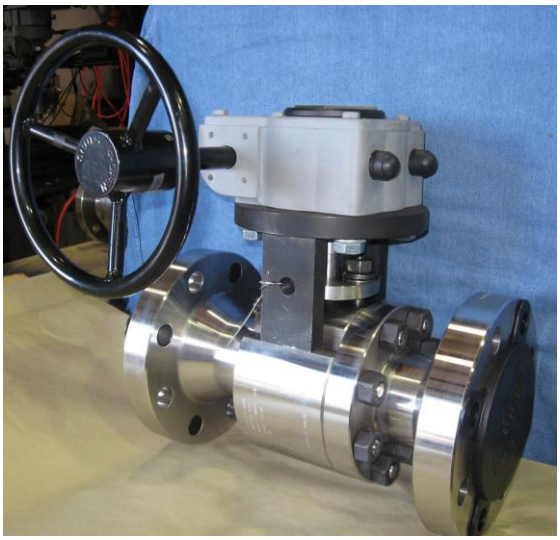
# REMINGTON SEVERE SERVICE BALL VALVES

## Contents



Figure 1. Remington J Series



# Introduction

### Scope of Manual

This instruction manual provides safe handling, installation, operation, maintenance, and parts information for the Remington J, R, M, P, C Series Severe Service Ball Valve (see figure 1).

Do not install, operate, or maintain any Remington Series valves without being fully trained and qualified in valve, actuator, and accessory installation, operation, and maintenance. To avoid personal injury or property damage, it is important to carefully read, understand, and follow all the contents of this manual, including all cautions and warnings. If you have any questions about these instructions, contact Remington Valve or Local Business Partner before proceeding.

### Description

The Remington severe service ball valve is a split body bolted design, full or reduced port, with a blowout proof stem. It can be lever operated, gear operated, or actuated. The Remington J, R or M Series severe service ball valve lines are a two-piece or three-piece floating ball design with metal seat(s) meant to provide Class VI metal seating shutoff in high temperature, high pressure, corrosive, and erosive applications across all industries.

### Specifications

Specifications for these valves are shown in Table 1.

## Table 1. Specifications

### Valve Sizes

1/2 through 36 inch 150# through 4500# ANSI designed according to ASME B16.34.

### Maximum Working Pressures[1][2]

Consistent with applicable pressure-temperature ratings per ASME B16.34, **do not exceed the material temperature or pressure capabilities**.

### Shutoff Classification[1]

Valves are tested to MSS-SP-61 and or API 598 in the preferred flow direction.
Class V shutoff in reverse flow in bi-directional design (Must be specified). For other shutoff requirements, please contact Remington Valve.

### Construction Materials

All ASME B16.34 approved materials.

### Temperature Capabilities[1]

Consult ASME B16.34 or local representative. **Do not exceed design temperatures of materials. Exceeding temperature limits will damage valve and may cause personal injury.**

### Packing Constructions

Chesterton braided graphite inner rings, Inconel wire reinforced extrusion rings. 316 SS nitrided solid metal anti-extrusion ring at bottom of stuffing box.
Low E packing available and tested to ISO 15848-2 (7 ppm). Virgin Teflon also available in Chevron style packing arrangement.

### Standard Flow Direction

Preferred Flow Direction: Preferred flow for optimal sealing is into the downstream seat. Bi- Directional sealing is optional.

1. **The pressure/temperature limits in ASME B16.34, and any applicable code or standard limitation, should not be exceeded.**
2. **Over pressurization of valve could lead to machinery damage and possible personal injuries, DO NOT OVERPRESSURE VALVE.**

# Installation

**⚠ WARNING**

**Always wear protective gloves, clothing, and eyewear when performing any installation operations to avoid personal injury.**

**Personal injury or equipment damage caused by sudden release of pressure may result if the valve assembly is installed where service conditions could exceed either the valve body rating or the mating pipe flange joint rating. To avoid such injury or damage, provide a relief valve for overpressure protection as required by government or accepted industry codes and good engineering practices.**

**Check with your process or safety engineer for any additional measures that must be taken to protect against process media.**

**If installing into an existing application, also refer to the WARNING at the beginning of the Maintenance section in this instruction manual.**

**⚠ WARNING**

**When ordered, the valve configuration and construction materials were selected to meet particular pressure, temperature, pressure drop, and controlled fluid conditions. Responsibility for the safety of process media and compatibility of valve materials with process media rests solely with the purchaser and end-user. To avoid possible personal injury and because some valve/trim material combinations are limited in their pressure drop and temperature ranges, do not apply any other conditions to the valve without first contacting Remington Valve or Local Representative.**

1. Temperature Capabilities **The pressure/temperature limits in ASME B16.34, and any applicable code or standard limitation, should not be exceeded.**

Consult Remington Valve, ASME B16.34 specifications or local representative for more information.

