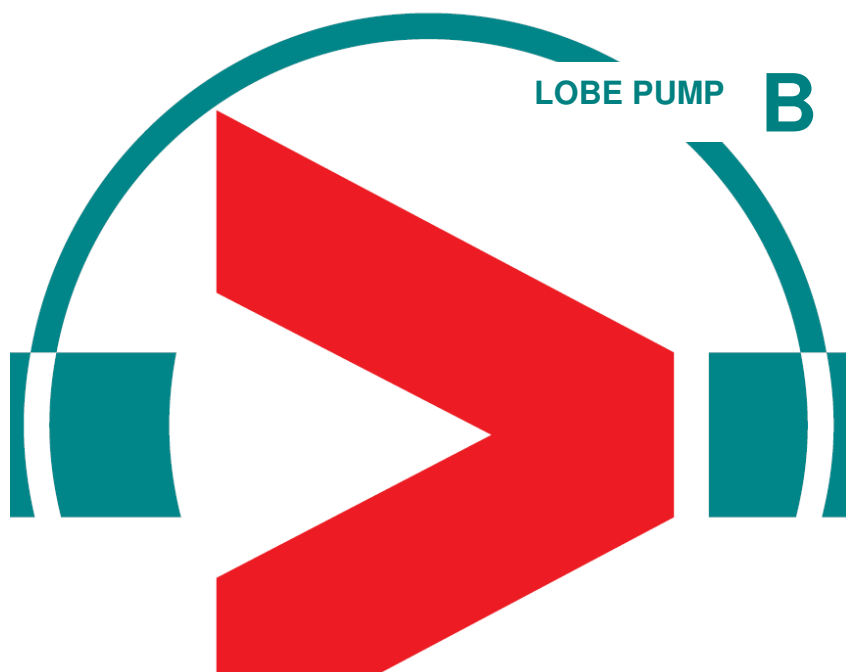
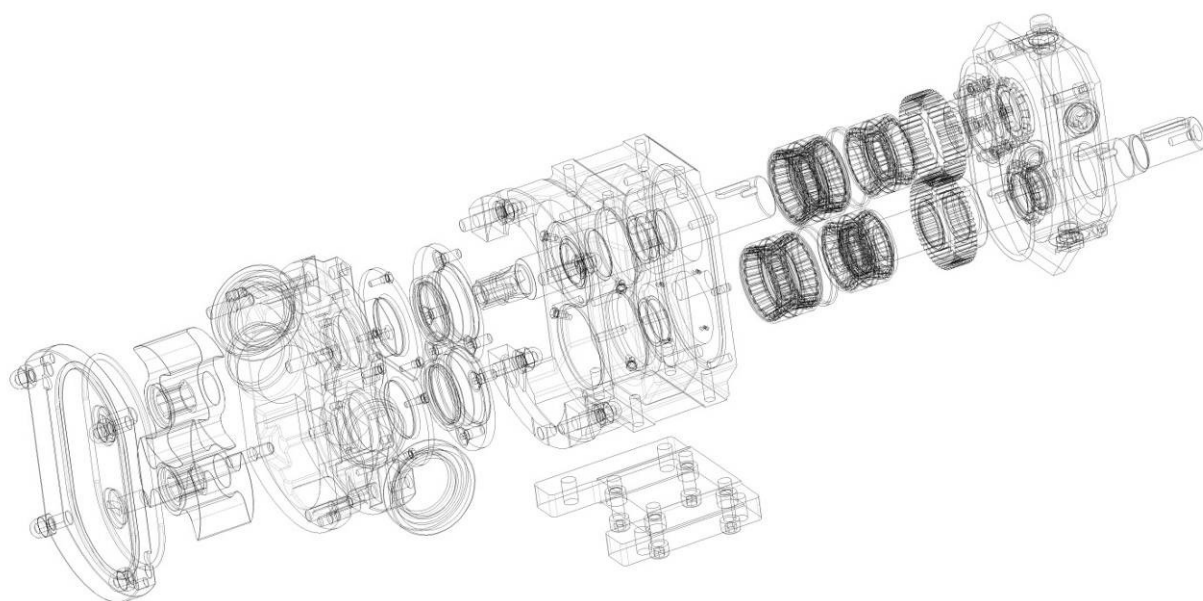


Maintenance- and service manual



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1 Introduction

This handbook contains the necessary instructions for the right use and maintenance of the 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 “dangerous area” are no sparking.

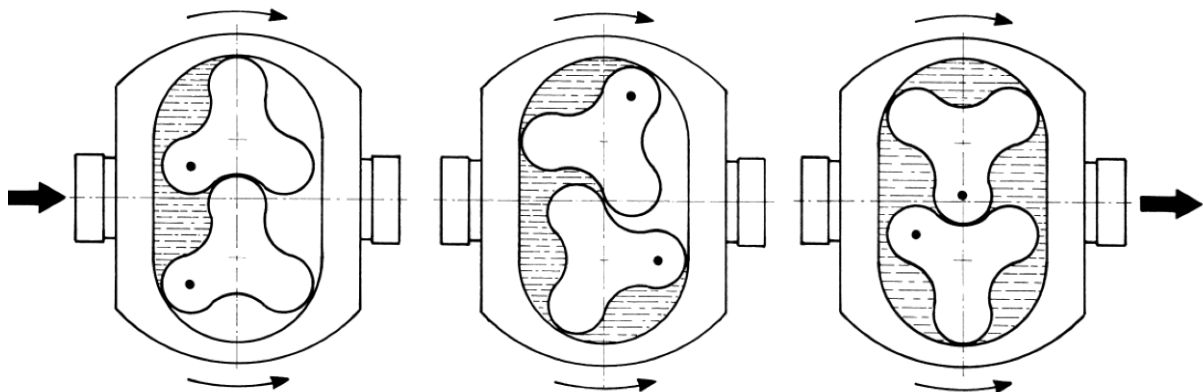


Fig. 1

3 Installation

3.1 Positioning

- 1 - If the pump is delivered in bareshaft 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.

- 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 - Lobe pump suction and discharge are sized to suit passage of even very viscous medium; consequently the piping should not be necessary 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.

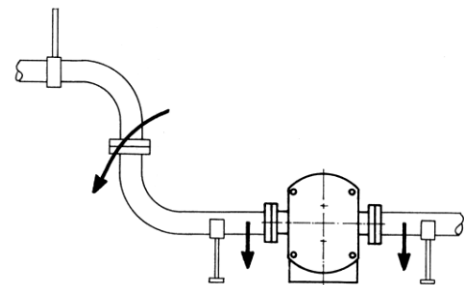


Fig. 2

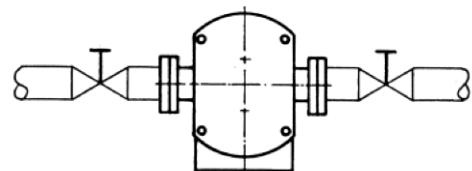


Fig. 3

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

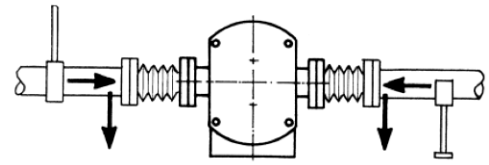


Fig. 4

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

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

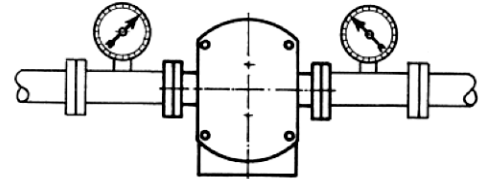


Fig. 5

- 12 - Where necessary arrange an inlet filter, whose suction area must not be smaller than 4-5 times the suction pipe to minimize the friction losses.
- 13 - During the pump unit installation it's necessary to leave a useful 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..

RIGHT

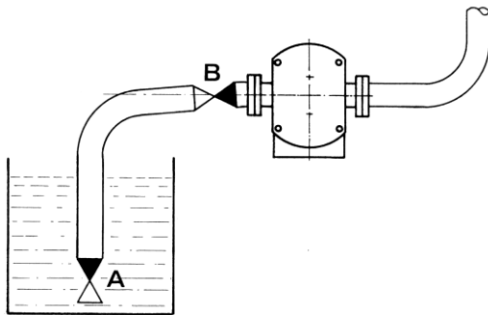
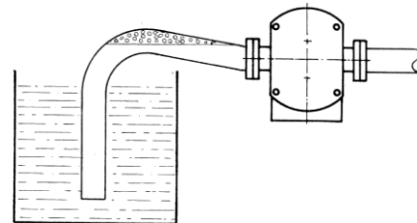


Fig. 6

WRONG



- 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.

RIGHT

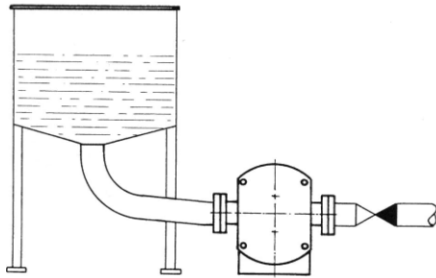
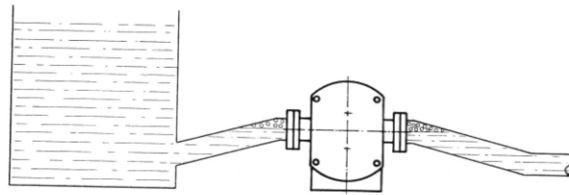


Fig. 7

WRONG



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 an load.

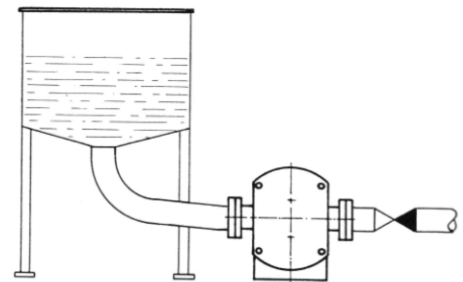


Fig. 8

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.
- 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.

