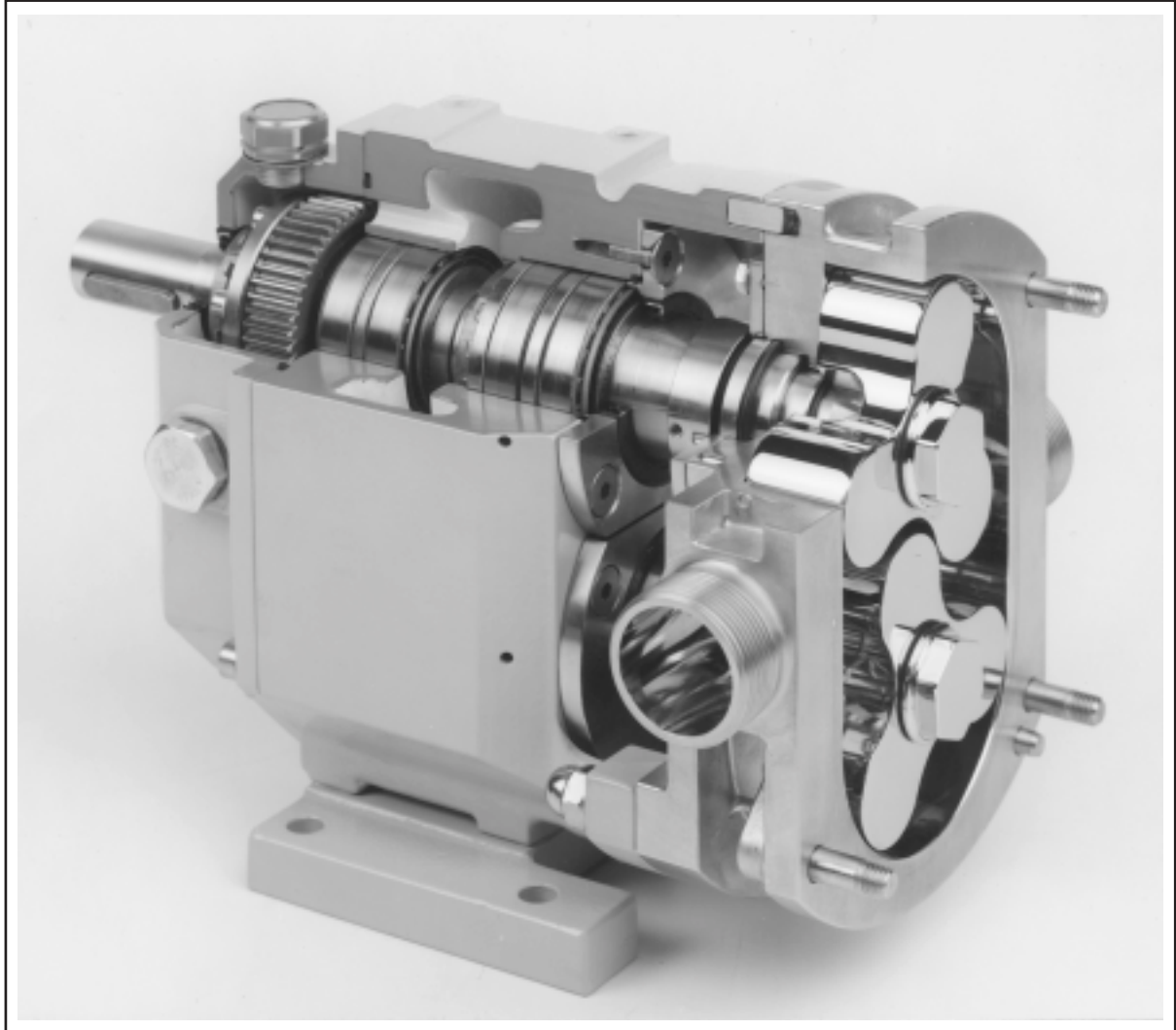


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# OMAC



## **Installation operation and maintenance manual**



AUT. N° 810

## CONTENTS

B Serie lobe pump code	page	3
Pump materials	"	4
Introduction	"	5
Preliminary checks	"	5
Installation	"	5
Piping system	"	6
First starting	"	8
General maintenance	"	9
Relief Valve and manual By-pass	"	11-12
Trouble shooting guide	"	13
Reference tables - Rotor clearances - Tightening torque	"	14
– Heating jacket and seal flushing connections	"	15
– Mechanical seal overall dimensions	"	15
– Bearings	"	16
Instructions for assembly and disassembly - pump type B1-B2-B3-B4-B550	"	17
Instructions for bearing housing assembly - pump type B1 - B2 - B3 - B4	"	22
Instructions for assembly and disassembly - pump type B5 - B6	"	25-32
Instructions for driving shaft inversion - pump type B5 - B6	"	33
Spare parts choice	"	33
– Seals for pump type B1 - B2 - B3 - B4 - B470 - B490 - B550	"	33-34
– Seals for pump type B660 - B680	"	35
– By pass - relief valve	"	36
– Aseptic rotor case	"	37
– Jacketed end cover and rotor case	"	37
– Technical drawing - pump type B105 - 110 - 115	"	38
– Technical drawing - pump type B215-220-325-330-430-440-470-490-550	"	39
– Technical drawing - pump type mod. B660 - 680	"	40
– Materials, seals and options codes	"	41
– Components and rotor cases codes	"	42
– Parts list - spare parts code	"	43-44-45
– Technical drawing - pump type B100	"	46-47
– Seals for pump type B100	"	48
– Parts list - spare parts code	"	49
– Common fluids features - Seal/Rotor preferred choice	"	50-51

## B SERIE LOBE PUMP CODE

EXAMPLE:



FINISHED PRODUCT  
CATEGORY  
LOBE PUMP SERIE

B

PUMP  
SIZE

- |     |
|-----|
| 100 |
| 105 |
| 110 |
| 115 |
| 215 |
| 220 |
| 325 |
| 330 |
| 430 |
| 440 |
| 470 |
| 490 |
| 550 |
| 660 |
| 680 |

SEAL  
TYPE

- |   |  |
|---|--|
| 0 | Type UM (lip seal)                               |
| 1 | Teflon packing rings                             |
| 2 | Teflon packing rings + hydraulic barrier         |
| 3 | SS/Carbon balanced mech. seal                    |
| 4 | Tung. Carbide/Carbon balanced mech. seal         |
| 5 | Tung. Carbide/Tung. Carbide balanced mech. seal  |
| 6 | Ceramic/Carbon balanced mech. seal               |
| 7 | Ceramic/Rulon balanced mech. seal                |
| 8 | Silicon Carbide/Sil. Carbide balanced mech. seal |
| 9 | Special seals                                    |

SUCTION/DISCHARGE  
PORT CONNECTIONS

- |   |                   |
|---|-------------------|
| 0 | Gas - BSP ports   |
| 1 | Flanged ports     |
| 2 | DIN 11851 F ports |
| 3 | SMS ports         |
| 4 | RJT (BS) ports    |
| 5 | IDF ports         |
| 6 | Clamp ports       |
| 7 | Female gas thread |
| 8 | Oenological       |
| 9 | Special           |

ROTOR  
TYPE

- |   |  |    |
|---|--|----|
| 0 | Standard stainless steel tri-lobe            | ST |
| 1 | Stainless steel tri-lobe increased clearance | SM |
| 2 | Standard stainless steel bi-lobe             | ST |
| 3 | Stainless steel bi-lobe increased clearance  | SM |
| 4 | Rubber-coated stainless steel/NBR tri-lobe   |    |
| 5 | Dual wing rotary piston in Acteon            |    |
| 6 | Rubber-coated stainless steel/NBR bi-lobe    |    |
| 7 | Gear rotor in Acteon                         |    |
| 8 | Stainless steel gear rotors                  |    |
| 9 | Special rotors                               |    |

TYPE OF END  
COVER

- |   |                               |
|---|-------------------------------|
| 0 | Standard end cover            |
| 1 | End cover with relief valve   |
| 2 | End cover with heating jacket |

SPECIAL  
VERSIONS

- |                             |                                  |
|-----------------------------|----------------------------------|
| A Aseptic pump              | M Polymer/Monel pump             |
| B External by-pass          | P Teflon trim                    |
| C Single flushed mech. seal | Q Double flushed mech. seal      |
| D Duplex shafts             | R Rotor case with heating jacket |
| F Polymer/Hastelloy pump    | S S1 polymer lip seal            |
| G Inner polishing surface   | T Hydraulic flange pump          |
| H High-pressure pump        | U EPDM trim                      |
| I Monel 400 pump            | V Viton trim                     |
| J Titanium pump             | W Polymer/Titanium pump          |
| K Surface hardening         | Y Hastelloy pump                 |
| L Enlarged inlet port       | Z Hastelloy/Titanium pump        |

## PUMP MATERIALS

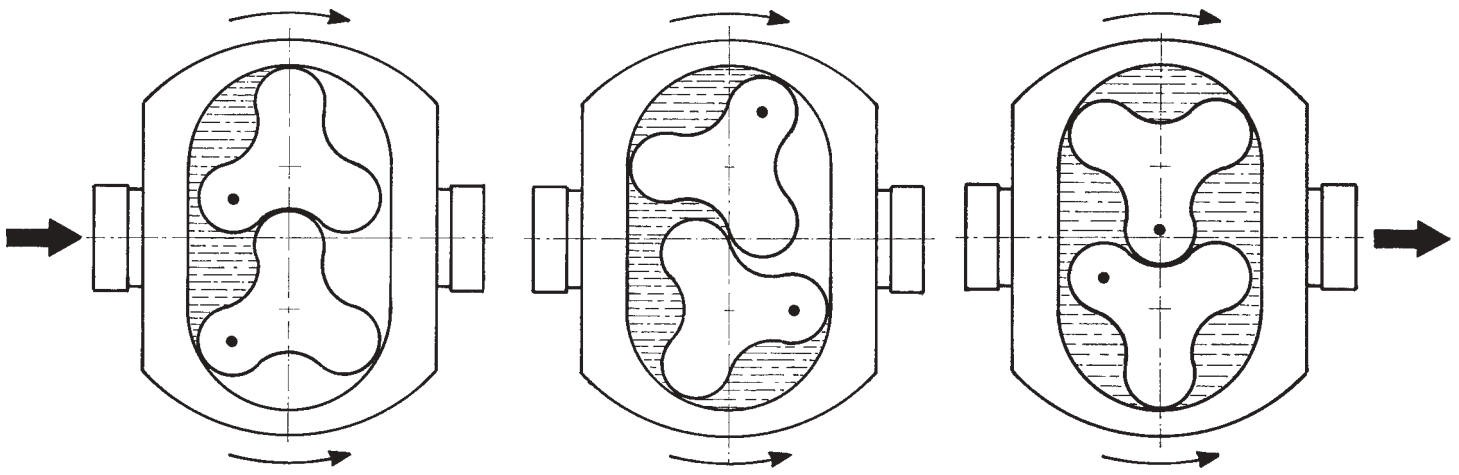
Bearing housing		G 25 cast iron
Gear cover	serie B1 - B2 - B3 - B4	Aluminium
	serie B5 - B6	G25 cast iron
Rotor case and end cover	standard	AISI 316 stainless steel
	optional	Titanium degree 2
	optional	Hastelloy C 276
	optional	Mekton S polymer
Shaft (driving driven)	standard	AISI 316 stainless steel
	optional	Titanium degree 5
	optional	Hastelloy C 276
Rotors – standard clearance ST	standard	AISI 316 stainless steel
and increased clearance SM	optional	Titanium degree 2
	optional	Hastelloy-alloy C 276
– rubber coated		AISI 316 stainless steel insert + N.B.R. (EPDM, VITON)
– dual wing or bi-lobe	standard	Stainless steel anti-seizure alloy (Acteon)
	optional	Dew 88 met alloy
	optional	AISI 316 stainless steel
	optional	Titanium degree 2
	optional	Hastelloy-alloy C 276
<b>SHAFT SEALS</b>		
code 0 "UM" lip seal	standard	Viton
	optional	Polymer S1
code 1-2 Teflon packing rings		Lubricated P.T.F.E.
code 3 B.T. C5E B2GVGG or Fluiten KL2A Z32Y1DJE mech. seal		AISI 316 stainless steel/Carbon
code 4 Roten U7K X73Z7-HX or Fluiten KL2A Z32K22DJE mech. seal		Tungsten Carbide/Carbon
code 5 Roten U7K X7337-HX or Fluiten KL2A K22K22DJE mech. seal		Tungstene Carbide/Tung. Carb.
code 6 B.T. C5E B2V1VGG or Fluiten KL2A Z32CDJE mech. seal		Ceramic/Carbone
code 7 B.T. C5E YV1VGG mech. seal		Ceramic/Rulon
code 8 Fluiten KL2A U32U31VJE mech. seal		Silicon Carbide/Silicon Carbide
code Q Fluiten KL2A double mech. seal standard (other by request)		Required materials

## 1. INTRODUCTION

This handbook contains the necessary instructions for the right use and maintenance of the OMAC lobe pumps. Before installing the pumps, you should read and respect carefully the following rules in order to avoid mistakes which may compromise the performance. For special applications, not covered by these rules, our technical office is at your disposal for further suggestions.

## 2. PRELIMINARY CHECKS

- 1 - Remove the possible protection caps, arranged on the outlet and inlet ports.
- 2 - Disassemble the front cover and check that inside the pumping body there are no foreign bodies or dust.
- 3 - Choose the running direction for a right pump positioning. In standard versions the direction is reversible, i.e.: by inverting the rotation direction the outlet becomes inlet.
- 4 - Be sure on installation you have respected all the safety measures in use concerning the protections of the running parts and of the heated parts above 60°C with "overheated area" indication. Check also the protections of the "dangerous area" are no sparking.



## 3. INSTALLATION

### 3.1 - POSITIONING

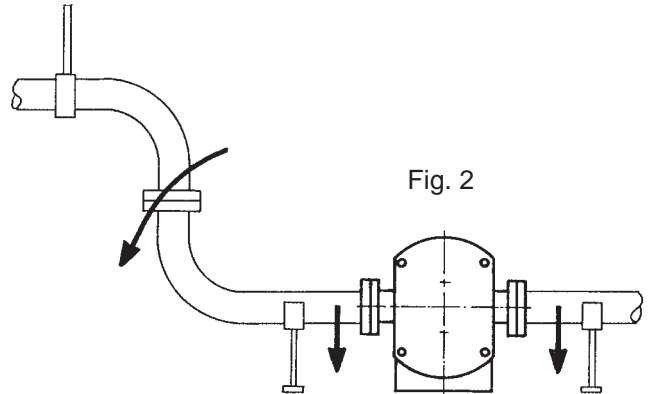
- 1 - If the pump is delivered in bare shaft version, the coupling with the motorization should be entrusted to qualified staff. A joint misalignment can cause a damaging stress, that may produce vibration in the pipeline and accelerated pump wear.
- 2 - In choosing the speed, at which the pump must run, consult carefully the chart, given by manufacturer, about medium viscosity (see technical handbook and table at page 46).
- 3 - If the pump is delivered with motor, coupling and base, the assembling has been carried out at our works. Anyway check to see that no damage has occurred during transit.
- 4 - Where possible we advise you to fix the base to floor; after bolting down, re-check the alignment pump-motor and correct it, if necessary, by introducing shims under the base.
- 5 - In some applications height adjustable feet are normally used, because they allow a regular cleaning under the base.

### 3.2 - PIPING SYSTEM

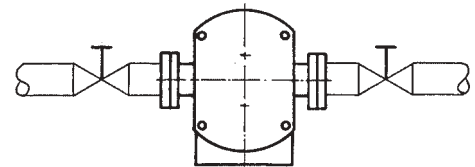
- 1 - OMAC pump suction and discharge are sized to suit passage of even very viscous medium; consequently the piping should not be necessarily proportionate to them.
- 2 - The suction and discharge piping should be sized according to the calculus in the technical handbook, considering the expected capacity, viscosity and friction losses.
- 3 - The lobe pumps can work with great friction losses in outlet, but not in inlet, where we advise as large and short piping as possible in order to have a lower NPSH that the available one.

- 4 - The pump should be installed near the source, from which it sucks.
- 5 - Reduce at min. bends and necks along the whole line.
- 6 - Use large radius bends, avoiding Tees and needless runs.
- 7 - Check the perfect inlet connection seal not to reduce the pump suction power.

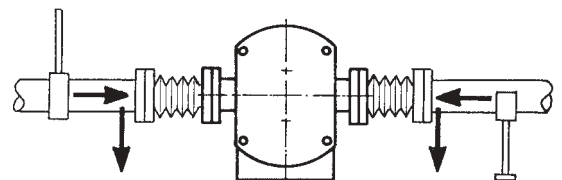
8 - The piping weight must not load on pump body and the connection must be carried out without forcing in order to avoid overloads and distortion of the rotor case.



9 - Especially in case of very long piping system isolation valves on both inlet and outlet side to permit pump maintenance and removal without total draining of the piping system.

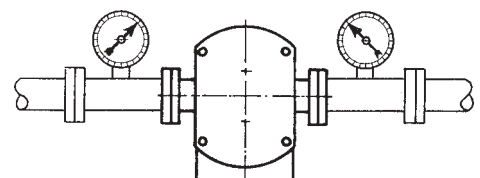


10 - Where possible arrange a flexible expansion joint to reduce vibration and to avoid forcing, due to thermal expansion of piping.



11 - We advise to arrange gauges and vacuum gauges near the pump. They are usefull to check the pump working conditions and diagnose possible trouble such as:

- pressure overload
- flow absence
- instability in duty conditions
- cavitation



- 12 - Where necessary arrange on inlet a filter, whose suction area must not be smaller than 4-5 time the suction pipe to minimize the friction losses.
- 13 - During the pump unit installation it's necessary to leave a usefull room for maintenance and possible removal.
- 14 - If the pump is not flooded, arrange on inlet side a "foot" valve or a check valve to keep the priming.

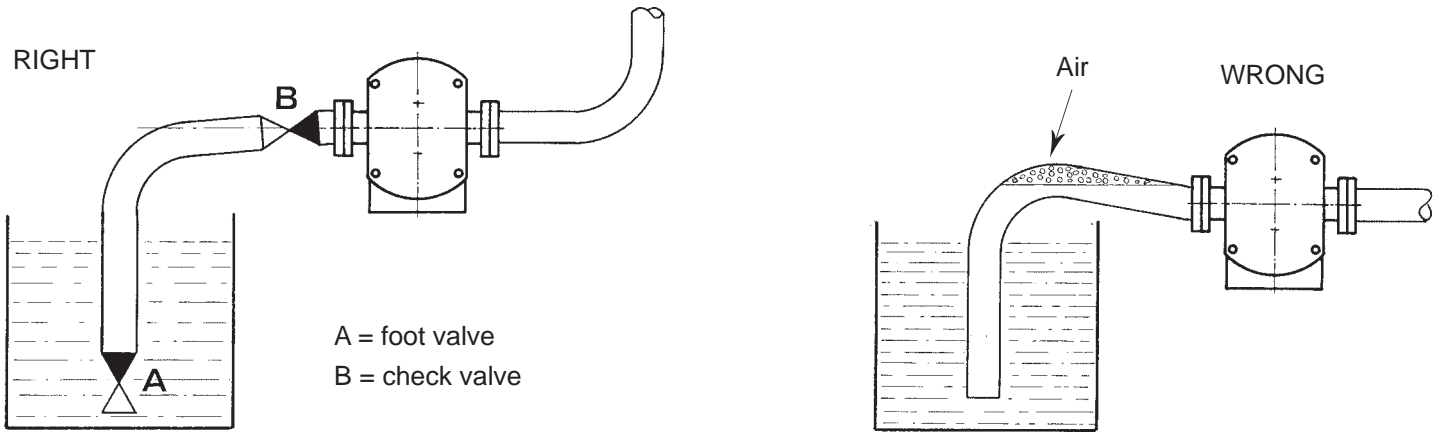


Fig. 6

15 - The horizontal sections of the suction pipe must be a bit inclined towards to the top in order to avoid the creation of air pockets, which can damage the pump priming.

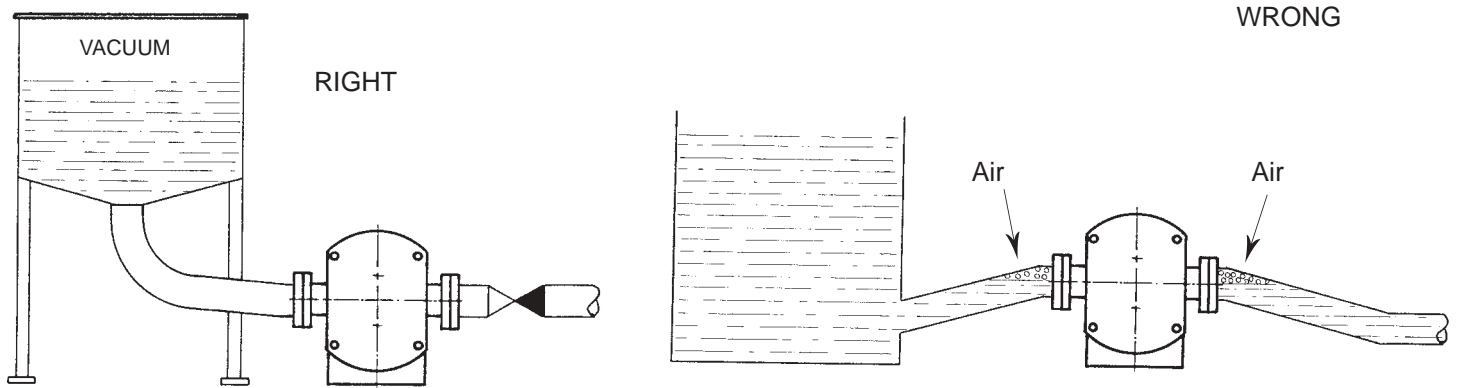


Fig. 7

16 - In vacuum sucking reduce at min. the friction losses due to suction pipe. Arrange a check valve on outlet side in order to:

- avoid the air or liquid reflux during the pause so that to keep the piping completely full;
- to make easier the starting on load.

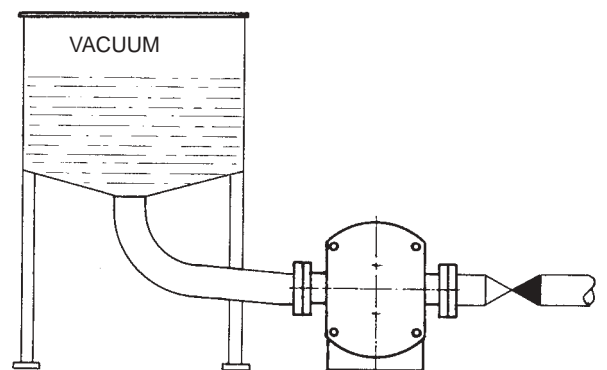


Fig. 8

### 3.3 - FIRST STARTING

1 - The terminal board connection and the thermic setting, made according to the maximum allowable absorption, must be carried out by qualified staff and following the instructions of the electric motor plate (♥ Δ).

2 - Wash the piping by means of clean water to remove foreign bodies, drosses and load.  
**IMPORTANT: Don't use a lobe pump for the a.m. duty.**

3 - Check all the gates on inlet and outlet are completely open.

4 - With dry lobes, the lobe pump has got a very low sucking power, therefore if the pump is not flooded, fill the rotor case and the suction pipe by means of liquid.

**IMPORTANT:** Lobe pumps can run even dry, because the moving parts are not in touch, except for slip faces of the seals which, especially at high speed, tend to get overheated. Therefore we suggest you should not let the pump run dry for long time in order to avoid seal wear. The allowed time for dry running depends on turning speed and on materials of seal slip faces (5 minutes for PTFE or carbon and 15 seconds for carbide).

5 - In pumps with flushed seals and heating jacket, check all these devices are regularly connected and the liquid used for flushing, above all for stuffing box seals with hydraulic barrier, is consistent with the pumped fluid.

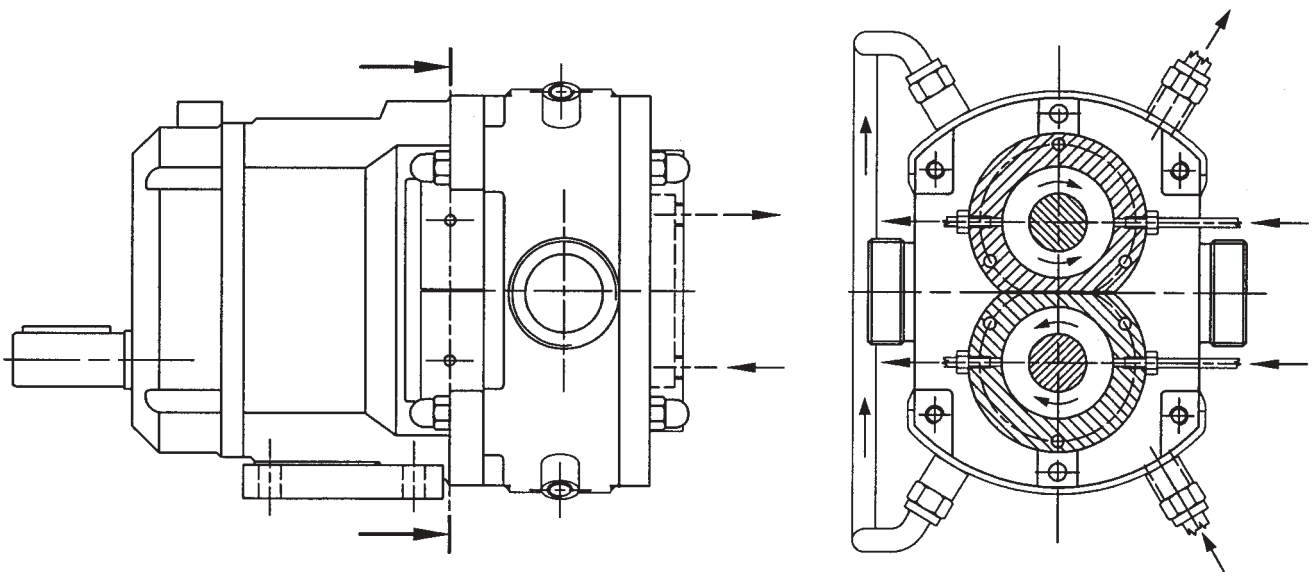


Fig. 9

6 - Check the right direction of pump rotation according to the position of the driving shaft. In standard versions the direction of rotation is reversible.

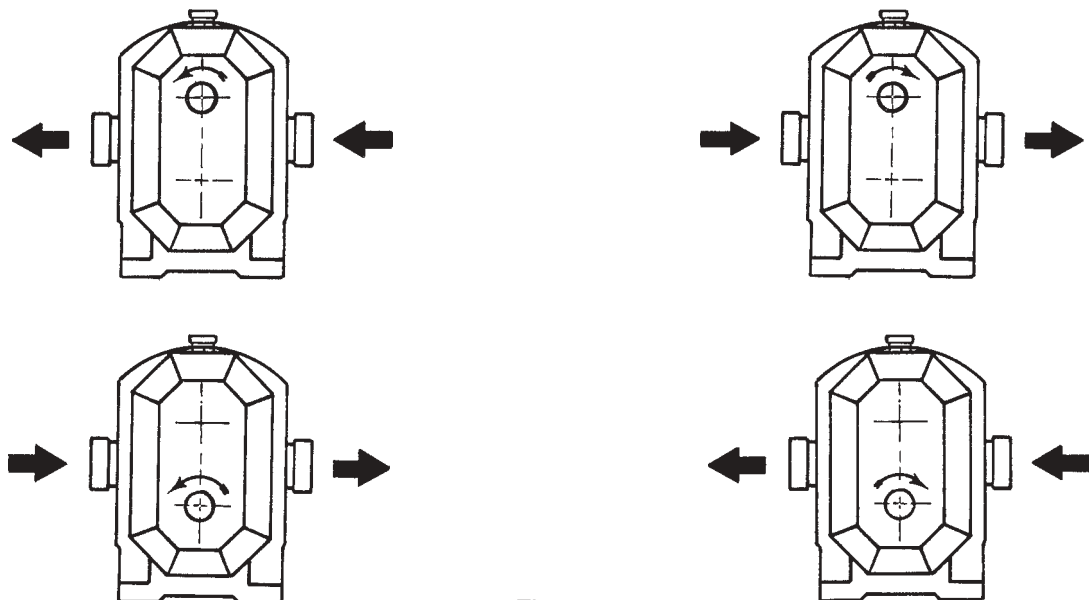


Fig. 10

- 7 - Start the pump possibly at reduced speed, then increase it till it reaches the duty speed, checking possible troubles (pressure overload, loss in piping, cavitation, vibration).
- 8 - If the duty speed is very high, it's normal that the bearing housing temperatures reaches 50-60°C, especially during the first working hours.

#### 4. GENERAL MAINTENANCE

##### 4.1 - LUBRICATION

- 1 - OMAC pumps are delivered ready filled with oil of ISO VG 68.

