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### I. INTRODUCTION

Series B Floating Ball Valves are designed and manufactured in conformance of industry requirements and are available in a wide variety of materials, suitable for many oil/gas and industrial applications. The valve configuration may be noted on the stop plate and/or cast or stamped into the body, which includes valve size and part number.

Several body, trim, seat and seal materials are available. It is the user's responsibility to specify the materials appropriate to assure chemical/temperature/pressure suitability for their particular application.

### II. TRANSPORTATION & STORAGE

While loading or unloading, check for and adhere to any markings or arrows on the box/crate which may be present to indicate upward orientation. Valves should be stored, with protective end caps in place, in a suitably dry, clean environment, protected from the weather. Factory grease and end-cap protectors should be adequate for storage up to six months if properly protected. Longer term storage should include a suitable inspection process to assure valves have not been compromised and are suitably maintained in good condition.

### III. INSTALLATION

Before installation, remove the end protectors and clean the valve ends and bore, using solvent or as per the

### Base Part Numbers

RATING	1"FP	2"RP	2"FP	3"RP	3"FP	4"RP	4"FP
1000					2105	2106	2107
1500		2152	2153	2154	2155	2156	2157
2000		2202	2203	2204	2205	2206	2207
2160	2211	2212	2213	2214	2215	2216	2217
2500	2251	2252	2253	2254	2255	2256	2257
3000	2301	2302	2303	2304	2305	2306	2307
5000	2501	2502	2503				

### Trim Option Suffix Code

**XXXX - X X X X X X X**

#### Base Part No.

See chart above

#### Options

9 • None

#### Actuation

- 1 • Handle
- 2 • Square Nut
- 3 • Gear Operator w/Lkg. Device
- 4 • Gear Operator
- 9 • Bare Stem

#### Seal Material

- 1 • Buna-N
- 2 • Viton
- 3 • Low-Temp Buna-N
- 4 • HNBR
- 5 • Aflas
- 7 • James Walker®
- 8 • Peroxide-Cured Buna-N
- 9 • EPDM

#### Seat Material

- 1 • Delrin®
- 2 • PTFE
- 3 • RTFE
- 4 • Devlon®
- 5 • PEEK
- 6 • HTFM (Hostafion®)

#### End Connections

- 1 • Threaded LP
- 2 • Socketweld x Socketweld
- 3 • Threaded 8RD
- 4 • Socketweld x Threaded LP

#### Trim Material (Ball & Stem)

- 1 • CS / CS (NACE MR0175 compliant)
- 2 • 316 SS / 316 SS (NACE MR0175 compliant)

#### Body & Adapter Material

- 1 • Carbon Steel
- 2 • Stainless Steel (CF8M)
- 3 • Ductile Iron
- 4 • Low-Temp. Carbon Steel (LCC)
- 5 • Coated Ductile Iron
- 6 • Coated Carbon Steel

customer's specification. If valves are to be painted prior to installation, appropriate steps must be taken to prohibit the ingress of blast media, paint, solvents or any other foreign contamination that might cause damage to the valve's internal components. Assuring a properly clean valve bore will help to avoid possible seat damage during operation.

**IMPORTANT: Assure that the adjacent pipeline is clean of all debris, scale, weld slag, etc. Completely flushing the system of such debris prior to installation will greatly reduce the possibility of seat compromise at startup. Failure to do so may result in damage to the soft seat, metal seat and/or seals during operation.**

## CAUTION

The valve body and adapter are the proper places to lift the valve. Never lift the valve by handle or other appendage as doing so may result in damage to the valve and/or injury to the installer. End-cap protectors should always be left in place until the valve is actually being installed in the pipeline.

Series B valves are bi-directional and may be installed with flow from either direction. The valve should preferably be installed in a stem-up or stem-horizontal position. NEVER install the valve in a stem-down condition. When installing vertically, it is preferred that the upstream pressure be above the valve. This allows the weight of the ball to assist in sealing against the downstream seat.

