



MANUAL: *Jumbo Low Profile Ball Intake Valve*

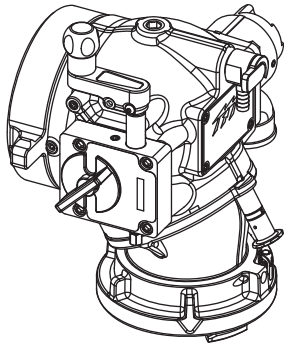
INSTRUCTIONS FOR INSTALLATION, SAFE OPERATION AND MAINTENANCE



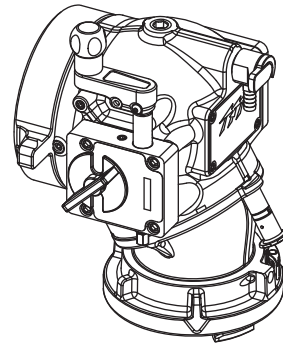
WARNING Understand manual before use. Operation of this device without understanding the manual and receiving proper training is a misuse of this equipment. Obtain safety information at www.tft.com/serial-number

This instruction manual is intended to familiarize firefighters and maintenance personnel with the operation, servicing and safety procedures associated with the Ball Intake Valve Series.

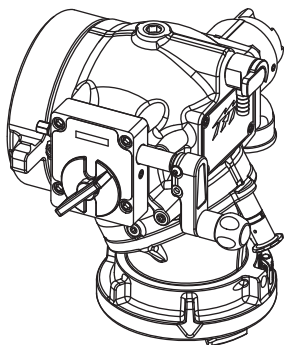
This manual should be kept available to all operating and maintenance personnel.



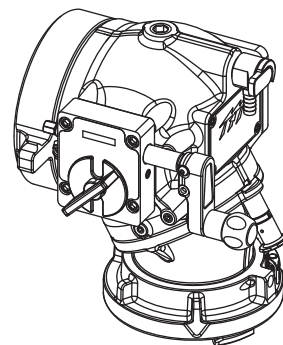
AXD1ST-NX-T
Jumbo Low Profile Ball Intake Valve
With Pressure Relief Valve



AZD1ST-NX-T
Jumbo Low Profile Ball Intake Valve
Without PRV



AXD1ST-NX-F
Jumbo Low Profile Ball Intake Valve
With Pressure Relief Valve



AZD1ST-NX-F
Jumbo Low Profile Ball Intake Valve
Without PRV

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OPERATING RANGE:

For Jumbo Ball Intake Valves
Pressure Max 250 PSI (17 bar)
Pressure Min Full Vac.

NFPA 1962 Test Pressure
300 PSI (21 bar)
Six seconds from open to close
meets NFPA 1901
slow close requirement.



PERSONAL RESPONSIBILITY CODE

The member companies of FEMSA that provide emergency response equipment and services want responders to know and understand the following:

1. Firefighting and Emergency Response are inherently dangerous activities requiring proper training in their hazards and the use of extreme caution at all times.
2. It is your responsibility to read and understand any user's instructions, including purpose and limitations, provided with any piece of equipment you may be called upon to use.
3. It is your responsibility to know that you have been properly trained in Firefighting and/or Emergency Response and in the use, precautions, and care of any equipment you may be called upon to use.
4. It is your responsibility to be in proper physical condition and to maintain the personal skill level required to operate any equipment you may be called upon to use.
5. It is your responsibility to know that your equipment is in operable condition and has been maintained in accordance with the manufacturer's instructions.
6. Failure to follow these guidelines may result in death, burns or other severe injury.



Fire and Emergency Manufacturers and Service Association
P.O. Box 147, Lynnfield, MA 01940 • www.FEMSA.org

1.0 MEANING OF SIGNAL WORDS

A safety related message is identified by a safety alert symbol and a signal word to indicate the level of risk involved with a particular hazard. Per ANSI standard Z535.6-2011, the definitions of the four signal words are as follows:



DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTICE is used to address practices not related to physical injury.

2.0 SAFETY



Injury or death can result from burst hoses and fittings. Risk can be minimized by the proper care and use of hose and appliances per NFPA 1962. The relief valve must be set to an appropriate pressure based on the type of hose and equipment you are using.



Injury or death may occur by attempting to use a damaged Valve. Before using the valve inspect it for damage resulting from:

- Failure to drain valve followed by exposure to freezing conditions
- Exposure to temperatures in excess of 160 degrees F
- Missing parts, physical abuse



This equipment is intended for use by trained personnel for firefighting. Its use for other purposes may involve hazards not addressed by this manual. See appropriate guidance and training to reduce risk of injury.



Kinks in supply hose may reduce water flow and cause injury or death to persons dependant on water flow. When this valve is used on a hydrant or fire truck it is recommended that it be used with an elbow to minimize risk of hoseline kinks.



Maximum operating pressure for the valve is 250 PSI (17 bar). Do not exceed 250 PSI on either side of the valve.



Valve must be properly connected. Mismatched or damaged connectors may cause leaking or uncoupling under pressure and could cause injury.



The valve may become damaged if it is allowed to freeze while containing water. Always drain after use to avoid damage and possible loss of use.



Dissimilar metals coupled together can cause galvanic corrosion that can result in the inability to unscrew the threads or complete loss of thread engagement over time; Per NFPA 1962 (current edition), if dissimilar metals are left coupled together an anti-corrosive lubricant should be applied to the threads. Also the couplings should be disconnected and inspected at least quarterly.



Any alterations to the valve and its markings could diminish safety and constitutes a misuse of this equipment.



Use with salt water is permissible provided the valve is thoroughly cleaned with fresh water after each use. The service life of the valve may be shortened due to the effects of corrosion and is not covered under warranty.

3.0 GENERAL INFORMATION

The Low Profile Ball Intake Valve is intended for use on either the intake manifold of a fire engine or on a discharge port of a fire main. The valve is kept closed while the water supply from a hydrant or another pumper to the engine is being established. This prevents the pump from sucking air through the intake manifold and losing its prime. Once the supply hose is filled and under pressure, and the air has been vented from the hose, the valve may be opened to connect the pump to the water supply. An adjustable pressure relief valve mounted on the valve opens to relieve any excess pressure that may damage the hose or the pump. The valve may be used for pressure or vacuum/drafting service.