Advised lubricants Tab. 9

MAKE	DUTY TEMPERATURE	
	da -20°C a + 90°C	da +90°C a + 150°C
ESSO	SPARTAN EP 68	SPARTAN EP 150
SHELL	OMALA OIL 68	OMALA OIL 150
CASTROL	ALPHA SP 68	ALPHA SP 150
BP	ENERGOL GR-XP 100	ENERGOL GR-XP 150
MOBIL	MOBILGEAR 626	MOBILGEAR 629
AGIP	BLASIA 68	BLASIA 150
FINA	GIRAN 100	GIRAN 150

Oil quantity Tab. 10

PUMP TYPE	LITER
B100	0,2
B105 - B110 - B115	0,5
B215 - B220	1
B325 - B330	2,2
B430 - B440	4,5
B470 - B490	6,7
B550	15
B660-B680	30

- 2 - Check every day the oil level arranged on pump side, which must be completely filled with the pump off.
- 3 - When necessary top up using the lubricant oil as per Tab. 9.
- 4 - If the pump is used with vertical openings invert the plug position with the oil level.
- 5 - The oil replacement should be carried out after running-in of about 150 working hours, then after every 2500 hours.
- 6 - If the bearing housing works constantly with temperatures over 90°C, lubricate by means of oil with higher viscosity (see Tab. 9) and replace it every 1000 working hours.

##### 4.2 - SINGLE BALANCED MECHANICAL SEALS Fig. 23 - 24

- 1 - The mechanical seals require no maintenance.
- 2 - If a leakage occurs, because of contact surface wear, replace the complete seal (see disassembling instructions).
- 3 - In case of long working with worn seals, check the product doesn't enter the bearing housing.
- 4 - **IMPORTANT:** Don't work the simple mechanical seals dry.

##### 4.3 - FLUSHED MECHANICAL SEALS Fig. 25

- 1 - As well as the single mechanical seals, the flushed mechanical seals require no maintenance.
- 2 - When the mechanical seal is replaced, replace the turning ring (224) and the lip ring (223) of the auxiliary seal too.
- 3 - With a well connected flushing, the pump can work even with no product being pumped, because the seals can not become overheated.
- 4 - Check the fluxing is efficient during the pump working, in order not to damage the auxiliary seals (see connection diagram Fig. 9).
- 5 - To disassemble the flushed mechanical seals, see single mechanical seals instructions.
- 6 - To remove the stationary part of the mechanical seal, remove the flushing box from the rotor case.
- 7 - During the assembling, before inserting the rotating part of the mechanical seal, put rightly the turning ring (224) and assemble the auxiliary sealing ring (223) in its seat on the flushing box (220) according to drawing Fig. 25.

##### 4.4 - SEALS BALANCING

- 1 - All the mechanical seals of the lobe pumps are balanced, that is with stationary part locked by a special balancing ring 210 - 230 (Fig. 23 - 24 - 25).

2 -The balancing of the mechanical seal is indispensable when the pressure, measured on pump outlet, is about or exceeds 10 bar.

3 -The balancing is suggested even for low duty pressure, when there are:

- pressure peaks due to first breakaway
- extremely viscous products
- frequent starting
- fragile or soft seal material (graphite, ceramic, PTFE).

#### 4.5 - PACKING GLANDS Fig. 28 - 29

1 -Initial adjustment of the packing glands should be carried out during commissioning.

2 - After the pump has run for a few hours, the packing will have compacted and a further adjustment is necessary, taking care to leave a slow drop to provide lubrication of the packing.

3 - When the dropping loss is too big and further tightening is no more possible replace packing rings as well as shaft protection bush.

#### 4.6 - LIP SEALS Fig. 27

1 -The lip seals are composed by a support, in which two lip gaskets type UM are arranged: one turned inside for product sealing and the other turned outside for suction sealing. The shaft is protected by a bush in AISI 316.

2 -During the assembling, check the lip gaskets are rightly arranged on the support (244).

3 - Assemble the supports on rotor case, lubricate by means of grease between the gaskets and insert the bushes (241).

4 -Being the gaskets already seated, assemble the rotor case and tighten the socket head screws of the bushes, locking them on the shaft.

#### 4.7 - CAUTIONS

1 - If the product is subject to easy drying, crystallization or decantation, it's necessary to wash pump and piping system at the end of each work or at the beginning of a long plant pause.

2 - The reversibility of the rotation direction, peculiarity of all OMAC pumps, allows the product return, emptying discharge piping.

3 - If the pump hasn't run for long period, at starting check the sealing devices are not blocked, turning by hand the pump shaft.

4 - If the product is subject to congelation or solidification, before starting, check the pumps and piping are not blocked by solids, created during the pause.

#### 4.8 - DAILY CHECK

1 - Visual check of all sealing devices and of general working.

2 - If a leakage from mechanical seal occurs, arrange a replacement as soon as possible in order to avoid the product enters the bearing housing.

#### 4.9 - WEEKLY CHECK

1 - Check the oil level of the pump and of the motor unit; if necessary top up by means of oil according to manufacturer instructions.

2 - Check the rotor case and clean it, removing possible product deposits.

3 - Check that no siezures between rotors or among rotors and static surfaces of rotor case have occurred.

4 - Check the by-pass valve, when arranged, is not blocked after long working pause. To see it, it's necessary to untighten completely the adjusting screw (59) and re-arrange it in its initial position, indicated by retainer (62) Fig. 21.

#### 4.10 - SIX MONTH CHECK

1 -If the pump works constantly at high temperature, over 120°C, check the lubricant oil health; if it has become dark, arrange its replacement.

2 - Check the timing gears don't allow the rotors get in touch; otherwise replace the worn gears.

3 - Check the shaft stiffness; if they show a min. axial or radial play, replace the bearings.

4 - Check the corrosion of the bearing housing; if necessary arrange its repainting by means of a paint, suitable to protect it from a quick wear. The OMAC standard pumps are painted with: BRIGHT EPOXID ENAMEL RAL 7032.

If you carry out these checks sistematically, the pump will keep its initial performaces for many years.

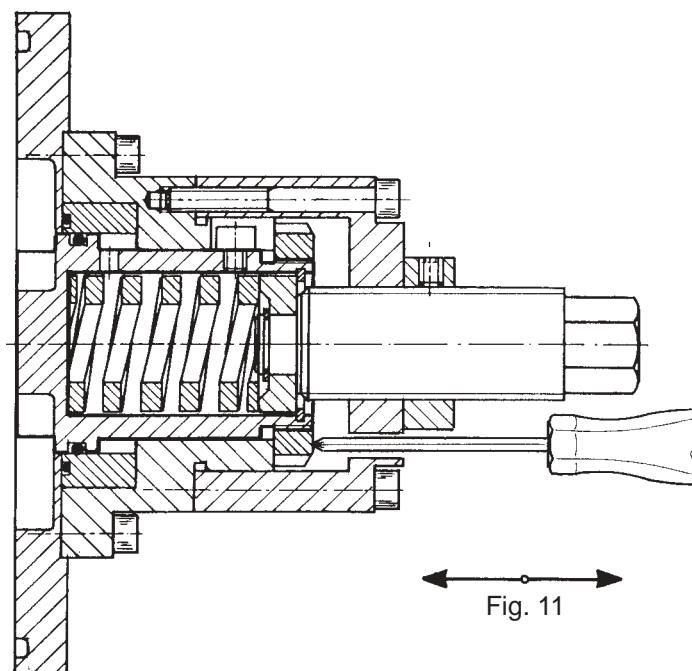
## 5. - RELIEF VALVE AND MANUAL BY-PASS

### 5.1 - RELIEF VALVE

- 1 - Arranging a safety valve, directly on pump or plant, is always suggested to save the pump in case of wrong acts, which may cause overpressure peaks.
- 2 - If the pump hasn't got a relief valve, it can not work with even partly blocked outlet pipe.
- 3 - Upon request OMAC pumps can be delivered with relief valve.
- 4 - The relief valve, directly arranged on pump end cover, is reversible and driven by a spring, register compressed.
- 5 - The relief valve adjustment must be carried on pump working because the recycle consistency depends on pump speed, product absolute weight and viscosity.
- 6 - In order to avoid continuous vibrations, the relief valve must be adjusted in such a way that it starts working with a pressure over 10% of duty pressure.

### 5.2 - RELIEF VALVE ADJUSTMENT Fig. 21

- 1 - Start the pump with the relief valve, still loose, i.e. with the spring not under pressure.
- 2 - Tighten the adjustment screw (59), compressing gradually the spring, checking the pressure on pump outlet doesn't exceed the max. allowed pressure.
- 3 - Acting on adjustment screw and checking by means of a probe, find out the valve critical opening point, under the required pressure.
- 4 - Compress the spring for 1/4 screw turn over the critical point in order to avoid vibrations.
- 5 - Put the register clamp (62) and tighten it by means of a suitable socket haed screw (65).



## 5.3 - MANUAL BY-PASS VALVE

- 1 - The relief valve can be used even as manual by-pass to adjust the capacity.
- 2 - Loosening the register screw (59), release the pressure on the spring so that to remove the piston (57) from the pumping chamber, letting part of the pumped liquid go back into the sucking chamber.
- 3 - This operation is not allowed with volatile liquids or with products sensitive to temperature increase, due to the product continuous recycle.
- 4 - For products with viscosity over 15.000 Cps, if you have to recycle the whole pumped product, we suggest you should arrange on line a by-pass, rightly proportionate, so that it allows the whole flow transit.

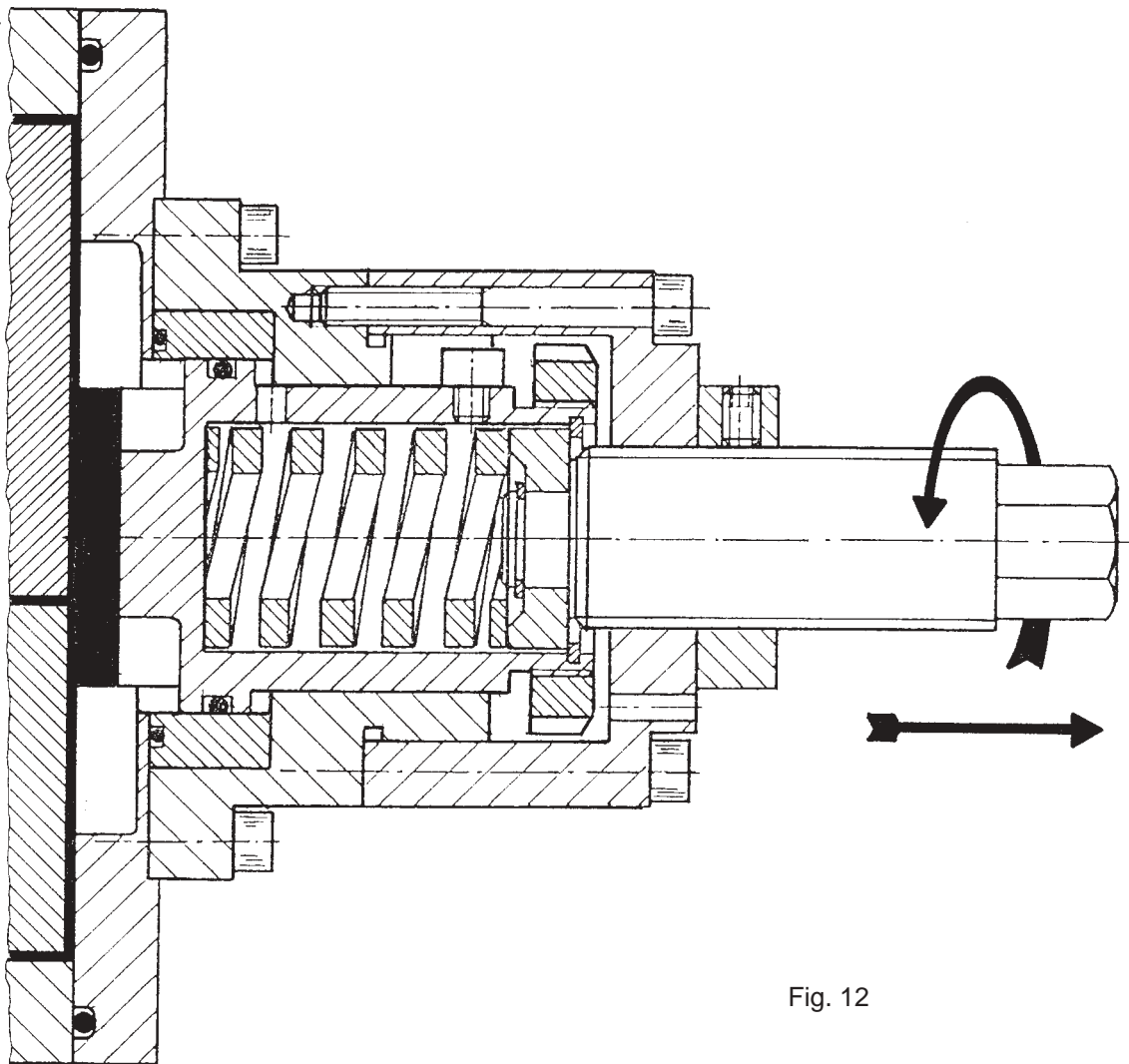
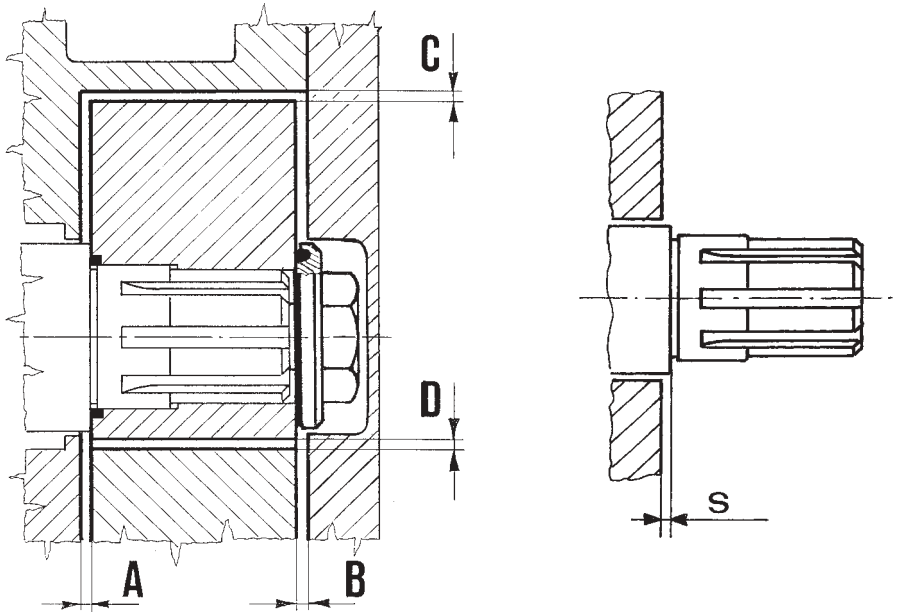


Fig. 12

## 6. - TROUBLE SHOOTING GUIDE

No flow	Insufficient flow	Irregular flow	Pump loses prime	Pump blocks as soon as it starts	Pump gets overheated	Motor gets overheated	Pump absorbs too much power	Pump is noisy or vibrates	Rotors wear out	Seals wear out quickly	Pump seizes	INCONVENIENCES	CAUSES	REMEDIES
●													Wrong rotation direction	1. Invert it
●													Unprimed pump	2. Fill pumping chamber and feeding piping with liquid, expelling air
●	●	●	●					●					Not enough flushed	3. Increase flushing height, enlarge suction piping diam, reduce suction piping length and bends, reduce pump speed and medium temperature, check the viscosity increase is suitable to motor power
	●	●	●					●					Product evaporates at inlet	4. Remedies as per par. 3
	●	●	●					●					Air enters inlet	5. Check and tighten suction piping connections, tighten the packing gland, if necessary replace it
●	●	●	●					●					Air is in suction piping	6. Remedies as per par. 2
	●	●	●					●					Not enough flushed in suction container	7. Increase product level, lower suction opening position
●	●	●	●					●					Dirty or blocked valve or suction filter	8. Clean them
			●	●	●	●	●	●					Excessive product viscosity	9. Reduce pump speed, increase product temperature
●				●				●	●	●			Insufficient product viscosity	10. Increase pump speed, decrease product temperature
●				●		●	●						Excessive product temperature	11. Decrease product temperature, cool pumping chamber
			●		●	●							Insufficient product temperature	12. Increase product temperature, heat pumping chamber (within the limits given by manufacturer)
								●	●	●	●		Suspended particles in product	13. Clean suction pipe, arrange on inlet a filter
●				●	●	●	●	●			●		Excessive back pressure	14. Remove possible obstructions in outlet piping, clean it, enlarge its diam., reduce lengths and bends of outlet piping
				●	●	●					●	●	Too tight packing	15. Loosen packing gland and tighten it rightly (see instructions)
●	●	●						●					Too loose packing	16. Tighten packing gland rightly (see instructions)
		●	●			●	●	●					Insufficient seal liquid	17. Check liquid flow and if necessary increase it
		●	●			●	●	●					Excessive pump speed	18. Decrease pump speed
●													Insufficient pump speed	19. Increase pump speed
				●	●	●	●	●			●		Press on rotor case	20. Check piping alignment, insert flexible joints, sustain piping
●													Belt slips	21. Stretch it
				●	●	●	●						Not alined joint	22. Adjust alignment between pump and drive device
								●					Pump or drive device not fixed on base	23. Tighten anchor bolts, re-checking alignment
				●	●	●	●	●	●	●	●		Worn out bearings	24. Have them replaced by manufacturer
			●	●	●	●	●	●	●	●	●		Worn out or unsynchronized gears	25. Replace them or adjust them according to manufacturer's instructions
				●	●	●	●				●		Wrong quantity or quality of gear oil	26. Act according to manufacturer's instructions
			●	●	●	●	●	●	●	●	●		Parts in touch rotor case	27. Check plan pressure and duty pressure, contact manufacturer
●				●	●								Worn out rotors	28. Replace them
●	●			●									Check valve leaks	29. Check valve adjustment, check and clean sealing devices, if necessary replace parts
●								●					Check valve vibrates	30. Check valve adjustment (see instructions), check and clean valve
●								●					Check valve is bad adjusted	31. Adjust spring compression, so that valve opens with a pressure over 10% of duty pressure.



Tab. 13 - ROTOR CLEARANCES

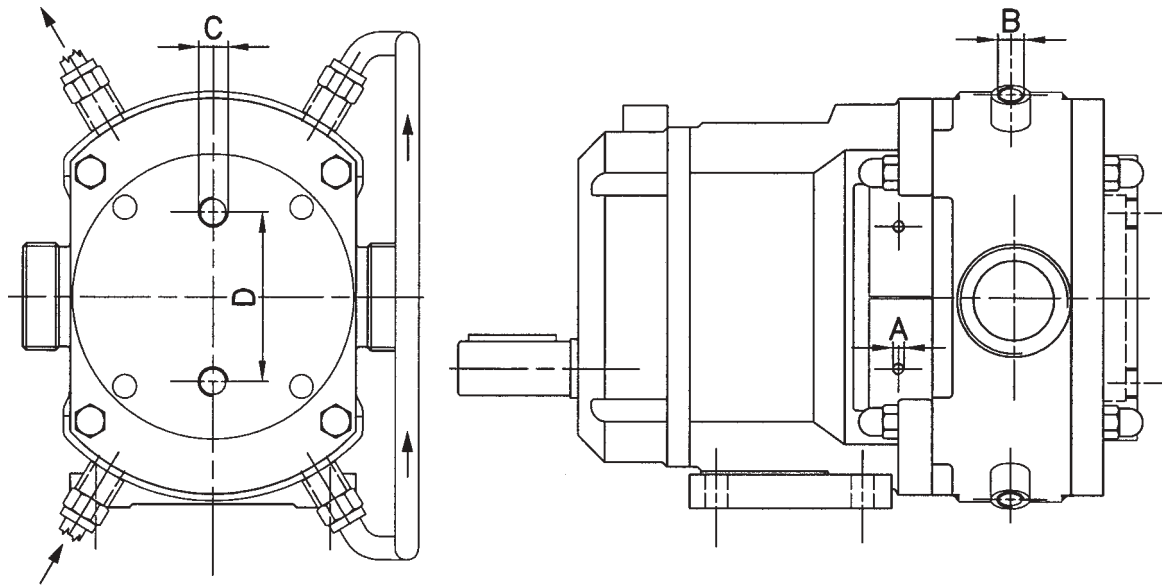
	Rotors in AISI 316 ST version				Rotors in AISI 316 SM version				Rotors in S.S. anti-seizure alloy				Shaft jut
	A	B	C	D	A	B	C	D	A	B	C	D	S
B100	0,12	0,12	0,15	0,20	0,15	0,15	0,20	0,20	0,07	0,08	0,12	0,15	0,12
B105 - B110	0,14	0,14	0,15	0,30	0,19	0,19	0,22	0,30	0,07	0,08	0,20	0,20	0,14
B115	0,14	0,14	0,18	0,30	0,19	0,19	0,22	0,30	0,07	0,08	0,20	0,20	0,14
B215	0,15	0,15	0,18	0,30	0,22	0,23	0,32	0,30	0,07	0,08	0,20	0,20	0,15
B220	0,15	0,17	0,23	0,30	0,25	0,25	0,32	0,30	0,07	0,08	0,20	0,20	0,15
B325	0,17	0,17	0,20	0,35	0,25	0,25	0,32	0,35	0,10	0,10	0,25	0,20	0,17
B330	0,17	0,19	0,23	0,35	0,27	0,28	0,32	0,35	0,10	0,10	0,25	0,20	0,17
B430	0,18	0,18	0,22	0,35	0,27	0,27	0,32	0,35	0,10	0,10	0,25	0,20	0,18
B440	0,18	0,18	0,22	0,35	0,27	0,27	0,32	0,35	0,10	0,10	0,25	0,20	0,18
B470	0,20	0,20	0,27	0,35	0,32	0,32	0,35	0,35	0,10	0,10	0,25	0,20	0,20
B490	0,20	0,20	0,27	0,35	0,32	0,32	0,35	0,35	0,10	0,10	0,25	0,20	0,20
B550	0,22	0,22	0,35	0,40	0,32	0,32	0,40	0,40	0,15	0,15	0,35	0,25	0,22
B660	0,27	0,27	0,35	0,50	0,37	0,37	0,50	0,50					0,27
B680	0,27	0,27	0,35	0,50	0,37	0,37	0,50	0,50					0,27

Dimension in mm - Tolerance 0/+0,03

Tab. 14 - Tightening torque - Nm

Pump size	Pos. 8 gear adjustment		Pos. 42 rotor locking		Pos. 52 rotorcase		Pos. 51 end cover	
	Key size (mm)	Torque (Nm)	Key size (mm)	Torque (Nm)	Key size (mm)	Torque (Nm)	Key size (mm)	Torque (Nm)
B100	A=7	3,5	A=17	27	A=10	7	A=10	7
B1	B=4	8	A=27	83	A=13	18	A=13	18
B2	B=5	12	A=30	127	A=17	32	A=17	32
B3	B=6	29	A=38	350	A=19	54	A=17	54
B4	B=8	52	A=46	520	A=24	127	A=19	54
B470	B=8	52	A=46	520	A=30	223	A=22	83
B5	A=19	88	A=46	520	A=22	54	A=19	54
B6	A=24	203	A=60	750	A=22	83	A=22	83

Key type: A= hexagonal-head, B= Allen, socket head  
 Equivalences: 1 mm= 0,0394 inches



Tab. 15 - Heating jacket and seal flushing connections

	B100	B1	B2	B3	B4	B470 - 490	B5	B6
A	-	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/4"
B	-	1/4"	1/4"	1/4"	1/2"	3/4"	3/4"	3/4"
C	1/8"	1/4"	1/4"	1/4"	1/2"	3/4"	3/4"	3/4"
D	56	75	100	122	150	180	230	300

Cylindrical GAS thread UNI 228 - Dimensions in mm

	B100	B1	B2	B3	B4	B470-490	B5	B6
d1	20	30	35	50	65	80	65	100
d6	29	39	44	62	77	95	77	115
d7	35	45	50	70	85	105	85	125
L1	29,1	29,1	29,1	34,1	38,8	43,8	38,8	41,3
L2	44	44	44	50	55,5	59	55,5	85
L3	19,1	19,1	19,1	21,1	25,8	25,8	25,8	25,8
L4	10	10	10	13	13	18	13	15,5
L5	2	2	2	2,5	2,5	3	2,5	3
L6	5	5	5	6	6	7	6	7
L7	9	9	9	9	9	9	9	9
L8	2	9,5	14	14	16	21	45	56

Tab. 16 - Mechanical seal overall dimensions in mm

Tab. 17 - Bearings

Pump size	Bearings pre-assembled	
	front	rear
B1	32006 X	
B2	32008 X	32007 X
B3	32010 X	32008 X
B4	32014 X	32012 X

Pump size	ISO Bearings	
	front	rear
B100	TLA 3020 Z	NATB 5904
	LRT 253020	
B5	NJ 2216 E	3214
B6	NJ 224 E	3220

- 1 - The bearings of pump types B1 - B2 - B3 - B4 are composed by 2 off single row taper roller bearings, a spacer for inside rings and a spacer for outside rings.  
The assembling of type SET-RIGHT™, of TIMKEN company, is carefully carried out by our staff in order to grant an ideal rolling without clearances.  
Therefore these bearings must be directly requested to OMAC, that supply them already pre-assembled for the right pre-loading.
- 2 - The bearings for pump type B5 - B6 are according ISO norms of straight roller type and double ball crown type, everywhere available.
- 3 - The bearings life time depends on duty conditions (speed, pressure, absorbed power). Calculus about bearing life time will delivered, upon request, only if duty conditions are well know.

