

Delayed coker service Metal seated Ball valve

3"- 24", ANSI Classes 300-900
Series MA and S7

Installation, maintenance and
operating instructions

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Subject to change without notice.

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READ THESE INSTRUCTIONS FIRST!

These instructions provide information about safe handling and operation of the valve.

If you require additional assistance, please contact the manufacturer or manufacturer's representative.

SAVE THESE INSTRUCTIONS!

Addresses and phone numbers are printed on the back cover.

1. GENERAL

1.1 Scope of the Manual

This installation, operation, and maintenance manual provides essential information on MA and S7-series ball valves which have been constructed specifically for delayed coker applications (coker valves). The actuators and instrumentation to be used with coker valves are also discussed briefly. Refer to the separate actuator and control equipment instruction manuals for further information.

NOTE:

Selection and use of the valve in a specific application requires close consideration of detailed aspects. Due to the nature of the product, this manual cannot cover all the individual situations that may occur when installing, using, or servicing the valve.

If you are uncertain about use of the valve or its suitability for your intended purpose, please contact Valmet for more information.

For valves in oxygen service, please see also the separate installation, maintenance and operating instructions for oxygen service (see Valmet document id:10O270EN.pdf)

1.2 Valve Description

Coker valves are metal seat supported, flanged, and full bore ball valves. The valve body is in two parts, fastened together by body-joint bolting. The ball and shaft are separate. Shaft blow-out is prevented by a shoulder machined on the shaft and body.

Tightness is provided to the metal seats by a pressure differential which forces the ball up against the downstream seat, and also by circular E-rings located behind the seats.

Coker valves are true 2-way tight (bidirectional), providing consistently tight shut-off regardless of the media's pressure differential orientation across the valve.

Construction details of individual valves are included in the type code shown on the valve identification plate. If detailed interpretation of valve construction code is required, contact manufacturer.

Coker valves are specially designed for moderate control and tight shut-off applications involving abrasive and/or corrosive media and highly demanding temperature/pressure combinations. They feature steam purges for minimizing residual media buildup and in turn reducing down time. Live-loaded stem packing prevents these valves from leaking harmful media into the environment

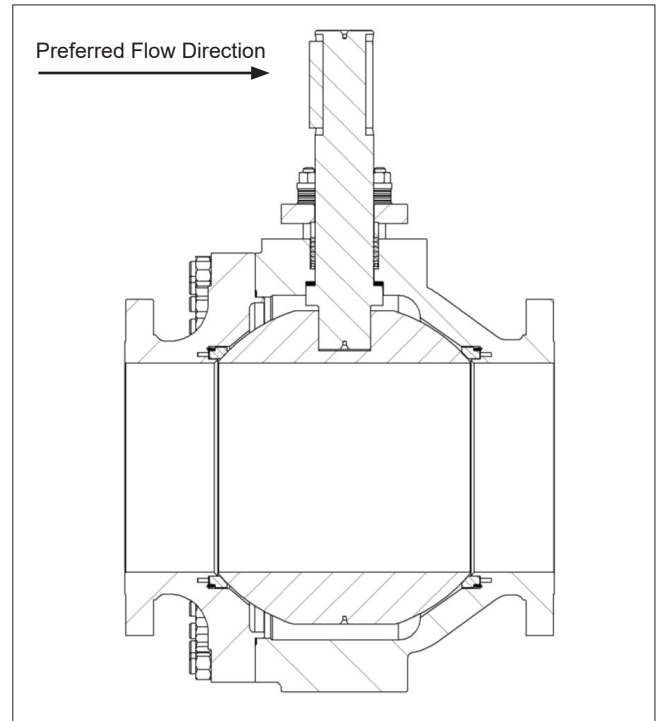


Fig. 1 Construction of Coker Valve, MA Series

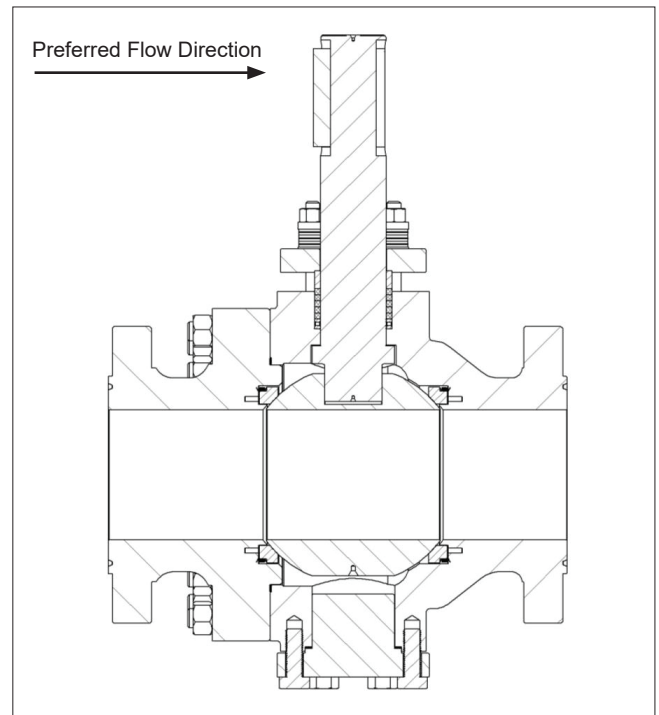


Fig. 2 Construction of Coker Valve, S7 Series

1.3 Markings

Body markings are stamped on the body. (See Fig. 3).

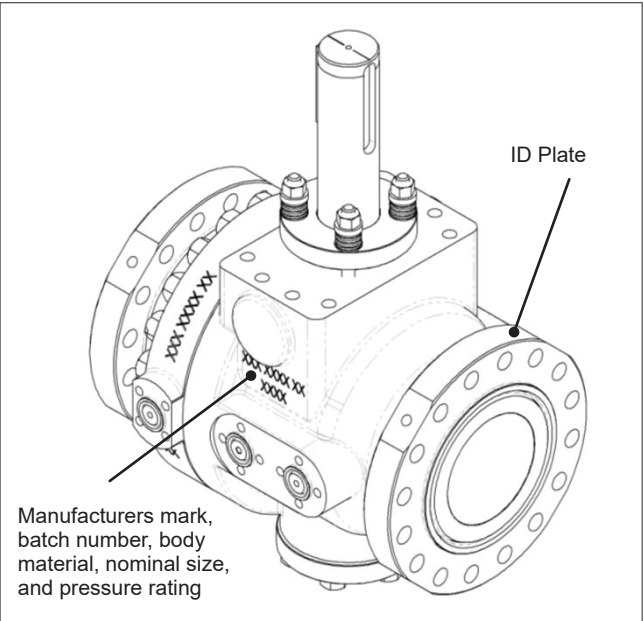


Fig. 3 Valve Markings

The identification plate is attached to the flange. (Fig. 4). Identification plate markings are:

