

GOIZPER

MOUNTING & MAINTENANCE INSTRUCTIONS

HYDRAULIC CLUTCH-BRAKE UNIT

SERIE 62



PLEASE READ THIS MANUAL VERY CAREFULLY BEFORE
SETTING UP THE CLUTCH BRAKE UNIT

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Torque Technologies, the exclusive U.S. stocking agency of GOIZPER Clutches, Brakes and Clutch-Brakes provides expert, computerized application engineering and retrofit services to customers across the USA.

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1. GENERAL ASPECTS

1.1 Application

- This kind of hydraulically actuated combined clutch-brake is mainly used in mechanical presses and other applications when it is necessary to transmit high torques and accelerate important masses, and when the characteristics match together with the ones required in the 5.2 paragraph of the EN 692 norm, fulfilling its requirements.
- This clutch-brake unit is designed for wet running.
- Due to the high potential technical loads involved, it is very important to calculate the application depending on parameters such as inertia to accelerate and decelerate, speed, frequency of operation, torques, working pressure, lubrication and ambient temperature. Therefore, it is very important to fulfill the conditions that the clutch-brake has been calculated for.
- GOIZPER S. COOP. is not responsible for the eventual personal or material damage that may arise from the unforeseen use of the clutch-brake neither for the modifications introduced in the unit without express authorization or the non fulfillment of the indications subject of this manual.
- Besides the indications of this manual, safety regulations must be satisfied according to the working areas.

1.2 Who is this manual addressed to?

This manual should be read and understood before the installation and set up of the clutch-brake unit by:

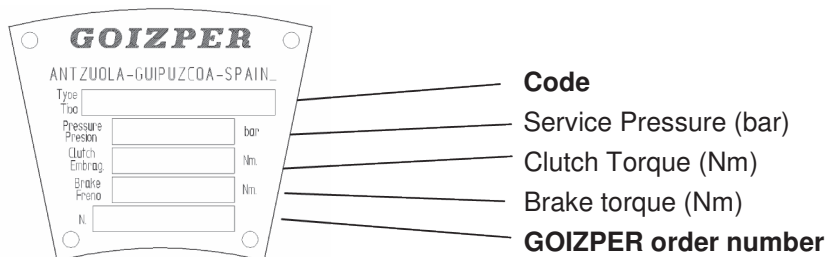
- Qualified personnel responsible for the machine
- Qualified personnel responsible for the mounting of the machine
- Qualified personnel responsible for maintenance

It is important that this manual is at the disposal of the a/r personnel.

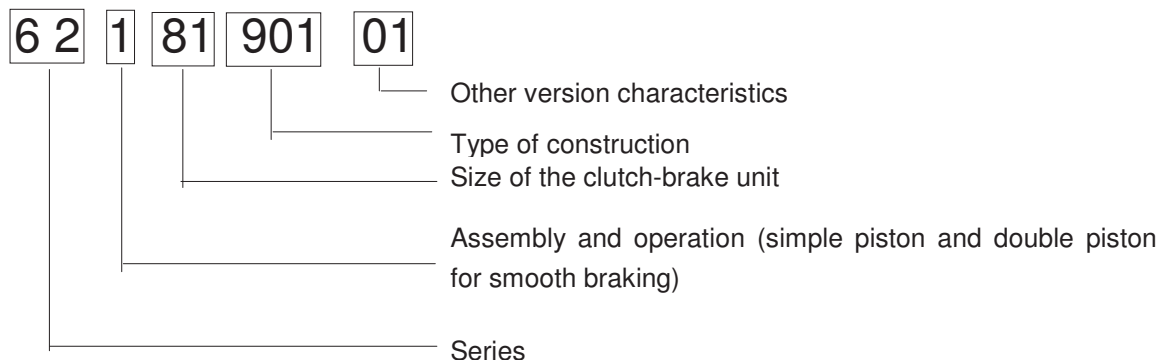
If there is any doubt, please contact GOIZPER S. COOP.

1.3 Identification of the unit

- Clutch-brake units are provided with an identification plate, where all the necessary data regarding the unit is indicated in the clutch and brake side hubs:

**Fig. 1**

The size of the unit is defined by numbers 4 and 5 of the code:



2. VERSIONS AVAILABLE

	PISTON	FIXATION TO THE SHAFT	OIL INLET	
621 -- 90 - - -	Simple	Keyways	Shaft	Clutch brake without collector
622 -- 90 - - -	Double		Lateral	
623 -- 90 - - -	Simple			
624 -- 90 - - -	Double			
625 -- 90 - - -	Simple	Locking ring	Shaft	
626 -- 90 - - -	Double		Lateral	
627 -- 90 - - -	Simple			
628 -- 90 - - -	Double			
623 -- 91 - - -	Simple	Fixation at end of shaft by key	Lateral	Clutch-brake unit with rotary collector
624 -- 91 - - -	Double	Fixation at end of shaft by locking ring		
627 -- 91 - - -	Simple			
628 -- 91 - - -	Double			

Table 1

In chapter 9 their designs are shown.

There are other special versions apart from those already mentioned, which are used in very specific applications. It is possible to combine clutch-brake units from construction type **9 0** - with Goizper static collector.

3. GENERAL FEATURES

The clutch brake is arranged with the following main parts:

- a) The central unit mounted to the shaft consists of the following components:
 - Brake hub (1)
 - Clutch hub (2)
 - Piston (3) (Simple or double)
 - Springs (6)
 - Internally and externally teathed friction discs (4 and 5)
- b) Brake side housing (7) fixed to the machine
- c) Clutch housing (8) fixed to the flywheel

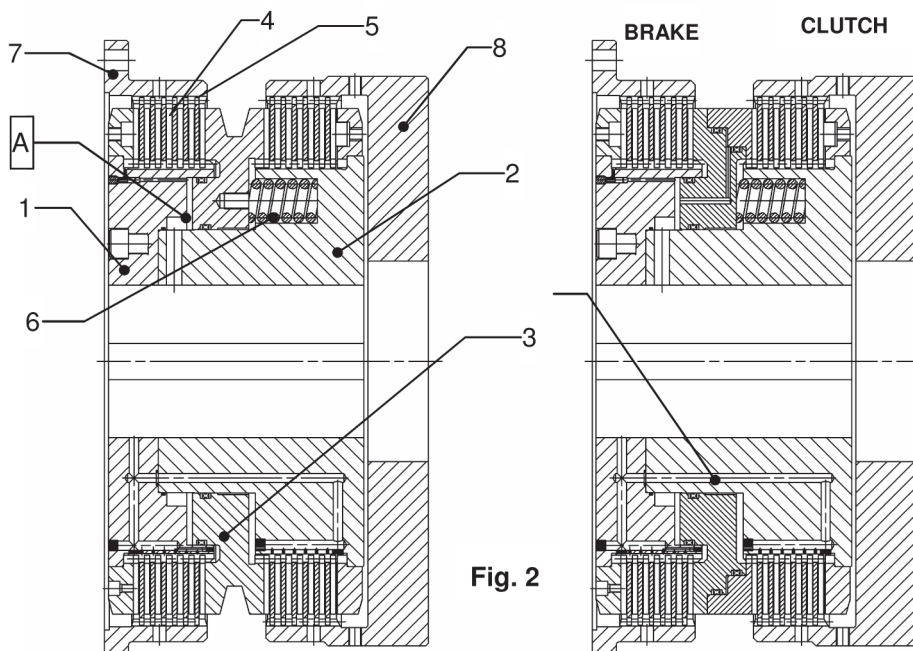


Fig. 2

- For clutching oil is introduced in the chamber (A), the piston (3) moves and releases the brake discs and engages the clutch discs. Flywheel rotation is transmitted to the clutch-brake unit and the shaft.
- For braking hydraulic oil exhausts from cylinder, brake springs (6) act against piston (3) disengaging the clutch discs. Brake discs are engaged and clutch brake and shaft are brought to rest.
- Due to the high thermal energy generated, it is important to apply the necessary oil flow (wet running).



The normal service pressure is 60 bar, and maximum should be 65 bar. Screws, which fasten the brake and clutch side hubs, **could be broken at higher pressure**



A satisfactory thermal balance must exist between the friction heat and the heat dissipated by the hydraulic unit. Otherwise, **the clutch brake may be overheated** and there is a risk of damaging the friction discs.

4. ASSEMBLY OF THE CLUTCH-BRAKE IN THE MACHINE



The assembly/disassembly of the clutch-brake unit should be carried out by qualified personnel, taking into consideration the security procedures.

4.1 Transport and manipulation

4.1.1 Lifting mode for the main unit.

The diagrams show the different possibilities that can be used for lifting the main unit. Use 2 DIN 580 eyebolts.

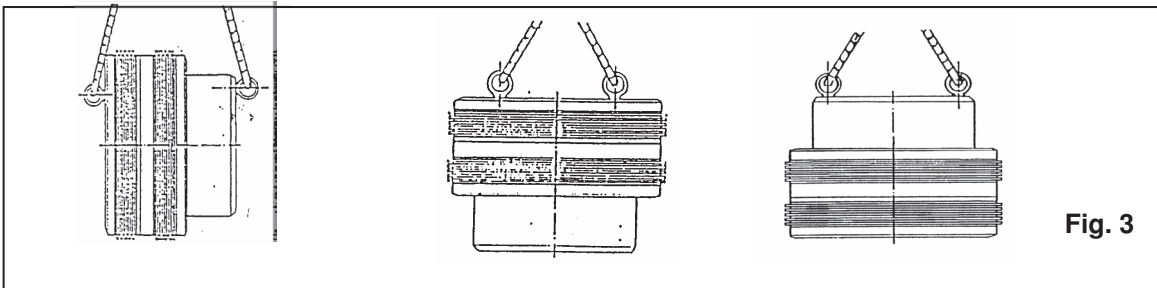
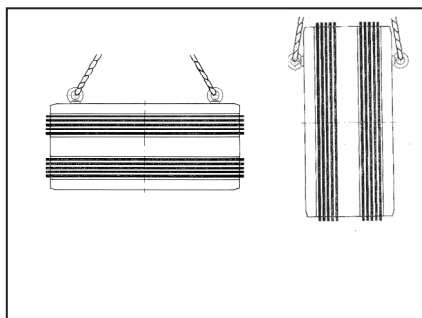


Fig. 3



During the unpacking and manipulation of this main unit, DO NOT REST OR BEAT OVER THE EXTERNAL TEETH OF THE DISCS, in order to avoid their misplacement or a bad position.