The valve should be adequately supported, especially when heavy actuators are included as this may cause a top-heavy, imbalanced condition. If necessary, support the valve and/or actuator as necessary with straps/brackets/piers to assure a rigid installation. Valve/actuator weight should not cause undue stress to the piping system when properly installed and supported.

Remove the end-cap protectors. When handling the valve without end-cap protectors, keep the ball in the open position to minimize the possibility of damaging an exposed ball surface.

### Threaded-End Valves

Valve should be installed onto a suitably sized mating male threaded NPT connection. Use the appropriate thread sealant compound to minimize the risk of galling.

### Socketweld-End Valves

It is important to minimize heat and weld slag during the installation process to prevent damage to the seats and seals of the valve.

1. Clean all grease from the ball and bore of the valve body/adapter.
2. Electric welding is preferable. If oxygen-acetylene equipment is used extreme caution must be exercised to avoid excessive temperatures.
3. Orient the valve in the OPEN position. Use Tempil sticks or other suitable methods to assure that the temperature in the seat and seal areas do not exceed 250°F (121°C).
4. Weld with continuous bead, avoiding application of excessive material.
5. IMPORTANT! Thoroughly clean all weld slag from bore before turning the valve to the closed position. Failure to do so may result in damage to the soft seats.

## IV. OPERATION

## WARNING!

**Unless specifically noted otherwise, ViNtrol Series B Ball Valves are NOT suitable for OXYGEN SERVICE. Using these valves in oxygen service may result in catastrophic failure resulting in equipment damage, as well as operator injury or death.**

Series B Ball Valves are intended for ON-OFF service only. As with any soft-seated ball valve, prolonged throttling or pinching flow will cause premature wear of the soft seat and ultimate failure. The valve operates within a 90° turn from fully open to fully closed. Handle or gear operator should be turned until it is against the stop pin or travel stops. The valve bore position may be

noted by the position arrow on the handle or gear operator. Alignment of the handle/arrow with the pipeline indicates an OPEN condition. Alignment of the arrow 90° across the pipeline indicates a CLOSED position. Some gear operators/actuators may have different alignment devices. Consult specific device documentation for proper assessment of position when these devices are employed.

### Hydrostatic Testing

When Series B Valves are installed in a system requiring hydrostatic testing, user should use the following procedure to minimize possibility of damage to the valve:

1. Open the valve fully prior to introducing test fluid to

allow flushing of any debris through valve bore and from the system.

2. Once the system is completely filled, the valve should be positioned in a partially-open condition (at least 20°) to allow the body cavity to completely fill with fluid.
3. Hydrostatically shell test to a maximum pressure not exceeding 1.5 times the rated working pressure of the valve.
4. Bleed pressure from the system.
5. Close the valve completely.
6. The valve seats may be tested by introducing pressure, first from one side, and then from the other. During seat testing, pressure should not exceed 1.1 times the working pressure of the valve. NEVER attempt to test both seats at the same time with pressure from both sides.
7. Upon completion of testing, purge the valve of all test fluid and open valve fully.