- 1. Body Material
- 2. Shaft Material
- 3. Trim Material
- 4. Seat Material
- 5. Max and Min Operating Temperature
- 6. Max Shut-Off Differential Pressure
- 7. Pressure Class
- 8. Type Designation
- 9. Valve Manufacturing Parts List Number

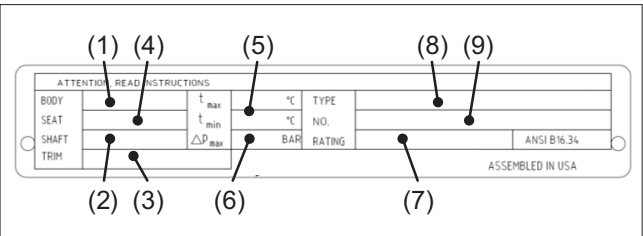


Fig. 4 Identification Plate

1.4 Specifications and Approvals

Face-to-Face:	ASME B16.10 long pattern
Pressure Rating:	ASME Class 300-900
Flow Direction:	Bidirectional
Tightness:	ANSI/FCI 70-2 Class V

Delayed coker service valves are designed to meet a range of industrial approvals. Relevant approvals are called out in the product assembly drawing included with your valve.

Specific temperature/pressure ratings, along with general dimension/weight metrics, and other valve information may also be retrieved from the included assembly drawing. Please contact Valmet for more information.

1.5 Recycling and Disposal

Most valve parts can be recycled if sorted according to material.

Most parts have material marking. A material list is supplied with the valve. In addition, separate recycling and disposal instructions are available from the manufacturer. A valve can also be returned to the manufacturer for recycling and disposal against a fee.

1.6 Safety Precautions

CAUTION:

Do not exceed the valve performance limitations! Exceeding the limitations marked on the valve may cause damage and lead to uncontrolled pressure release. Damage or personal injury may result.

CAUTION:

Do not dismantle the valve or remove it from the pipeline while the valve is pressurized!

Dismantling or removing a pressurized valve will result in uncontrolled pressure release. Always isolate the relevant part of the pipeline, release the pressure from the valve and remove the medium before dismantling the valve. Be aware of the type of medium involved. Protect people and the environment from any harmful or poisonous substances. Make sure that no medium can enter the pipeline during valve maintenance. Failure to do this may result in damage or personal injury.

CAUTION:

Beware of the ball cutting movement!

Keep hands, other parts of the body, tools and other objects out of the open flow port. Leave no foreign objects inside the pipeline. When the valve is actuated, the ball functions as a cutting device. Close and detach the actuator pressure supply pipeline for valve maintenance. Failure to do this may result in damage or personal injury.

CAUTION:

Beware of noise emission!

The valve may produce noise in the pipeline. The noise level depends on the application. It can be measured or calculated using the Neles Nelprof computer program. Observe the relevant work environment regulations on noise emission.

CAUTION:

Beware of extreme temperatures!

The valve body may be very hot or very cold during use.
Protect people against cold injuries or burns.

CAUTION:

When handling the valve or the valve package, bear in mind its weight!

Never lift the valve or valve package by the actuator, positioner, limit switch or their piping.

Place the lifting ropes securely around the valve body (see Fig. 6).

Damage or personal injury may result from falling parts.

See included assembly drawing for valve weights.

CAUTION:

Follow the proper procedures when handling and servicing oxygen valves.

2. TRANSPORTATION, RECEPTION AND STORAGE

Check the valve and the accompanying device for any damage that may have occurred during transport.

Store the valve carefully. We recommend storing indoors in a dry place.

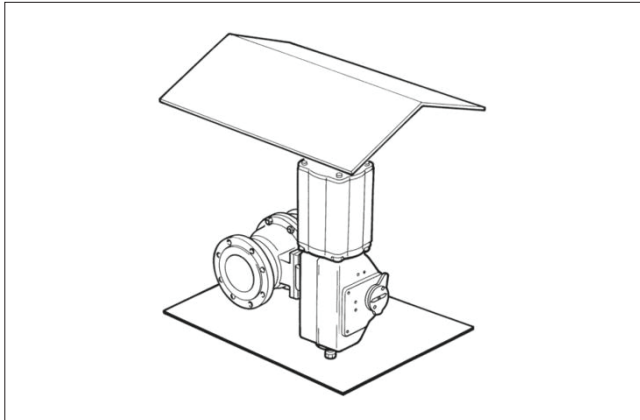


Fig. 5 Storing the Valve

Do not remove the flow port protectors until installing the valve. It is recommended to move the valve to its intended location just before installation. Generally, the valve is delivered in the open position.

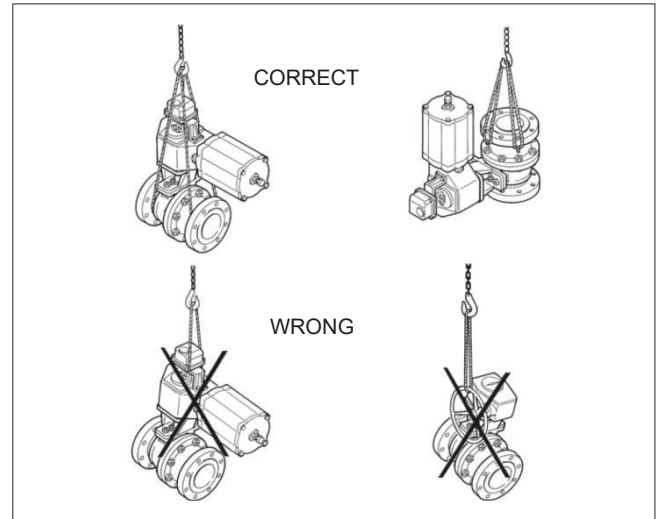


Fig. 6 Lifting the Valve

3. INSTALLATION AND USE

3.1 General

Remove the flow bore protectors and check that the valve is clean inside. Clean the valve if necessary.

3.2 Mounting the Valve in the Pipeline

CAUTION:

When handling the valve or the valve package as a whole, bear in mind the weight of the valve or the entire package!

Flush the pipeline carefully before installing the valve. Make sure the valve is entirely open when flushing. Foreign particles, such as sand or pieces of welding electrode, will damage the ball and seats.

NOTE:

Use screws, nuts, bolts and gaskets equivalent to the fastenings used elsewhere in the pipeline. Center the flange gaskets carefully when fitting the valve between flanges.

NOTE:

Do not attempt to correct pipeline misalignment by means of flange bolting.

The valve may be installed in any position and offers tightness in both directions. However we do not recommend installing the valve with the actuator on the underneath side because dirt in the pipeline may then enter the body cavity and damage the gland packing. (The position to be avoided is shown in Figure 7).

