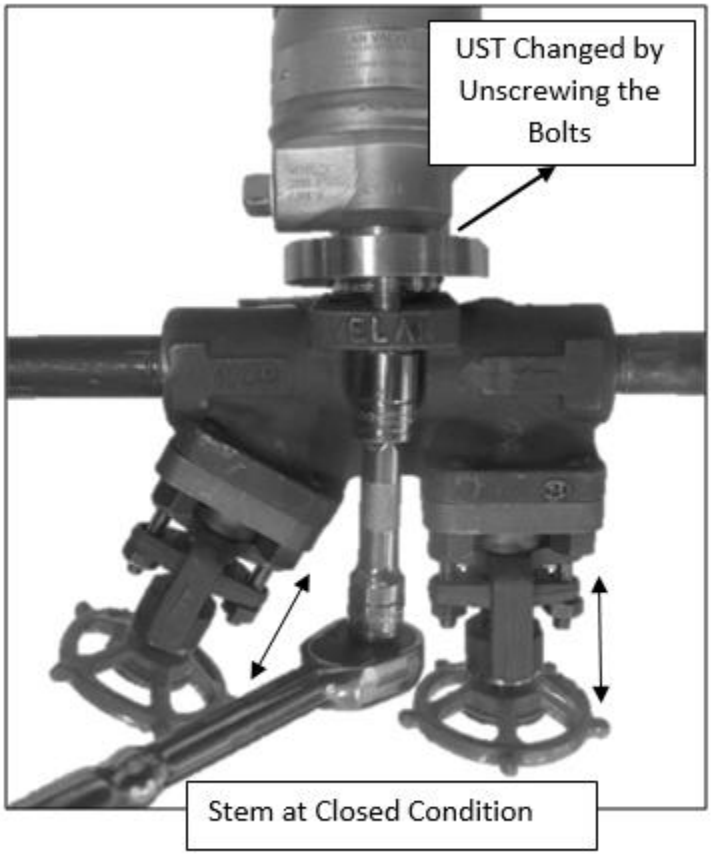


Fig: Trap Changeover

⚠ WARNING!

! Hot condensate and flash steam may be discharged from the test valve. Be cautious as it may harm / injure the personnel

ⓘ NOTE

! Equipment must be operated with in the allowable pressure and temperature as mentioned in Name plate.

8.3 VTCS TROUBLE SHOOTING

SYMPTOM	GENERAL PROBLEMS	SOLUTION	DETAILS
Valve Shaft won't rotate	Valve packed with debris	Flush or clean valve to remove debris	
	Valve stem bend/Seizure	Replace the stem	Contact Velan
Packing Leak	Gland bushing binding	Loosen the gland bush and re-adjust bushing	
	Packing rings damaged	Depressurize the valve and replace packing rings	
	Packing worn out	Depressurize the valve and replace packing rings	
	Stem/Packing chamber damage	Repair or replace the stem	Contact Velan
Valve Leak	Valve not closed fully	Close the valve fully (Do Not Use Cheaters)	
	Debris trapped in the valve	Cycle and flush to remove debris	
	No full circumferential	Lap seat	General manual
Jerky operation	Valve Jams or hard to close	May need pressure relief	Contact Velan
	Valve does not open		
	No full circumferential sealing contact	Loosen packing, hand tighten to a torque value in the table, cycle and retighten	
Blow down valve (BDV) leak	Not closed fully	Close the stem fully (Do not apply excessive torque)	
	No circumferential sealing contact/contact damage	Replace the steam or BDV	Contact Velan
Blow down valve joint leak	Loosening of Blow down valve	Tighten it appropriately	
	Gasket damage	Replace gasket	Contact Velan
BDV open	Failure of stopper pin (grooved pin)	Replace the pin	Contact Velan
Strainer Clog	Clogged with debris	Flush the debris by opening blowdown	
	Strainer fully clogged	Replace with new strainer	Contact Velan

8.4 DISASSEMBLY OF VALVE

There are two basic ways to disassemble the valves depending on the maintenance requirement

a) Total disassembly
b) Partial disassembly

TOTAL DISASSEMBLY	PARTIAL DISASSEMBLY
1. Valve internal 2. Spiral wound gasket 3. Disc 4. Strainer 5. Blowdown etc.,	1. Valve top works 2. Handwheel etc.,

NOTE: Make sure that the pressure is completely relieved from both sides of the valve before starting disassembly work.

8.4.1 Total Disassembly:

The disassembly instructions below cover the Velan's basic designs. As general disassembly progresses, place matching marks on parts so that the same orientation of parts can be maintained at reassembly.

