

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

3 way ball valve "L" and "T" bore
threaded and flanged ends



GENEBRE Reference: 2040 – 2041 – 2540 – 2541

Installation, operation and maintenance instructions

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1. Product description.

Genebre, S.A. offers a wide range of ball valves (90° turn), designed and assembled to handle and drive fluids in industrial procedures.

The compatibility of materials used to build the valves (see technical specifications) and the application of valves to the different industrial processes is at user's risk. Valves will have an optimal behavior when working conditions do not exceed pressure and temperature limits (pressure curve) for which they have been designed.

2. Transport and Storage conditions



Transport and storage of this kind of products must be done keeping them in their original package!

VISUAL INSPECTION

Check whether during transport, unloading and placement the products have suffered damages.

During storage it is recommended to keep them into the included protective wrapping to avoid damages or dirt accumulation in the ball. The wrap must not be removed until valve is to be installed.

Valves must be stored in a dry and clean environment.



If you notice any kind of anomaly during reception of the goods, contact immediately with GENE BRE in order to determine the possible responsibilities on the issue.

IMPORTANT NOTE:

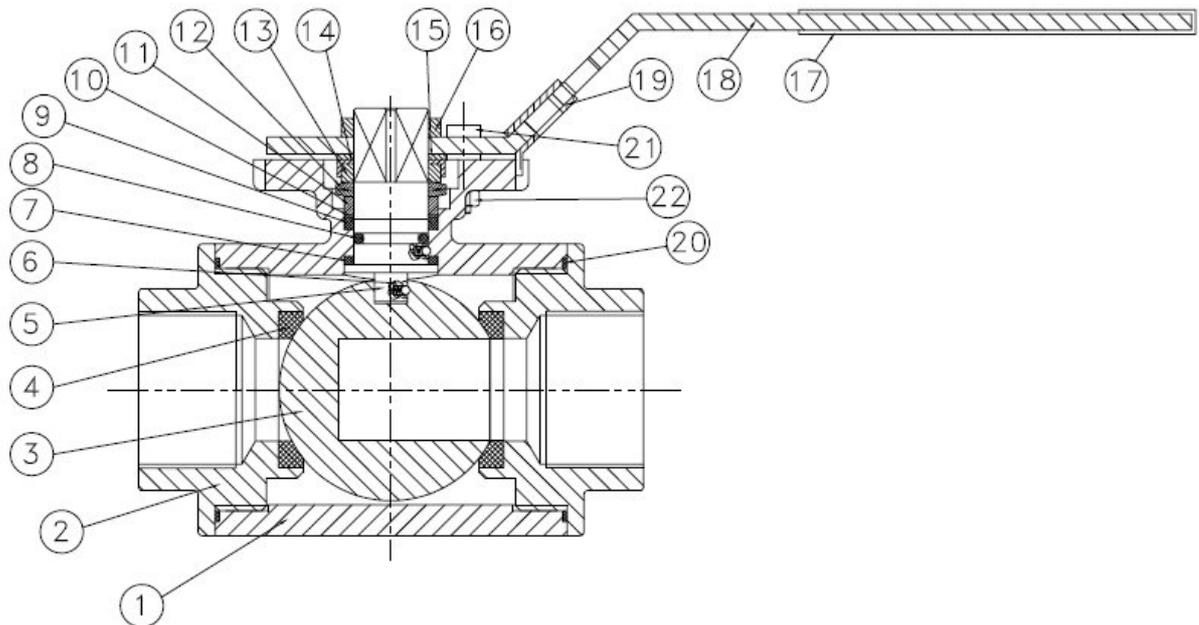
Before installing and/or manipulating these elements, **READ CAREFULLY** these instructions for use and **OBSERVE** all contained information. If you fail to understand any of their content, please **contact GENEBRE, S.A.**



User is responsible for the safe use of these products, according to present instructions for use and specific technical documentation of the device.