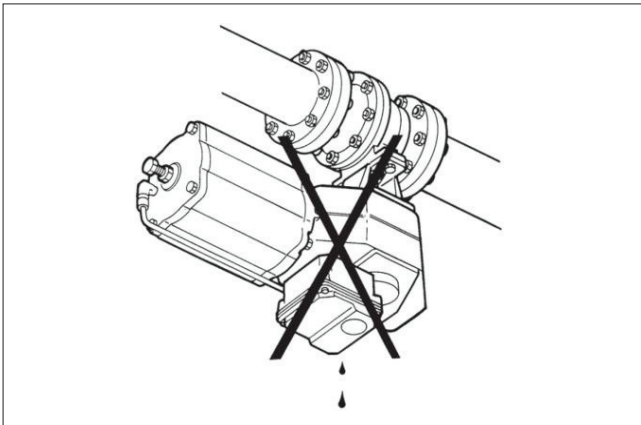


Fig. 7 Avoid This Mounting Position

It may be necessary to firmly support the pipeline in order to protect the valve from excess stress. Sufficient support will also reduce pipeline vibration and thus ensures proper functioning of the positioner. To facilitate servicing, it is preferable that the valve be supported by the body, using pipe clamps and supports. Do not fasten supports to the flange bolting or to the actuator. (See Figure 8). Check that pipe-induced stress on valve is not excessive, per ANSI B31.1 paragraph 35.

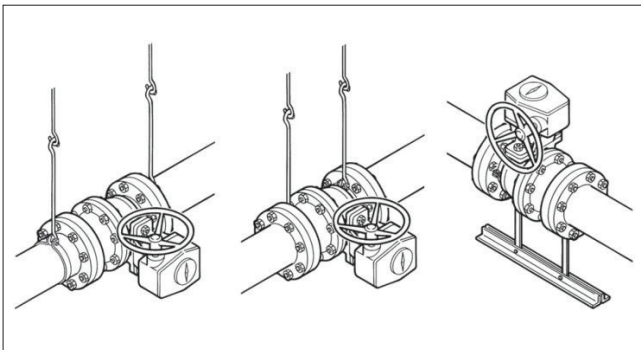


Fig. 8 Supporting the Valve

Valve Insulation

If necessary, the valve may be insulated. Insulation must not continue above the upper level of the valve body. (See Figure 9).

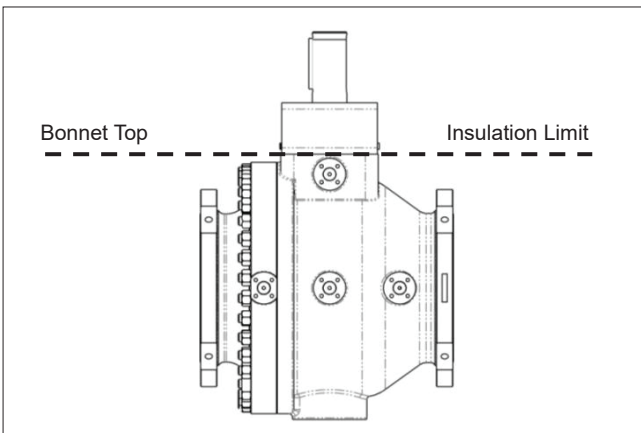


Fig. 9 Insulation of the Valve

3.3 Actuator

NOTE:

When installing the actuator on the valve, make sure that the valve package functions properly. Detailed information on actuator installation is given in Section 6 or in the separate actuator instructions.

The valve open/closed position is indicated as follows:

- by an indicator on the actuator
or
- by a groove at the end of the ball shaft (parallel to the ball flow opening).

If there is any uncertainty about the indicator, check the ball position by the groove.

The actuator should be installed in a manner that allows plenty of room for its removal.

The upright position is recommended for the actuator cylinder.

The actuator must not touch the pipeline, because pipeline vibration may interfere with its operation.

In certain cases it may be considered advantageous to provide additional support to the actuator. These cases will normally be associated with large actuators, extended shafts, or where severe vibration is present. Please contact Valmet business for advice.

3.4 Commissioning

Ensure that there is no dirt or foreign objects left inside the valve or pipeline. Flush the pipeline carefully. Make sure that the valve is entirely open when flushing.

Ensure that all nuts, pipings, and cables are properly fastened.

Check that the actuator, positioner, and switch are correctly adjusted. Actuator adjustment is explained in Section 6. To adjust the accompanying devices refer to the separate control equipment instruction manuals.

4. MAINTENANCE

CAUTION:

Observe the safety precautions mentioned in Section 1.6 before maintenance!

CAUTION:

When handling the valve or the valve package as a whole, bear in mind the weight of the valve or the entire package!

4.1 Maintenance General

Although Valmet Neles valves are designed to work under severe conditions, proper preventative maintenance can significantly help to prevent unplanned downtime and in real terms reduce the total cost of ownership. Valmet recommends inspecting the valves at least every five (5) years. The inspection and maintenance interval depends on the actual application and process condition. The inspection and maintenance intervals can be specified together with

your local Valmet experts. During this periodic inspection the parts detailed in the Spare Part Set should be replaced. Time in storage should be included in the inspection interval.

Maintenance can be performed as presented below. For maintenance assistance, please contact your local Valmet office. The part numbers in the text refer to the exploded view and to the parts list in Section 10, unless otherwise stated.

NOTE:

When sending goods to the manufacturer for repair, do not disassemble them. Clean the valve carefully and flush the valve internals. For safety reasons, inform the manufacturer of the type of medium used in the valve (include material safety datasheets (MSDS)).

NOTE:

In order to ensure safe and effective operation, always use original spare parts to make sure that the valve functions as intended.

NOTE:

For safety reasons, replace pressure retaining bolting if the threads are damaged, have been heated, stretched or corroded.

4.2 Maintenance of Valve Packing

CAUTION:

Do not dismantle the valve or remove it from the pipeline while the valve is pressurized!

The packing around the shaft requires no regular tightening. Packing tightness is provided by the pipeline pressure and ensured by contact between the compression ring (8) and the packing (14, 15) itself.

The packing (14, 15) must be changed if leakage occurs even after the hex nuts (12) have been tightened. The packing must be tightened with care because excess force may damage the rings.

- Make sure that the valve is not pressurized.
- Detach the actuator and bracket according to the instructions in Section 4.4.
- Remove the key (21).
- Remove the hexagon nuts (12), disc spring set (22, 23, 24), compression plate (7), and compression ring (8). (Some valves may have pre-assembled spring set (23), see Figure 11).
- Remove the packing rings (14, 15) from around the shaft using a packing removal tool. Make sure that there is no damage to the shaft or the counterbore. Please note that the thrust bearings (9) may come off as you remove the packing. They should be placed back in position before installing the new packing.
- Remove the lantern ring (16), clean it along with the packing ring counterbore, then replace it.
- There are two general packing constructions available, identify which is used (A or B, Fig. 10).