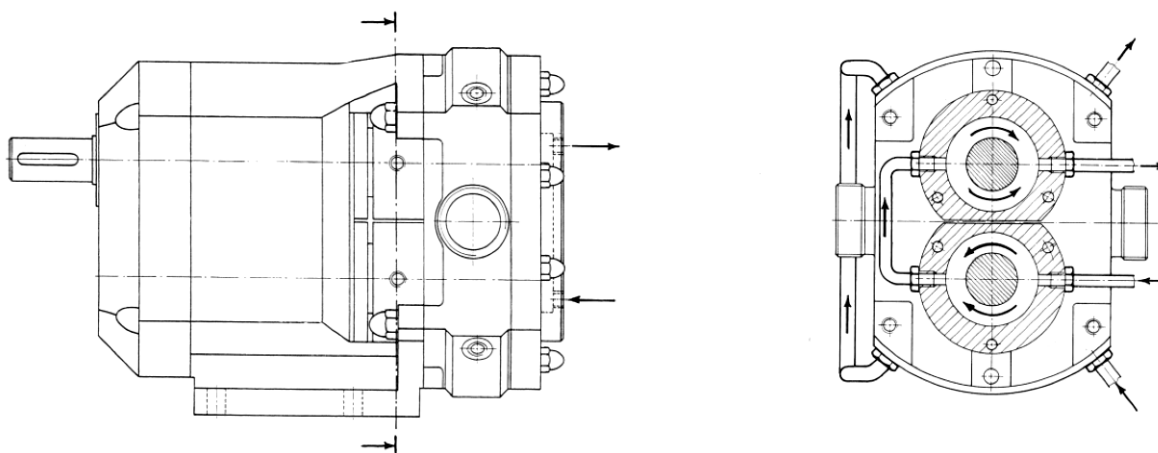


Fig. 9

- 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.

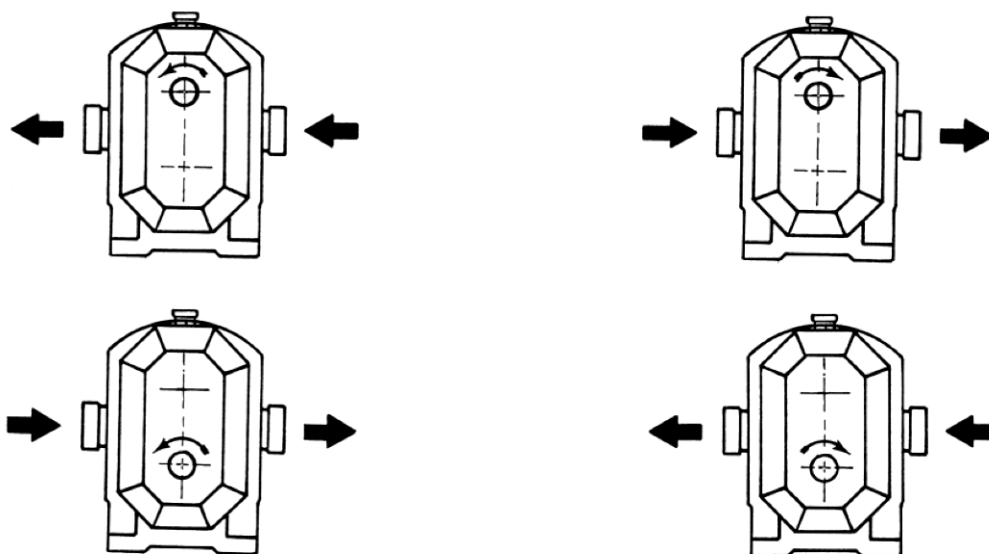


Fig. 10

- 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 - Lobe pumps are delivered ready filled with oil of ISO VG 68

Tab. 9 Advised lubricants

MAKE	DUTY TEMPERATURE [°C]	
	von -20 bis +90	von +90 bis +150
ESSO	SPARTAN EP 68	SPARTAN EP 150
SHELL	OMALA OIL 68	OMALA OIL 150
CASTROL	ALPHA SP 68	ALPHA SP 150
BP	ENERGOL GR-XP100	ENERGOL GR-XP150
MOBIL	MOBILGEAR 626	MOBILGEAR 629
AGIP	BLASIA 68	BLASIA 150
FINA	GIRAN 100	GIRAN 150

Tab. 10 Oil quantity

PUMP TYPE	LITER
B100	0,2
B105 – B110 – B115	0,5
B215 – B220	1,0
B325 – B330	2,2
B430 – B440	4,5
B540 – 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 opening 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

- 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 - **IMPOTANT:** Don't work the simple mechanical seals dry.

4.3 Flushed mechanical seals

- 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.
- 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

- 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

- 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 lobe 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 seizures 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).

4.10 Six month check

- 1 - If the pump works constantly at high temperature, over 120 °C, check the lubrication 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 standard pumps are painted with: BRIGHT EPOXID ENAMEL RAL 7032.

If you carry out these checks systematically, the pump will keep its initial performances 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 lobe 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

- 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 o 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 $\frac{1}{4}$ 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 head screw (65).

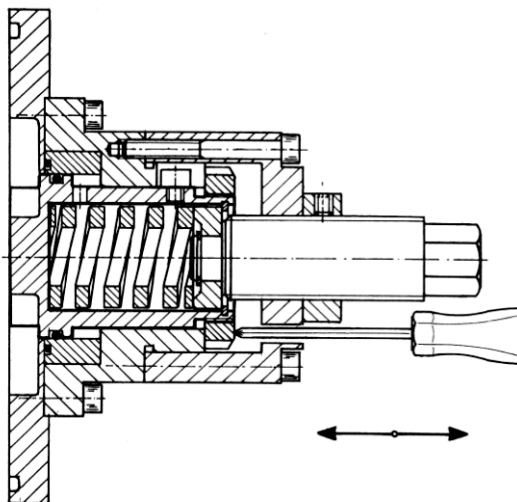


Fig. 11

5.3 Manual by-pass valve

- 1 - The relief valve can be used even as manual by-pass to adjust the capacity.
- 2 - Loosing 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.

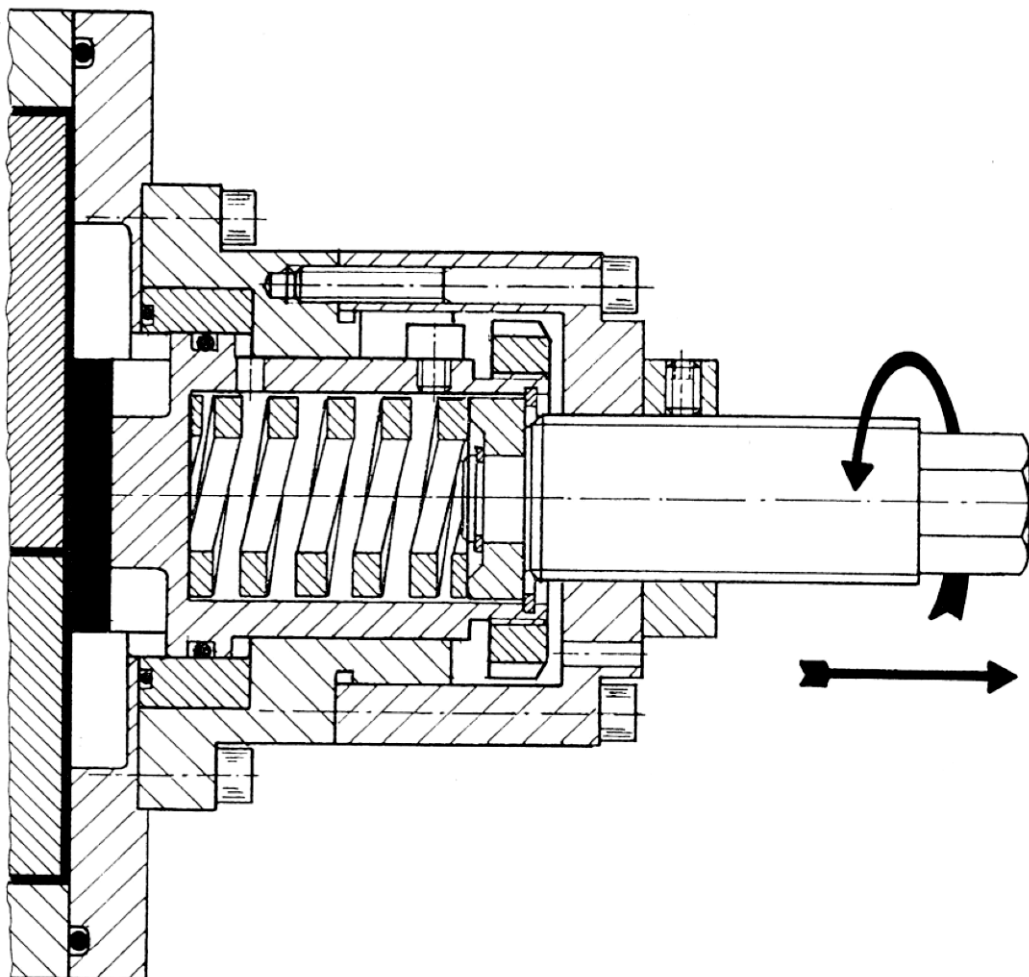


Fig. 12

6 Trouble shooting guide

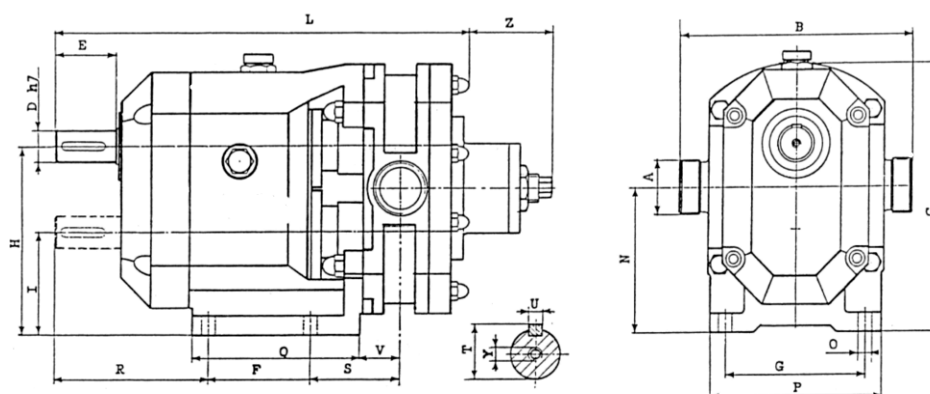
No flow	Insufficient flow	Irregular flow	Pump loses prime	Pump blocks as soon as it starts	Pump becomes overheated	Motor becomes overheated	Pump absorbs too much power	Pump is noisy or vibrates	Rotors wear out	Seals wear out quickly	Pump seizes	Inconvenienenes Causes	Remedies
<input type="checkbox"/>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