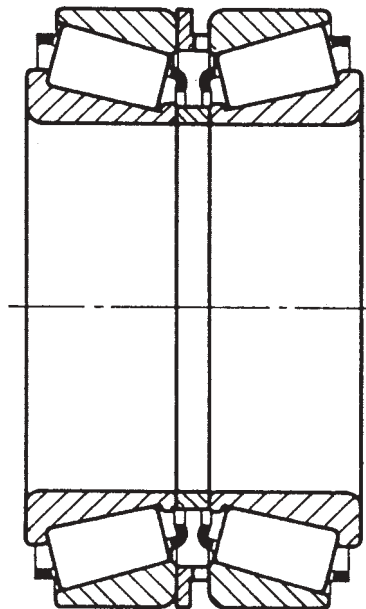


Fig. 13 - Bearing SET-RIGHT™

8. - INSTRUCTIONS FOR ASSEMBLY AND DISASSEMBLY. PUMP TYPE B1 - B2 - B3 - B4 - B550

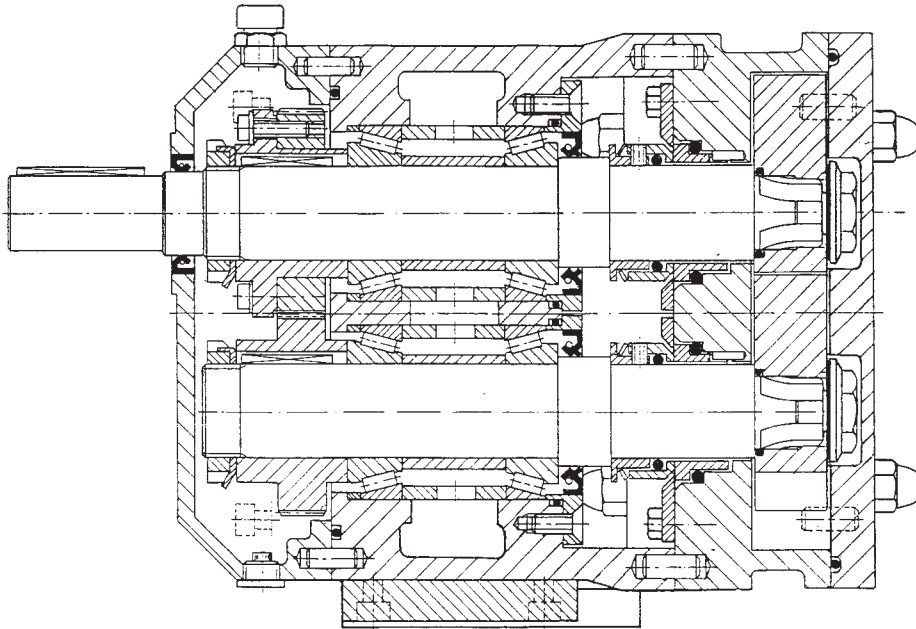


Fig. 14 - Cross section type B105 - B110 - B115

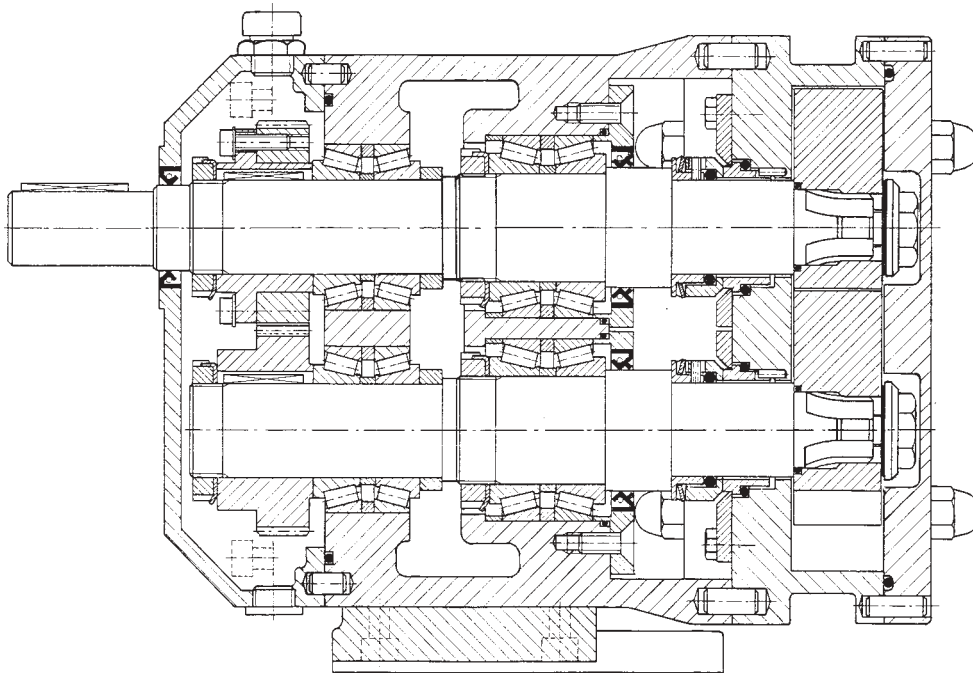
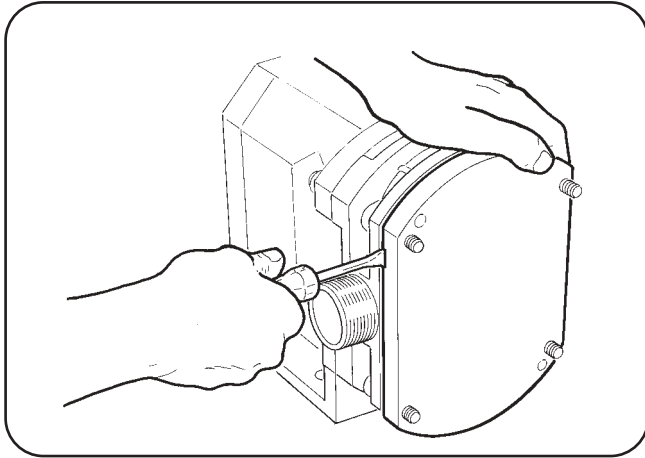
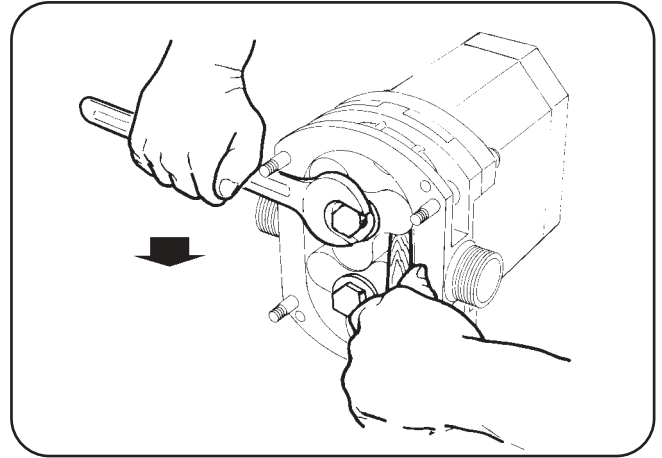


Fig. 15 - Cross section type B215 - B220 - B325 - B330 - B430 - B440 - B550

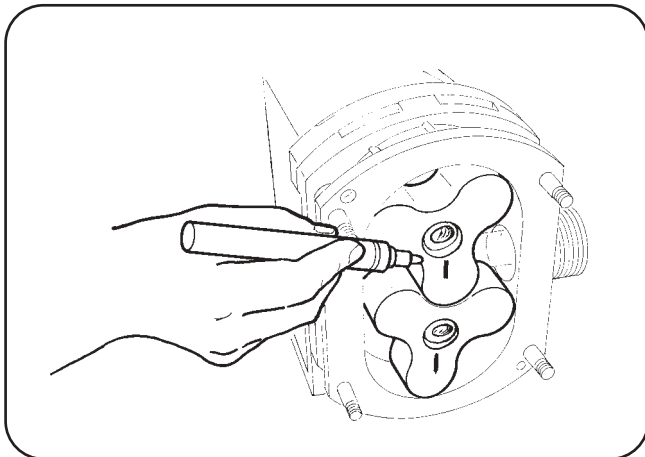
## ROTOR CASE DISASSEMBLY - PUMP TYPE B1 - B2 - B3 - B4 - B550



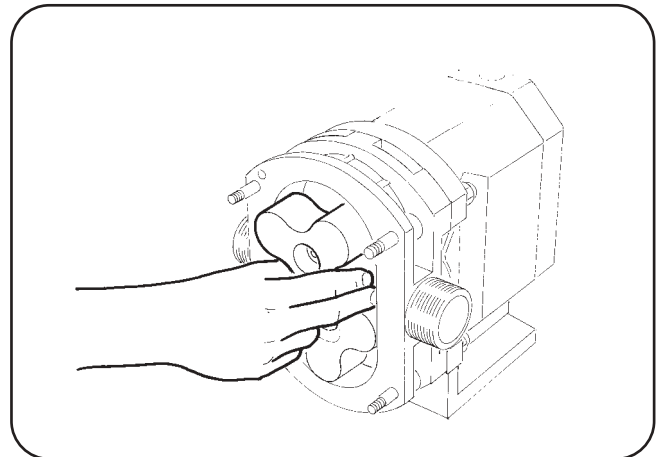
1. Remove the front nuts and exert leverage in the provided slots on cover.



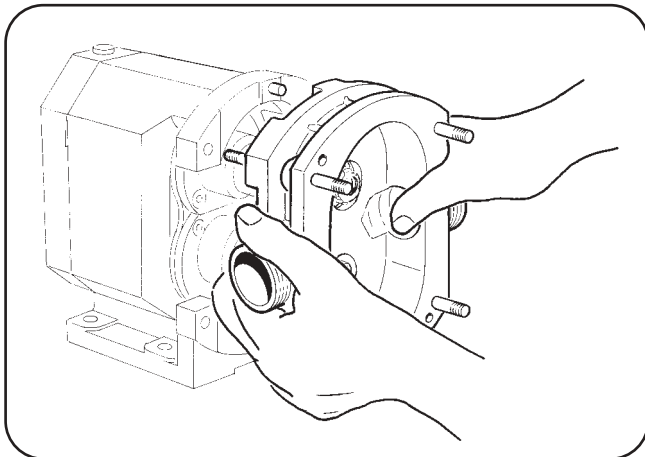
2. Unscrew anticlockwise the rotor nuts, interposing a non metal element between the rotors, making them stop rolling.



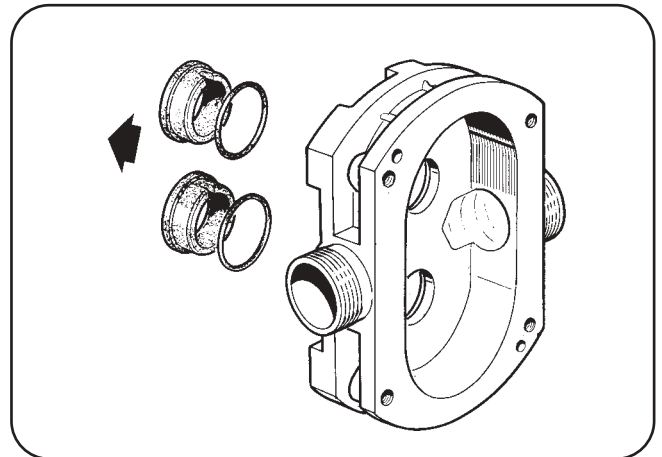
3. Take care of the reference marked on rotors and shafts (1-2) so that you will set them rightly while re-assembling.



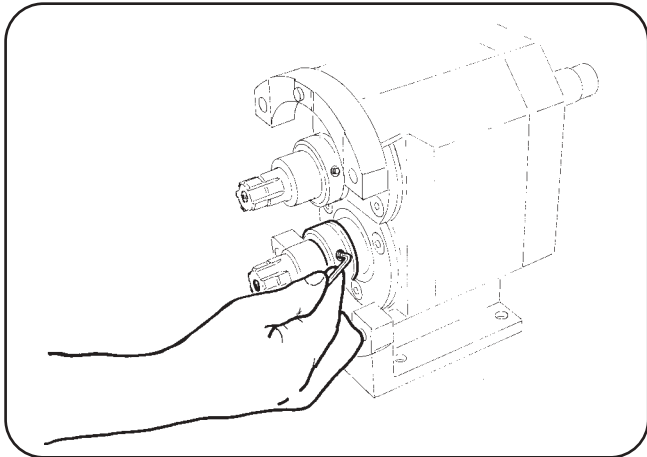
4. Extract the rotors, taking care you don't damage them by means of metal tools.



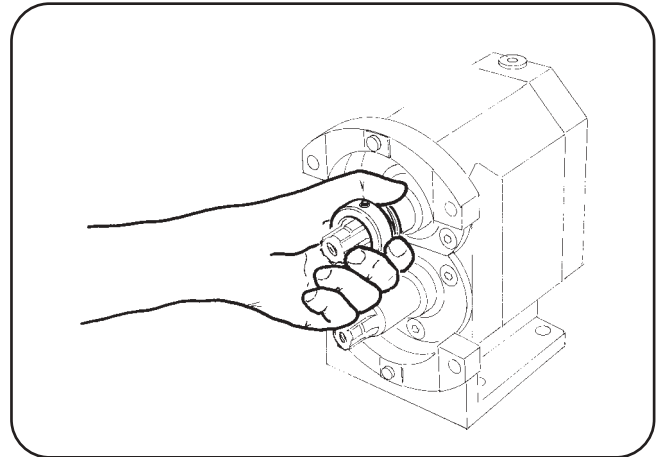
5. Unscrew the back nuts and extract the rotor case.



6. Extract the stationary part of the mechanical seal from rotor case.



7. Untighten the socket head screws on mechanical seal.



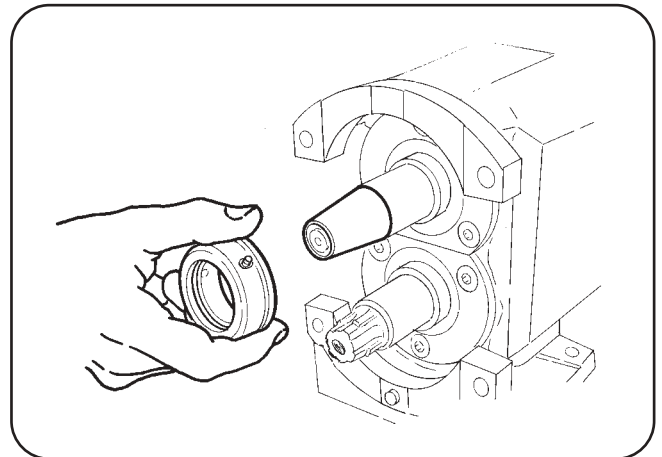
8. Extract the rotating part of the mechanical seal from the shaft.

## ROTOR CASE ASSEMBLY Mod. B1 - B2 - B3 - B4 - B550

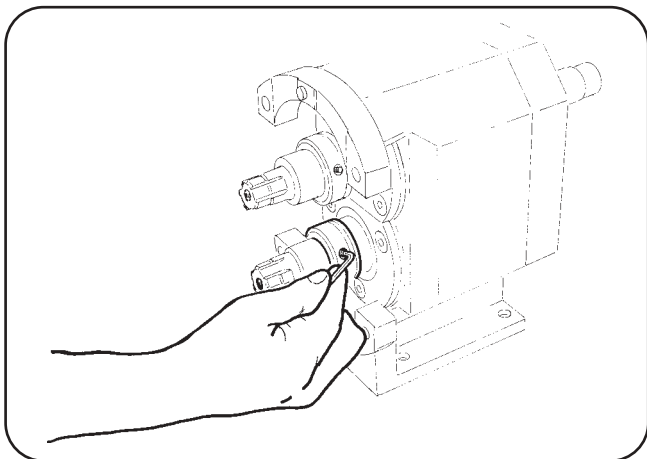


### 9. IMPORTANT!

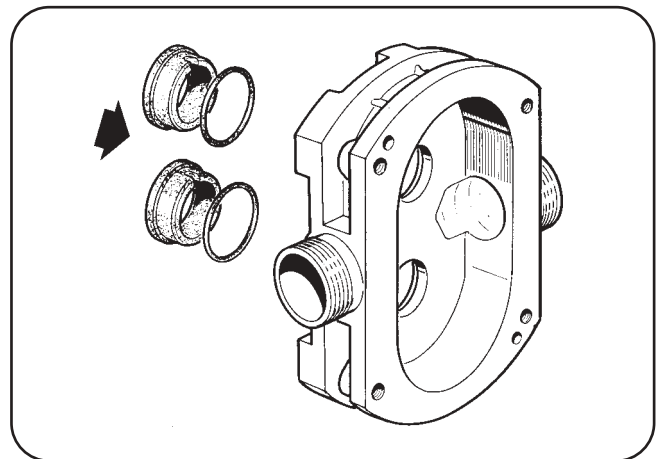
During the following operations, take care you don't damage the lapped seal surface; don't lay them on the bench and handle them with clean hands.



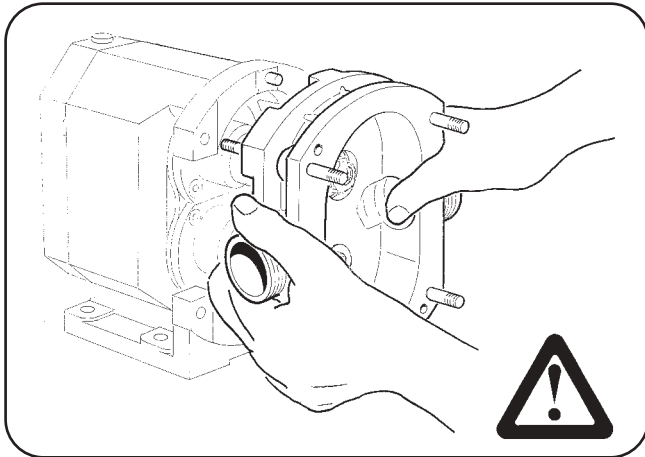
10. Clean carefully the shafts.  
Lubricate lightly the O-ring and introduce the rotating part of the seal, possibly by means of a conical bush.  
Exert pressure only with hands; avoid using metal tools.



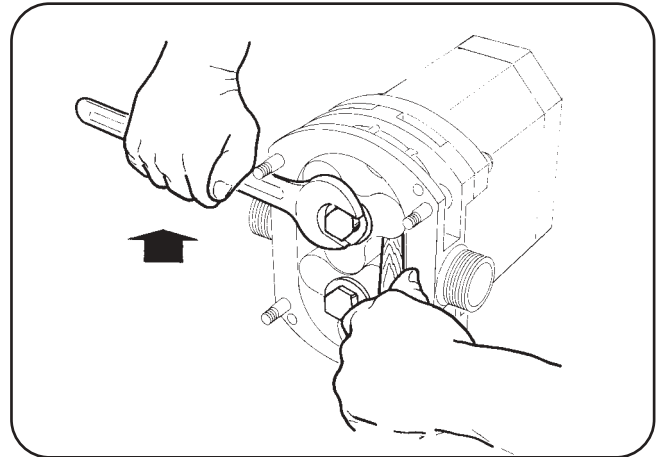
11. Be sure the mechanical seals stand on the shaft shoulder and tighten by degrees the socket head screws. We suggest you should use a thread locking adhesive in order to avoid their untightening on work.



12. Assemble the stationary part of the seal on rotor case, taking care to align the slot with the retainer pin, already arranged on seat bottom.

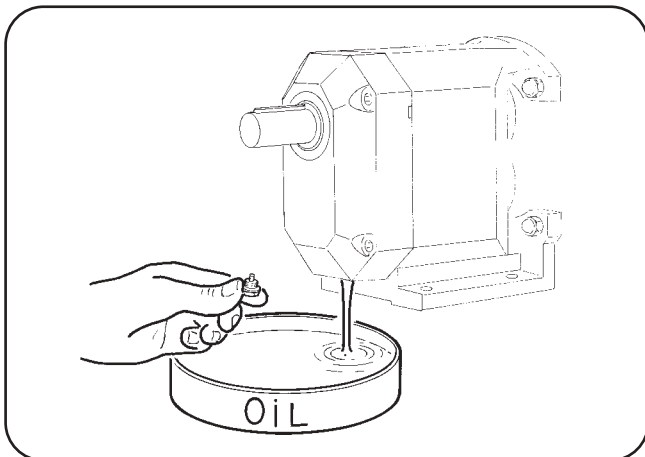


13. **Clean carefully the seal slide surfaces and assemble the rotor case** delicately in order not to damage the seals and be sure it is well set on plugs. Clamp the back nuts.

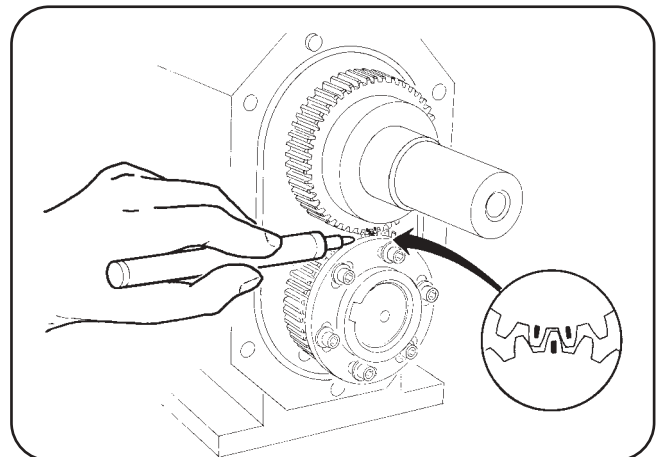


14. Assemble the rotors, setting them on pitch setting, according to reference marks (1-2). Clamp the rotor nuts (see tab. 14). In order to stop turning, interpose a non metal element between rotors

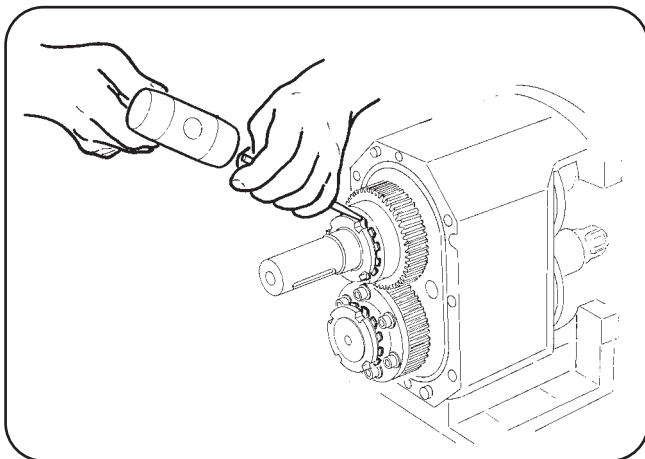
## BEARING HOUSING DISASSEMBLY - PUMP TYPE B1 - B2 - B3 - B4



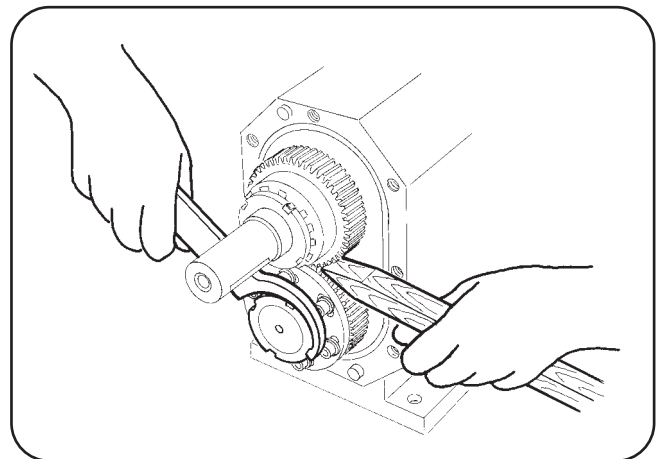
15. After disassembling the rotor case, remove the oil and the drive key on shaft.



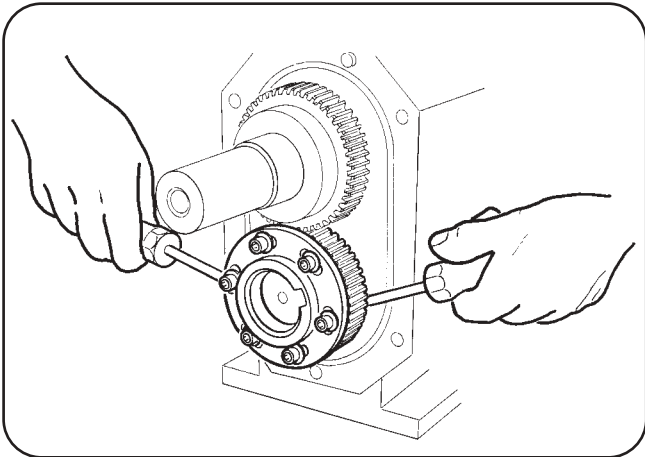
16. Remove the gear cover and make a reference mark on gears in order to respect the right timing while re-assembling.



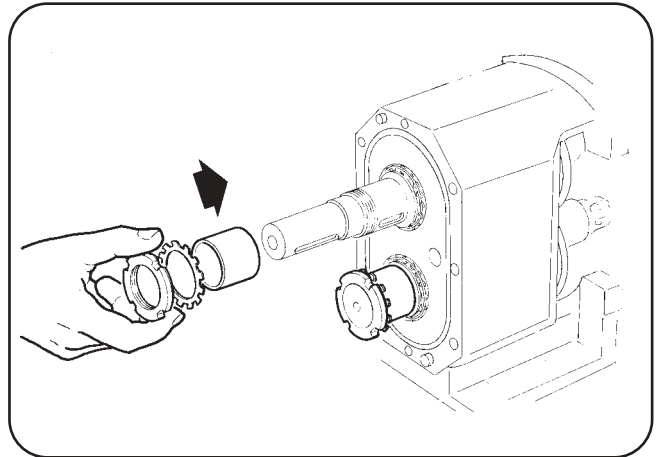
17. Disconnect the retainer keys on lock washers.



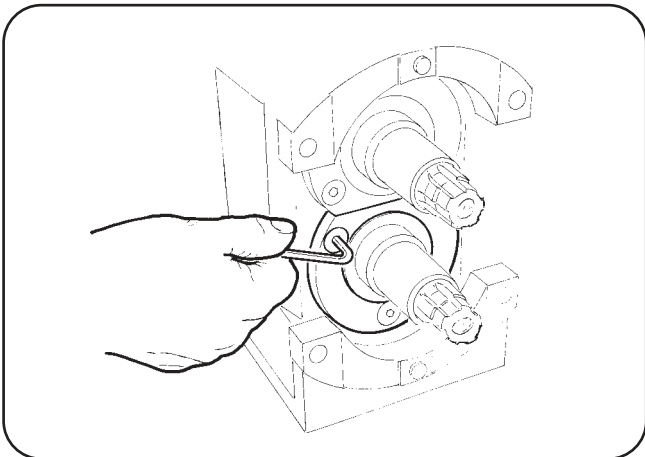
18. Unscrew the retainer ring nut, inserting a non metal wedge between gears in order to stop turning.



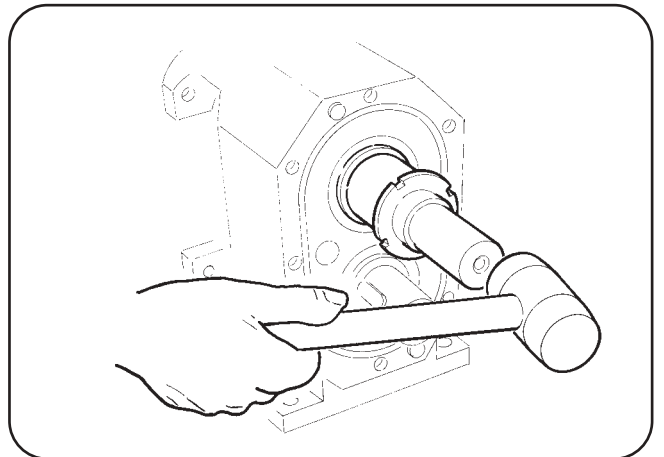
19. Extract the gears, exerting leverage between the bearing housing and the gears side, without damaging the tothing outline.



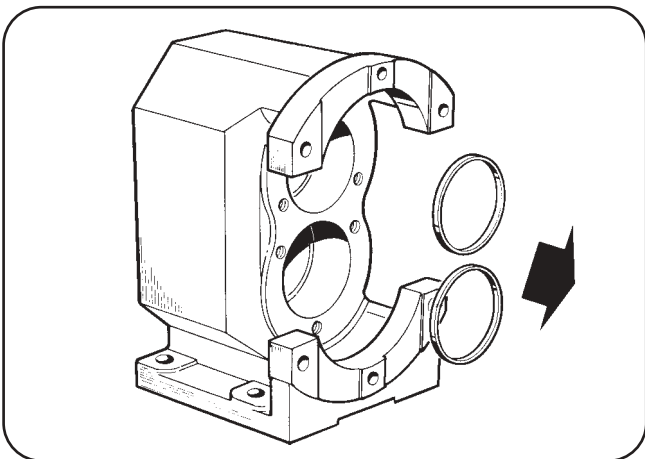
20. On mounting and dismounting we suggest you should replace the gears with a spacer in order not to break down the pre-assembled bearing.



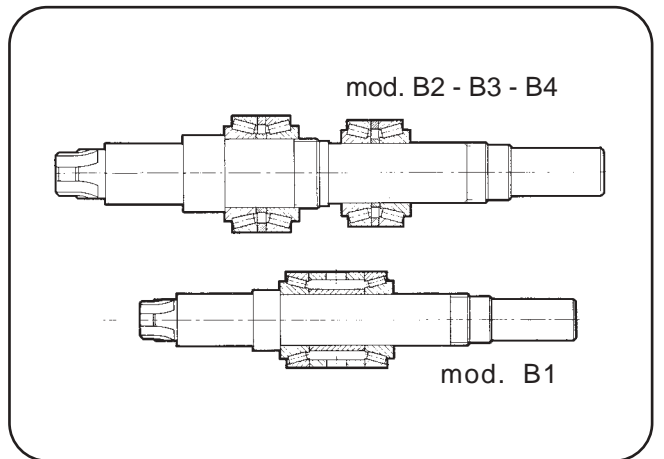
21. Remove the bearing retainers.



22. Extract the shafts by means of a non metal hammer.

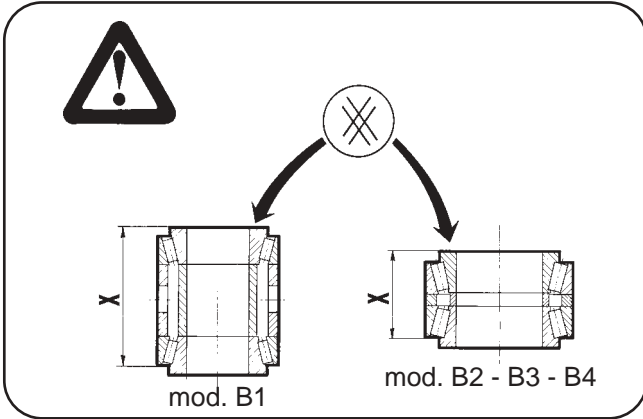


23. Mark the spacers for the axial shaft adjustment, then replace them rightly while re-assembling.

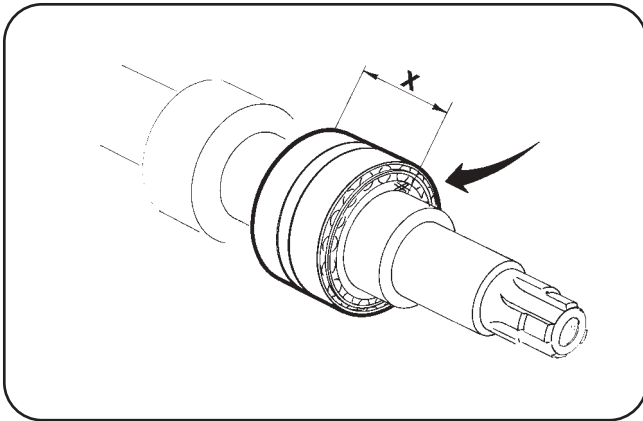


24. Disconnect the retainer keys of lock washers; unscrew the retainer ring nuts and remove the bearings.

## BEARING HOUSING ASSEMBLY - PUMP TYPE B1 - B2 - B3 - B4

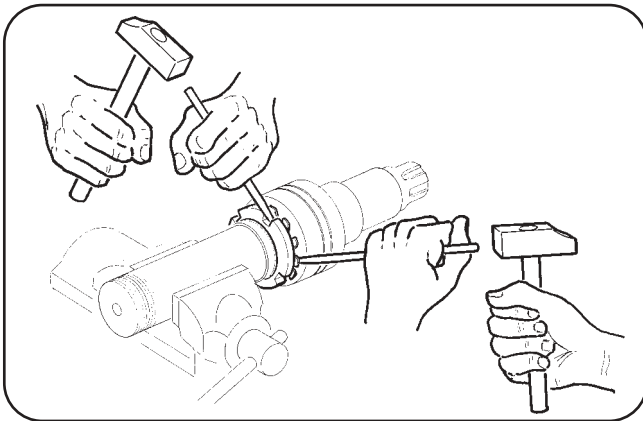


25. The bearing are pre-assembled with right preloading. Bearing parts can not be replaced with others. You can not invert parts of the same bearing. In order to interchange front bearings, that lock the shaft axially, you should respect the reference mark (⊗) that must be put on shaft shoulder. On type B 105, B 110, B 115 a single, pre-assembled and axially locked bearing is arranged.