- Place the new packing rings (14, 15) over the shaft (3). Do not damage packing rings with the shaft keyway. If installing an all woven packing, make sure that the seams are staggered at least 90° apart. This should create two 180° zones between adjacent seals with only one seam each. (See Figure 10).

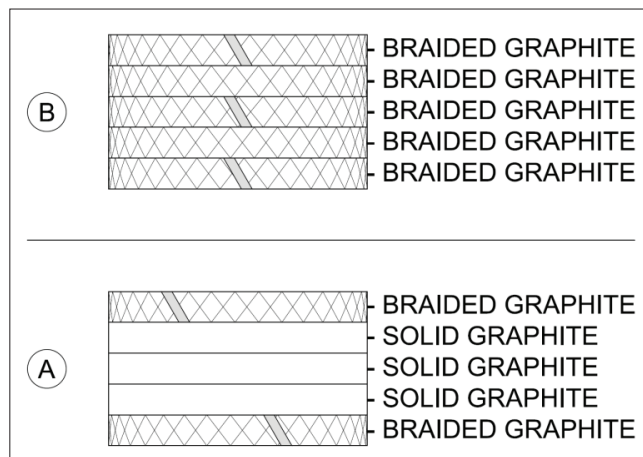


Fig. 10 Packing Constructions

- The compression ring (8) and compression plate (7) may now be used for pushing the rings into the counterbore. (See Figure 11).
- Place the disc spring set (22, 23, 24) on the compression studs. Tighten the nuts (12) to the torque described by Equation 1. (Some valves may have pre-assembled spring set (23), see Figure 11).

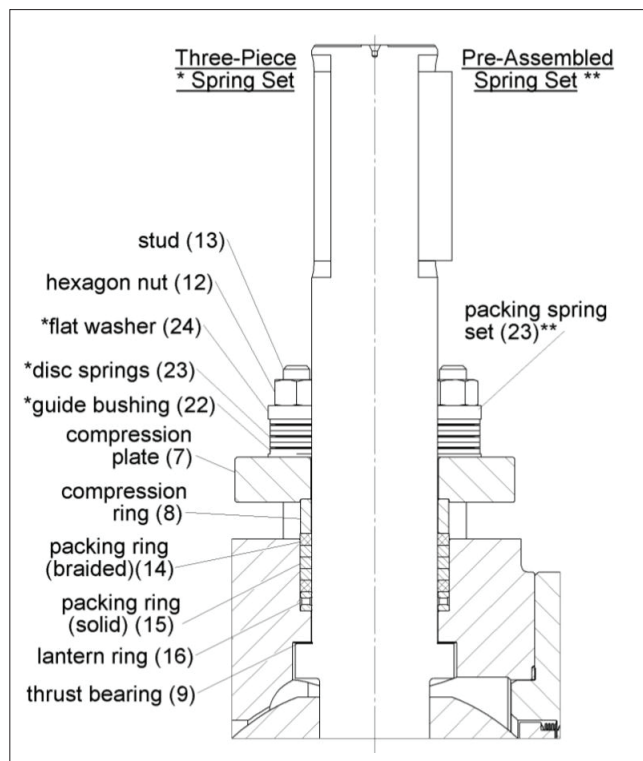


Fig. 11 Packing Detail

$$T = \frac{(3500) (0.2) (\pi) (D_o^2 - D_i^2) (D_s)}{4N}$$

Where...

T = Torque on nuts (12) [in·lbs per nut]

3500 = Force required to seal graphite [psi]

0.2 = Friction coefficient of lubricated st. st'l

D_o = Outer diameter of packing (16) [inch]

D_i = Inner diameter of packing (16) [inch]

D_s = Nominal diameter of stud (15) [inch]

N = Number of packing nuts (12)

- Spray the seating with leak testing compound. Evaluate seal quality. If bubble tight seal is present, continue to the next step. If the seal is compromised, increases the nut torque by 10% of the value calculated in the previous step, and then repeat this step.
- Lock the nuts (12) with locking compound e.g. Loctite 221. (See Figure 11).

4.3 Repair of a Jammed or Stuck Valve While it is in the Pipeline

Jamming may be due to the ball (4) and seats (5) becoming clogged with flow medium. They may be cleaned by turning the ball to the partly open position and flushing the pipeline. If this does not help, follow the instructions in the following sections.

4.4 Detaching the Actuator

CAUTION:

When handling the valve or the valve package as a whole, bear in mind the weight of the valve or the entire package!

NOTE:

Before dismantling, carefully observe the position of the valve with respect to the actuator and positioner/limit switch so as to make sure that the package can be properly re-assembled.

It is generally most convenient to detach the actuator before removing the valve from the pipeline. If the valve is small or if it is difficult to access, it may be more practical to remove the entire package at the same time.

Note that the seats can be replaced without detaching the actuator.

- Close and detach the actuator pressure supply pipeline and remove control cables.
- Unscrew the bracket screws.
- Detach the actuator. The actuator can be removed by hand or with a special tool made for this purpose. The tool can be ordered from the manufacturer (see Section "Tools").
- Remove the bracket and coupling.

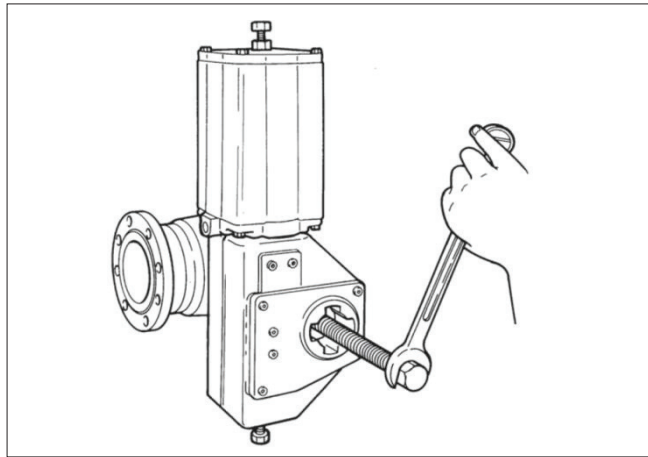


Fig. 12 Removing the Actuator with an Extractor

4.5 Removing the Valve from the Pipeline

CAUTION:

Do not dismantle the valve or remove it from the pipeline while the valve is pressurized!

- Make sure that the valve is not pressurized and that the pipeline is empty. Make sure that the medium cannot flow into the section where servicing is to take place.
- Support the valve carefully with a hoist. Place ropes carefully and unscrew the pipe flange bolts. See that the ropes are positioned correctly. Lift valve down. (See Figure 8).