C-B Size	25	75	77	78	81	82	83
Eyebolt	M8	M10	M12	M16	M20	M20	M24

4.1.2 Lifting mode for the clutch and brake housings

Use 1 DIN 580 EYEBOLT

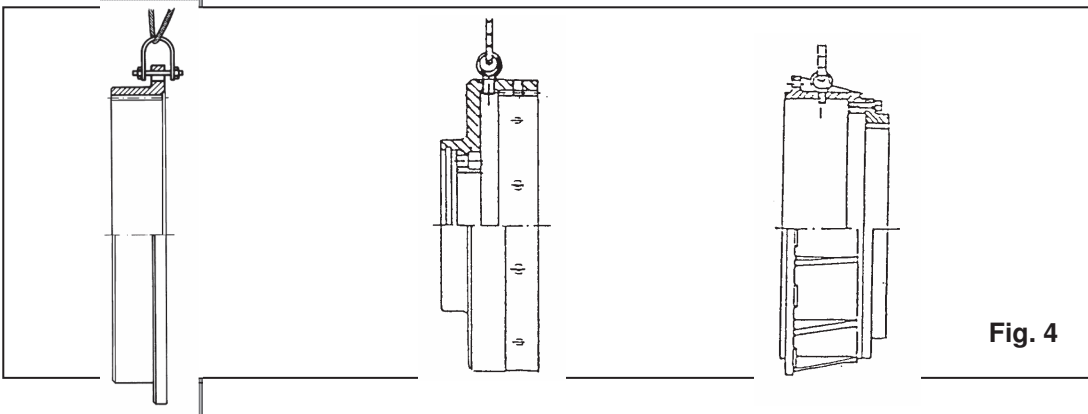


Fig. 4

C-B Size	25	75	77	78	81	82	83
Eyebolt	M8	M10	M12	M16	M16	M16	M22

4.2 Mounting procedure of the machine

The central unit is supplied with the friction discs aligned for an easier assembly. The fixing position of the above discs during the transport is obtained by the action of the springs and piston in this case of the brake side discs and by means of 2 T screws (see drawing 5 and 6), which fix the clutch side discs.

VERSIONS WITHOUT COLLECTOR

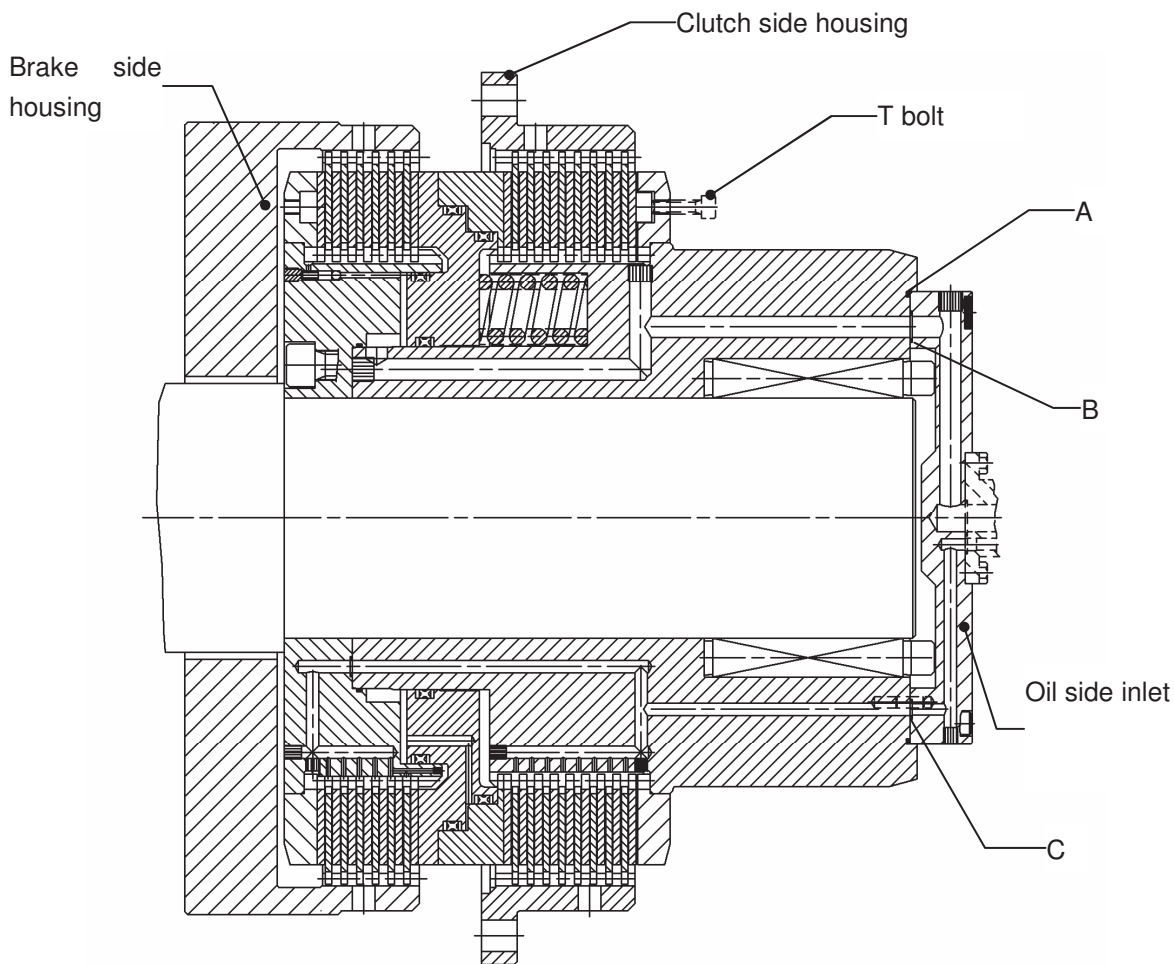


Fig. 5

After checking that the outside diameters of the discs are concentric with the diameter of the main body and that their teeth are aligned axially, the clutch-brake can be mounted on the machine as follows:

1. Fix the brake housing using the screws and dowel pins, at their tightening torques. Use LOCTITE 270 or similar for the bolts.



2. Fit the main unit on the shaft of the machine, adjusting the discs and housing. Fixation the shaft can be carried out by keyways or fixation ring.
3. Assembly by locking ring: Fix the central unit to the shaft by the fixation ring. Apply the proper tightening torque by using a dynamometric key. **It is very important to keep the tightening torque recommended by GOIZPER S. COOP.**



An excess of the tightening torque can result negatively on the resistance of the clutch-brake unit and an insufficient tightening could carry out sliding in the shaft.

For the assembly of the ring, please follow up the instructions of the manufacturer. The usual process is the following:

- 1) Clean the contact surfaces and cover with a light oil cover (do not use any oil that might contain molybdenum disulphide).
 - 2) Tighten opposite and uniformly the bolts 2-3 times, until tightening torque indicated by GOIZPER is reached.
 - 3) Tighten all the bolts to the torque indicated by GOIZPER S. COOP. and according to the instructions indicated by the locking ring manufacturer.
4. Fit the clutch side housing to the flywheel, placing the dowel pins and fastening the screws, tightened at their correct torque. Use LOCTITE 270 or similar for the bolts.



Once that the clutch cover is fixed, **LOOSEN AND TAKE OUT the 2 T bolts** that fix the discs.

5. If the clutch-brake unit counts with lateral oil inlet, fix it to the clutch side hub (see Fig. 5) with the rotary coupling (supplied upon request). Assure that the o-rings are in their position (A, B and C in Fig. 5).

NOTE:

- The outside diameter of the rotary coupling must be inside 0,1 mm of the radial movement when the shaft is running
- Depending on the assembly of the machine sometimes the clutch housing shall be installed before the brake housing.

