

## KTM RICHARDS FIGURE R721/R723 AND R751 BALL VALVES

### INSTALLATION AND MAINTENANCE INSTRUCTIONS

Before installation these instructions must be fully read and understood

Complete disassembly and assembly instructions for ASME 150 and 300 flanged ball valves:

- R721, DN 15 - 200 full bore fire safe
- R751, DN 50 - 100 full bore ASME 150 (BS2080 fire safe)
- R723, DN 15 - 150 full bore fire safe

#### MAINTENANCE

The only routine maintenance required is periodical checks and adjustment to the stem assembly. Adjustment to the gland nut is recommended after the first 5000 and 10000 cycles thereafter to compensate for the bedding of thrust and gland seal and ensure leak free operation.

When tightening the gland nut, do not exceed recommended torques. See table overleaf. After reaching recommended gland nut torque, back off to nearest flat on nut. Bend the lock washer over the nut in this position. When fitting actuators to valves follow the mounting instructions supplied with the mounting kit.

#### SAFETY PRECAUTIONS

Whenever a valve is being installed or removed from the pipeline:

1. Use properly qualified personnel for installation, maintenance and/or removal from the pipeline.
  2. Use appropriate protective equipment/clothing normally used to work with the process where the valve is to be installed/removed, such as safety glasses, shoes and industrial gloves.
  3. Ensure the valve pressure/temperature limitations marked on the nameplate are suitable for the service conditions prior to valve installation.
- Note:** these ratings must not be exceeded.
4. For valves running at non-ambient conditions, appropriate protection should be worn.
  5. Before valve installation and removal ensure the valve and line are not pressurized and any hazardous medium is drained away.

6. Slowly cycle the valve several times to relieve the cavity area and leave in the open position.
7. Double-seated valves on liquid service, which may be subjected to rapidly increasing temperatures in the 'closed' position, will need a positive means of relieving excessive cavity pressures. For further information, contact your local Emerson sales office.
8. The R700 series valve range is not recommended for dead end service unless a blanking flanged is used.
9. The normal shelf life of the R700 series soft seal repair kits is 5 years under clean, dry, ambient conditions without UV exposure prior to installation.
10. Tighten all pipeline flange bolting as per the nominated flange standards working diagonally opposite in sequence.
6. Straighten out the lock washer (258) and remove the gland nut (207).
7. Remove the spring washer (206) and gland (213) from the stem and push the complete stem through into the body of the valve from where it may be withdrawn.
8. For DN 15 to 25 valves the stem seals (201 and 202) gland packing (217) and thrust washer (204). For DN 40 valve the weather seal (251) and auxiliary stem seal (235) can then be removed from the valve body both internally and externally from the stem bore taking care not to damage the machined faces.
9. The components should then be cleaned and checked for wear and damage. If replacement parts are required other than the seat and stem seal kit, refer to Emerson sales office for part numbers and availability.

#### DISASSEMBLY INSTRUCTIONS (DN 15 - 40)

1. Remove the valve from the pipeline by undoing the flange bolts and discard the old flange gaskets. Ensure that there is no hazardous matter in the valve. If this is a possibility, the valve needs to be decontaminated prior to disassembly.
2. Turn the ball to the closed position and holding the valve body (001) firmly, withdraw the body insert (002) using a suitable tool to engage with the drive slots in the insert. The insert is unscrewed by rotating in an anticlockwise direction. Completely remove the insert together with the fire-safe seal (026), body seal (003) and seat (101).
3. The ball (100) can now be removed. This may necessitate turning the valve so that it can be gently tapped with a soft object so as not to dent the face of the ball. Care should be taken that the ball does not fall from the valve, thus causing damage.
4. The other seat (101) can then be removed from the body. Care should be taken when doing this so not to damage the fire safe edges on fire safe valves.
5. The handle can now be removed, by undoing the nut (301) and removing the wrench (300).

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## INSTALLATION AND MAINTENANCE INSTRUCTIONS

### ASSEMBLY INSTRUCTIONS (DN 15 - 40)

- Check that all components are clean and that there is no damage, which will affect the performance of the rebuilt valve. On fire safe valves, specific care should be taken in inspecting the fire safe lip to ensure that it is free from nicks or other imperfections.
- Insert the seat (101) into the cavity of the valve.
- Place the primary stem seal (201) and fire safe stem seal (202) onto the base of the stem (200). Insert the stem (200) into the valve body (001) from inside the bore of the valve.
- Whilst holding the stem in position, fit the gland packing (217) and upper thrust washer (204). Note for 40 mm valves fit auxiliary stem seal (235) and weather seal (251).
- Fit the gland (213) and spring washer (206).
- Fit the lock washer (258). Lubricate thread with anti-seize compound and screw down the gland nut (207) hand tight.
- Ensure that the stem (200) is in the closed position and slip the ball (100) into position in the valve body (001).

