IM-TEV-f-SS-OR-STD-H95-06-EN

Maintenance and Installation Instructions

FLOATING BALL VALVE
TYPE: TEV-f
SERVICE: STANDARD

Rev.	Comments	Carried out by	Checked by	Approved by	Date
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6.1	New logo, brand review	A.Suresh	E. Guillaumes	T.Paradinas	29-04-2025

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1 DECLARATION

The **TEV-f** "BAC" ball valves have been designed and manufactured for handling and control of fluids during industrial processes suitable to the valve performance, in accordance with applicable regulations.

It is thus very important to follow the instructions set out below. Failure to follow these instructions may rend the manufacturer's warranty null and void.

2 APPLICATIONS

2.1 The user is responsible for ensuring the suitability of materials and design of the valve type according to its working conditions.

2.2 Special attention should be paid when handling corrosive products, and in these cases the material must be checked to see if it is suitable or not and in the event that it is, inspections should be provided according to the possible corrosion.

2.3 In the case of valves that are used in points or applications that may suffer erosion due to the product they are carrying, the required inspection plan should be implemented and applied to ensure the continued capacity of the valve for the process conditions.

2.4 The valves are identified with a name plate which indicates the maximum pressure-temperature performance of use in terms of their component materials and design rating. The valve should never be installed in processes that, while even compatible, may exceed some of the limitations indicated.

3 STORAGE

3.1 All the valves are supplied wrapped a special plastic and / or flange covers to protect the gasket surfaces and their interior.

3.2 The valves should be stored in a dry area, protected from temperature extremes and away from any thing that may cause damage. Special attention should be paid to the gasket surfaces due to the fact that their deterioration may lead to leaks following installation.

3.3 The valves should always be stored with the ball fully open and the covers placed on the ends for as long as possible prior to being assembled.

4 INSTALLATION, HANDLING AND TRANSPORTATION

4.1 The handling and transportation of valves should be undertaken with caution, using the required jeans, depending on their size and weight to prevent risks to people handling them. Never use the operating lever or handle to carry the valve while handling or transporting it.

4.2 Check the condition of the valve for any possible damage that may have occurred during transportation and / or handling. Both the inside of the valve and the adjacent pipe should be checked. It is important to check for any foreign particles that could damage the valve seats.

4.3 When it is likely that the valve is to be located at a waste collecting point, such as those for welding slag, rust and scale, filters or screens should be temporarily installed.

4.4 Place the valve in a fully open position to ensure that the foreign particles do not damage the seats and the ball.

4.5 The valve should be positioned in a way that it is accessible for inspection and periodic maintenance.

4.6 Being bidirectional, there is no preference regarding the flow direction of these valves. In any case, a check should be carried out to ensure that there is no marking on the body such as an arrow or a plate indicating a preferential direction or that it is a unidirectional valve.

4.7 The valve can be assembled in any position, but it is preferable for the shaft to be vertical.

4.8 The valves should not have to withstand stress from the piping. The assembly should be done with proper alignment and parallelism to avoid such stress.

4.9 The flange gasket must be correctly installed following manufacturer's instructions.

4.10 Valves can be welded in line without being taken apart, but special care must be taken. Ensure the valve it's in open position during welding and until it cools down to room temperature. Welding should only be done by qualified personnel following procedures outlined in ASME Boiler Pressure Vessel Code Section IX. To prevent damage, the temperature in critical areas (as depicted in Figure 1) must not exceed 80°C.

⚠ CAUTION: Welding on in-service valves under pressure is not permitted.

4.11 If multiple welds for each end are needed, weld passes must alternate between the ends until they are all completed. After cooling, adjust the bonnet fasteners to the specificated torque.

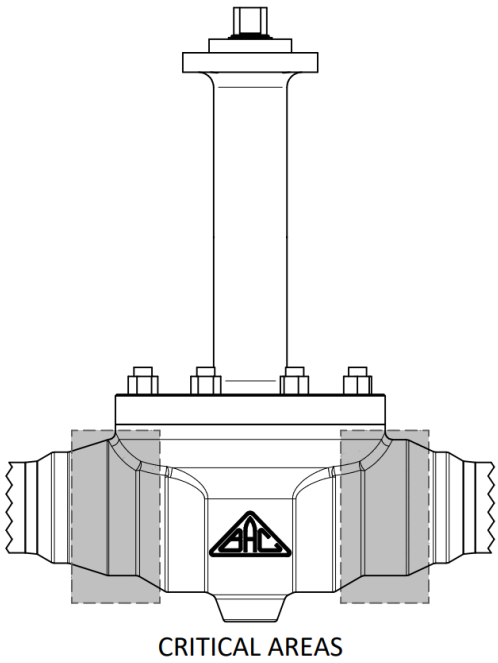


Figure 1. *Critical weld areas*

4.12 A final check of the valve should be carried out once it has been installed. An opening and closing must be carried out to ensure that it works properly. If necessary, readjust the top flange nut (55A) if NPS ≤ 1"or the screws (92) if NPS ≥ 1 ½". In the case of valves supplied with the operating rod as a separate part (90), the installer is responsible for ensuring that this is put on properly, as well as for carrying out an assessment of potential risks involved in its installation and to take any necessary measures to deal with them.

4.13 Filters can be removed following the checks. In the event that rust and scale are detected in this normal process, the use of permanent filters should be considered.

4.14 Those valves weighing over 250 kg, excluding accessories, are supplied with fixing hooks for their handling and installation.

4.15 We recommend the use of belts when handling painted valves due to the fact that doing this any other way could lead to damage of the paint.

4.16 It is recommended that special attention is paid to all the accessories during all the operations just as with the paint.

4.17 The valve handling straps must be positioned symmetrically on each side of the valve ensuring that the centre of mass is centred and that the straps can not shift during transport (e.g. using the space between the body and flanges). For user safety, it is very important that the straps are farthest from the centre of the valve as possible. All movements should be made slowly, ensuring that there is no possibility of accident or damage to persons or to the valve.

5 MAINTENANCE

5.1 The maintenance operations consist of an inspection to ensure that the valve works properly.

5.2 The valves must be routinely actuated at least every 6 months, depending on the flow and application of the valve, checks and actuation plans in the shortest timeframe possible should be set up. These should never be left open or closed for an extended period of time.

5.3 A very high torque increase may be due to the entry of foreign particles into the seats. Therefore, an inspection and possible replacement of the seats should be carried out without forcing the valve actuation, in order to avoid damage to the ball.

5.4 Where a thorough review of the installation or any type of repair to it is carried out, the joints and seats should be replaced if necessary.

5.5 The valves are produced and assembled to be operative throughout its useful lifetime, at the end of it, the different materials that compose it, most of them metallic, must be environmentally managed correctly, completing its life cycle.

5.6 Use only genuine BAC Valves spare parts for maintenance and replacements to ensure proper functioning of the valve. Bac Valves cannot accept responsibility for any damages that occur from using spare parts from other manufacturers.

5.7 The recommended spare parts (gaskets, O-rings, friction rings, etc) are clearly marked with ✓ in the assembly drawing of the valve (General Arrangement Drawing).

5.8 Spare parts can be ordered to BAC Valves providing the serial number of the valve or specific purchasing order for the original valve.

5.9 If BAC Valves products have been stored for long periods check for deterioration before using these products. Do not re-use parts or components which appear to be in good condition after they have been checked or replaced by qualified personnel and declared unsuitable for use.

5.10 At the end of design life, the spare parts can be scrapped and can be recycled if sorted according to material. Separate the parts of the valve according to their nature (ex. metallic, plastic materials, etc.) and send them to differentiated waste collection sites, see Table 1. Check local authority regulation before disposal.

SUBJECT	HAZARDOUS	RECYCLABLE	DISPOSAL
Metals	No	Yes	Use licensed recyclers
Plastics	No	Yes	Use specialist recyclers
Seals	Yes	No	May require special treatment before disposal, use specialist waste disposal companies

Table 1. Recycling and disposal.

6 PRECAUTIONS PRIOR TO DISMANTLING

6.1 Ensure that the line is closed and completely depressurized. The valves must be activated repeatedly to depressurize and drain its dead cavity.

6.2 Appropriate protective equipment should be used for installation flow.

6.3 Ensure that you have all necessary elements for repair (tools and BAC replacement kits).

7 DISMANTLING

7.1 In order to carry out valve dismantling, it is necessary to have the necessary tools as well as appropriate clothing (e.g. protective goggles, work coat or overalls, gloves, safety boots, etc.).

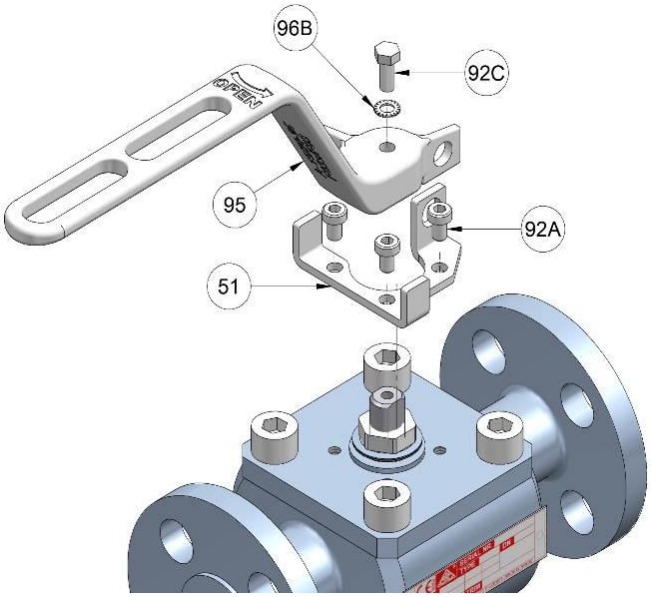
7.2 Prior to dismantling, ensure that the ball is in the closed position.