VERSIONS WITH COLLECTOR

This version is adapted for being used with rotary oil collector. The clutch-brake unit is formed by the following parts (see Fig. 6):

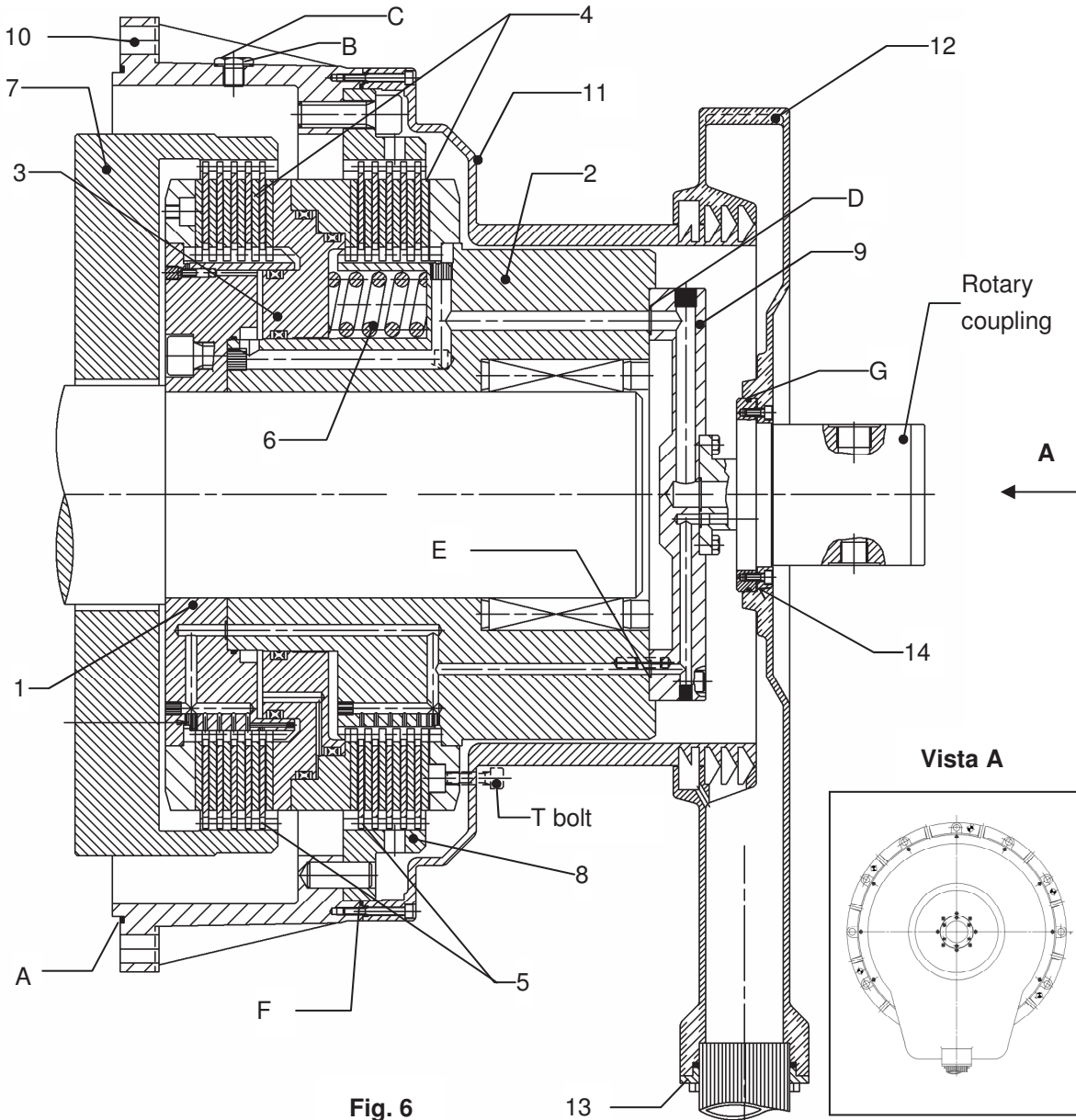


Fig. 6

a) The main body is formed by the following components:

- Brake side hub (1)
- Clutch side hub (2)
- Piston (3) (Simple or double)
- Inner and outer discs (4 and 5)
- Springs (6)
- Oil inlet (9)

- b) Brake side housing (7) fitted to the machine frame
- c) Clutch side housing (8) fitted to the flywheel with the clutch housing holder (10-11).
- d) Static oil collector (12) with the adapter (13), fitted to the rotary coupling (supplied upon request)

After checking that the outside diameters of the discs are concentric with the diameter of the main body and that their teeth are aligned axially, the clutch-brake can be mounted on the machine as follows:

1. Fix the brake housing (7) using the screws and dowel pins, at their tightening torques. Use LOCTITE 270 or similar for the bolts.
2. Fit the main unit on the shaft of the machine, adjusting the discs and housing. Fixation the shaft can be carried out by keyways or fixation ring.
3. Assembly by locking ring: Fix the central unit to the shaft by the locking ring. Follow up the instructions on point 3.
4. Fit the housing holder (10) and clutch housing (8) with dowel pins and screws tightened at the correct torque. Use LOCTITE 270 or similar for the bolts. The o-ring (A in Fig. 6) must be in its correct position.

Tap the threatened hole using B bolt and C washer (Fig. 6).



Once that the clutch housing is fixed, **LOOSEN AND TAKE OUT the 2 T bolts** that fix the discs.

5. Fit the oil inlet disc (9) (with the rotary coupling) into the clutch brake unit with 8.8 quality screws tightened in its tightening torque. O-rings D and E (see Fig.6) must be in their position.
 - **NOTE:** The outside diameter of the rotary coupling must be inside 0,1 mm of the radial movement when the shaft is running
6. Fit the clutch housing holder (11) on the clutch housing (8), taking into account that the o-ring (F in Fig. 6) must be in its correct position. See instructions figure 7.
7. Fit the static oil collector (12) to the rotary coupling by the means of bolts tightened to its tightening torque, taking care of the correct position of G O-ring (Fig. 6).
8. Connect the hydraulic pipes for application and lubrication connections.



Before mounting the rotary collector (11), check that face F1 (see Fig. 7) of the rotary seal and face F2 of the static housing (12) are in the same plain.

- If it is so, with a tolerance of 0,25 mm, a 1 mm thickness washer will be used (14 in Fig. 6).
- If face F2 exceeds more than 0,25 mm with regard to F1, an additional washer will be used.
- If surface F2 is 0,25 mm further than F1 a narrower washer will be used.

Position of face F2 with regard to face F1

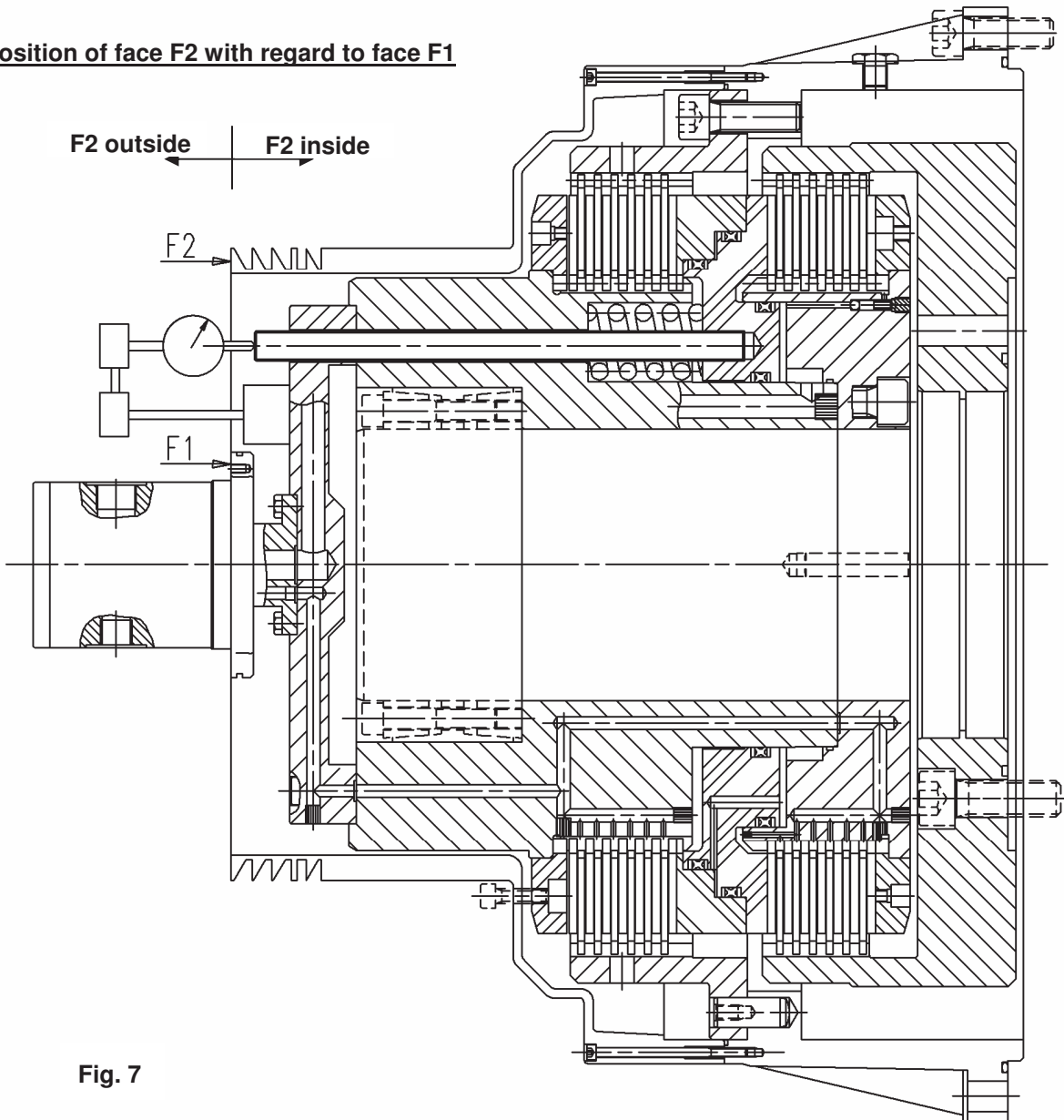


Fig. 7



GOIZPER _{S.COOP}	Mounting and Maintenance Instructions	Revision:
	Hydraulic Clutch-Brake. Series 62	01.2005