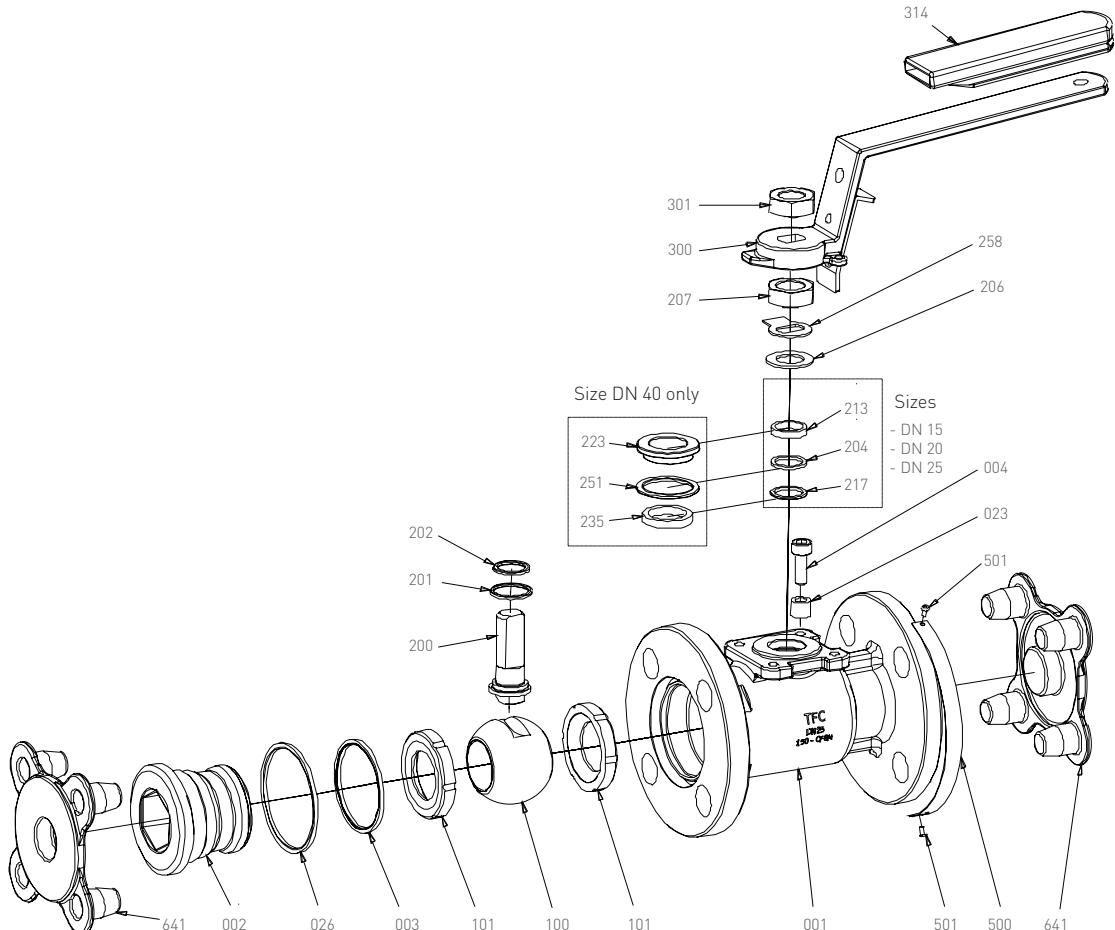
- Place the other seat (101) in position and fit the body seal (003) into the body cavity. This seal is PTFE and position auxiliary body seal (026) into flange face, great care should be taken with the auxiliary body seal as it is manufactured from flexible graphite and can be easily damaged.
- Lubricate the thread on the body insert with a copper based grease.
- Screw in the body insert and tighten down to recommended torque per Table 1.
- Tighten down the stem nut to recommended gland torque and back off until the flat lines up with the tab on the lock washer. Bend up the lock washer to lock the nut in this position.
- Refit the handle (300) and handle nut (301).
- Check the valve for operation and if possible, perform a pressure test on the bench to ensure that the valve has been correctly reassembled.

**TABLE 1 - TORQUE VALUES (Nm)**

Valve size DN	Gland torque (Nm)*	Body insert torque (Nm)
15	12	160
20	30	300
25	30	350
40	40	400
50	65	N/A

### NOTE

\* Tighten to correct torque and back off to nearest flat on nut.