7 Technical details

Tab. 11 Technical datas

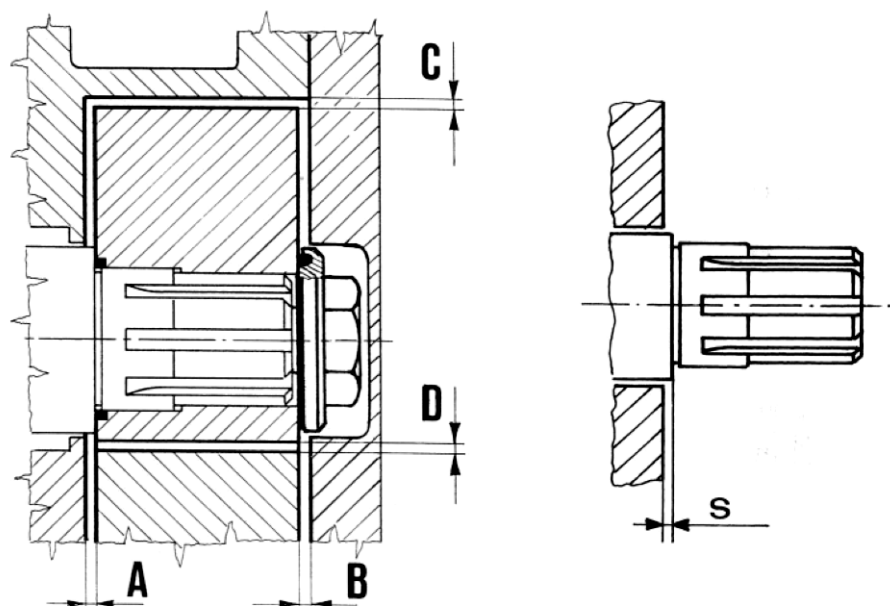
Pump type	displacement l/100U	max. pressure bar		max. rotation U/min	max. performance kW	connections standard	
		ST	SM			DN	Zoll
B100	3	10		1400	1,5	25	1
B105	7	10	15	1000	4	40	1,5
B110	12	10	15	1000	4	40	1,5
B115	18	7	12	1000	5,5	40	1,5
B215	23	10	15	950	5,5	40	1,5
B220	34	7	12	950	5,5	50	2
B325	55	10	15	720	11	65	2,5
B330	70	7	12	720	11	80	3
B430	116	10	15	600	22	80	3
B440	155	7	12	600	22	100	4
B540	240	7	10	500	30	100	4
B550	400	5	7	500	30	125	5
B660	700	7	10	500	75	150	6
B680	1050	5	7	500	75	200	8

Tab. 12 dimensions in mm



Type	A	B	C	D	E	F	G	H	I	L	N	O	P	Q	R	S	T	U	V	Z	Y	kg
B100	1"	160	115,5	18	45	65	105	80		265	58,6	9	125	85	108	52	20,5	6	42			10,5
B105	1½"	170	181	24	50	65	105	125	62	291	93,5	10	125	103	115	55	27	8	25	135	M6	20
B110	1½"	170	181	24	50	65	105	125	62	291	93,5	10	125	103	115	55	27	8	25	135	M6	20
B115	1½"	170	181	24	50	65	105	125	62	303	93,5	10	125	103	115	67	27	8	36	135	M6	21
B215	1½"	208	238	28	55	90	125	165	90	365	128	12	152	147	135	78	31	8	35	135	M8	41
B220	2"	208	238	28	55	90	125	165	90	380	128	12	152	147	135	87	31	8	44	135	M8	43
B325	2½"	236	270	35	65	120	140	190	100	455	145	14	174	190	165	93	38,5	10	41	140	M10	63
B330	3"	236	270	35	65	120	140	190	100	470	145	14	174	190	165	102	38,5	10	50	140	M10	65
B430	3"	335	370	48	85	140	190	255	130	545	192	18	235	220	205	112	52	14	53	140	M12	130
B440	4"	335	370	48	85	140	190	255	130	565	192	18	235	220	205	120	52	14	60	140	M12	135
B540	4"	540	515	55	110	200	300	350	178	670	264	19	350	250	228	95	60	16	70	-	M12	240
B550	5"	570	515	55	110	200	300	350	178	710	264	19	350	250	228	115	60	16	90	-	M12	270
B660	6"	680	690	80	140	300	400	480	250	800	365	26	460	360	285	137	85	22	106	-	M16	610
B680	8"	680	690	80	140	300	400	480	250	860	365	26	460	360	285	167	85	22	136	-	M16	670

Tab. 13 Rotor clearances



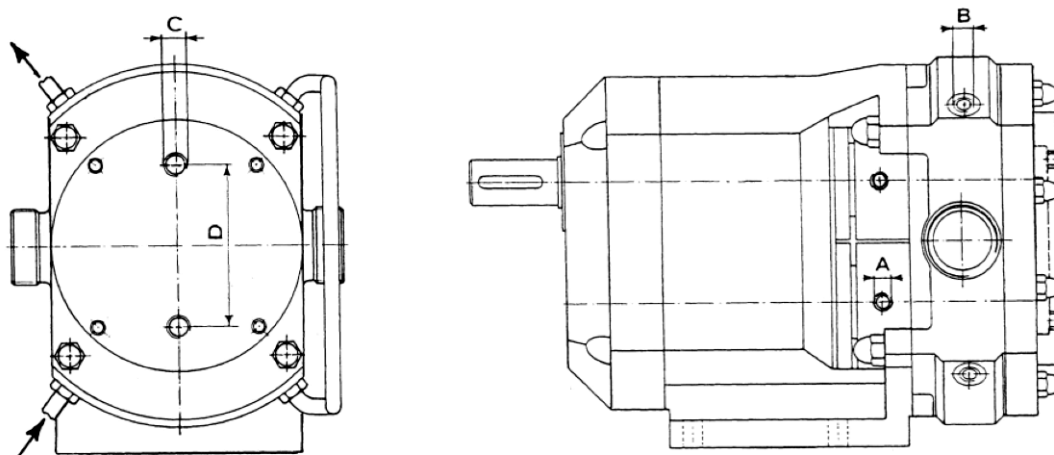
	Rotors in AISI 316 ST version				Rotors in AISI 316 SM version				Rotors in cupronickel ST version				Shaft jut
	A	B	C	D	A	B	C	D	A	B	C	D	
B100	0,12	0,12	0,15	0,20	0,15	0,15	0,20	0,20	0,07	0,08	0,12	0,15	0,12
B1	0,14	0,14	0,15	0,30	0,19	0,19	0,22	0,30	0,08	0,08	0,10	0,25	0,14
B2	0,15	0,15	0,15	0,30	0,22	0,22	0,25	0,30	0,09	0,09	0,13	0,25	0,15
B3	0,17	0,17	0,20	0,35	0,25	0,25	0,28	0,35	0,10	0,10	0,13	0,30	0,17
B4	0,18	0,18	0,22	0,35	0,25	0,25	0,30	0,35	0,11	0,11	0,15	0,30	0,18
B5	0,22	0,22	0,25	0,40	0,32	0,32	0,35	0,40	0,15	0,15	0,20	0,35	0,22
B6	0,27	0,27	0,35	0,50	0,37	0,37	0,50	0,50	0,15	0,15	0,25	0,45	0,27

Dimension in mm – Tolerance/- 0,02

Tab. 14 Tightening torque - Nm

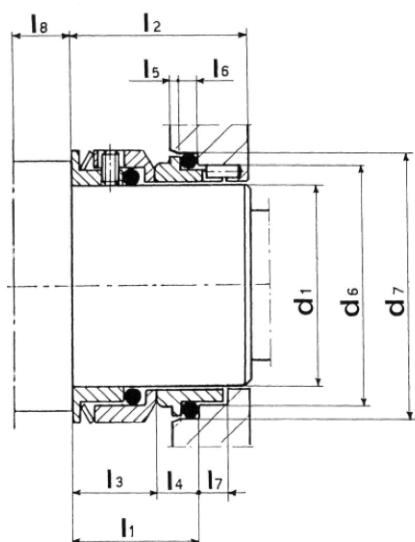
Pump size	Pos. 8 gear adjustment	Pos. 42 rotor locking	Pos. 52 rotor case	Pos. 51 end cover
B100	3,5	27	7	7
B1	8	83	18	18
B2	12	127	32	32
B3	29	223	54	54
B4	52	348	127	54
B5	88	348	54	54
B6	203	348	83	83

Tab. 15 Heating jacket and seal flushing connections



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

Cylindrical GAS thread UNI 338 – Dimensions in mm



	B100	B1	B2	B3	B4	B5	B6
d ₁	20	30	35	50	65	65	100
d ₆	29	39	44	62	77	77	115
d ₇	35	45	50	70	85	85	125
l ₁	29,1	29,1	29,1	34,1	38,8	38,8	41,3
l ₂	44	44	44	50	55,5	55,5	85
l ₃	19,1	19,1	19,1	21,1	25,8	25,8	25,8
l ₄	10	10	10	13	13	13	15,5
l ₅	2	2	2	2,5	2,5	2,5	3
l ₆	5	5	5	6	6	6	7
l ₇	9	9	9	9	9	9	9
l ₈	2	9,5	14	14	16	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
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 the manufacturer, that supply them already pre-assembles 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.