5. HYDRAULIC SUPPLY

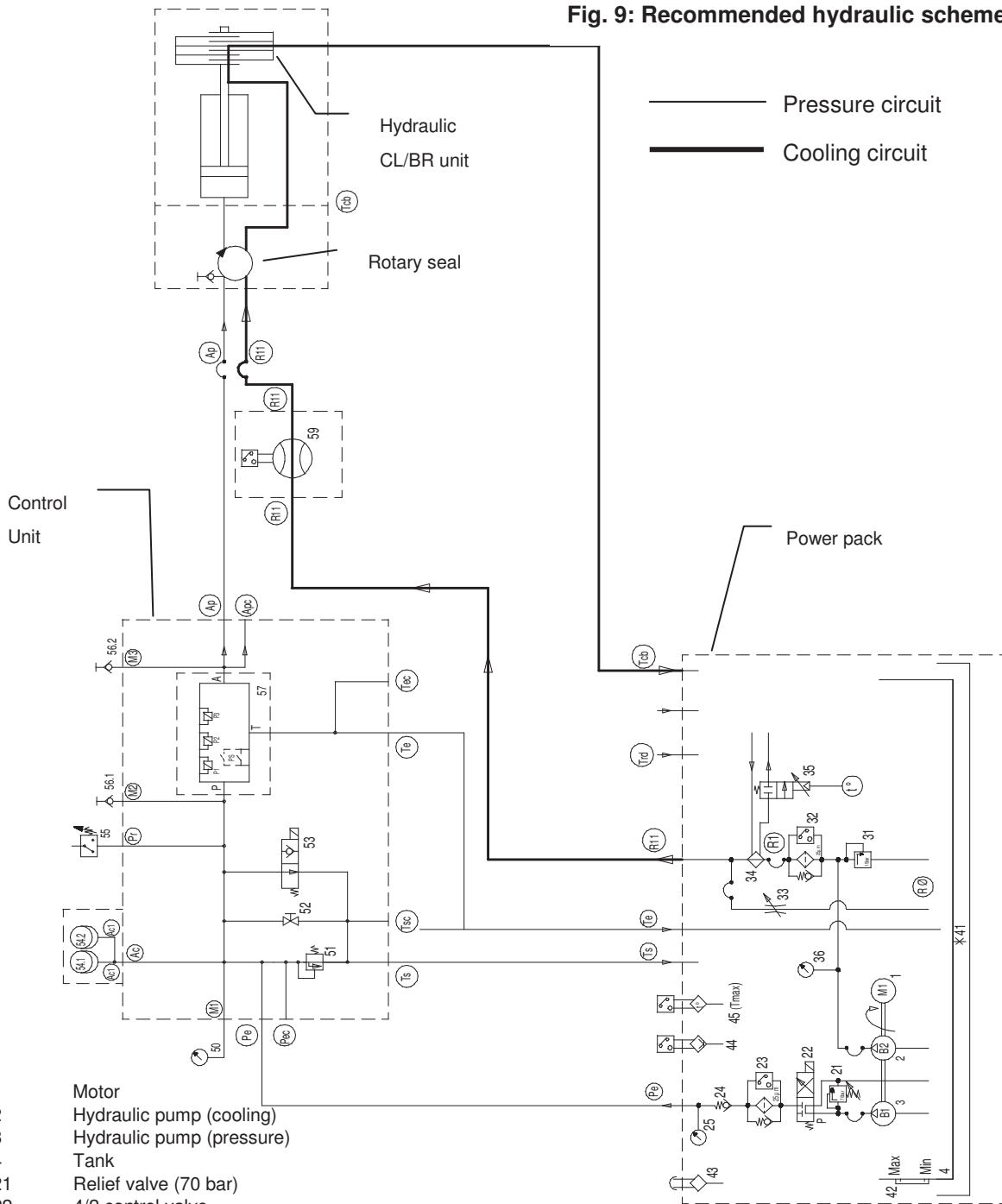
5.1 Recommendations for hydraulic installation

For guaranteeing a correct performance of the clutch brake unit it is very important to make the proper hydraulic installation. Take into account the following main aspects:

- Do not reduce any hydraulic section.
- The distance between the command valve (see 57 in Fig. 9) and the clutch-brake unit must be the minimum possible for guarantee a fast time of response.
- The distance between the accumulators and the valve shall be the minimum possible.
- Put the valve at a higher level than the oil inlet to the clutch-brake unit.
- The power pack must be designed according to the values calculated by Goizper for each particular application (cooling flow, power of the exchanger, etc.) or use the Goizper power packs.
- Figure 9 shows the recommended hydraulic scheme.



Fig. 9: Recommended hydraulic scheme



- | | | | |
|----|---------------------------------------|-----------|----------------------------|
| 1 | Motor | 50 | Manometer |
| 2 | Hydraulic pump (cooling) | 51-52-53 | Accumulator security valve |
| 3 | Hydraulic pump (pressure) | 54.1-54.2 | Accumulator |
| 4 | Tank | 55 | Pressure switch |
| 21 | Relief valve (70 bar) | 56.1-56.2 | Measuring point (mini-mix) |
| 22 | 4/2 control valve | 57 | Goizper control valve |
| 23 | Pressure filter + dirt indicator | 59 | Flow meter |
| 24 | Valve | | |
| 25 | Manometer | | |
| 31 | Relief valve (15 bar) | | |
| 32 | Pressure filter + dirt indicator | | |
| 33 | Flow valve | | |
| 34 | Heat water-oil exchanger (or air-oil) | | |
| 35 | Solenoid valve | | |
| 41 | Tank waste valve | | |
| 42 | Visual indicator | | |
| 43 | Filling tap | | |
| 44 | Level switch | | |
| 45 | T ^o max. thermostat | | |

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5.2 Recommended oil

A neutral against to copper and without additive oil is recommended. The corrosion rate must not be higher than 2 (DIN 51759).

The oil viscosity varies with the relative surface speed between the discs. Taking as a reference the outside diameter of the friction surface (490mm) to calculate V, the recommended oil viscosity is:

CL/BR SIZE		25	75	77	78	81	82	83
Diameter	mm	196	260	320	390	490	630	778

V = 6 a 12 m/s Viscosity. 45 a 65 mm² /s 40° C.

V > 12 m/s Viscosity. 30 a 45 mm² /s 40° C.

Recommended oil:

Manufacturer	V = 6 to 12 m/s	V > 12 m/s
ARAL	Aral Vitam DE 46	Aral Vitam DE 32
BP	BP Energol HL 46	BP Energol HLP-D32
TEXACO	Rando HD 46	Rando HD 32
ESSO	NUTO H 46	NUTO H 32
FINA	Hydran 46	Hydran 32
MOBIL	Mobil DTE 25	Mobil DTE 24
AVIA	AVIA Fluid RSL 46	AVIA Fluid RSL 32
FUCHS	RENOLIN B 15	RENOLIN B 10
SHELL	Tellus 46	Tellus 32
	Tellus S 46	Tellus S 32
KLUBER	LAMORA HLP 46	LAMORA HLP 32

Table 2

5.3 Hydraulic drive

The hydraulic clutch-brake unit is provided with a self-air elimination system. It means that there is a constant small oil flow from the cylinder towards the friction discs when the hydraulic pressure is acting (clutching position).



Normal working pressure is 60 bar.

Higher pressure than 65 bar can origin the breakage of screws which fasten the brake and clutch sides of the unit and therefore it can cause serious damages or injures.

5.4 Lubrication

The main function of oil is to absorb the heat produced among the discs, so the oil flow must be calculated according to the generated heat value.

The Goizper clutch-brake units, if nothing is indicated, are designed and manufacture for a forced internal cooling circuit (Fig. 10). The circuit consists on an oil inlet that distributes through some internal ways, making oil flow from the inside towards outside to outer discs in both sides (clutch and brake)

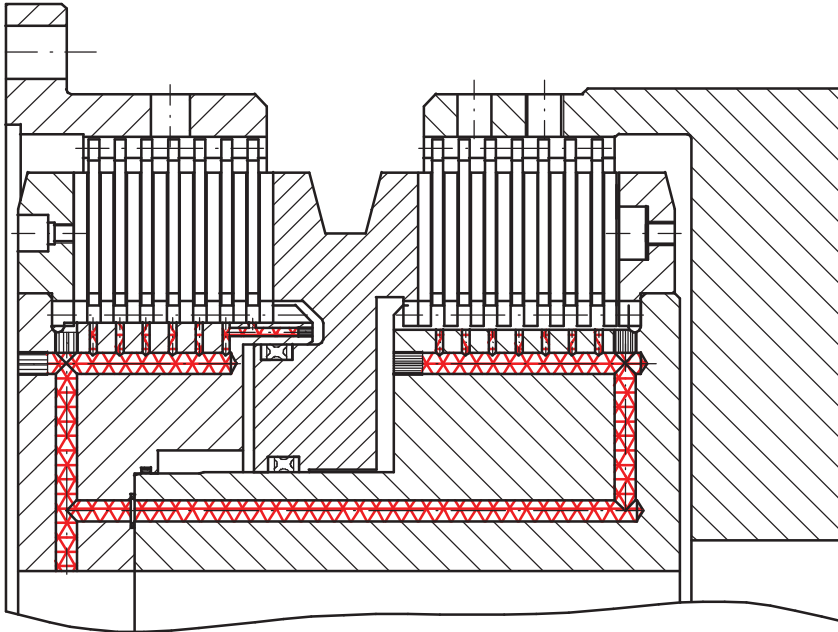


Fig. 10

Normally an oil supply of 30 to 80 l/min is used with a pump arranged to obtain 6 to 15 bar pressure, in order to solve the pressure fall caused by the filter.



There must ALWAYS be a proportion between the heat generated by friction and the heat dissipated by the cooling oil (cooled in the heat exchanger), on the other hand the **clutch-brake will heat in excess existing the risk of damaging the friction discs.**

6. START UP

The hydraulic clutch-brake unit must run up during 20 hours as a start up operation at 5 engagements per minute, or doing 5000 engagements at the half of the maximum allowable frequency.

After the run up, the nominal torque is reached.