8.4.2 Disassembly of Top Works:

1. The valve should be in a partially open position.
2. Remove the body-bonnet cap screw.
3. Once all the cap screws are removed, the entire yoke-bonnet assembly can be lifted out of the valve body.
4. Remove used spiral wound gasket.

NOTE: If a valve has been in high-temperature service for an extensive period of time, the cap screw may be seized to the body. Tight nut threads can sometime be loosened by applying penetrating oil or heat to the nut and working it free. As a last resort, a hacksaw, cutting torch or cold chisel can use to cut the nut away from the stud. When lifting the Yoke-bonnet assembly, care should be taken to prevent internal parts from disengaging from the stem. The disc is attached to the stem with a "T-slot "and they could slip off the stem when it disengages from the guides in the body.

5. The valve is now ready for inspection and repairs of disc, seat, etc.
6. During the inspection, check the conditions of the body-bonnet cap screw. If cap screw is found damaged, remove and replace them.

8.4.3 Disassembly of Blowdown:

If any leakage occurs through the blowdown, it can be removed as mentioned below.

1. Use appropriate wrench to unscrew the body (1B) of blowdown. The entire blow down assembly shall come out.

⚠ CAUTION!

! Make sure that the spanner is held rigidly on the Blowdown body. Depending on the thread type, the rotation of spanner could be clockwise or anticlockwise.

2. Check the graphite gasket. If the gasket is damaged, it need to be removed.
3. The Blowdown valve is ready for inspection and repair of the seat.

8.4.4 Disassembly of Strainer:

1. Using suitable wrench, unscrew and remove the retainer (75) which holds the strainer (157).
2. If you find hard to remove the strainer, use appropriate tools to remove the strainer from the body.
3. Check the graphite gasket. If the gasket is damaged, it need to be replaced.

8.4.5 Removal and Replacement of Strainer:

1. The strainer can be cleaned on regularly scheduled maintenance basis.
2. If the clogging appears, remove the strainer, inspect the screen and clean the debris. Replace with new strainer when needed.
3. Place the new or cleaned strainer into the body cavity. Observe that the strainer has got an orientation lock. Strainer lock need to be placed in to the cavity provided in the valve body

8.5 REASSEMBLY OF VALVE

The reassembly procedure are not as detailed as the disassembly procedure since in most cases the reverse procedure is required.

1. The most important consideration is the cleanliness of all parts. Rust and dirt should be removed from all the parts with a wire brush or emery cloth. Oil and grease should be removed with suitable solvents.
2. Threaded parts (Cap screw, studs, nuts, retainer bush, and blowdown) must be well lubricated. Old grease should be removed from the stem and the stem nut thread before the new coat of grease is applied. Recommended lubricants can be found in Table 4.2.
3. Repaired or replaced parts must be checked to make sure that repair procedures have been followed and that the replaced parts (e.g. packing rings, spiral wound gaskets, gasket ring, etc.) have been checked for size so that they fit into the valve you are servicing.
4. All orientation marks assigned during disassembly must be checked to ensure the valve is assembled correctly.

8.5.1 Reassembly of Blow Down Valve:

1. Check the gasket before the Blowdown valve is assembled with valve body.
2. Apply thread locker (recommended) on the threads and assemble the Blowdown valve with the main valve body.
3. Allow the thread lock to cure for 15 minutes before it exposed to the working medium.

SPARE PARTS

Table 9.1

VALVE TYPE	PRESSURE CLASS	FIGURE No.	SIZE	BODY & BONNET JOINT					
				GASKET DIMENSION				STUD SIZE	STUD QTY.
				O.D.	I.D.	HEIGHT	TYPE		
VTCS ½" & ¾" Bolted Bonnet Globe	800	03-2444B / 2464B	½"	1.063	1.048	0.125	Flexital	¾" -16 UNC x 1.375	8
		04-2444B/ 2464B	¾"						

Table 9.2

VALVE TYPE	PRESSURE CLASS	FIGURE No.	SIZE	PACKING CHAMBER						
				PACKING DIMENSION			QTY.	GLAND STUD SIZE	STUD QTY	NUT QTY.
				O.D.	I.D.	HEIGHT				
VTCS ½" & ¾" Bolted Bonnet Globe	800	03-2444B/ 2464B	½"	0.344	0.563	0.125	5	¼"-20 UNC x 1.625	4	8
		04-2444B/ 2464B	¾"							

Table 9.3

VALVE TYPE	PRESSURE CLASS	FIGURE No.	SIZE	BLOW-DOWN VALVE ASSY	
				COTTER PIN SIZE	QTY.
VTCS ½" & ¾" Bolted Bonnet Globe	800	03-2444B/ 04-2444B	½" & ¾"	3/32" x 0.375"	2