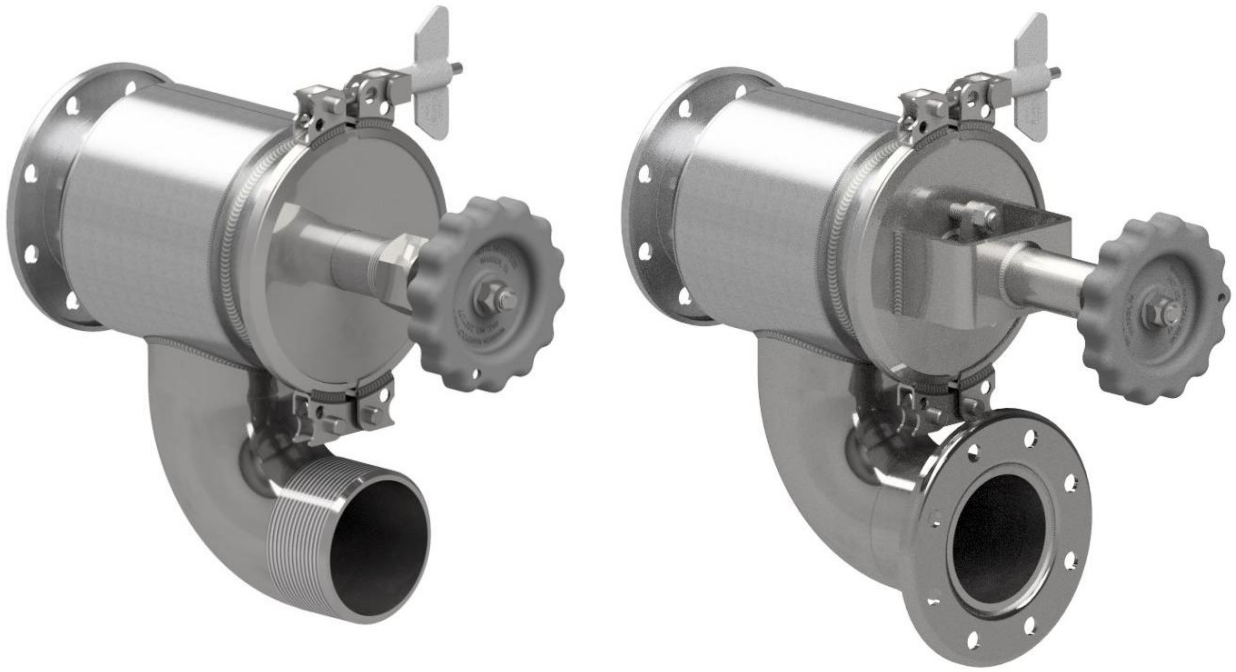
PART NUMBERS (Including, but not inclusive)

QC703SST	QR70_SST	QY70_SST	JQ70_SST	JY70_SST
QC713SST	QR71_SST	QY71_SST	JQ71_SST	JY71_SST
QC763SST	QR72_SST	QY72_SST	JQ72_SST	JY72_SST
QC773SST	QR73_SST	QY73_SST	JQ73_SST	JY73_SST
	QR76_SST	QY76_SST	JQ76_SST	JY76_SST
	QR77_SST	QY77_SST	JQ77_SST	JY77_SST



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6.0 Disassembly and Rebuild Instructions
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1.0 General Maintenance Manual Guidelines

1.1. It is strongly recommended that this entire manual be read prior to any operation, disassembly, or assembly of this equipment.

1.2. Betts Industries, Inc. provides this manual as a guideline for reference only and assumes no responsibility for personal injury or property damage that may occur in conjunction with this manual. Betts Industries, Inc. cannot be held responsible for incorrect installation, operation or maintenance of this equipment.

1.3. Use only genuine Betts replacement parts. Substitute parts will void all warranties and could impair the proper function making this equipment unsafe. Product warranty shall be void if equipment is subject to misapplication, misuse, neglect, alteration, or damage.

