

SERIES-EFR



ANSI

CE

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REVIEW CONTROL

PROCEDURE REF.: DOC.MMM700E

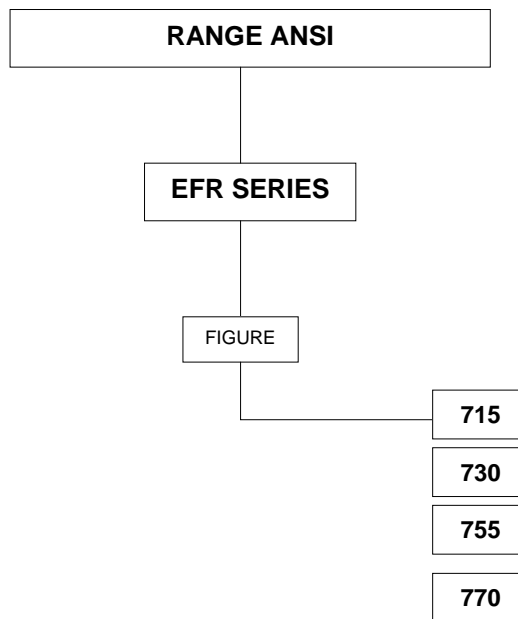
REV.	DATE	CARRIED OUT BY	APPROVED BY	DESCRIPTION
0	12/03/2001	C.Gallardo	J.Tejedor	General adaptation to EC Directive
1	20/06/2002	C.Gallardo	J.Tejedor	Add important note page 8 Chart removal page 14
2	12/12/2003	C.Gallardo	J.Tejedor	Incorporation of the ATEX Declaration page 5
3	16/02/2005	J.Rubio	J.Tejedor	Update of improvements (add position 72 & 39)
4	28/09/2005	J.Rubio	J.Tejedor	Add LCC material (page 7)
5 & 6	09/04/2008	J.Rubio	J.Tejedor	Updates in EN Standards, page 5-6 Add section "Environmental Considerations" page 7
7	10/05/2011	D. Grau	J. Tejedor	Update of Standards, working temperatures and drawings.

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JC VALVE ASSEMBLY AND MAINTENANCE PROCEDURE
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1.- **APPLICABLE RANGE**



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2.- GENERAL INFORMATION

2.1 STATEMENT

JC EFR Series Ball Valves have been designed and manufactured for the use, circulation and control of fluids in those industrial processes in which conditions are suitable for the performance levels of the valves, according to the applicable standards.

Steel & Stainless Steel Valves DN greater than 25

JC Fábrica de Válvulas, S.A states that JC valves covered by this certificate have been designed and manufactured according to the following European Directive requirements:

- European Pressure Equipment Directive 97/23 EC: Evaluation Procedure of Conformity Mod H Cat III, certified by Bureau Veritas nº CE-PED-H-JCV 001-04-ESP. Marking CE0062 Cat III Mod H.
- Directive 94/9 EC ATEX, classification Group II, Cat 2 for use in explosive atmospheres, areas 1,2 & 21,22. Evaluation of conformity according to Appendix VIII. Marking CE Ex II2GDc.

Applied harmonized and non-harmonized technical Standards:

- EN 10213, EN 10204, EN12266-1, EN 15848-1 & (2)*, EN ISO 17292, EN 1983, EN 19 :2002, others, see JC's Catalogue and Assembly & Maintenance Procedures.
- EN 13463-1:2001, EN 1127-1.

The electrical and mechanical extras are not covered by this statement and will have to carry their own in order to be assembled with JC valves.

Steel & Stainless Steel Valves DN lower than 32

JC Fábrica de Válvulas, S.A states that JC valves covered by this certificate have been designed and manufactured according to the following European Directive requirements:

- European Pressure Equipment Directive 97/23 EC: classified according article 3, part 3, cat SEP, must not carry the CE label.
- Directive 94/9 EC ATEX, classification Group II, Cat 2 for use in explosive atmospheres, areas 1,2 & 21,22. Evaluation of conformity according to Appendix VIII. Marking CE Ex II2GDc.

Applied harmonized and non-harmonized technical Standards:

- EN 10213, EN 10204, EN12266-1, EN 15848-1 & (2)*, EN ISO 17292, EN 1983, EN 19 :2002, others, see JC's Catalogue and Assembly & Maintenance Procedures.
- EN 13463-1:2001, EN 1127-1.