7. MAINTENANCE AND CAUTIONS TO BE TAKEN



- The assembly/disassembly operations and the necessary adjustments should be carried out by **qualified personnel**, taking the necessary security measurements.
- Ensure that the machine has **stopped** and cannot be started.
- In the event of similar machines or presses, be sure that the flywheel is at BDC (Bottom Dead Centre) secured with chocks. In any case, please follow the instructions of the manufacturer of the machine.

Precautionary measures should be used as a complement to the security prescriptions and advice included in:

- ⇒ Health and Safety regulations and factory and section norms.
- ⇒ Laws and national regulations.

7.1 Preventive maintenance and periodic controls

Hydraulic clutch-brake units do not nearly suffer from disc wear if pressure of the control unit, flow and oil temperature are correct, so these kind of units nearly require no maintenance.

However, a decrease of pressure or an overheat of the discs can origin wear, that would involve the slipping in the clutching or an increase of braking angle.

- **Check the piston stroke** at least every 2000 hours, when the machine is in the bottom dead centre position (BDC), following the procedure in **chapter 7.2**. If the stroke is longer than the maximum admissible stroke (S_{max} en Table 3), check the discs and replace the worn out discs. This replacement must be done always with discs supplied from the original supplier and following up the instructions in chapter 8.
- If any of these defects is seen, **STOP THE MACHINE IMMEDIATELY** and ask for the technical assistance of the machine.
- Carry out the necessary revisions according to the instructions from the manufacturer of the machine, understanding the clutch-brake unit as a part of it (discs, brake springs, o-rings and other components of the clutch-brake unit), cleaning it and if necessary, replacing the necessary parts with material from the original supplier.
- As a security instruction, the working pressure, lubrication oil, pipes, leakages oil temperature, etc must be checked following the instructions of the hydraulic group manufacturer.

ATTENTION: Not keeping carefully the safety instructions can cause injuries and damages of people and the machine.

7.2 Clearance control

In order to control clearance (**S**) the piston stroke shall be measured.

- Introduce a threaded bar through one of the clutch hub holes, and tighten it to the main piston. Adjust the dial indicator as shown in figures 7, 11 and 12.
- In order to measure the stroke in the dial indicator, move the piston hydraulically, with the shaft stopped, having previously closed the oil circuit.

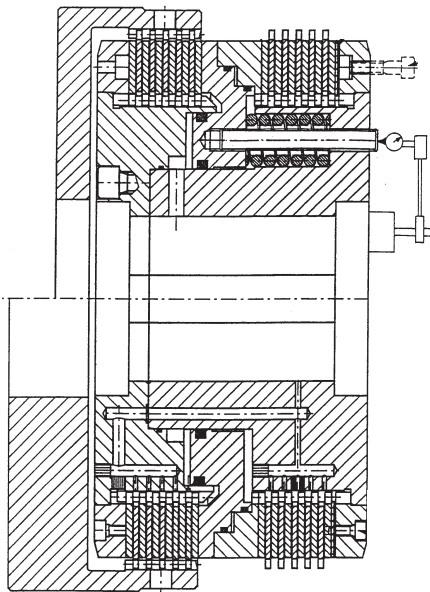


Fig. 11

During the initial running, until the friction surfaces are set up, there can be a little increase of clearance.

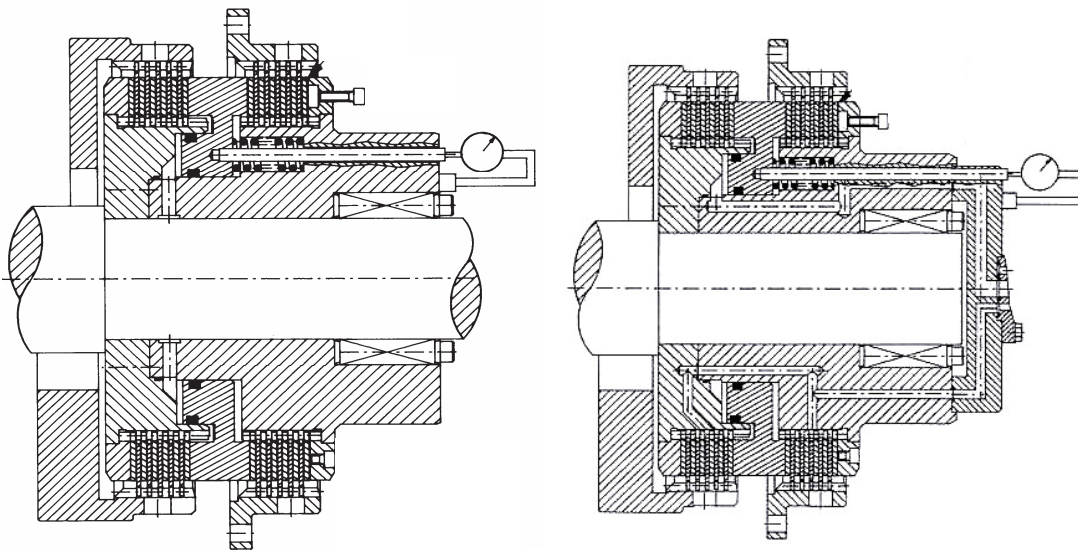
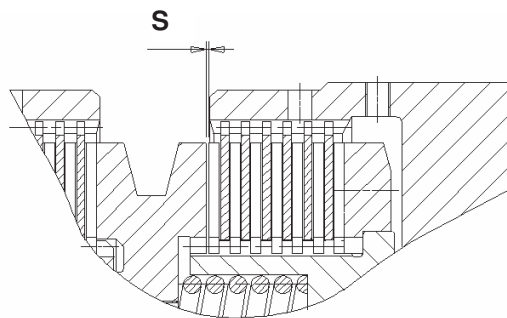


Fig. 12

Size	NL_ext ⁽¹⁾	S new ± 0,1		MAXIMUM ADMISSIBLE STROKE Smax	Threaded bar ⁽²⁾		
		Simple piston	Double piston		Size	Length	
						(621-622 623-624)	(625-626 627-628)
25	5	0,8	---	2	M8	95	180
	6	0,9	---			100	185
	7	1,05	---	2,5		105	190
	8	1,25	---			110	195
75	5	0,9	---	2,2	M10	110	195
	6	1,1	---			115	200
	7	1,25	---	2,9		120	210
	8	1,45	---			125	215
77	5	1	1,2	2,4	M12	135	240
	6	1,2	1,65			145	250
	7	1,4		3,3		155	260
	8	1,65	165			270	
78	5	1,1	1,3	2,6	M16	160	280
	6	1,25	1,75			170	290
	7	1,5		3,5		180	300
	8	1,75	190			310	
81	5	1,3	1,55	3,1	M20	190	340
	6	1,55	2			200	350
	7	1,8		4		210	360
	8	2,05	220			370	
82	5	1,5	1,95	3,9	M20	215	365
	6	2	2,95			230	380
	7	2,5		5,9		245	395
	8	3	260			410	
83	5	2,75	3	6			
	6	3					
	7	3,25	3,5	7			
	8	3,5					

Table 3

(1) It refers to the greater number of outer discs (in the clutch or brake)

(2) Threaded bars for NL_ext in the clutch side

8. ASSEMBLY AND DISASSEMBLY OF THE CLUTCH-BRAKE UNIT



- Assembly and disassembly operations, as well as the necessary adjustments should be carried out by **qualified personnel** taking the necessary security measurements.
- Ensure that the machine has **stopped** and cannot be started.
- In the event of similar machines or presses, be sure that the flywheel is at **BDC** (Bottom Dead Center) secured with **chocks**. In any case, please follow the instructions of the manufacturer of the machine.

8.1 Disassembling procedure of the clutch-brake unit

1. Take out the clutch-brake unit from the shaft, by using 2 threaded holes, that are the ones used for its removal and transport (Chapter 4.4.1).
2. Assembly the threaded bars (see table 3 for lengths) in the piston, through the clutch side hub holes. Then introduce the nuts with washers as indicated in figure 13.

CB Size	25	75	77	78	81	82	83
Threaded bar	M8	M10	M12	M16	M20	M20	M24
Number of bars	2	2	2	2	4	4	4

Table 4

This way, while the taking out the brake side hub these threaded bars keep the piston and hub with clutch side discs in its position, assuring the user against the force of springs.

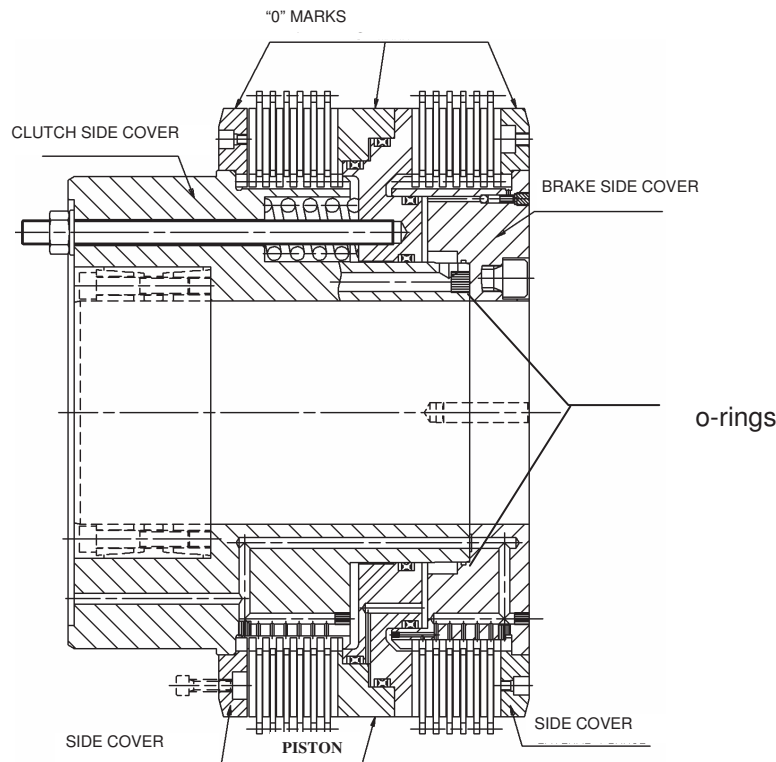


Fig. 13

3. Verify that both side covers (see Fig. 13) and the piston have a mark "0" in its surface in order to keep the original position for assembly.
4. Disassembly the clutch hub bolts and pins (the bolts are fitted with LOCTITE).
5. Loosen the nuts in the threaded bars for separating the brake side hub from the clutch side hub by springs. Separate the brake side hub with its discs from the piston and clutch side hub.