4.6 Dismantling the Valve

- Place the valve in a standing position on the pipe flange end. Use a level surface that will not scratch the flanges. See that the body stud nuts (10) are facing upward.
- Mark the body halves for correct orientation during re-assembly.
- Turn the ball to the closed position.
- Remove the key (21).
- **S7 series coker valves only:** Remove the bottom plug (20) by removing the screws (18).
- Remove the nuts (10) that fasten the body cap (2) to the body (1).
- Remove the body cap (2). If the seat (5) and E- ring (6) are not laying on the ball (4), prevent them from falling from the body cap (2) and detach them later. **Don't leave your fingers between the body cap and the surface!** Stand the removed body cap on its pipe flange. (See Figure 13).
- Remove the seat (5) and E-ring (6) from the body or cap.
- Lift the ball (4) from the body (1) by gripping by the flow bore (small sizes) or by passing a rope through the flow bore and turning it at the same time around the flow bore axis. Handle the ball carefully and place it on a soft surface. (Fig. 14).

- Remove the hexagon nuts (12), disc spring set (22, 23, 24), compression plate (7), and compression ring (8). (Some valves may have pre-assembled spring set (23), see Figure 11).
- Remove the shaft (3) and thrust bearings (9) by sliding the shaft down through the stuffing box and out of the body through the flow bore on MA series coker valves or through the bottom plug hole on S7 series coker valves.
- Carefully remove the packing rings (14, 15) and lantern ring (16) from the counterbore using a packing removal tool.
- Remove the remaining seat (5) and E-ring (6).

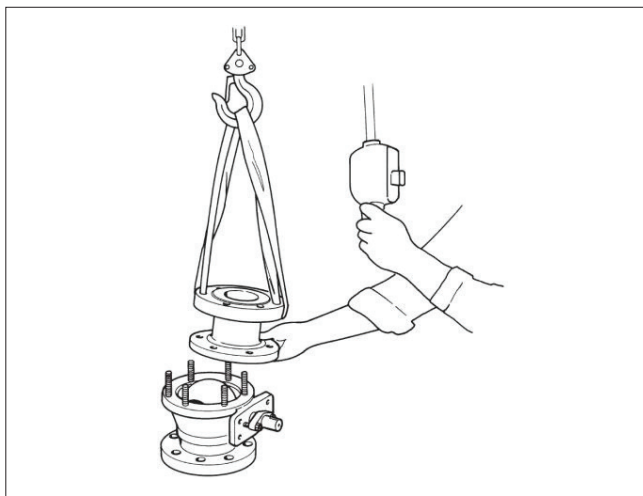


Fig. 13 Lifting the Body Cap

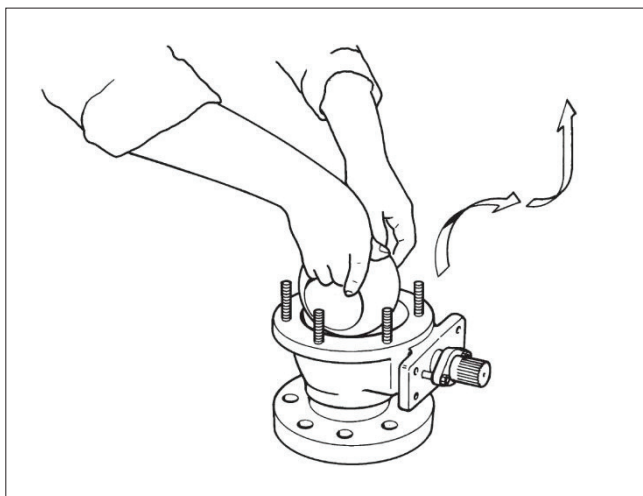


Fig. 14 Removing the Ball

4.7 Inspection and Maintenance of Removed Parts

- Clean all parts carefully using a suitable solvent as necessary.
- Inspect the ball, seat sealing surfaces, and shaft packing area for damage. Look for minor scratches on the sealing surfaces. Also check the bearing faces of the thrust bearings, body, and shaft. If any of the parts require polishing they can be smoothed with a fine emery paper (600 grit). **Do not create flat spots on the ball! Do not polish the shaft by rubbing lengthwise!**
- Check the sealing surface on the body and cap. Minor defects may be removed by lapping with fine (600 grit) lapping compound. Do not lap excessively.
- For soft material parts, see Section "Replacing Parts".
- After cleaning and inspection, keep all parts well protected until re-assembling. If damage to the valve components too severe for manual repair the valve should be re-assembled, packed to prevent further damage, and sent to a Valmet Authorized Service Center for repair.

4.8 Replacing Parts

We recommend that soft material parts be replaced whenever the valve is dismantled for servicing. Other parts may be replaced if necessary. Always use genuine spare parts to ensure proper functioning of the valve (see Section "Ordering Spare Parts").

4.9 Assembly

- Place the valve body (1) in a standing position on its pipe flange. Use a level surface that does not scratch the flanges.
- If removed prior, coat body studs (11) with anti-galling compound and screw them into the body (1) until they bottom out in the holes.
- Lubricate the body's seat pocket and the back of the seat with anti-galling compound, then place the E-ring (6) all the way into the body counter bore and slide the seat (5) down over it. Coat the seat's spherical sealing surface with Molykote or equivalent lubricant (See Figure 15).
- Coat the thrust bearings with anti-galling compound. Assemble the shaft (3) and thrust bearings (9) with bearing chamfers towards shaft shoulder. Insert the assembly all the way into the shaft bore. The shaft bore can be reached through the flow bore on MA series coker valves or through the bottom plug hole on S7 series coker valves.
- Place the ball (4) into the body (1) and onto the installed seat (5) so that the slot faces the shaft entrance opening. Push the shaft (3) into the valve from outside. Make sure that the end of the shaft fits into the ball slot.
- Coat the rear of the remaining seat (5) with anti-galling compound and the spherical sealing surface with Molykote or equivalent lubricant, then rest it on the ball (4) so that it is centered in the flow bore. Mind the seat's orientation. (See Figure 15).
- Place the E-ring (6) around the seat (5) keeping the assembly centered on the ball (4).
- Verify that the body seal groove is free of contaminate, coat the groove with anti-galling compound, then place a new body seal (17) into the groove.

- Coat the seat and body seal grooves of the end cap (2) with anti-galling compound, then place the end cap over the body studs and pins being careful not to damage the seat (5) and springs (6) or pinch the body gasket (17). Make sure that the seat and spring stay centered atop the ball (4). **Don't leave your fingers between the body cap and the surface!**
- Coat the bearing surfaces of the body stud nuts with anti-galling compound and screw them on the body studs using a criss-cross tightening sequence. Torque the nuts to the value shown in Table 1.
- S7 series coker valves only:** Assemble the bottom plug (20) and plug gasket (19). Place the plug into position then fasten it to the body (1) by tightening the hex head screws (18) in a criss-cross fashion, around the plug.
- Replace the lantern ring (16), packing and live loading by referencing the details in Section 4.2 (beginning with the 5th bullet point).

- Mount the key (21) by pressing it into its groove on the shaft (3).
- Recheck the valve packing for leaks with the valve pressurized to assure that it will function as expected in the pipeline.
- Install the valve in the pipeline as carefully and accurately as when you removed it. Note the instructions in Section 3.