1.4. Betts Industries, Inc. recommends all equipment be placed on a regular maintenance schedule that includes the routine replacement of seals and visual inspection for leaks and corrosion. The end user must make their own determination and set their own schedule based upon specific use and severity of the application and environment. At a minimum, yearly preventive maintenance including replacement of wear items and seals is recommended. In some cases, regulations may dictate the minimum testing frequency of items. Make sure operators are aware of all applicable codes.

1.5. Only trained and qualified personnel should perform maintenance on this equipment.

1.6. As with any maintenance work, proper safety gear must be utilized and approved procedures must be followed at all times. Examples of safety gear may include but are not limited to gloves, safety goggles, face shields, protective suits and respirators. It is the responsibility of the person/company working on this equipment to identify the hazardous products that the equipment has been exposed to and designate specific and appropriate protective gear and safety procedures.

1.7. Safety alert symbols are used to alert operators to potential personal injury hazards. These symbols are per ANSI Z535.5 and are listed below. Operators MUST obey all instructions that follow a safety symbol. Alerts will be used to indicate known safety concerns.

⚠ DANGER	Indicates an imminently hazardous situation which, if not avoided, **will result** in death or serious injury.
⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, **could result** in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, **may result** in minor or moderate injury. It may also be used to alert against unsafe practices.

1.8. A list of hazards may include but are not limited to fall hazards, pressure hazards, loaded springs, corrosive material, flammable product and pinch points. Additional concerns are possible and should be identified and avoided by the operator.

1.9. Specific details described in this document are for reference only and are subject to change without notice. See Betts webpage for the most recent revision to this document. www.bettsind.com

1.10. ⚠ **WARNING:** This product can expose you to chemicals including Chromium (hexavalent compounds), which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to: www.P65Warnings.ca.gov

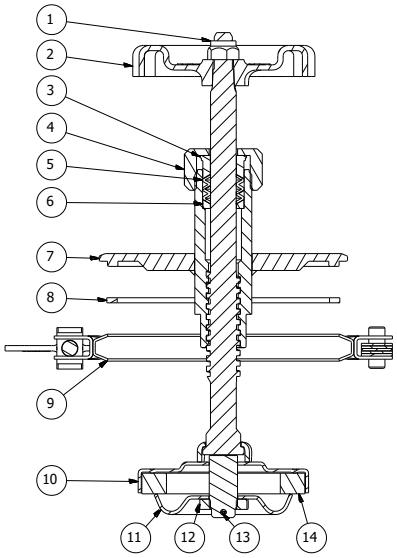
1.11. For additional questions or more detailed technical assistance, contact Betts, Customer Service, Sales or Engineering Department at (814) 723-1250.

1.0 Parts List

QRB & QC STYLE					
No.	Description	Size	Req.	Material	Part no
1	Hex Nut 7/16-14 Thread	3" & 4"	1	Steel Zinc Plate	9Q8579
				304 Stainless	9Q8580
2	Hand Wheel	3"	1	Aluminum	25186AL
		4"		Aluminum	25245AL
3	Top Gland	3" & 4"	1	316 Stainless	15220SS
4	Stuffing Box Nut	3" & 4"	1	Aluminum	15026AL
			1	304 Stainless	15026SL
5	Packing (3 Rings)	3" & 4"	1	Teflon	15227NT
6	Bottom Gland	3" & 4"	1	316 Stainless	15076SS
7	Top Head & Bonnet	3"	1	316 Stainless	15573SS
		4"	1	316 Stainless	16126SS
8	Top Head Gasket	3"	1	Cork Buna-N	15905CB
				Teflon-Envelope	15905TF
		4"	1	Cork Buna-N	15977CB
				Teflon-Envelope	15977TF
9	QRB Clamp Ring	3"	1	304 Stainless	25641SL
		4"		304 Stainless	25683SL
10	Disc Holder & Stem	3"	1	316 Stainless	17683SS
		4"	1	316 Stainless	17684SS
11	Disc Retaining Plate	3"	1	316 Stainless	17028SS
		4"	1	316 Stainless	15051SS
12	Disc Plate Nut	3" & 4"	1	316 Stainless	15204SS
13	Cotter Pin – 1/8 x 1	3" & 4"	1	316 Stainless	9Q5867
14	Disc	3"	1	Buna-N	15202BU
				Non-Asbestos	15202NA
				Teflon	15202TF
				Viton	15202VT
		4"	1	Buna-N	15024BU
				Non-Asbestos	15024NA
				Teflon	15024TF
				Viton	15024VT