Nuts must be loosen with a maximum difference between them of 1 turn in order to avoid that a nut supports the whole charge of the springs.

6. In order to disassembly the piston and the clutch side discs, keep on loosening the nuts as indicated in the above paragraph until the springs are completely loosen. Then move the piston from the clutch side hub alter **having taken the nuts out.**

8.2 Assembly of the clutch-brake unit

1. Position the springs symmetrically in the clutch hub.
2. Assembly the inner discs and outer discs in the clutch hub.
3. Mount the piston (with the o-rings fitted in their place), with the threaded bars as per chapter 8.1, in the clutch side hub.

The threaded bar will give the position between the piston teeth and the hub teeth. "0" marks must be aligned.

4. Assembly and tighten the nuts in the threaded bar until the springs are completely compressed.
5. Fit the inner discs and the outer discs in the brake hub and verify that the o-rings are in their placement (see Fig. 13).
6. Tighten both hubs using the bolts for its correct position between them. "0" marks must be aligned.
7. Before the final tightening up of the bolts, introduce the pins.
8. Tighten the bolts at their correct tightening as per Table 5 after **applying LOCTITE (270 or similar)**.
 - Tighten in cross the bolts at 3/4 from the final torque.
 - Carry out final tightening to the torques indicated in table 5. In order to verify the tightening torque of the bolts, tighten once again at the same torque.

CL Size		25	75	77	78	81	82	83
Bolt	Type 12.9	M8	M10	M12	M16	M20	M24	M24
Tightening torque	Nm	41	83	145	355	690	1200	1200

Table 5

9. Discs must be placed concentrically to the lateral cover and align the teeth by using the outer housing (brake or clutch side). Mount the housing in the discs as shown in figure 14 and insert 3 pins in order to obtain the concentricity of the discs.

CL Size		25	75	77	78	81	82	83
ϕ pins	mm	8	8,5	15	10	16	16	14

Table 6

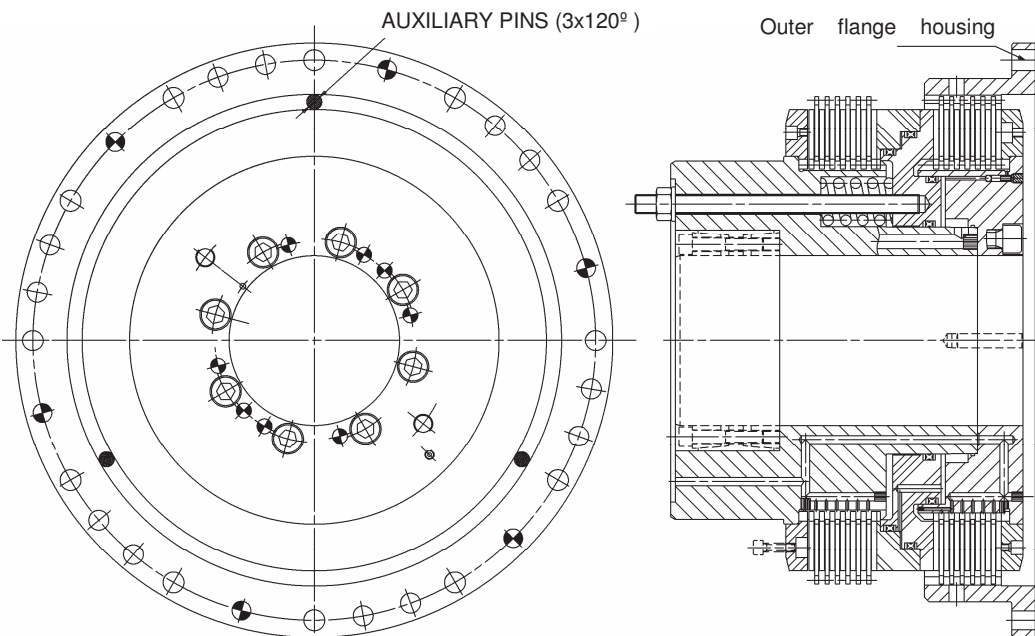


Fig. 14

10. Loosen the nuts from the threaded bars following the procedure described in point 5 of chapter 8.1 and take out the threaded bars. The piston will keep the brake side discs aligned and concentric, allowing the taken out of housing.



9. SPARE PARTS

Replace the spare parts with parts from the original supplier. Goizper will only assure guarantee for the final product if the used spare parts are originally supplied by Goizper S. Coop.

In order to ask for spare parts, follow up the following instructions:

- Indicate the code, manufacturing number of the clutch-brake unit that is indicated in the identification plate (Chapter 1.3).
- Identify the spare part piece as per tables 7 and 8 and figures 15, 16, 17 and 18

 Spare parts material

N.	Designation	621 - - - - 90	622 - - 90 - - -	623 - - - 90 - - -	624 - - 90 - - -	625 - - - 90 - - -	626 - - 90 - - -	627 - - - 90 - - -	628 - - 90 - - -	623 - - - 91 - - -	624 - - 91 - - -	627 - - - 91 - - -	628 - - - 91 - - -
1	Brake side hub	●	●	●	●	●	●	●	●	●	●	●	●
2	Clutch side hub	●	●	●	●	●	●	●	●	●	●	●	●
3	Simple piston	●		●		●		●		●		●	
4	Double piston		●		●		●		●		●		●
5	Outer spring	●	●	●	●	●	●	●	●	●	●	●	●
6	Inner spring	(●)	(●)	(●)	(●)	(●)	(●)	(●)	(●)	(●)	(●)	(●)	(●)
7	Inner disc	●	●	●	●	●	●	●	●	●	●	●	●
7.1	Adjusting inner disc	●	●	●	●	●	●	●	●	●	●	●	●
8	Outer sintered disc	●	●	●	●	●	●	●	●	●	●	●	●
9	Side cover	●	●	●	●	●	●	●	●	●	●	●	●
10	Brake side housing (inner or outer flange)	●	●	●	●	●	●	●	●	●	●	●	●
11	Clutch side housing (inner or outer flange)	●	●	●	●	●	●	●	●				
11.1	Outer flange housing									●	●	●	●
12	DIN 912 – 12.9 Allen bolt	●	●	●	●	●	●	●	●	●	●	●	●
13	DIN 7979 pin	●	●	●	●	●	●	●	●	●	●	●	●
14	Inner quad-ring	●	●	●	●	●	●	●	●	●	●	●	●
15	Outer quad-ring	●	●	●	●	●	●	●	●	●	●	●	●
16	Inner hard ring	●	●	●	●	●	●	●	●	●	●	●	●
17	Outer hard ring	●	●	●	●	●	●	●	●	●	●	●	●
18	O-ring	●	●	●	●	●	●	●	●	●	●	●	●
19	O-ring	●	●	●	●	●	●	●	●	●	●	●	●

N.	Designation	621 - - 90 - - -	622 - - 90 - - -	623 - - 90 - - -	624 - - 90 - - -	625 - - 90 - - -	626 - - 90 - - -	627 - - 90 - - -	628 - - 90 - - -	623 - - 91 - - -	624 - - 91 - - -	624 - - 91 - - -	624 - - 91 - - -
20	Steal ball 1/4"	●	●	●	●	●	●	●	●	●	●	●	●
21	Leakage piston	●	●	●	●	●	●	●	●	●	●	●	●
22	Leakage spring	●	●	●	●	●	●	●	●	●	●	●	●
23	Leakage tap	●	●	●	●	●	●	●	●	●	●	●	●
24	Stud	●	●	●	●	●	●	●	●	●	●	●	●
25	DIN 912 Allen bolt (only for fixing the discs. Loosen it and take it out)	●	●	●	●	●	●	●	●	●	●	●	●
26	GAS DIN 906 Allen tap (springs)	●	●	●	●	●	●			●	●		
27	GAS DIN 906 Allen tap (cooling circuit.)	●	●	●	●	●	●	●	●	●	●	●	●
28	Allen DIN 913 threaded bar	●	●	●	●	●	●	●	●	●	●	●	●
29	Oil inlet disc			●	●			●	●	●	●	●	●
30	O-ring (pressure circuit)			●	●			●	●	●	●	●	●
31	O-ring (refrigeration circuit)			●	●			●	●	●	●	●	●
(31.1)	O-ring							●	●				
32	GAS DIN 906 Allen tap (press. circuit)			●	●			●	●	●	●	●	●
33	GAS DIN 906 Allen tap (cooling circuit)			●	●			●	●	●	●	●	●
34	DIN 912 Allen bolt			●	●			●	●	●	●	●	●
35	GAS DIN 906 Allen tap (pressure circuit)							●	●			●	●
40	Clutch housing holder									●	●	●	●
41	Rotary oil collector									●	●	●	●
42	Static oil collector									●	●	●	●
43	Tap									●	●	●	●
44	Cooper washer									●	●	●	●
45	DIN 912 Allen bolt									●	●	●	●
46	DIN 7979 pin									●	●	●	●
47	Seal									●	●	●	●
48	DIN 912 Allen bolt									●	●	●	●
49	Seal									●	●	●	●
50	O-ring									●	●	●	●
51	End bridle									●	●	●	●
52	DIN 933 bolt									●	●	●	●
53	Adjusting washer									●	●	●	●
54	Adjusting washer									●	●	●	●