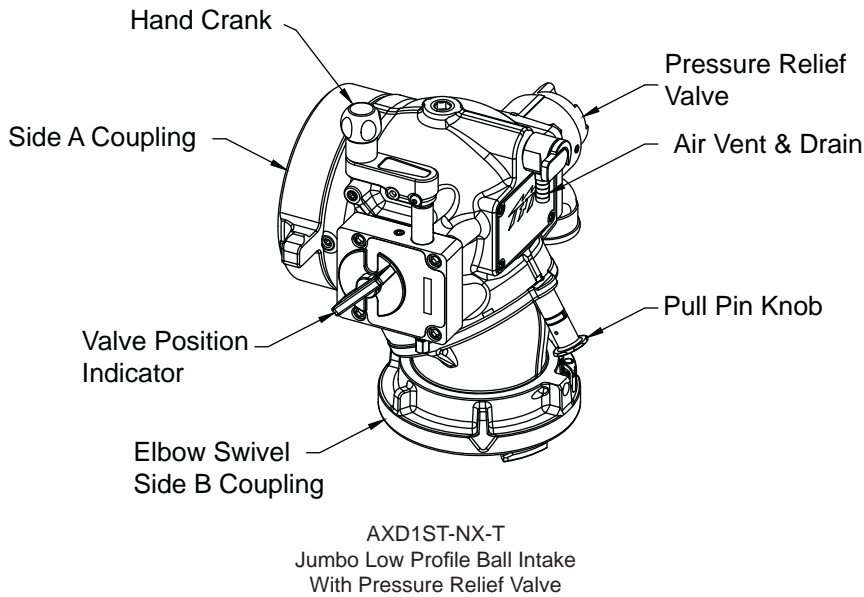
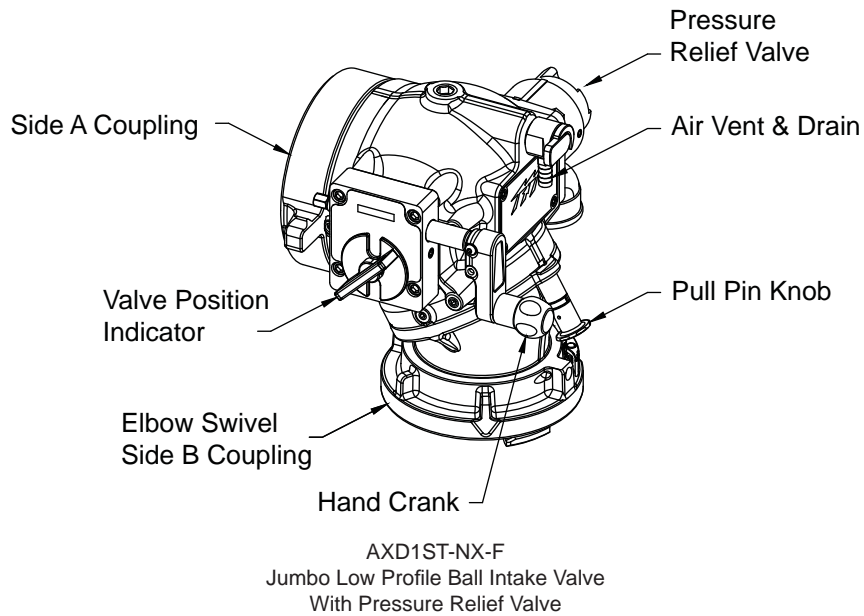
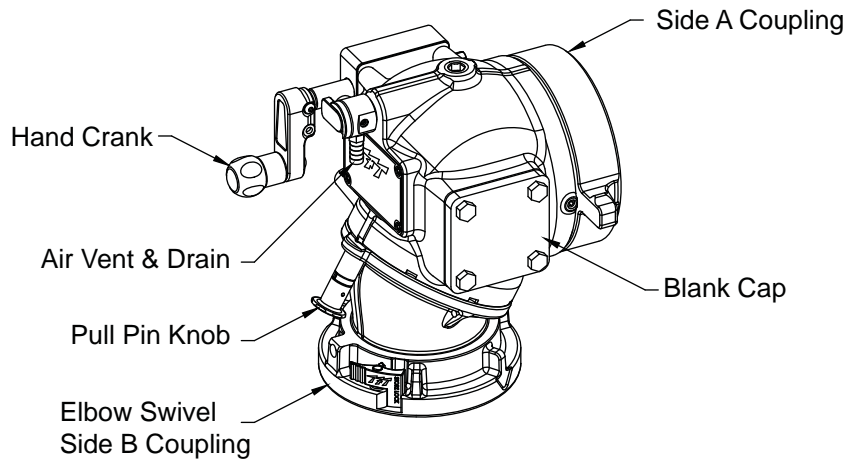
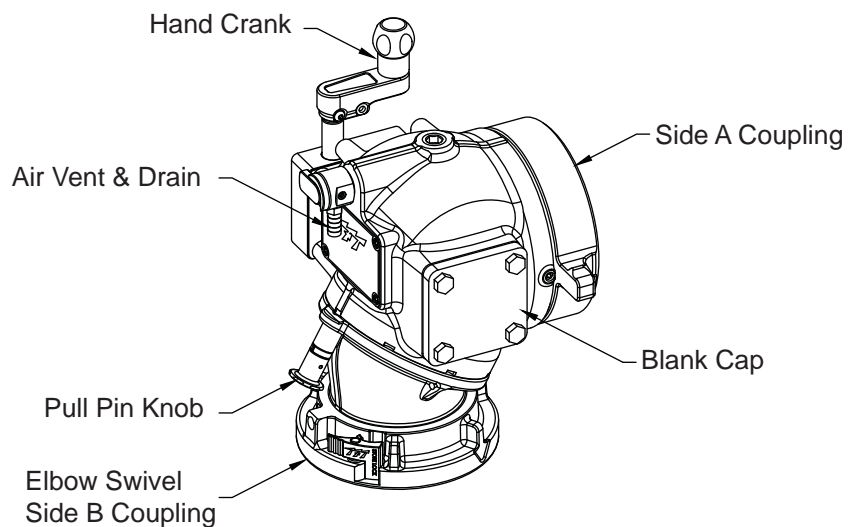


Figure 3.0
General Information



AZD1ST-NX-F
Jumbo Low Profile Ball Intake
Without PRV



AZD1ST-NX-T
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Without PRV

Figure 3.0
General Information

3.1 SPECIFICATIONS

MODEL	LOW PROFILE JUMBO INTAKE VALVE
Waterway Size	5.25" (133mm)
Max Pressure	250 psi (17 bar)
Min Pressure	Full Vacuum
Temperature Rating*	-25°F to 135°F (-32°C to 57°C)
Valve Meets NFPA 1965 Slow Close Requirements	
*For temperatures below 32°F(0°C), valves must be drained after use to avoid damage. See section 2.0 SAFETY.	

3.2 CORROSION

Aluminum parts are hard anodized. All castings are then powder coated inside and out to help prevent corrosion. Hose couplings are attached using polymer bearing rings which provides electrical insulation to help prevent galvanic corrosion. The effects of corrosion can be minimized by good maintenance practice. See section 10.0 for maintenance.

3.3 USE WITH SALT WATER

Use with salt water is permissible provided valve is thoroughly cleaned with fresh water after each use. The service life of the valve may be shortened due to the effects of corrosion and is not covered under warranty.

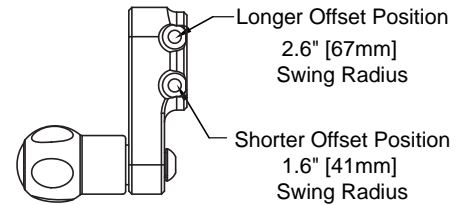
4.0 INSTALLATION

4.1 MOUNTING THE VALVE

Screw the large coupling to a pump manifold or fire water discharge port and tighten securely. The valve position indicator should be clearly visible, but need not be level.

4.2 CHANGING OFFSET OF CRANK HANDLE

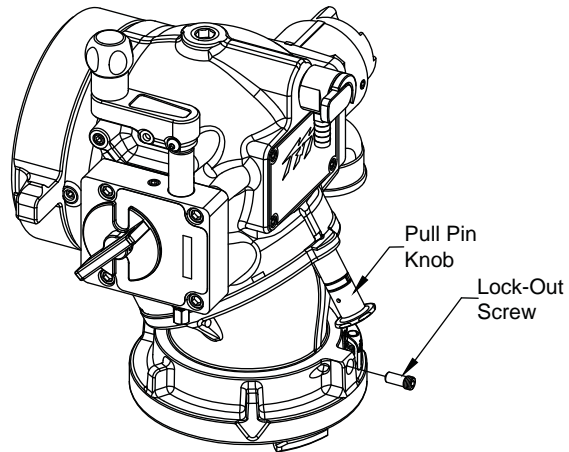
When equipped with a crank handle, two offset positions are available to adjust the swing radius of the crank and knob as shown in figure 3.0. The longer offset position offers reduced effort to operate the valve. The shorter offset is available to avoid interference with other equipment on the apparatus. To change the offset, remove two 1/4"-20 x 1/2" button head cap screws from crank. Place crank in desired position and replace screws. Apply Blue Loc-Tite thread locking compound to all of the screw threads.