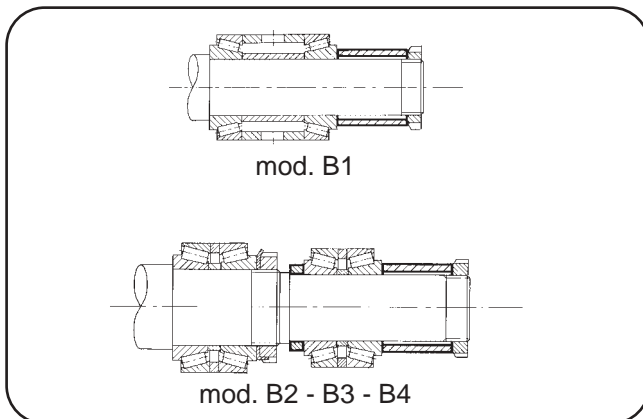
26. Dimensions "X" ( $\pm 0,02$ )

B1	B2	B3	B4
63	39,50	41,40	50,90

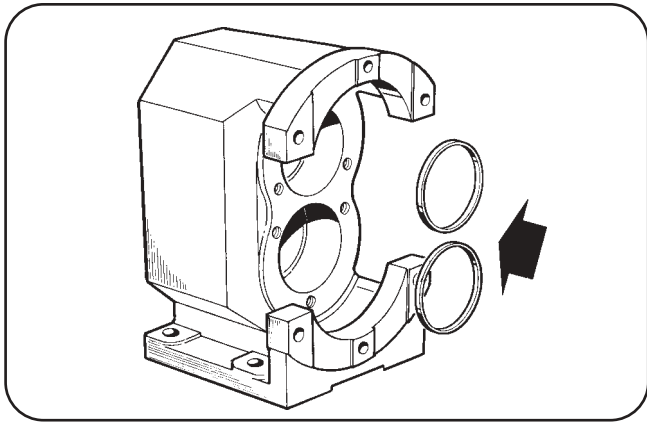


27. Assemble the pre-assembled front bearing, tighten the ring nut and set the retainer key in the ring nut slot.

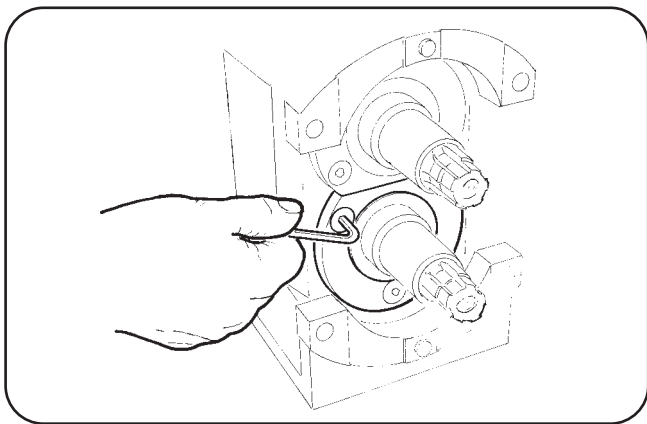
**IMPORTANT:** Put all keys of the safety washer up to the ring nut in order to let the spacer pass for the axial adjustment.



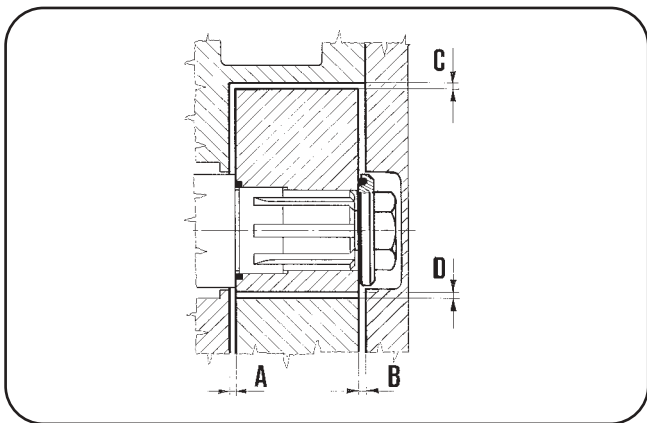
28. Assemble the pre-assembled rear bearing, tighten the retainer ring nut inserting a spacer suitable to replace the gear, in order to keep the bearing assembled during the mounting operations.



29. Set the spacers for axial shaft adjustment and assemble the shafts with the already fixed bearings.

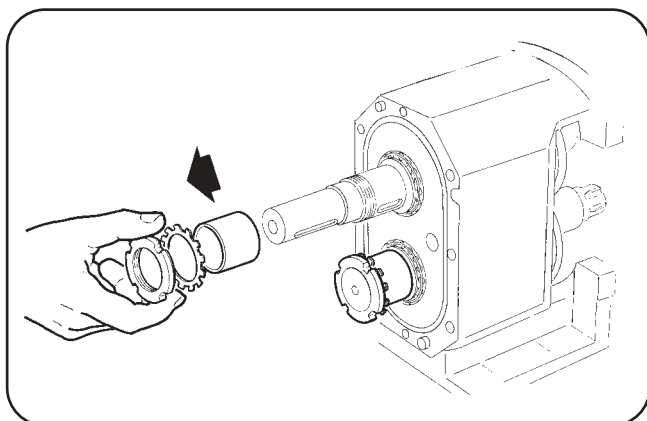


30. Set the O-ring gasket in its seat and assemble the bearing retainers with oil lip seal already fixed. Assemble the rotor case and rotors as previously described and check the plays as per tab. 13.

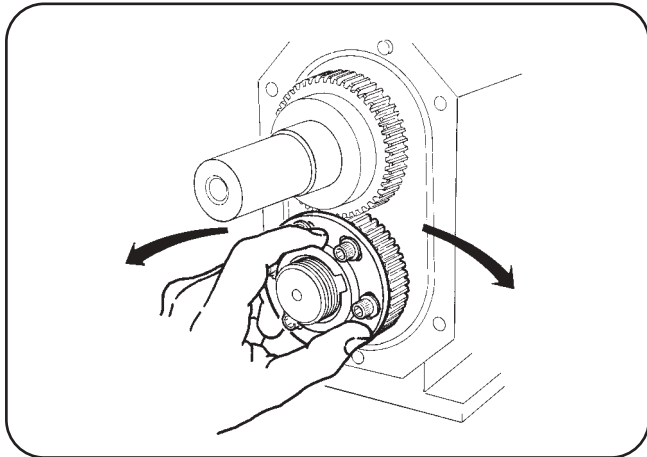


31. If rotor clearances are not included in tolerances as per tab. 13, disassemble rotors, the rotor case and adjust the spacer according to the requested dimension.

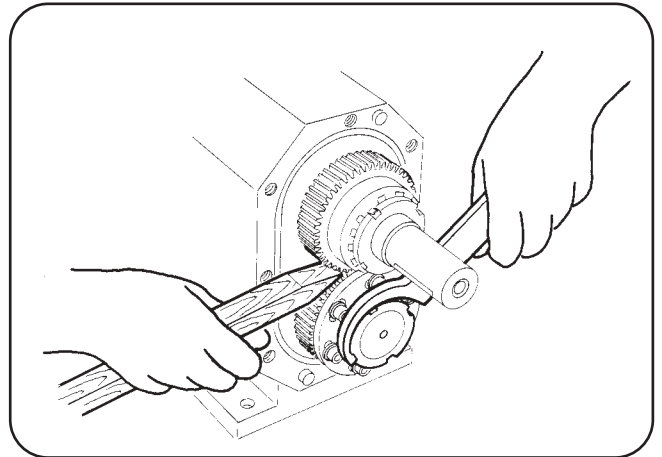
**N.B.** A spacer set can be requested to the manufacturer company.



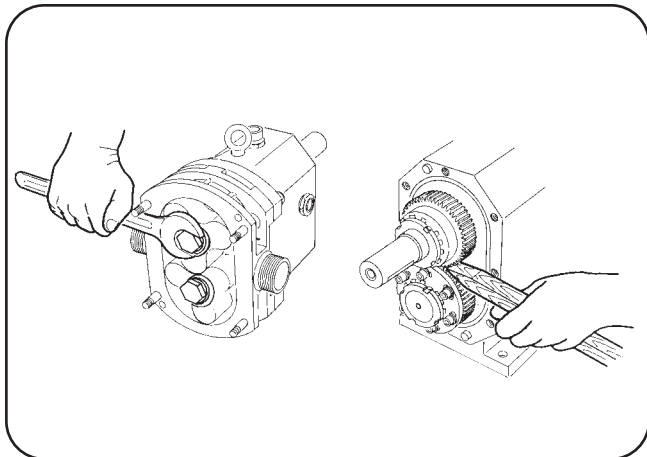
32. Remove the spacers used for dismounting and insert the keys for gear drive in their seats with a lightly forced connection.



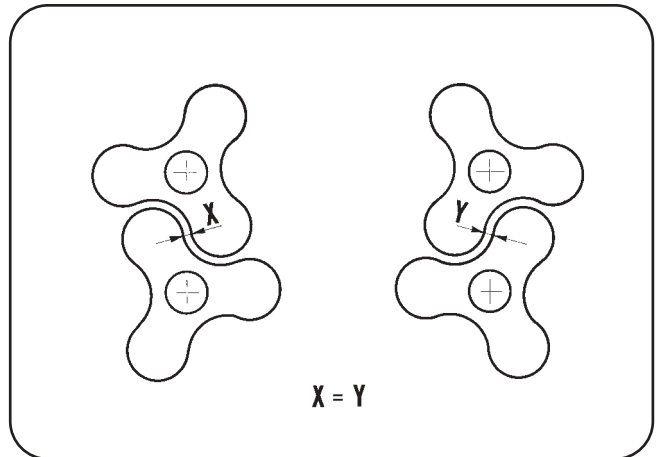
33. The gear couple is composed by a fixed gear and an adjustable one. Assemble the fixed gear, then the adjustable one with untightened screws, taking care to a first approximate rotor timing.



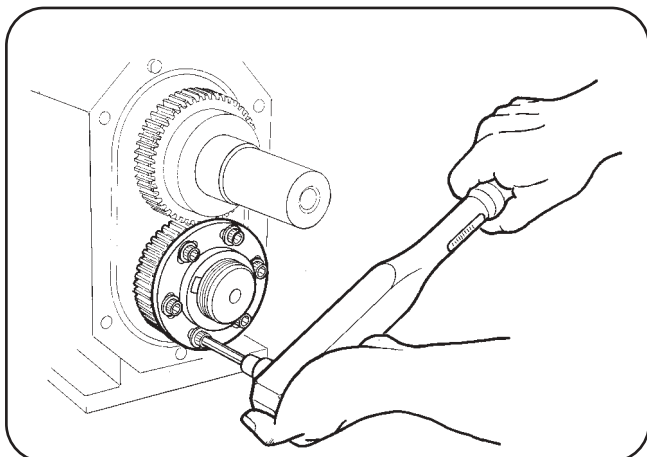
34. Tighten the retainer ring nuts with the corresponding safety washers and set rightly the suited retainer key. In order to avoid turning during operation insert a wedge in soft material among the gear teeth.



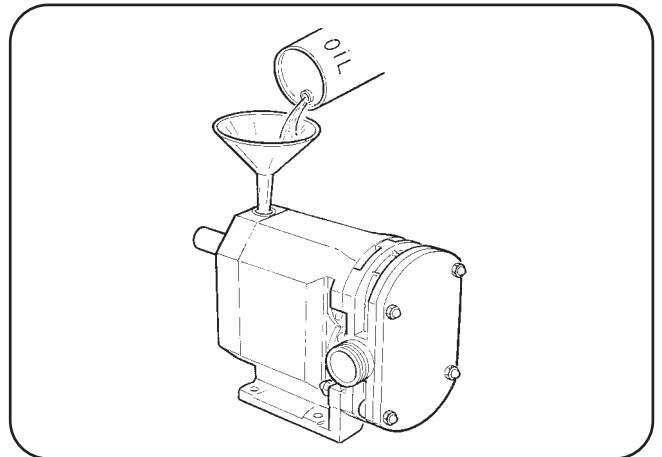
35. Being the wedge inserted among the gears tighten the rotor nuts, taking care of the driving torque as per tab. 14.



36. Time perfectly the rotors and tighten the screws of the adjustable gear gradually, checking the rotor timing.



37. Tighten completely the adjustable gear screws taking care of the driving torque as per tab. 14.  
**N.B.** IN CASE OF RE-TIMING IT'S NECESSARY TO REPLACE THE PLANE WASHERS, CAVED BY PREVIOUS CLAMPING.



38. Assemble the gear cover, taking care to set the O-ring gasket and insert the key on the shaft. Put into bearing housing the oil quantity as per tab. 10.

9. INSTRUCTIONS FOR ASSEMBLY AND DISASSEMBLY. PUMP TYPE B6

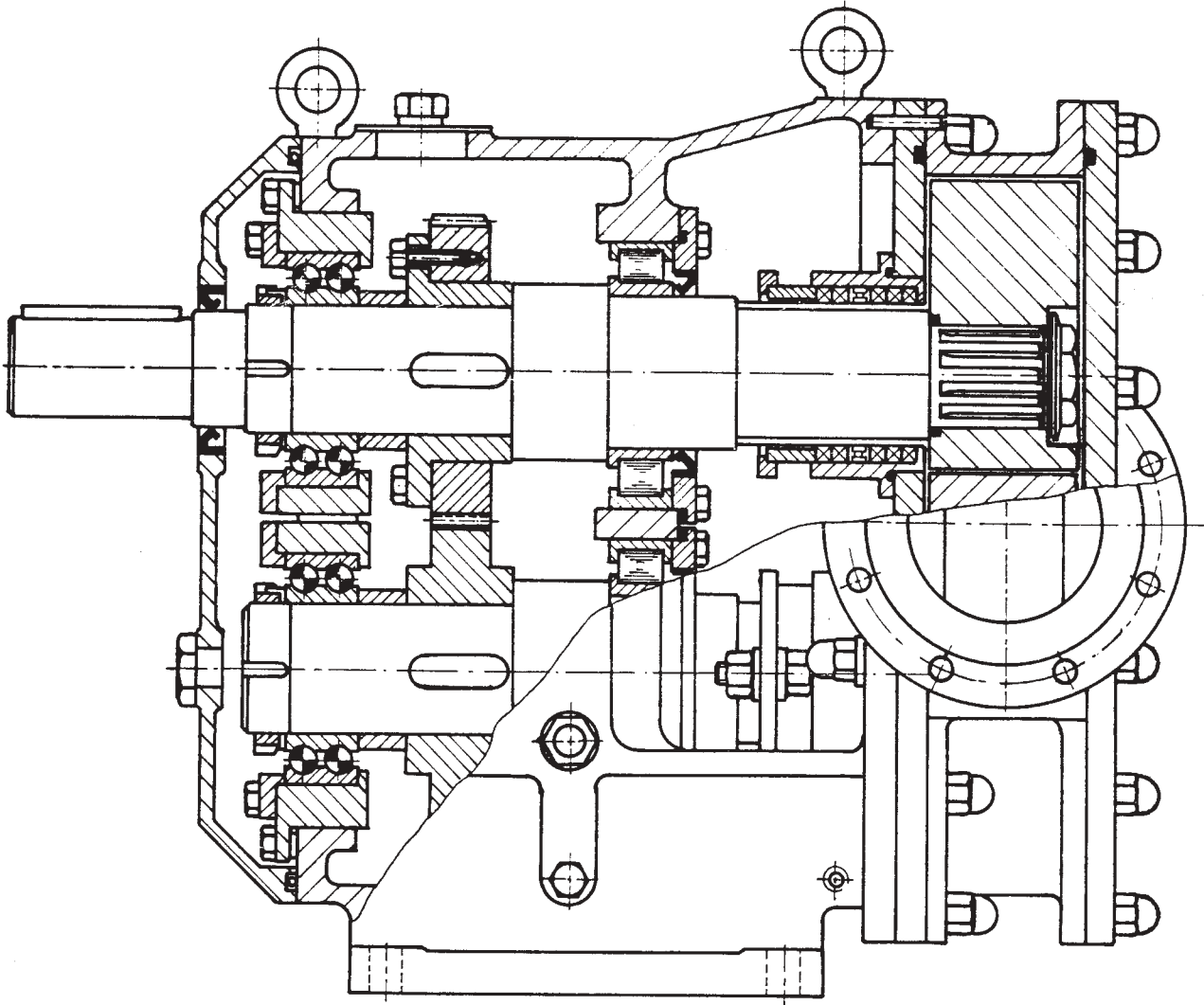


Fig. 16 Cross section type B660 - B680

## 9. INSTRUCTIONS FOR ASSEMBLY AND DISASSEMBLY. PUMP TYPE B550

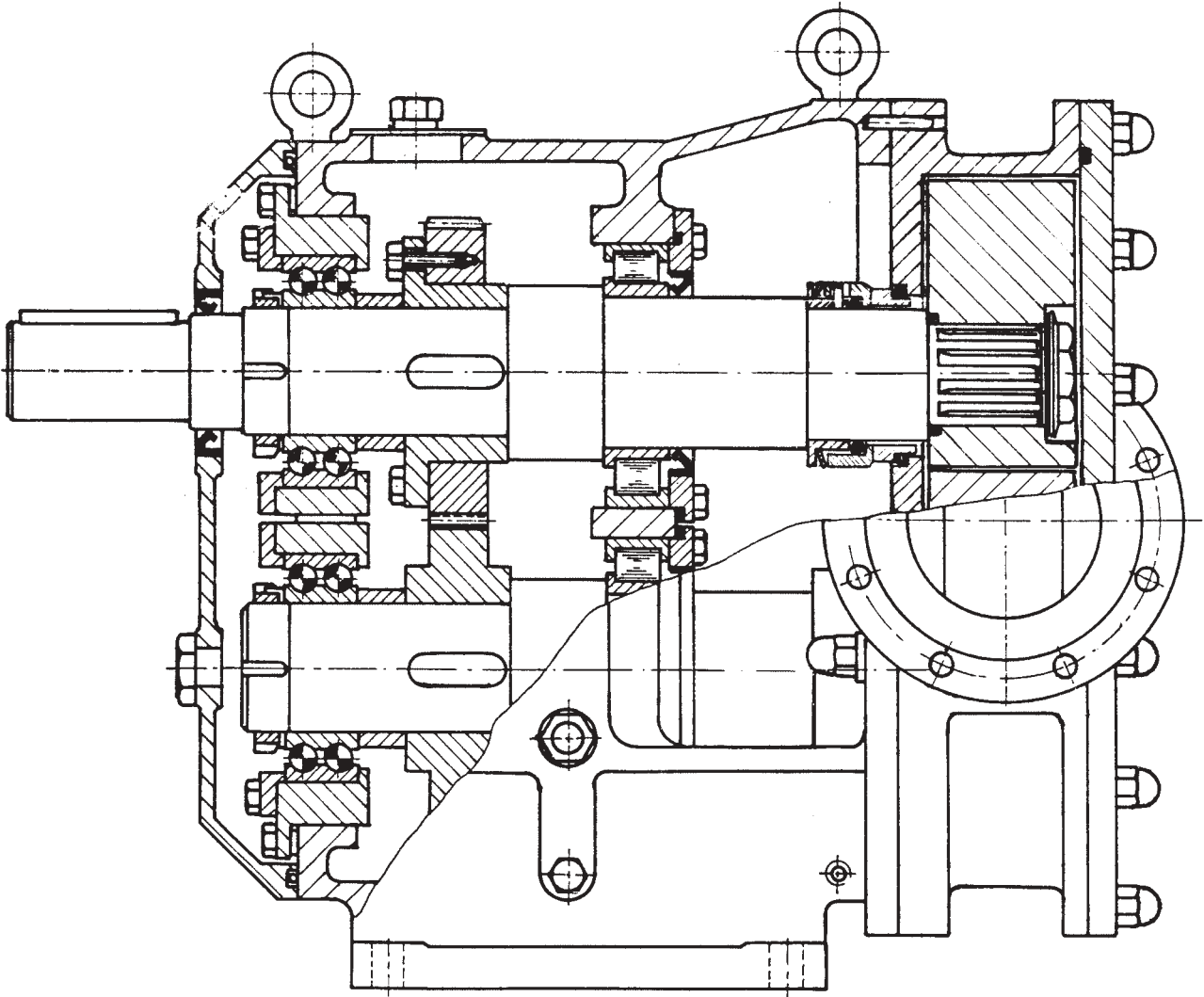
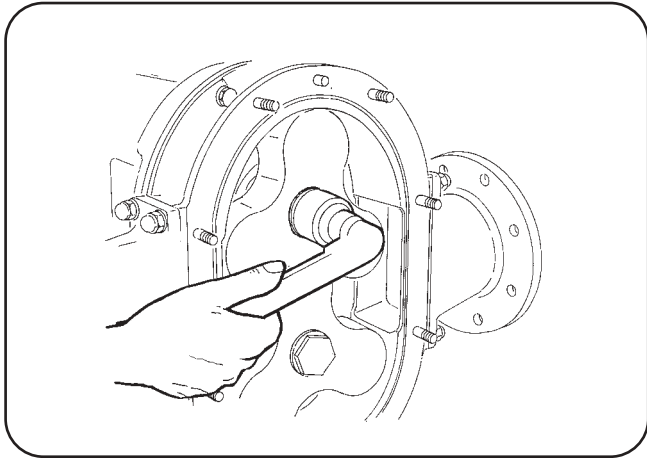
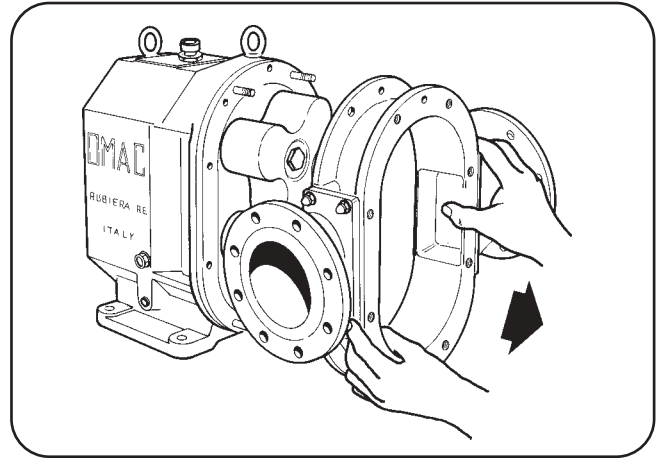


Fig. 16/bis Cross sections type B550

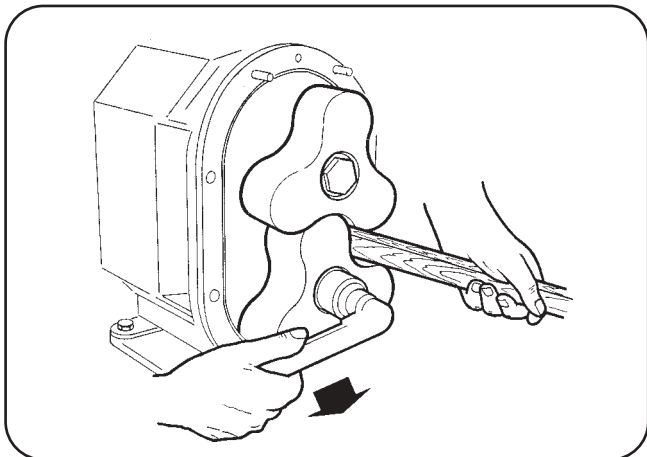
## ROTOR CASE DISASSEMBLY - PUMP TYPE B660 - B680



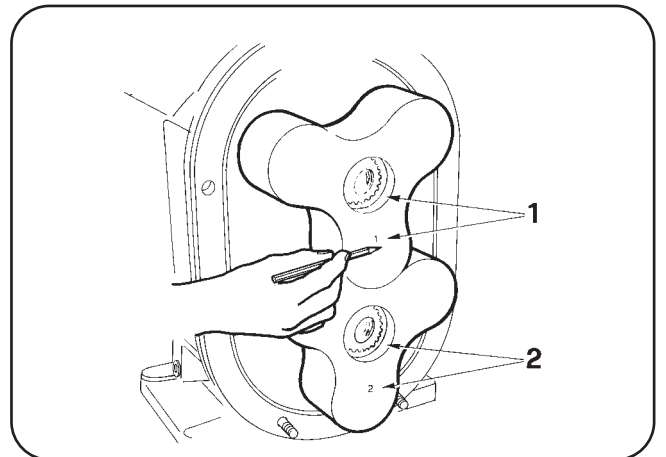
1. Remove the end cover and untighten the two locking nuts of the rotors.



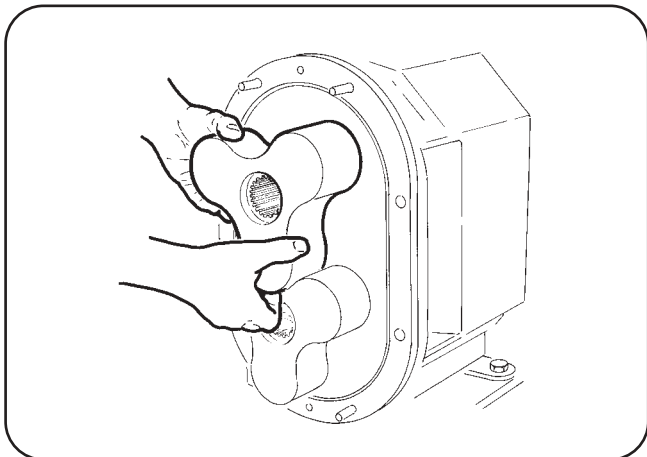
2. Untighten the back nuts and remove the rotor case.



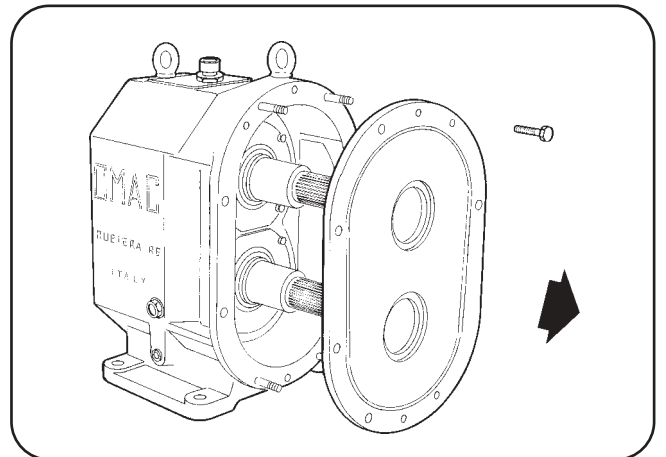
3. Unscrew anticlockwise the rotor nuts, interposing a non metal element between the rotors, making them stop rolling.



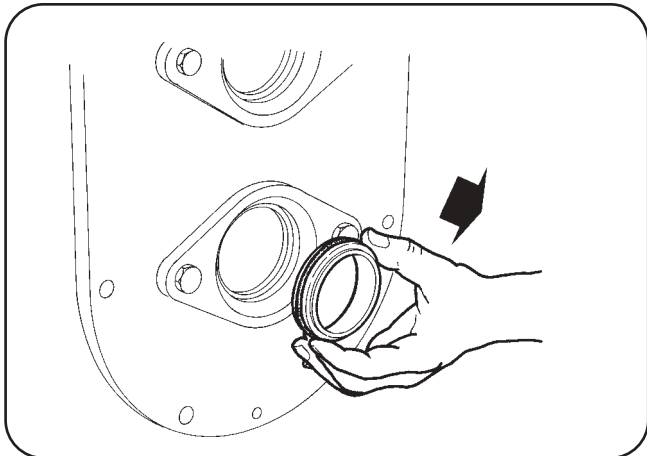
4. Take care of the reference marked on rotors and shafts (1-2) so that you will set them rightly while re-assembling.



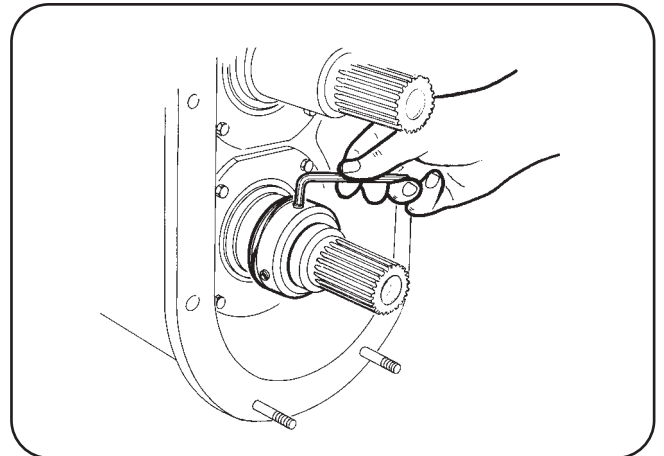
5. Extract the rotors, taking care you don't damage by means of metal tools.