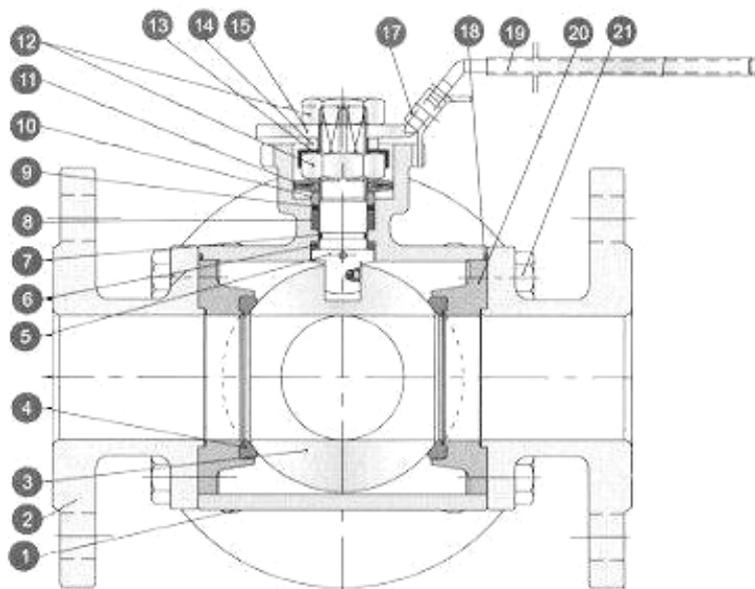
3. Valve breakdown

3.1 Drawing and Components (Art. 2040 / 2041)



Part num.	Description	Quant.	Material	Replacement (ref.)
1	Body	1	CF8M	----
2	Caps	3	CF8M	----
3	Ball	1	316	2802(L) – 2803(T)
4	Seat	4	PTFE+FV	2821
5	Stem	1	316	2815
6	Antistatic device	2	Inox.	----
7	Friction washer	1	PTFE	2821
8	O-ring	1	Viton	2821
9	Wrapping	1	PTFE	2821
10	Washer	1	PTFE+INOX	2821
11	Presser	1	304	----
12	Belleville Washer	2	301	----
13	Stem nut	1	304	----
14	Lock nut	1	304	----
15	Divider	1	304	----
16	Handle nut	1	304	----
17	Handle caps	1	Plastic	----
18	Handle	1	304	----
19	Safety Stopper	1	304	----
20	Joint	3	PTFE	2821
21	Stopper screw	1	304	----
22	Stopper nut	1	304	----

3.2 Drawing and Components (Art. 2540 / 2541)



Part num.	Description	Quant.	Material	Replacement (ref.)
1	Body	1	CF8M	----
2	Caps	3	CF8M	----
3	Ball	1	316	B2540(L) – B2541(T)
4	Seat	4	PTFE+FV	2928
5	Stem	1	316	----
6	Friction washer	1	PTFE	2928
7	O-ring	1	Viton	2928
8	Wrapping	1	PTFE	2928
9	Washer	1	PTFE+INOX	2928
10	Presser	1	304	----
11	Belleville Washer	2	301	----
12	Stem nut	2	304	----
13	Lock nut	1	304	----
14	Divider	1	304	----
15	Handle	1	304	----
16	Back caps	1	CF8M	----
17	Safety Stopper	1	304	----
18	Joint	4	PTFE	2928
19	Handle caps	1	Plastic	----
20	Seat holder	4	316	----
21	Screw	16	304	----

4. Installation instructions

4.1) Preparation

Remove any material remains of the valve wrapping.

Serious problems may arise with the installation of a valve in a dirty pipe.

Make sure the pipe is not dirty and doesn't have welding particles, for example, before installing it. This may cause irreparable damages in the valve when the equipment is started → *prepare a clean working area.*

Plan beforehand enough space for future maintenance operations.

Control correct operation of the valve by turning the handle clockwise and making sure the ball closes the fluid flow. If this is not the case, check if there are foreign particles inside the valve and repeat the whole operation.

4.2) Assembling

- Art. 2040 / 2041 (valve with threaded ends)

Make sure the valve's pipe and thread end are clean and are compatible one with another (type of thread end) Apply an appropriate sealing in the pipes' thread ends and thread the valve being careful not to excessively tighten the conical threaded ends. Do not use valve's handle as a lever to thread the valve into the pipe. To tighten the valve it is recommended to use a spanner or monkey wrench only on the hexagonal area of the valves edges, the torque applied being less than 30 Nm.