The electrical and mechanical extras are not covered by this statement and will have to carry their own in order to be assembled with JC valves.

The suitability of the materials and the design of the type of valve in terms of their working conditions is the responsibility of the end user of the valve.

*** on request**

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EFR SERIES FOR ANSI DESIGN

2.2 DESCRIPTION OF THE APPLICABLE VALVES

Category III Module H (ISO EN 9001)

Series	Body	Ball	Bore	Class	JC Fig.	DN	Flanges
EFR	Two pieces	Floating	Reduced	150	715 755	1/2" - 12"	RF Stock Finish
				300	730 770	1" - 8"	

2.3 APPLICABLE TECHNICAL STANDARDS

- EN 19: Marking of general purpose industrial valves
- EN 558: Face-to-face and centre-to-face dimensions of metal valves for use in flanged pipe systems
Part 2: Class-designated valves
- EN 1503-2: Valves – Materials for bodies, bonnets and covers - Part 2: Steels other than those specified in the European Standards.

Fire Safety Certificate:	BS 6755 Part 2 / API 607 6 th Edition / API 6FA / ISO 10497
Valves Design:	API 6D / ASME B 16.34 / EN 1983 / EN ISO 17292
Body Design:	ASME VIII Div 1
Shell thickness:	ASME B 16.34 / BS ISO 17292
Flanges:	ASME B 16.5
Face-to-face Dimensions:	ASME B 16.10 / API 6D
Shell finishing quality:	MSS SP 55
Wetted parts, Materials and Bolting:	NACE MR 01.75
Marking:	EN 19 / API 6D / EN ISO 17292
Pressure Testing:	API 598 / ISO 5208 / EN 12266
Actuator Mounting Flange:	ISO - EN 5211
Fugitive emissions:	EN 15848-1 & (2)*

* on request

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**2.4 SCOPE OF INSTALLATION ACCORDING TO THE TYPE OF FLUID
(DANGEROUS FOR THE ENVIRONMENT OR HUMAN HEALTH)**

GROUP 1 CLASSIFICATION

- .- The incorporation of additional safety elements “Double packing” is recommended for the range of products included in Group 1.
- .- The use of valves without additional safety devices in Group I will be the responsibility of the user or the purchaser, as well as the advisability of installing leakage detection systems.

GROUP 2 CLASSIFICATION

- .- Carbon Steel valves will not be used in corrosive fluid lines.

Warning is given that when the use of fluids that could cause damages to human's health, the environment or property, then the necessary safety elements to prevent risks must also be used!

ENVIRONMENTAL CONSIDERATIONS:

According to the premises marked by the ISO 14000 Regulations and the environmental policy of JC Fábrica de Válvulas.

The recyclability of the components that form part of JC valves is the following:

Recyclable components:

Metal parts, PTFE (hard), plastic plug (low-density polyethylene).

Non-recyclable components:

PTFE mixed with other compounds (Glass-fiber, graphite, etc...), nylon, graphite and graphite mixed with metal.

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2.5 DESIGN CONDITIONS

SERIES EFR FOR CLASS-DESIGNATED VALVES
API 6D / ANSI B 16.34 / BS EN ISO 17292 / EN 1983

CLASS 150 - ISO PN 20

	Unit	A216 WCB	A351 CF8M	LCC
Class	psig	150		
Design Temp.	°C	-29 / 230 (see Note 1)	-50 / 230 (see Note 1)	-46/230
Design Pressure	psi/N/mm ²	285/1.965	275/1.896	290/1.999
Test Temp.		Ambient		
Test Pressure	Psi/N/mm ²	428/2.947	412/2.844	435/3.002
Castings quality factor		0.8		

CLASS 300 - ISO PN 50

	Unit	A216 WCB	A351 CF8M	LCC
Class	psig	300		
Design Temp.	°C	-29 / 230 (see Note 1)	-50 / 230 (see Note 1)	-46/230
Design Pressure	Psi/N/mm ²	740/5.102	720/4.964	750/5.170
Test Temp.		Ambient		
Test Pressure	Psi/N/mm ²	1110/7.653	1080/7.446	1125/7.75
Castings quality factor		0.8		

Note 1: Seats in PTFE. For other seats material consult the JC catalogue or the manufacturer.