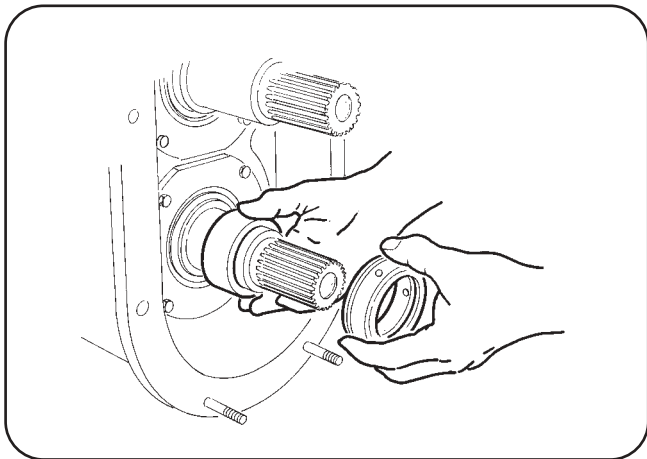
6. Untighten the two security screws and remove the seal flange.



7. Extract the stationary part of the seal from the support fixed on seal flange.



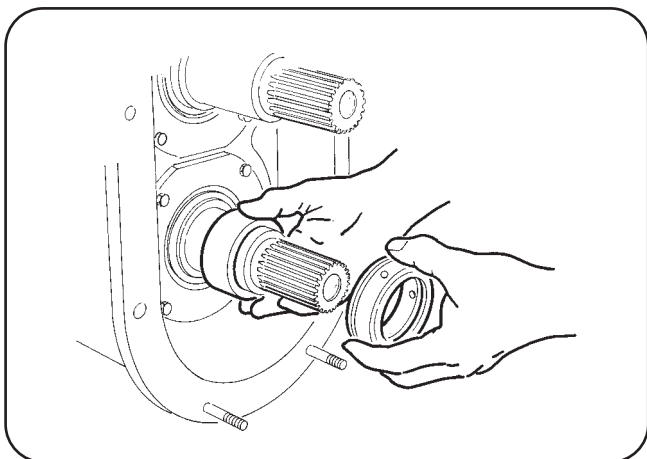
8. Untighten the socket head screws on mechanical seal.



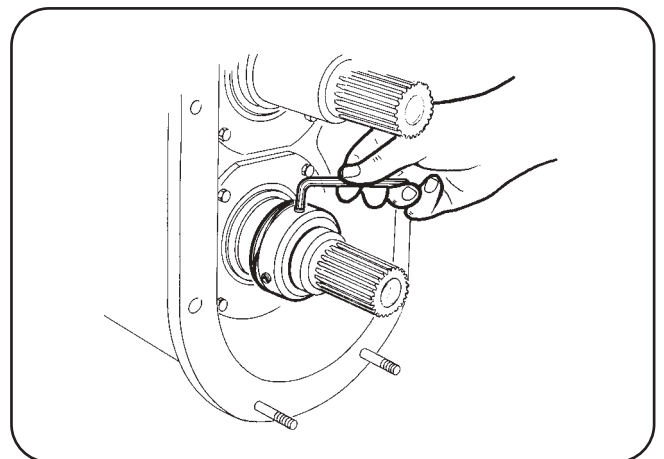
9. Extract the rotating part of the seal from the shaft.

## ROTOR CASE ASSEMBLY

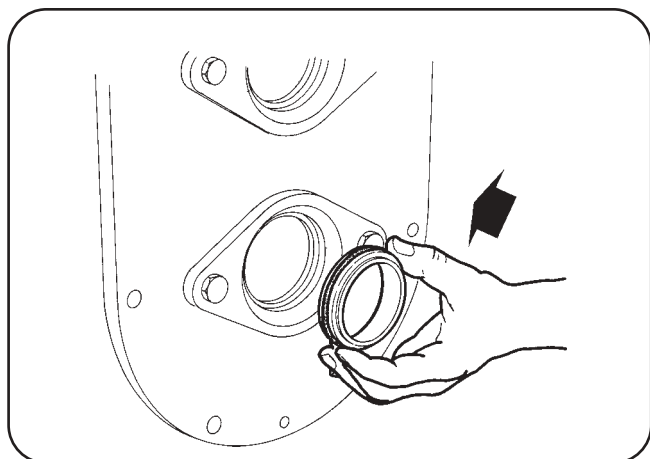
10. **IMPORTANT!**  
During the following operations, take care you don't damage the lapped seal surfaces; don't lay them on the bench and handle them with clean hands.



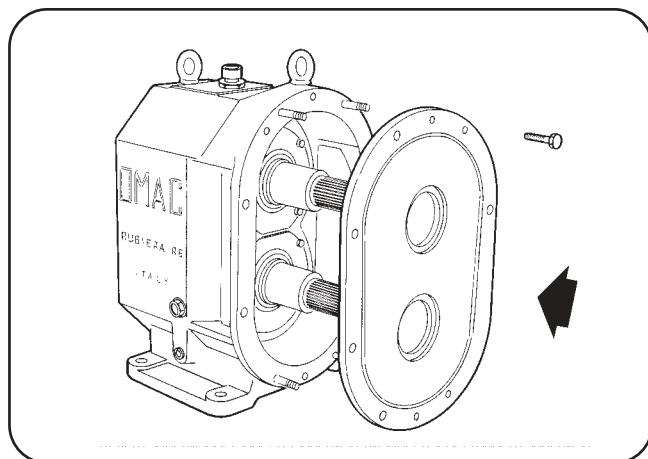
11. Clean carefully the shafts. Be sure the spacers for the seals are set (295). Lubricate lightly the O-rings and insert the rotating part of the seals on the shafts. Exert pressure only with hands; avoid using metal tools.



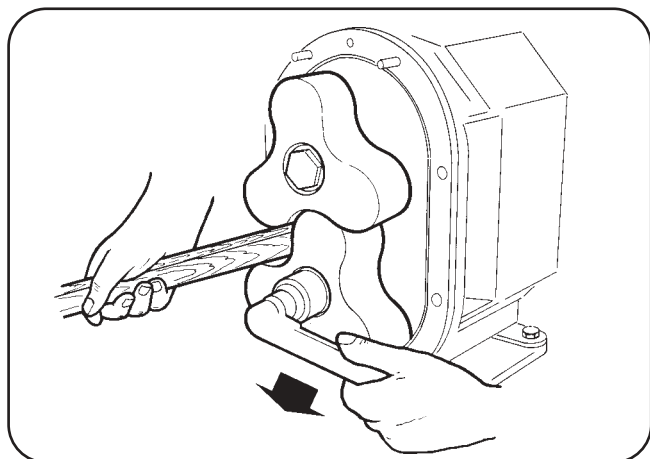
12. Be sure the mechanical seals stand on the shaft shoulder and tighten by degrees the socket head screws. We suggest you should use a thread locking adhesive in order to avoid their untightening on work.



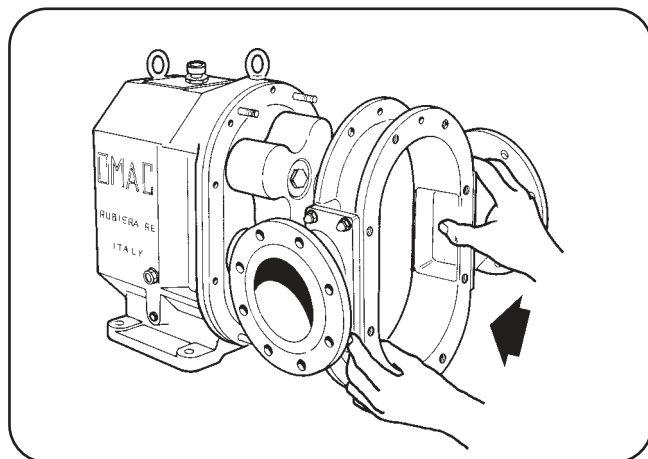
13. Assemble the stationary part of the seals on supports, taking care to align the slot with the retainer pin. Assemble these supports on seal flange, setting the O-ring.



14. **Clean carefully the seal slide surface** and assemble the seal flange delicately in order not to damage the seals. Be sure the flange is set according to reference pins and tighten the suited screws.

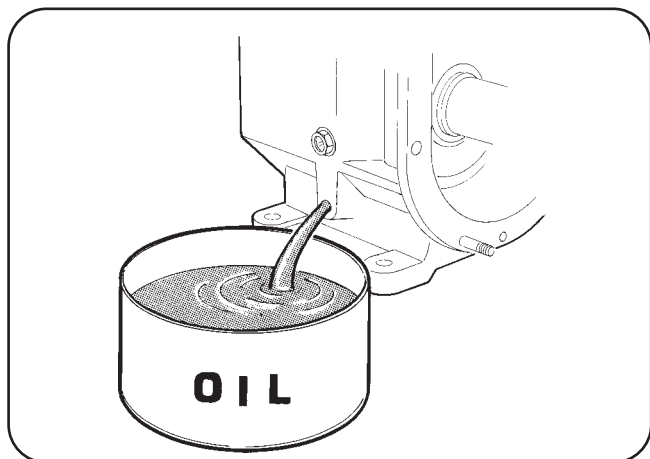


15. Assemble the rotors, setting them on pitch according to the reference marks (1-2). Clamp the rotors nuts (see tab. 14). In order to stop turning, interpose a non metal element between rotors. Tighten the rotor nuts.

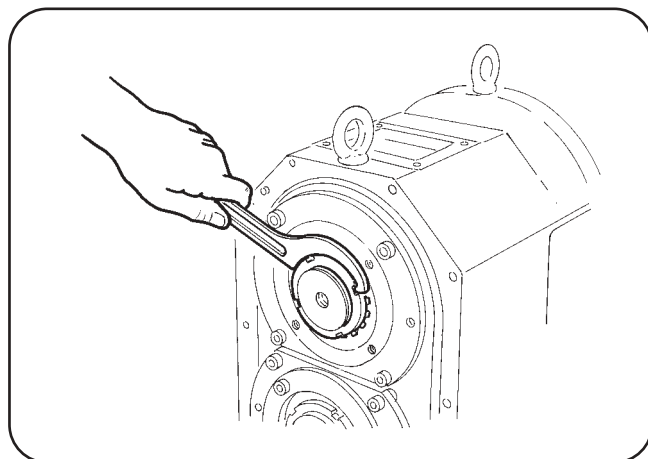


16. Assemble the rotor case, setting the O-ring.

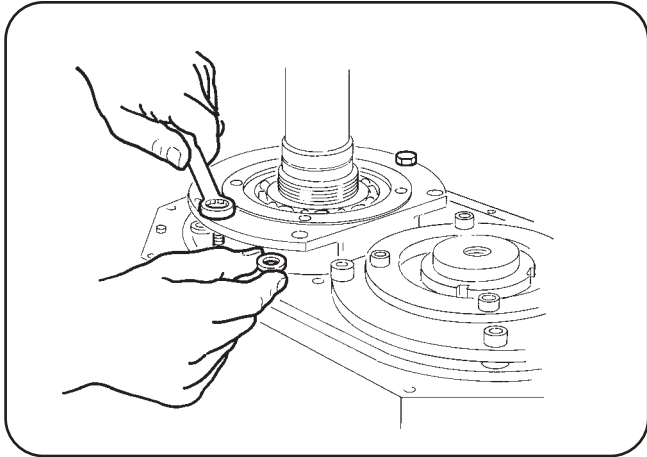
## BEARING HOUSING DISASSEMBLY



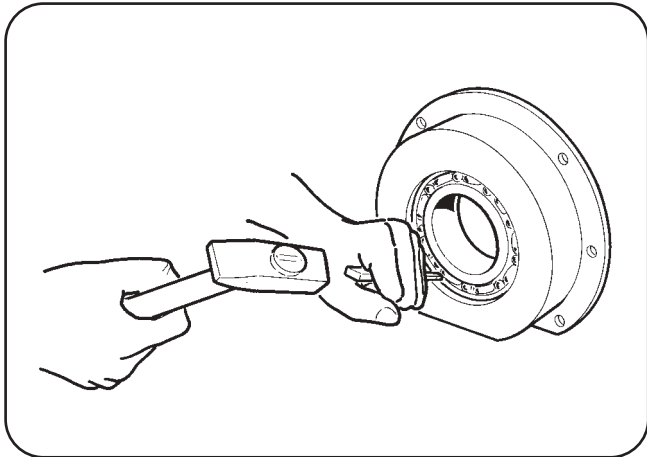
17. After disassembling the rotor case remove the oil and the drive spline on shaft.



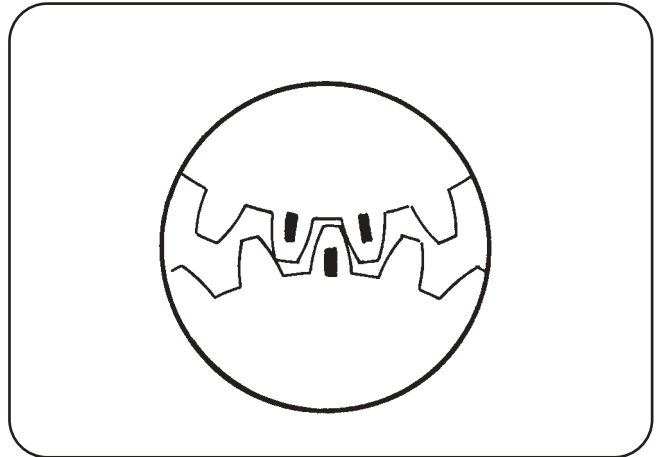
18. Remove the gear cover, disconnect the retainer keys of the lock washer and unscrew the ring nuts.



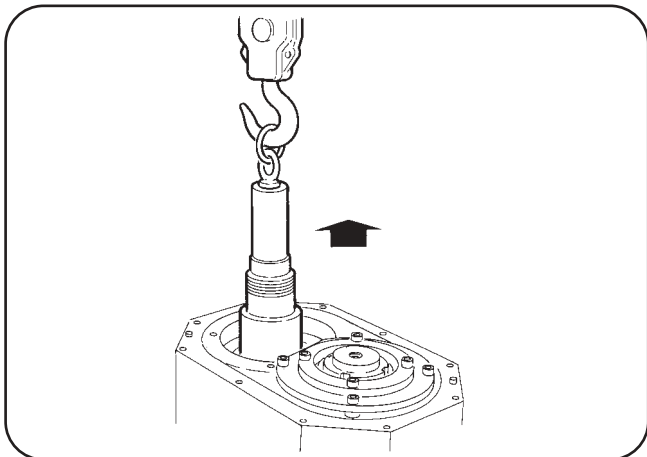
19. Stand the pump upright and extract the two bearing supports, making use of the threaded holes for removal. ▲ Doing so you will remove the spacers for axial adjustment too, which should be marked and separated for a right re-setting while assembling.



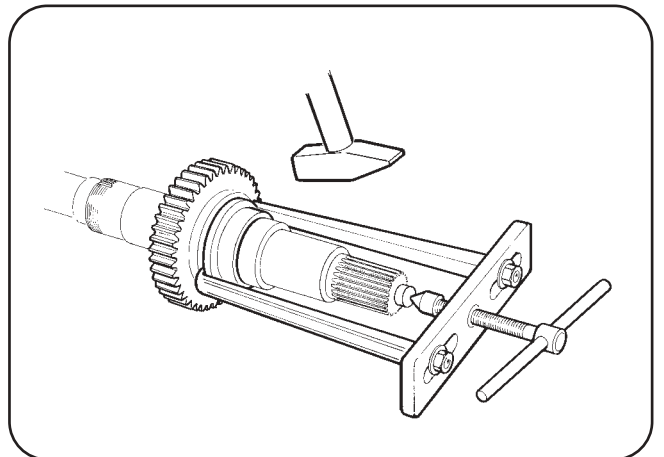
20. Remove the ball bearing from its support, taking away the bull ring.



21. Mark the gears in order to set them rightly while re-assembling.

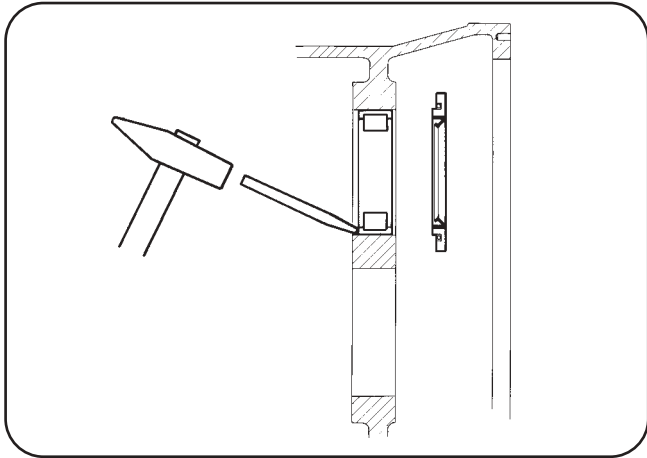


22. Withdraw the shafts, with the gears, still inserted. For this operation we suggest a mechanical lifting equipment, which can use the threaded holes arranged on shaft ends.

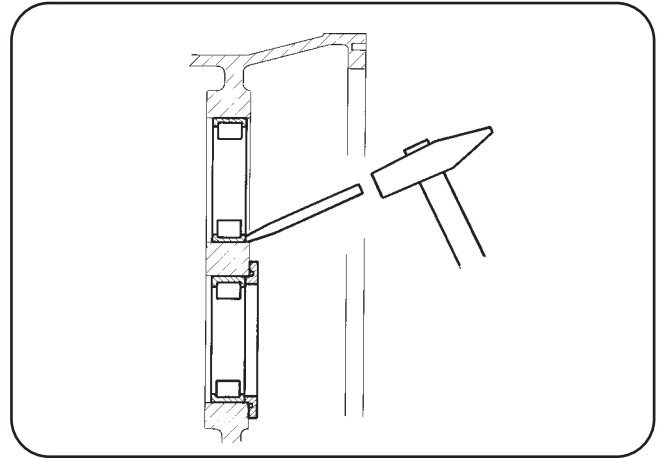


23. Remove the inside ring of the roller bearing by means of an extractor. Remove the gear taking care not to damage the tothing outline.

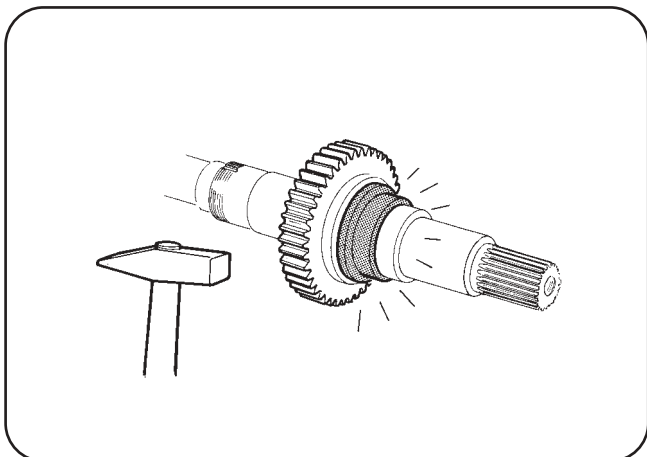
## BEARING HOUSING ASSEMBLY



24. Remove the ring and extract the outside ring of the roller bearing from the bearing housing.

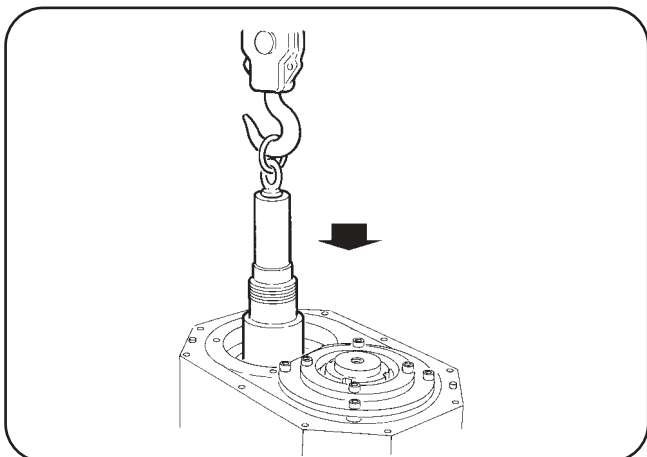


25. Assemble the outside rings of the roller bearings on the bearing housing, using a retaining ring to set them axially, because no counterboring is arranged. Assemble the retaining rings without seal rings.

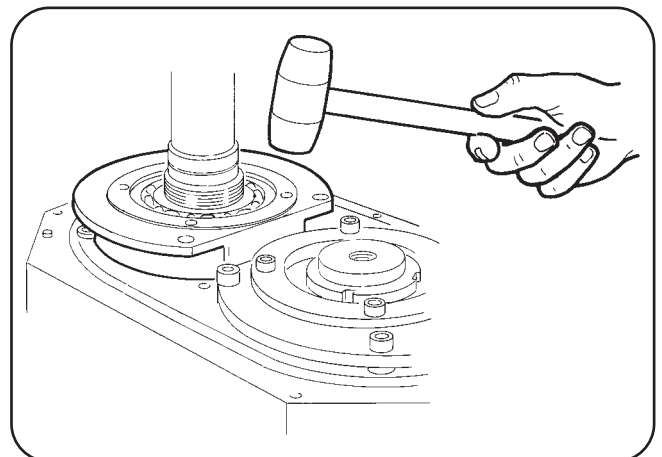


26. The inside ring of the roller bearing is assembled with a interference, therefore we suggest a shrink fitting, heating the ring in 90°C oil bath, in order to avoid any seizure. Insert the gear keys in their seats with a lightly forced connection.

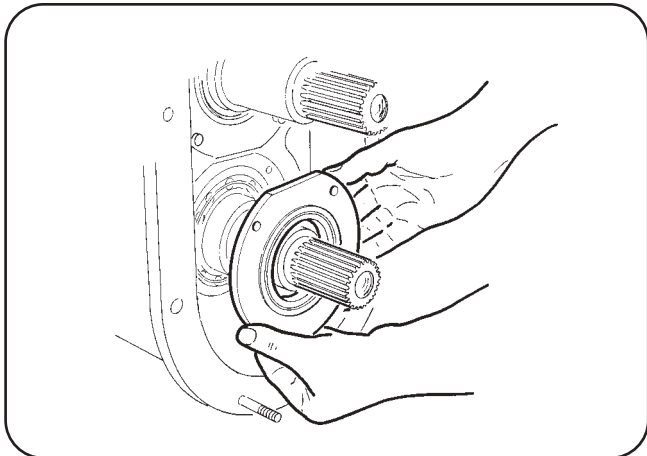
**IMPORTANT:** Assemble the adjustable gear on the shaft, which will be set up on the pump.



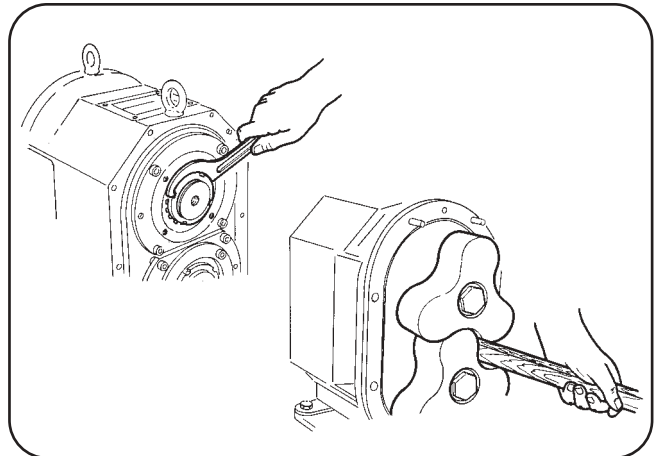
27. Assemble the shafts. If the gears haven't been removed from the shafts, respect the timing previously marked while re-assembling.



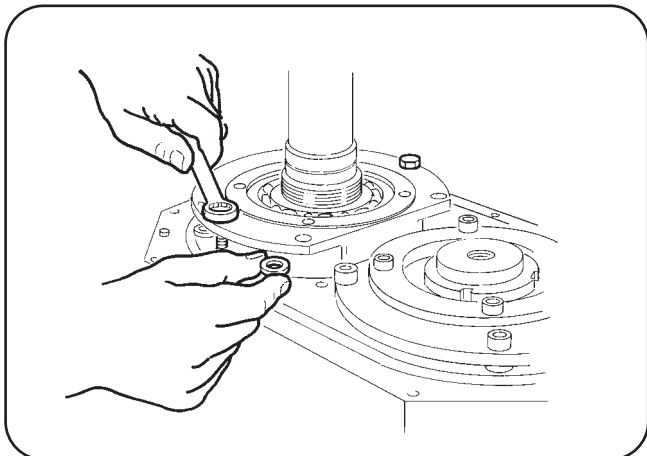
28. Insert the spacers (10) on the shafts and assemble the supports (75) with the ball bearings already connected. Set the spacers for axial adjustment (11) and tighten the screws.



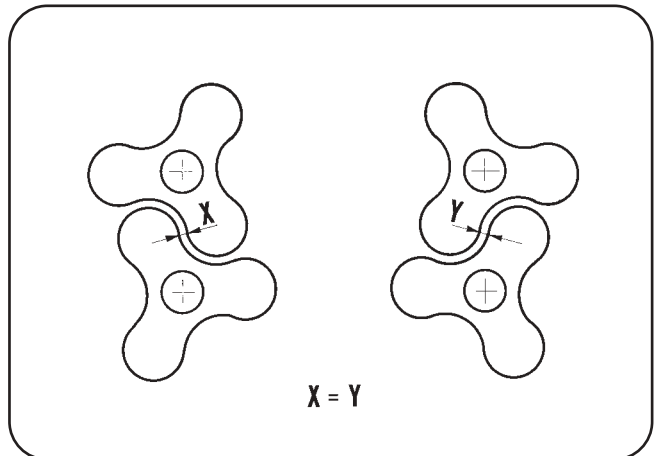
29. Assemble the seal rings (18) on retainers (9).



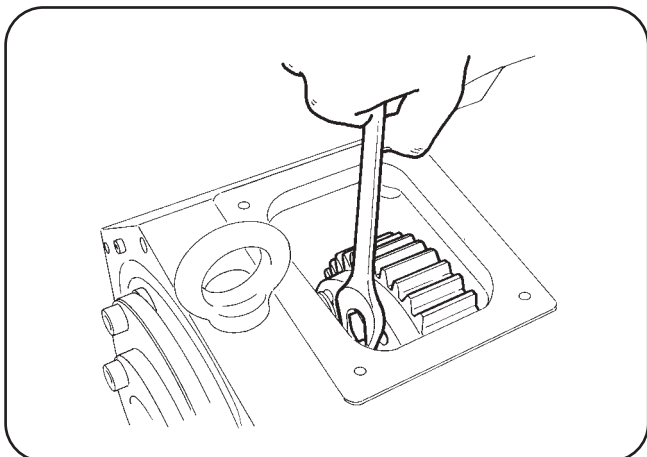
30. Assemble the rotor case as previously described; tighten the retainer ring nut with the corresponding lock washers and set rightly the retainer keys. In order to avoid turning during operation insert a non metal wedge between rotors.



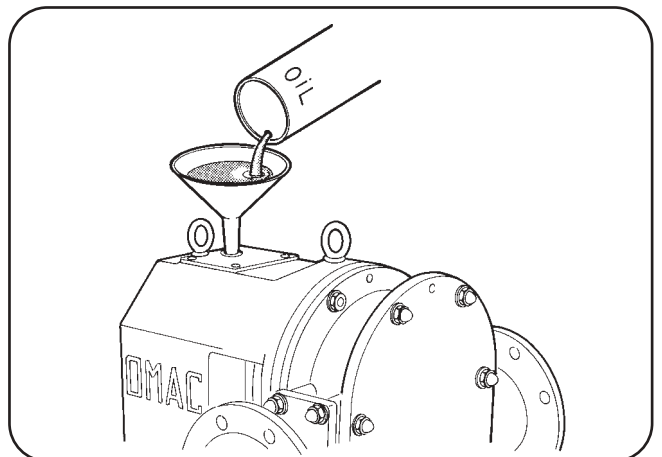
31. If clearance are not included in tolerances as per tab. 13, untighten the screws which lock the back bearing supports, remove the spacers and adjust them according to the requested dimension.  
**N.B.** a spacer set can be requested to the manufacturer company.



32. Time perfectly the rotors and tighten the screws of the adjustable gear gradually checking the rotor timing. You can reach the adjustable gear through a window arranged on the top of the bearing housing.



33. Tighten completely the adjustable gear screws taking care of the driving torque as per tab. 14.  
**N.B.** IN CASE OF RE-TIMING IT'S NECESSARY TO REPLACE THE PLANE WASHERS, CAVED BY PREVIOUSLY CLAMPING.