7.3 Dismantling the manoeuvring device and the axis

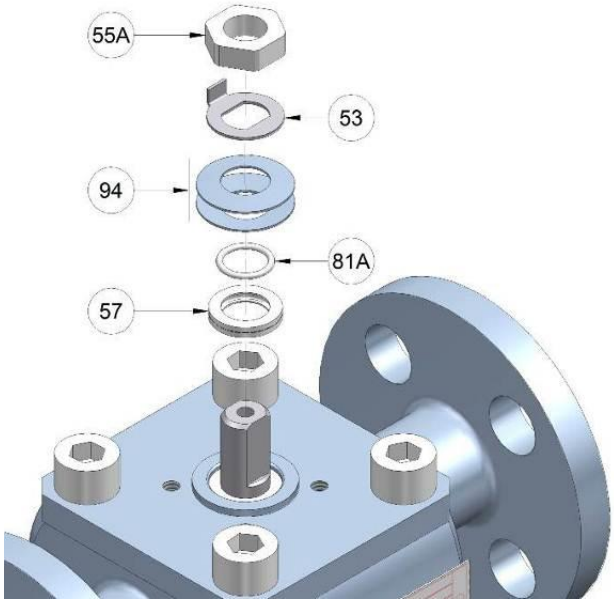
7.3.1 NPS ½", ¾" and 1"

* In the event of only wishing to change the seats (60) go directly to step *7.3.1.3*

7.3.1.1 If the valve has a handle, unscrew the screw (92C) and remove the washer (96C) and lever (95). Unscrew the screws (92A) that secure the indicator (51) thus removing it.

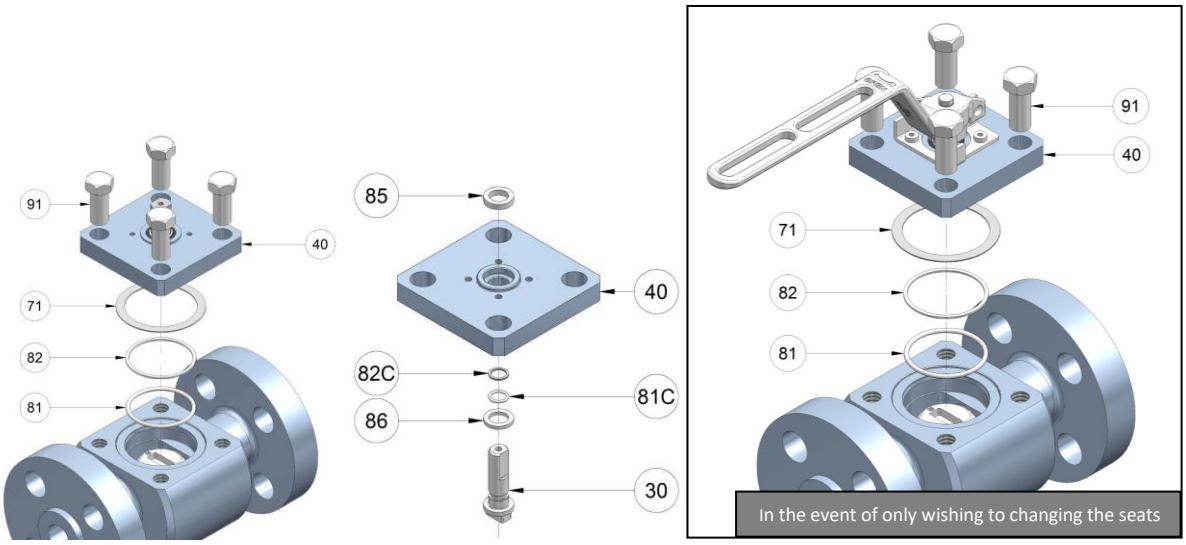


7.3.1.2 Open the locking washer (53) tab and unscrew the nut (55A), spring washer (94) and the guide ring (57) with the O-ring (81A).



7.3.1.3 Unscrew the screws (91) from the body cover bolting and remove the cover (40), intermediate gasket (71), back-up (82) and O-ring (81). Remove the stem (30) from the cover (40) together with the stem O-ring (81C), the back-up (82C), the axial bearing (86) and packing gasket (85).

* In the event of just wishing to change the seats, start at this point and remove the top pieces together with the cover (40) without dismantling them.

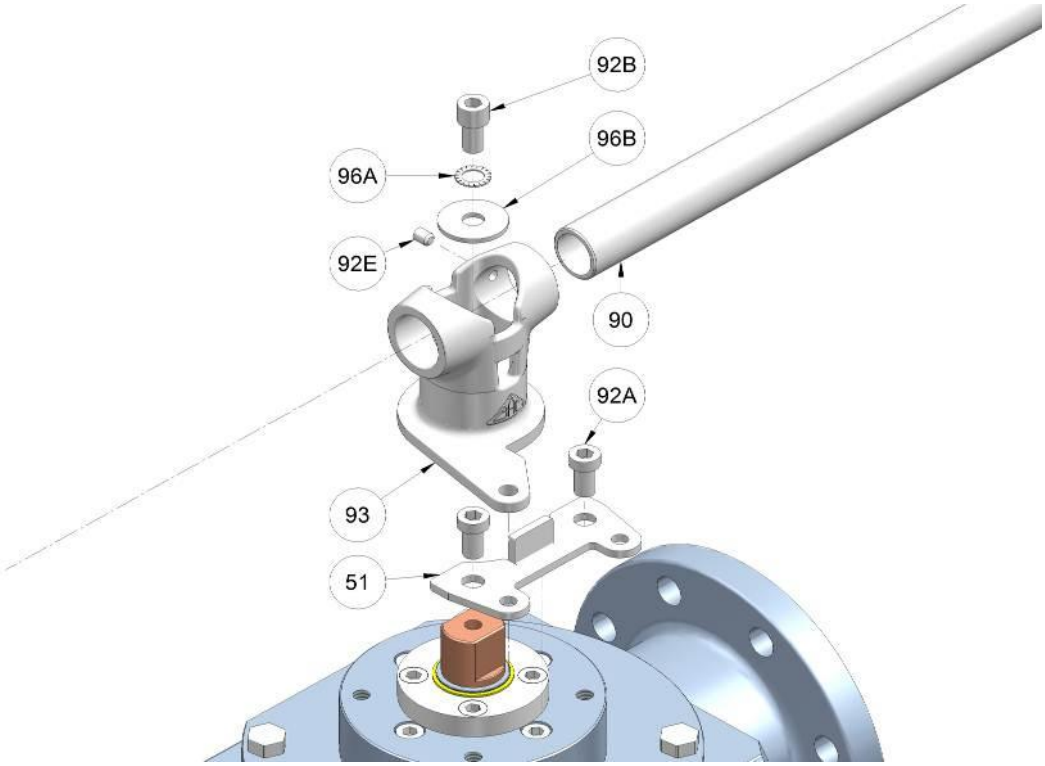


* The O-ring (81) and back-ups (82 and 82C) are for class 900 and 1500 only

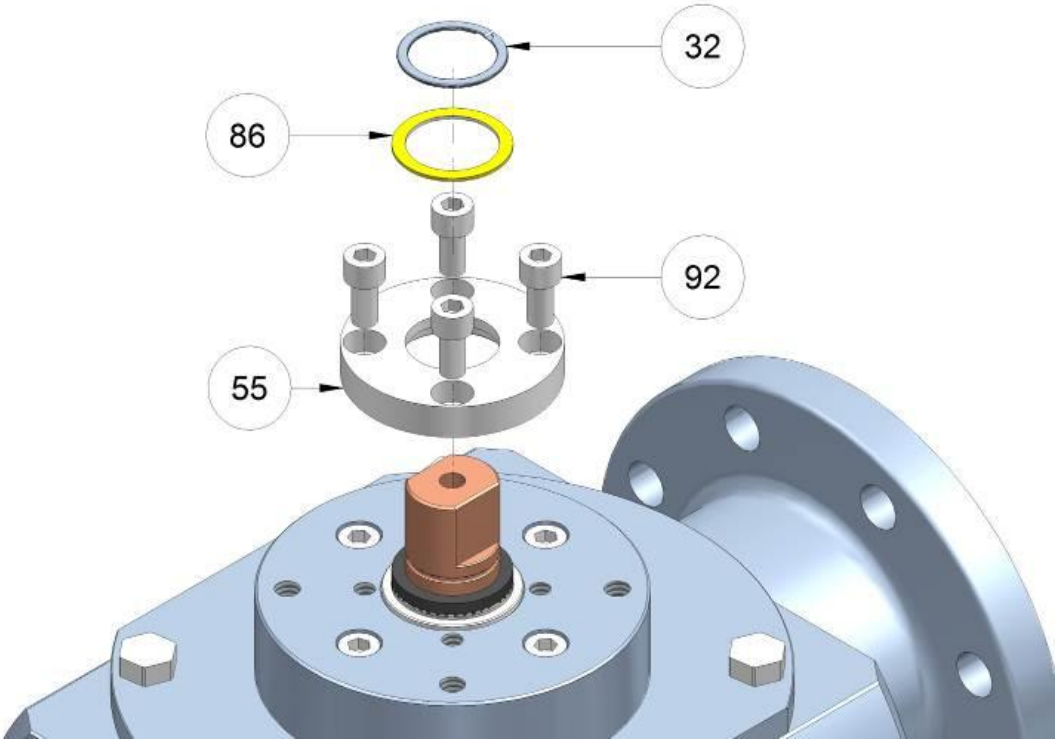
7.3.2 NPS 1½" and larger

* In the event of only wishing to change the seats (60) go directly to *step 7.3.2.4*