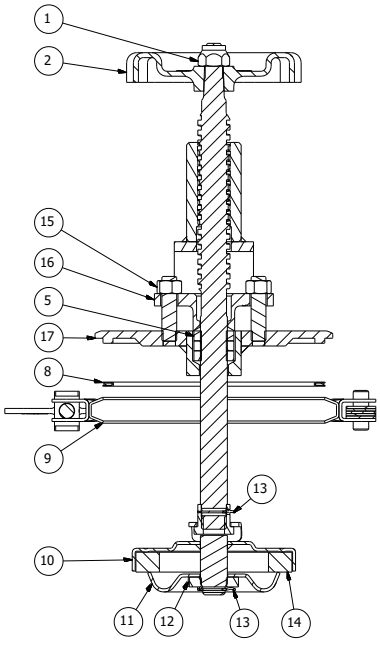
OUTSIDE SCREW & YOKE STYLE					
No.	Description	Size	Req.	Material	Part no
1	Hex Nut 7/16-14 Thread	3" & 4"	1	Steel Zinc Plate	9Q8579
				304 Stainless	9Q8580
2	Hand Wheel	3"	1	Aluminum	25186AL
		4"		Aluminum	25245AL
5	Packing (3 Rings)	3" & 4"	1	Teflon	15227NT
8	Top Head Gasket	3"	1	Cork Buna-N	15905CB
				Teflon-Envelope	15905TF
		4"	1	Cork Buna-N	15977CB
				Teflon-Envelope	15977TF
9	QRB Clamp Ring	3"	1	304 Stainless	25641SL
		4"		304 Stainless	25683SL
11	Disc Retaining Plate	3"	1	316 Stainless	17028SS
		4"	1	316 Stainless	15051SS
12	Disc Plate Nut	3" & 4"	1	316 Stainless	15204SS
13	Cotter Pin – 1/8 x 1	3" & 4"	1	316 Stainless	9Q5867
14	Disc	3"	1	Buna-N	15202BU
				Non-Asbestos	15202NA
				Teflon	15202TF
				Viton	15202VT
		4"	1	Buna-N	15024BU
				Non-Asbestos	15024NA
				Teflon	15024TF
				Viton	15024VT
15	Gland Nut	3" & 4"	2	304 Stainless	9Q5809
16	Packing Gland	3" & 4"	1	304 Stainless	16758SL
17	OS&Y Top Head & Bonnet	3"	1	316 Stainless	26133SS
		4"	1	316 Stainless	26138SS
18	Disc Holder & Stem	3"	1	316 Stainless	28003SS
		4"	1	316 Stainless	28004SS

QRB Style



NOTE: Quick Clean Hydrolets (QC version) are only offered in the 3" size but use a 4" clamp ring, 4" top head gasket and 4" top head and bonnet.

Outside Screw & yoke (OS&Y) Style



2.0 Description and Intended Use

2.1 The Betts Quick Release Bonnet (QRB) hydrolet valve is designed to be used for a manual external loading/unloading stop valve. Typical use is a secondary stop valve working in conjunction with a primary self-closing stop valve. The QRB valve provides for a quick release clamp ring design, making it easy to clean the valve body and replace the seat and packing of the valve without unmounting it from the trailer. The valves are made from 316 stainless steel for compatibility with a wide range of products. Hydrolet valves are also available in a steam jacket version for use with temperature sensitive products.

2.2 There are 3 distinct QRB style valve families:

2.2.1 Standard QRB – Quick Release Bonnet - This style incorporates a large body diameter with a necked down bonnet flange and would be considered the standard hydrolet style.

2.2.2 QC – Quick Clean style – This style incorporates a casting body for seamless construction. It is only offered with a 3” inlet and 3” outlet. The clamp ring, top head gasket and top head bonnet are all the 4” size.

2.2.3 OS&Y – Outside Screw & Yoke – This style refers only to the top head and bonnet design, which can be put on either of the body styles described above. The OS&Y utilizes a threaded yoke that is exterior of the valve and isolates the threads of the stem from the product being hauled.