34. Assemble the gear cover, taking care to set the O-ring and insert the key on the shaft. Put into gear box the oil quantity as per tab. 10.

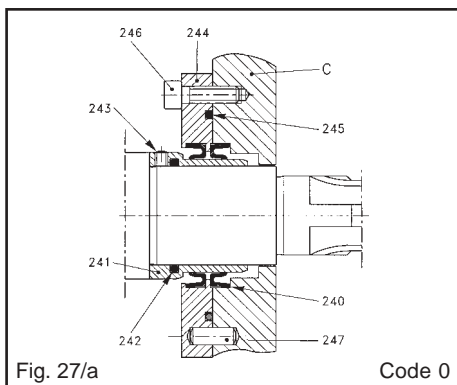
### 10. DRIVING SHAFT INVERSION - PUMP TYPE B5 - B6

1 - To invert the drive shaft position it's necessary to remove the shafts from bearing housing, as previously described. **IMPORTANT!** (See fig. 20): Mark the rotors B, the bearing supports (75) and the axial adjustment spacers (11) in order to re-set them rightly on the same shaft while re-assembling.

2 - Re-assemble the inverted shafts, each with the corresponding marked details on disassembly. The gears must mesh with the same gear and tooth space, previously marked, in order to respect timing. Being completely assembled, check clearances and rotor timing are included in tolerance table as per tab. 13.

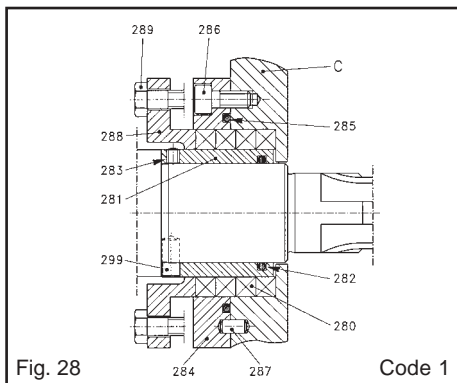
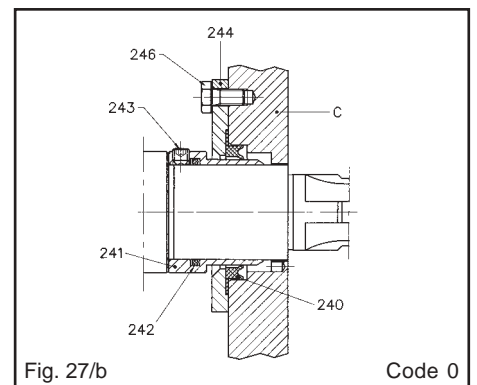
### 11. SPARE PARTS CHOICE

1 - Seals for pump type B1 - B2 - B3 - B4 - B550



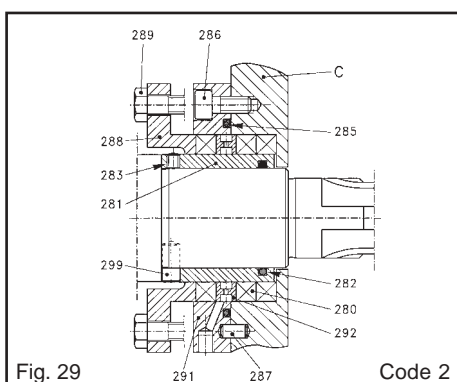
#### LIP SEAL

Pos. 242 - 245 = N.B.R. (viton) O-ring  
 Pos. 240 = "UM" viton rings (Fig. 27/a)  
 "UM" polymer S1 rings (Fig. 27/b)



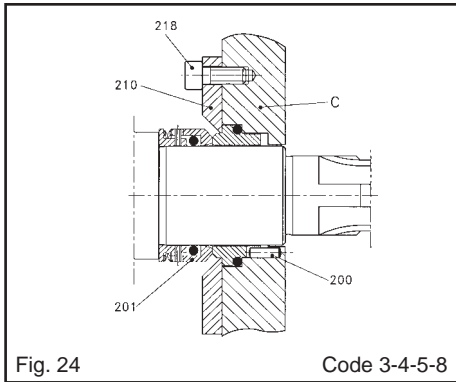
#### PACKING GLAND

Pos. 285 - 282 = N.B.R. (viton) O-ring  
 Pos. 280 = PTFE lubricated braid packing ring



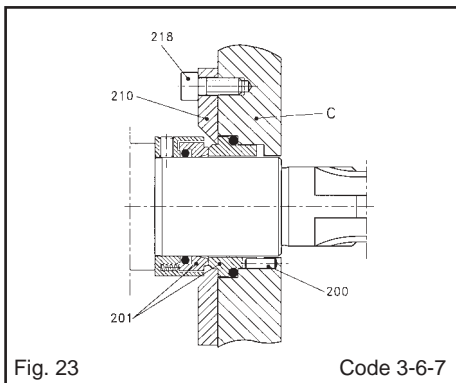
#### PACKING GLAND WITH HYDRAULIC BARRIER

Pos. 292 = AISI 316 SS hydraulic ring for flushing of a liquid.



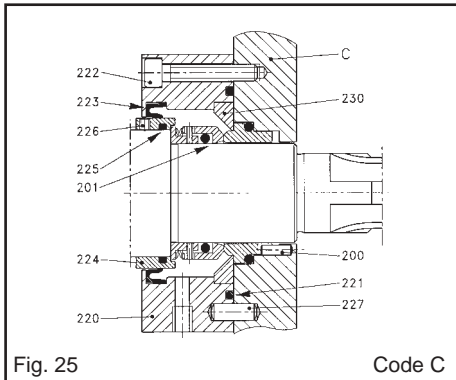
### BALANCED ROTARY MECHANICAL SEAL TYPE "U7K" - "KL2A"

- |        |                                     |                         |
|--------|-------------------------------------|-------------------------|
| Code 3 | • Stationary part = carbon          | - O-ring = EPDM (viton) |
|        | • Rotating part = AISI 316 SS       |                         |
| Code 4 | • Stationary part = carbon          | - O-ring = EPDM (viton) |
|        | • Rotating part = tung. carbide     |                         |
| Code 5 | • Stationary part = tung. carbide   | - O-ring = EPDM (viton) |
|        | • Rotating part = tung. carbide     |                         |
| Code 8 | • Stationary part = silicon carbide | - O-ring = EPDM (viton) |
|        | • Rotating part = silicon carbide   |                         |



### BALANCED ROTARY MECHANICAL SEAL TYPE "C5E" - "KL2A"

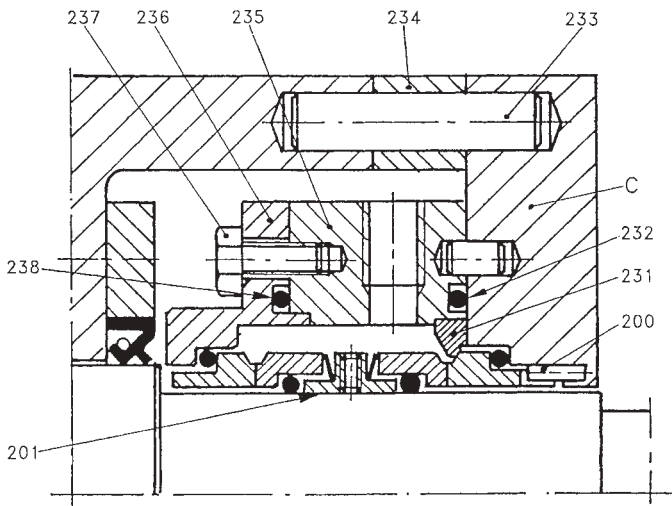
- |        |                                 |                         |
|--------|---------------------------------|-------------------------|
| Code 3 | • Stationary part = 316 AISI SS | - O-ring = EPDM (viton) |
|        | • Rotating part = carbon        |                         |
| Code 6 | • Stationary part = ceramic     | - O-ring = EPDM (viton) |
|        | • Rotating part = carbon        |                         |
| Code 7 | • Stationary part = ceramic     | - O-ring = EPDM (viton) |
|        | • Rotating part = rulon         |                         |



### SINGLE FLUSHED MECHANICAL SEAL TYPE "U7K" - "C5E" - "KL2A"

- 220 = Flushing seal box at low pressure with free liquid unloading.  
 223 = EPDM-VITON "UM" seal ring or PTFE special lip ring.  
 224 = AISI 316 SS turning ring for "UM" ring.  
 AISI 316 SS ceramic coated turning ring for special PTFE lip ring.

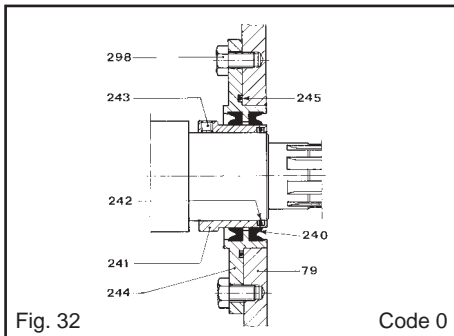
### CODE Q - DOUBLE FLUSHED MECHANICAL SEAL



Special applications only by request

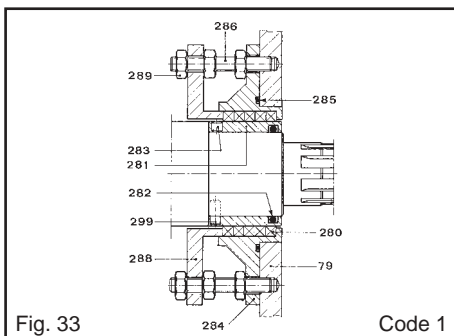
- Pumped fluid seal
- AISI 316 SS/carbon
- Carbide/carbon
- Carbide/carbide
- Ceramic/carbon
- Ceramic/rulon
- Flushing liquid seal
- AISI 316 SS/carbon

## 2 - SEALS FOR PUMP TYPE B660 - B680



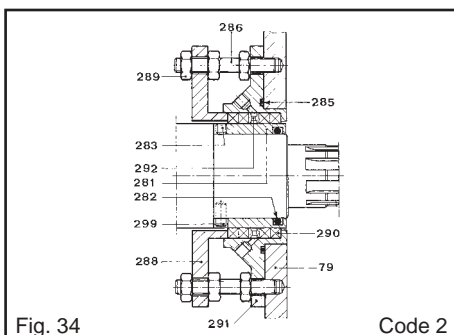
### LIP SEAL

- Pos. 242 - 245 = N.B.R. (viton) O-ring
- Pos. 240 = "UM" viton rings
- = "UM" polymer S1 rings



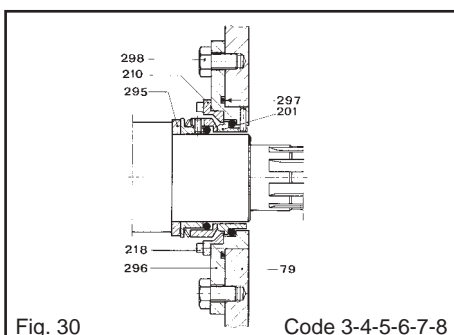
### PACKING GLAND

- Pos. 285 - 282 = N.B.R. (viton) O-ring
- Pos. 280 = PTFE lubricated braid packing rings.



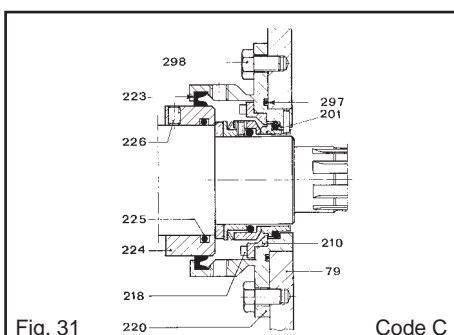
### PACKING GLAND WITH HYDRAULIC BARRIER

- Pos. 292 = AISI 316 SS hydraulic ring for flushing of a liquid.



### BALANCED MECHANICAL SEAL TYPE "7K" - "C5E" - "KL2A"

- Code 3 = AISI 316 SS/Graphite + EPDM (viton) O-ring
- Code 4 = Tung. Carbide/Graphite + EPDM (viton) O-ring
- Code 5 = Tung. Carbide/Tung. Carbide + EPDM (viton) O-ring
- Code 6 = Ceramic/Graphite + EPDM (viton) O-ring
- Code 7 = Ceramic/Rulon + EPDM (viton) O-ring
- Code 8 = Silicon Carbide/Sil. Carbide + Viton (EPDM) O-ring



### SIMPLE FLUSHED MECHANICAL SEAL TYPE "7K" - "C5E" - "KL2A"

- Pos. 220 = Flushing seal box at low pressure with free liquid unloading.
- Pos. 223 = EPDM-viton "UM" seal ring.

## 3 - BY-PASS - SAFETY VALVE ON PUMP COVER

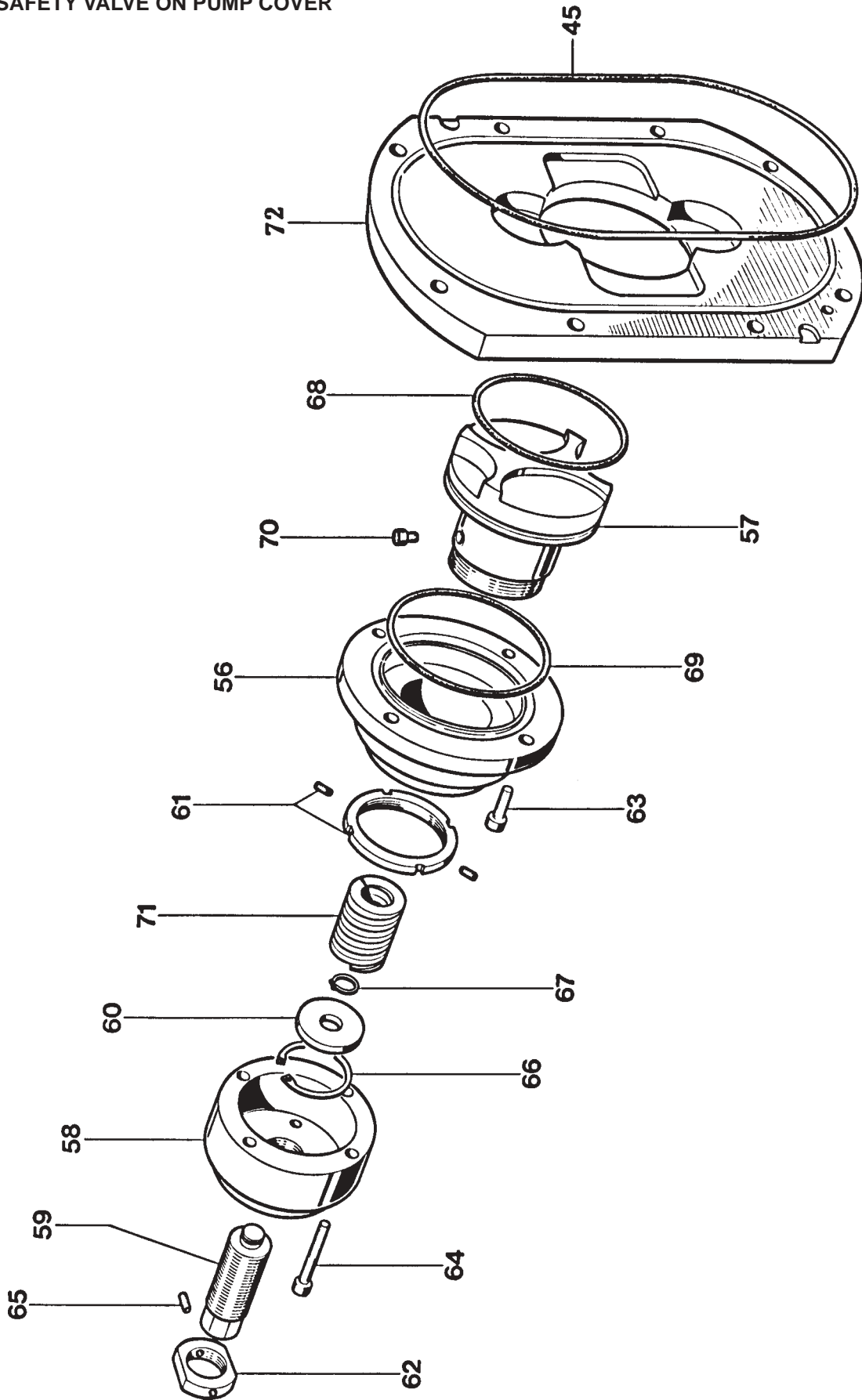
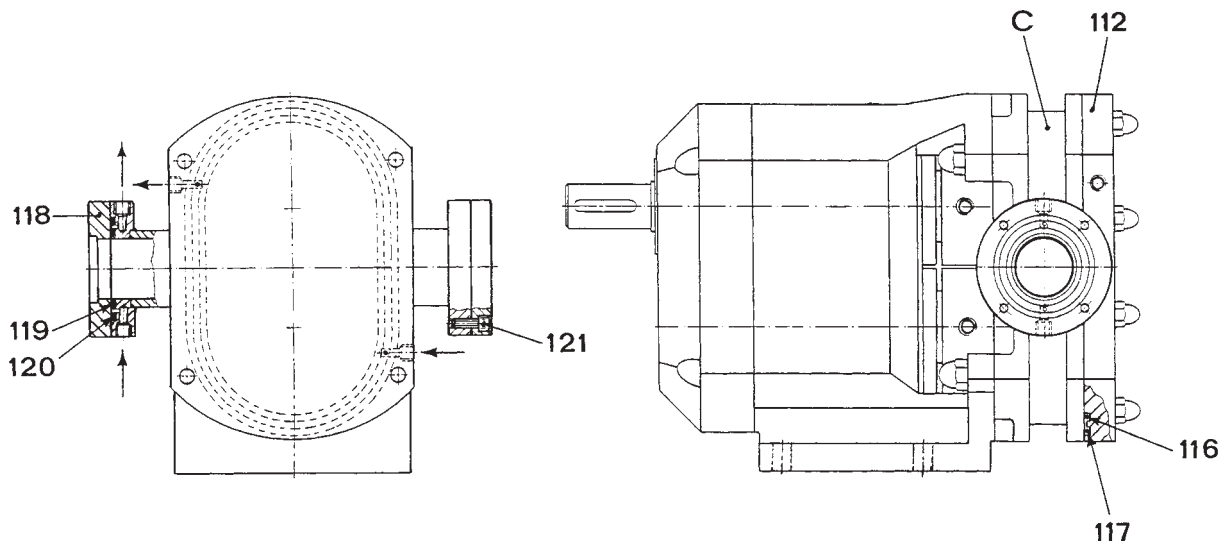


Fig. 21 Safety valve and hand by-pass

4 - ASEPTIC VERSION ROTOR CASE



5 - JACKETED END COVER AND ROTOR CASE FOR PUMP HEATING OR COOLING

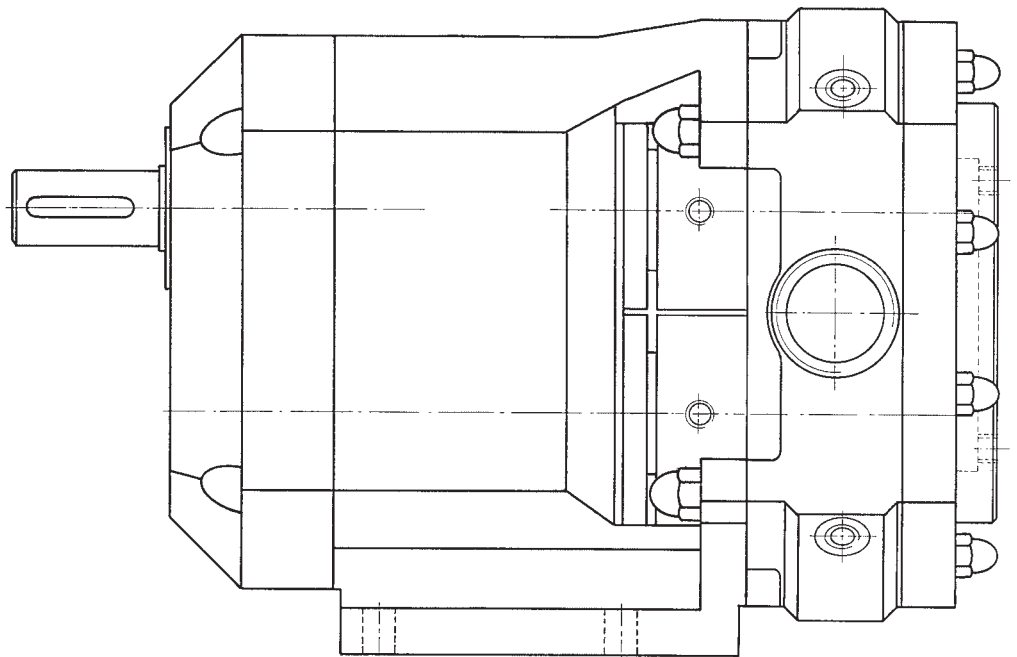
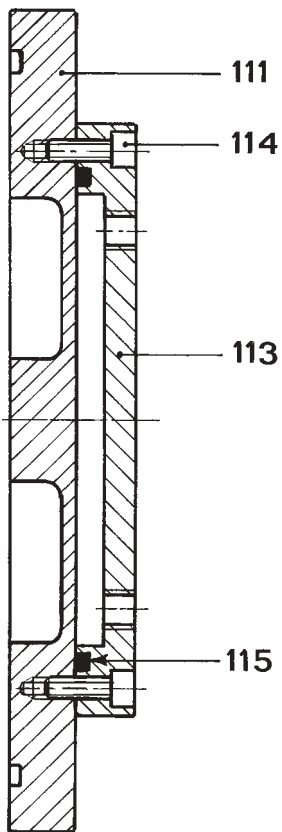


Fig. 36 Jacketed end cover

Fig. 37 Jacketed rotor case

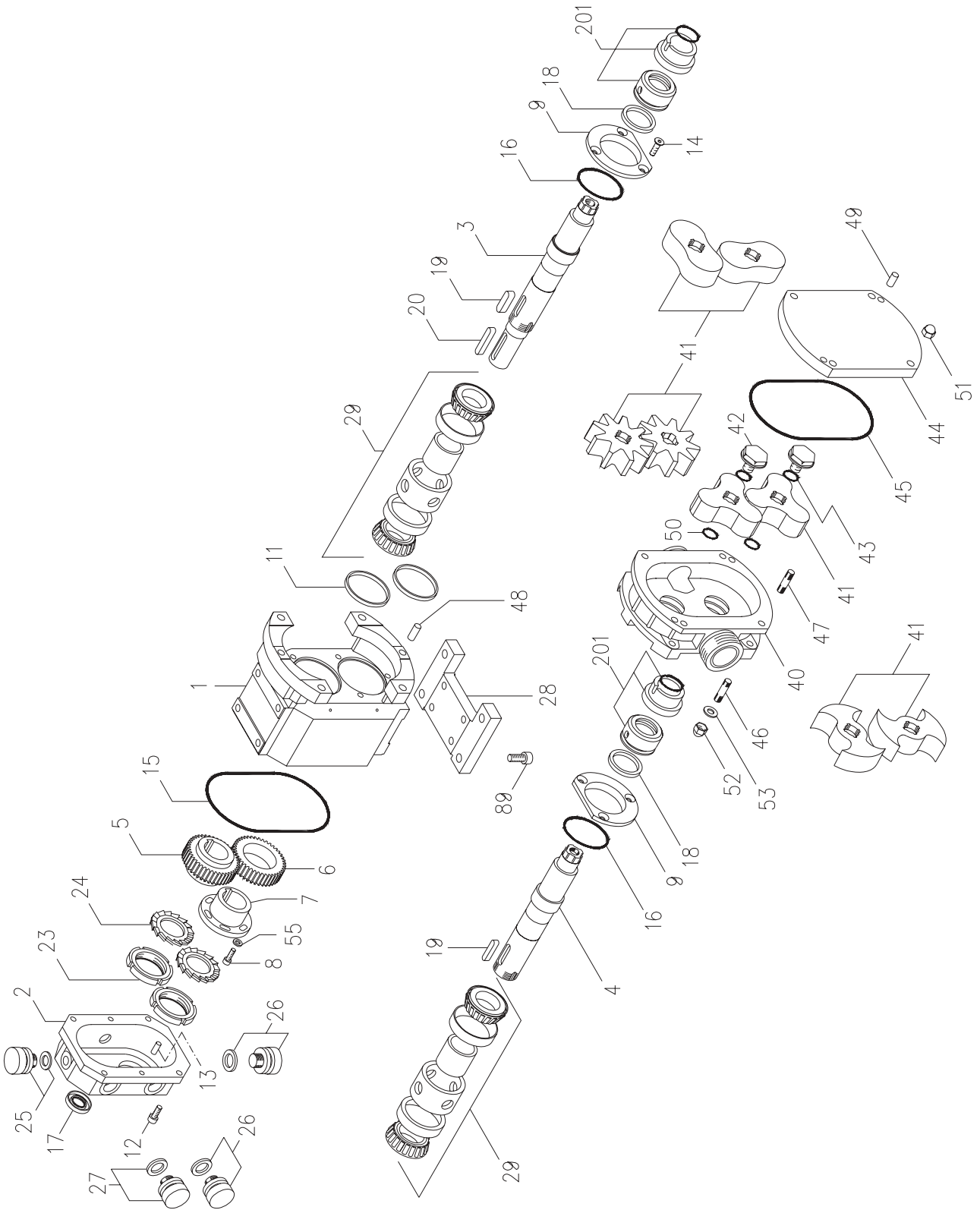


Fig. 18 Pump type B105 - B110 - B115



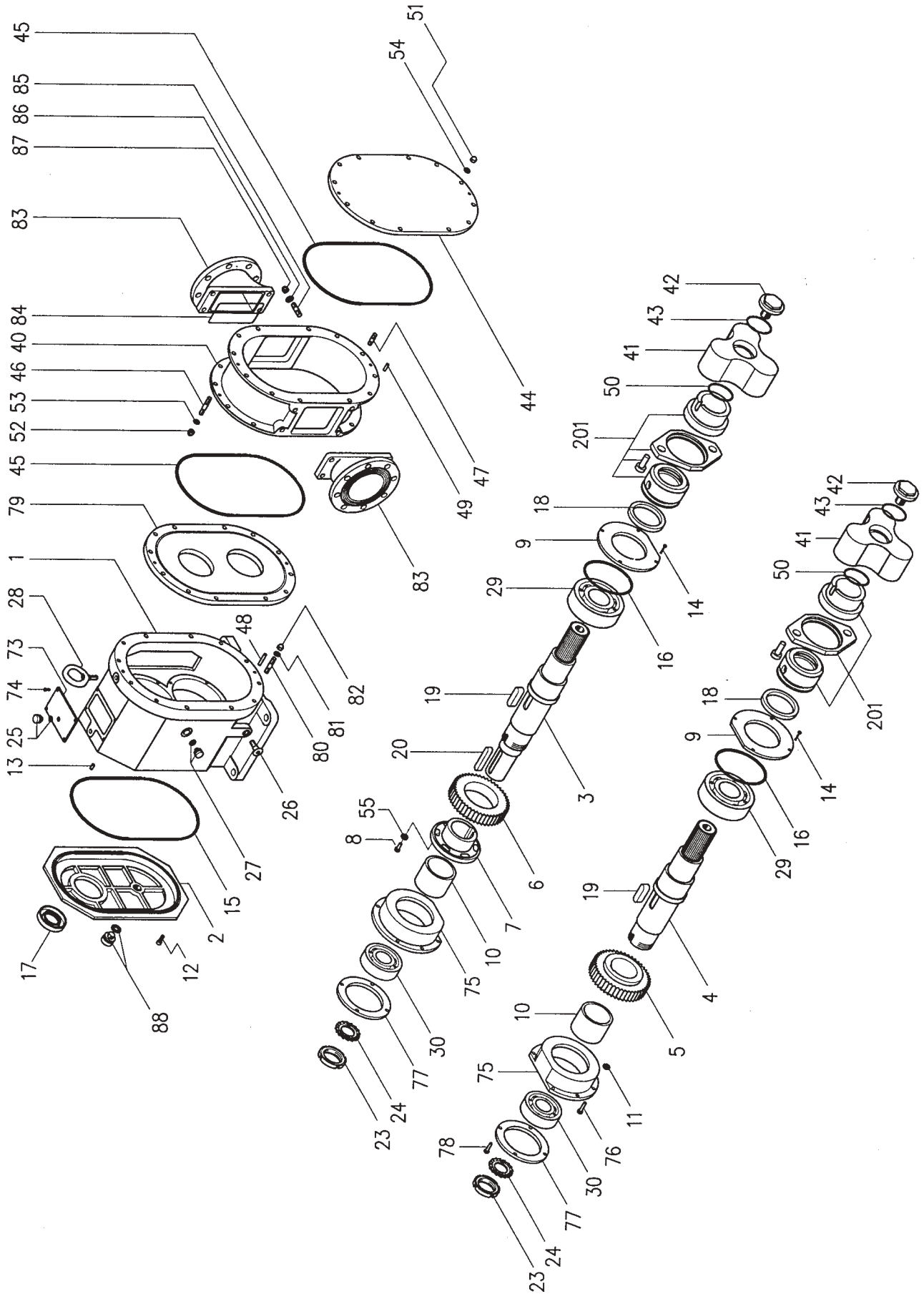


Fig. 20 Pump type B550 - B660 - B680



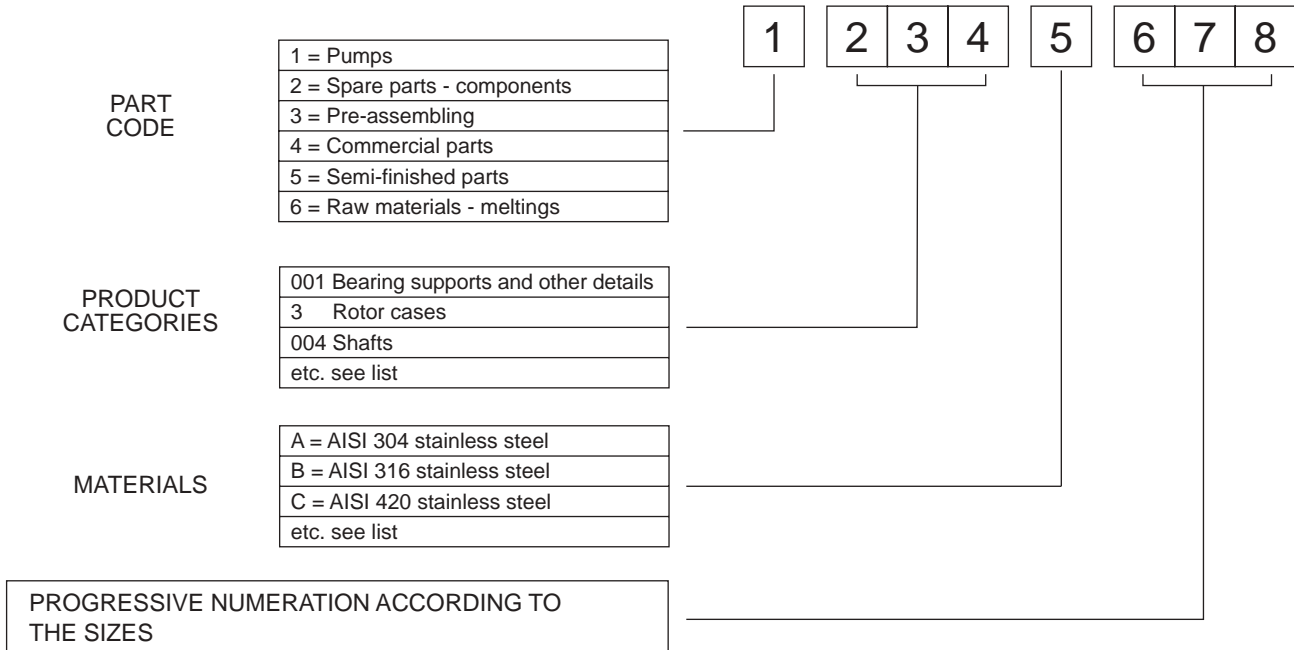
## MATERIALS, SEALS AND OPTIONS CODES

MATERIALS
A - 304 AISI STAINLESS STEEL
B - 316 AISI STAINLESS STEEL
C - 420 AISI STAINLESS STEEL
D - DUPLEX STAINLESS STEEL
DS - SAF 2507 DUPLEX S.S.
E - DEW88MET ALLOY
F - IRON
G - G 25 CAST IRON
H - HASTELLOY-ALLOY C 276
I - MONEL
J - TITANIUM DEGREE 2
K - CUPRONICKEL
KA - KALREZ®
L - ALUMINIUM
M - CARBON STEEL
N - BRASS
& - ACTEON
P - TEFLON (PTFE)
Q - S1 POLYMER
R - MECTON S POLYMER
S - SILICON RUBBER
T - NBR
U - EPDM
V - VITON
W - HYPALON
Y - NATURAL RUBBER
Z - ELECTRICAL MATERIAL