## V. MAINTENANCE

### WARNING!

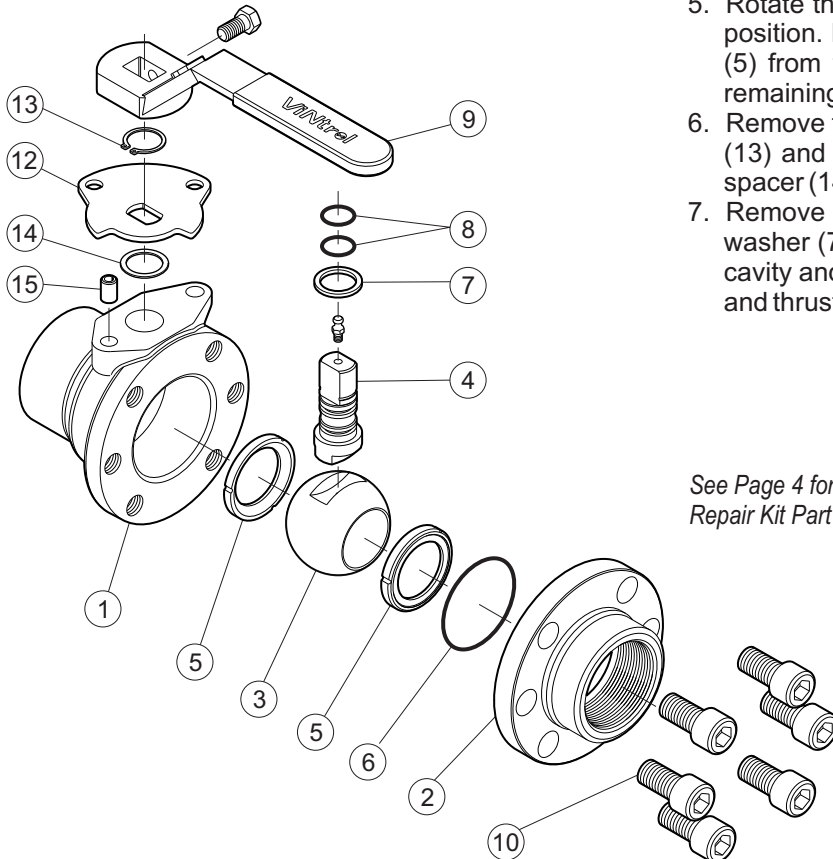
**Prior to removing valve from line, system pressure must be bled completely. Valve should be partially opened to assure no residual pressure is trapped in the body cavity. Failure to adhere to this warning may result in catastrophic leakage or damage to valve/surrounding equipment and/or injury or death.**

The Series B Valve is designed for long, continuous operation with minimal maintenance required.

### Disassembly

Should the valve components need to be inspected or replaced, the valve can be disassembled as follows:

1. Mount the valve in a vice or other holding fixture, with the adapter (2) positioned on top.
2. Remove the handle (9) or gear operator.
3. Loosen and remove the cap screws (10) in a crisscross manner, thereby allowing removal of the adapter.
4. Remove the body seal (6) from the adapter.
5. Rotate the stem (4) until the ball (3) is in the closed position. Remove the ball and then remove the seat (5) from the seat pocket in the body. Remove the remaining seat from its pocket in the adapter.
6. Remove the stem by first removing the retaining ring (13) and lifting the stop plate (12) (if included) and spacer (14) off the top of the stem.
7. Remove the stem, with stem seals (8) and thrust washer (7) intact, by pushing the stem into the body cavity and out of the body. Remove the stems seals and thrust washer from the stem.



See Page 4 for  
Repair Kit Part Numbers

### Parts List

Item No.	Description
1	Body
2	Adapter
3	Ball
4	Stem
5 *	Seat
6 *	Body Seal
7 *	Thrust Bearing
8 *	Stem Seal
9	Handle
10	Cap Screw
12	Locking Plate
13	Retainer Ring
14	Spacer
15	Stop Pin

\* Recommended Spare Parts

8. Clean all parts and inspect them for wear.

### Reassembly

Inspect the body and adapter for damage/wear. Visible wear of the metal surface in the seat pockets, stem journal or valve bore will likely cause continued leakage, a possible unsafe condition and is grounds for disposal and replacement of the valve. Clean and inspect all other components, replacing them as necessary with ViNtrol factory-new parts.

1. Position the body and the adapter with the threaded ends down on a clean surface, preferably wooden or plastic.
2. Apply a thin coating of grease to the cleaned or new seats and install them into the cleaned seat pockets in the body and the adapter.
3. Lightly grease new thrust washer and stem seals and install them in place on the stem. Apply a liberal amount of grease to the stem between the three seal grooves. Reach into the body opening, gently installing the stem/seal assembly into the cleaned stem journal, taking care not to cut the stem seals as the assembly is pushed into place. Continue pressing the stem into position, protruding out of the top pad of the body.
4. Place the spacer over the stem, followed by the stop plate (if included) and finally, reinstall the retainer ring in its groove on the stem, holding all parts in place. If the retainer ring groove is not visible, the stem is not fully pressed into place inside the body.
5. Rotate the stem assembly to the closed position with the ball-engaging key aligned with the bore of the body.