**⚠ WARNING**

**To avoid damage to coated surfaces during welding, ground on same side of pipe as the weld. Do not ground across valve as this may result in arcing across ball and seat. Do not wrap entire valve during post weld heat treatment, wrap only welded portion.**

**⚠ WARNING**

**Valve packing was tightened before shipment; however, the packing might require some readjustment to meet specific service conditions. Check with your process or safety engineer for any additional measures that must be taken to protect against process media. Remington suggest tightening packing bolts to required torque after installation and after first elevated temperature or pressure.**

## When a valve is shipped bare shaft:

a. Valve is shipped in the open position with exposed stem.

## When a valve is shipped with mounting kit:

a. Valve will ship in the in open position.
b. Valve will have the mounting finger-tight to the valve. This allows for centering of actuator on stem.
c. Customer shall ensure proper mounting of the actuator.

Continued.

Continued:

d. Customer shall ensure valve shaft has not been pushed or forced down into the valve ball and seat arrangement.
e. Customer shall ensure no binding occurs when mounting the actuator.
f. Customer shall ensure the correct alignment is done when mounting the actuator.
g. No hammering or forcing down of the shaft (stem) adapter is allowed.
h. Customer shall ensure all bolts are torqued down appropriately.
i. Customer shall ensure the actuator mounting surface is completely flush with the mounting bracket.

## When a valve is shipped with actuator:

a. Valve will be shipped in the required failure position.
b. All bolting will be torqued as required.
c. Remington recommends that the customer not remove the actuator for final installation in the line. This could void warranty.

## Prior to installing valve:

1. Inspect the valve prior to installation into the piping system to ensure there is no shipping damage, damage from being dropped or any other external damage. End protectors and shipping materials must be removed to allow a complete inspection.
2. Inspect the actuator, if included, for damage and then cycle the valve, with the actuator, to ensure proper functioning.

**CAUTION**

**Make sure the valve is installed in the correct orientation. Put the high-pressure side (body side) on the upstream side. The arrow on the valve should point from the high pressure to low pressure side when the valve is closed. The valve could be damaged if installed incorrectly.**

**⚠ WARNING**

**Remington Valve, LLC. is not responsible for improper installation or inspection of any valve which falls outside the criteria presented in this instruction manual.**

**CAUTION**

**Weld fill between the valve and pipe should never be used to correct for improper pipe installation length or misalignment. Additional welding beyond what is required may cause the valve to reach higher temperatures and have a larger heat-affected zone, which can cause permanent damage to the valve or its components.**

For additional information, refer to ASME Boiler and Pressure Vessel Code Section IX.

# Installation

### Initial Preparation Weld End Valves

1. Ensure the valve (Butt Weld Valves only) is in the fully open position so that vital sealing areas of the ball are not exposed to weld spatter.
2. Never make arc strikes on the valve body or end adapter except inside the groove intended for butt welding or inside the corner of the joint for socket welding. Arc strikes made on areas which are not intended to be welded can cause a localized increase in hardness and micro-cracks and can otherwise compromise the intended mechanical properties of the material.
3. Attach the welding ground strap to the side of the valve being welded.
4. Install the valve into the piping system prior to welding to minimize piping loads. Orient the valve with the shaft vertical, if possible, and install the piping such that pipe loads are minimized on the valve.
5. Weld the valve into the line using welders and procedures fully qualified per ASME Boiler and Pressure Vessel Code Section IX.

# Post-Weld Heat Treatment

**CAUTION**

**Depending on valve body materials used, post weld heat treating may be required. If so, damage to internal parts is possible. Do not place the entire valve in a stress relief furnace, or cover the entire valve with stress relieving blankets, as this could damage the valve.**

1. Weld the valve into the line using qualified welders and procedures per Section IX of the ASME Boiler and Pressure Vessel Code.
2. Apply post weld heat treat in accordance with valve material and code requirements. Only local post weld heat treat on each end of the valve must be used.

