



INSTALLATION, OPERATION AND MAINTENANCE MANUAL

METAL SEATED FLOATING BALL VALVE





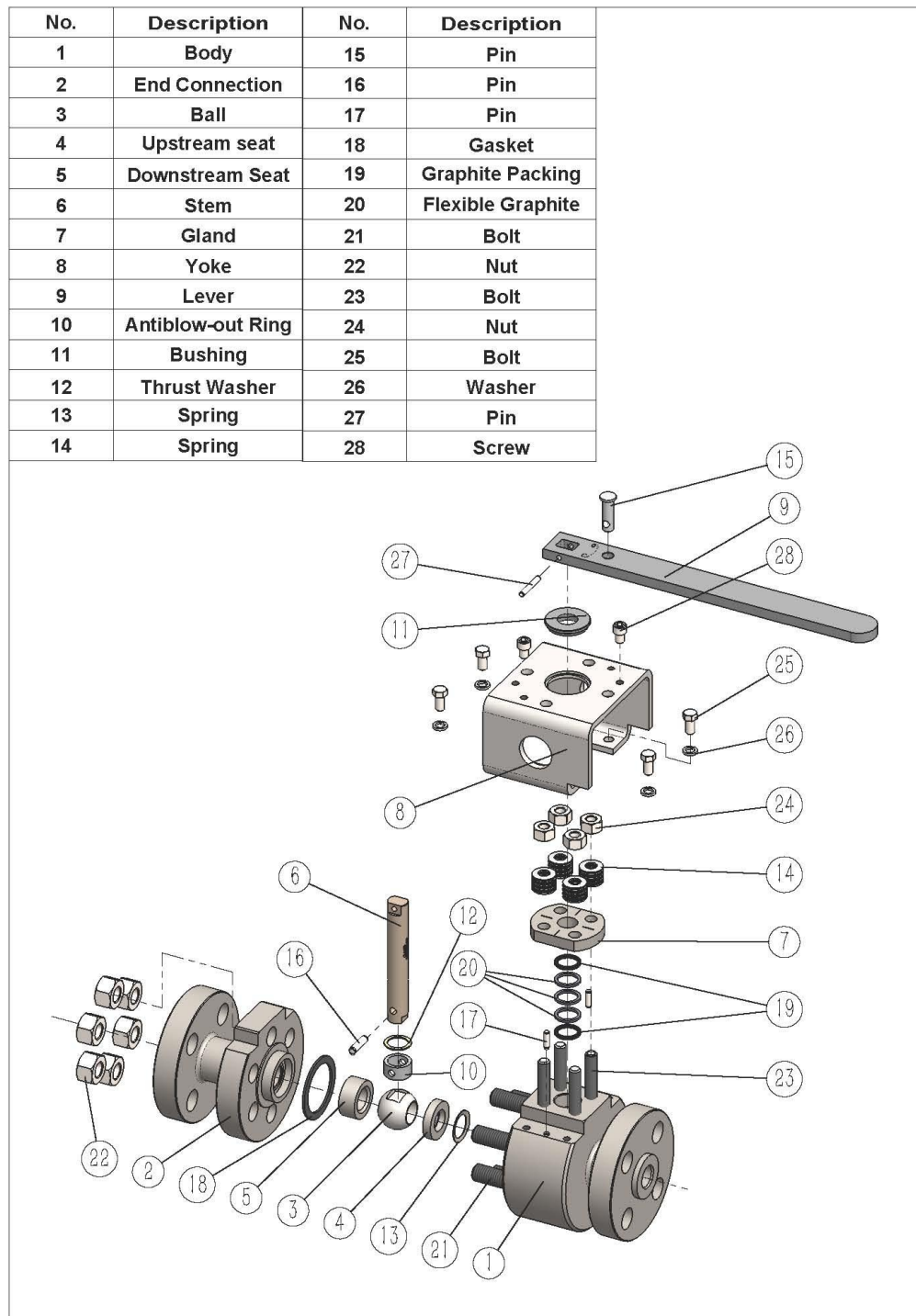
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TYPICAL CONFIGURATION

VALVE DETAILS – METAL SEATED FLOATING BALL VALVE





FOREWORD

Personal safety and Long Term Ownership of your DHV API-6D Trunnion Ball Valve is the most important matter in reviewing our Installation, Operation & Maintenance Manual. This manual will provide all the necessary safety guidelines for our valve including information for the valve transportation, storage, installation, operation and maintenance. Please read carefully before installing or servicing the valve.

DHV provides general guidelines in this manual, and cannot provide specific data and warnings for all possible applications. The purchaser/end user must therefore assume responsibility for proper valve selection, sizing, installation, operation, and maintenance of DHV valve products. The purchaser/end user should read and understand this document and any instructions provided with the product, and conduct training with its employees and contractors to ensure they are aware of the proper and safe use of DHV valve products in connection with the specific application.