4.3 CHANGING COUPLING LOCK-OUT

To change a coupling from rigid to full time swivel, use a 7/32" Allen driver to back out the lockout screw until the coupling moves freely.

To change a coupling from full time swivel to rigid, first align the pull pin in the elbow to vertical. Rotate the coupling until the lockout screw is aligned with the pull pin. Use a 7/32" Allen driver to tighten the lockout screw into the lockout divot in the elbow. Do not tighten the screw onto the polymer bearing strip.



5.0 USE

5.1 ELBOW

The elbow swivels 360 degrees to help prevent hose kinks, and make connection of suction lines easier. The elbow can be turned forward or backward to help make connections in tight places if the water supply is in front of or behind the truck. To turn the elbow, pull the pull pin knob on top of the elbow. The elbow will lock into a detent every 45 degrees. There is a hole on the side of the elbow that can be used to attach the lanyard or chain of a cap by use of a key ring. The elbow may be swivelled to any of eight positions by pulling the pull pin knob.

5.2 VALVE POSITION INDICATOR

To open the valve turn the hand crank until the valve position says "OPEN". To close the valve turn the hand crank the opposite way until the valve position indicator says "CLOSED". Once the indicator shows "closed" and the hand crank stops turning, additional force does not cause the valve to close tighter. Continuing to apply force to the hand crank will cause damage to the gearbox. See section 10.3 for Crankshaft Override and Replacement.

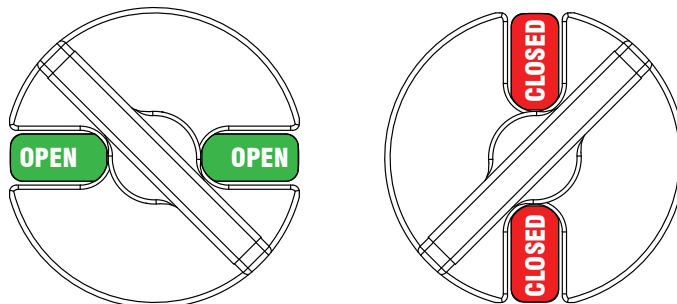


Figure 5.2
Valve Position Indicator

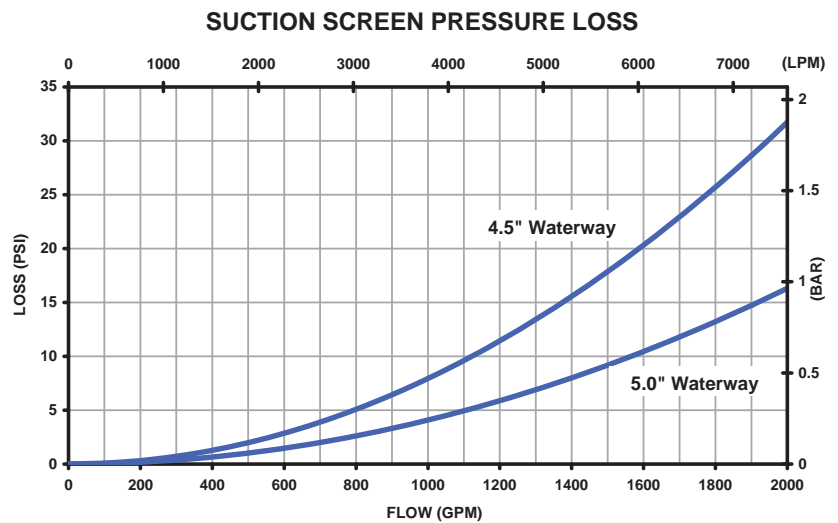
5.3 STORZ 'SUCTION GASKET' REQUEST

If your application of this product requires drafting, you may need a suction gasket, please call 1-800-348-2686 to receive a free suction gasket by mail.

Part Numbers: 4" STORZ - item # A4216, 5" STORZ - item # A4221, 6" STORZ - item #A4226

5.4 SUCTION SCREEN

This device may be equipped with a suction screen to catch debris larger than 3/8" diameter in the waterway. See chart to determine additional loss caused by the screen. To add or replace a suction screen, order TFT part #A1410-KIT for the 4.5" waterway, and TFT part #A1411-KIT for the 5.0" waterway.



6.0 AIR VENT AND WATER DRAIN



Loss of prime can interrupt water flow and cause injury or death. Always bleed out air with air valve to prevent possible loss of prime.

The BIV-LP comes with an Air Vent/Drain Valve situated on the front of the valve. There is a second plugged port on the top of the valve. To use a different port position, relocate the factory supplied Air Vent/Drain Valve or install an additional Air Vent/Drain Valve. If the Air Vent/Drain Valve is being relocated, use a 3/4" NPT plug to seal the empty port.

7.0 PRESSURE RELIEF VALVE



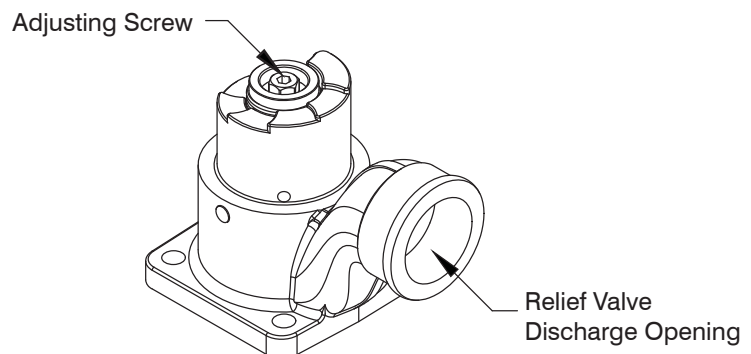
Do not leave the pressure relief valve in the OFF position. The pressure relief valve is disabled in the OFF position and offers no protection against over pressurization. The OFF position may be used for controlled pump testing but should not be used for service conditions. Exercise great care to avoid water hammer or other pressure spikes when the pressure relief valve is in the OFF position.

LDH valved appliances may be equipped with a pressure relief valve that can be set to any pressure between 90 and 300 psi. Its function is to protect the pump and supply hose from excess pressure. A piece of hose or tubing may be mounted on the round spout to direct water coming out of the relief valve away from the device. The relief valve may be mounted with its opening facing the front, back, right, or left. To change the orientation of the relief valve, remove the four 7/16" bolts (5/8" wrench) on the corners of the relief valve flange, orient the valve in the desired position, and replace the bolts. Use thread-locking compound on the threads of the bolts to prevent them from vibrating loose.

See [LIA-202](#) Pressure Relief Valve Instructions for Safe Operation and Maintenance.