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3.- **INSPECTION AT RECEPTION AND STORAGE**

- 3.1 All of the valves will be examined on reception, to ensure that they have not suffered any damages during transport, and the supplier will immediately be informed of any damages observed.
- 3.2 The valves leave the factory in open position as a measure of protection and to ensure that no foreign body can damage the ball, excepting the fail to close actuated valves that close when they lack air or current. (Actuator normally closed)
- 3.3 **WARNING!**
The valves will be stored under cover and protected from inclement weather conditions and foreign bodies.
- 3.4 The valves will not be unpacked until they are to be definitively installed, except for purposes of inspection. After inspection they will be packed again.

4.- **INSTALLATION**

- 4.1 The handling and transporting of the valves must be carried out with extreme precaution and using the necessary and adequate means on the basis of their size and weight, in this way avoiding any risks to the persons that handle them.
- 4.2 **WARNING!**
Never use a wrench to hold the valve during handling, assembly or transport.

Check the condition of the valve, firstly to detect any possible damages caused during their transport and/or handling.

Likewise inspect the inside of the valve, as well as the interior of the pipe that connects up to the valve. It is of utmost importance that there are no foreign bodies that could damage the valve seats, insofar as these parts are fundamental to the correct operation of the valve.

WARNING!

When it is known or assumed that the valve is to be installed at a collection point for waste, such as welding slag, rust or scale, protective filters or screens must be placed, temporarily or definitively (depending on the installation), upstream, before connection with the valve.

The valve must be installed in such a way that it is accessible for the necessary periodic inspection and maintenance required, guaranteeing the performance levels for which it has been designed.

JC Standard EFR Series construction, up to -20°C have been designed without any fluid direction preference – ***“They are Bi-directional”***.

When the valves have been specifically designed, even being a part of the EFR Series, to work at temperatures below -20°C or even -46°C (**LOW TEMPERATURE**), the valves will be ***“Unidirectional”*** and will bear an identifying plate that indicates the fluid flow direction.

The valve can be installed with the stem in any position, although it is recommended that this be done in a vertical position, with the stem pointing upwards.

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WARNING!

The valves must not support stress from the piping, the installation must be carried out ensuring correct alignment and parallelism in order to ensure that it is not subject to any unexpected stress.

Make sure when installing the valve that the flange seal that connects up to the valve is correctly fitted, following the seal manufacturer's instructions, also ensuring that it is compatible with the circulating fluid.

IMPORTANT!

After installation run a final check on the valve, opening and closing it to make sure that it is working perfectly.

WARNING!

Make sure that the fluid used in cleaning operations and the way in which the cleaning is done are compatible with the installed valve.

Having done the final cleaning operations prior to bringing the valve on-line, if protective filters have been installed they can be removed or, on the other hand if the user considers that rust or scale formations may be encountered, they must be left permanently in place.

IMPORTANT!

When ball valves are destined to end line, you should reduce the hydrostatic proof pressure of the line to 1,1 Rating pressure.

5.- PREVENTIVE MAINTENANCE

- 5.1 Preventative maintenance operations essentially consist of periodic inspections to ensure that the valve is working correctly.
- 5.2 The valves must be opened and closed at least once every 6 months and, should such be required on the basis of the fluid or the application of the valve and its importance, opening and closing check plans will have to be established for shorter periods.
- 5.3 *The user will be responsible for establishing opening and closing plans that are adequate for the work conditions and the fluids used!*
- 5.4 **WARNING!**
Never leave the valves open or closed for a long period of time.
- 5.5 A very high torque increase could be due to the inclusion of foreign bodies in the seats. It is important not to force the valve! Proceed with an inspection of the seats in order to avoid damaging the ball.
- 5.6 We advise replacement of the seals and the seats whenever an in-depth revision of the installation is made.

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6.- **MAINTENANCE OPERATIONS**

PRECAUTIONS BEFORE DISASSEMBLY!

Make sure that the line has been closed and depressurised.
Open and close the valve several times in order to release the pressure and drain the valve cavity.

WARNING!

Wear protective clothing adequate for the circulating fluid. (Comply with the safety guidelines laid down by the company!)

Remove the valve from the line in the closed position, and clean off any remaining fluid.

The replacement of parts must be done using original JC spare parts!

The manufacturer will not be responsible for the malfunctioning of the valve if original JC parts are not used!

7.- **REASONS FOR PARTS REPAIR AND REPLACEMENT**

7.1 LEAKAGE THROUGH THE PACKING

7.1.1 If a leakage is observed through the packing:

- For valves up to DN-10": Open-out the rib on the locking washer (46) and tighten the gland nut (7) by an eighth of a turn.
Repeat this operation if the leakage persists, then return the rib to its original position. If there is still a leakage replace the packing (11).
- For DN-12" valves: Open the gland (10A) by loosening the bolts (26).
Repeat this operation if the leakage persists. If there is still a leakage replace the gland packing (11).