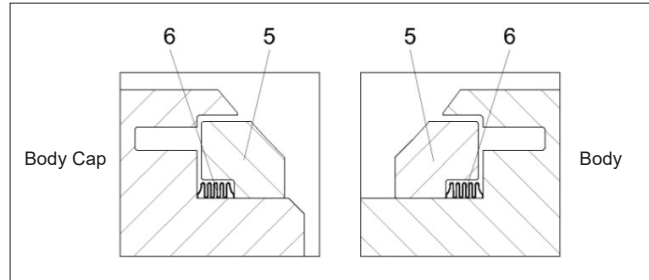


Fig. 15 E-Ring Backed Seat Assembly

Table 1 Proper Torque for Body Fastening Nuts [Ft-Lb (Nm)]

Fastener Size	Fastener Material				
	A193 B7	A193 B8	K Monel	A193 B7M	A193 B8M
1/4"	7-13 (9-18)	6-12 (8-16)	7-13 (9-18)	5-11 (7-15)	5-11 (7-15)
5/16"	17-23 (23-31)	14-20 (19-27)	17-23 (23-31)	13-19 (18-26)	12-18 (16-24)
3/8"	30-40 (41-54)	24-34 (32-46)	30-40 (41-54)	22-32 (30-43)	21-30 (28-41)
1/2"	75-85 (102-115)	70-85 (95-115)	65-75 (88-102)	55-65 (75-88)	60-75 (81-102)
9/16"	110-115 (149-160)	95-110 (129-149)	85-100 (115-136)	75-90 (102-122)	85-100 (115-136)
5/8"	160-190 (217-258)	155-180 (210-244)	140-160 (190-217)	125-145 (169-197)	135-160 (183-217)
3/4"	250-290 (339-393)	235-275 (319-373)	210-245 (285-332)	190-220 (258-298)	205-240 (278-325)
7/8"	380-445 (515-603)	290-340 (393-461)	325-380 (441-515)	290-340 (393-461)	250-295 (339-400)
1	575-630 (780-854)	435-510 (590-692)	495-540 (671-732)	435-510 (590-692)	375-445 (508-603)
1-1/8"	850-1000 (1153-1356)	526-615 (713-834)	690-805 (936-1092)	650-760 (881-1031)	475-555 (644-753)
1-1/4"	1160-1360 (1573-1844)	715-840 (970-1139)	940-1100 (1275-1492)	885-1030 (1200-1397)	645-755 (875-1024)
1-3/8"	1625-1900 (2203-2576)	770-900 (1044-1220)	1310-1540 (1776-2088)	1240-1450 (1681-1966)	695-810 (942-1098)
1-1/2"	2000-2360 (2712-3200)	1030-1120 (1397-1519)	1630-1910 (2210-2590)	1530-1800 (2075-2441)	930-1000 (1261-1356)
1-5/8"	2600-2900 (3526-3932)	1200-1400 (1627-1898)	2200-2400 (2983-3254)	2100-2300 (2848-3119)	—
1-3/4"	3170-3450 (4298-4678)	1510-1770 (2048-2400)	2570-3000 (3485-4068)	2420-2825 (3282-3831)	—
2	4700-5530 (6373-7498)	2245-2635 (3044-3573)	3820-4480 (5180-6075)	3590-4200 (4868-5695)	—

5. TESTING THE VALVE

CAUTION:

Pressure testing to be carried out using equipment conforming to the correct pressure class!

We recommend that the valve be pressure tested after assembly to insure body integrity and seat tightness before returning to service. The test should be carried out in accordance with an applicable standard using the pressure rating required by the pressure class or flange drilling of the valve.

- With the valve in the "half-open" position, subject the water filled pressure shell hydrostatically to 150% of the maximum allowable cold working pressure for a period of ten minutes with no external leakage (see ANSI B16.34 for maximum allowable cold working pressure for applicable valve body material).

- Test both seats for tightness by subjecting the closed valve to the pressure and duration required by the applicable customer specification, in both directions. Every effort should be made to assure that the valve is filled with water at the start of the test, and that sufficient time is given prior to the measurement of leakage to allow for proper seating of components.
- Dry the valve, following the testing. **Be sure that all water is drained from the valve and all passages are blown dry!**
- Preserve the valve by spraying Cortex VCI369 or equivalent rust inhibitor in all ports.

6. INSTALLING THE ACTUATOR

6.1 General

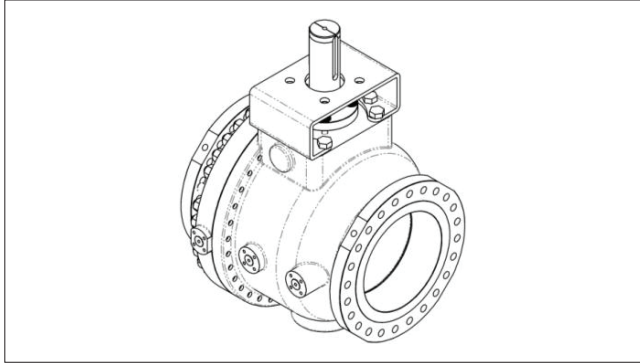


Fig. 16 Bracket Mounted on Valve

Different Neles actuators can be mounted using suitable brackets and couplings. The valve can be actuated by an M-series handwheel operator or B1-series actuators.

6.2 Installing the M-Series Handwheel

- The mark at the end of the shaft indicates the direction of the ball flow bore. Turn the valve to the closed position.
- Lubricate the operator shaft bore and the shaft. Place the bracket on the valve and turn the lubricated screws a few times.
- Turn the actuator to the closed position and push it carefully onto the valve shaft. Please note the marks on the handwheel and the shaft.

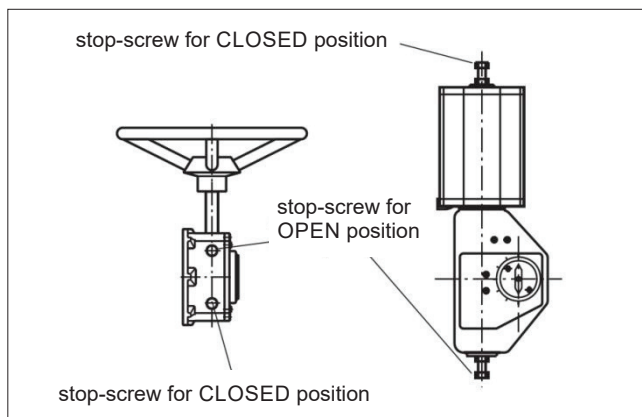


Fig. 17 Open and Closed Positions of the Actuator

- Lubricate the operator screws. Tighten all screws.
- Adjust the circular movement of the ball with the hexagon screws located at the side of the housing (see Figure 17). The stop-screw for the open position is nearest to the handwheel on the side of the housing and the screw for the closed position is at the opposite end. The turning directions for the handwheel are marked on the wheel.