1. ENDUSER INSTRUCTION

Personnel safety is always the most important factor in the transportation, storage, installation, operation and maintenance of any valve. DHV valves are designed to meet the customer's order requirements and specifications. DHV disclaims all responsibility for problems that may be caused by applications other than the specified use. Valve service pressure/temperature information is detailed on the valve name plate. When selecting a valve, always consider the application, service and temperature for the intended service. Select the applicable valve material for anti-corrosion and anti-abrasive service. For safety of personnel and plant/environment: Prior to conducting any service to the valve, ensure the valve is not under pressure, properly vented, and drained before servicing. For all electric, hydraulic or pneumatic actuated valves, all power connections to the valve/actuator must be turned off before performing any maintenance and service. When performing any operation, maintenance or service, personal protective equipment should be used, such as protective clothing, oxygen masks, safety glasses, work gloves, etc. DHV will not be responsible for any loss or expense resulting from the failure of equipment, damage to any property, or death or injury to any person resulting in whole or in part from repairs or modification performed by other than authorized DHV personnel. Such unauthorized repairs shall also serve to terminate any contractual or other warranty, if any, on the equipment and may result in equipment no longer meeting applicable requirements.



2. VALVE TRANSPORTATION AND STORAGE

2.1 TRANSPORTATION

1. Valves should remain in the open position to prevent damage to the seating surface during shipping and handling. Each valve should be securely packaged either on a pallet or in a crate to avoid any damage during shipping.
2. Use the proper hoisting equipment to transport the valve, especially during lifting or lowering the valve. Special attention to personnel safety and the care of the valve should be made when transporting the valve. Avoid impacting or striking the valve during transportation. Lay the valve on a clean flat surface; make sure to avoid laying the valve on the flange face. Ensure there is adequate clearance around the valve for proper operation and maintenance.

When lifting the valve, use the valve lifting lug; if the valve does not come with lifting lug, use an appropriate sized sling to go around the body flange neck to lift the valve. Never lift the valve by the gear/neck area or the flange holes. See Fig 1-A & 1-B below that illustrates correct and incorrect valve handling.

3. During transportation, ensure the valve paint, name plate and flange sealing surfaces are fully protected. Do not drag the valve on the floor, nor put the valve flange sealing face on the floor.
4. For those valves not required to be immediately installed, do not open the end flange protective covers. Ensure the valves are stored in a safe clean environment and are protected from rain and dust.