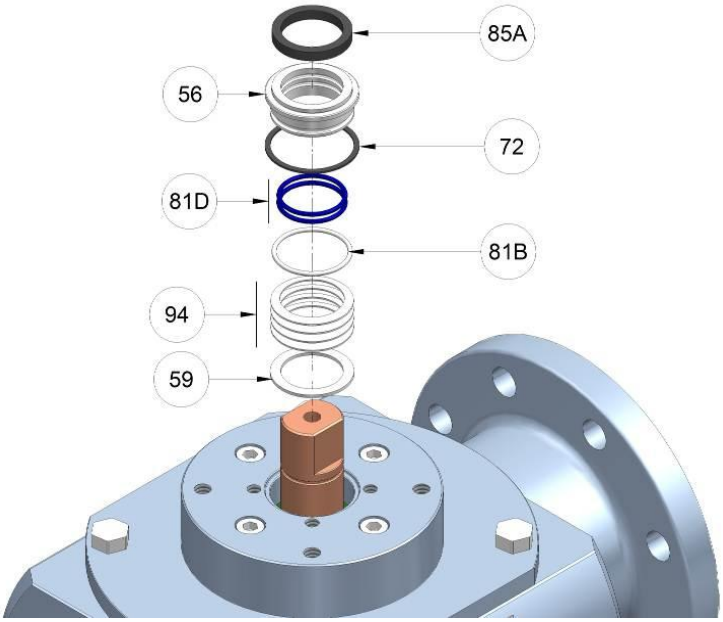
7.3.2.1 If the valve has a wrench, remove the wrench tube screw (92E), the wrench tube (90), the screw (92B) and their washers (96A) and (96B). Also remove the wrench support (93). Remove the screws from the indicator (92A) and the indicator (51) itself.



7.3.2.2 Remove the circlip (32), gasket (86) and remove the screws (92) in order to remove the gland plate (55).



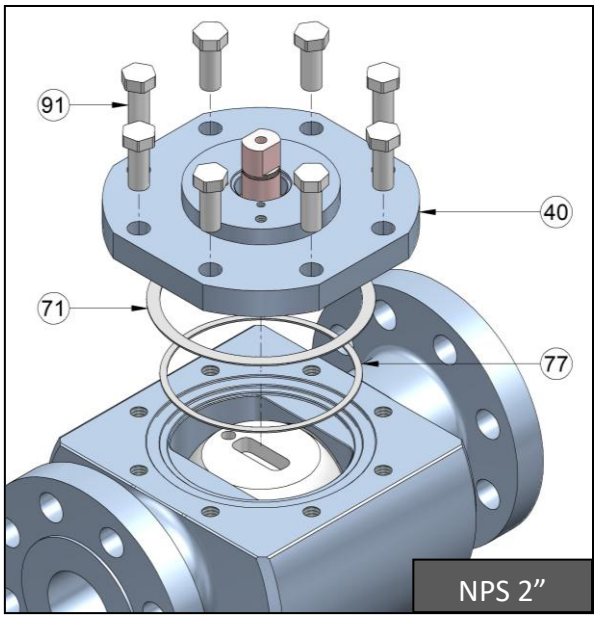
7.3.2.3 Remove the graphite gaskets (85A and 72) together with the gland ring (56) and its O-rings (81D) and (81B). Afterwards, remove the spring washers (94) and ring (59).



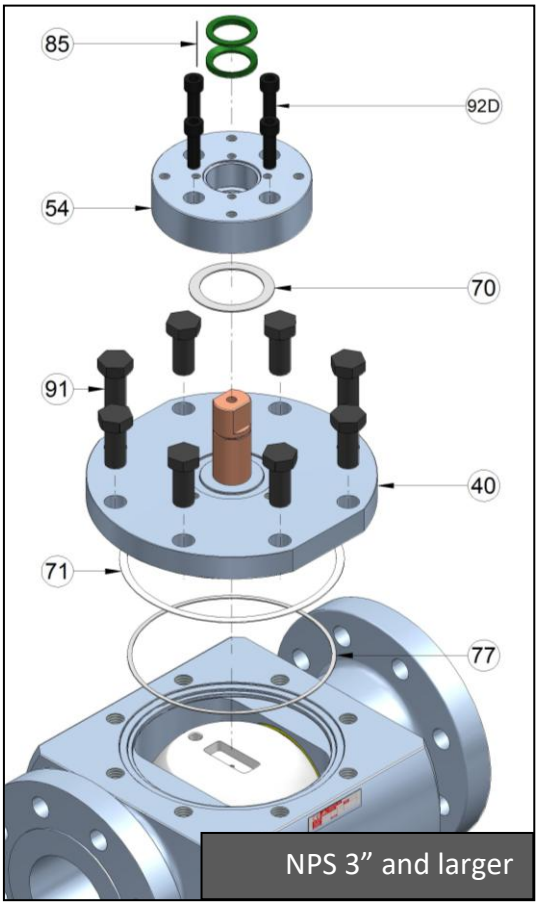
7.3.2.4 Remove the screws (91) from the body cover bolting. In the case of 1 ½ "and 2" valves, the cover (40), its gaskets (71 and 77), the back-up (82) and O-ring (81) can be extracted directly. For those that are 3" and larger, the screws (92D), the body bonnet (54) and its gasket (70) must be removed beforehand.

Along with the cover (40) [for 1 ½ "and 2" valves], or with the body bonnet (54) [for 3" valves and larger], also remove the two PTFE parts (85), the stem (30) and the axial bearing (86) which must be removed later.

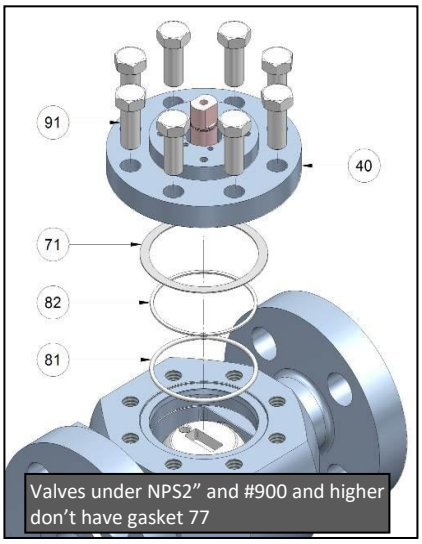
* In the event of just wishing to change the seats, start at this point and remove the previous parts together with the cover (40) without dismantling them.



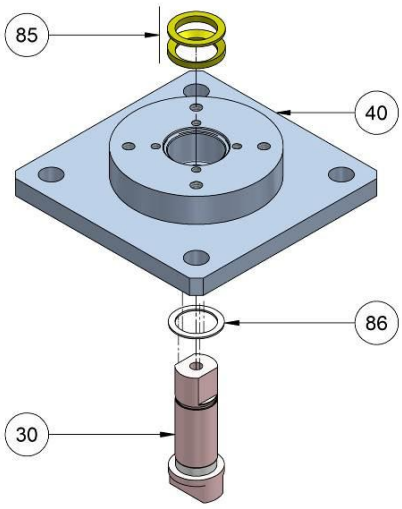
NPS 2”

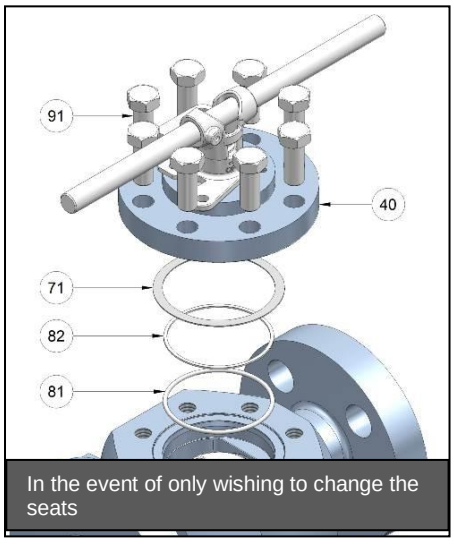


NPS 3” and larger



Valves under NPS2” and #900 and higher don’t have gasket 77





In the event of only wishing to change the seats

* The O-ring (81) and back-up (82) are for class 900 and 1500 only

7.4 Dismantling the ball

* Prior to dismantling the ball, it is important to check that it is in the closed position.

The next step is to dismantle the ball (20). The use of a specific tool is recommended for this (threaded rod or long screw).

NPS	THREAD	LENGTH (mm)
½”	M4	160
¾”	M5	200
1”	M5	200
1½”	M10	300

NPS	THREAD	LENGTH (mm)
2”	M10	300
3”	M14	400
4”	M14	400
6”	M16	500

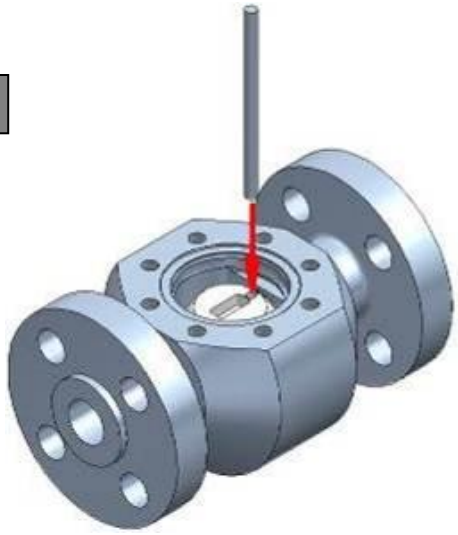
a) First, secure the tool onto the ball (20)

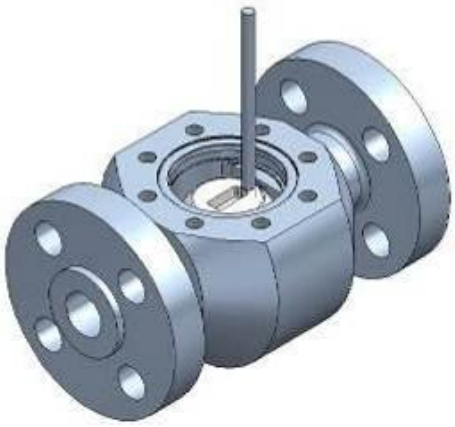
b) Rotate the ball about 55° and remove the tool

c) Next, insert it into the hole that has been exposed owing to the rotation.