- Art. 2540 / 2541 (valve with threaded ends)

Do not disassemble the valves for their installation.

Make sure the pipe's and edges flanges of the valve are clean.
Use the corresponding screws in all of the flanges drill holes.
Place an adequate joint in each end and align it in the center of the flanges.
Tighten screws evenly and cross-shaped to avoid deformations. To do so, you must not force in any case the pipe to center the valve; it should take its position smoothly. Last, verify that screws are tightened with the recommended torque for each type of screw.
Make sure the flanges' joints are well situated.
After assembling, check the tightness and performance of the valve.

IMPORTANT INFORMATION:

The design of this type of 3-way ball valves with four seats allows us to install them in any position as the fluid entrance can be any of the three.

If possible, it is recommended to install the valve in horizontal position and the stem (handle) upwards.

Valves do not have to support pipe's efforts so it is advisable to anticipate a good alignment and parallelism of such pipe.

Once installed, it is recommended to open and close it a couple of times to verify its good knowledge and to check if there is any obstruction in the ball that prevents it from closing.

It is also recommended to use filters in the pipes to extend lifecycle of the valve.

5. Operating instructions

5.1) Usage

Ball valves provide a leakproof lock when used adjusted to the pressure and temperature values for which they have been designed.

Avoid by all means leaving the valves in partially open position if you are not aware of the pressure drop and flow rate in that position, as the service life of the seat can be reduced and/or it can be damaged due to the ball bore valve.

Seats for the valve, joints, body, ball, stem and ends have to be fully compatible with the fluid circulating through the valve. Otherwise, the valve could be seriously damaged.

Torques required to operate valves are listed in the table Torques to activate the valves (see Section 8.1).

5.2) Manual operation

When operating the valve you must avoid excessive lateral efforts with the handle. In case you need to remove the handle to automate the valve, the *stem* (part 5) has a mechanized linear mark at the front part that allows us to know its current position.

5.3) Remote operation

When automation of the valves is required, GENE BRE S.A. can provide a great variety of pneumatic actuators, electric actuators, electropneumatic and electronic positioners to cover a large range of operations.

6. Maintenance instructions

Frequency, place and process of maintenance will be determined by the user by taking into account usage of the product. However, periodical checks explained below will be useful to extend the service life of the valve and reduce installation problems.

Valves must not remain in the same position for a long period of time. It is recommended, if the process allows for it, to operate it for control purposes every six months.

6.1) Stem leaks

Remove the handle or actuator, the *lock nut washer* (part 14 / part 13 Art. 2540) and tighten the nut (part 13 / part 12 Art. 2540) of the stem packing (see *Section 8.2*). If the leak persists, valve should be disassembled to replace the stem washers (parts 7,8,9,10 / parts 6, 7, 8, 9 Art.2540).

See reparation instructions.

6.2) Body/Caps joints leak

- Art. 2040 / 2041 (valve with threaded ends)

Check if the caps (part 2) is tight. If it was loose, tighten it. If leak continues, it is probably due to a damage in the body's joint or the locking surface, and it will be necessary to disassemble the valve to repair it.

See reparation instructions.

- Art. 2540 / 2541 (valve with flanged ends)

Check if the body screws (part 21) are tightened. If they were loose, adjust them up until the recommended torques (IMPORTANT: adjustment of such screws will have to be done at room temperature). If leak continues, it is probably due to a damage in the body's joint or the locking surface, and it will be necessary to disassemble the valve to repair it.

See reparation instructions.

6.3) Line leaks (through seats).

Check if the valve entrance is in a completely closed position. If so, the leak is due to a seat or locking surface being damaged and it will be necessary to disassemble the valve for repairing it.

See reparation instructions.

7. Reparation instructions



Before disassembling the pipe's valve to repair or replace it, make sure that line has been closed and depressurized because a bad operational procedure could cause a serious accident to staff and installation system

7.1) Disassembling

You must remove the valve from the installation to repair it.

Prepare a clean working area and adequate tools to perform mechanical tasks.