- Check the handwheel by turning the valve to the extreme positions. The yellow arrow should indicate the direction of the ball flow bore.

6.3 Installing the B1C-Series Actuator

CAUTION:

Beware of ball cutting movement!

- Turn the valve to the closed position and drive actuator piston to the extreme outward position.
- File off any burrs and clean the shaft bore.
- Note the correct position. The line at the end of the shaft indicates the direction of the ball flow bore.
- Lubricate the valve shaft and shaft bore. Fasten the bracket loosely to the valve.
- Slip the actuator carefully onto the shaft. Avoid forcing it since this may damage the ball and seats. We recommend mounting the actuator so that the cylinder is pointing upwards.
- Position the actuator parallel or vertical to the pipeline as accurately as possible. Lubricate the actuator mounting screws and then fasten all screws.
- If re-installing an actuator on the same valve, stop screw adjustment should not be necessary. If installing on a new valve or the alignment is off, adjust the ball open and closed positions by means of the actuator stop screws located at both ends. (See Figure 17). An accurate open position can be seen in the body flow bore. Check that the yellow arrow on the actuator indicates the ball flow opening position. **Keep fingers out of the flow bore!**
- Check the stop screw thread tightness. An O- ring is used for sealing.
- Check that the actuator is functioning correctly. Drive the actuator piston to both cylinder ends and check the ball position and its movement with respect to the actuator (close: clockwise; open: counterclockwise). The valve should be closed when the piston is in the extreme outward position.
- If necessary, change the position of the actuator pointing cover to correctly indicate the valve open/closed position.

6.4 Installing the B1J-Series Actuator

Spring-return actuators are used in applications where valve opening or closing movement is needed in case the air supply is interrupted.

The B1J type is used for spring-to-close operation; the spring pushes the piston towards the cylinder end, the extreme outward position. In turn, the B1JA type is used for spring-to-open operation; the spring pushes the piston towards the housing.

Spring-return actuators are installed in a manner similar to B1C-series actuators, taking into account the following.

B1J-Type

- Install the actuator so that the piston is in the extreme outward position. The cylinder must not be pressurized and air supply connections must be open. The valve must be in the **closed** position.

B1JA-Type

- Install the actuator so that the piston is in the cylinder end position at housing side. The cylinder must not be pressurized and air supply connections must be open. The valve must be in the **open** position.

The rest of the installation procedure is the same as in Section 6.3.

6.5 Installing Other Makes of Actuators

NOTE:

Valmet accepts no responsibility for compatibility of actuators not installed by Valmet.

Other actuators can be installed only if they have an ISO 5211 actuator connection.

7. MALFUNCTIONS

Table 2, see following page, lists malfunctions that might occur after prolonged use. Possible causes and remedial actions are also listed here.

Table 2 Possible Malfunctions

Symptom	Possible Fault	Actions
Leakage through a closed valve	Wrong stop screw adjustment of the actuator	Adjust the stop screw for closed position
	Damaged ball surface	Turn the ball by 180°
	Damaged seat(s)	Replace seat(s)
	Ball cannot move freely	Clean the inside of the valve
Irregular valve movement	Impurities between the ball and seats	Flush the valve from the inside
		Clean the sealing surfaces and seats mechanically
Leakage through gland packing	Loose packing	Tighten the nuts
	Worn-out or damaged packing	Replace the gland packing

8. TOOLS

In addition to standard tools, the following special tools might be needed for removal of the actuator:

Extractor Tools (Actuator Series B1C/B1J)	
Product:	ID:
B1C/B1J 6	303821
B1C 8-11 / B1J 8-10	8546-1
B1C 12-17 / B1J 12-16	8546-2
B1C/B1J 20	8546-3
B1C/B1J 25	8546-4

9. ORDERING SPARE PARTS

When ordering spare parts, always include the following information:

- Name of the Part
- Quantity Required
- Part Number
- Parts List Number
- Valve Type Code
- Serial Number (stamped on valve)
- Sales Order Number

This information can be found from the identification plate or documents.