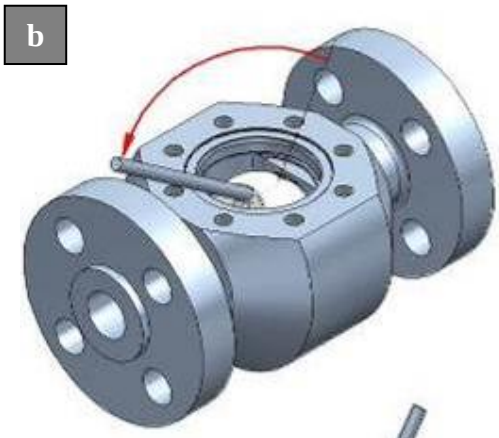
d) Once secured, rotate the ball until the tool is vertical and then remove the ball vertically.

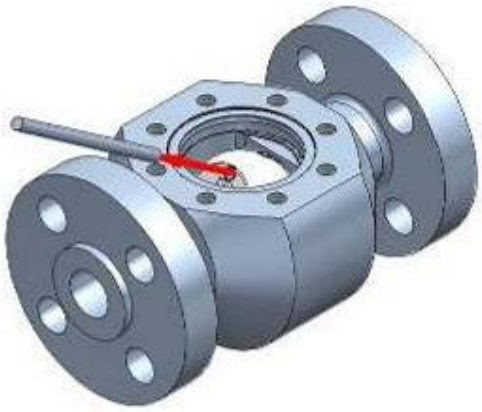
a



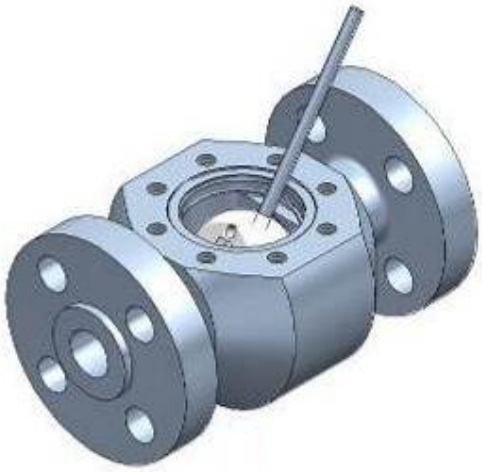


b

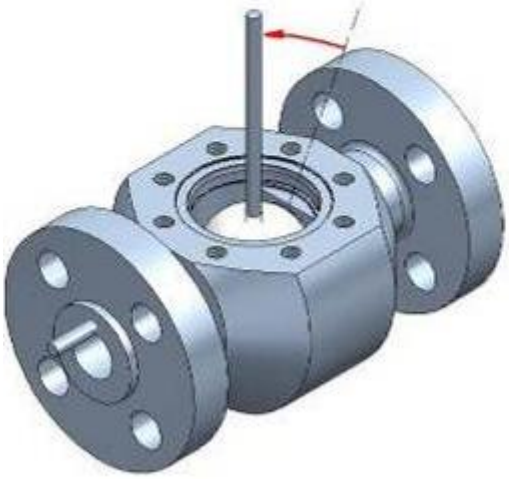


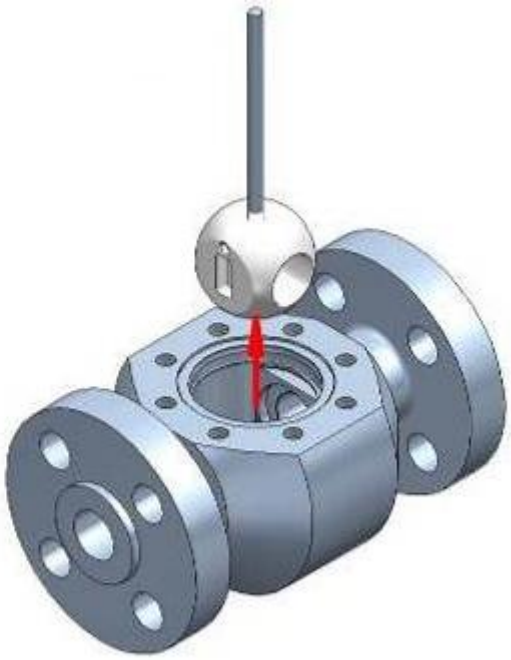


c

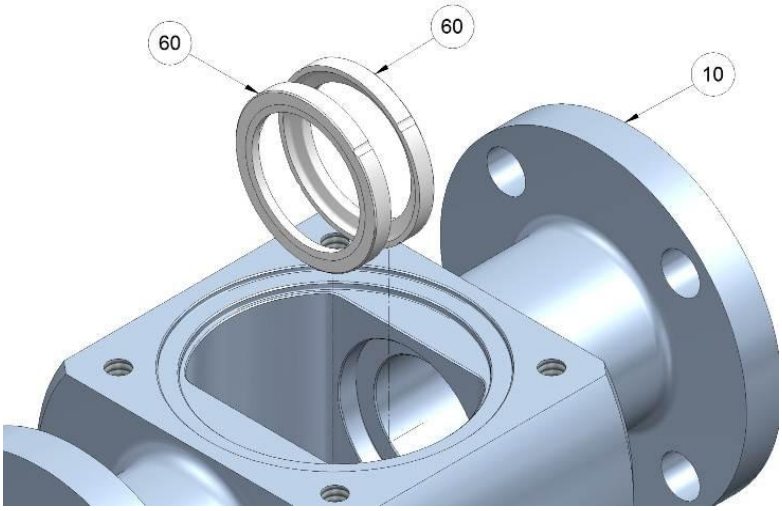


d





7.5 Finally, remove the seats (60) from the body (10).



7.6 Clean and inspect all the parts.

7.7 Replacement of all the parts included in the replacement kit is recommended each time a valve is removed. It is also recommended that all damaged parts are replaced.

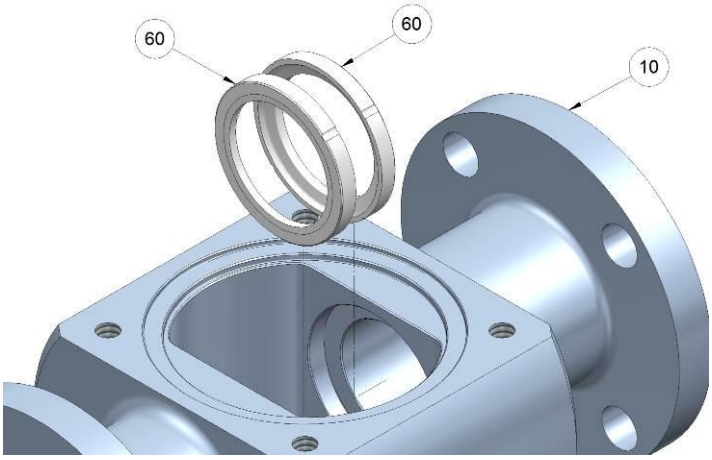
7.8 For valve ratings of # 1500, the O-rings (81) and (81C) come with the corresponding back-ups (82) and (82C). These back-ups are to be positioned exactly as illustrated in *Figure 5 - Back-up detail* (# 1500)