Table 7



DOUBLE PISTON (4)

N.	Designation
4.1	Main piston
4.2	Auxiliary piston
4.3	DIN 912 Allen bolt
4.4	Spacer
4.5	Spring
4.6	Washer
4.7	DIN 912 Allen bolt
4.8	Quad-ring
4.9	Quad-ring
4.10	Hard ring
4.11	Hard ring
4.12	DIN 7979 Pin

Table 8

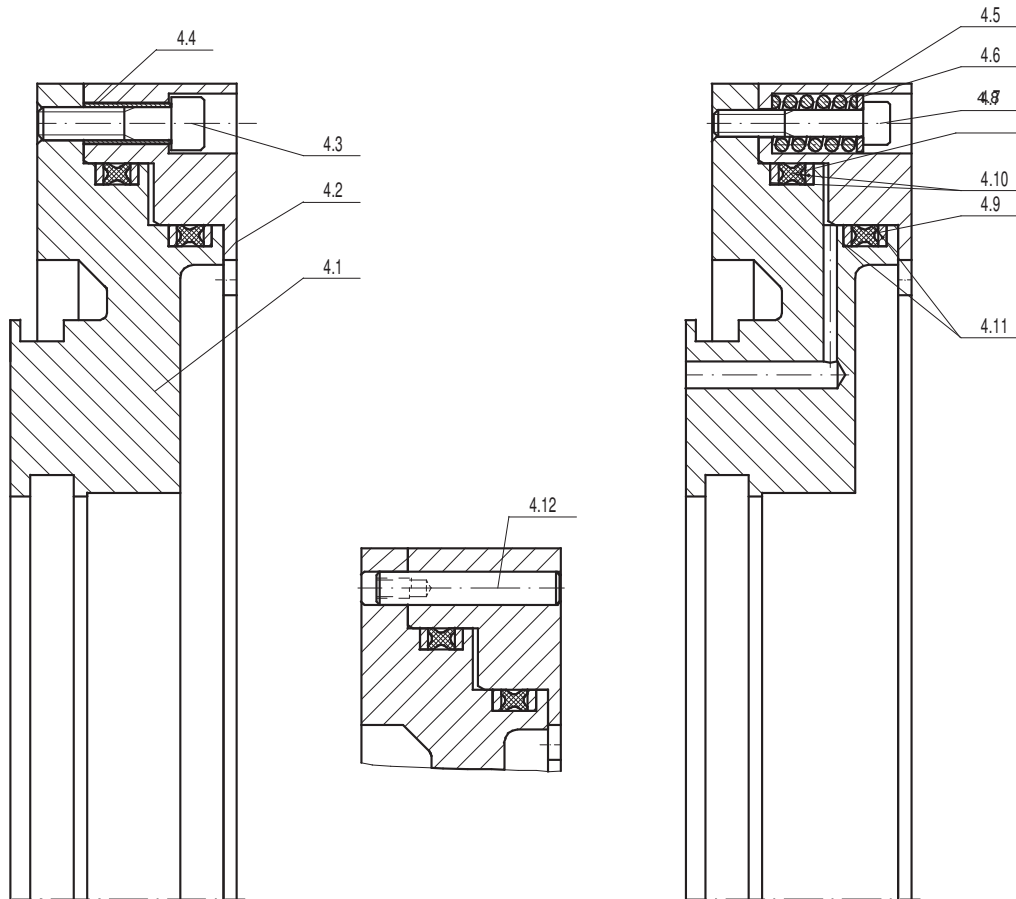
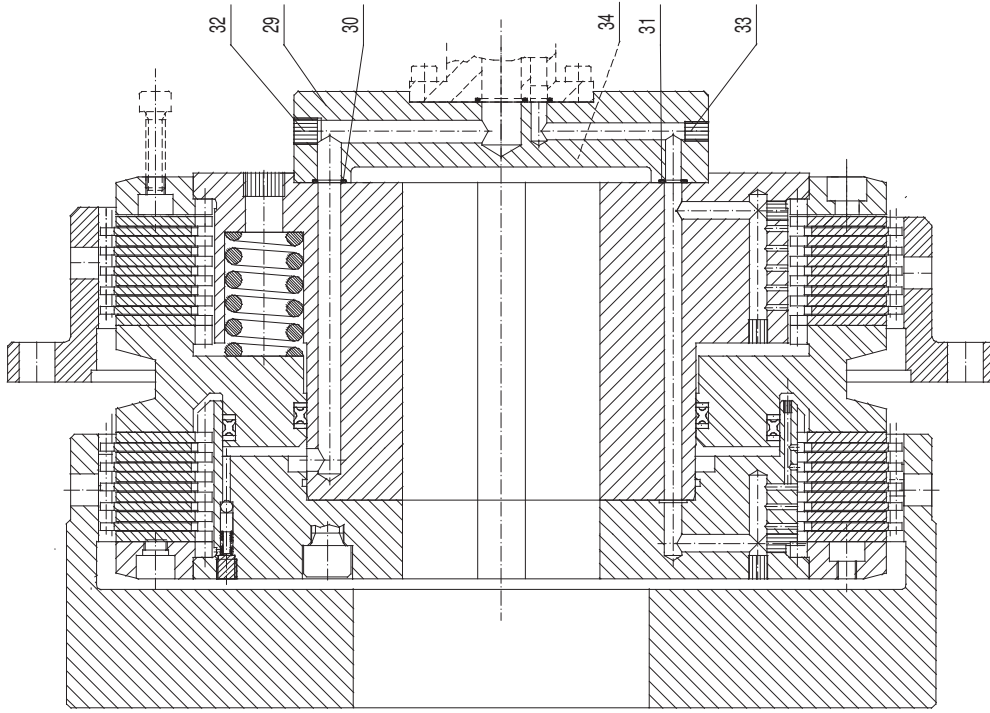