NOTE : Please see important safety information on OS&Y design in Engineering Bulletin EB-08-99.

3.0 Installation

3.1 A flat mounting surface must be provided for the valve inlet flange.

3.2 Gaskets are available to seal between the mounting flange and the inlet flange of the valve. See section 40 of the catalog for details.

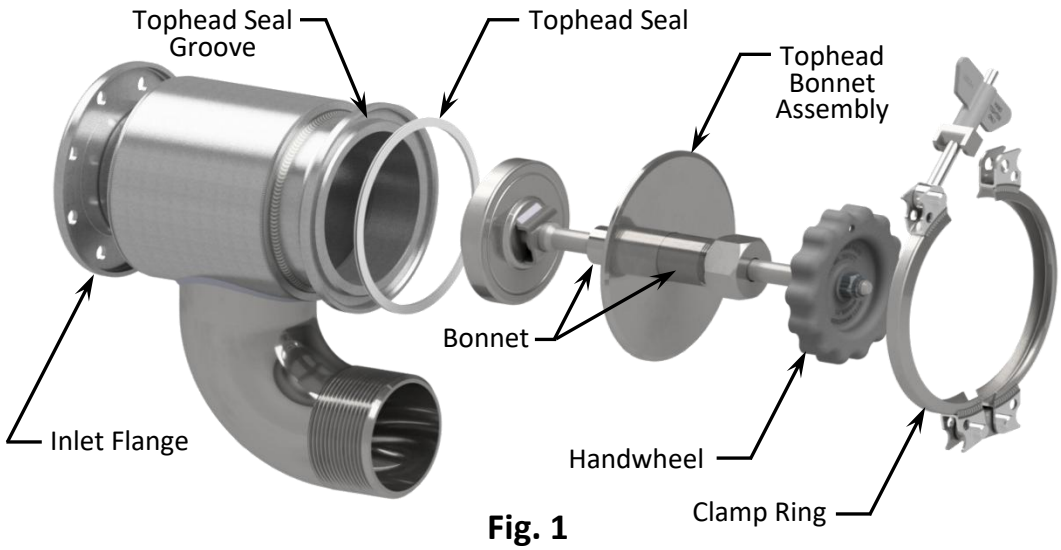


Fig. 1

3.3 When bolting the valve inlet flange to the mounting flange, care should be taken to be sure to not over compress gasket material. Initial tightening should be done with a star pattern with gradually increasing bolt torque followed by clockwise pattern to ensure even pressure on gasket.

3.4 To install the top head and clamp ring assembly:

3.4.1 Inspect valve to ensure all components are genuine Betts’ parts and not “look-alike” replacements. Non-Betts’ parts will impede the proper function and safety of the valve.

3.4.2 Inspect valve and replace any worn or damaged parts. Pay particular attention to gaskets and sealing surfaces.

3.4.3 Inspect *Tophead Seal Groove* to ensure groove is clean and free of corrosion or debris. (See Fig. 1)

3.4.4 Install *Tophead Seal* in *Tophead Seal Groove*. (See Fig. 1) Various styles of seals are available, such as a PTFE Envelope gasket or a Teflon Encapsulated O-ring.

3.4.5 Before the *Tophead Bonnet Assembly* can be properly seated on the valve body, the *Handwheel* **must** first be rotated counterclockwise until the visible threads of the stem are hidden within the *Bonnet*. (See Fig. 2)

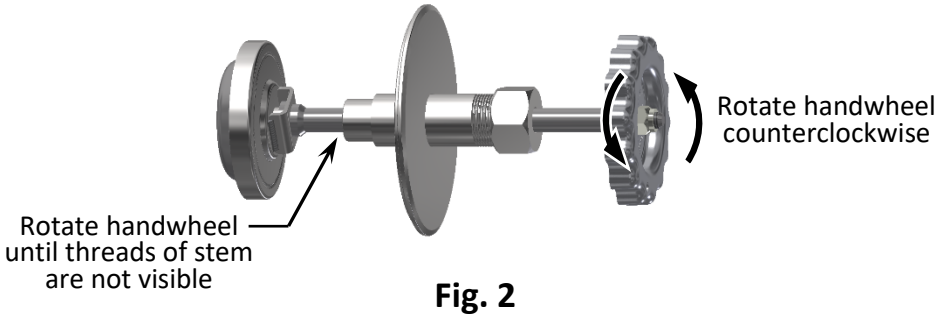


Fig. 2

3.4.6 Place *Tophead Bonnet Assembly* on valve body and wrap *Clamp Ring* around perimeter of *Tophead Bonnet Assembly* and *Valve Body* so the "V" shaped clamp ring halves engage the tapered edges of the *Tophead Bonnet Assembly* and *Valve Body*. (See Fig. 3)