- Art. 2040 / 2041 (valve with threaded ends)

- a.- Loosen and remove the stoppers (part 2). Be careful not to damage the valve surfaces.
- b.- Once the stoppers are removed (part 2) remove the ball (part 3) being careful not to damage it.
- c.- Remove the seats (part 4) from their corresponding location inside the body and also inside the stoppers.
- d.- After this, remove the body's *seat holders* (part 20). They should be removed being carefully not to scratch or damage the mechanized surfaces over which they are hermetically sealed.
- e.-To disassemble the *stem* (part 5), remove the following elements:

Name	Art. 2040 / 2041
Handle nut	Part 16
Handle	Part 18
Dividing washer	Part 15
Lock nut	Part 14
Stem nut	Part 13
Spring washers	Part 12
Gland nut	Part 11

Push the stem to the inside part of the body and remove it. Then, remove the washer (part 10 and the *packaging* (part 9) located inside the body. Remove the *o'ring* (part 8) from its location and the *friction washer* (part 7).

f.- Once the valve is disassembled you must verify the state of each single piece that forms it. All pieces to be reused have to be cleaned completely and be kept in a safe and clean environment.

All locking surfaces in the ball, seats, joints and sides have to be checked for corrosion, erosion or metallic inlays in the seats and marks. If they were damaged or in case of doubt, they will need to be replaced.

g.- Cleaning of the valve's pieces must be done using an adequate degreasing agent. You must be careful with the locking surfaces, for example, of the ball, locking sides of the stopper and joints, because if they were damaged this could cause a bad impact in the valve's performance.

- Art. 2540 / 2541 (valve with flanged ends)

a.- Loosen and remove the 4 screws (part 21) from each caps (part 2) and remove the capss. Be careful not to damage the edges surfaces.

b.- Remove the seat holders (part 20).

c.- Once the seats holders are removed (part 20), remove the ball (part 3) being careful not to damage it.

d.- Remove the seats (part 4) from their corresponding location inside the body and also inside the seat holders (part 20).

e.- After this, remove the caps's *joints* (part 18). They should be removed being carefully not to scratch or damage the mechanized surfaces over which they are hermetically sealed.

f.-To disassemble the *stem* (part 5), remove the following elements:

Name	Art. 2540 / 2541
Handle nut	Part 12
Handle	Part 15
Dividing washer	Part 14
Lock nut	Part 13
Stem nut	Part 12
Spring washers	Part 11
Stuffing box	Part 10

Push the stem to the inside part of the body and remove it. Then, remove the washer (part 9) and the *packaging* (part 8) located inside the body. Remove the *o'ring* (part 7) from its location and the *friction washer* (part 6).

g.- Once the valve is dismantled you must verify the state of each single piece that compose it. All pieces to be reused have to be cleaned completely and be kept in a safe and clean environment.

All locking surfaces in the ball, seats, joints and sides have to be checked for corrosion, erosion or metallic inlays in the seats and marks. If they were damaged or in case of doubt, they will need to be replaced.

h.- Cleaning of the valve's pieces must be done using an adequate degreasing agent. You must be careful with the locking surfaces, for example, of the ball, locking sides of the stopper and joints, because if they were damaged this could cause a bad impact in the valve's performance.

7.2) Reassembling

Before proceeding to reassemble the valve, make sure that reparation kit and/or pieces to be used are appropriate and original from the factory.
When it is armored again, cleaning is essential for a long life for the valve.

- Art. 2040 / 2041 (valve with threaded ends)

a.- Place a new *friction washer* (part 7) on the stem (part 5) and also the o'ring (part 8) in its stem corresponding location, lubricate the stem with a thin layer of grease or silicon (for example, Dow Corning 200) and insert it in the valve's *body* (part 1), in the internal cavity, by pushing a bit to fix it.

b.- Place a new packaging (part 9) into its location in the upper cavity of the *body* (part 1), the *washer* (part 10) the *gland nut* (part 11) and the *spring washers* (part 12) with external borders together (concave position). Place the *nut* (part 13) and tighten it. Make the stem turn a couple of times and readjust the nut respecting the torque specified value (See Section 8.2).

If necessary, fasten with a wrench the internal body of the stem to tighten properly the nut without making the stem turn.