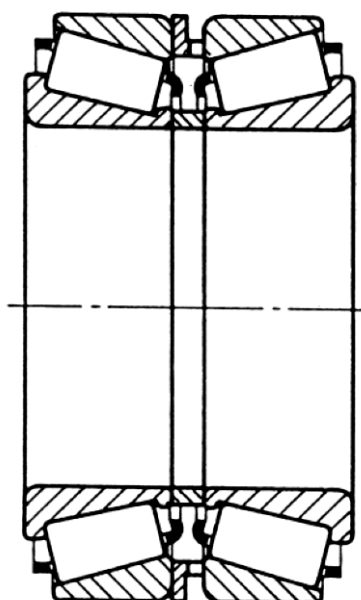
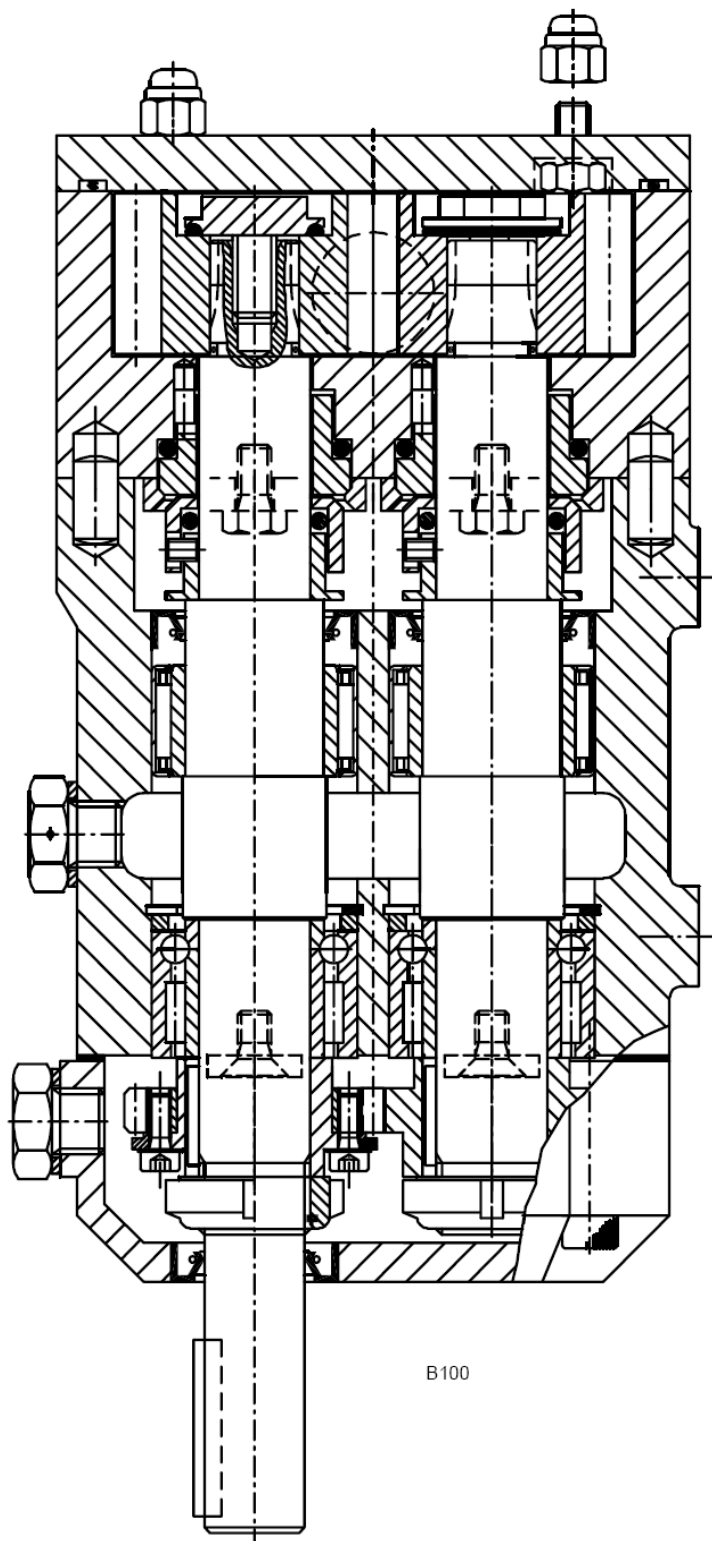


Fig. 13: bearing set right

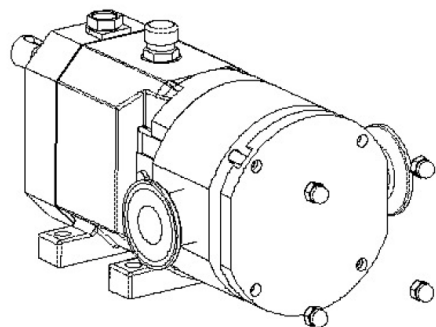
8 Assembly and disassembly instructions for pump B100



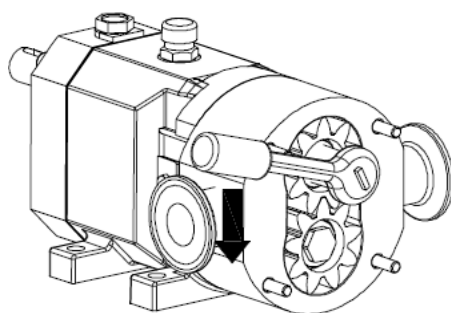
B100

8.1 Disassembly of the pumping body

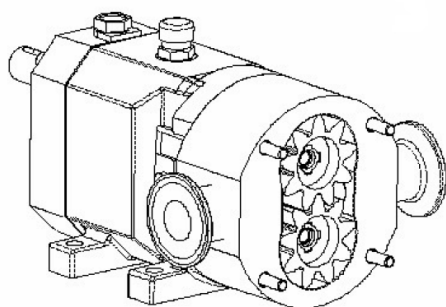
Before removing the cover, ensure that the pump and motor are insulated, that the pump is cold enough to be touched safely, that all fluids have been discharged and make sure that the pump body is insulated and de-pressurised. If the end cover is fitted with a by-pass valve consult the relative section. Then proceed as follows:



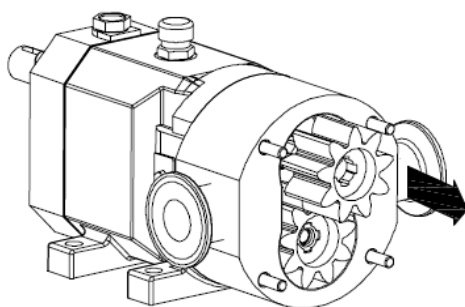
1. Remove the front nuts and exert leverage in the provided slots on cover



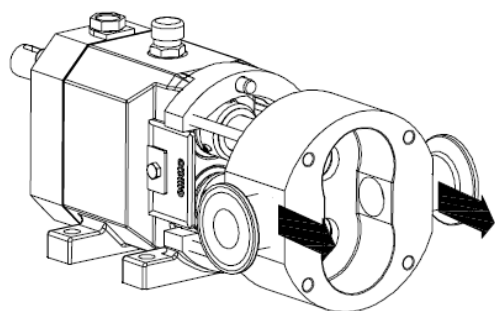
2. Unscrew anticlockwise the rotor nuts, interposing a nonmetal element between the rotors, making them stop rolling



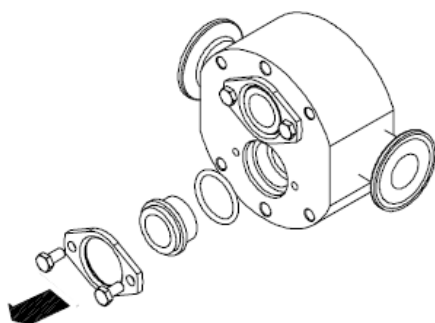
3. Take care of the reference marked on rotors and shafts (1-2) so that you will set them rightly while reassembling



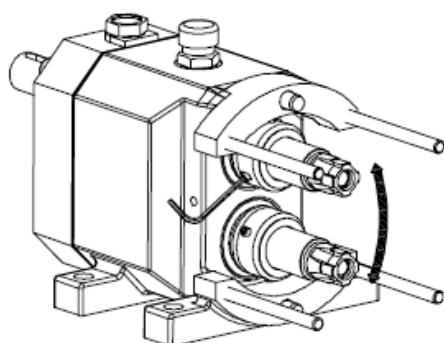
4. Extract the rotors, taking care you don't damage them by means of metal tools



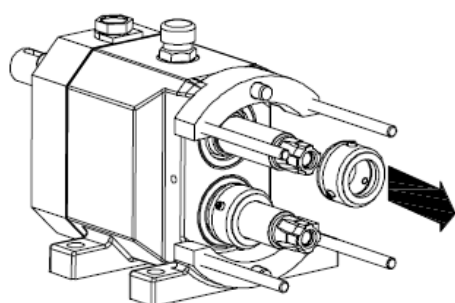
5. extract the rotor case



6. Extract the rotating part of the mechanical seal from the shaft, after disassembling the bearing retainers



7. Untighten the socket head screws on mechanical seal



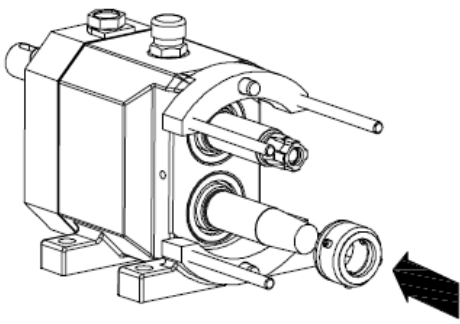
8. Extract the rotating part of the mechanical seal from the shaft

8.2 Assembly of the pumping body

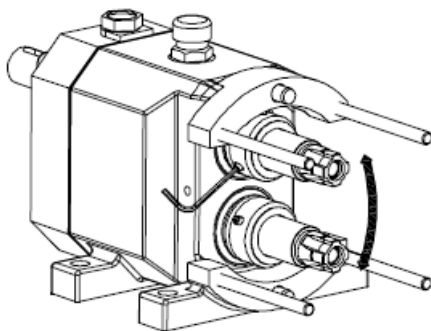


ACHTUNG

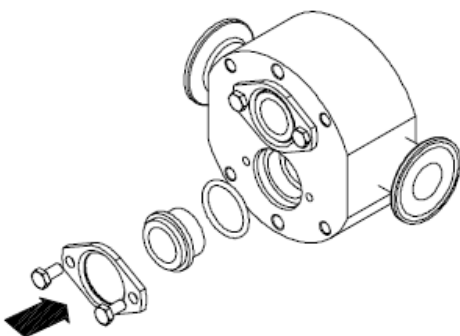
9. During the following operations, take care you don't damage the lapped seal surface; don't lay them on the bench and handle them with clean hands



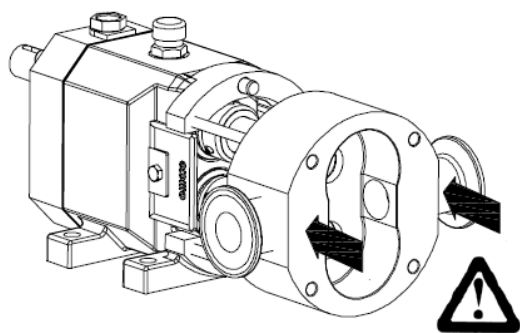
10. Clean carefully the shafts. Lubricate lightly the O-ring and introduce the rotating part of the seal, possibly by means of a conical bush. Exert pressure only with hands; avoid using metal tools