3.4.7 Pull the Clamp Ring halves together and rotate *Wing Nut/Swing Bolt Assembly* into place. (See Fig. 4)

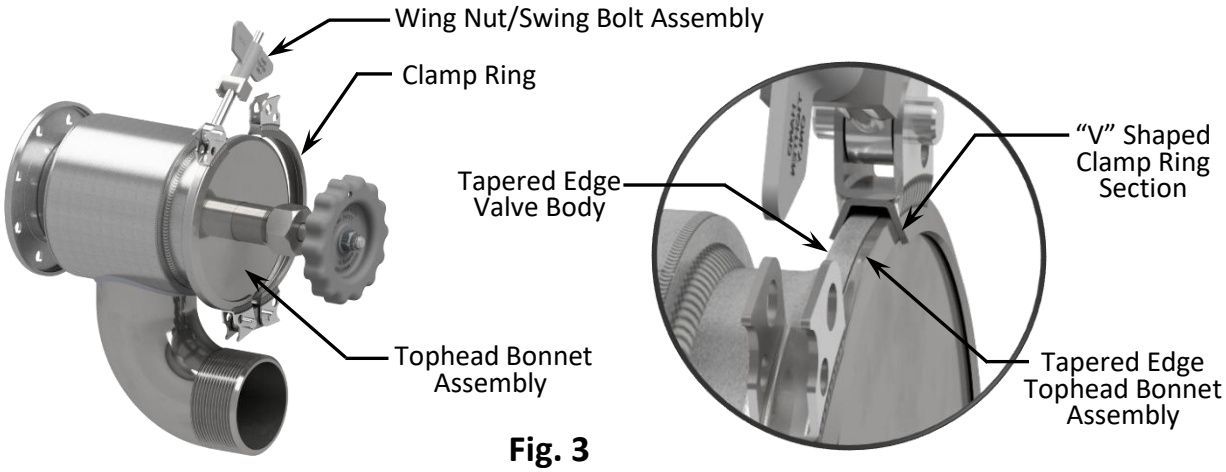


Fig. 3

3.4.8 Ensure that the *Wing Nut Washer Ears* straddle both sides of the *Clamp Ring Lug*. (See Fig. 4) Failure to do so can allow Clamp Ring Lugs to spread apart, leading to failure of Clamp Ring.

3.4.9 Gently tap each *Clamp Ring* half at Point "A" and Point "B" (See Fig. 4) with a non-sparking and non-marring hammer to help seat the *Clamp Ring*.