7.2 LEAKAGE THROUGH THE BODY / TAILPIECE SEAL

7.2.1 If a leakage is detected in the body seal (13) then the seal must be changed. Follow the instructions in point 7.5.

7.3 LEAKAGE THROUGH THE PACKING IN VALVES WITH DOUBLE PACKING

7.3.1 If a leakage is detected in the stem packing lantern ring, as an emergency measure follow the instructions given in point 7.1.1. In continuation replace packings and the stem O'rings, following the procedure indicated in point 7.6 "Change of the packing in valves with double packing".

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7.4 CHANGE OF THE PACKING

We recommend that whenever it is necessary to change the packing, the seats should also be replaced, along with the body seal and stem thrust washers. Nevertheless, should it not be possible to disassembly the valve due to process needs, then the following sequence should be carried out:

DISASSEMBLY

7.4.1 Make sure that the installation is not under pressure.

7.4.2.a For valves up to DN-10": Disconnect the handle (6), or actuator, open-out the rib on the locking washer (46), in order to remove the gland nut (7), take off the locking washer (46), the disk springs (8) and the spacer (41), should there be one. Take off the stop (9), marking its top side for reassembly, the thrust washer (18) and the gland (10). Remove the packing (11) without damaging the stem and body surfaces.

7.4.2.b For DN-12" valves: Disconnect the actuator, the locking washer (471), the spring protector (58), the spring (8), the gland (10A) by loosening the bolts (26) and the gland (10). Remove the packing (11) without damaging the stem and body surfaces.

7.4.3 Fit a new packing (11).

ASSEMBLY

Fit a new packing (11).

7.4.4.a For valves up to DN-10": Refit the gland (10), the new thrust washer (18), the stop (9) with the marked side facing up, the spacer (41), should there be one, the disk springs (8), the locking washer (46) and tighten the gland nut (7) up to the torque indicated in point 8.

7.4.4.b For DN-12" valves: Refit the gland (10), assemble the gland (10A) tightening the bolts (26), replace the spring (8), the spring protector (58) and the locking washer (471).

7.4.5 Before refitting the handle, or actuator, check the valve under pressure to ensure the seal of the packing. If a leakage is detected refer to point 7.1.1. Finish off by bending back the rib of the locking washer (46) for valves up to DN-10".

7.4.6 Refit the handle (6), or actuator.

7.5 CHANGING THE SEATS, PACKING AND SEALS

DISASSEMBLY

7.5.1 Make sure that the installation is not under pressure.

7.5.2 Remove the valve from the line. If the circulating fluid is noxious or inflammable precautions must be taken to avoid accidents.

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- 7.5.3.a For valves up to DN-10": Remove the body connector (2), making use of the notches made inside it. Bear in mind that there may be fluid trapped in the body cavity.
- 7.5.3.b For DN-12" valves: Remove the hex-nuts (28) joining the body to the tailpiece, bearing in mind that there may be fluid trapped in the body cavity. Detach the tailpiece (2) from the body (1).
- 7.5.4.a For valves up to DN-10": Remove the seat (5) from the insert (2) and the seals (13) and (74) from the body – body connector.
- 7.5.4.b For DN-12" valves: Remove the seat (5) from the sidepiece (2) and the seal (13) from the body - sidepiece.
- 7.5.5 Turn the ball (3) to the closed position and remove it from the body. Clean the exterior surfaces of the bore and the slot, making sure that the pressure release needle at the bottom is not plugged. Check the exterior surface of the ball, particularly the area in contact with the seats and the radius of transition between the exterior surface and the bore. If the surface of the ball or the slot are damaged, replace the ball with a new one.
- 7.5.6 Remove the seat (5) from the body.
- 7.5.7 Disassemble the stem (4), for this operation follow points 7.4.2 and 7.4.3. Then extract the stem through the inside of the body. Remove the thrust washer (12). The stem will incorporate one or two (see figures) O'rings (72) which must also be replaced.
- 7.5.8 Clean the interior surfaces of the body and the tailpiece, particularly in the areas that hold the seats, the body seal, thrust washer and packing.
- 7.5.9 Clean and check the stem. Check that the antistatic device is working, by pushing the balls inwards in their housing and making sure that they return to their original position. If any of the balls are seized, or the stem surface is damaged, replace the stem with a new one.