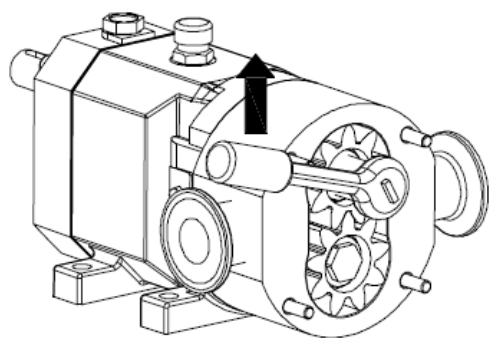
11. Be sure the mechanical seals stand on the shaft shoulder and tighten step by step the socket head screws. We suggest you should use a thread locking adhesive in order to avoid their untightening on work



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

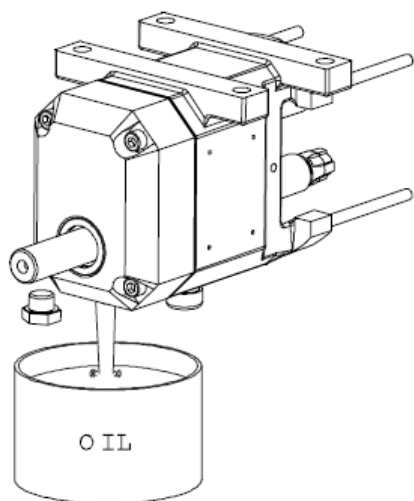


13. Clean carefully the seal slide surfaces and assemble the rotor case delicately in order not to damage the seals and be sure it is well set on plugs. Clamp the back nuts

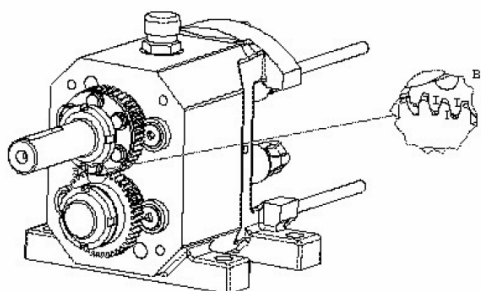


14. Assemble the rotors, setting them on pitch setting, according to reference marks (1-2). Clamp the rotor nuts (see cap.1.3.6). In order to stop turning, interpose a nonmetal element between rotors

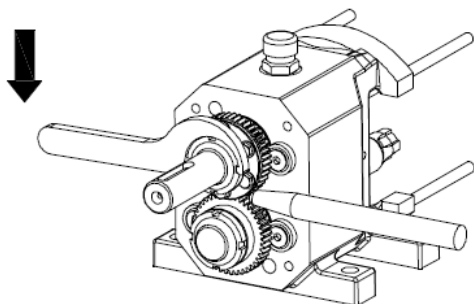
8.3 Disassembly of the bearing box



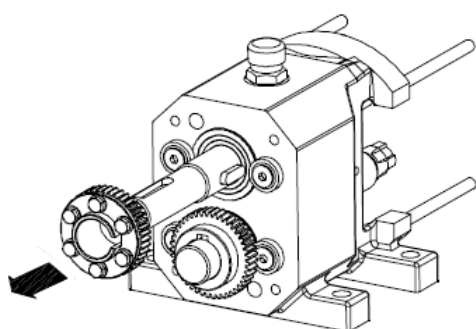
15. After disassembling the rotor case, drain the oil and the remove drive key on shaft



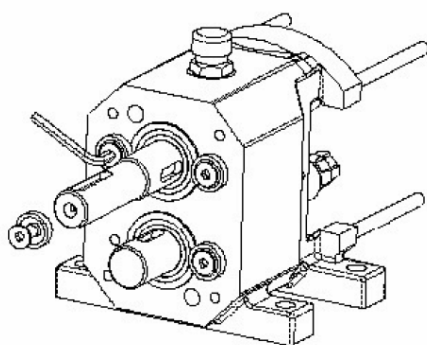
16. Remove the gear cover and make a reference mark on gears in order to respect the right timing while reassembling



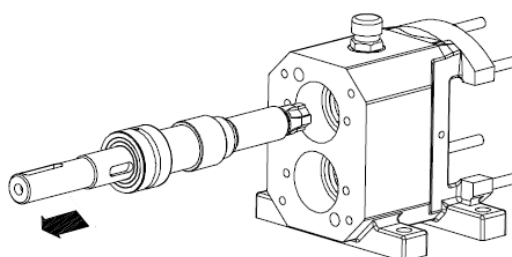
17. Disconnect the retainer keys on lock washers



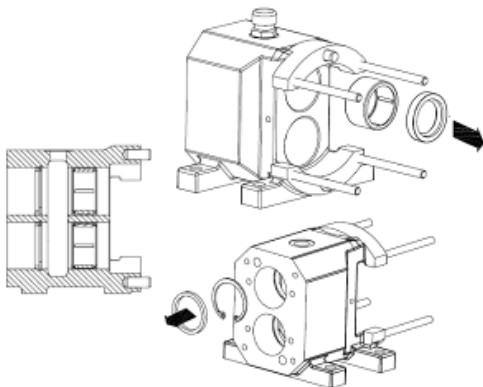
18. Unscrew the gear ring nut, inserting a non metal wedge between gears in order to stop turning



19. Disassemble the shafts, unscrewing the flathead screw, with the lock washer



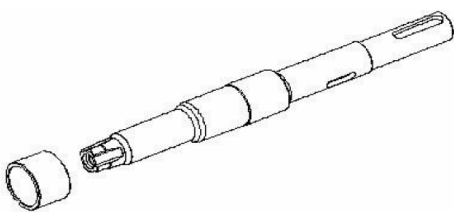
20. Extract the shafts by the posterior side of the pump



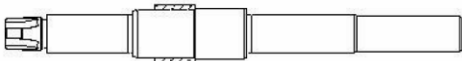
21. Extract the oil retainer and the external rings of the front bearing

22. Extract the spacers and the snap rings

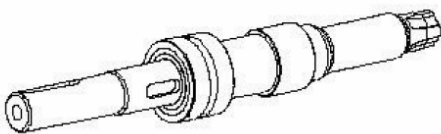
8.4 Assembly of the bearing box



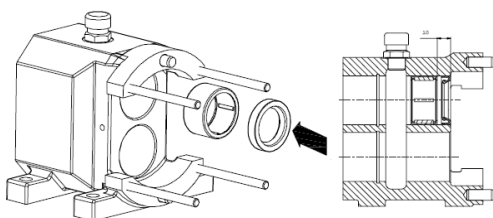
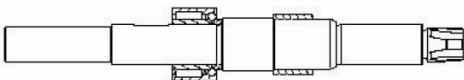
23. Prepare the shafts and the bearings, checking they are without dents and burrs



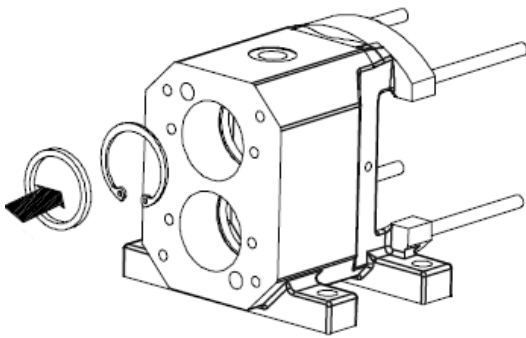
24. Drive the inner ring on the driving shaft. Repeat the operation on the driven shaft.



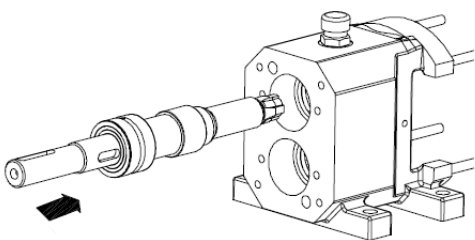
25. Assemble the rear bearing on the driving shaft and then on the driven one



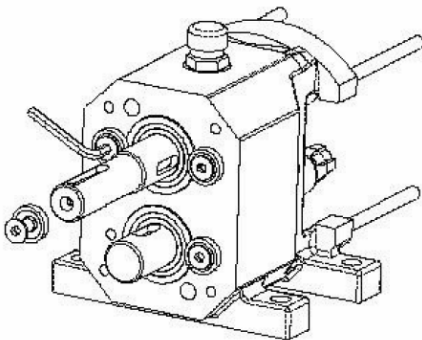
26. Drive the external bearing rings on the gear box, observing the depth on the figure (10 mm)



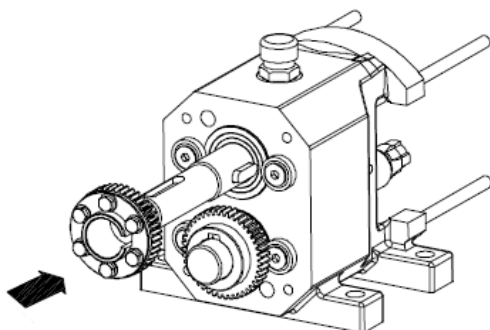
27. Insert the snap rings and the spacers for the axial setting



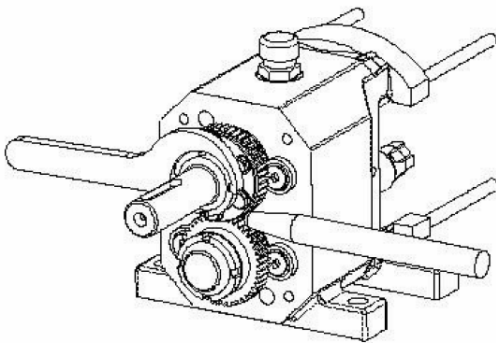
28. Assemble the shafts by the rear side of the pump, respecting the timing previously marked while reassembling, with the numbers marked "1" and "2" turned towards the high



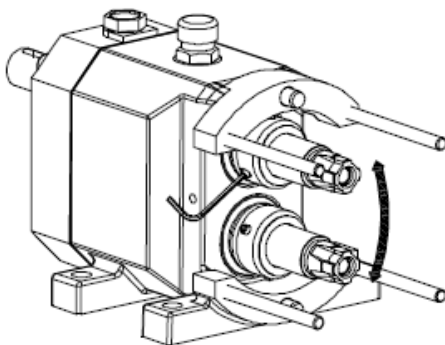
29. Fixed the rear bearings with the washers and the flange screws



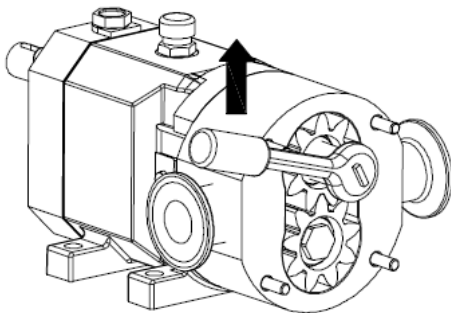
30. The gear couple is composed by a fixed gear and an adjustable one. Assemble the fixed gear, then the adjustable one with untightened screws, taking care to a first approximate rotor timing