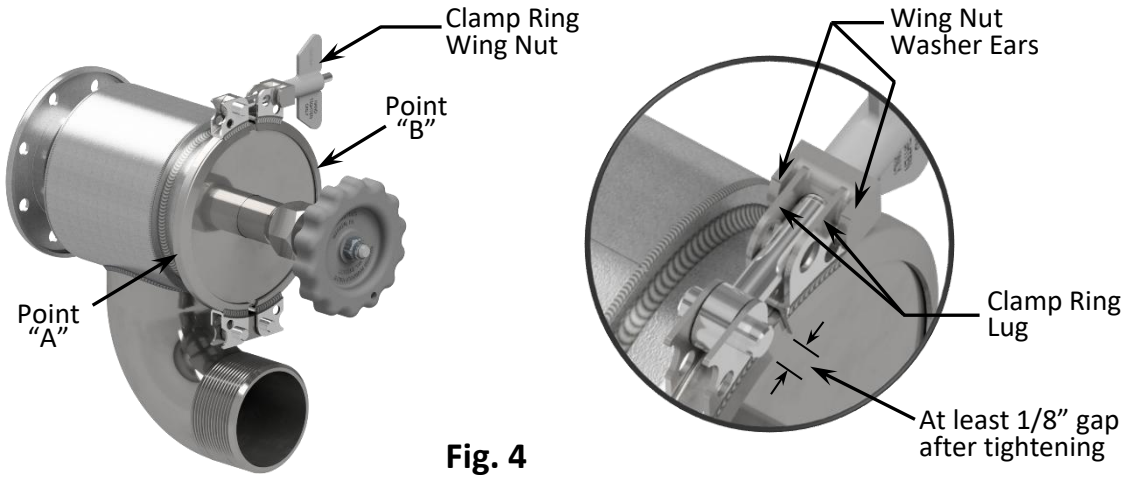


Fig. 4

3.4.10 Tighten the *Clamp Ring Wing Nut* "hand-tight" to **no more than** 7.5 lbf·ft [10.2 N·m] torque.

⚠ WARNING	**Do not exceed 7.5 lbf·ft torque on *Clamp Ring Wing Nut*. Greater torque can damage clamp ring assembly causing failure of Clamp Ring.**

3.4.11 Inspect the *Clamp Ring* to ensure it is seated properly around the entire perimeter and inspect to make sure there is at least an 1/8" gap between the ends of the clamp ring. See figure 4. Replace the clamp ring if needed.

3.4.12 Leak test the Hydrolet valve prior to returning to service.

4.0 Inspection and Testing

4.1 Once the valve has been mounted and the top head is correctly in place, pressure can be applied to the valve to test for leaks. Do not stand in front of valve during testing.

4.2 Apply no more than 35 psi to valve.

4.3 Inspect inlet flange connection, clamp ring joint, and stem packing for leaks.

4.4 See Engineering Bulletin EB-03-18 for additional testing details.

5.0 Disassembly and Rebuild Instructions

5.1 Prior to disassembly always wear protective gear appropriate to the product being transported. Examples may include gloves, safety goggles, face shields, protective suits and respirators. It is the responsibility of the operator to know the product being hauled and the gear required.

5.2 Ensure the primary outlet (emergency valve) is closed and the piping and hydrolet do not contain pressure or product.

⚠ WARNING		**Pressure Hazard** – Cargo tank, piping or valve may contain residual pressure and failure to safely relieve could result in sudden loss of pressure causing death or serious injury.

WARNING		**Flammable Product** – Cargo tank, piping or valve may contain product that could present risk of fire, explosion or other hazards resulting in death or serious injury.
WARNING		**Corrosive Material** – Cargo tank, piping or valve may contain corrosive material. Protective clothing including gloves and face shield shall be worn.

5.3 Place appropriate container under outlet of valve to catch any residual product.

5.4 Remove any cap or cover that may be on the outlet piping of the valve.

5.5 Slowly turn the hand wheel of the valve in a counterclockwise direction. If any product drains from the outlet of the valve, stop and turn handwheel in clockwise direction to close valve. Do not continue until you have verified the primary outlet valve is closed and the piping is empty.

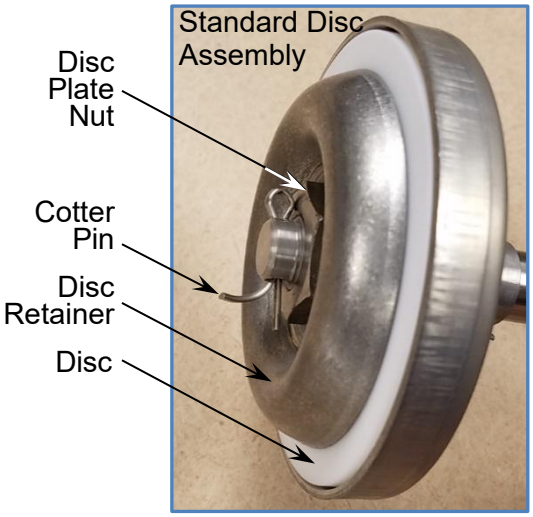
5.6 Loosen the clamp ring and remove the top head from the valve body.

5.7 Remove the top head gasket and inspect the gasket groove for damage or debris. If damaged, replace valve body. Clean all debris and replace the top head gasket.