6. Apply a light coat of grease to a cleaned or new ball and slide it into the body, engaging the stem key with the ball's keyway as the ball drops into place, resting on the seat (ball will be in closed position).
7. Apply a light coat of grease to the body seal and install it in place in the appropriate groove on the adapter. Apply a liberal coating of grease to the pilot diameter of the adapter where the body seal is located.
8. Gently lower the adapter (with seat and body seal installed) down on the body, aligning the holes with the threaded holes in the body, engaging the adapter pilot diameter into the body. Exercise care to assure that the body seal is not pinched or cut during this reassembly. Install the cap screws and hand-tighten. Finally, fully tighten in a crisscross manner.
9. Reattach the handle or gear operator and cycle the valve from open to closed several times to assure smooth operation. If valve is gear-operated, recheck the travel stop settings as described above to assure proper setting.

### Ordering Repair Kits

Repair Kits are available for Series B Ball Valves. The Kit Assembly Part Number may be configured as shown below to include the desired combination of ball, stem, seats and seals.

### EXAMPLE:

Part No: **REPAIR-2202-211** • Includes Stainless Steel Ball & Stem, Buna-N Seals, Delrin® Seats for a 2"RP 2000 Valve.

### Base Part Numbers

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1000					2105	2106	2107
1500		2152	2153	2154	2155	2156	2157
2000		2202	2203	2204	2205	2206	2207
2160	2211	2212	2213	2214	2215	2216	2217
2500	2251	2252	2253	2254	2255	2256	2257
3000	2301	2302	2303	2304	2305	2306	2307
5000	2501	2502	2503				

### REPAIR - Base No. - X X X

#### Trim Material (Ball / Stem)

- None • X
- CS / CS (NACE compliant) • 1
- 316 SS / 316 SS (NACE compliant) • 2

#### Seal Material

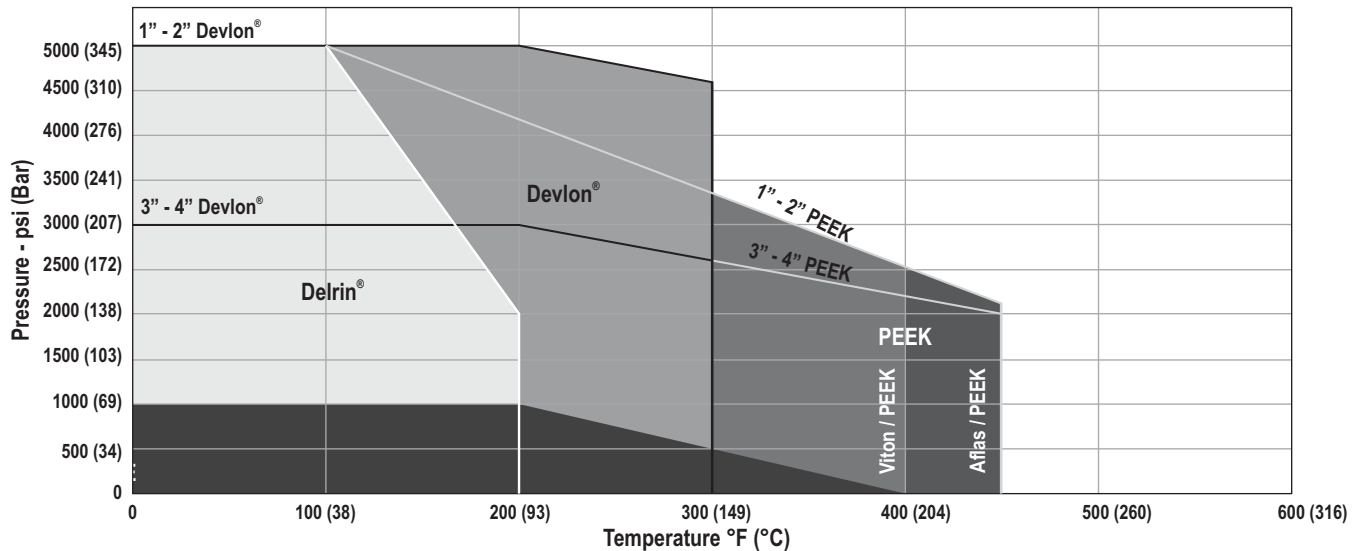
- X • None
- 1 • Buna-N
- 2 • Viton
- 3 • Low-Temp Buna-N
- 4 • HNBR
- 5 • Aflas
- 7 • James Walker®
- 8 • Peroxide-Cured Buna-N
- 9 • EPDM