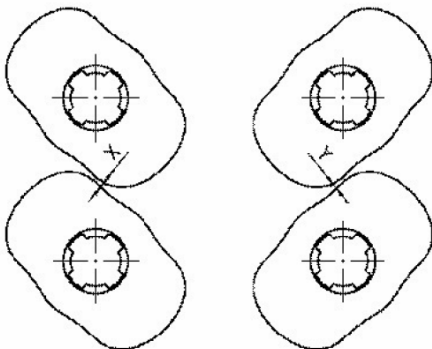
31. Tighten the retainer ring nuts with the corresponding safety washers and set rightly the suited retainer key. In order to avoid turning during operation insert a wedge in soft material among the gear teeth



32. Assemble the rotor case and rotors as previously described and check the "Clearances" (see par.1.3.4). If rotor clearances are not included in tolerances as prescribed in chap. 1, disassemble rotors, the rotor case and adjust the spacer according to the requested dimension

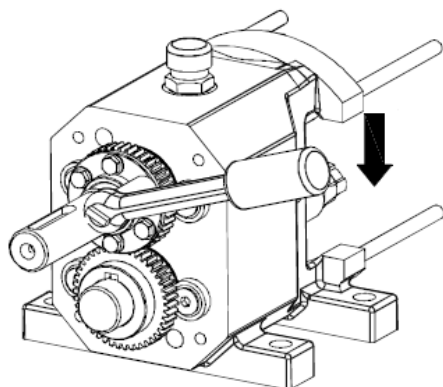


33. Being the wedge inserted among the gears tighten the rotor nuts, taking care of the driving torque (see par.1.3.6)

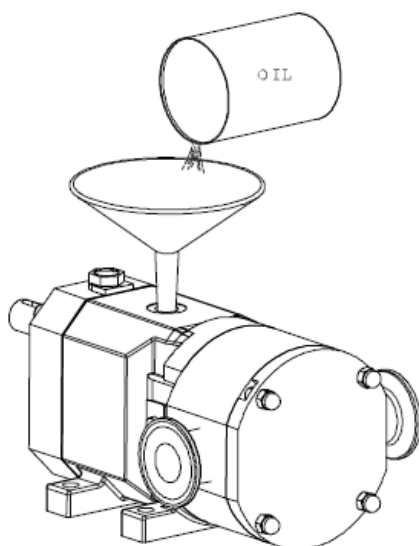


$$X = Y$$

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



35. Tighten completely the adjustable gear screws taking care of the driving torque (see par.1.3.6) **N.B.** IN CASE OF RE-TIMING IT'S NECESSARY TO REPLACE THE PLANE WASHERS, CAVED BY PREVIOUS CLAMPING



36. 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 chap.1.3.12

9 Assembly and disassembly instructions for pump B1- B4

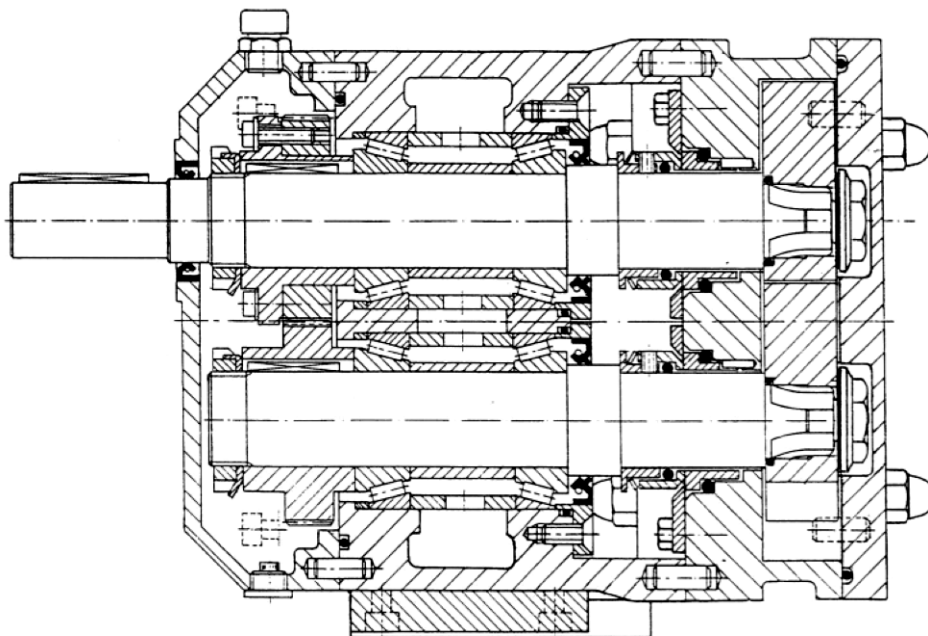


Fig. 14: Cross section type B105-B110-B115

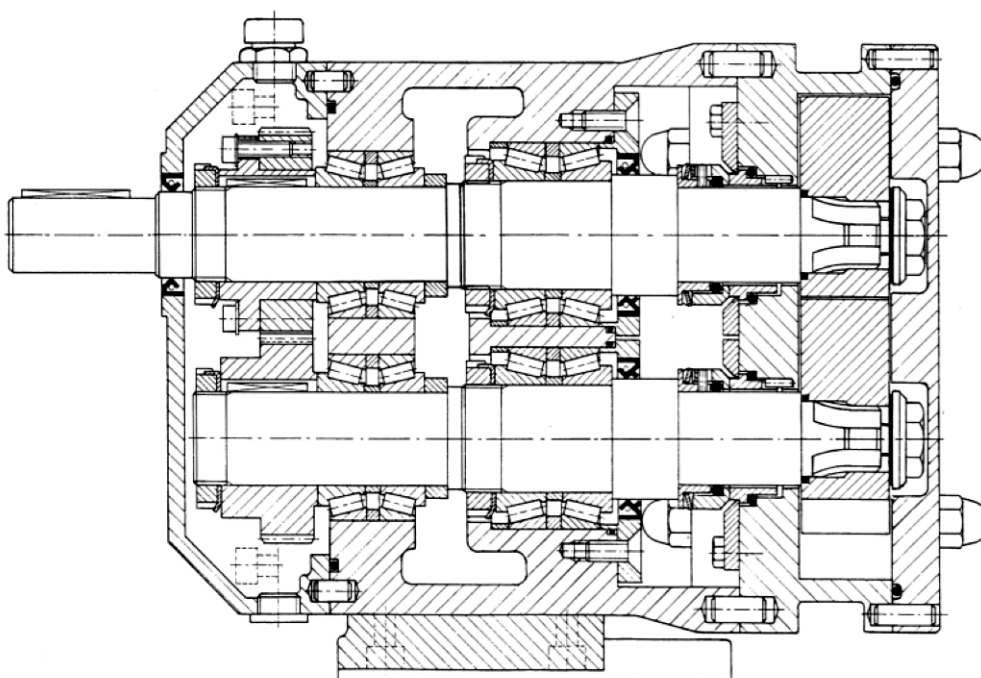
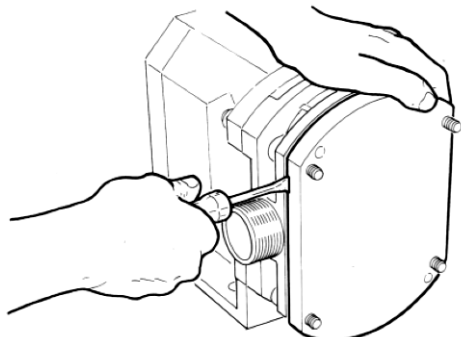
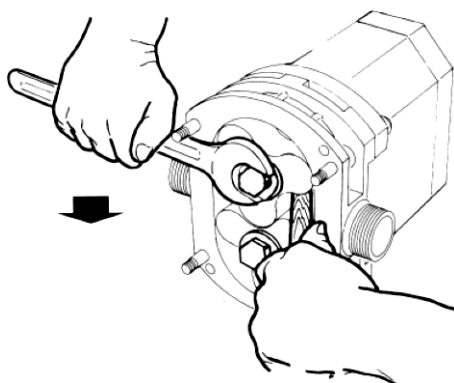


Fig. 15: Cross section type B2-B5

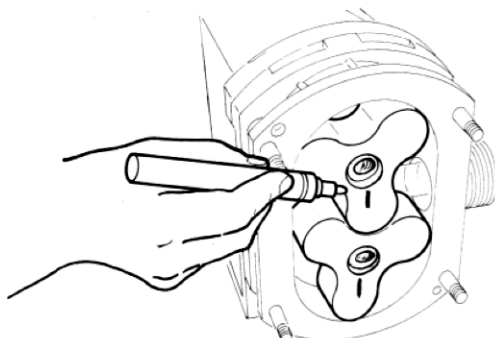
9.1 Rotor case disassembly



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

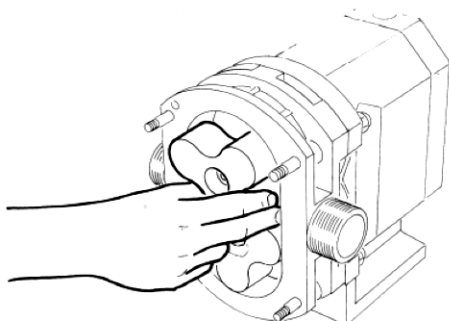


2. Unscrew anticlockwise the rotor nuts, interposing a non metal element between the rotors, marketing them stop rolling.

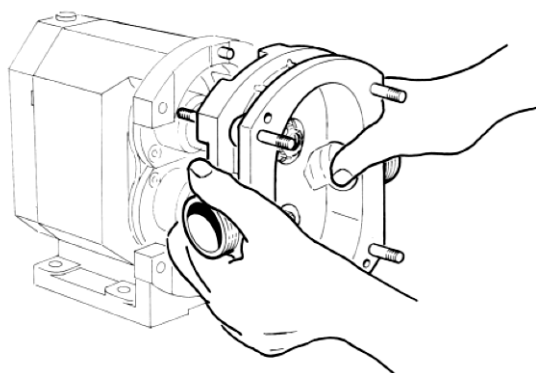


3. Take care of the reference marked on rotors and shafts (1-2) so that you will set them rightly while reassembling.

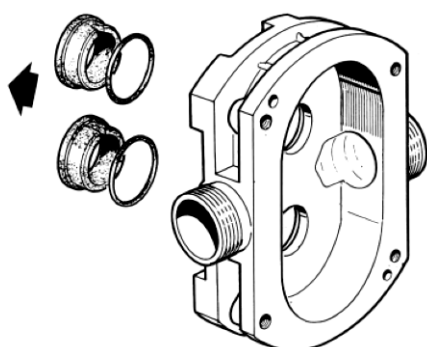
4. Extract the rotors, taking care you don't damage them by means of metal tools.