5.8 Inspect the main valve seat for damage or corrosion. Replace valve body if damaged.

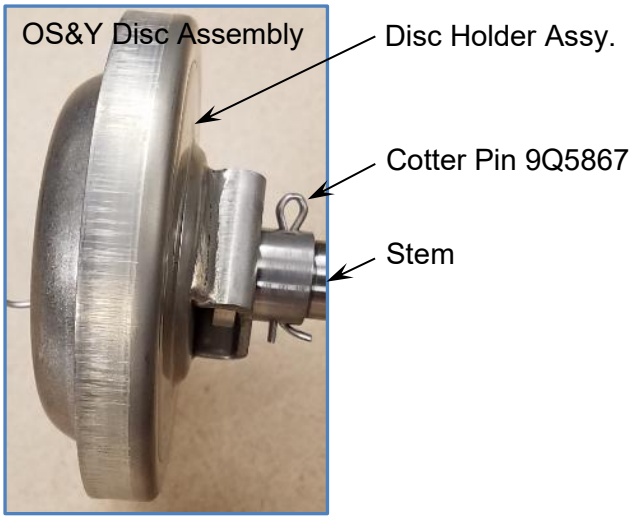
5.9 To replace the disc.

- 5.9.1 Remove the cotter pin and discard.
- 5.9.2 Remove the disc plate nut, the disc retainer, and disc.
- 5.9.3 Inspect the disc holder for any damage and replace if necessary.
- 5.9.4 Install a new disc and secure with disc retainer, and disc plate nut.
- 5.9.5 Install a new cotter pin and secure by bending over the ends.



5.10 The OS&Y hydrolet disc holder assembly utilizes an additional cotter pin to secure the disc holder assembly to the stem.

- 5.10.1 The OS&Y stem cotter pin is located at the junction of the stem and the disc holder assembly. It prevents the stem from disengaging from the disc holder assembly. This 316-stainless pin should be inspected for corrosion or wear and replaced, if necessary, at regular intervals depending on service conditions.
- 5.10.2 The correct size and material cotter pin must be installed.



5.10.3 See important safety information on OS&Y design in Engineering Bulletin EB-08-99.

5.11 The packing is packed tight at the factory and all final assemblies are pressure tested. Heating and cooling cycles may cause the packing to relax causing leakage at the stem. This condition is more prevalent on new valves or newly packed valves.

5.12 It is recommended to tighten the packing after each heating and cooling of the valve for the first 1 or 2 loads. After this "break in period" packing should be checked and tightened if necessary, at regular intervals depending on individual service conditions

⚠ WARNING	**Procedure Notice** – If cotter pin is not installed, the stem can separate from the disc and extract from the valve. Physical injury or product leakage could result.

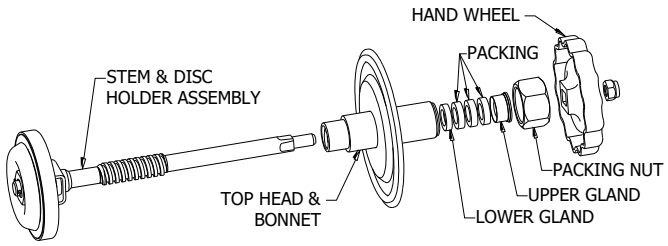
5.13 Standard hydrolet packing adjustment and replacement.

5.13.1 Verify the *Stuffing Box Nut* is tightened in a clockwise direction. The *Stuffing Box Nut* should be tightened sufficiently to seal the stem but not over-tightened to the point the *Handwheel* cannot be turned by hand. Do not exceed 25 lbf·ft [34 N·m] of torque on *Stuffing Box Nut*.

5.13.2 To replace packing, remove the packing nut and top gland.

5.13.3 Remove the packing from the stuffing box and inspect for wear or corrosion to both the stem and/or interior of the stuffing box.