Fig. 15

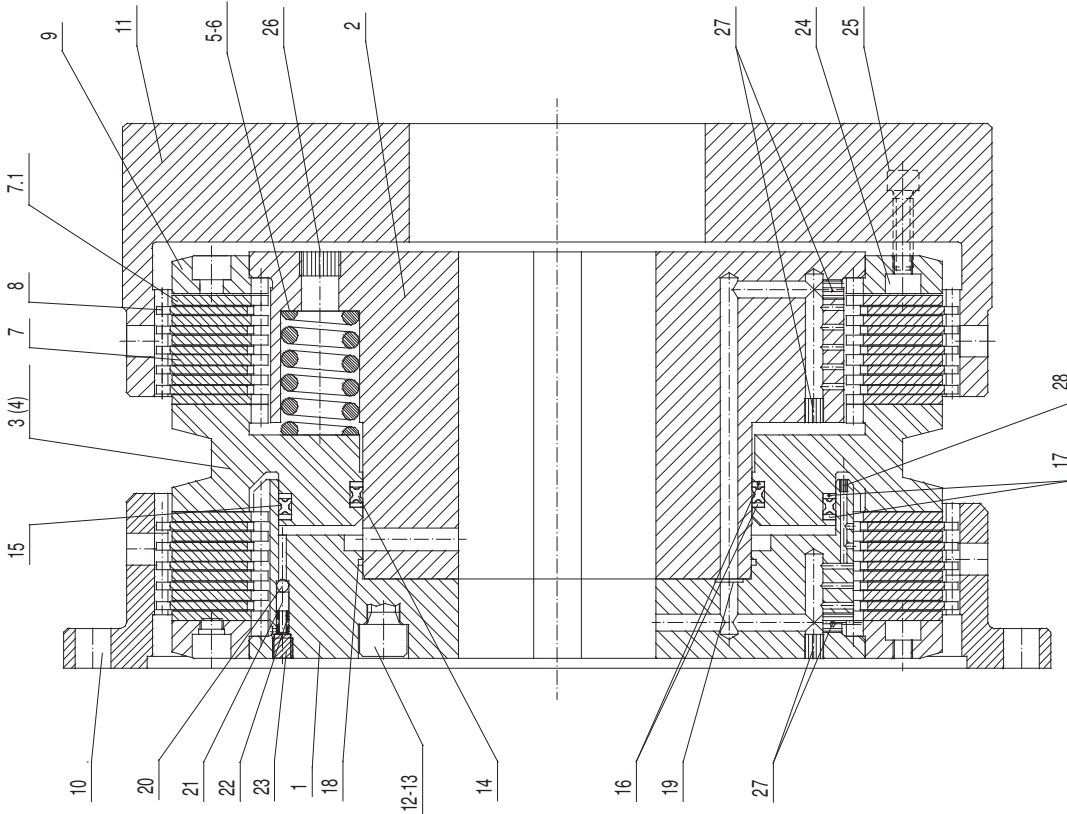


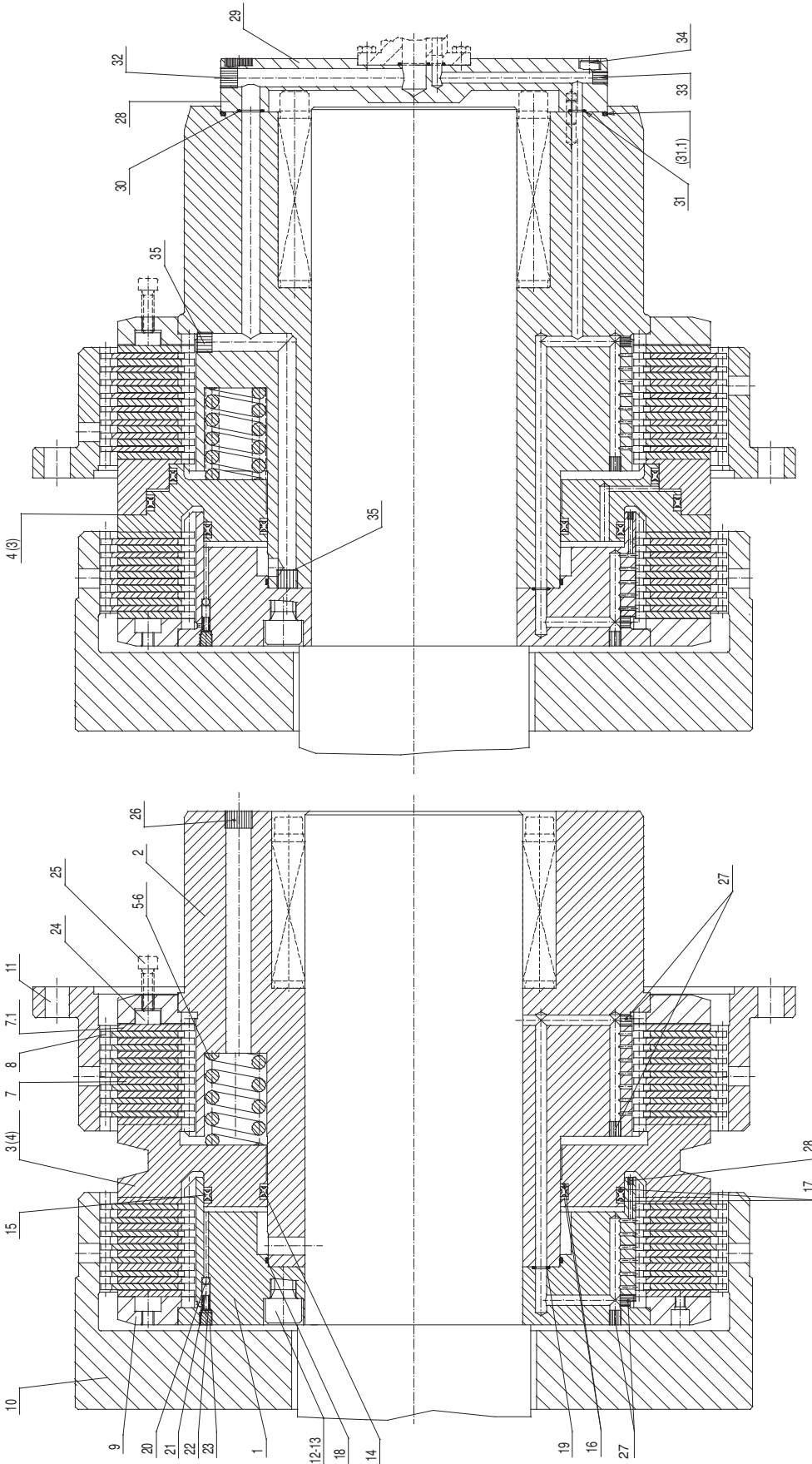


623 - - - 90 - - - -
624 - - - 90 - - - -

Fig. 16

621 - - - 90 - - - -
622 - - - 90 - - - -

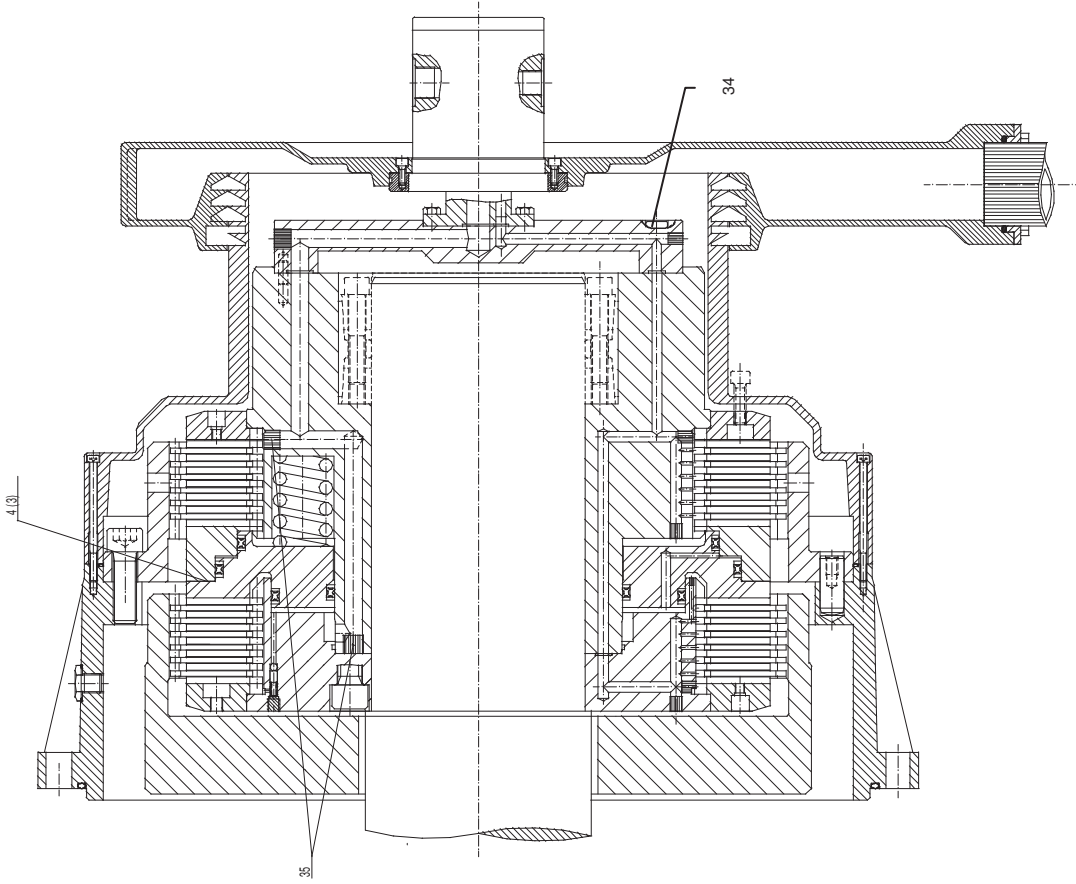




627 --- 90 ---
628 --- 90 ---

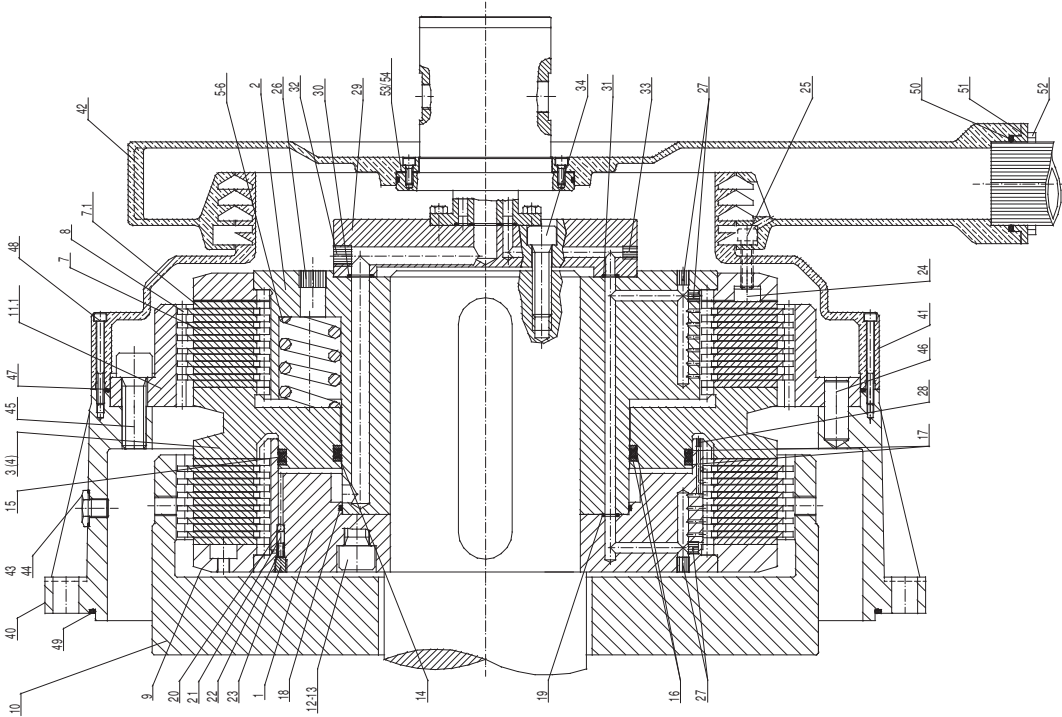
625 --- 90 ---
626 --- 90 ---

Fig. 17



627 - - 91 - - - -
628 - - 91 - - - -

Fig. 18



623 - - 91 - - - -
624 - - 91 - - - -

10. REPAIRS: CAUSES AND SOLUTIONS

In the following table we indicate the most common problems. If any other problem occurs, please contact the technical assistance service.

■ PROBLEM	■ CAUSE	■ SOLUTION
The clutch torque is insufficient	Low or lack of oil pressure	Check the oil pressure
		Check the hydraulic installation (valves, etc.)
		Check if there is oil leak from the clutch-brake seals.
	Worn friction discs (at maximum permissible piston stroke)	Change the clutch discs
Increase of the braking angle	Worn friction discs (at maximum permissible piston stroke)	Change the brake discs
High temperature of the lubrication oil.	Oil cooler is not enough	Check oil cooling installation
	Oil flow is not enough	Check oil cooling installation
	The number of stroke is too high	Verify the number of strokes