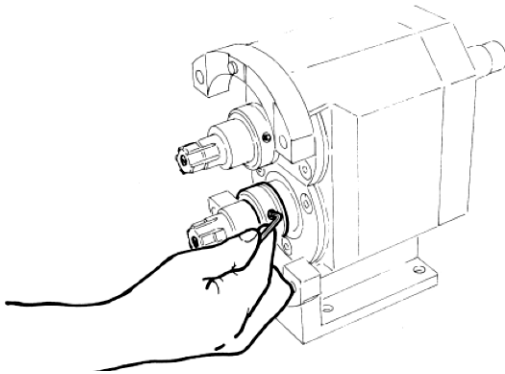


5. Unscrew the back nuts and extract the rotor case.

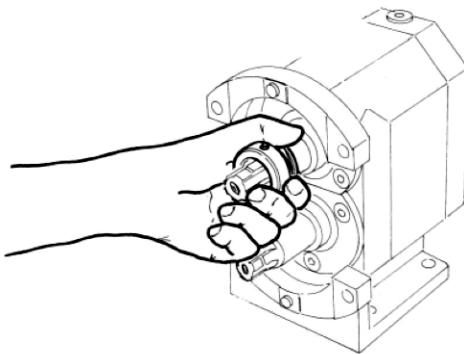


6. Extract the rotating part of the mechanical seal from the shaft.





7. Untighten the socket head screws on mechanical seal.

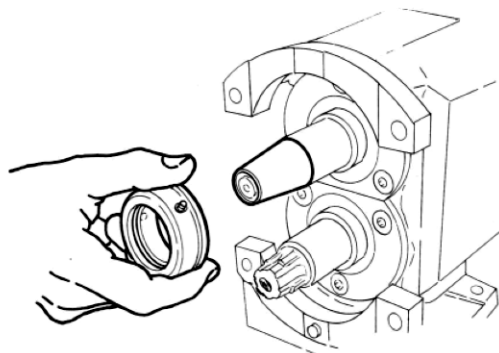


8. Extract the rotating part of the mechanical seal from the shaft.

9.2 Rotor case assembly

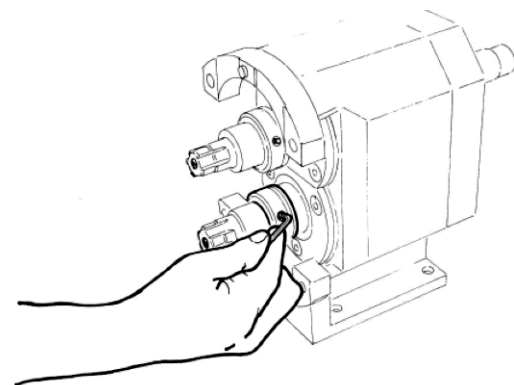


9. **IMPORTANT!**
During the following operations, take care you don't damage the lapped seal surface; don't lay them on the bench and handle them with clean hands.

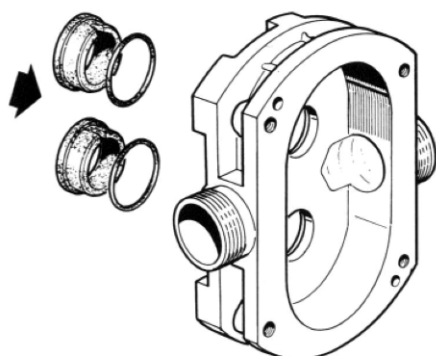


10. Clean carefully the shafts.

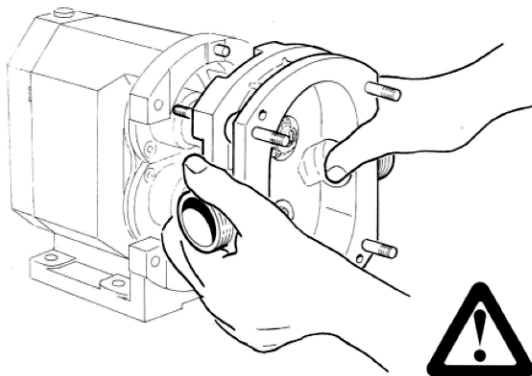
Lubricate lightly the O-ring and introduce the rotating part of the seal, possibly by means of a conical bush. Exert pressure only with hands; avoid using metal tools.



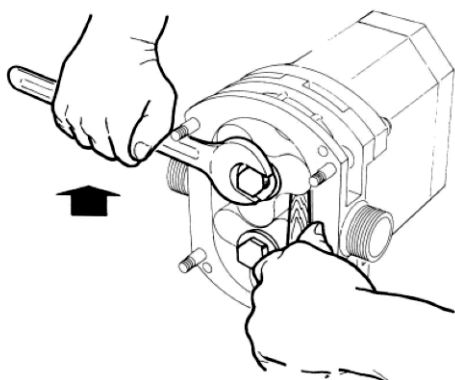
11. Be sure the mechanical seal stand on the shaft shoulder and tighten by degrees the socket head screws. We suggest you should use a thread locking adhesive in order to avoid their untightening on work.



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.

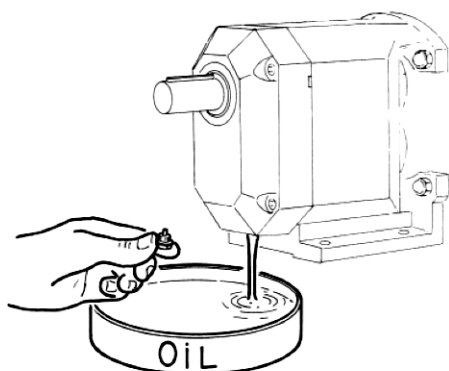


13. Clean carefully the seal slide surfaces and assemble the rotor case delicately in order not to damage the seals and be sure it is well set on plugs. Clamp the back nuts.

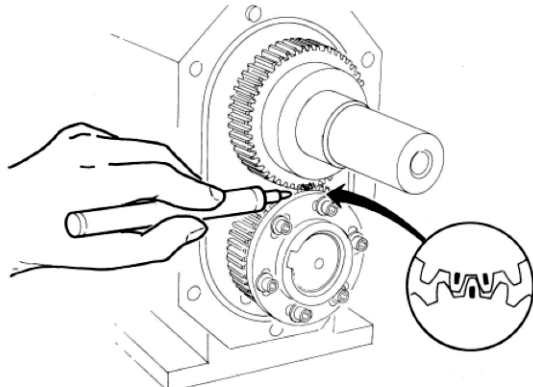


14. Assemble the rotors, setting them on pitch setting, according to reference marks (1-2). Clamp the rotor nuts (see tab. 14). In order to stop turning, interpose a non metal element between rotors.

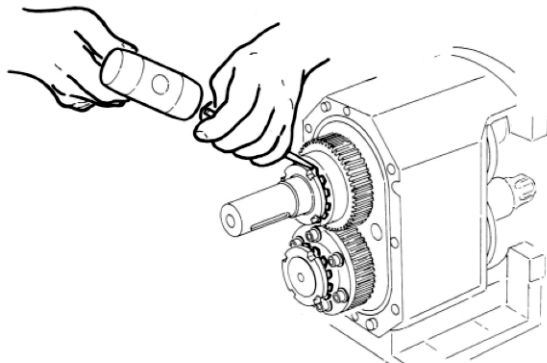
9.3 Bearing housing disassembly



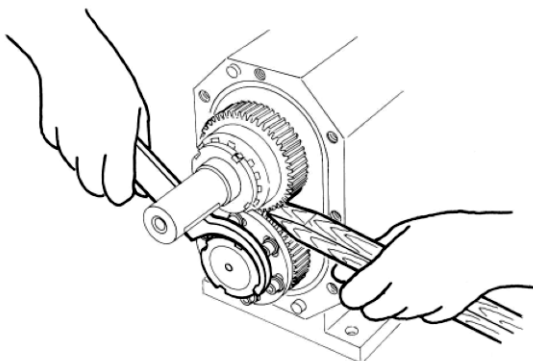
15. After disassembling the rotor case, remove the oil and the drive key on shaft.



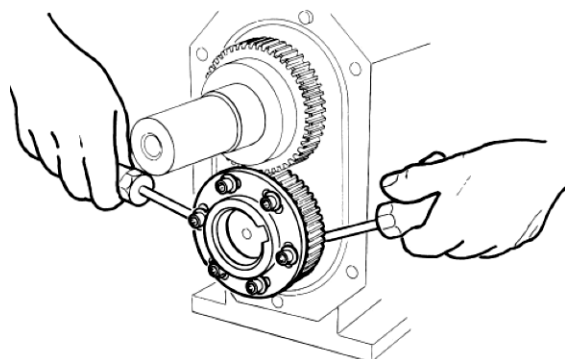
16. Remove the gear cover and make a reference mark on gears in order to respect the right timing while re-assembling.



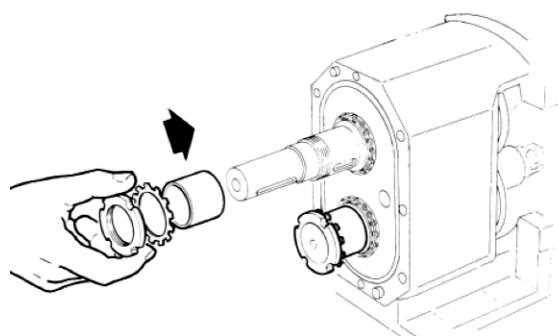
17. Disconnect the retainer keys on lock washers.



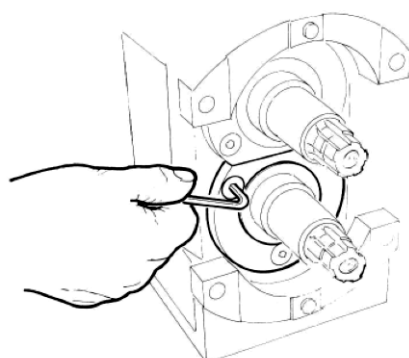
18. Unscrew the retainer ring nut, inserting a non metal wedge between gears in order to stop turning.