5.13.4 Replace the lower gland, packing, upper gland, and packing nut.

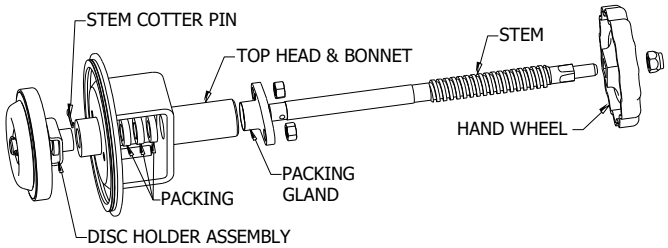


5.14 OS&Y hydrolet packing adjustment and replacement.

5.14.1 If leakage is coming from the stem, tighten the two nuts on both sides of the packing gland. Always tighten these nuts evenly so the top of the packing gland is parallel with the top of the bonnet plate.

5.14.2 If leakage at the stem continues the packing must be replaced.

- Remove the hand wheel and stem cotter pin and unscrew stem from the top head & bonnet and set aside.
- Remove packing gland and then remove packing being sure not to damage the stuffing box.
- Clean and flush the stuffing box and inspect for damage. Replace the top head & bonnet if necessary.



- With the packing gland and stem in place, install new packing being careful not to damage the stuffing box. Use the packing gland to compress the packing by hand if necessary.
- Reinstall the packing gland and tighten evenly to compress the packing. (see section 6.14.1)
- Reassemble the hand wheel and disc holder assembly to stem (See Section 6.10)

5.15 Reinstall top head and bonnet assembly

5.16 Clamp Ring

5.16.1 Inspect clamp ring for corrosion or damage.

5.16.2 Closely inspect welds for cracks.

5.16.3 Inspect “V” form of clamp ring to ensure profile has not been flared. Overall width of “V” form should not exceed .65”.

5.16.4 Inspect threads of wing nut and swing bolt for damage.

5.16.5 Lubricate the threads of the clamp ring assembly.

5.16.6 Replace clamp ring assembly if needed.

5.16.7 Reinstall clamp ring per section 4.4.

5.17 Test Hydrolet Valve to verify performance prior to putting it into service.

SEE TROUBLESHOOTING GUIDE AT THE END OF THIS MANUAL

6.0 Trouble Shooting Guide - Prior to proceeding, read entire manual and follow all safety guidelines.

Problem	Potential Cause	Potential Solution
Product leaking at stem, stuffing box nut, packing gland or bonnet.	Stuffing box nut or packing gland loose.	Tighten stuffing box nut or packing gland (be sure to tighten evenly).
	Packing has taken a set and needs replaced.	Safely drain all product in Hydrolet Valve and ensure there is no pressure in the valve. See section 6 to replace packing.
	Stem damaged or corroded.	Safely drain all product in Hydrolet Valve and ensure there is no pressure in the valve. See section 6 to replace the stem.
	Bore of bonnet damaged or corroded.	Safely drain all product in Hydrolet Valve and ensure there is no pressure in the valve. See section 6 to replace top head and bonnet assembly.
Product leaking around clamp ring or top head.	Clamp ring not fully seated or tightened.	Hand tighten clamp ring wing nut. Gently tap each clamp ring half at Point “A” and Point “B” with a non-sparking or non-marring hammer to help seat the Clamp Ring. Tighten the clamp ring wing nut “hand-tight” to no more than 7.5 lbf·ft [10.2 N·m] torque. See section 4.4.
	Clamp ring not installed properly.	Ensure the primary self-closing stop valve is closed and properly sealing. Safely drain all product in Hydrolet Valve and ensure there is no pressure in the valve. Remove inspect and reinstall clamp ring per section 4.4.
	Top head gasket is worn out or damaged.	Ensure the primary self-closing stop valve is closed and properly sealing. Safely drain all product in Hydrolet Valve and ensure there is no pressure in the valve. Clean or replace components as needed per section 4.4.
	Clamp ring is worn out or damaged.	
	Top head gasket channel or gasket boss is damaged	
Product is leaking past main disc.	Hand wheel is not tightened enough.	Hand tighten the hand wheel in a clockwise direction.
	Disc is worn out or damaged	Ensure the primary self-closing stop valve is closed and properly sealing. Safely drain all product in Hydrolet Valve and ensure there is no pressure in the valve. See section 6 to replace disc.
	Seat is worn out or damaged	The entire valve will need to be removed from the cargo tank and the valve body must be replaced.