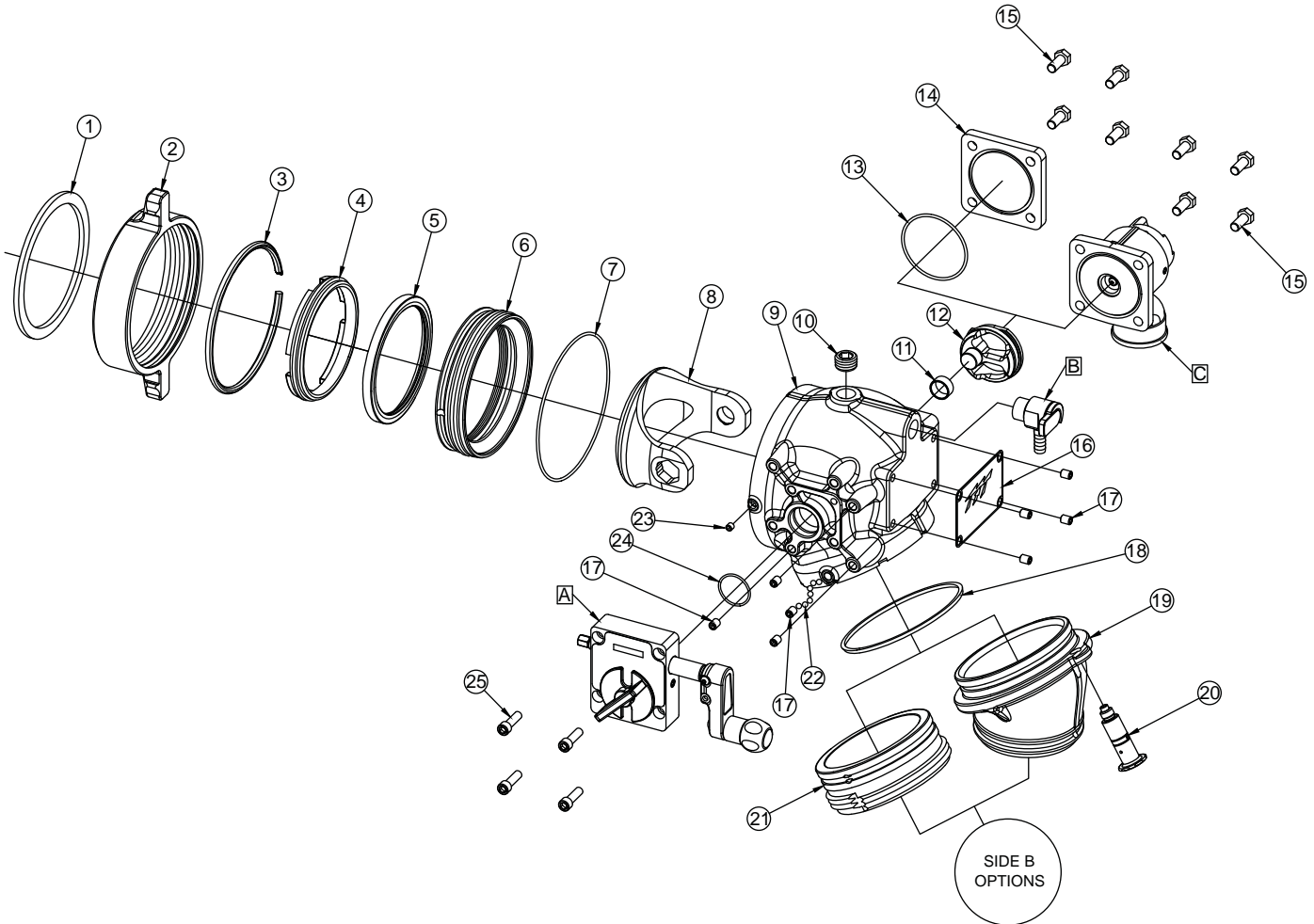
7.1 RELIEF VALVE SETTING PRESSURE

To set the relief valve pressure turn the adjusting screw on the relief valve housing until the surface of the screw is even with the desired pressure. A 9/16" (14mm) socket or a 1/4" Allen wrench may be used to turn the adjusting screw. The Pressure relief valve should not be disabled (IE: capped, plugged, or set to the OFF position) for normal service conditions. Disabling the relief valve may result in system damage or hose rupture if the system exceeds operating limits. The pressure relief valve meets the requirements of NFPA 1901.



8.0 EXPLODED VIEWS AND PARTS LISTS

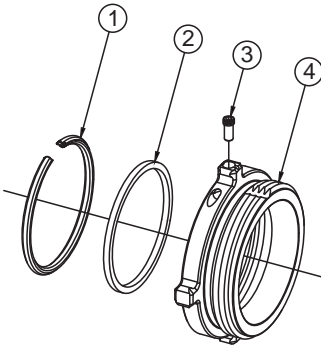
8.1 JUMBO BALL INTAKE VALVE - AXD SERIES EXPLODED VIEW AND PARTS LIST



INDEX	DESCRIPTION	QTY	PART #
1	GASKET - 6.0"	1	V3240
2	COUPLING SH 6.0"NHF X PSF7.0-NFS	1	A1266NX
3	PLASTIC STRIP 7.00"	1	A1290
4	SEAT RETAINER 6" ALUMINUM	1	ZB1025A
5	VALVE SEAT	1	A1082
6	6" BACK RING ALUMINUM	1	A1084A
7	O-RING-262	1	VO-262
8	HALF BALL 8" ALUM NO_DRAIN	1	A1088A
9	BODY	1	A1085
10	3/4"NPTM HEX SOCKET PLUG	1	XG410
11	BUSHING HALF BALL TRUNNION	1	A2094
12	TRUNNION ALUMINUM	1	A1087A
13	O-RING-236	1	VO-236
14	LDH BLANK CAP	1	X631

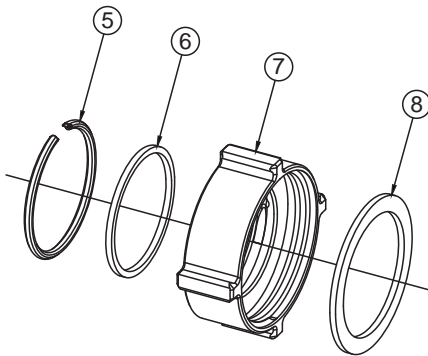
INDEX	DESCRIPTION	QTY	PART #
15	7/16-14 X 1 HEX HEAD BOLT	4	VT43-14HX1.0
16	TFT NAME LABEL	1	A1313
17	3/8-16 X 1/2 SOCKET SET SCREW	7	VT37-16SS500
18	CUP SEAL	1	A1545
19	ELBOW	-	SEE SECTION 8.2
20	PULL PIN SUBASSEMBLY	1	A1615
21	MATE/SPOUT	-	SEE SECTION 8.2
22	1/4 SS BALL	72	V2125
23	5/16-18 X 3/8 SOCKET SET SCREW	2	VT31-18SS375
24	O-RING-128	1	VO-128
25	3/8-16 X 1-1/4 SOCKET HEAD SCREW	4	VT37-16SH1.2
A	WORM DRIVE GEARBOX	-	SEE SECTION 8.3
B	AIR VENT/DRAIN VALVE	-	SEE SECTION 8.4
C	PRESSURE RELIEF VALVE	-	SEE SECTION 8.5

8.2 SIDE B OPTIONS EXPLODED VIEWS AND PARTS LISTS



ELBOW - MALE HOSE THREADS						
INDEX	DESCRIPTION	QTY	4.0"	4.5"	5.0"	6.0"
19	ELBOW	1	A1054	A1054	A1054	A1091
1	PLASTIC STRIP	1	A1291	A1291	A1291	A1293
2	CUP SEAL	1	A1596	A1596	A1596	A1594
3	LOCK-OUT SCREW	1	A1294	A1294	A1294	A1294
4	SPOUT	1	A4620N	A4625N	A4630N	A4640N