# Final Inspection after Post-Weld Heat Treatment

After post weld heat treat, verify valve body studs and packing studs are tight. See BOM for torque requirements.

**CAUTION**

**Before cycling the valve in the line, make sure the line is clean of weld slag and other debris that could damage the valve. Cycle the valve after installation to ensure proper functioning.**

**Flanges End Valves:**

Flanged end valves should be installed with stem pointing up if at all possible. Bolt end connection to piping using proper gaskets and bolting grades for specific piping type.

**After Installation:**

Cycle the valve to verify proper operation. Ensure that the torque required to cycle the valve has remained within acceptable limits. Verify that the body and packing bolting are tightened to the correct torque per BOM. Install proper insulation as required for insulated piping systems.

# Operation

1. After first pressure and temperature elevation, check packing bolt torque for proper load.
2. No routine maintenance or lubrication is required.
3. Body fastener should be checked for proper torque requirements
4. Packing bolting may be re-tightened if a stem leak is noted during operation.
5. Actuators supplied with the valve may require maintenance per the actuator manufacturer's recommendations.
6. For valves supplied with gears, the grease in the gearbox may need to be cleaned out and replaced periodically. Use only high temperature grease recommended for gearboxes.
7. Metal-seated ball valves have high torques.
8. Valves operate clockwise to close and counterclockwise to open. Punch mark on top of stem indicates lapped side of ball.
9. Gears and actuators are marked with arrows and symbols to show valve position and operating direction.
10. Lever operated valves have an integral locking device so that only the correct operating direction is possible. The lever is always aligned with the ball bore for positive proof of ball position.
11. Gears and actuators have adjustable stops for proper ball positioning.
12. The ball is mate lapped to the seat.
13. Valve should be either normally open or normally closed. Throttling with this valve is not recommended for extended periods. Throttling for brief periods during startup or shutdown is allowed.

# Maintenance

Valve parts are subject to normal wear and must be inspected and or replaced, as necessary. The frequency of inspection and replacement depends upon the severity of service conditions. Corrosion and erosion may occur, inspect valves regularly for corrosion and erosive impact.

**WARNING**

**Avoid personal injury from sudden release of process pressure. Before performing any maintenance operations:**

- **Do not remove the actuator from the valve while the valve is pressurized.**
- **Disconnect any operating lines providing air pressure, electric power, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.**
- **Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure from both sides of the valve. Drain the process media from both sides of the valve.**
- **Vent the power actuator loading pressure and relieve any actuator spring precompression.**
- **Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.**
- **Always wear protective gloves, clothing, and eyewear when performing any maintenance operations.**
- **The valve packing area may contain process fluids that are pressurized.**
- **Check with your process or safety engineer for any additional measures that must be taken to protect against process media.**

1. If valve maintenance is required, contact Remington sales office or Local Representative.

# Troubleshooting

## Operation Issues

- Valve does not cycle or fully cycle -Shaft adapter/actuator may be misaligned-- Remove actuator and shaft adapter, then reassemble per assembly procedures for actuators.
- Valve struggles to cycle -Over-tightened shaft packing-- Loosen packing to hand tight, cycle valve and re-tighten per procedures following torque on BOM.
- Valve will not operate with actuator - Inadequate air supply-- Increase air supply or install larger solenoid or quick exhaust valve. Refer to actuator manufacturer's specifications.

## Valve will not Rotate

- Valve body ID or bore may be clogged-- Flush or clean valve ID and try to cycle valve.
- Actuator is not operating correctly or has failed-- Replace or repair actuator and cycle valve.
- Shaft keys have sheared-- Remove stem adapter, check for galling or wear. If problem persist, bore may be clogged.

## Valve Shaft Packing Leaking

- Packing flange bolting is loose-- Tighten packing nuts. See BOM for proper torque.
- Packing is damaged or improperly installed-- Depressurize valve, remove old packing, and replace with new assembly per packing replacement instruction.
- Actuator misalignment-- Remove actuator and align properly.

## Valve Body Gasket Leaking

- Body bolting is loose-- Tighten body bolting per BOM torque requirements.
- Body gasket damaged-- Contact Remington sales office or Local Business Partner.