ASSEMBLY

Before reassembling all of the parts make sure that they have not suffered any damage and that both the parts and the interior of the valves are completely clean.

Make sure that the spare parts are JC originals, made of the same materials and with the same dimensions as the parts being replaced.

For valves manufactured before 1983, the spares may be different from those for current models. The stems have also changed their length. In case of whatsoever doubt consult your regular supplier.

WARNING!

If the valve has to be degreased (Oxygen, Hydrogen Peroxide, etc. Services.) consult the manufacturer.

- 7.5.10 Fit the thrust washer (12) to the stem (4). The spare parts set includes two thrust washers. For some of the nominal diameters they are the same while in others they are different. Should they be different then this thrust washer (12) is the one with the thicker gauge. Fit the O'ring (72) (two depending on the figure) into the stem slot.
- 7.5.11 Insert the stem (4) into its housing inside the body.

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- 7.5.12 Assemble the packing and the other parts according to points 7.4.4, 7.4.5 and 7.4.6
- 7.5.13 Fit a new seat (5) to the body.
- 7.5.14 Turn the stem to the closed position so that it can be inserted into the slot in the ball (3).
Fit the ball (3) into place in the closed position, make sure that there is no play between the ball slot and the stem.
- 7.5.15a For valves up to DN-10": Insert the other seat (5) into the body connector (2) and the seals (13) and (74) into their respective housings in the body.
Make the body connector (2) up onto the body (1) until the flange of the body connector is metal-to-metal with the body (1). Flange height 1.6 mm.
- 7.5.15b For DN-12" valves: Insert the other seat (5) into the tailpiece (2), and the body – tailpiece seal (13) into its housing in the body.
Adjust the tailpiece (2) onto the body (1). Make sure that the holes of the two flanges are in the same position with regard to the valve's axis of symmetry.
Make up the hex-nuts (28) following the most adequate sequence (See the nut tightness torque chart in point 9).
- 7.5.16 Fit the handle (6), or actuator.
- 7.5.17 Before reassembling the valve in the line, make sure that it is a half-open position in order to check the packing and the body seal, and then close it, checking the seal-tightness of the seats.

7.6 CHANGING THE PACKING IN VALVES WITH DOUBLE PACKING

We recommend that when a packing change is necessary that all of the seats, body seals, O'rings and stem thrust washers should also be changed. Nevertheless should it be the case that it is not possible to remove the valve from the line, as a result of process needs, follow the sequence indicated below:

DISASSEMBLY

- 7.6.1 Make sure that the installation is not under pressure.
- 7.6.2 Remove the handle (6), or actuator, open-out the rib on the locking washer (46), remove the gland nut (7), take off the safety washer (46), the disk springs (8) and the spacer (41), should there be one.
Take off the stop (9), marking its topside for reassembly, and the thrust washer (18).
- 7.6.3 Remove the bolts (933.1) with their washers (127) to separate the neck (68) from the body of the valve. Remove the seal (40).
- 7.6.4 Withdraw the stem (4) from the neck and then remove the following parts in this order:
- The gland (10) and the O'ring (72.1)
 - The gland packing (11)
 - The packing collar (64)
 - The other graphite gland packing (11)

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- 7.6.5 Continue to disassemble the following parts from the stem:
- O'ring (72.2)
 - Thrust washer (12)
 - The two O'rings (72)

7.6.6 Remove the guide collar (39) from the body.

ASSEMBLY

Before reassembling the new parts clean both the parts and their housings with the utmost care:

- The gland in the body
- The O'rings on the stem
- The graphite gland packing, etc. on the neck

7.6.7 Fit the guide collar (39) in place, lightly greased, in its housing on the body (1).

7.6.8 Fit the O'rings (72) and (72.2), lightly greased, onto the stem (4).

7.6.9 Place the thrust washer (12) onto the stem and insert it into the neck (68).

7.6.10 Fit the seal (40) into place on the body.

7.6.11 Fit the neck and stem assembly into place on the body (1), fit the safety washers (127) into place on the bolts and make them up.

7.6.12 Assemble the following parts into the packing housing in the neck, as follows:

- Fully insert the graphite gland packing (11).
- Insert the packing collar (64) and a second graphite gland packing (11).
- Fit the gland (10) with its O'ring (72.1).
- Fit the thrust washer (18), the stop (9), the spacer (41), the disk springs (8), the locking washer (46), the gland nut (7) and make them up to the torque indicated in point 8.