8 ASSEMBLY

8.1 In order to assemble the valve, the same material described in section 7.1 must be used.

8.2 Ball assembly

8.2.1 Position the seats (60) onto the body (10) so that the lip is positioned to support the ball (20).

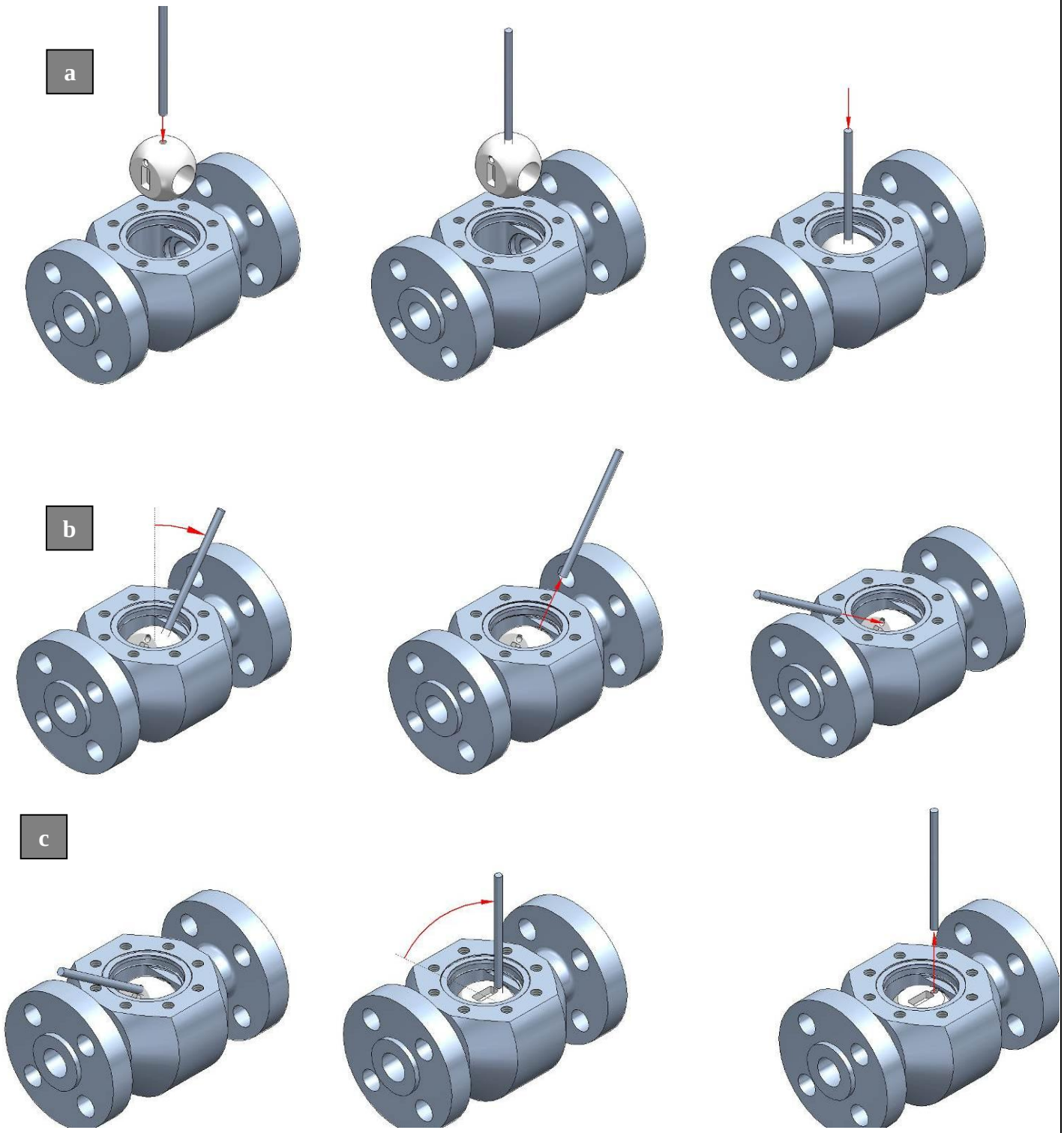


8.2.2 Next, insert the ball. It is recommended that a specific tool is used to carry this out (threaded rod). [See table in *point 7.3*].

a) First, position the tool onto the ball (20) and insert it vertically into the body (10).

b) Rotate the ball until the tool reaches the body (10). Extract it and position it onto the ball hole which has been exposed owing to the rotation.

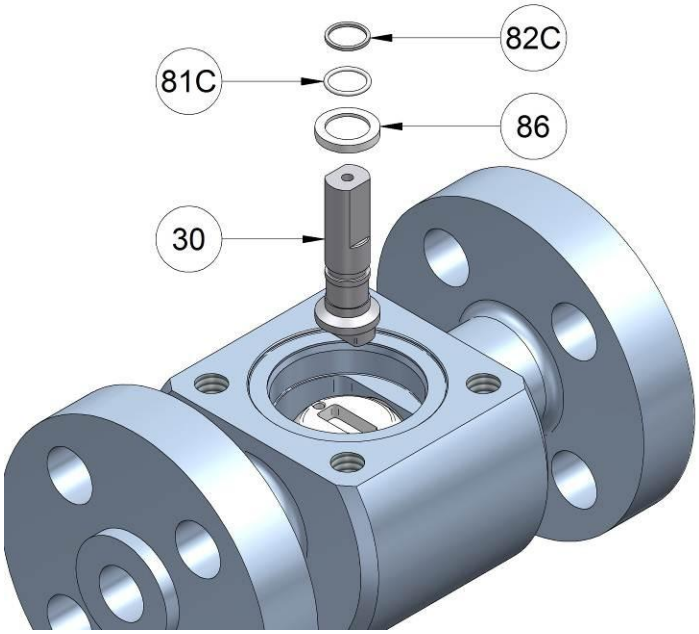
c) Next, rotate it about 55° until the ball (20) is positioned in the correct position and remove the tool.



8.3 Assembly of the stem, packing and cover

8.3.1 NPS ½", ¾" and 1"

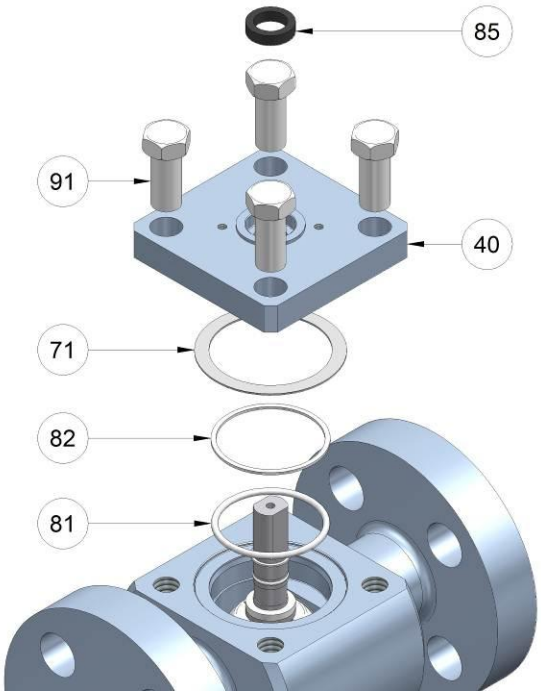
8.3.1.1 Insert the stem (30) together with the O-ring (81C) and the axial bearing (86) into the ball (20).

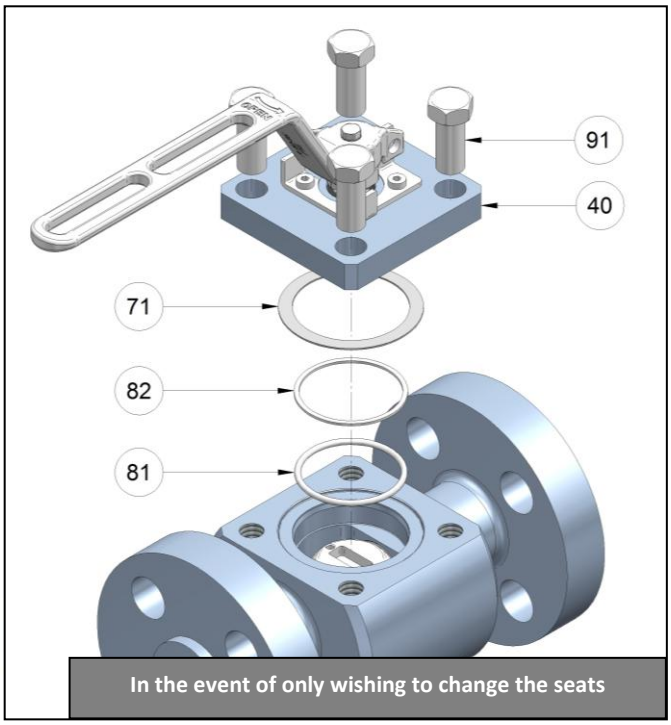


* The back-up (82C) is for class 900 and 1500 only

8.3.1.2 Insert the O-ring (81) and its back-up (82), the intermediate gasket (71) and cover (40) and secure them by tightening the screws (91) of the body cover bolting. Next, insert the packing gasket (85).

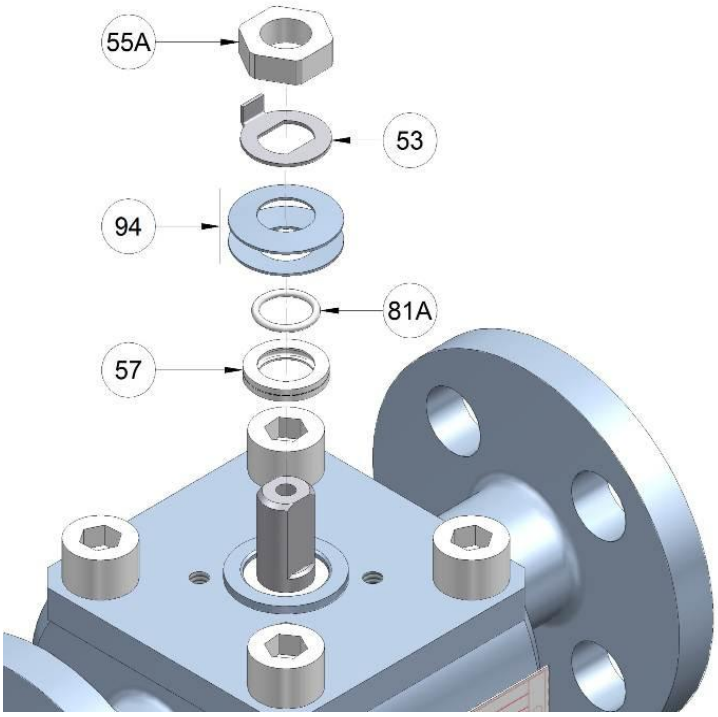
* In the event of just wishing to change the seats, finish at this point and assemble the top pieces together with the cover (40) if these have not been dissembled.