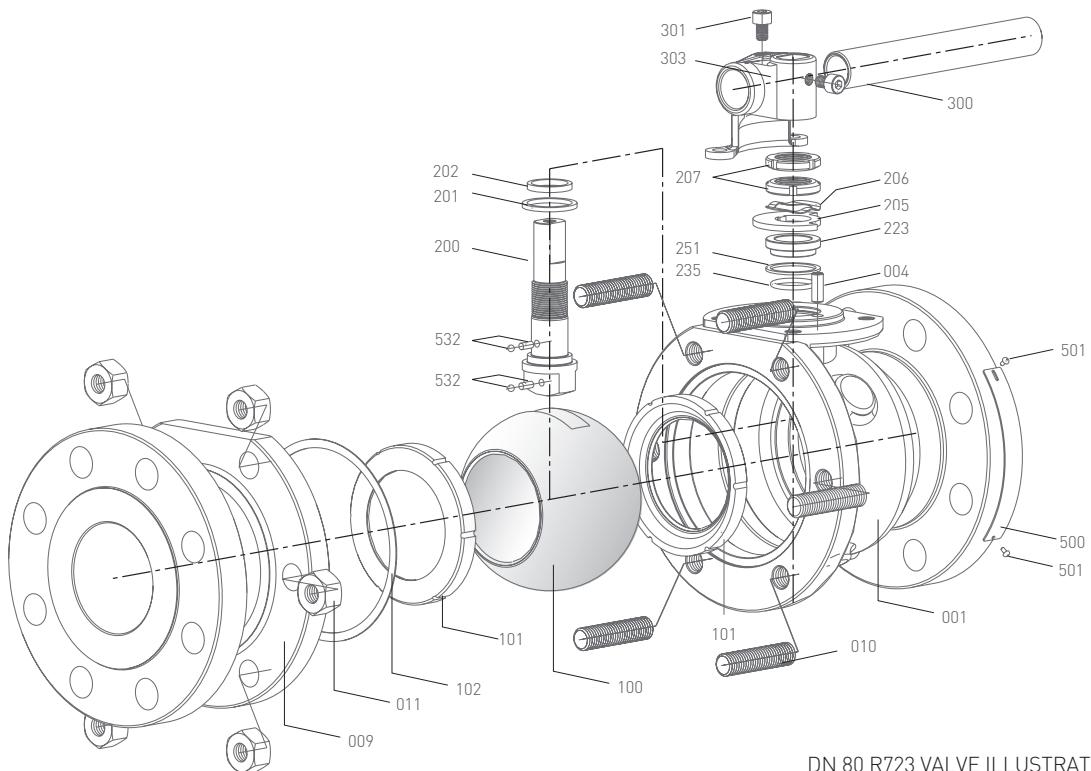
DN 25 R721 VALVE ILLUSTRATED

# KTM RICHARDS FIGURE R721/R723 AND R751 BALL VALVES

## INSTALLATION AND MAINTENANCE INSTRUCTIONS

### **DISASSEMBLY INSTRUCTIONS (DN 50 - 150)**

1. Remove the valve from the pipeline by undoing the flange bolts and discard the old flange gaskets. Ensure that there is no hazardous matter in the valve. If this is a possibility, the valve needs to be decontaminated prior to disassembly.
2. Turn the ball (100) to the closed position and by holding or clamping the valve body (001) firmly, loosen the nuts (011) on the center flange.
3. Remove the center flange nuts where upon the body connector (009) should pull away from the valve body. It may be necessary to tap around the periphery with a soft face hammer to break the gasket seal.
4. With the ball in the closed position, remove the ball (100) from the body. Care should be taken that the ball does not fall from the valve, thus causing damage to the ball surface.
5. Remove the seat rings (101) from the body and body connector. Care should be taken when doing this not to damage the machined fire safe lip at the rear of the seat pocket.
6. Remove the wrench (300, 303) assembly if fitted.
7. Remove the gland nuts (207).
8. Remove the spring washer (206), stop plate (205) and gland (223) from the stem and push the complete stem through into the body of the valve from where it may be withdrawn. The top of the stem may require a tap with a soft face hammer to break the stem seal.
9. The stem seals (201 and 202), weather seal (251) and auxiliary seal (235) can then be removed from the valve body both internally and externally from the stem bore taking care not to damage the machined faces.
10. The components should be cleaned and checked for wear and damage. If replacement parts are required other than the seat and stem seal kit, refer to Emerson sales offices for part numbers and availability.