#### Seat Material

- X • None
- 1 • Delrin®
- 2 • PTFE
- 3 • RTFE
- 4 • Devlon®
- 5 • PEEK
- 6 • HTFM (Hostafion®)
- 7 • Metal-to-Metal

## VI. Technical Information & Troubleshooting

**Pressure/Temperature Chart** • Pressures and temperatures ratings are based on valve rating and the trim materials selected.



### Operating Torque (in-lbs)

RATING	1.5"FP	2"RP	2"FP	3"RP	3"FP	4"RP	4"FP
1000	710		945		2145		3950
1500	890		1200		2700		4425
2000	1120		1500		3200		5036
2500	1400		1880		3700		
3000	1750		2350		3850		
5000	2700		3850				

### Flow Coefficient Cv

Cv	1.5"FP	2"RP	2"FP	3"RP	3"FP	4"RP	4"FP
	130	120	360	350	996	480	1893

Technical data provided for customer convenience and is subject to change without notice. Please consult factory for specific application and additional product information.

Torque values are based on clean, lubricating fluids. A service factor should be applied for all other conditions.

### Troubleshooting

Symptom	Probable Cause	Solution
Valve will not operate (open or close)	<ol style="list-style-type: none"> <li>Foreign matter in line/valve</li> <li>Iced up due to pressure drop or low temp</li> </ol>	<ol style="list-style-type: none"> <li>Flush line to remove debris. Valve may have to be removed from line to facilitate cleaning.</li> <li>Flush line with warm liquid.</li> </ol>
Valve is difficult to operate	<ol style="list-style-type: none"> <li>Debris in valve</li> <li>Stem seized</li> <li>Seats/seals swollen</li> </ol>	<ol style="list-style-type: none"> <li>Flush valve to remove debris. Valve may have to be removed from line to facilitate cleaning.</li> <li>Inject cleaner/lubricant into stem grease fitting. Valve may have to be disassembled and parts cleaned/dressed or replaced if greasing stem does not alleviate problem.</li> <li>Trim is incompatible with flow media. Reevaluate trim choice and replace with compatible seats/seals.</li> </ol>
Leakage through valve when closed	<ol style="list-style-type: none"> <li>Downstream seat is damaged or trapped debris inhibiting seal</li> <li>Travel stops on gear operator are not set properly</li> </ol>	<ol style="list-style-type: none"> <li>Clean/inspect and/or replace seat. Inspect ball for wear and replace if necessary. NOTE: It is possible that the upstream seat is still functional. If inspection shows the upstream seat and ball surface to be good, then switching the components to the downstream side will facilitate a quick-fix if spare parts are not readily available.</li> <li>Check travel stops and adjust as described in Section III.</li> </ol>
Leakage from stem	<ol style="list-style-type: none"> <li>Foreign matter impeding stem seal</li> <li>Stem seal(s) damaged</li> </ol>	<ol style="list-style-type: none"> <li>Inject new grease into the grease fitting to dislodge debris and renew lubrication.</li> <li>Remove valve from line and disassemble. Clean stem and stem journal. Inspect stem seals and thrust bearing, replacing worn parts as necessary.</li> </ol>
Leakage from body/adaptor seal	<ol style="list-style-type: none"> <li>Body Seal damaged</li> </ol>	<ol style="list-style-type: none"> <li>Remove valve from line and disassemble. Remove body seal, clean o-ring groove in adaptor. Install new body seal.</li> </ol>

More questions? Consult your local ViNtrol representative or contact the factory for assistance.