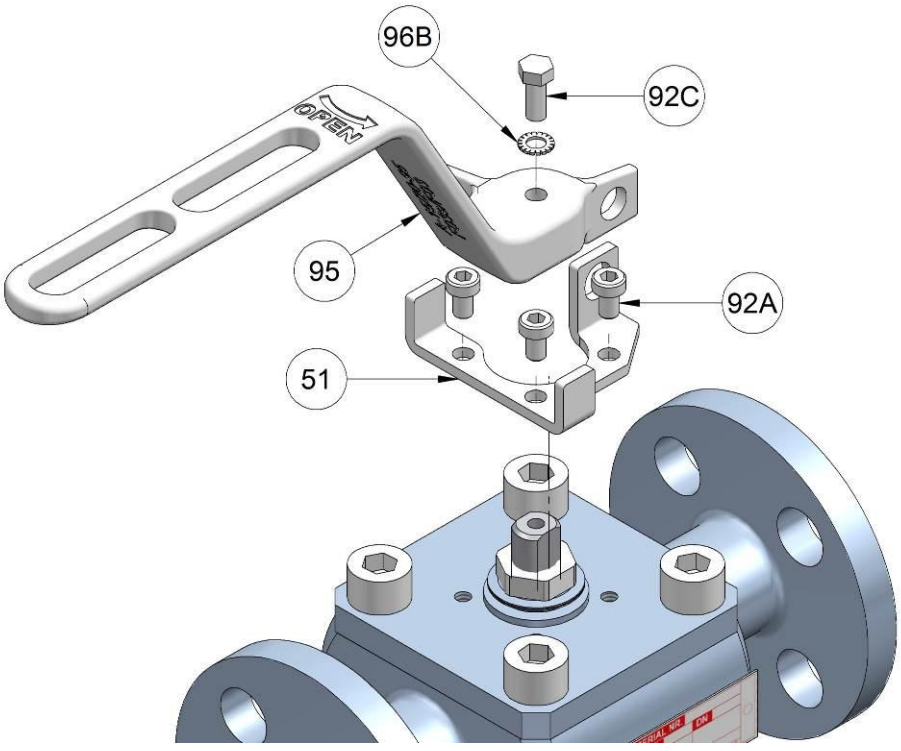


* The O-ring (81) and back-up (82) are for class 900 and 1500 only

8.3.1.3 Insert the guide ring (57) with the O-ring (81A), spring washers (94), lock washer (53), nut (55A) and bend the lock washer (53) tab to secure the nut (55A).

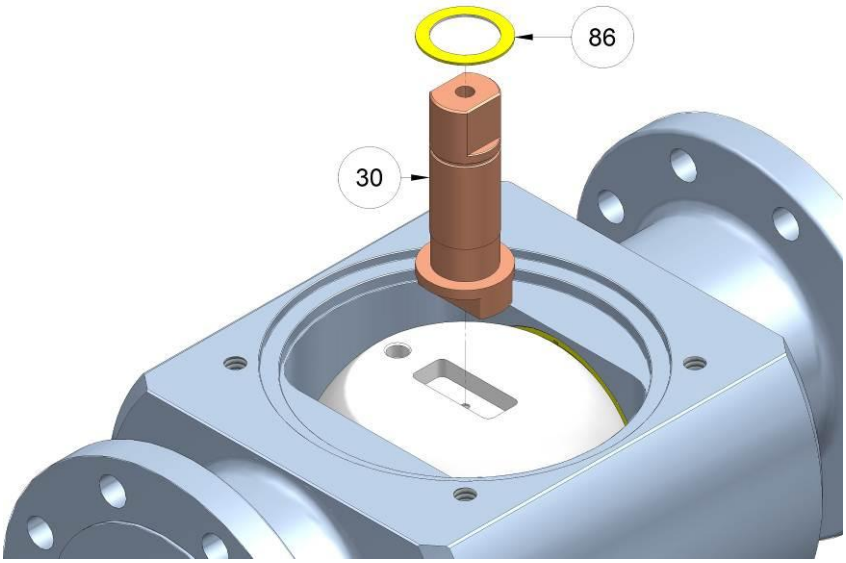


8.3.1.4 If the valve has a handle, position the indicator (51) and secure it with the screws (92A). Insert the lever (95) and secure it with the washer (96B) and screw (92C).



8.3.2 NPS 1½" and larger.

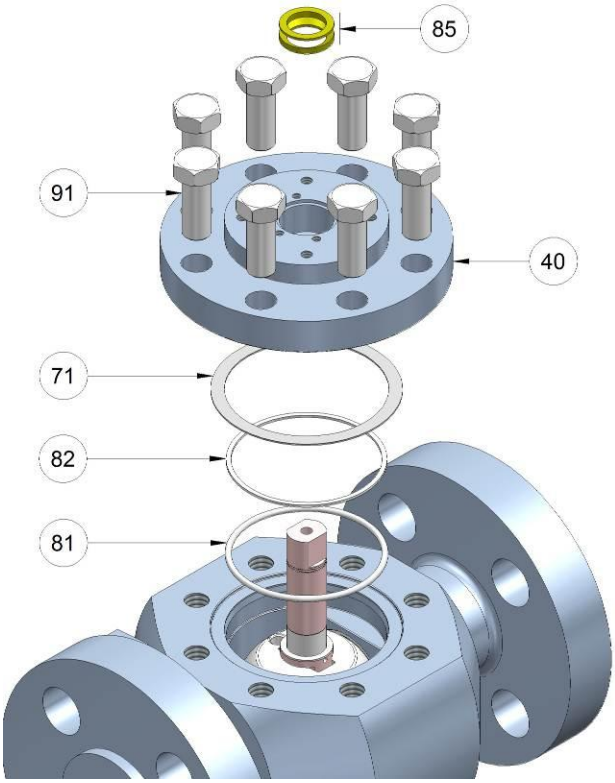
8.3.2.1 Insert the stem (30) together with the axial bearing (86).

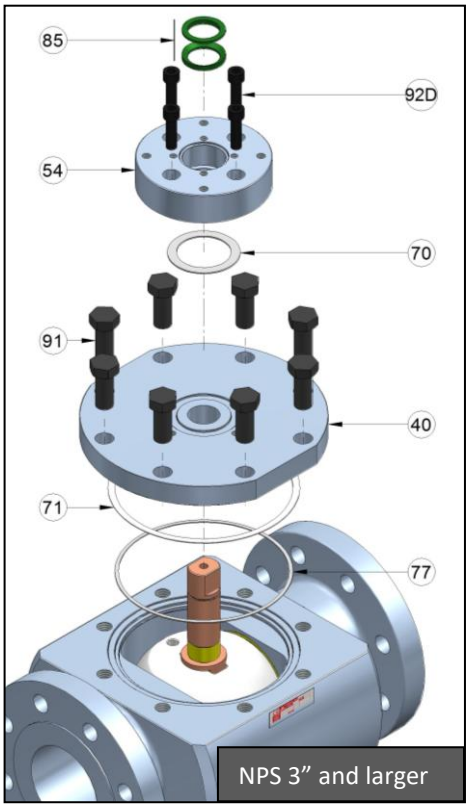


8.3.2.2 Insert the O-ring (81) and its back-up (82), the cover (40) and its gaskets (71 and 77) and secure them by tightening the screws (91) of the body-cover bolting.

For those that are 3"and larger, assemble the body bonnet (54) together with its gasket (70) and secure them with the screws (92D).

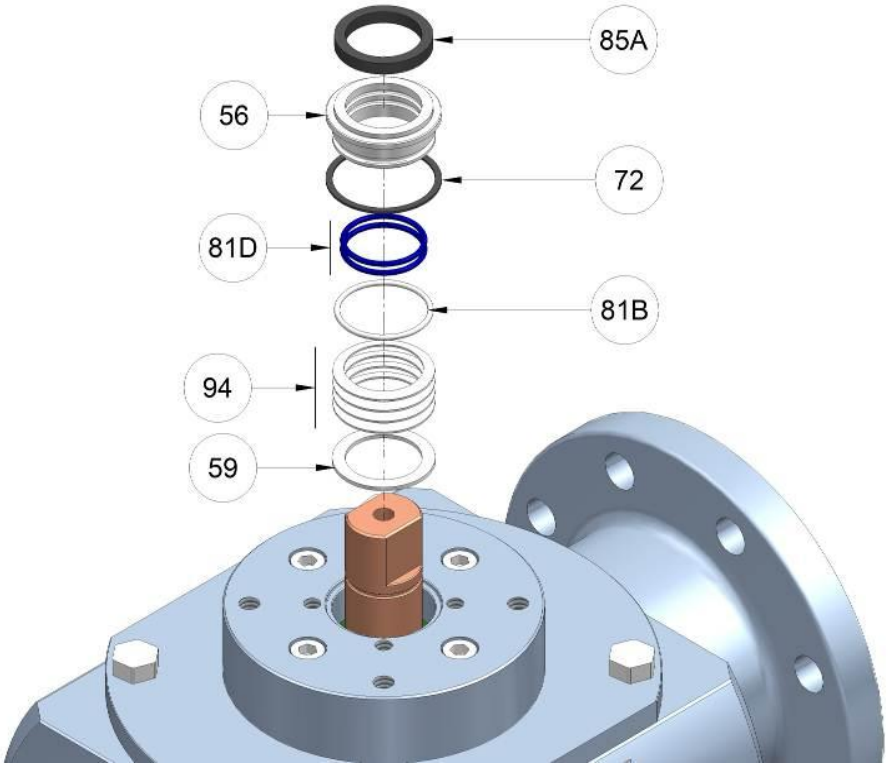
After the cover (40) [for 1 ½ "and 2" valves], or after the body bonnet (54) [for 3 " valves and larger], insert the two PTFE parts (85).