BODY TO END CONNECTION LUBRICATED SUGGESTED TORQUE. BILL OF MATERIAL LIST BOLTING TORQUE. CONTACT REMINGTON OR LOCAL REPRESENTATIVE.

Never adjust torque on bolting while valve is pressurized.

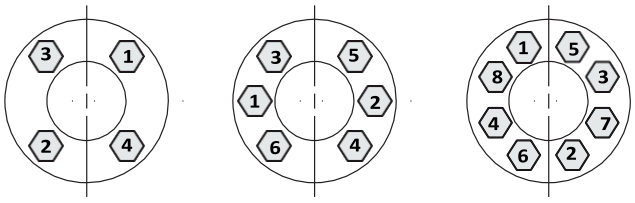
**Torque Chart For B-7 And B-16 (105 KSI Yield)**

Copper-Based Anti-Anti seize Max. Nut Factor Used Is .15 For

| Stud Size | Hex Size | Torque Lb.-Ft. | Yield % of bolt |
|---|---|---|---|
| 1/2”-13 | 7/8” | 70 | 75 |
| 5/8”-11 | 1-1/16” | 139 | 75 |
| 3/4”-10 | 1-1/4” | 247 | 75 |
| 7/8”-9 | 1-7/16” | 398 | 75 |
| 1”-8 | 1-5/8” | 596 | 75 |
| 1-1/8”-8 | 1-13/16” | 875 | 75 |
| 1-1/4”-8 | 2” | 1,230 | 75 |
| 1-3/8”-8 | 2-3/16” | 1,447 | 75 |
| 1-1/2’-8 | 2-3/8’ | 2,203 | 75 |
| 1-5/8”-8 | 2-9/16” | 2,839 | 75 |
| 1-3/4”-8 | 2-3/4” | 3,587 | 75 |
| 1-7/8”-8 | 2-15/16” | 4,456 | 75 |
| 2”-8 | 3-1/8” | 5,455 | 75 |
| 2-1/4”-8 | 3-1/2” | 7,879 | 75 |

**IMPORTANT: Gasket must be seated before starting final loading torque. 1”-8 studs and above must start with 50-lb-ft and gradually increase until body and end connect are metal to metal (.030 raised face portion on end connect engages body). Then final torque increments can be applied. This seats gasket properly.**

Figure 2. Bolting Tightening Pattern. Bolt torque should be done in increments of ¼ until final loading is achieved. Example if Max torque is 100 ft-lbs torque to 25 ft-lbs then 50, 75 and final at 100 ft-lbs.




## Valve Leaking through Ball or Seating Area

1. Valve body ID or bore is clogged-- Flush or clean valve ID and cycle valve several times.
2. Valve is not fully closed-- Visually check if scribe mark on stem is aligned with scribe mark on gland flange.
3. Actuator travel stops are not set correctly-- Set stops and cycle, checking for leaks.
4. Seat or Ball is damaged-- Contact Local Business Partner for repair.
5. Belleville spring is collapsed — Contact your Local Business Partner for repair.

**Note**

If you need additional trouble-shooting assistance, please contact Remington Valve or your Local Business Partner.