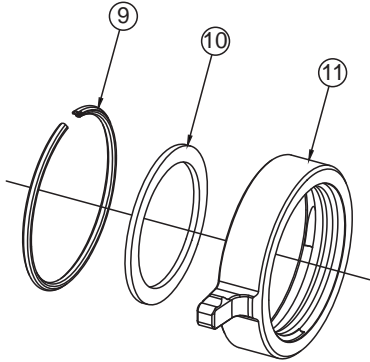
SHORT - MALE HOSE THREADS						
INDEX	DESCRIPTION	QTY	4.0"	4.5"	5.0"	6.0"
21	MATE/SPOUT	1	A1055	A1055	A4631N	A4641N
1	PLASTIC STRIP	1	A1291	A1291	-	-
2	CUP SEAL	1	A1596	A1596	A1545	A1545
3	LOCK-OUT SCREW	1	A1294	A1294	-	-
4	SPOUT	1	A4620N	A4625N	-	-



ELBOW - FEMALE HOSE THREADS ROCKER LUG						
INDEX	DESCRIPTION	QTY	3.5"	4.0"	4.5"	5.0"
19	ELBOW	1	A1054	A1054	A1054	A1054
5	PLASTIC STRIP	1	A1291	A1291	A1291	A1291
6	CUP SEAL/O-RING	1	A1596	-	-	A1596
7	COUPLING	1	A4655N	A4662N	A4667N	A4670N
8	GASKET	1	V3196	V3198	V3210	V3220
-	NFS RING/O-RING	1	-	A4561/VO-248	A4566/VO-248	-
-	MATE	1	A4730	-	-	-
-	PLASTIC STRIP	1	A1292	-	-	-
-	CUP SEAL	1	A1597	-	-	-
-	BALL	1	VB.437	-	-	-

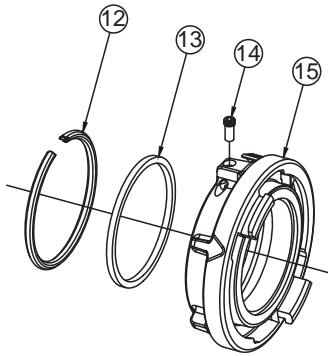
SHORT - FEMALE HOSE THREADS ROCKER LUG						
INDEX	DESCRIPTION	QTY	3.5"	4.0"	4.5"	5.0"
21	MATE/SPOUT	1	A1055	A1055	A1055	A1055
5	PLASTIC STRIP	1	A1292	A1291	A1291	A1291
6	CUP SEAL	1	A1597	-	-	A1596
7	COUPLING	1	A4655N	A4662N	A4667N	A4670N
8	GASKET	1	V3196	V3198	V3210	V3220
-	NFS RING/O-RING	1	-	A4561/VO-248	A4566/VO-248	-
-	MATE	1	A4730	-	-	-
-	PLASTIC STRIP	1	A1291	-	-	-
-	CUP SEAL	1	A1596	-	-	-
-	BALL	1	VB.437	-	-	-
-	BALL	1	VB.437	-	-	-

8.2 SIDE B OPTIONS EXPLODED VIEWS AND PARTS LISTS



ELBOW - FEMALE HOSE THREADS LONG HANDLE						
INDEX	DESCRIPTION	QTY	4.0"	4.5"	5.0"	6.0"
19	ELBOW	1	A1054	A1054	A1054	A1091
9	PLASTIC STRIP	1	A1291	A1291	A1290	A1293
10	GASKET	1	V3198	V3210	V3220	V3240
11	COUPLING	1	A4562N	A4567N	A4570NT	A4575NX
-	NFS RING/O-RING	1	A4561/VO-248	A4566/VO-248	-	A4576/VO-254
-	MATE	1	-	-	-	-
-	PLASTIC STRIP	1	-	-	-	-
-	CUP SEAL	1	-	-	-	-

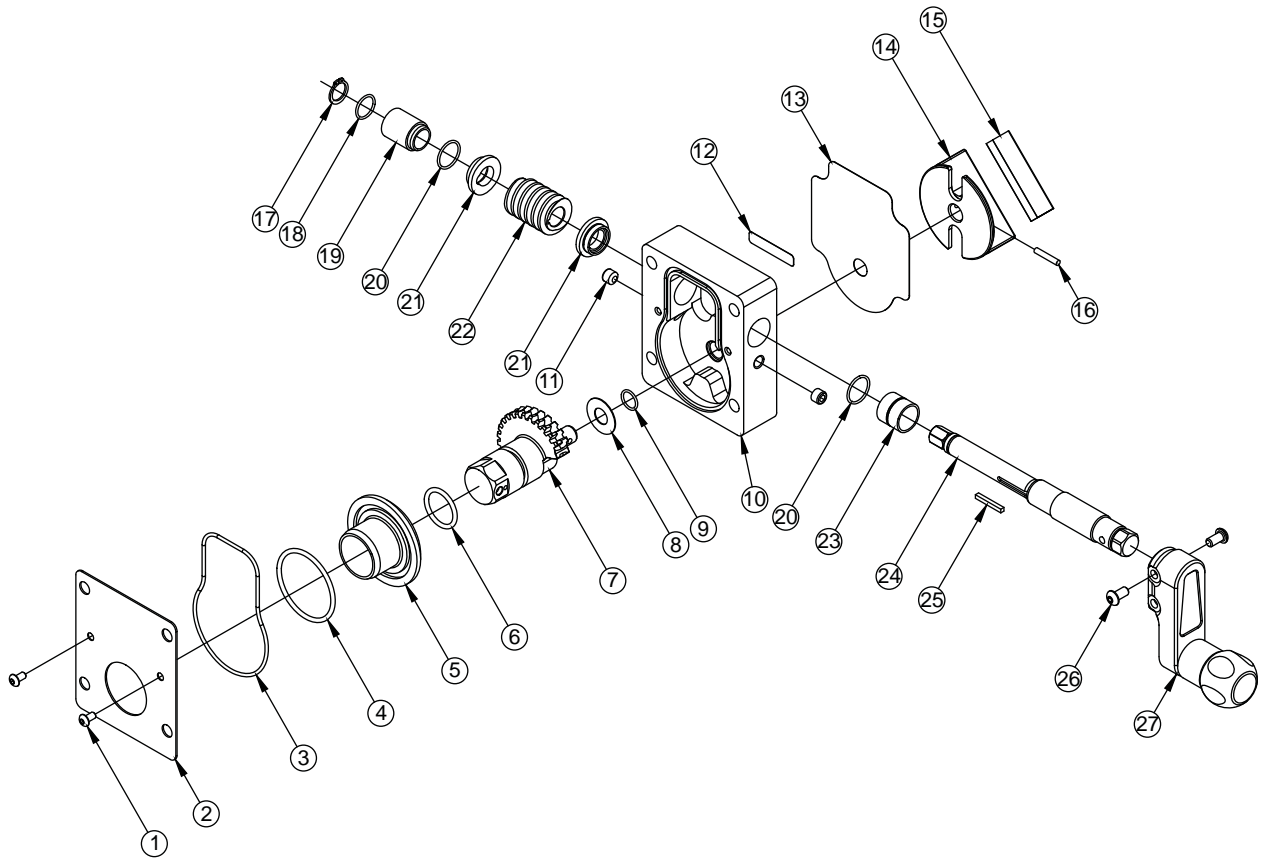
SHORT - FEMALE HOSE THREADS LONG HANDLE					
INDEX	DESCRIPTION	QTY	4.0"	4.5"	5.0"
21	MATE/SPOUT	1	A1055	A1055	A1055
9	PLASTIC STRIP	1	A1291	A1291	A1290
10	GASKET	1	V3198	V3210	V3220
11	COUPLING	1	A4562N	A4567N	A4570NT
-	NFS RING/O-RING	1	A4561/VO-248	A4566/VO-248	-