It is convenient to match one of the nut vertex with one of the stem vertex to be able to place later on the lock nut (part 14).

Note that if the nut is too tight, the rod torque will increase and service life of its elements will be reduced.

c.- Place one of the seats (part 4) in the inside part of the body and the other three seats in the caps's location.

c.- Place the stem in closed valve position and insert the *ball* (part 3) inside the *body* cavity (part 1) matching the ball slot with the stem milling (part 5).

e.- Place the corresponding *seat holders* (part 20) on each one of the valve's stoppers (part 2).

f.- Place the stoppers on the body and tighten them as much as possible.

It is required that the body and caps make contact in their metal sides.

- Art. 2540 / 2541 (valve with flanged ends)

a.- Place a new *friction washer* (part 6) on the stem (part 5) and also the o'ring (part 7) in its stem corresponding location, lubricate the stem with a thin layer of grease or silicon (for example, Dow Corning 200) and insert it in the valve's *body* (part 1), in the internal cavity, by pushing a bit to fix it.

b.- Place a new packaging (part 8) into its location in the upper cavity of the *body* (part 1), the *washer* (part 9) the *gland nut* (part 10) and the *spring washers* (part 11) with external borders together (concave position). Place the *nut* (part 12) and tighten it. Make the stem turn a couple of times and readjust the nut respecting the torque specified value (See *Section 8.2*).

If necessary, fasten with a wrench the internal body of the stem to tighten properly the nut without making the stem turn.

It is convenient to match one of the nut vertexes with one of the stem vertexes to be able to place later on the lock nut (part 13).

Note that if the nut is too tight, the rod torque will increase and service life of its elements will be reduced.

c.- Place the stem in closed valve position and insert the *ball* (part 3) inside the *body* cavity (part 1) matching the ball slot with the stem milling (part 5).

d.- Place each one of the seats (part 4) on its corresponding seat holder (part 20) and place each one of them into the body's sides (part 1).

e.- Terminals or *capss* (part 2) need to have locking parts cleaned before proceeding to final assembly. Place each one of them in their corresponding position using the caps's joints (part 18).

f.- Then, proceed to place the screws (part 21) adjusting slowly and alternating diagonal and evenly until obtaining the recommended tightening torque (*see Section 8.3*).

8. Torques table:

8.1) Torques to activate the valves:

MEASURE	Activating torque (N.m.)	
	2040 / 2041	2540 / 2541
1/4"	5 – 6	***
3/8"	5 – 6	***
1/2"	5 – 6	***
3/4"	8 – 9	***
1"	11 – 12	20 – 21
1 ¼"	14 – 15	27 – 28
1 ½"	20 – 21	37 – 38
2"	30 – 31	50 – 51
2 ½"	***	81 – 82
3"	***	130 – 135
4"	***	220 – 225

8.2) Tightening torque for stem nut:

Following numerical data is provided as reference only. Torques mentioned are the ones used to activate the assembled stem before ball and seats are assembled.

Valve size	Torque value (N.m.)
1/4" - 3/8" - 1/2"	6 - 9
3/4" - 1"	8 - 12
1 ¼" - 1 ½" - 2"	13 - 18
2 ½" - 3" - 4"	19 - 24.5

8.3) Tightening torque for screws/nuts that join the valve's three different parts:

It is required for all body screws to make contact metal with metal between the body terminals and the caps.

Screw	Torque value (N.m.)
M6	8 - 11
M8	13.5 - 16
M10	22 - 25
M12	74.5 - 81

9. Hygiene and Safety Instructions:

9.1) Fluid passing through a valve or accessory can be corrosive, toxic, flammable or pollutant. When operating valves, you must follow the security instructions and it is recommended to use personal protection gadgets:

- 1) Protect your eyes.
- 2) Wear gloves and appropriate working clothes.
- 3) Wear safety footwear.
- 4) Wear a helmet.
- 5) Have running water at hand.
- 6) To operate flammable fluids, make sure you have an extinguisher at hand.



Before removing a valve from a pipe, always check if the line is completely drained and depressurized.

9.2) Operate the valve in open position to make sure there is no pressure in the internal cavity.

9.3) Any valve being used by toxic services department needs to obtain a cleanliness certificate before being operated.