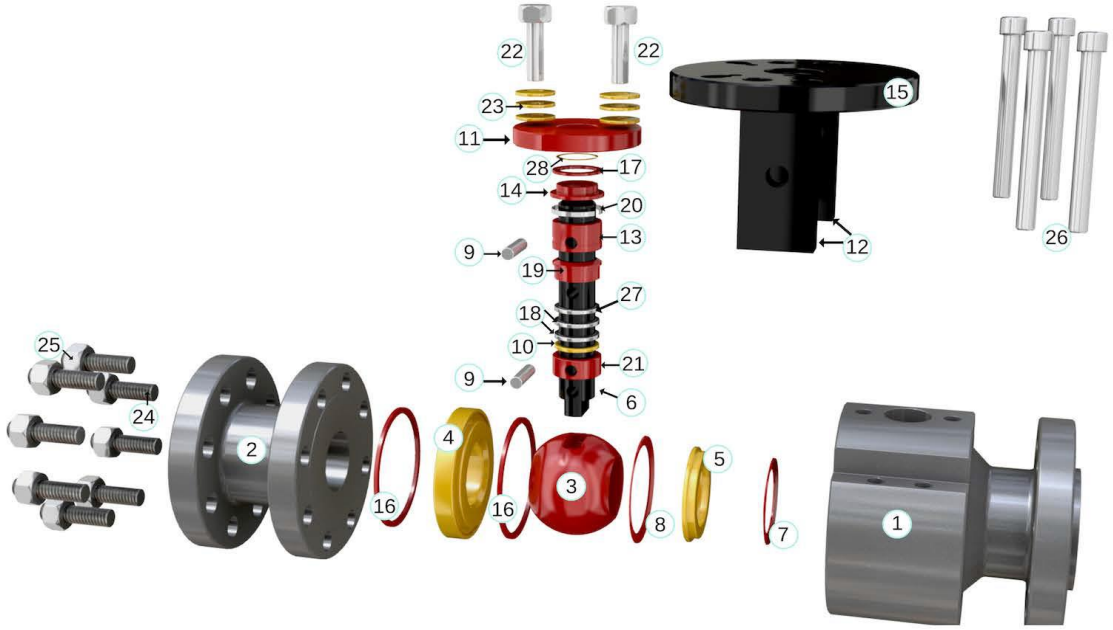
# Packing Replacement

**WARNING**

**Avoid personal injury from sudden release of process pressure. Before performing any maintenance operations:**

- **Do not remove the actuator from the valve while the valve is still pressurized.**
- **Disconnect any operating lines providing air pressure, electric power, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.**
- **Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure from both sides of the valve. Drain the process media from both sides of the valve.**
- **Vent the power actuator loading pressure and relieve any actuator spring precompression.**
- **Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.**
- **Always wear protective gloves, clothing, and eyewear when performing any maintenance operations.**
- **The valve packing area may contain process fluids that are pressurized, *even when the valve has been removed from the pipeline*. Process fluids may spray out under pressure when removing the packing hardware or packing rings.**
- **Check with your process or safety engineer for any additional measures that must be taken to protect against process media.**
- **See "Packing Replacement Section".**

# Construction Features




**A CLOSER LOOK**

1. BODY
2. END CONNECTION
3. BALL
4. DOWNSTREAM SEAT
5. PUSH RING
6. STEM
7. INNER LOAD SPRING
8. SOLIDS EXCLUDER SPRING
9. RETAINER PINS
10. PACKING BUSHING
11. GLAND FLANGE
12. MOUNTING LEG
13. OUTER COLLAR
14. UPPER BUSHING
15. MOUNTING FLANGE
16. GASKETS BODY
17. SNAP RING
18. PACKING RINGS
19. PACKING FOLLOWER
20. HOOPSTER RING
21. INNER COLLAR
22. STUD (GLAND)
23. BELLVILLE SPRINGS
24. STUD (BODY)
25. NUT- HEAVY HEX (BODY)
26. SOCKET CAP SCREW
27. ANTI EXTRUSION RING
28. WASHER

## CAUTION

**Never attempt to work on valve while in service. Use proper lock out procedures and read entire instruction manual before attempting work on the valve. Ensure all pressure, gas or liquids are removed from valve before attempting to perform repairs or inspection.**

## Packing Replacement

1. Remove valve from service, do not remove packing while valve is in service.
2. Remove handle adapter.
3. Remove Snap Ring (28).
4. Remove Bushing (17).
5. Remove Mounting Flange (26, 15, 12).
6. Remove Upper Bushing (14).
7. Remove Upper Pin (9) if present.
8. Remove Upper Collar (13) if present.
9. Remove Nuts (22).
10. Remove Belleville Springs (23) note orientation of springs.
11. Remove Gland Flange (11).
12. Remove Packing Follower (19). The follower is very tight tolerance and may need to be removed by a puller.
13. Remove old packing. Note packing bushing will be on bottom of stuffing box and does not require removal.
14. Replace two pieces of Inner Packing staggering joints by 60 Deg. packing part numbers 1400R. Use packing follower to seat packing rings. Ensure packing joint does not have a gap.
15. Replace one piece of outer packing ring. Part number 1601.
16. Compress packing rings using packing follower and gland flange. Place packing follower on stem and slide down to packing, place gland flange on stem and tap on packing follower to compress rings.
17. Replace Belleville springs in orientation removed. Live loading is required. (1 cone up, one down, one up).
18. Tighten nuts according to torque chart found on BOM.
19. Replace all other items in reverse order using torque requirements on BOM.
20. Cycle valve to ensure proper function.
21. Tighten packing live loading nuts to required torque after first elevated pressure and temperature.