7.6.13 Before fitting the handle, or actuator, pressure test the valve to ensure the seal-tightness of the packing. If a leak is detected follow the steps indicated in point 7.1.1.

7.6.14 Attach the handle (6), or actuator.

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8.- MAXIMUM GLAND NUT TIGHTNESS TORQUE, in mKp.

<u>NOMINAL DIAMETER</u>	<u>PTFE PACKING</u>	<u>GRAPHITE PACKING</u>
1/2"	2	2.2
3/4"	2	2.2
1"	2	2.2
1.1/2"	2.5	2.5
2"	4	4
3"	6.5	7
4"	7.5	8
6"	8	8
8"	8.5	9
10"	9	9

9.- TIGHTNESS TORQUE CHART FOR BODY/TAILPIECE UNION STUDS AND HEX-NUTS, VALUES IN MKG.

ANSI ASSEMBLY UNC THREAD ()**

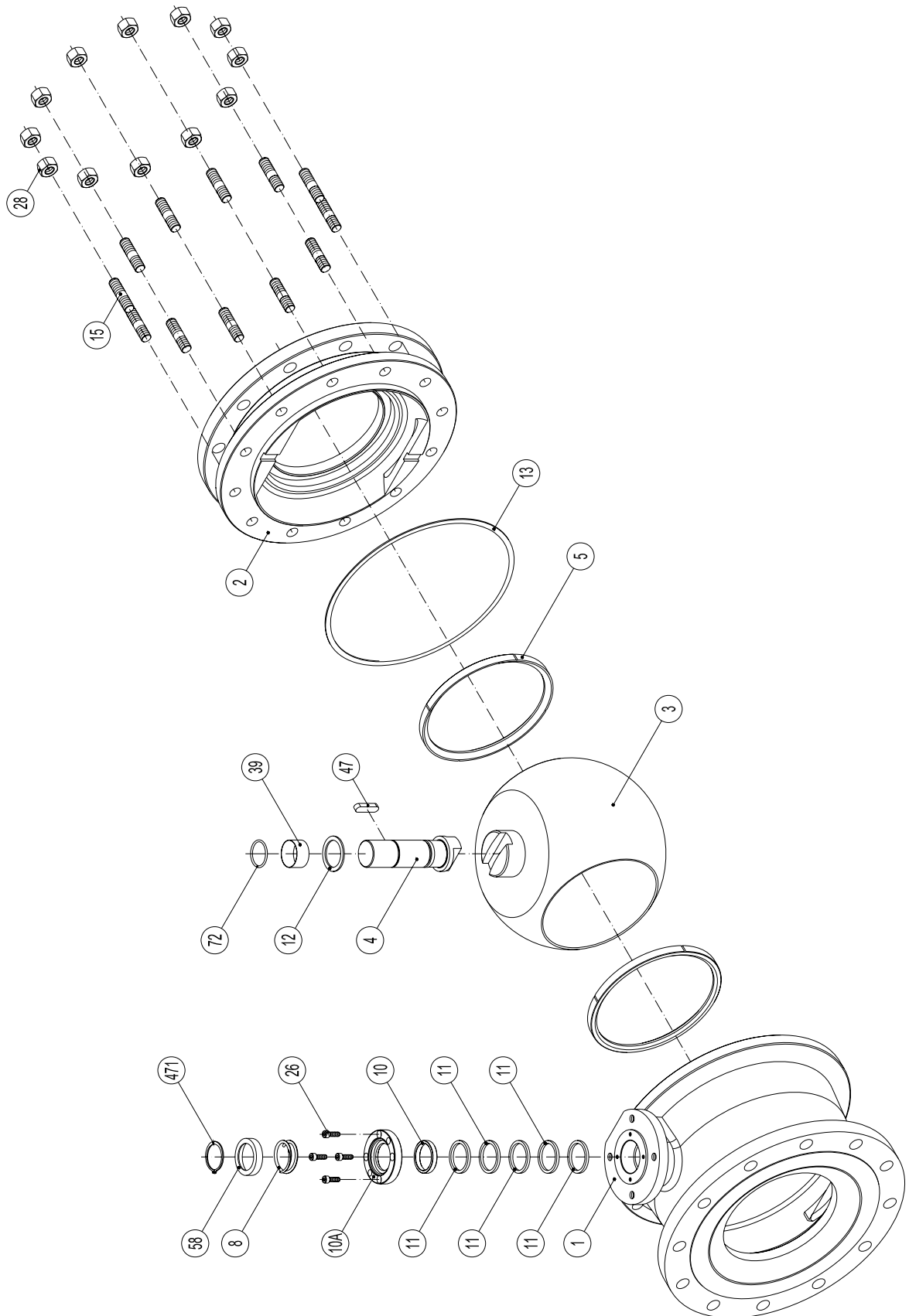
Elastic Limit 0.2% (Kg/mm ²)	21	55	72.4	55
Material	B8/B8M	L7M	B7	B7M
Stud Ø				
3/8"	1.57	4	5.44	4
7/16"	2	5.5	7.4	5.5
1/2"	2.6	7	9.5	7
9/16"	4.2	11	15	11
5/8"	6.3	16.5	22.5	16.5
3/4"	10	27	37	27
7/8"	16.8	44	59	43
1"	25	65	87	72
1.1/8"	35	93	125	93
1.1/4"	48	128	171	128
1.3/8"	70	167	223	167
1.1/2"	95	247	330	247