Figure 1-A Correct Valve Handling

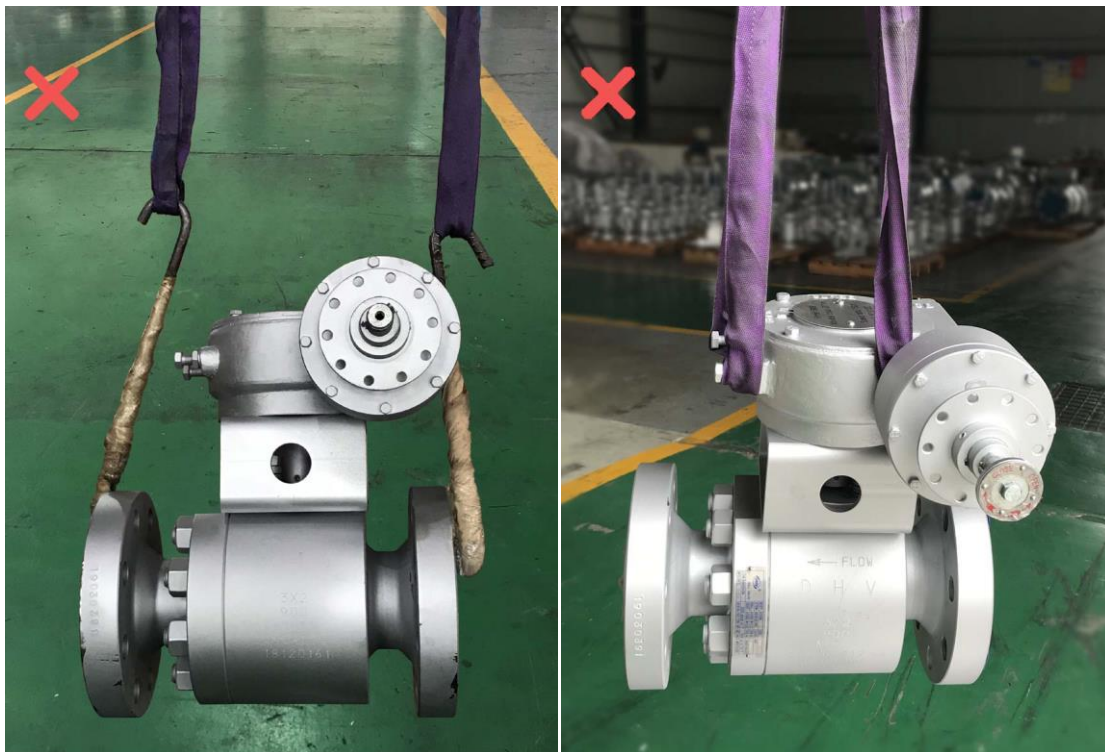


Figure 1-B Incorrect Valve Handling




2.2 STORAGE

1. Valves should be stored in the open position. Valve ports and flange serration surfaces should be kept sealed with protective flange covers.
2. Valves should be stored in a dust free, low humidity and well ventilated room, not in direct contact to the floor. If possible, the valves shall be kept in the original packing box. If valves have to be stored outdoors, keep the valve in the original crate or shipping container. Ensure the valve packaging is stored on raised blocking to avoid moisture damage. Protective covering should be used for protection against dust and rain.
3. Valves should never be stacked on top of each other, to avoid any valve distortion which may affect valve performance and cause personnel injury.
4. Valves that have been stored for an extended period of time should be cleaned and inspected prior to installation. Inspect the sealing surface to ensure it is clean and free of any debris or damage.
5. Do not expose the valve to any corrosive environment as this may cause damage to the valve components.

3. VALVE INSTALLATION

- Review all documentation to fully understand the valve and related information that will provide safe installation and a long service life for your valve.
- Valve information can be found on the valve body, and the name plate. Fig 2 is a typical nameplate. Reference the information on our nameplate for ordering replacement parts, or when making inquiries about your valve's operation or maintenance needs.
- Valve ends should have a protective cover to protect the valve port from any foreign particles and dust which will damage the ball and seat sealing surfaces.

 BALL VALVE	BODY: A105N	SIZE: 3x2
	STEM: A638-Gr.660	CLASS: 900
	BALL: 410SS W/CCC	S/N NO.:
	SEAT: 410SS W/CCC	FIG NO.: BA901F4A-GO
LOW EMISSION	2220 psi at 32 °F 1508 psi at 752 °F	
MFG DATE:	B16.34/ISO 17292 API 607 NACE MR0175-2002	

SIZE	Nominal valve size
CLASS	API class designation
FIG NO.	See the DHV Catalog
S/N NO.	Serial number
BODY	Body material designation
STEM	Stem material designation
BALL	Ball material designation
SEAT	Seat material designation
psi at °F	Operating pressure
DATE	Valve manufacturing date

Figure 2 Typical Valve Nameplate Information



3.1 INSPECTION BEFORE INSTALLATION

3.1.1 Before installation, check the valve nameplate and valve body information to ensure the valve is suitable for the intended service.

3.1.2 Before installation, remove the flange cover and the protective film on the flange sealing face, inspect the ports and the flange sealing surface, remove any dirt with a clean soft cloth, use an anti-corrosive cleaning liquid to clean if necessary, and never use any other chemical products.

3.1.3 Inspect the flange gasket (including ring gasket) sealing surface and ensure it is in acceptable condition for installation.

3.1.4 After cleaning the valve and before installation, open and close the valve one time. Ensure the valve cycles smoothly. If abnormal operation is experienced, stop the operation and inspect the valve internals for any obstructions that may be preventing normal operation.

3.1.5 After successfully cycling and assuring the proper operation of the valve, return the valve to the open position and ensure the valve sealing surfaces are protected until installation is complete.

3.2 INSTALLATION

3.2.1 Position the valve into the pipe or the flange connection; ensure that any stresses caused by improper pipe alignment are relieved. Valves are not intended to be a means of aligning improperly fitted pipe.

3.2.2 Install the valve using qualified piping standards and practices. Valves marked with flow direction must be installed in line with the piping flow.

3.2.3 The recommended orientation for ball valves is upright with the valve in a horizontal line. The valve may be installed in other orientations; however, any deviation from recommended horizontal position may compromise proper valve operation and void the warranty.

FLANGE ENDS:

- Select the proper gasket (including ring gasket) to install, line up the bolt holes between the valve flange and pipeline flange, then install the bolts and nuts and tighten to the accepted piping and bolting standards. The bolt threads should be lubricated first for ease of bolting.
- Use an appropriate sized torque wrench when tightening the bolt/nut, to avoid flange deformation. Please follow Fig 3 and Table 1 for bolting sequence and bolting torque. If the bolting quantity is different from the chart shown, please follow the same principle to get a new sequence to follow.
- For large diameter valves, the valve must be properly and safely supported during installation. After installation is completed, valve supports should be moved to the bottom of the valve flanges.
- After valve installation is complete, recheck and tighten the bolts including the gland bolts as necessary to the values provided in Table1 & Figure 3



- It is recommended that the tightness of the joint bolt tension and gland bolts be inspected at least yearly. Refer to Table 1 & Figure 3



DURING INSTALLATION, IF VALVE IS NOT IN LINE WITH THE PIPELINE, FLANGE FACES ARE NOT PARALLEL TO EACH OTHER, OR BOLTING TORQUE IS NOT UNIFORM, VALVE LEAKAGE MAY BE EXPERIENCED.