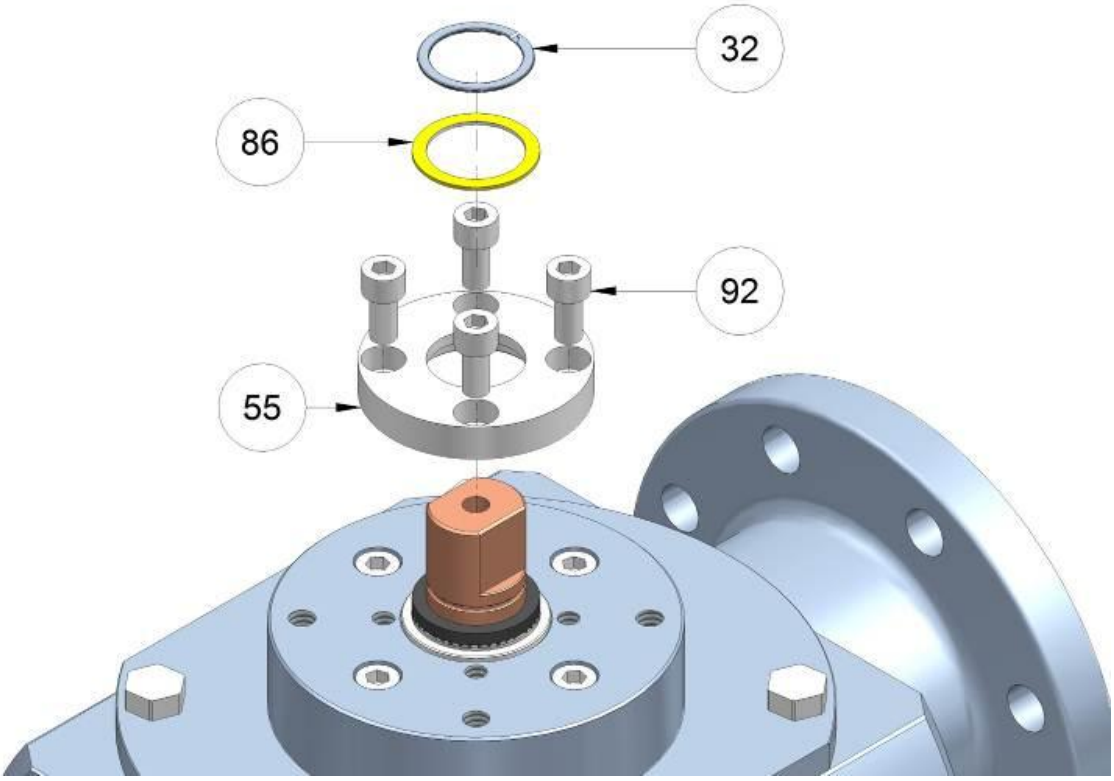


* The O-ring (81) and back-up (82) are for class 900 and 1500 only. For those classes, gasket 77 doesn't exist neither for NPS lower than 2".

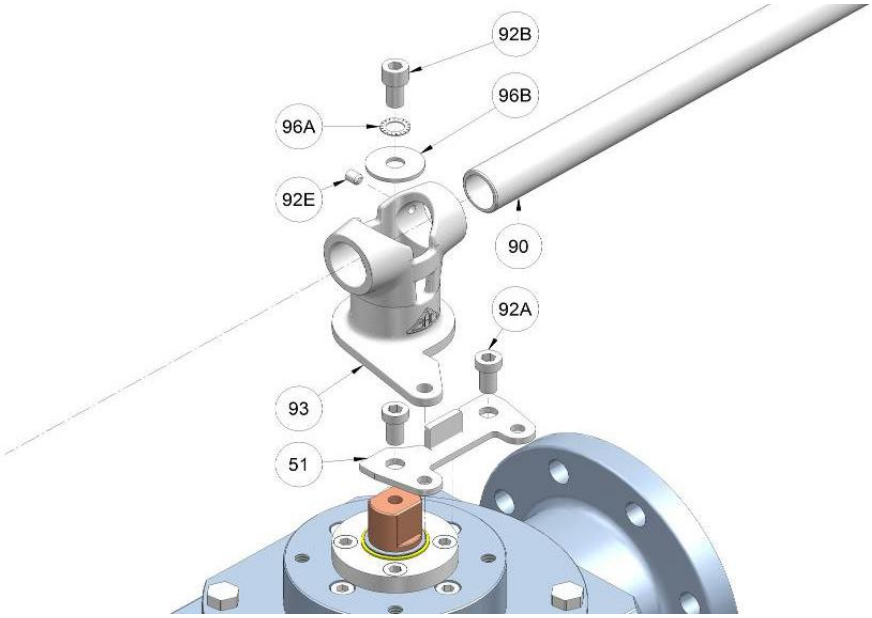
8.3.2.3 Next, insert the ring (59), spring washers (94) according point 10, the gland ring (56) with its graphite gaskets (72) and O-rings (81D and 81B), and finally the graphite gasket (85A).



8.3.2.4 Place the gland plate (55) and secure it with the screws (92), the axial bearing (86) and the circlip (32).



8.3.2.5 If the valve has a wrench, position the indicator (51) and secure it with the screws (92A). Insert the wrench support (93) over the stem (30), securing it with the screw (92B) and washers (96A) and (96B), and then insert the wrench tube (90), securing it with the corresponding screw (92E).



8.4 To conclude, it is recommended to actuate the valve slowly, until a full operation is completed. This will allow a perfect fit between the ball (20) and the seats (60).

8.5 For valve ratings of # 1500, the O-rings (81) and (81C) come with the corresponding back-ups (82) and (82C). These are to be positioned as illustrated in Figure 5 - Back-up detail (# 1500)

9 FINAL INSPECTION

9.1 After assembly, a test should be carried out to check the tightness of the valve. Once this has been completed, it should be drained and cleaned.

9.2 If the valve has to be stored following repair, the carbon steel parts must be protected with an anti-corrosion agent.

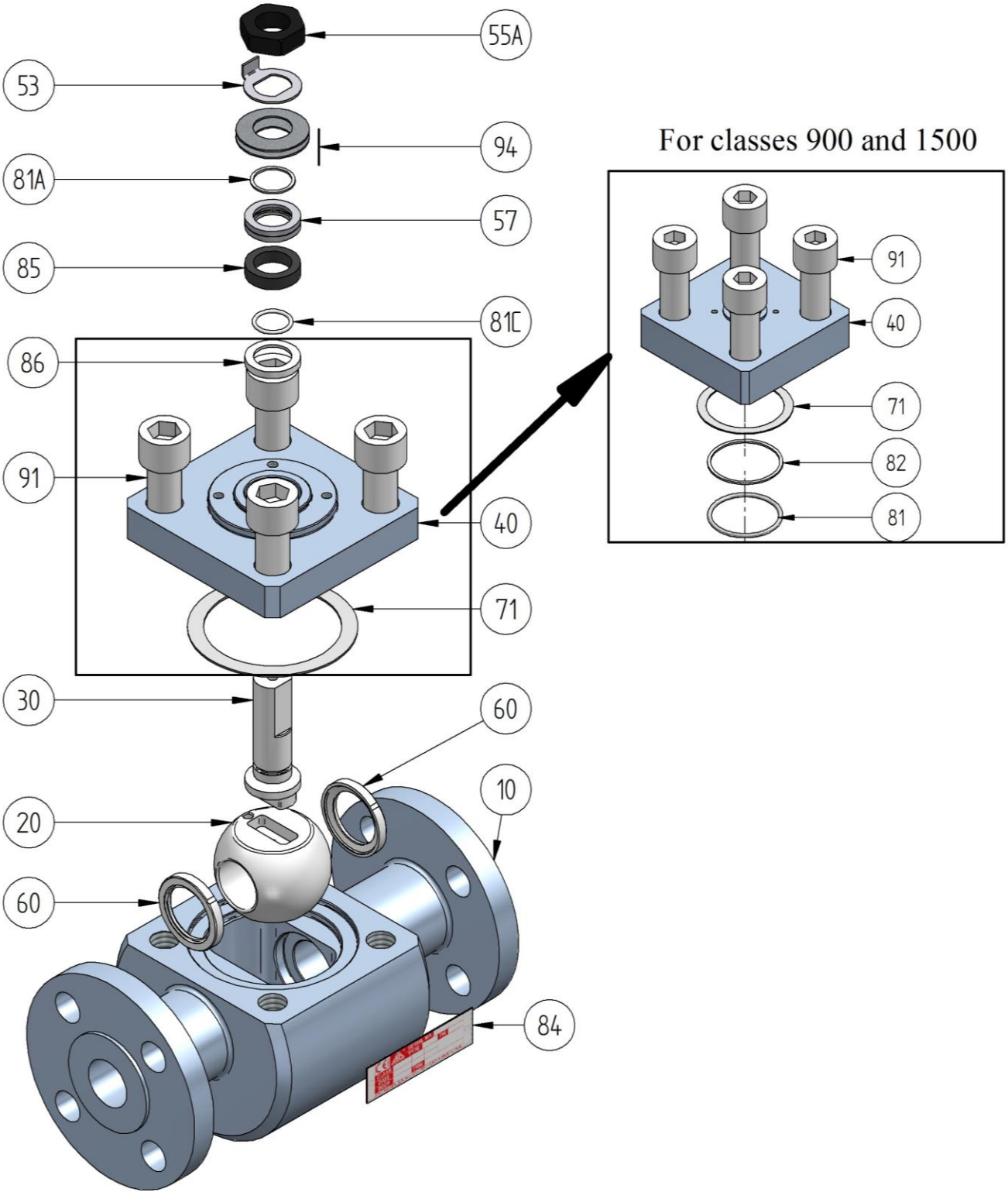
9.3 If the valve has to be operated by an actuator, the correct shaft alignment and parallelism must be considered when installing it, in order to ensure that no stress bending occurs.

9.4 See the corresponding Installation and Maintenance instructions for maintenance and final inspections of the actuator.