TYPE OF SEALS
0 - LIP SEAL VITON UM
LIP SEAL EPDM UM
LIP SEAL POLYMER S1
1 - TEFLON PACKING GLAND
2 - TEFLON FLUSHED PACKING GLAND
3 - MECHANICAL SEAL: BTC5E - B2GVGG (316 S.S./CARBON/VITON)
MECHANICAL SEAL: BTC5E - B2GEGG (316 S.S./CARBON/EPDM)
MECH. SEAL: UNITEN 7K - X7XZ7HX (316 S.S./CARBON/EPDM)
MECH. SEAL: FLUITEN KL2A Z32Y1DJE (316 S.S./CARBON/EPDM)
4 - MECH. SEAL: UNITEN 7K - X73Z7HX (TUNG. CARBIDE/CARBON/EPDM)
MECH. SEAL: UNITEN 7K - XY3ZYHX (TUNG. CARBIDE/CARBON/VITON)
MECH. SEAL: FLUITEN KL2A Z32K22DJE (TUNG. CARBIDE/CARBON/EPDM)
5 - MECH. SEAL: UNITEN 7K - X7337HX (TUNG. CARBIDE/TUNG. CARBIDE/EPDM)
MECH. SEAL: UNITEN 7K - XY33YHX (TUNG. CARBIDE/TUNG. CARBIDE/VITON)
MECH. SEAL: FLUITEN KL2A K22K22DJE (TUNG. CARBIDE/TUNG. CARBIDE/EPDM)
6 - MECH. SEAL: BTC5E - B2V1VGG (CERAMIC/CARBON/VITON)
MECH. SEAL: FLUITEN KL2A Z32 CDJE (CERAMIC/CARBON/EPDM)
7 - MECH. SEAL: BTC5E - YV1VGG (CERAMIC/RULON/VITON)
8 - MECH. SEAL: FLUITEN KL2A U32U31VJE (SILICON CARBIDE/SIL. CARB./EPDM)
Q - DOUBLE MECHANICAL SEAL: FLUITEN KL2A (REQUIRED MATERIALS)
MATERIALS FOR SEALS (TYPES)
- METALS, CARBIDES, OXIDES
H - 304 STAINLESS STEEL (UNITEN)
X - 316 STAINLESS STEEL (UNITEN)
G - 316 STAINLESS STEEL (BT)
J - STELLITE (UNITEN)
L - HASTELLOY (UNITEN)
3 - BRAZED TUNG. CARBIDE (WIDIA) (UNITEN)
R - INTEGRAL TUNG. CARBIDE (WIDIA) (UNITEN)
K - SILICON CARBIDE (UNITEN)
2 - CERAMIC (UNITEN)
V1 - CERAMIC (BT)
- CARBONS, RESINS, ELASTOMERS
Z - CARBON (UNITEN)
B2 - CARBON (BT)
5 - TEFLON (UNITEN)
4 - RULON (UNITEN)
Y - RULON (BT)
F - O-RING FEP (UNITEN)
E - EPDM (BT)
7 - EPDM (UNITEN)
Y - VITON (UNITEN)
V - VITON (BT)

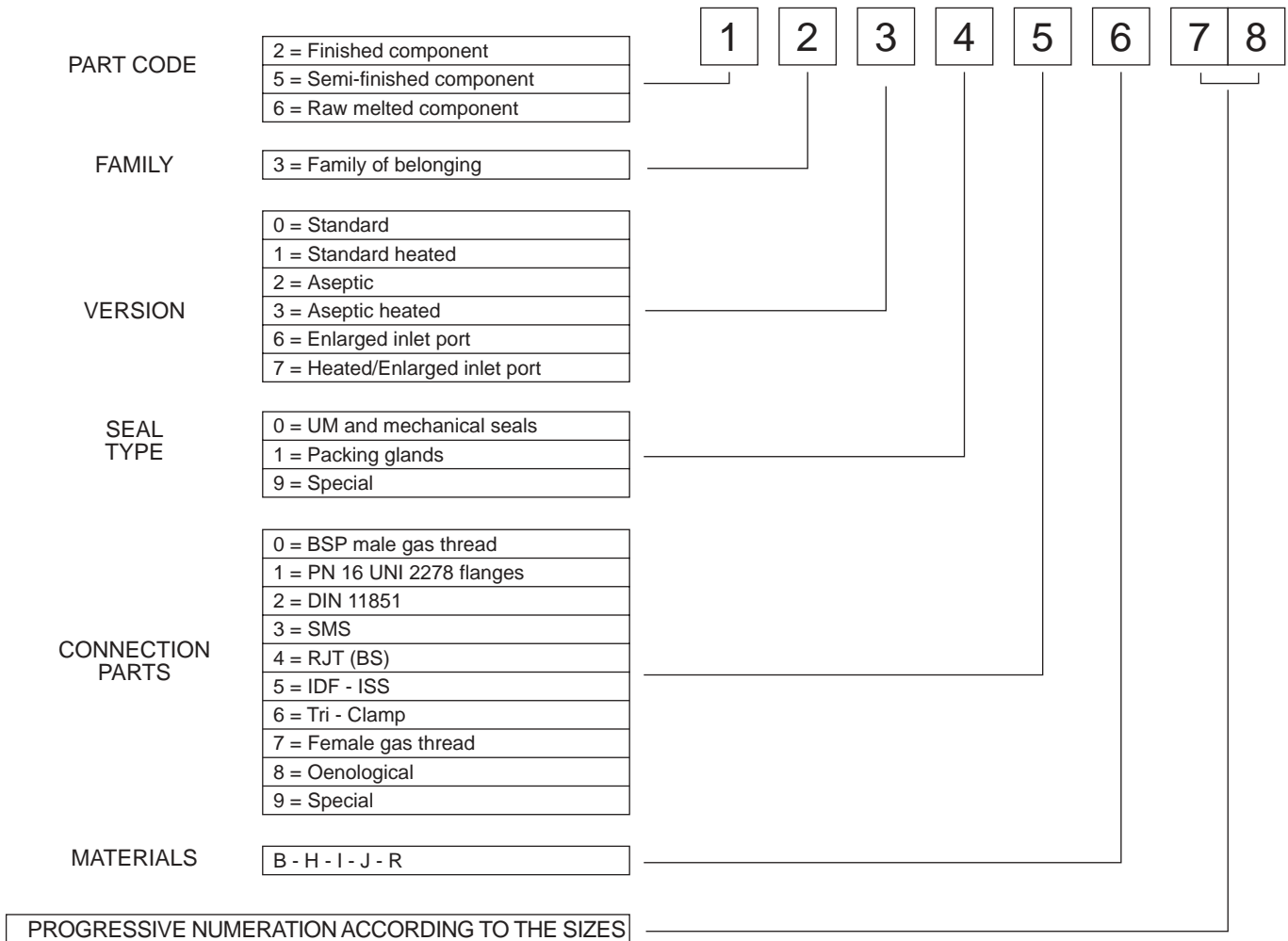
SPECIAL VERSIONS
A - ASEPTIC PUMP
B
C - FLUSHED MECHANICAL SEAL
D - DUPLEX SHAFTS
E - STAINLESS ANTI-SEIZURE ALLOY ROTORS
F - POLYMER/HASTELLOY PUMP
G - INNER POLISHING SURFACE
H - HIGH PRESSURE PUMP
I - MONEL 400 PUMP
J - TITANIUM PUMP
K - SURFACE HARDENING
L - ENLARGED INLET PORT
M - POLYMER/MONEL PUMP
N
O
P - TEFLON TRIM
Q - DOUBLE FLUSHED MECH. SEAL
R - ROTOR CASE WITH HEATING JACKET
S - S1 POLYMER LIP SEAL
T - HYDRAULIC FLANGE PUMP
U - EPDM TRIM
V - VITON TRIM
W - POLYMER/TITANIUM PUMP
Y - HASTELLOY PUMP
Z - HASTELLOY/TITANIUM PUMP
1 - END COVER WITH RELIEF VALVE
2 - END COVER WITH HEATING JACKET

## COMPONENTS CODE



Example = bearing support B220 cast iron      cod. 2001G002

## ROTOR CASES CODE



Example = rotor case with mech. seals - DIN - Heated - AISI 316 SS - B430

cod. 23102 B 07



KEY No.	DESCRIPTION	PART No. BY MODEL															
		B105	B110	B115	B215	B220	B325	B330	B430	B440	B470	B490	B550	B650	B680		
53	PLANE WASHER	412A08	412A08	412A08	412A10	412A10	412A12	412A12	412A16	412A16	412A20	412A20	412A14	412A14	412A14		
54	PLANE WASHER	-	-	-	-	-	-	-	-	-	-	-	412A12	412A14	412A14		
55	PLANE WASHER	412F05	412F05	412F05	412F06	412F06	412F08	412F08	412F10	412F10	412F10	412F10	412F12	412F16	412F16		
56	BY PASS - COMPLETE RELIEF VALVE	2013B001	2013B001	2013B001	2013B002	2013B002	2013B003	2013B003	2013B004	2013B004	2013B004	2013B004	-	-	-		
57	BY PASS SUPPORT	2013L021	2013L021	2013L021	2013L021	2013L021	2013L022	2013L022	2013L023	2013L023	2013L023	2013L023	-	-	-		
58	BY PASS PISTON	2013B025	2013B025	2013B025	2013B026	2013B026	2013B027	2013B027	2013B028	2013B028	2013B028	2013B028	-	-	-		
59	BY PASS COVER	2013L029	2013L029	2013L029	2013L029	2013L029	2013L029	2013L029	2013L030	2013L030	2013L030	2013L030	-	-	-		
60	THRUJEST WASHER	2013B031	2013B031	2013B031	2013B031	2013B031	2013B031	2013B031	2013B031	2013B031	2013B031	2013B031	-	-	-		
61	ADJUSTMENT RING NUT	2013L032	2013L032	2013L032	2013L032	2013L032	2013L032	2013L032	2013L033	2013L033	2013L033	2013L033	-	-	-		
62	BY PASS ADJUSTMENT SCREW	2013B034	2013B034	2013B034	2013B034	2013B034	2013B034	2013B034	2013B035	2013B035	2013B035	2013B035	-	-	-		
63	SCREW	2013L036	2013L036	2013L036	2013L036	2013L036	2013L036	2013L036	2013L036	2013L036	2013L036	2013L036	-	-	-		
64	SPLIT RING	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	-	-	-		
65	SPLIT RING	421A381	421A381	421A381	421A381	421A381	421A381	421A381	421A381	421A381	421A381	421A381	-	-	-		
66	SPLIT RING	421A16E	421A16E	421A16E	421A16E	421A16E	421A16E	421A16E	421A16E	421A16E	421A16E	421A16E	-	-	-		
67	BY PASS PISTON ORING	404T4200	404T4200	404T4200	404T4200	404T4200	404T6275	404T6275	404T189	404T189	404T189	404T189	-	-	-		
68	BY PASS SUPPORT ORING	404T3250	404T3250	404T3250	404T3250	404T3250	404T4337	404T4337	404T4482	404T4482	404T4482	404T4482	-	-	-		
69	BY PASS PISTON ORING	422F001	422F001	422F001	422F001	422F001	422F004	422F004	422F007	422F007	422F007	422F007	-	-	-		
70	SPRING	2006B031	2006B031	2006B031	2006B032	2006B032	2006B033	2006B033	2006B034	2006B034	2006B034	2006B034	-	-	-		
71	END COVER FOR BY PASS	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
72	INSPECTION COVER	-	-	-	-	-	-	-	-	-	-	-	2001L221	2001L222	2001L222		
73	TCEI SCREW	4	4	4	4	4	4	4	4	4	4	4	411A06X16	411A06X16	411A06X16		
74	TCEI SCREW	2	2	2	2	2	2	2	2	2	2	2	2001G150	2001G151	2001G151		
75	BEARING SUPPORT	-	-	-	-	-	-	-	-	-	-	-	411F10X30	411F12X40	411F12X40		
76	TCEI SCREW	-	-	-	-	-	-	-	-	-	-	-	2001F202	2001F202	2001F202		
77	BACK BULL RING	-	-	-	-	-	-	-	-	-	-	-	411F10X30	411F12X35	411F12X35		
78	TCEI SCREW	-	-	-	-	-	-	-	-	-	-	-	2006B132	2006B132	2006B132		
79	SEAL FLANGE B5-B6	-	-	-	-	-	-	-	-	-	-	-	419A14X75	419A14X75	419A14X75		
80	STUD	-	-	-	-	-	-	-	-	-	-	-	412A14	412A14	412A14		
81	PLANE WASHER	-	-	-	-	-	-	-	-	-	-	-	414A14	414A14	414A14		
82	CAP NUT	-	-	-	-	-	-	-	-	-	-	-	2006B152	2006B152	2006B152		
83	FLANGED PORT	-	-	-	-	-	-	-	-	-	-	-	404T005	404T005	404T005		
84	PORT ORING	-	-	-	-	-	-	-	-	-	-	-	419A16X60	419A16X60	419A16X60		
85	STUD	-	-	-	-	-	-	-	-	-	-	-	412A16	412A16	412A16		
86	PLANE WASHER	-	-	-	-	-	-	-	-	-	-	-	414A16	414A16	414A16		
87	CAP NUT	-	-	-	-	-	-	-	-	-	-	-	407L1T	407L1T	407L1T		
88	OIL CLOSE CAP	-	-	-	-	-	-	-	-	-	-	-	2006B056	2006B056	2006B056		
111	END COVER FOR HEATING VERSION	2006B051	2006B051	2006B051	2006B052	2006B052	2006B053	2006B053	2006B054	2006B054	2006B057	2006B057	2006B055	2006B056	2006B056		
112	END COVER FOR ASEPTIC VERSION	2006B101	2006B101	2006B101	2006B102	2006B102	2006B103	2006B103	2006B104	2006B104	2006B105	2006B105	2006B105	2006B105	2006B105		
113	END COVER JACKET	2006B161	2006B161	2006B161	2006B162	2006B162	2006B163	2006B163	2006B164	2006B164	2006B168	2006B168	2006B168	2006B168	2006B168		
114	TCEI SCREW	411A06X16	411A06X16	411A06X16	411A06X16	411A06X16	411A06X16	411A06X16	411A06X16	411A06X16	411A06X16	411A06X16	411A06X20	411A08X20	411A08X20		
115	END COVER JACKET ORING	404T4375	404T4375	404T4375	404T4500	404T4500	404T4587	404T4587	404T4750	404T4750	414T4875	414T4875	404T81175	404T81300	404T81350		
116	INTERNAL COVER ORING FOR ASEPTIC vers.	404V007	404V007	404V007	404V4625	404V4625	404V4750	404V4750	404V009	404V009	404T81175	404T81175	404T81175	404T81300	404T81350		
117	EXTERNAL COVER ORING FOR ASEPTIC vers.	404V008	404V008	404V008	404V4675	404V4675	404V4825	404V4825	404V010	404V010	404T81300	404T81300	2006B185	2006B185	2006B185		
118	CONNECTION COUNTER FLANGE for AS vers.	2006B181	2006B181	2006B181	2006B182	2006B182	2006B183	2006B183	2006B184	2006B184	2006B185	2006B185	2006B185	2006B185	2006B185		
119	INTERNAL CONNECTION ORING for AS vers.	404V3168	404V3168	404V3168	404V3212	404V3212	404V174	404V4325	404V4325	404V4325	404V4426	404V4426	404V4426	404V4426	404V4426		
120	EXTERNAL CONNECTION ORING for AS vers.	411A06X20	411A06X20	411A06X20	411A06X20	411A06X20	411A06X20	411A06X20	404V4412	404V4412	404V4525	404V4525	404V4525	404V4525	404V4525		
121	TCEI SCREW	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
200	RETAINER PIN	2014B200	2014B200	2014B200	2014B200	2014B200	2014B200	2014B200	2014B200	2014B200	2014B200	2014B200	2014B200	2014B200	2014B200		
201	MECHANICAL SEAL BTC5E-B2GVGG	4U030CSEBGE	4U030CSEBGE	4U030CSEBGE	4U035CSEBGE	4U035CSEBGE	4U050CSEBGE	4U050CSEBGE	4U065CSEBGE	4U065CSEBGE	4U080CSEBGE	4U080CSEBGE	4U085CSEBGE	4U100CSEBGE	4U100CSEBGE		
	MECHANICAL SEAL BTC5E-B2V1GG	4U030CSEBVE	4U030CSEBVE	4U030CSEBVE	4U035CSEBVE	4U035CSEBVE	4U050CSEBVE	4U050CSEBVE	4U065CSEBVE	4U065CSEBVE	4U080CSEBVE	4U080CSEBVE	4U085CSEBVE	4U100CSEBVE	4U100CSEBVE		
	MECHANICAL SEAL BTC5E-YV1VGG	4U030CSEYVV	4U030CSEYVV	4U030CSEYVV	4U035CSEYVV	4U035CSEYVV	4U050CSEYVV	4U050CSEYVV	4U065CSEYVV	4U065CSEYVV	4U080CSEYVV	4U080CSEYVV	4U085CSEYVV	4U100CSEYVV	4U100CSEYVV		
	MECHANICAL SEAL UNITEN 7K-XTXZ-HX	4U030UJKXZT	4U030UJKXZT	4U030UJKXZT	4U035UJKXZT	4U035UJKXZT	4U050UJKXZT	4U050UJKXZT	4U065UJKXZT	4U065UJKXZT	4U080UJKXZT	4U080UJKXZT	4U085UJKXZT	4U100UJKXZT	4U100UJKXZT		
	MECHANICAL SEAL UNITEN 7K-XYXZ-HX	4U030UJKXZY	4U030UJKXZY	4U030UJKXZY	4U035UJKXZY	4U035UJKXZY	4U050UJKXZY	4U050UJKXZY	4U065UJKXZY	4U065UJKXZY	4U080UJKXZY	4U080UJKXZY	4U085UJKXZY	4U100UJKXZY	4U100UJKXZY		
	MECHANICAL SEAL UNITEN 7K-XFXZ5-HX	4U030UJKXZ5	4U030UJKXZ5	4U030UJKXZ5	4U035UJKXZ5	4U035UJKXZ5	4U050UJKXZ5	4U050UJKXZ5	4U065UJKXZ5	4U065UJKXZ5	4U080UJKXZ5	4U080UJKXZ5	4U085UJKXZ5	4U100UJKXZ5	4U100UJKXZ5		
	MECHANICAL SEAL UNITEN 7K-X73Z7-HX	4U030UJK3Z7	4U030UJK3Z7	4U030UJK3Z7	4U035UJK3Z7	4U035UJK3Z7	4U050UJK3Z7	4U050UJK3Z7	4U065UJK3Z7	4U065UJK3Z7	4U080UJK3Z7	4U080UJK3Z7	4U085UJK3Z7	4U100UJK3Z7	4U100UJK3Z7		

KEY No.	DESCRIPTION	PART No. BY MODEL																			
		B105	B110	B115	B215	B220	B325	B330	B430	B440	B470	B490	B550	B660	B680						
201	MECHANICAL SEAL UNITS 7K-X327HX	4U030U7K327	4U030U7K327	4U030U7K327	4U035U7K325	4U035U7K325	4U050U7K325	4U050U7K325	4U065U7K325	4U065U7K325	4U080U7K325	4U080U7K325	4U085U7K325	4U100U7K325	4U100U7K325						
202	MECHANICAL SEAL UNITS 7K-X337HX	4U030U7K337	4U030U7K337	4U030U7K337	4U035U7K335	4U035U7K335	4U050U7K335	4U050U7K335	4U065U7K335	4U065U7K335	4U080U7K337	4U080U7K337	4U085U7K337	4U100U7K337	4U100U7K337						
203	MECHANICAL SEAL UNITS 7K-X337HX	4U030U7K337	4U030U7K337	4U030U7K337	4U035U7K335	4U035U7K335	4U050U7K335	4U050U7K335	4U065U7K335	4U065U7K335	4U080U7K337	4U080U7K337	4U085U7K337	4U100U7K337	4U100U7K337						
204	MECHANICAL SEAL UNITS 7K-XF335HX	4U030U7K335	4U030U7K335	4U030U7K335	4U035U7K335	4U035U7K335	4U050U7K335	4U050U7K335	4U065U7K335	4U065U7K335	4U080U7K335	4U080U7K335	4U085U7K335	4U100U7K335	4U100U7K335						
205	MECHANICAL SEAL UNITS 7K-XF335HX	4U030U7K335	4U030U7K335	4U030U7K335	4U035U7K335	4U035U7K335	4U050U7K335	4U050U7K335	4U065U7K335	4U065U7K335	4U080U7K335	4U080U7K335	4U085U7K335	4U100U7K335	4U100U7K335						
206	DOUBLE MEC. SEAL FLUITEN KLA2A32ZY10JE	4Q030Z2YE	4Q030Z2YE	4Q030Z2YE	4Q035Z2YE	4Q035Z2YE	4Q050Z2YE	4Q050Z2YE	4Q065Z2YE	4Q065Z2YE	4Q080Z2YE	4Q080Z2YE	4Q085Z2YE	4Q100Z2YE	4Q100Z2YE						
207	DOUBLE MEC. SEAL FLUITEN KLA2A32ZY10JE	4Q030Z2YE	4Q030Z2YE	4Q030Z2YE	4Q035Z2YE	4Q035Z2YE	4Q050Z2YE	4Q050Z2YE	4Q065Z2YE	4Q065Z2YE	4Q080Z2YE	4Q080Z2YE	4Q085Z2YE	4Q100Z2YE	4Q100Z2YE						
208	DOUBLE MEC. SEAL FLUITEN KLA2A32Z2DJE	4Q030Z2YE	4Q030Z2YE	4Q030Z2YE	4Q035Z2YE	4Q035Z2YE	4Q050Z2YE	4Q050Z2YE	4Q065Z2YE	4Q065Z2YE	4Q080Z2YE	4Q080Z2YE	4Q085Z2YE	4Q100Z2YE	4Q100Z2YE						
209	DOUBLE MEC. SEAL FLUITEN KLA2A32Z2DJE	4Q030Z2YE	4Q030Z2YE	4Q030Z2YE	4Q035Z2YE	4Q035Z2YE	4Q050Z2YE	4Q050Z2YE	4Q065Z2YE	4Q065Z2YE	4Q080Z2YE	4Q080Z2YE	4Q085Z2YE	4Q100Z2YE	4Q100Z2YE						
210	BALANCING RING for MECHANICAL SEALS C5E	2014B021	2014B021	2014B021	2014B022	2014B022	2014B023	2014B023	2014B024	2014B024	2014B026	2014B026	2014B024	2014B026	2014B026						
211	BALANCING RING for MECHANICAL SEALS C5E	2014B021	2014B021	2014B021	2014B022	2014B022	2014B023	2014B023	2014B024	2014B024	2014B026	2014B026	2014B024	2014B026	2014B026						
212	FLUSHING SEAL BOX	404T3218	404T3218	404T3218	404T168	404T168	404T4312	404T4312	404T4437	404T4437	404T4500	404T4437	404T4625	404T4625	404T4625						
213	FLUSHING SEAL BOX ORING	404T3218	404T3218	404T3218	404T168	404T168	404T4312	404T4312	404T4437	404T4437	404T4500	404T4437	404T4625	404T4625	404T4625						
214	TURNING RING	2004B151	2004B151	2004B151	2004B152	2004B152	2004B153	2004B153	2004B154	2004B154	2004B167	2004B167	2004B165	2004B165	2004B165						
215	TURNING RING ORING	404T2137	404T2137	404T2137	404T3181	404T3181	404T4237	404T4237	404T4312	404T4312	404T4350	404T4350	404T4475	404T4475	404T4475						
216	SCREW	420A04X05	420A04X05	420A04X05	420A05X05	420A05X05	420A06X05	420A06X05	420A06X06	420A06X06	420A06X08	420A06X08	420A06X06	420A06X08	420A06X12						
217	PIN	417A06X10	417A06X10	417A06X10	417A06X12	417A06X12	417A06X12	417A06X12	417A06X15	417A06X15	417A06X15	417A06X15	417A06X15	417A06X15	417A06X15						
218	BALANCING RING for FLUSHED MEC. SEALS 7K	2014B007	2014B007	2014B007	2014B008	2014B008	2014B009	2014B009	2014B010	2014B010	214B019	214B019	2014B010	2014B010	2014B010						
219	BALANCING RING for FLUSHED MEC. SEALS C5E	2014B031	2014B031	2014B031	2014B032	2014B032	2014B033	2014B033	2014B034	2014B034	214B237	214B237	2014B034	2014B034	2014B034						
220	BALANCING RING for DOUBLE FLUSHED M. SEALS 2	2014B011	2014B011	2014B011	2014B012	2014B012	2014B013	2014B013	2014B014	2014B014	214B237	214B237	2014B014	2014B014	2014B014						
221	FLUSHING DOUBLE MEC. SEAL BOX ORING	404T3218	404T3218	404T3218	404T168	404T168	404T4312	404T4312	404T4437	404T4437	404T4500	404T4437	404T4625	404T4625	404T4625						
222	TURNING RING	2004B151	2004B151	2004B151	2004B152	2004B152	2004B153	2004B153	2004B154	2004B154	2004B167	2004B167	2004B165	2004B165	2004B165						
223	TURNING RING ORING	404T2137	404T2137	404T2137	404T3181	404T3181	404T4237	404T4237	404T4312	404T4312	404T4350	404T4350	404T4475	404T4475	404T4475						
224	SCREW	420A04X05	420A04X05	420A04X05	420A05X05	420A05X05	420A06X05	420A06X05	420A06X06	420A06X06	420A06X08	420A06X08	420A06X06	420A06X08	420A06X12						
225	PIN	417A06X10	417A06X10	417A06X10	417A06X12	417A06X12	417A06X12	417A06X12	417A06X15	417A06X15	417A06X15	417A06X15	417A06X15	417A06X15	417A06X15						
226	BALANCING RING for FLUSHED MEC. SEALS 7K	2014B007	2014B007	2014B007	2014B008	2014B008	2014B009	2014B009	2014B010	2014B010	214B019	214B019	2014B010	2014B010	2014B010						
227	BALANCING RING for FLUSHED MEC. SEALS C5E	2014B031	2014B031	2014B031	2014B032	2014B032	2014B033	2014B033	2014B034	2014B034	214B237	214B237	2014B034	2014B034	2014B034						
228	BALANCING RING for DOUBLE FLUSHED M. SEALS 2	2014B011	2014B011	2014B011	2014B012	2014B012	2014B013	2014B013	2014B014	2014B014	214B237	214B237	2014B014	2014B014	2014B014						
229	FLUSHING DOUBLE MEC. SEAL BOX ORING	404T3218	404T3218	404T3218	404T168	404T168	404T4312	404T4312	404T4437	404T4437	404T4500	404T4437	404T4625	404T4625	404T4625						
230	PIN	417A06X05	417A06X05	417A06X05	417A10X50	417A10X50	417A12X60	417A12X60	417A12X65	417A12X65	417A16X80	417A16X80	417A16X80	417A16X80	417A16X80						
231	DOUBLE MEC. SEAL SPACER	2001F231	2001F231	2001F231	2001F232	2001F232	2001F233	2001F233	2001F234	2001F234	2001F235	2001F235	2001F235	2001F235	2001F235						
232	FLUSHING DOUBLE MEC. SEAL BOX	2014B147	2014B147	2014B147	2014B148	2014B148	2014B149	2014B149	2014B150	2014B150	2014B151	2014B151	2014B151	2014B151	2014B151						
233	FLUSHING DOUBLE MEC. SEAL BOX COVER	2014B153	2014B153	2014B153	2014B154	2014B154	2014B155	2014B155	2014B156	2014B156	2014B157	2014B157	2014B162	2014B162	2014B162						
234	COVER ORING	404T3218	404T3218	404T3218	404T168	404T168	404T4312	404T4312	404T4437	404T4437	404T4437	404T4437	404T4437	404T4437	404T4437						
235	SEAL RING LIM VITON	402V45356	402V45356	402V45356	402V48405	402V48405	402V705510	402V705510	402V705510	402V705510	402V1058510	402V1058510	402V1058510	402V1058510	402V1058510						
236	SEAL RING LIM EPDM	402U45356	402U45356	402U45356	402U48405	402U48405	402U705510	402U705510	402U705510	402U705510	402U1058510	402U1058510	402U1058510	402U1058510	402U1058510						
237	SEAL RING POLYMER S1	402Q45357	402Q45357	402Q45357	402Q48406	402Q48406	402Q70558	402Q70558	402Q70558	402Q70558	402Q1058510	402Q1058510	402Q1058510	402Q1058510	402Q1058510						
238	SEAL RING POLYMER S1	402Q45357	402Q45357	402Q45357	402Q48406	402Q48406	402Q70558	402Q70558	402Q70558	402Q70558	402Q1058510	402Q1058510	402Q1058510	402Q1058510	402Q1058510						
239	SEAL RING POLYMER S1	402Q45357	402Q45357	402Q45357	402Q48406	402Q48406	402Q70558	402Q70558	402Q70558	402Q70558	402Q1058510	402Q1058510	402Q1058510	402Q1058510	402Q1058510						
240	SEAL RING POLYMER S1	402Q45357	402Q45357	402Q45357	402Q48406	402Q48406	402Q70558	402Q70558	402Q70558	402Q70558	402Q1058510	402Q1058510	402Q1058510	402Q1058510	402Q1058510						
241	SEAL RING POLYMER S1	402Q45357	402Q45357	402Q45357	402Q48406	402Q48406	402Q70558	402Q70558	402Q70558	402Q70558	402Q1058510	402Q1058510	402Q1058510	402Q1058510	402Q1058510						
242	BUSH ORING	2004B156	2004B156	2004B156	2004B157	2004B157	2004B158	2004B158	2004B159	2004B159	2004B168	2004B168	2004B168	2004B168	2004B168						
243	SCREW	420A05X05	420A05X05	420A05X05	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A06X08	420A06X08	420A06X06	420A06X08	420A06X10						
244	SEAL RING SUPPORT	2014B051	2014B051	2014B051	2014B052	2014B052	2014B053	2014B053	2014B054	2014B054	2014B057	2014B057	2014B054	2014B057	2014B056						
245	SUPPORT ORING	404T3218	404T3218	404T3218	404T168	404T168	404T4312	404T4312	404T4437	404T4437	404T4500	404T4437	404T4625	404T4625	404T4625						
246	PIN	417A06X10	417A06X10	417A06X10	417A06X12	417A06X12	417A06X12	417A06X12	417A06X15	417A06X15	417A06X15	417A06X15	417A06X15	417A06X15	417A06X15						
247	PIN	417A06X10	417A06X10	417A06X10	417A06X12	417A06X12	417A06X12	417A06X12	417A06X15	417A06X15	417A06X15	417A06X15	417A06X15	417A06X15	417A06X15						
248	PTFE PACKING RING KIT	205P38506	205P38506	205P38506	205P45576	205P45576	205P60768	205P60768	205P60968	205P60968	205P10012010	205P10012010	205P10012010	205P10012010	205P10012010						
249	STUFFING BOX SEAL BUSH	2004B161	2004B161	2004B161	2004B162	2004B162	2004B163	2004B163	2004B164	2004B164	2004B169	2004B169	2004B165	2004B165	2004B165						
250	BUSH ORING	404T3118	404T3118	404T3118	404T4137	404T4137	404T4200	404T4200	404T4312	404T4312	404T168	404T168	404T4400	404T4400	404T4400						
251	SCREW	420A05X05	420A05X05	420A05X05	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A06X08	420A06X08	420A06X06	420A06X08	420A06X10						
252	STUFFING BOX SEAL SUPPORT	2014B071	2014B071	2014B071	2014B072	2014															