Table 1 Bolting Tightening Torque Chart

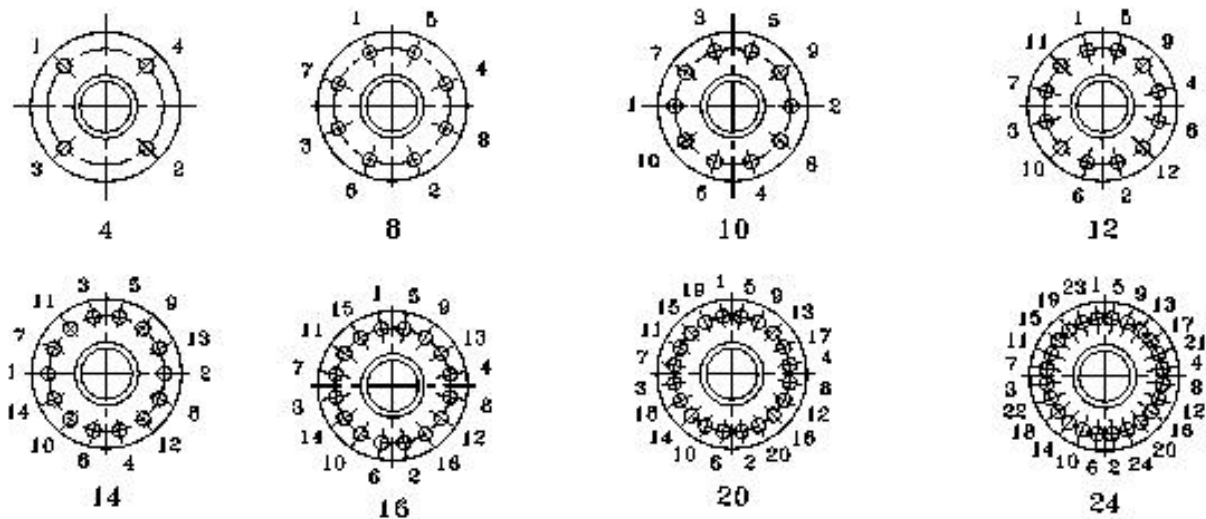
Stud Size (Inch)	Measurement: Newton-meters N·m Tolerance: +/- 10%						
	(Conversion: 1 ft·lb= 1.36 N·m 1 N·m = .74 ft·lb)						
	B7M/L7M	B7/L7	B8 (I)/ B8M(I)	B8M (II)	B8 (II)	B8MLCuN	B16
5/16-18UNC	21	27	8	25	26	9	28
3/8-16UNC	36	47	13	43	45	16	48
1/2-13UNC	85	111	32	101	107	37	112
9/16-12UNC	121	158	45	144	152	53	160
5/8-11UNC	165	217	62	197	208	72	218
3/4-10UNC	289	378	108	344	362	126	380
7/8-9UNC	459	601	171	459	-	200	605
1-8UNC	683	894	255	683	-	298	901
1-1/8-8UN	992	1298	370	811	-	433	1308
1-1/4-8UN	1381	1807	515	1130	-	602	1820
1-3/8-8UN	1860	2435	693	1167	-	812	2452
1-1/2-8UN	2438	3192	909	1530	-	1064	3214
1-5/8-8UN	3126	4092	1165	-	-	1364	4120
1-3/4-8UN	3931	5146	1465	-	-	1715	5182
1-7/8-8UN	4863	6367	1813	-	-	2122	6411
2-8UN	5933	7767	2211	-	-	2589	7820
2-1/4-8UN	8519	11152	3175	-	-	3717	11229
2-1/2-8UN	11764	15400	4385	-	-	5133	15507
2-3/4-8UN	15742	18747	5867	-	-	6869	18747
3-8UN	20528	24447	7651	-	-	8958	24447



Table 1 Bolting Tightening Torque Chart (cont.)