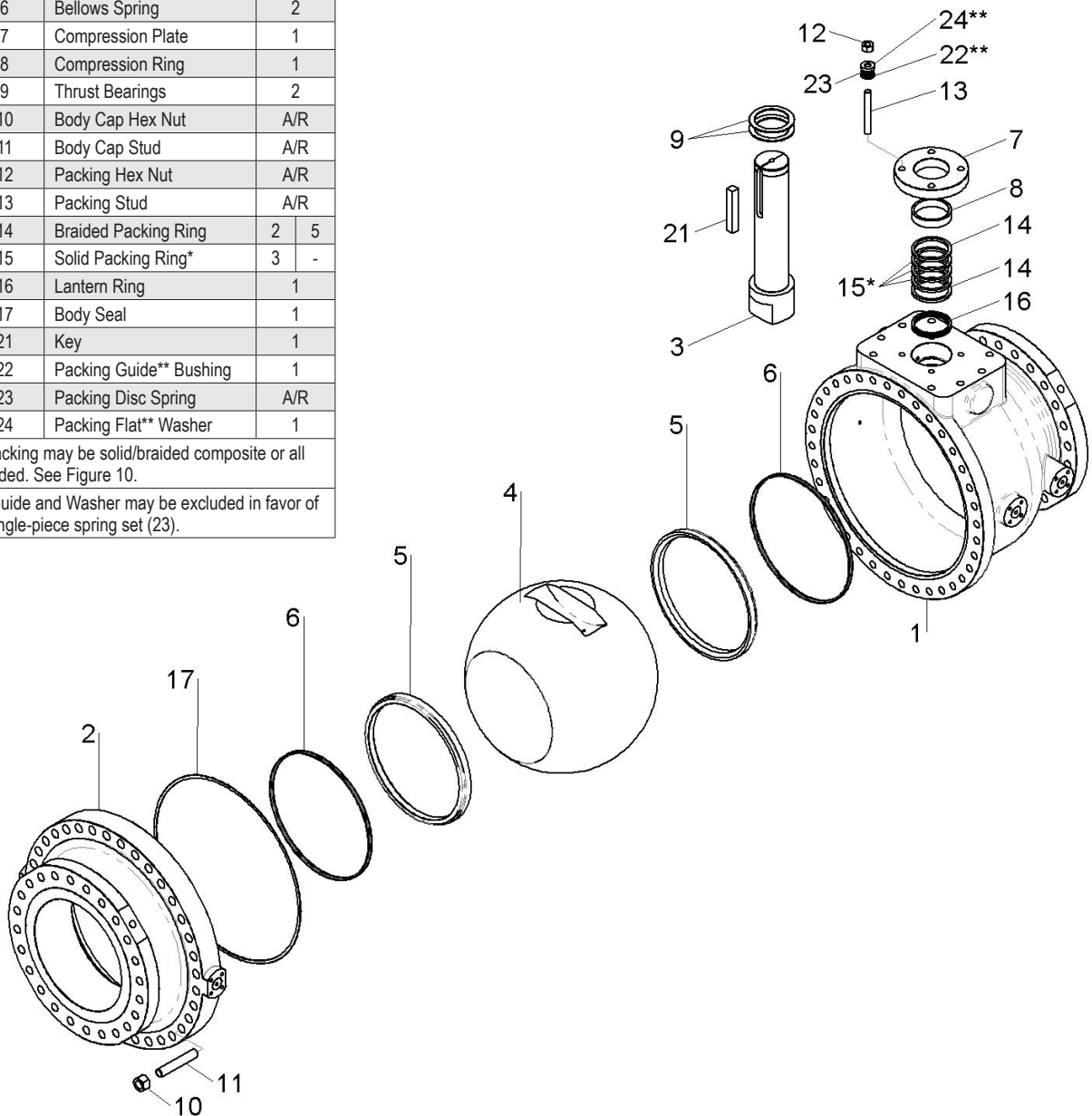
10. EXPLODED VIEWS AND PARTS LISTS

10.1 MA Series Coker Construction

Parts list		
Item	Part name	Qty
1	Body	1
2	Body Cap	1
3	Shaft	1
4	Ball	1
5	Seat	2
6	Bellows Spring	2
7	Compression Plate	1
8	Compression Ring	1
9	Thrust Bearings	2
10	Body Cap Hex Nut	A/R
11	Body Cap Stud	A/R
12	Packing Hex Nut	A/R
13	Packing Stud	A/R
14	Braided Packing Ring	2 5
15	Solid Packing Ring*	3 -
16	Lantern Ring	1
17	Body Seal	1
21	Key	1
22	Packing Guide** Bushing	1
23	Packing Disc Spring	A/R
24	Packing Flat** Washer	1

* Packing may be solid/braided composite or all braided. See Figure 10.

** Guide and Washer may be excluded in favor of a single-piece spring set (23).



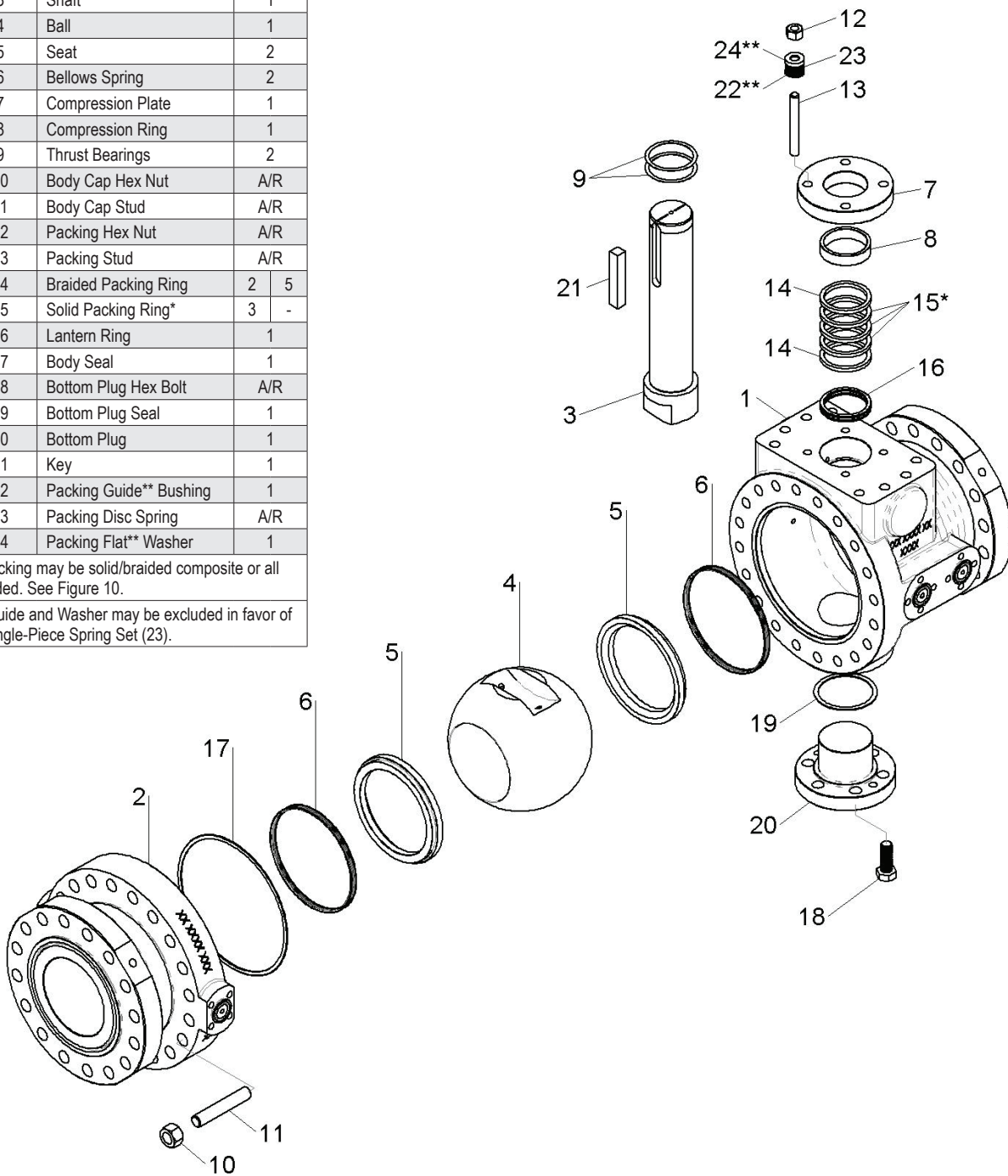
NOTE: 12" and smaller may have welded on purges

10.2 S7 Series Coker Construction

Parts list		
Item	Part name	Qty
1	Body	1
2	Body Cap	1
3	Shaft	1
4	Ball	1
5	Seat	2
6	Bellows Spring	2
7	Compression Plate	1
8	Compression Ring	1
9	Thrust Bearings	2
10	Body Cap Hex Nut	A/R
11	Body Cap Stud	A/R
12	Packing Hex Nut	A/R
13	Packing Stud	A/R
14	Braided Packing Ring	2 5
15	Solid Packing Ring*	3 -
16	Lantern Ring	1
17	Body Seal	1
18	Bottom Plug Hex Bolt	A/R
19	Bottom Plug Seal	1
20	Bottom Plug	1
21	Key	1
22	Packing Guide** Bushing	1
23	Packing Disc Spring	A/R
24	Packing Flat** Washer	1

* Packing may be solid/braided composite or all braided. See Figure 10.

** Guide and Washer may be excluded in favor of a Single-Piece Spring Set (23).



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