# Ball and Seat Replacement - Flanged Valves

**CAUTION**

**Never attempt to work on valve while in service. Use proper lock out procedures and read entire instruction manual before attempting work on the valve. Ensure all pressure, gas or liquids are removed from valve before attempting to perform repairs or inspection. New body gaskets are required for internal inspection of valve.**

1. Use proper LOTO procedures to isolate valve.
2. If actuated, remove actuation.
3. Place valve in closed position.
4. Unbolt flanges and remove entire valve from the line.
5. Remove body nuts (25).
6. Slide end connect (2) off valves body (1).
7. Remove downstream seat (4).
8. Remove ball (Valve must be in closed position) (3).
9. Remove gaskets (16) from seat (4).
10. Remove push ring (5).
11. Remove spring(s) (7, 8) from valve body.
12. Clear any scale or build up from valve body that may hinder rebuild.
13. Remove rebuild kit from shipping box.
14. Identify items in the kit (Ball, Seat, Springs, Push Ring, Gaskets).
15. Replace spring(s) (7, 8) cone towards push ring.
16. Replace push ring (5).
17. Valve stem should be in closed position to allow ball slot to slide onto stem tang.
18. Replace ball (Dot in stem slot indicates lapped side of ball) this side should face the seat.
19. Place gaskets (two pieces 16) in seat gasket area, lightly grease to hold in place.
20. Place seat (4) into valve body with spherical surface towards ball (3).
21. Replace end connect (2) onto valve body (1).
22. Take note that gaskets were not pinched.
23. Torque nuts to correct torque following procedure in Figure 2.
24. Cycle valve, if possible, prior to actuator installation. If binding occurs repair disassembly and look for items out of alignment.
25. Place valve back in line adding any actuation removed prior to disassembly.
26. Cycle valve with actuation to ensure no binding of parts.

# Ball and Seat Replacement - Welded Valves

**CAUTION**

**Never attempt to work on valve while in service. Use proper lock out procedures and read entire instruction manual before attempting work on the valve. Ensure all pressure, gas or liquids are removed from valve before attempting to perform repairs or inspection. New body gaskets are required for internal inspection of valve.**

1. Use proper LOTO procedures to isolate valve.
2. If actuated, remove actuation.
3. Place valve in closed position.
4. Remove body nuts (25).
5. Remove body studs (24).
6. Separate piping to obtain accesses to trim set.
7. Remove downstream seat (4).
8. Remove ball (Valve must be in closed position) (3).
9. Remove gaskets (16) from seat (4).
10. Remove push ring (5).
11. Remove spring(s) (7, 8) from valve body.
12. Clear any scale or build up from valve body that may hinder rebuild.
13. Remove rebuild kit from shipping box.
14. Identify items in the kit (Ball, Seat, Springs, Push Ring, Gaskets).
15. Replace spring(s) (7, 8).
16. Replace push ring (5).
17. Valve stem should be in closed position to allow ball slot to slide onto stem tang.
18. Replace ball (Dot in stem slot indicates lapped side of ball) this side should face the seat (4).
19. Place gaskets (two pieces 16) in seat gasket area, lightly grease to hold in place.
20. Place seat (4) into valve body with spherical surface towards ball (3).
21. Navigate end connect (2) to align with body (1).
22. Replace studs and nuts ensuring gaskets are not pinched and in place.
23. Torque nuts to correct torque following procedure in Figure 2.
24. Cycle valve, if possible, prior to actuator installation. If binding occurs repair disassembly and look for items out of alignment.
25. Place valve back in line adding any actuation removed prior to disassembly.
26. Cycle valve with actuation to ensure no binding of parts.

# Parts Ordering

A serial number is assigned to each valve and stamped on the nameplate. Always refer to the valve serial number when contacting Remington Valve sales office or Local Business Partner regarding spare parts or technical information.

**WARNING**

**Use only genuine Remington replacement parts. Components that are not supplied by Remington Valve should not, under any circumstances, be used in any Remington valve, warranty will be voided and could give rise to personal injury and property damage.**

# Parts List

**Note**
Contact Remington Valve sales office or Local Business Partner for part number information.

**Remington Valve, LLC.**
**8226 Kerr St.**
**Houston, Texas 77029**
**832-413-4400**
**sales@remingtonvalve.com**