ELBOW - STORZ					
INDEX	DESCRIPTION	QTY	4.0"	5.0"	6.0"
19	ELBOW	1	A1054	A1054	A1091
12	PLASTIC STRIP	1	A1292	A1291	A1293
13	CUP SEAL	1	A1597	A1596	A1594
14	LOCK-OUT SCREW	1	A1294	A1294	A1294
15	COUPLING	1	A4124	A4125	A4326
-	MATE	1	A4730	-	-
-	PLASTIC STRIP	1	A1291	-	-
-	CUP SEAL	1	A1596	-	-
-	BALL	1	VB.437	-	-

SHORT - STORZ					
INDEX	DESCRIPTION	QTY	4.0"	5.0"	6.0"
21	MATE/SPOUT	1	A1055	A1055	A1093
12	PLASTIC STRIP	1	A1292	A1291	A1293
13	CUP SEAL	1	A1597	A1596	A1594
14	LOCK-OUT SCREW	1	A1294	A1294	-
15	COUPLING	1	A4124	A4125	A4326
-	MATE	1	A4730	-	-
-	PLASTIC STRIP	1	A1291	-	-
-	CUP SEAL	1	A1596	-	-
-	BALL	1	VB.437	-	VB.437

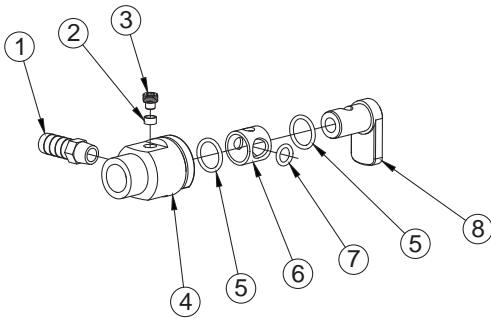
8.3 WORM DRIVE GEARBOX [A] EXPLODED VIEW AND PARTS LIST



ITEM	DESCRIPTION	QTY	PART #
1	10-24 X 3/8 BUTTON HEAD SCREW	2	VT10-24BH375
2	GEARBOX COVER	1	A1030
3	O-RING-154	1	VO-154
4	O-RING-226	1	VO-226
5	GEAR SPACER	1	A1511
6	O-RING-214	1	VO-214
7	INTEGRAL WORM GEAR & TRUNNION	1	A1501
	INTEGRAL WORM GEAR & TRUNNION GEARBOX ROTATED		A1503
8	GEAR THRUST WASHER	1	A1502
9	O-RING-014	1	VO-014
10	GEARBOX 250PSI	1	A1506
11	3/8-16 X 5/16 SOCKET SET SCREW	2	VT37-16SS312
12	MODEL NUMBER LABEL	1	A1303
13	LABEL BALL INTAKE GEARBOX	1	A1301
	LABEL BALL INTAKE GEARBOX ROTATED		A1301R

ITEM	DESCRIPTION	QTY	PART #
14	POSITION INDICATOR WITH FLAG	1	A1523R
15	POSITION INDICATOR LABEL	1	A1524
16	5/32 X 7/8 HDP SPIROL PIN	1	V1900
17	RETAINING RING	1	VR4275
18	O-RING-016	1	VO-016
19	LARGE BUSHING FOR SEALED GEARBOX	1	A1528
20	O-RING-018	2	VO-018
21	WORM THRUST WASHER	2	A1529
22	12 DP WORM - DEGREASED	1	X220
23	SMALL BUSHING FOR SEALED GEARBOX	1	A1527
24	SHAFT FOR SEALED GEARBOX	1	A1533
25	KEY	1	X225
26	3/8-16 X 1-1/2 BUTTON HEAD SCREW	1	VT37-16BH1.5
27	CRANK WITH KNOB SUBASSEMBLY	1	A1629

8.4 AIR VENT/DRAIN [B] EXPLODED VIEW AND PARTS LIST



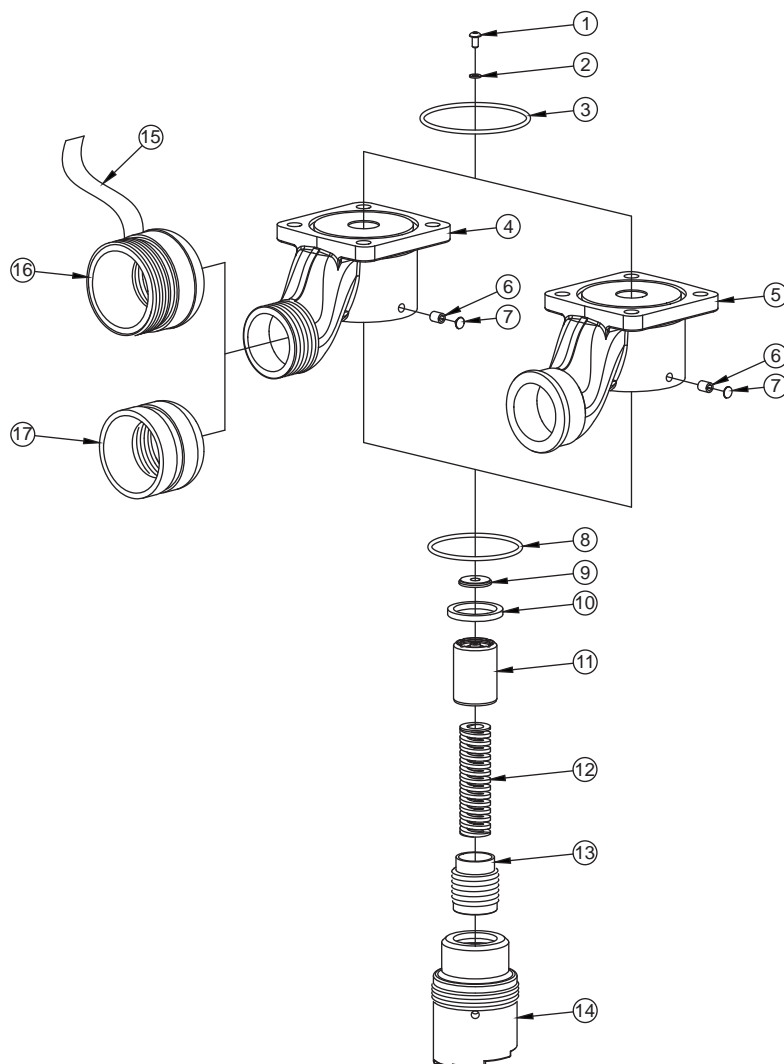
Replacement Kit A1621-KIT

ITEM	DESCRIPTION	QTY	PART #
1	1/2" BARB X 1/4"NPTM NIPPLE	1	XX329
2	FOLLOWER	1	U251
3	3/8-24 X 3/8 DOG POINT	1	H515
4	DRAIN HOUSING	1	A1543
5	O-RING 115	2	VO-115
6	DRAIN SLEEVE	1	A1541
7	O-RING-110	1	VO-110
8	DRAIN LEVER	1	A1542

8.5 PRESSURE RELIEF VALVE [C] EXPLODED VIEW AND PARTS LISTS

NOTICE

The Pressure Relief Valve contains no user serviceable components. If disassembled, the unit must be returned to the factory for service and calibration.