(*) LUBRICATION WITH SAE 10 AND A LOAD NO HIGHER THAN 80% OF THE ELASTIC LIMIT IS ASSUMED.

(**) A FRICTION COEFFICIENT OF 0.12 AND 75% OF THE ELASTIC LIMIT IS ASSUMED

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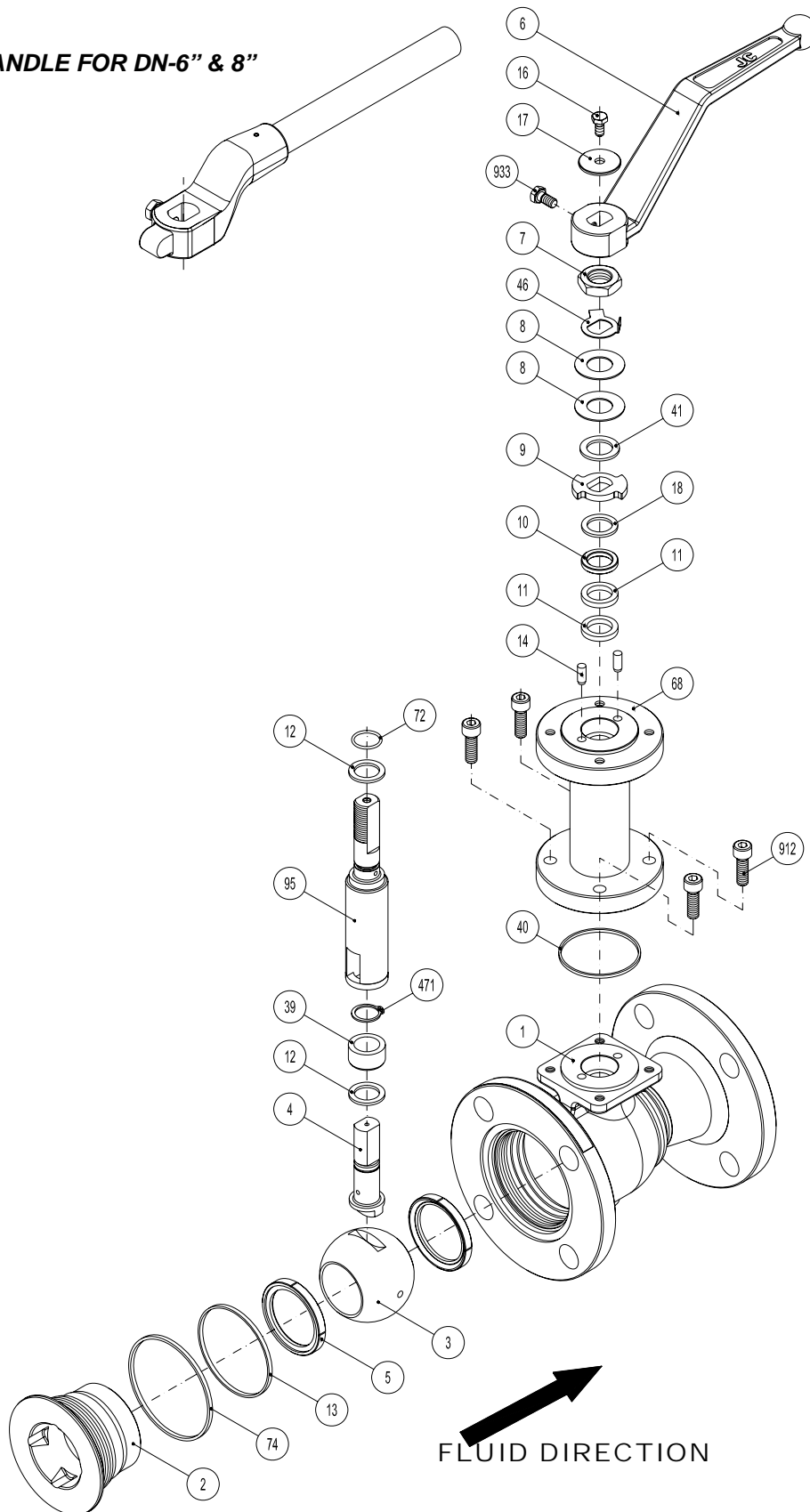
10.2.- Fig. 715 DN-12”