Stud Size (Metric)	Measurement: Newton-meters N·m Tolerance: +/- 10% (Conversion: 1 ft·lb= 1.36 N·m 1 N·m = .74 ft·lb)						
	B7M/L7M	B7/L7	B8 (I)/ B8M(I)	B8M (II)	B8 (II)	B8MLCuN	B16
M10	43	56	16	51	54	19	56
M12	73	96	27	87	92	32	96
M16	175	230	66	209	221	77	232
M20	338	443	126	338	424	148	446
M24	578	757	215	578	-	252	762
M30	1134	1484	422	928	-	495	1495
M36	1964	2572	732	1232	-	857	2589
M42	3125	4091	1165	1960	-	1364	4119

Figure 3 Bolt Tightening Sequence





WELD ENDS:

- Weld ends must be kept clean with no burrs, oil, dirt or foreign objects.
- The valve end and pipe end must be in proper alignment for effective welding.
- Follow the approved WPS to perform the welding. Ensure that the temperature of the body/seats area does not exceed 200°F, verify this temperature with a Tempil stick; welding too close to the seat/sealing area will cause area distortion. Protect the valve port area to prevent welding slag and foreign matter from entering the valve.
- After welding, use approved and proper Non-Destructive Testing (NDT) method to check the welds; clean the welds thoroughly, and then perform local heat treatment if required.
- When installation is complete, prior to system testing and start-up, clean the valve by flushing the line of debris and other materials that may have accumulated inside the valve and in the valve seating area and surfaces during construction. When flushing the valve, open the valve fully, flush for a determined time based on line size. Close the valve to allow the fluid to fill the line; operate the valve to the half open and half closed position repeatedly, this action allows the fluid to build up within the valve assisting in flushing heavier debris from the valve. Fully close the valve, if seat leakage is noted after flushing, repeat flushing procedure. If leakage from the seat is still evident, the seating surface maybe damaged and need repair. If the valve is equipped with seat injection, the seats should be charged with a valve lubricant to displace any residual fluids or moisture in the seal areas of the valve.



DURING WELDING, THE TEMPERATURE NEAR THE VALVE SEAT INSERT AND ANY O-RING AREAS SHOULD NEVER EXCEED 94°C/200°F. A TEMPERATURE INDICATING DEVICE SHOULD BE USED TO MONITOR THE TEMPERATURE DURING THE WELDING. THIS ALSO APPLIES TO POST WELD HEAT TREATMENT.

4. VALVE OPERATION

- To assure maximum valve performance, only use a valve that is suitable for the rated pressure/temperature and corrosive environment.
- For your safety and normal operation, please read the following valve operation procedures:
 - 4.1** The valve must be kept either in the fully open or fully closed position. Never throttle or leave the valve at the half-open position as erosion of the ball and seating surface may occur and damage will result.
 - 4.2** Valve open and closed positions are indicated on the valve gear box or lever. Rotating the valve hand wheel clockwise will close the valve; counter-clockwise operation will open the valve, this is also applicable to gear or motor actuated operation.
 - 4.3** There are position stops for the valve at the fully open and fully closed position. When the valve lever or hand wheel will not rotate any further it means the valve is already at the fully open or fully closed



position. The open/close stroke is 90°.

4.4 Lever operated valves are in the open position when the lever is in-line with the flow centerline. Conversely when the lever is perpendicular to the flow centerline the valve is in the closed position. Gear operated valves will have a position indicator on the gear.

4.5 Never operate the valve without authorization and a full understanding of the safe operation procedures, inspections and proper handling instructions.

Table 2

When Torque Wrenches are Not Available or Suitable, The Use of Standard Wrenches and Guidelines Will Apply to Avoid Over Torque or Damage to the Valve.	
BOLT SIZE	LENGTH OF WRENCH (inches)
3/8"	5"
1/2"	6"
9/16"	9"
5/8"	12"
3/4"	18"
7/8"	24"
1"	30"
1-1/8"	36"
1-1/4"	42"



5. VALVE MAINTENANCE

Valves should be inspected regularly during operation and any findings should receive immediate attention in order to avoid any further damage to the valve or the system. Regular inspection and maintenance should be scheduled at a minimum of twice per year, or more often if required.

5.1 In less corrosive environments, it is suggested to check the valve body thickness every six months. In more corrosive environments, it should be checked every three months. If the measured wall thickness is less than specified in ASME B16.34, the valve should be replaced immediately.

5.2 The valve seat pocket area is a primary area where the operation of the valve can be affected by debris and contaminants within the line. To ensure the seat's operational movement within the valve, it is recommended that the valve seat pockets be cleaned routinely with a product designed for the valve trim and the service needs. Routine service can vary depending on the severity of the operating service of the valve. Once the valve is in service, it is recommended to use a seat cleaning detergent or light lubricant to clean the seat sealing surface of any debris which may have been introduced into the piping or the valve at the time of installation. Recommended cleaning of the valve seats should be at minimum every six months; valves which are operated more often should be every three months to maintain and ensure the integrity of the seat's seal.