ITEM	DESCRIPTION	QTY	PART #
1	10-24 X 3/8 BUTTON HEAD SCREW	1	VT10-24BH500
2	WASHER	1	VW437X203-03
3	O-RING-236	1	VO-236
4	HOUSING W/ PIPE THREADS	1	A1110PH
5	HOUSING	1	A1110
6	5/16-18 X 3/8 SOCKET SET SCREW	1	VT31-18SS375
7	PLUG	1	A1162
8	O-RING-232	1	VO-232
9	GASKET	1	A1121

ITEM	DESCRIPTION	QTY	PART #
10	CUP SEAL	1	A1124
11	PISTON	1	A1120
12	RELIEF SPRING	1	A1172
13	ADJUSTING SCREW	1	A1122
14	SPRING HOUSING	1	A1123
15	PRV ADAPTER 2.5" LABEL	1	A1865L
16	PRV ADAPTER 2.0"NPT x 2.5"NH	1	A1861
17	PRV ADAPTER 2.0"NPT x 2.5"VICTAULIC	1	A1851

9.0 TROUBLE SHOOTING

SYMPTOM	POSSIBLE CAUSE	REMEDY
Leaks	Debris or damage in seal area	Clean out debris or replace damaged parts

10.0 MAINTENANCE

10.1 INSPECTION CHECKLIST

Appliances must be inspected for proper operation and function according to this checklist before each use. Before flowing water check:

- Valve opens and closes fully and smoothly
- Waterway is clear of obstructions
- There is no damage to any thread or other connection
- The pressure setting on the relief valve (if so equipped) is set correctly
- Gaskets are in good repair
- There is no obvious damage such as missing, broken or loose parts
- There is no damage to the appliance (e.g. dents, cracks or other defects that could impair operation)
- All swiveling elements rotate freely
- There is no corrosion on any surface
- There are no missing, worn out or broken lugs on couplings
- Hose is securely attached



Any valve failing any part of the inspection checklist is unsafe and must have the problem corrected before use. Operating a valve that fails any of the above inspections is a misuse of this equipment.

10.2 SERVICE TESTING

In accordance with NFPA 1962 (2013), appliances must be tested a minimum of annually. Appliances failing any part of this test must be removed from service, repaired and retested upon completion of the repair.

10.2.1 HYDRAULIC TEST

1. The appliance being tested shall be positioned in a protective device or cover capable of holding the appliance and tested to a minimum hydrostatic pressure of 300 psi (20.7 bar or 2070 kPa).
2. Test caps capable of withstanding the required hydrostatic pressure shall be attached to openings, and a device capable of exerting the required hydrostatic pressure shall be attached to the appliance.
3. Appliances with relief valves shall have the relief valve outlet blanked off or otherwise closed during the test.
4. All air shall be bled from the system.
5. The gauge pressure shall be increased by 50 psi (3.45 bar or 345 kPa) increments and held for 30 seconds at each pressure up to the maximum pressure for which the appliance is being tested and held for 1 minute without leakage.

10.2.2 RELIEF VALVE TEST

1. Hydrostatic testing of the appliance shall be conducted prior to testing the relief valve.
2. The relief valve shall be tested separately from any device it is connected to.
3. The relief valve shall be set to its lowest setting and pressurized.
4. If the relief valve does not operate at or below a pressure 10 percent over the setting, the test shall be discontinued and the relief valve repaired or replaced.
5. A calibrated test gauge shall be used to verify the setting.
6. After successful completion of the relief valve test, the relief valve shall be reset to the pressure designated by the authority having jurisdiction.
7. The final setting of the relief valve shall be confirmed by pressure testing.

10.2.3 SHUTOFF VALVE TEST

1. If the appliance has a shutoff valve, the intake side of the shutoff valve shall be hydrostatically pressurized to the maximum working pressure of the appliance with the valve in the shutoff position.
2. There shall be no leakage through the valve.
3. A water flow through the fire hose appliance at 100 psi (6.9 bar or 690 kPa) shall be established.
4. The valve shall be closed and reopened twice and shall operate smoothly without evidence of binding or other problems.

10.2.4 RECORDS

A record of testing and repairs must be maintained from the time the appliance is purchased until it is discarded. Each TFT appliance is engraved with a unique serial number which, if so desired, can be used to identify appliance for documentation purposes.

The following information, if applicable, must be included on the test record for each appliance:

1. Assigned identification number
2. Manufacturer
3. Product or model designation
4. Vendor
5. Warranty
6. Hose connection size
7. Maximum operating pressure
8. Flow rate or range
9. Date received and date put in service
10. Date of each service test and service test results
11. Damage and repairs, including who made the repairs and the cost of repair parts
12. Reason removed from service

10.3 CRANKSHAFT OVERRIDE AND REPLACEMENT

The crankshaft includes an intentional shear joint to protect the gear train from overload, costly repairs and loss of service. The magnitude of torque required to shear the crankshaft is several times greater than the torque typically needed to operate the valve at maximum operating pressure. If the crankshaft breaks during use, this is an indication that either there is something obstructing the half ball internally or the crank shaft has been abused (e.g. used as a step for climbing).

10.3.1 CRANKSHAFT OVERRIDE

In an emergency, the opposite side of the crankshaft can be turned using a 1/2" wrench or hex socket. This allows the valve to be open or closed until the crankshaft is replaced. To prevent loss of the 1/8" square key on the crankshaft, do not allow the crankshaft to slide out of gearbox until a replacement crankshaft is acquired. It is important not to rely on this as a long-term method of operation.

10.3.2 DIAGNOSIS

To diagnose the problem that caused the crankshaft to fail, complete the following steps:

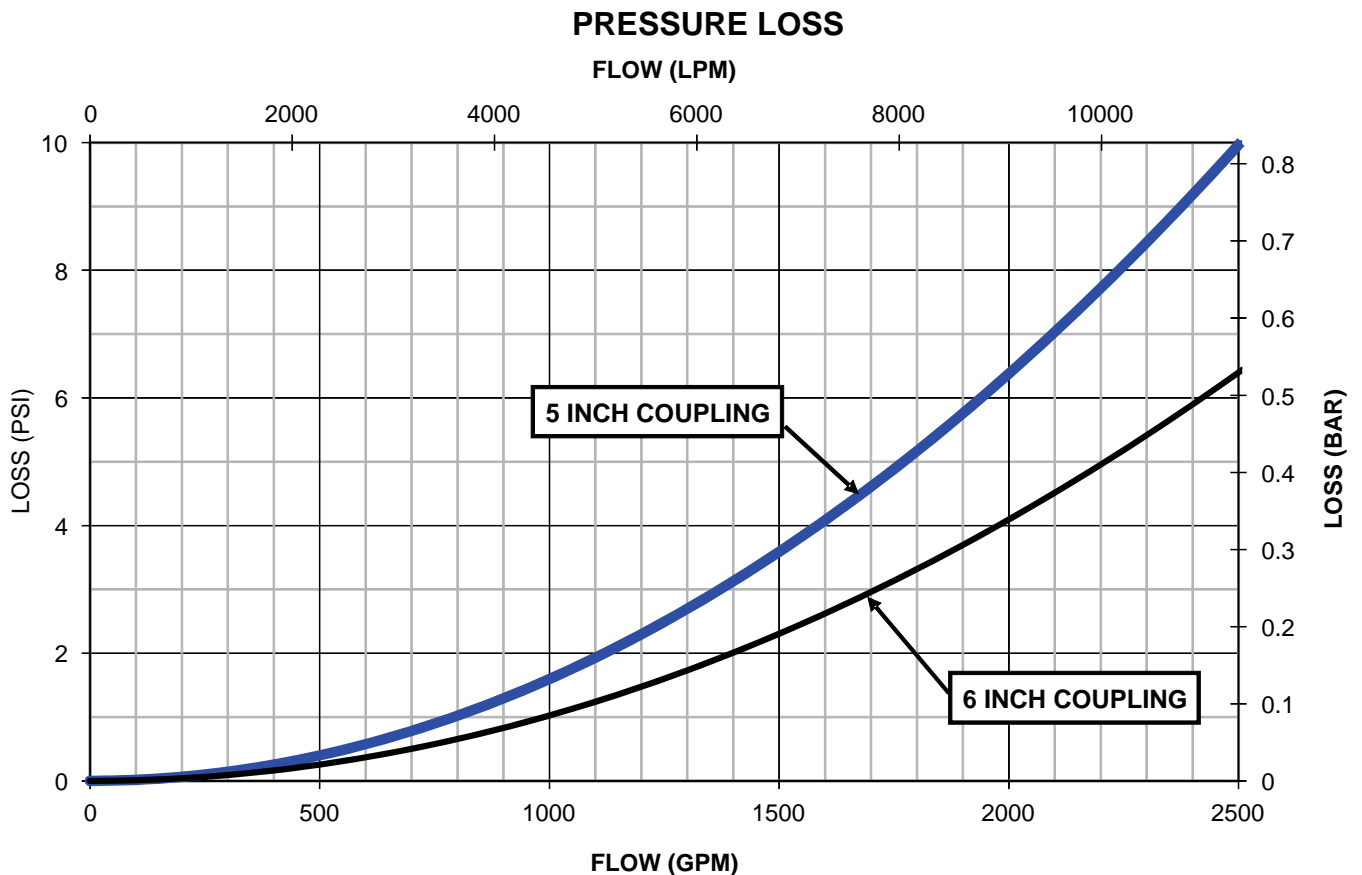
1. Close upstream water supply. If possible, relieve pressure leading up to valve.
2. Locate 1/2" hex where crankshaft protrudes from opposite side of gearbox.
3. Gently turn crank shaft away from travel stop using a 1/2" hex wrench. Do not attempt to shock crankshaft free and do not exceed 50 ft-lb (68 Nm) of torque.
4. If crankshaft will not rotate, then half ball is likely obstructed. Only after relieving pressure on flanged joint, unbolt valve. Clear any obstructions and evaluate whether repair is needed before returning to service.
5. If crankshaft is able to rotate, cycle the valve several times from open to closed to determine whether the crankshaft binds at any place between the travel stops. If crankshaft binds, consult Task Force Tips Service Department to determine the appropriate repairs.
6. If crankshaft rotates freely after clearing any obstructions, then a replacement crank shaft may be ordered from Task Force Tips and replaced as described below.

10.3.3 CRANKSHAFT REPLACEMENT

A broken crankshaft can be replaced at any time by completing the following steps, regardless of whether or not the upstream water supply is pressurized. Referring to index numbers shown in section 8.3, follow the steps below:

1. Remove external retaining ring (index 17) adjacent to ½" hex on crankshaft.
2. Using a punch or Phillips head screwdriver at least 6" in length, gently push on dimple in ½" hex end of crankshaft (index 24). Continue to push crankshaft through until it protrudes from opposite side of gearbox.
3. Grab broken end of crankshaft and pull out of gearbox. As crankshaft is withdrawn, grasp small key (index 25) on shaft so it does not get lost.
4. If 1/8" square x 1" long key is not visible in shaft, it has likely fallen into gearbox bore and must be removed before installing new crankshaft. If square key is visible in gearbox bore, slide it out of bore. Needle-nose pliers may be helpful depending on position of key in bore.
5. Verify polymer bushings (index 23 and 19) are still seated in bores on each side of gearbox. If not, locate and replace bushings.
6. Look through gearbox bore and note approximate orientation of square keyway in worm (index 22). Verify round notch in thrust washer (index 20) is aligned with square keyway in worm.
7. Prepare new crankshaft by applying small dab of grease to keyway and seating 1/8" square x 1" long key into keyway. Grease will keep key in place during assembly.
8. Slide shaft into gearbox with key orientation the same as keyway in worm. Rotate shaft slightly in alternating directions until key finds keyway, then push shaft in until it stops. Retaining ring groove and ½" hex should be protruding through opposite side of gearbox. If hex is not visible, it may be necessary to slide polymer bushing back into gearbox bore.
9. Install retaining ring (index 17) onto shaft. Do not over-expand the retaining ring.

11.0 BALL INTAKE VALVE PRESSURE LOSS



12.0 TEN YEAR EXTENDED WARRANTY FOR JBIV-LP SERIES VALVES

Task Force Tips, Inc., 3701 Innovation Way, Valparaiso, Indiana 46383-9327 USA ("TFT") warrants to the original purchaser of its Low Profile Ball Intake Valve ("equipment"), and to anyone to whom it is transferred, that the Low Profile Jumbo Intake Valve series includes a 10 year warranty against manufacturing defects and corrosion affecting the valve's operational performance.

TFT's obligation under this warranty is specifically limited to replacing or repairing the equipment (or its parts) which are shown by TFT's examination to be in a defective condition attributable to TFT. To qualify for this limited warranty, the claimant must return the equipment to TFT, at 3701 Innovation Way, Valparaiso, Indiana 46383-9327 USA, within a reasonable time after discovery of the defect. TFT will examine the equipment. If TFT determines that there is a defect attributable to it, TFT will correct the problem within a reasonable time. If the equipment is covered by this limited warranty, TFT will assume the expenses of repair.

If any defect attributable to TFT under this limited warranty cannot be reasonably cured by repair or replacement, TFT may elect to refund the purchase price of the equipment, less reasonable depreciation, in complete discharge of its obligations under this limited warranty. If TFT makes this election, claimant shall return the equipment to TFT free and clear of any liens and encumbrances.

This is a limited warranty. The original purchaser of the equipment, any person to whom it is transferred, and any person who is an intended or unintended beneficiary of the equipment, shall not be entitled to recover from TFT any consequential or incidental damages for injury to person and/or property resulting from any defective equipment manufactured or assembled by TFT. It is agreed and understood that the price stated for the equipment is in part consideration for limiting TFT's liability. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above may not apply to you.

TFT shall have no obligation under this limited warranty if the equipment is, or has been, misused or neglected (including failure to provide reasonable maintenance) or if there have been accidents to the equipment or if it has been repaired or altered by someone else.

THIS IS A LIMITED EXPRESS WARRANTY ONLY. TFT EXPRESSLY DISCLAIMS WITH RESPECT TO THE EQUIPMENT ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND ALL IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. THERE IS NO WARRANTY OF ANY NATURE MADE BY TFT BEYOND THAT STATED IN THIS DOCUMENT.

This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

13.0 ANSWERS TO YOUR QUESTIONS

We appreciate the opportunity of serving you and making your job easier. If you have any problems or questions, our toll-free "Hydraulics Hotline", 800-348-2686, is normally available to you 24 hours a day, 7 days a week.