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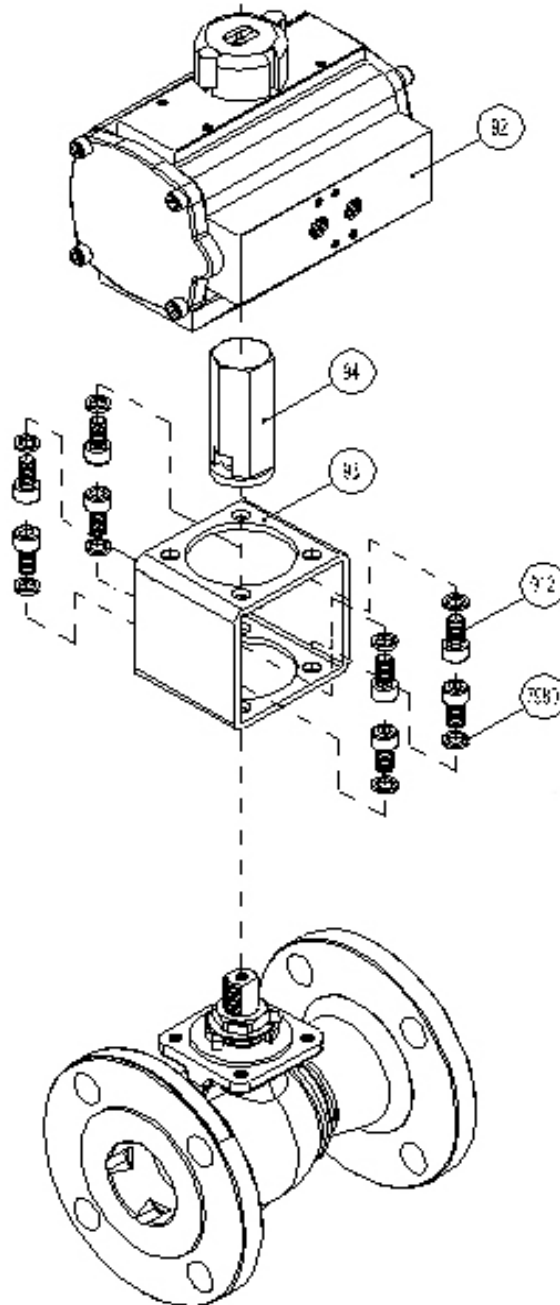
12.- LOW TEMPERATURE VALVE

HANDLE FOR DN-6" & 8"

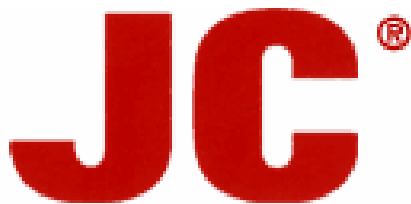


JC VALVE ASSEMBLY AND MAINTENANCE PROCEDURE
REF. DOC. MMM700E Rev. 7 – May 2011

13.- **AUTOMATED VALVE**



**DETAIL VIEW OF COUPLING
FOR OPERATION**



Fábrica de válvulas, s.a.

Cantàbria, 2. Pol. Ind. Les Salines
08830 Sant Boi de Llobregat
Barcelona (Spain)
Tel.: (+34) 936 54 86 86
Fax: (+34) 936 54 86 87
www.jc-valves.com
info@jc-valves.com