5.3 Before removing the valve from a pipeline, always mark the connecting flanges for proper fitment and valve flow direction.

5.4 After any valve repair, reference Table 1 for proper bolt torque to assemble the valve.

5.4.1 Over torquing can cause deformation of the body/bonnet flange causing leakage. Failure to properly follow the tightening sequence will result in the gasket not being compressed evenly, resulting in gasket leakage.

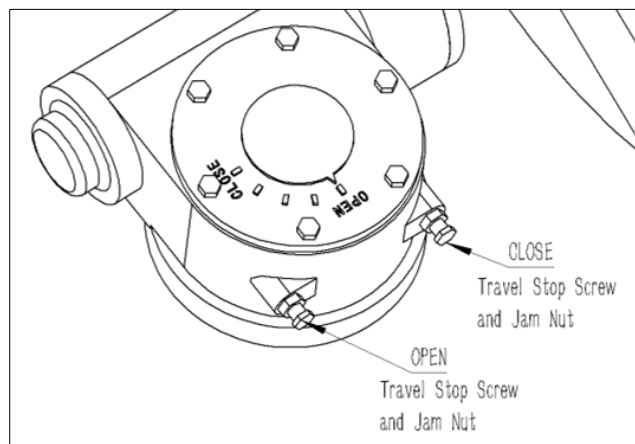
5.4.2 **WARNING:** Never use impact devices to tighten the bolting on the body/cap connections. Use suitable designed mechanical devices such as hand torque wrenches for tightening and refer to Table 1. Torque wrenches and standard wrenches may be used in combination when performing tightening sequences.

5.5 To assure the valve is sealing properly, perform the required pressure testing per recognized and applicable design standards.

5.6 During maintenance or servicing of the valve, all replacement parts must be the same as the original specification (parts dimensions and materials). End user may also purchase the spare parts such as packing, gaskets, bolts/nuts etc. when ordering the valve. With the new packing, gasket or bolt/nuts installed, the valve must pass the applicable pressure testing prior to installation and service.

5.7 The gear box requires different grease, suitable for -20°C (-4°F) to 80°C (176°F), contact DHV for other grease applications.

5.8 If the gear operator is used frequently, the gear box grease should be replaced every three years. If used less frequently, it should be replaced every five years.



5.9 Gear box position stop calibration:

Before calibration, isolate the valve from the system pressure. If the valve is already in the pipeline and cannot be isolated from the system pressure, ensure that valve operation will not affect the current system.

5.9.1 "Open Position" stop calibration: Valve should be in full open position, if possible, check the valve bore and ball bore are complete in line, if not, the top gear box indicating plate should be removed, check the stem position, loosen the "OPEN" position jam nut, counter-clockwise the bolt several turns (do not remove the bolt), turn the gear box hand wheel until the ball reaches the full open position which is in line with the valve bore, the stem flat surface should be also in line with the valve bore centerline. Once this position is located, clockwise the OPEN bolt until stopped, then tighten the jam nut. Operate the valve to the fully closed position until it engages with the travel stop screw.

5.9.2 Re-install the gear indicating plate, perform the valve seat pressure test to assure the seats are sealed. Valve body cavity medium will leak from the drain valve. If it continues to leak this may indicate the valve seat is leaking.

5.10 At no time shall any weld repair be conducted on the valve while in service. Never strike the valve with a hammer or other impact device. Ensure that no excess weight is placed on the valve that was not part of the original manufacture design.



WARNING ! ANY MAINTENANCE OR REPAIR MUST NOT OCCUR UNTIL THE VALVE BODY PRESSURE IS COMPLETELY RELEASED. NO REPAIR WORK WILL BE DONE WHILE THE VALVE IS UNDER PRESSURE.



6. DETAILED DISASSEMBLY AND ASSEMBLY

6.1 METAL SEATED FLOATING BALL VALVE DISASSEMBLY

Metal seated floating ball valve shall be removed from pipeline before disassembling the valve, and the valve must be in closed position, mark the direction and position on the parts. Assure any markings do not disappear during the cleaning process; take care not to damage any parts (stamping of the ball or seats may cause damage).

ATTENTION: Mark the valve seat and its matching ball sealing surface. Seats are not interchangeable, when reassembling, the corresponding ball and seats must be installed together.

- 6.1.1 Lever operated valves, remove the locating and locking pin and the hand lever,
- 6.1.2 Gear operated valve, Remove the gear box fastener (nuts and washer) and remove the gear box.
- 6.1.3 Place the valve vertically on a clean surface, preferable a wood or plastic surface material to assure protection for the flange sealing surface and to avoid damage to the RF or RTJ end connection. Loosen and remove the body/end connection nuts, and then remove the end connection and place the end connection vertically with flange facing downwards.
- 6.1.4 Remove the downstream seat from the ball and mark both the ball sealing surface and downstream seat, if it is a bolted type downstream seat, the seat holding plate and screws must be removed first, then remove the seat.