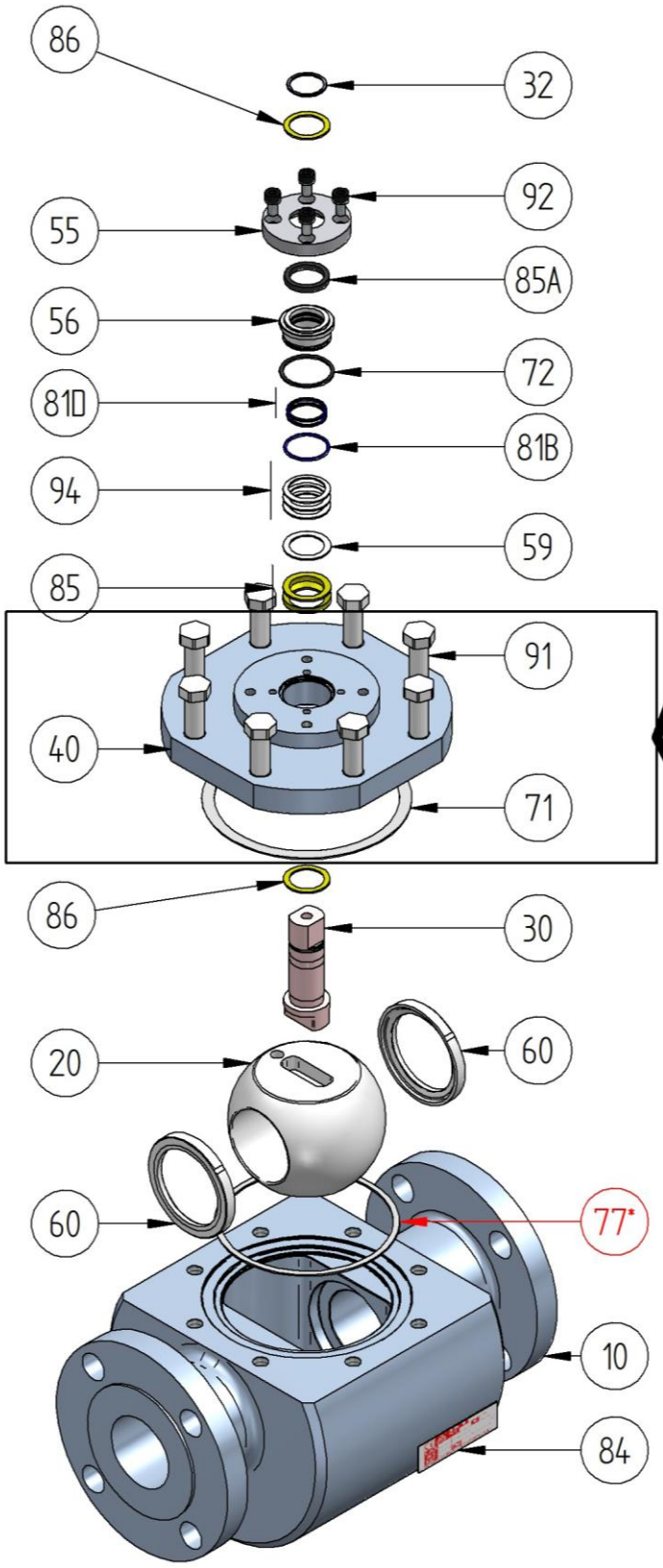
10 BELLEVILLE SPRING SETUP

Belleville Springs	F07	F10	F12	F14
STD 316	3 x PARALLEL 	3 x PARALLEL 	4 x PARALLEL 	6 x PARALLEL 
INC 718	2 x SERIAL 	2 x PARALLEL +1 x SERIAL 	2 PACKS SERIAL: 2 PARAL + 2 PARAL 	2 PACKS SERIAL: 3 PARAL + 2 PARAL 

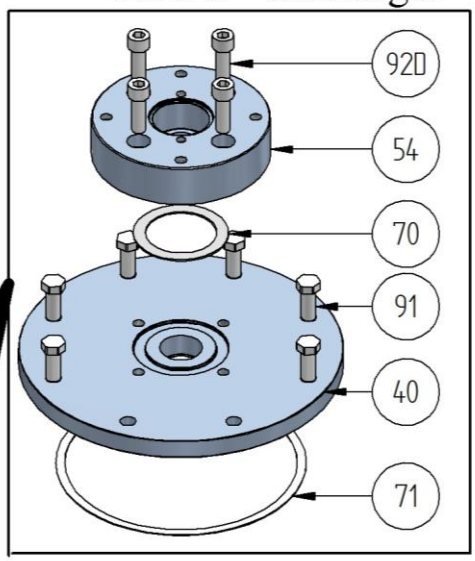
NPS ½ ” to 1”
Classe 150 to 1500



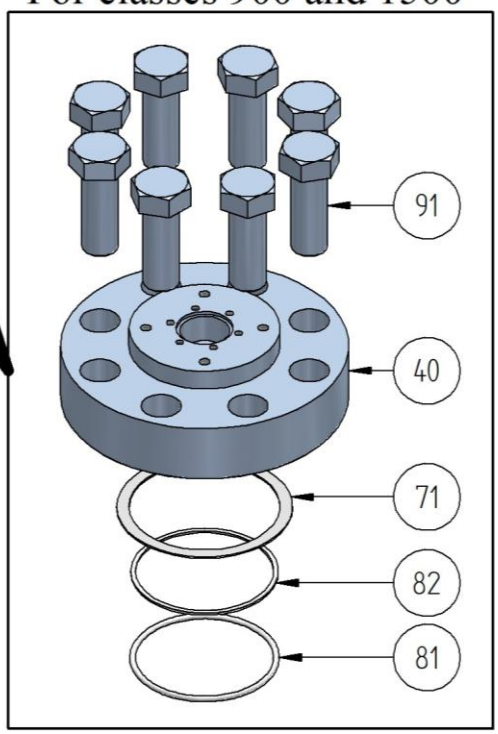
NPS 1½" and larger
Classe 150 to 1500



NPS 3" and larger



For classes 900 and 1500



*only for 2" and larger

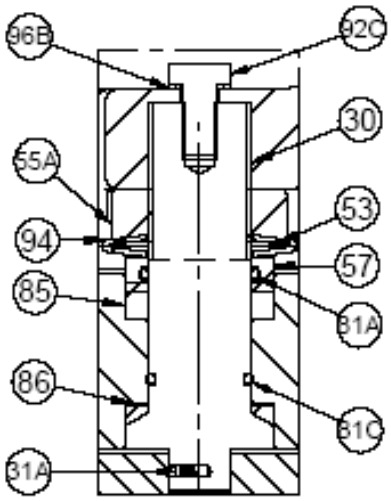


Figure 1 – Packing detail
(NPS ½“ to 1")

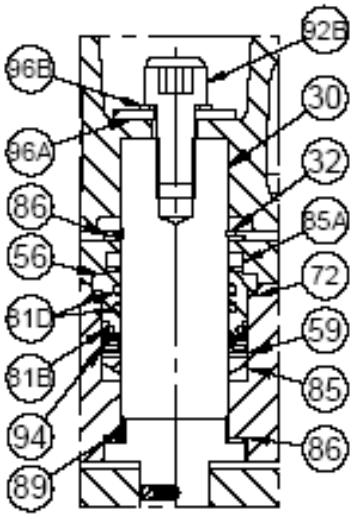


Figure 2 – Packing detail
(NPS 1" and larger)

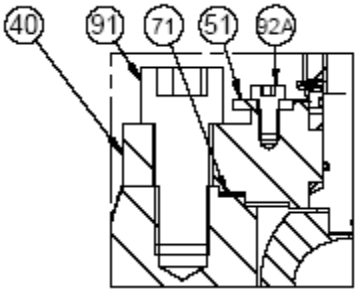


Figure 3 – Cover fixing detail
(NPS ½” to 1”)

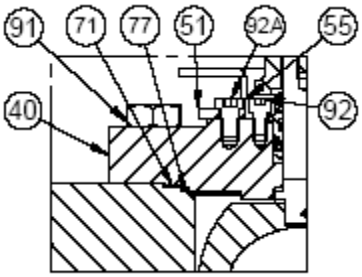


Figure 4 – Cover fixing detail
(NPS 1” and larger)

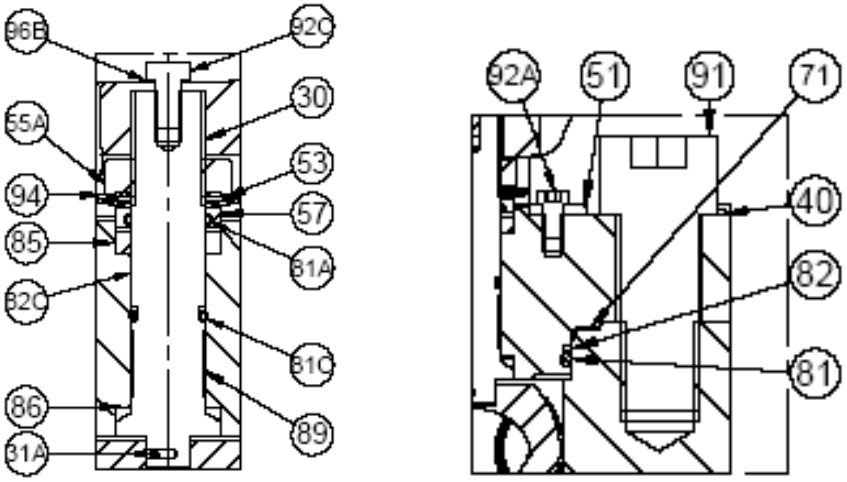


Figure 5 - Back-up detail
(#1500)

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