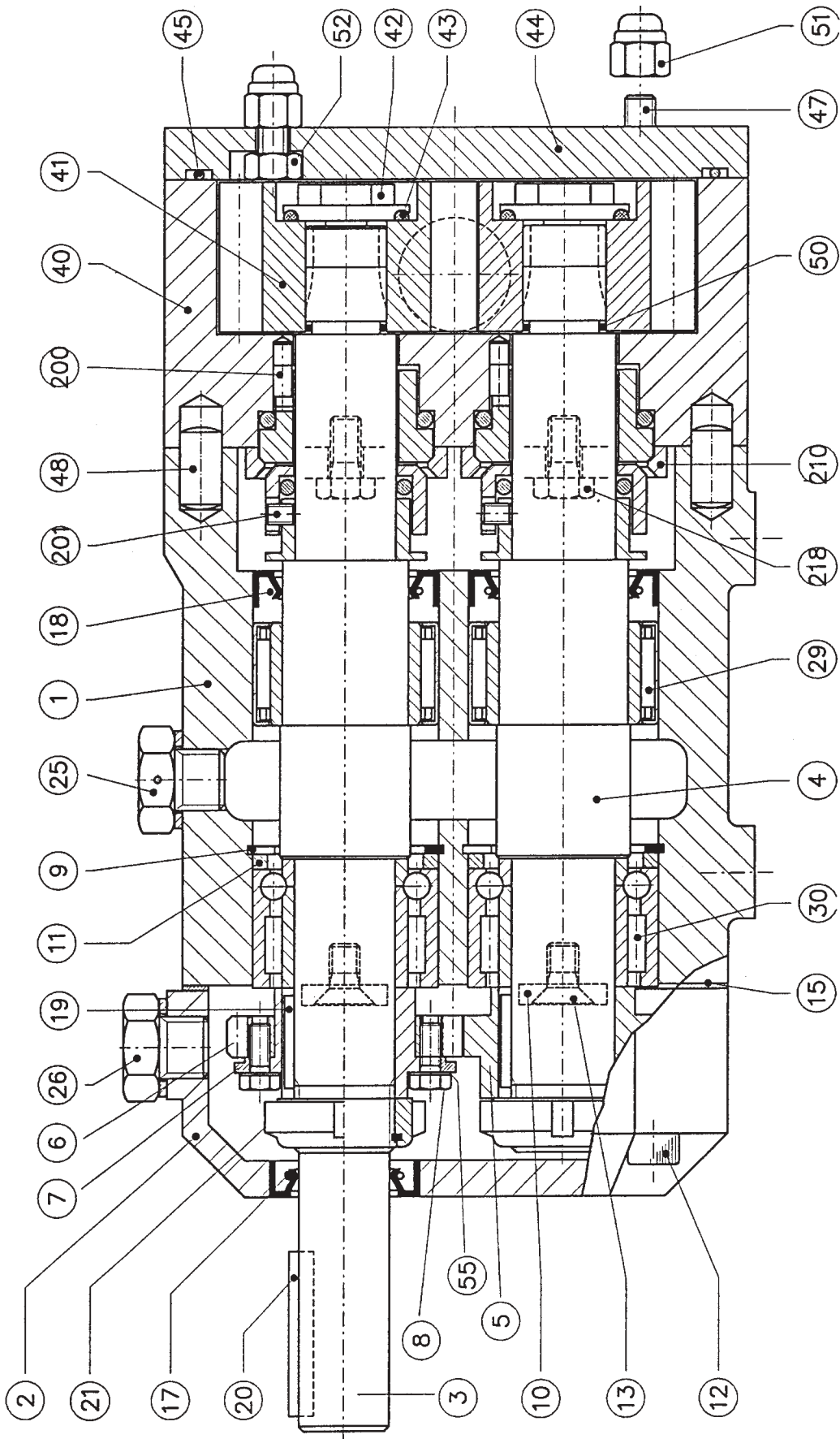


Fig. 40 Cross section type B100

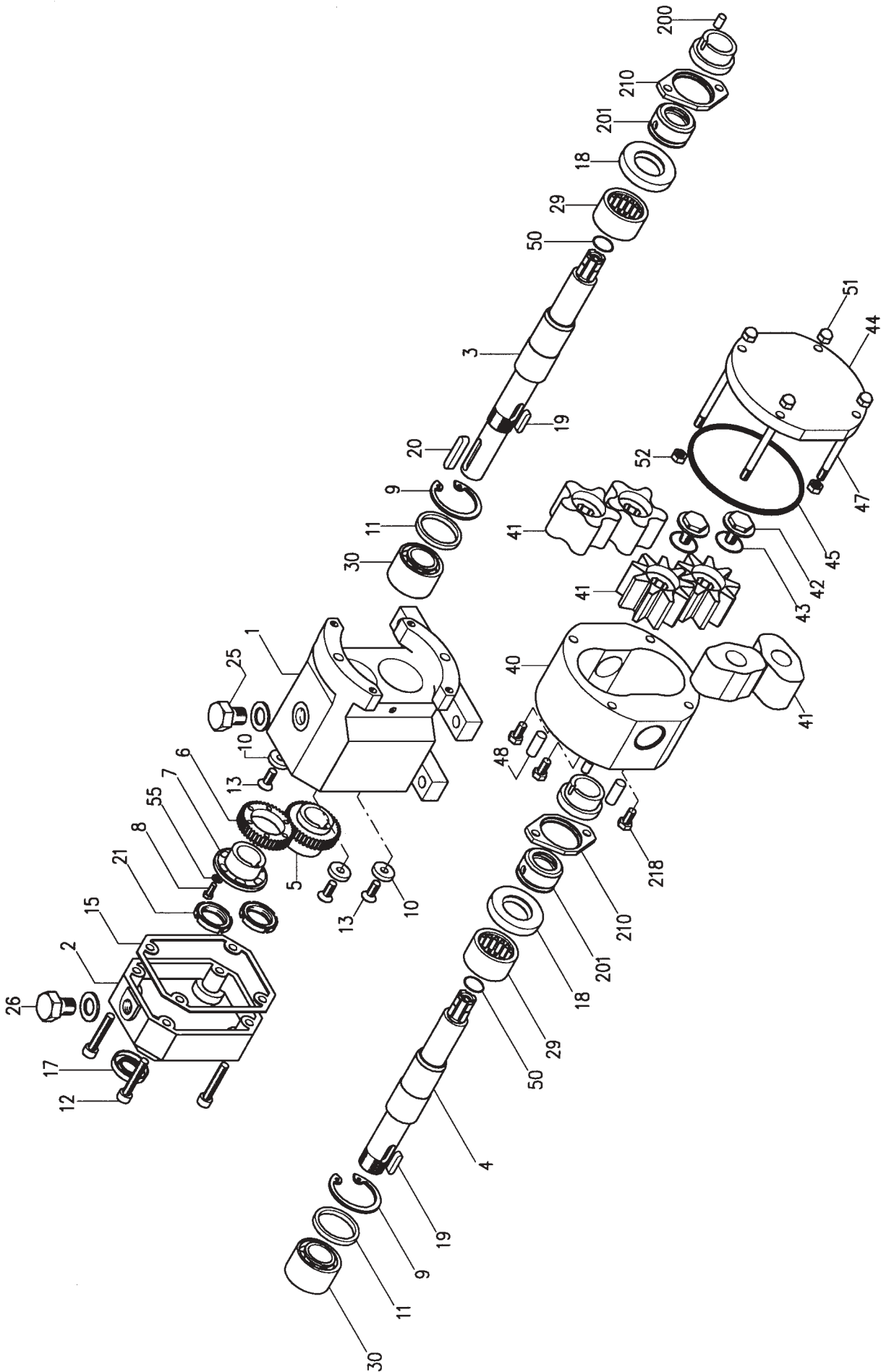
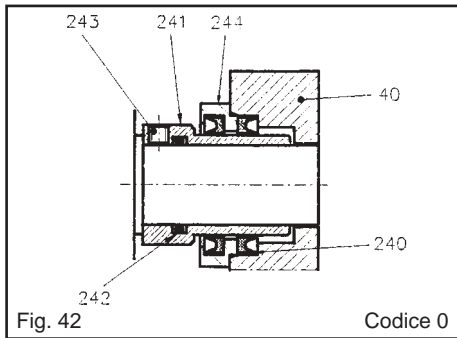


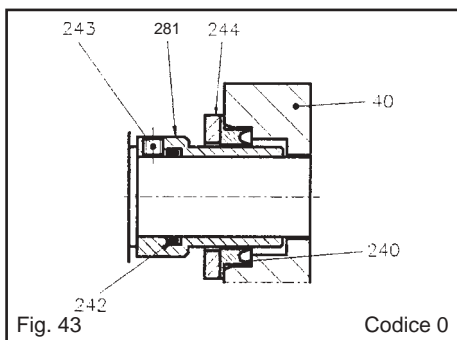
Fig. 41 Pump type B100

## SEALS FOR PUMP TYPE



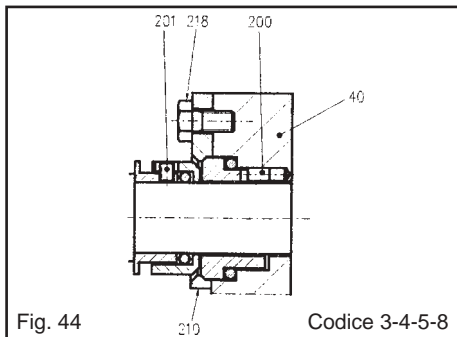
### LIP SEAL

- Pos. 242 = N.B.R. (Viton) O-ring
- Pos. 240 = "UM" Viton rings



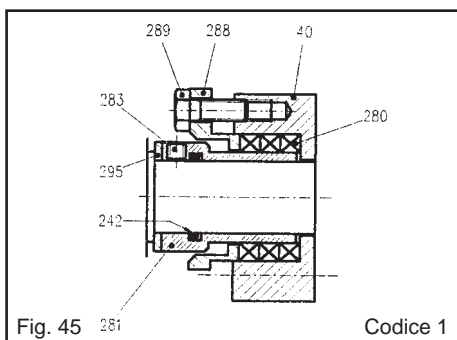
### S1 LIP SEAL

- Pos. 242 = N.B.R. (viton) O-ring
- Pos. 240 = "UM" polymer S1 rings



### BALANCED ROTARY MECHANICAL SEAL "U7K"

- Code 3 • Stationary part = carbon O-ring = EPDM (viton)
- Rotating part = aisi 316 s.s.
- Code 4 • Stationary part = carbon O-ring = EPDM (viton)
- Rotating part = tung. carbide
- Code 5 • Stationary part = tung. carbide O-ring = EPDM (viton)
- Rotating part = tung. carbide
- Code 8 • Stationary part = silicon carbide O-ring = EPDM (viton)
- Rotating part = silicon carbide



### PACKING GLAND

- Pos. 242 = N.B.R. (Viton) O-ring
- Pos. 280 = PTFE lubricated braid packing ring

## B100 PART LIST - SPARE PARTS CODE

Key No.	Description	Materials	No. REQ.	PART No.
1	Bearing Housing	G25 Cast Iron	1	2001G007
2	Gear cover	Aluminium	1	2001L037
3	Standard driving shaft	Aisi 316 L S.S.	1	2004B061
4	Standard driven shaft	Aisi 316 L S.S.	1	2004B062
5	Fixed gear	38NCD4	1	2008M013
6	Adjustable gear	38NCD4	1	2008M017
7	Adjustable gear bush	38NCD4	1	2008M038
8	M4x10 TE screw	Iron	6	410F04X10
9	Split ring	Iron	2	421F371
10	Din 6319 type G d=6x17 plane washer	Iron	4	412F06G17
11	Axial adjustment spacer	Iron	2	2014M030
12	M6x35 TCEI screw	Aisi 304 S.S.	4	411A06X35
13	M6x12 TCEI screw	Iron	4	411F06X12Z
15	Gear cover seal	Fibre	1	404T100
17	18x30x7 oil seal ring	N.B.R.	1	403Y18307D
18	25x37x7 oil seal ring	N.B.R.	2	403Y25377D
19	6x6x18 Key	Iron	2	418F06x18
20	6x6x30 Key	AISI 304 S.S.	1	418A06x30
21	M20x1 gear ring nut	Iron	2	415F20AUT
25	1/4" oil cap vent	Brass	1	407L14S
26	1/4" oil cap	Aluminium	1	407L14T
29	HK 3020 front bearing and bush		2	2019M020
30	NATB 5904 rear bearing		2	406 FNATB5904
40	Rotor case	AISI 316 L S.S.	1	23...B14
41	316 S.S. gear rotor ST	AISI 316 L S.S.	2	2005B086
	316 S.S.2 lobe ST	AISI 316 L S.S.	2	2005B089
	Rubber coated 316 S.S. 5 lobe	AISI 316 S.S. + Rubber	2	2005B098
	S.S. anti-seizure alloy gear rotor	Acteon	2	2005&086
	S.S. anti-seizure alloy 2 lobe	Acteon	2	2005&089
42	Locking nut for rotor	AISI 316 L S.S.	2	2004B107
43	3075 O'ring	N.B.R.	2	404T3075
44	Standard end cover	AISI 316 L S.S.	1	2006B007
45	4337 cover o'ring	N.B.R.	1	404T4337
47	M6x80 front stud	AISI 304 S.S.	4	419A06X80
48	d=8x20 front pin	AISI 304 S.S.	2	417A08X16
50	2056 O'ring	N.B.R.	2	404T2056
51	M6 cap nut	AISI 304 S.S.	4	414A06
52	UNI 5588 nut	AISI 304 S.S.	2	413A06
55	Plane washer	Iron	6	412F04
200	Retainer pin	AISI 304 S.S.	2	2014B200
201	Mechanical seal UNITEN 7K-X7XZ7.HX	AISI 316 S.S./Carbon/EPDM	2	4U020U7KXZ7
	Mechanical seal UNITEN 7K-XYXZY.HX	AISI 316 S.S./Carbon/Viton	2	4U020U7KXZY
	Mechanical seal UNITEN 7K-XFXZ5.HX	AISI 316 S.S./Carbon/PTFE	2	4U020U7KXZ5
	Mechanical seal UNITEN 7K-X73Z7.HX	Tung. Carbide/Carbon/EPDM	2	4U020U7K3Z7
	Mechanical seal UNITEN 7K-XY3ZY.HX	Tung. Carbide/Carbon/Viton	2	4U020U7K3ZY
	Mechanical seal UNITEN 7K-XF3Z5.HX	Tung. Carbide/Carbon/PTFE	2	4U020U7K3Z5
	Mechanical seal UNITEN 7K-X7337.HX	Tung. Carbide/Tung.Carb/EPDM	2	4U020U7K337
	Mechanical seal UNITEN 7K-XY33Y.HX	Tung. Carbide/Tung.Carb/Viton	2	4U020U7K33Y
	Mechanical seal UNITEN 7K-XF335.HX	Tung. Carbide/Tung. Carb./PTFE	2	4U020U7K335
	Mechanical seal UNITEN 7K-XYDKKY.HX	Silicon Carbide/Sil. Carb./Viton	2	4U020U7KKKY
210	Balancing ring for seal	304 AISI S.S.	2	2014B015
218	M6x12 TE screw	304 AISI S.S.	4	410A06X12
240	35x25x5 seal ring	Viton	4	402V35255
	35x25x5 seal ring	EPDM	4	402U35255
	S1 polymer lip seal	polymer	2	402Q35256
241	Seal ring bush	316 L Aisi S.S.	2	2004B171
242	3081 bush o'ring	N.B.R.	2	404T3081
243	M5x6 screw	304 AISI S.S.	6	420A05X05
244	Seal ring support	316 L AISI S.S.	2	2014B058
	S1 lip seal support	304 AISI S.S.	2	2014B065
280	Ptfe packing ring kit	PTFE	1	205P25355
281	Staffing box - S1 seal bush	316 L AISI S.S.	2	2004B170
283	Screw	304 AISI S.S.	6	420A05X05
288	Register	316 L AISI S.S.	2	2014B108
295	Spacer	304 AISI S.S.	2	2014B045

**COMMON FLUIDS FEATURES - SEAL / ROTOR PREFERRED CHOICE \*.**

FLUIDS	Viscosity cPs	Temperature C°	Speed r.p.m.	Seals		O-Ring	Rotor	
				1°	2°		1°	2°
<b>Dairy products</b>								
milk	2	18	250 - 450	3	0	T	0	-
yoghurt	500 - 150	20 - 40	250 - 350	6	3	T	0	2
butter	50.000	4	20 - 70	5	-	T	5	-
cream 30% Fat	14	16	250 - 350	3	0	T	0	-
curd	20 - 500	10	50 - 200	3	0	T	0	2-6
condensed milk	40 - 80	40	250 - 450	3	0	T	0	-
condensed milk 75% solid	2.000	20	200 - 400	5	3	T	0	-
melted butter	40	50	300 - 400	5	-	T	0	-
process cheese	30.000-6.500	18 - 80	200 - 400	5	-	T	0	-
cottage cheese	30.000	18	50 - 150	5	-	T	0	-
milk whey	1	20	300 - 500	3	0	T	0	-
milk enzymes	5	10	250 - 300	3	0	T	0	-
ice-cream	400	10	200 - 300	5	0	T	0	-
<b>Food products</b>								
soup	1 - 400	20	250 - 450	5	3	T	0	-
cocoa-butter	50 - 0.5	60 - 100	300 - 400	5	-	T	0	-
animal grease	60	40	250 - 400	3	-	T	0	-
meat extract	10.000	65	200 - 350	5C	-	T	0	-
mayonnaise	20.000	20	200 - 300	5	-	T	0	-
malt extract	3.000 - 9.500	18 - 60	200 - 300	5	1	T	0	-
caramel	30.000	20	150 - 250	5C	1	T	0	1
molasses	280-15.000	40	150 - 300	5	1	T	0	1
jam	8.000	16	200 - 350	5	-	T	1	0-5
honey	1.500	40	250 - 350	5	-	T	0	-
whole egg	150	4	200 - 350	6	5C	T	0	-
brewers yeast	350	18	300 - 400	5	-	T	0	-
soya bean lecithin	6.000	50	200 - 300	5	-	T	0	-
olive oil	40	38	250 - 350	5	3	T	0	-
seed oil	20 - 60	20	250 - 350	5	3	T	0	-
minced meat	100.000	30	20 - 150	5	1	T	5	-
pectin	300	30	300 - 400	3	5	T	0	-
pudding of maize meal	100	100	100 - 200	1	0	T	0	8
biscuit cream premix	5.000-10.000	18	50 - 150	5	-	T	5	1-0
chocolate	200 - 2.000	18 - 40	50 - 150	0	1	T	0	-
icing	500 - 2000	18	100 - 300	5	-	T	1	0
brine	1	20	300 - 450	6	5	T	0	-
tomato sauce	10	20	200 - 300	5	-	T	0	-
diced tomato	10	20	50 - 200	5	-	T	5	2
tomato purée	7.000	20	150 - 250	5	-	T	0	-
tomato triple concentrate	12.000	18	150 - 250	5	-	T	0	-
tomato paste 30%	200	18	200 - 300	5	-	T	0	-
ketchup	1.000	30	200 - 300	5	-	T	0	-
<b>Beverages</b>								
glucose	4.300 - 8.600	25 - 30	200 - 300	5C	-	T	0	-
sorbitol	200	20	250 - 300	5	-	T	0	-

FLUIDS	Viscosity cPs	Temperature C°	Speed r.p.m.	Seals		O-Ring	Rotor	
				1°	2°		1°	2°
sugar solution 30° Brix	4	10	300 - 400	5	-	T	0	-
" " 40° Brix	10	10	300 - 400	5	-	T	0	-
" " 50° Brix	25	10	300 - 400	5	-	T	0	-
" " 60° Brix	60	18	300 - 400	5	-	T	0	-
" " 70° Brix	550	18	250 - 350	5	-	T	0	-
" " 80° Brix	6.000	30	200 - 300	5	-	T	0	-
vinegar	15	20	300 - 500	3	-	T	0	-
wine	1	18	350 - 750	3	-	T	0	-
spirits	10 - 100	20	250 - 400	5	-	T	0	-
alcohol	1	18	300 - 500	3	-	T	0	-
grape juice	1	18	350 - 450	5	-	T	0	-
beer	1		300 - 400	3	-	T	0	-
fruit purée	400 - 4.000	18	150 - 300	5	-	T	1	0
fruit juice	20 - 80	18	250 - 400	5	-	T	0	-
orange juice concentrate	5.000 - 500	5 - 20	200 - 300		-	T	0	-
<b>Cosmetic and pharmaceutical</b>								
dodecilbensensulphonic acid	6.000	18	300 - 400	5	-	V	0	-
detergents	100 - 4.000	18	250 - 400	5	3	V	0	-
hand cream	800 - 35.000	20	150 - 350	5	3	V	0	-
shampoo	2.000	20	250 - 350	5	3	T	0	-
hair gel	5.000	20	250 - 350	5	3	T	0	-
nail-polish	10.000	20	250 - 350	5	-	P	0	-
soap	3.000	20	150 - 250	1	-	V	0	-
toothpaste	100.000	18	50 - 150	5	1	V	0	-
hydrogen peroxide	1	15	300 - 400	7	5	V	0	-
glycerine	600	18	250 - 350	6	4	T	0	-
vaseline	30.000 - 500	10 - 40	40 - 350	5	-	T	0	-
<b>Industrial products</b>								
citric acid	1	20	300 - 450	3		T	0	-
solphonic acid	125	30	250 - 400	5	6	V	0	-
etosilati neutralize alcohol	200 - 600	60 - 30	300 - 400	5	-	P	0	-
isopropyl alcohol	1	20	300 - 400	3	-	U	0	-
flavour for tobacco	10 - 100	20	300 - 450	5	3	T	0	8
fermentation soup	20	20	250 - 350	3	-	T	0	-
cellulose	6.000-15.000	18	250 - 350	5C	-	P	0	-
wax	500	93	200 - 300	5	-	T	0	-
vinyl glue	1.500	18	200 - 300	5C	1	V	0	-
ureic phenolic glue	600	20	200 - 300	5C	1	P	0	-
latex emulsion	200	20	300 - 400	5C	-	P	0	-
paraffin emulsion	3.000	18	250 - 350	5	-	V	0	-
ethylene	20	20	250 - 400	3	-	T	0	-
glycol ethylene	10	20	250 - 400	3	-	T	0	-
printers ink	500 - 2.000	35	300 - 500	6	-	V	0	-
fluid silicons	500	40	300 - 400	5C	-	P	0	-
dyes	1 - 200	20	300 - 500	6	-	V	0	-
acryl resin	5.000	20	200 - 300	5C	1	P	0	-
alkyl resin	180 - 900	5 - 40	250 - 350	5C	1	V	0	-
vinyl resin	5.500	20	200 - 300	5C	1	V	0	-

\*For further information the technical office of the manufacturer company is at your disposal.



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