WARNING: do not damage the sealing surface of seat and ball, do not damage the seat support surface on the end connection.

- 6.1.5 Remove the body/end connection bolting, and the body spiral wound gasket.
- 6.1.6 Carefully remove the ball from the body and avoid damaging the ball surface. mark the upstream and downstream seat side in the stem/ball connection slot.
- 6.1.7 Remove the upstream seat and disc spring from the body.
- 6.1.8 Remove the gland bolts, Belleville washer and the gland flange.
- 6.1.9 If the valve is designed with an anti-blow out device, , push the stem (including thee thrust bearing), towards the body cavity, to remove the anti-blow ring, pin, and stem thrust bearing, then remove the stem out from the stem packing bore area. For 1 piece stem design, remove the stem and thrust bearing from body cavity area.
- 6.1.10 Remove stem packing.

WARNING: Do not damage the surface of stem and packing bore area. This may cause stem leakage.



6.2 METAL SEATED FLOATING BALL VALVE ASSEMBLY

6.2.1 Clean all parts, and replace any damaged parts with new replacement parts

6.2.2 Place the valve body vertically on a clean surface, assure that flange surfaces are not damaged.

6.2.3 Install the seat disc spring, upstream seat into the seat pocket area.

ATTENTION: use the marked upstream seat to install, do not mix the upstream and downstream seats.

6.2.4 For anti-blowout stem, install the stem from the body packing bore area, install the thrust washer, and anti-blowout ring, line up the holes on the anti-blowout ring and the stem, insert the pin through and then pull up the stem all the way up to correct location. For one piece stem design, install the thrust washer from top of the stem all the way to the stem shoulder, and then install the stem through body cavity area all the way through the bottom stem packing bore and reach to the correct location.

6.2.5 Rotate the stem until the stem bottom flat face is parallel to the valve body bore, and then install the ball (closed position) connecting to the stem/ball connection area.



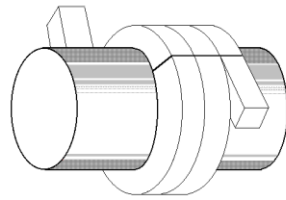
WARNING: DO NOT DAMAGE THE BALL, SEAT, OR SEALING SURFACE

6.2.6 Install the new spiral wound body gasket and the body/end connection bolting.

6.2.7 Install the downstream seat to the end connection, if it is the bolted type seat, use the holding plate and bolts to secure the seat.

6.2.8 Install the end connection/downstream seat to the valve body connection, make sure body and end connection are connecting correctly, flat top matching to the body, and then tighten the bolt/nut connections

6.2.9 Install the new stem packing to the packing bore area. Note: Install packing rings one at a time, the top and bottom rings are Inconel wound graphite packing, in between are the graphite packing ring (flexible graphite), compress each ring with the packing gland before installing the next one. Graphite packing ring may be cut by wrapping the packing around a round bar with the same stem diameter as shown in figure below. Do not stretch the packing and use a sharp knife to cut at 45°. The seam position between top and bottom packing ring shall be installed at 180° apart. Graphite packing rings are one piece ring shaped, and install around the stem and pushed into the packing bore into the valve body.



BUTT CUT



cut angle (45°)

6.2.10 Follow the sequence to install gland packing, Belleville spring, and gland bolt nut, bolt torque will be based on Table 2.

ATTENTION: Belleville washer installation, arrangement and quantity should match original installation (if applicable). Packing gland must be tightened evenly across the packing gland flange or the packing could be damaged and affect valve operation. Use the marked upstream seat to install, do not mix the upstream and downstream seats.

Table 2 – Gland Bolt Tightening Torque Chart Ft-Lb

Valve Size	Pressure Class	Bolt Size	Torque
13/20	900	3/8	2.6
3/4	300	5/16	1.5
1	900	1/2	4.5
	1500	1/2	5.7
1.4	1500	1/2	6.2
1 1/2	300	3/8	4.7
2	150-300	3/8	2.5
	900	1/2	9.7
	1500	1/2	12.4
3	150	3/8	4.6
	300	3/8	5.5
	900	1/2	11.3
4	150-300	3/8	6.4
	600	5/8	57.6
5 1/8	900	3/4	59.2
6	150-300	1/2	15.9



- 6.2.11** Install the mounting bracket to the valve body, tighten the mounting bracket bolt/nut to the right torque. Continue installing the adapter sleeve (if required), bushing to the stem, driving sleeve key (if required) etc.
- 6.2.12** For lever operated valve, install the connecting pin through the holes on the lever and the stem, locking pin on the lever.
- 6.2.13** For gear operated valve, install the gear box to the mounting bracket, tighten the bolt/nut/washer connection.