DN 80 R723 VALVE ILLUSTRATED

# KTM RICHARDS FIGURE R721/R723 AND R751 BALL VALVES

## INSTALLATION AND MAINTENANCE INSTRUCTIONS

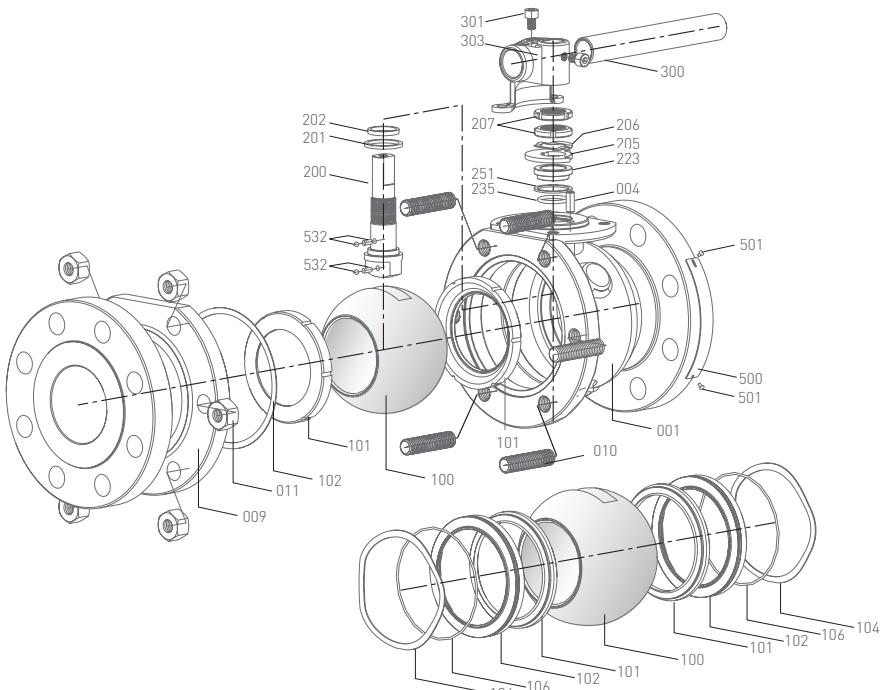
### ASSEMBLY INSTRUCTIONS (DN 50 - 150)

1. Check that all components are clean and that there is no damage, which will affect the performance of the rebuilt valve.  
On fire safe valves, specific care should be taken in inspecting the fire safe lip to ensure that it is free from nicks or other imperfections.
2. Cantilever seat assembly: Place seat (101) in each seat pocket body (001) and body connector (009).  
2.1 Cantilever O-ring seat assembly:  
Place O-ring (110) followed by seat (101) in each seat pocket (body (001) and body connector (009)).
- 2.2 Energized seat assembly: Place a seat spring (104) into each seat pocket (body (001) and body connector (009)), followed by a pre-assembled energized seat assembly with care, making certain that O-ring (106) is not damaged when pushing seat assembly down into seat pockets.
3. Place the primary stem seal (201) and fire safe stem seal (202) onto the base of the stem (200). Insert the stem into the valve body from inside the bore of the valve.
4. Whilst holding the stem in position, fit the auxiliary stem seal (235) and weather seal (251).
5. Fit the gland (223), stop plate (205) and the spring washer (206).
6. Lubricate thread with anti-seize compound and screw down the gland nuts (207) hand tight.
7. Ensure the stem (200) is in the closed position and slip the ball (100) into position in the valve body engaging the stem tongue into the ball slot.
8. Locate the body connector gasket (012) into the recess in the body (001) and lower the body connector (009) over the studs. Check that the seat is still correctly positioned before tightening body connector nuts (011).

9. Pre-tension body connector nuts (011) working diagonally opposite in sequence around the periphery of the body.
10. Rotate the stem through a full open closed sequence to settle the ball and seats. Leave the valve in the closed position.
11. Tighten all nuts to the torque values listed in Table 2. To apply even tension to the body joint, it is preferable to tighten stud nuts working diagonally opposite in sequence.
12. For DN 50 valve tighten down stem nut to the recommended gland torque (Table 1) and back off until the flat lines up with the tab on the lock washer. Bend up the washer to lock the nut in this position. For DN 80 and larger valves, tension stem until the stem spring is fully compressed, then back off a quarter of a turn and lock into position with upper stem nut.
13. Work the valve open and closed to ensure it is free in all sealing areas. The valve operation should be smooth and firm during the cyclic operation.
14. Refit wrench, gearbox or actuator mechanism.

TABLE 2 - BOLTING TORQUE VALUES (Nm)

Stud size inches	Assembly makeup torque lubricated thread
3/8" UNC	37 Nm / 27 lb·ft
1/2" UNC	90 Nm / 65 lb·ft
5/8" UNC	178 Nm / 128 lb·ft
3/4" UNC	316 Nm / 228 lb·ft



DN 80 R723 VALVE ILLUSTRATED

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