7. TROUBLESHOOTING

TROUBLE	PROBABLE CAUSE	REMEDY
Body gasket leakage	Body bolts are loose.	Torque the bolts accordingly
	Gasket sealing surface damaged on either the body or end connection.	Send back to Manufacturer to repair
	Gasket damage	Replace gasket
Seat leakage	Damaged valve seat or ball	Repair or replace
	Internal debris	Open/close valve, rinse and remove debris
	Ball may not be completely closed	Check gear calibration or stops
	Gear box may not be calibrated correctly	Calibrate according to section 5.9
Difficulty operating or high torque	Damaged gear box	Repair or replace
	Foreign object in the valve internals	Inspect and clean valve internals
	Stem packing over tightened	Adjust gland packing torque to the correct value
Leakage at stem	Packing gland loose	Tighten the gland to correct torque
	Stem sealing surface or valve itself is damaged	Repair or replace the valve stem
	Stem sealing parts are damaged	Replace stem sealing parts
Leakage from piping	Pipe has foreign objects inside	Clean the pipe and remove any foreign objects
	Foreign material inside the piping	Inject cleaning agent to remove foreign material
	Piping seal is damaged	Install emergency sealing parts, replace with new parts upon shut down
Loud noise / water hammer when opening and closing	Wrong sized valve for application or flow velocity is too high	Assure accurate valve size and flow



8. WARRANTY AND SERVICE

8.1 VALVE WARRANTY PERIOD

8.1.1 Valve warranty period is 12 months from the date shipped from the factory.

8.1.2 In the event the end user encounters an issue of quality, please notify DHV immediately. DHV reserve the right to investigate and settle all issues of quality concerns directly with the end user. Refer to DHV's standard warranty policies for questions or concerns regarding warranty concerns.

8.1.3 Addressing a valve quality issue within the warranty period:

DHV reserves the right to review and respond to all requests for warranty repair or replacement, prior to making any replacement or repairs by the end user.

8.1.4 DHV will not be held responsible for any damage due to natural disaster, such as earthquake, hurricane etc. during valve shipment.

8.1.5 DHV must to be consulted for any warranty issue before being held responsible for any repairs or valve replacement.

8.2 SERVICE

8.2.1 If required by the contract, DHV may provide and perform field installation and start up testing.

8.2.2 Upon end user request, DHV can provide services in monitoring the valve quality and history for Long Term Ownership. Additionally, DHV can provide all the necessary training of repair services to the valve, as well as training on safe valve operations.



APPENDIX I

Installation & Automation Requirements for DHV Ball Valves

Assembly

Includes all non DHV branded hand levers, gearboxes, actuators, and any connecting adaptor plates and/or couplings.

- Gearboxes, actuators and necessary adapters must conform to the valve's ISO pad top work design where applicable.
- It is important that adapter plates and gears should be bolted to the valve's top work plate using the correct bolt size, torque, and tightening pattern.
- Care should be taken at all times to protect the stem from any movement, stress, force or other potential damage while ensuring the stem remains centered in the valve mounting flange during installation.
- Automation mechanisms must be designed, assembled, and supported in a manner as to not exert uneven or unbalanced forces on the valve assembly that could contribute to a side load condition.

NOTE: DHV valve top works fully comply with the requirements set forth in ISO 5211 latest edition. All gears or actuators assembled to DHV valves shall comply with the requirements of ISO 5211 latest edition. Additionally, all gears or actuators shall utilize a spigot return to ensure proper ISO pad alignment on all connections and/or attachments including valve, adapter plates, gearboxes, and actuators. Exceptions may be considered based on order requirements outlined in the purchase order.

Operation

- Personnel installing the operator must ensure there is no abnormal stem movement or run out during operation.
- It is extremely important that all "stops" and or "limits" are correctly set to prevent damage or unnecessary wear to the valve.

Testing

Applies to all methods of hydro testing and pre-commissioning testing.

- Procedures must be compliant to API specifications.
- Always ensure any vents or drains opened during the testing process are securely closed upon completion of the test.

Installation

- Ball valves are best suited for operation in the horizontal position.
- Ball valves must always be either fully open, or fully closed once installed and are not designed or intended for throttling applications.

Shipping

Valves need to be fully open during shipment and actuators need to be braced to support the extra weight at the top end of the valve.

Failure to follow these manufacturer prescribed requirements will void any warranties



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DHV is committed to providing you with the necessary information to support our products. Our global network of authorized service centers, technical support personnel and warranty support personnel are ready to serve your needs for support on applications, products, service and warranty. Contact our USA Bakersfield headquarters for immediate assistance to your support needs.