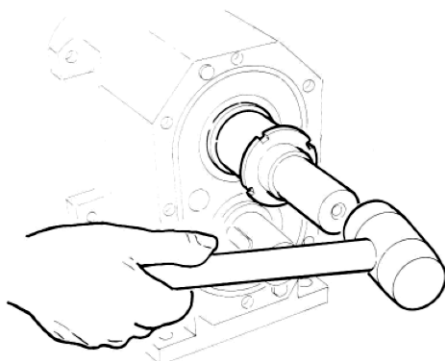
19. Extract the gears, exerting leverage between the bearing housing and the gears side, without damaging the toothing outline.



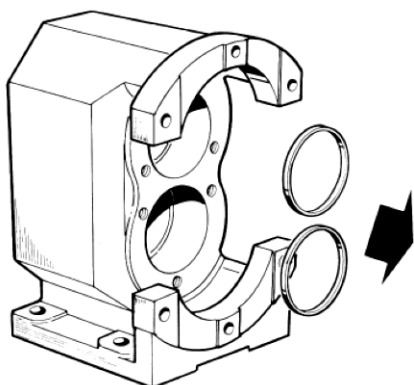
20. On mounting and dismounting we suggest you should replace the gears with a spacer in order not to break down the pre-assembled bearing.



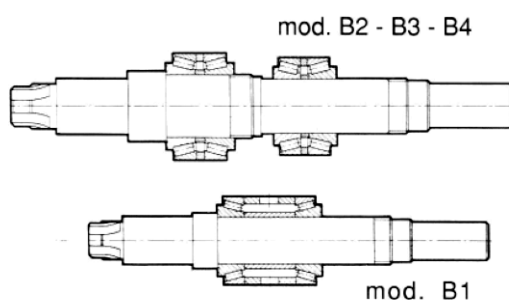
21. Remove the bearing retainers.



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

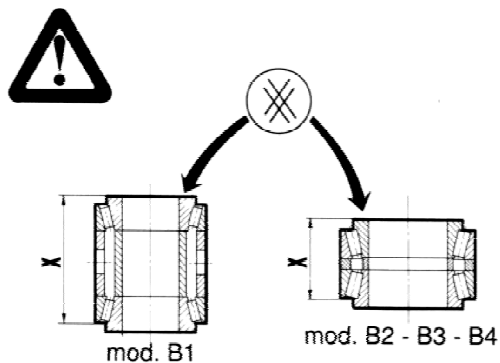


23. Mark the spacer for the axial shaft adjustment, then replace them rightly while re-assembling.



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

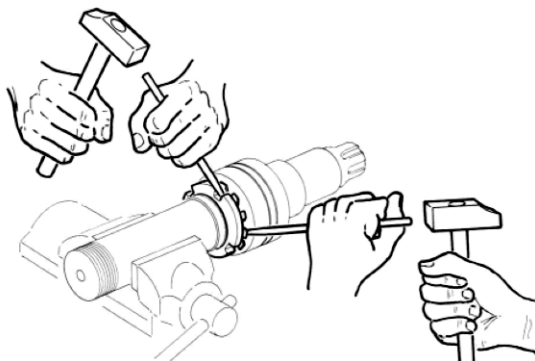
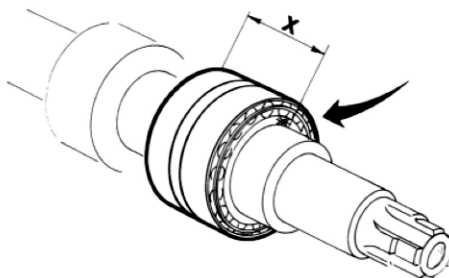
9.4 Bearing housing assembly



25. The bearing are pre-assembled with right preloading. Bearing parts can not be replaced with others. You can not invert parts of same bearing. In order to interchange front bearings, that lock the shaft axially, you should respect the reference mark (XX) that must be put on shaft shoulder. On type B105, B110, B115 a single, pre-assembled and axially locked bearing is arranged.

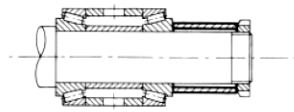
26. Dimensions „X“ (+/-0,02mm)

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

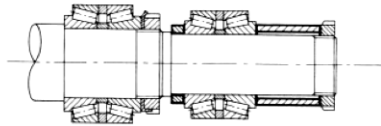


27. Assemble the pre-assembled front bearing, tighten the ring nut and set the retainer key in the ring nut slot.

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

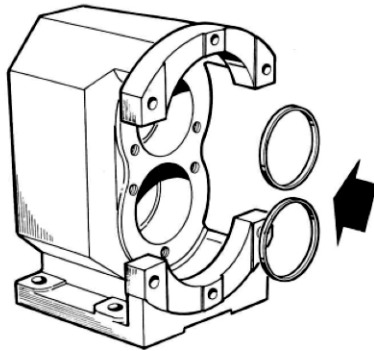


mod. B1

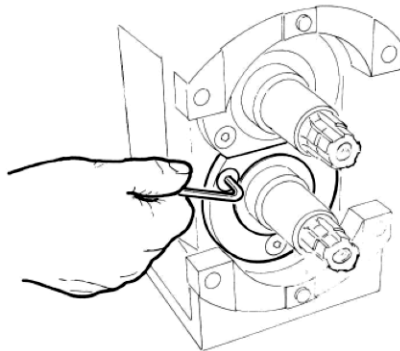


mod. B2 - B3 - B4

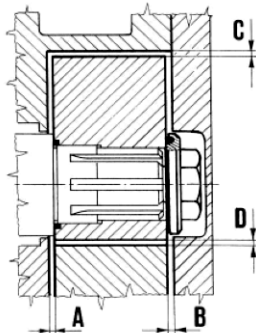
28. Assemble the pre-assembled rear bearing, tighten the retainer ring nut inserting a spacer suitable to replace the gear, in order to keep the bearing assembled during the mounting operations.



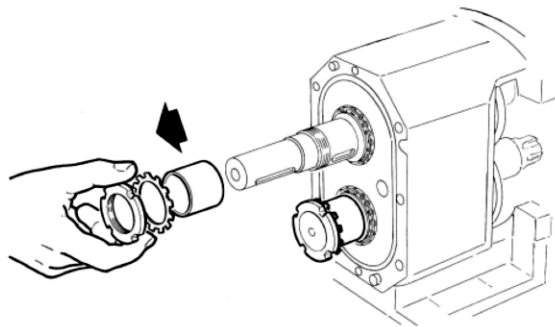
29. Set the spacers for axial shaft adjustment and assemble the shafts with the already fixed bearings.



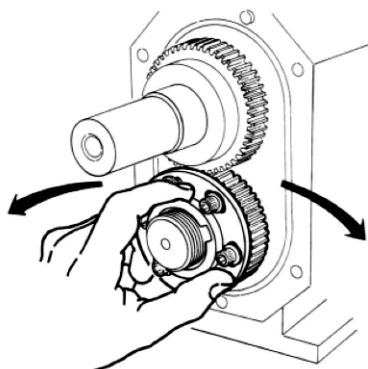
30. Set the O-ring gasket in its seat and assemble the bearing retainers with oil lip seal already fixed. Assemble the rotor case and rotors as previously described and check the plays as per tab. 13.



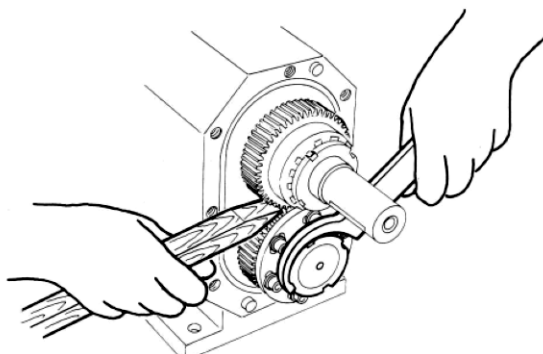
31. If rotor clearances are not included in tolerances as per tab. 13, disassemble rotors, the rotor case and adjust the spacer according to the requested dimension. N.B. A spacer set can be requested to the manufacturer company.



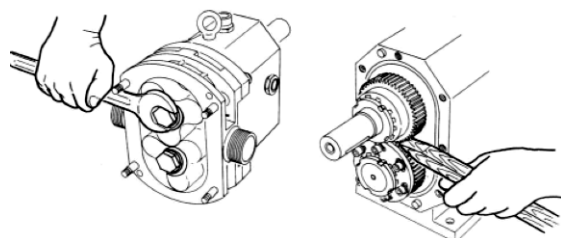
32. Remove the spacers used for dismounting and insert the keys for gear drive in their seats with a lightly forced connection.



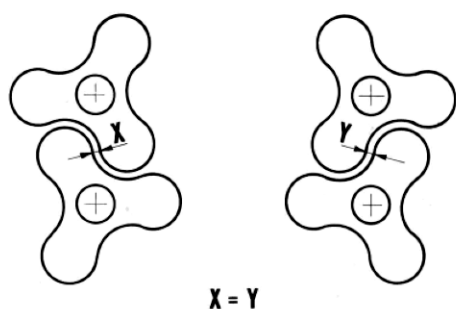
33. The gear couple is composed by a fixed gear and an adjustable one. Assemble the fixed gear, then the adjustable one with untightened screws, taking care to a first approximate rotor timing.



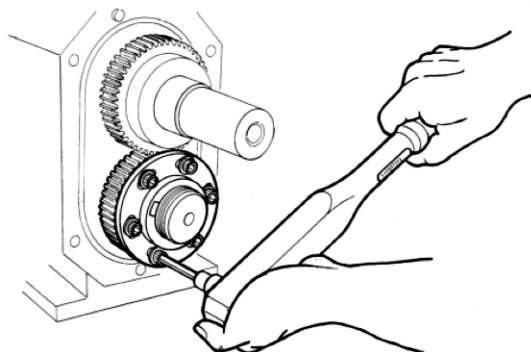
34. Tighten the retainer ring nuts with the corresponding safety washers and set rightly the suited retainer key. In order to avoid turning during operation insert a wedge in soft material among the gear teeth.



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

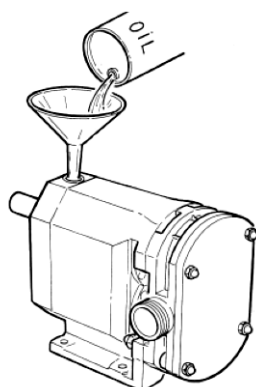


36. Time perfectly the rotors and tighten the screws of the adjustable gear gradually, checking the rotor timing.



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 CAMPING.



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.

10 Assembly and disassembly pump type B5- B6

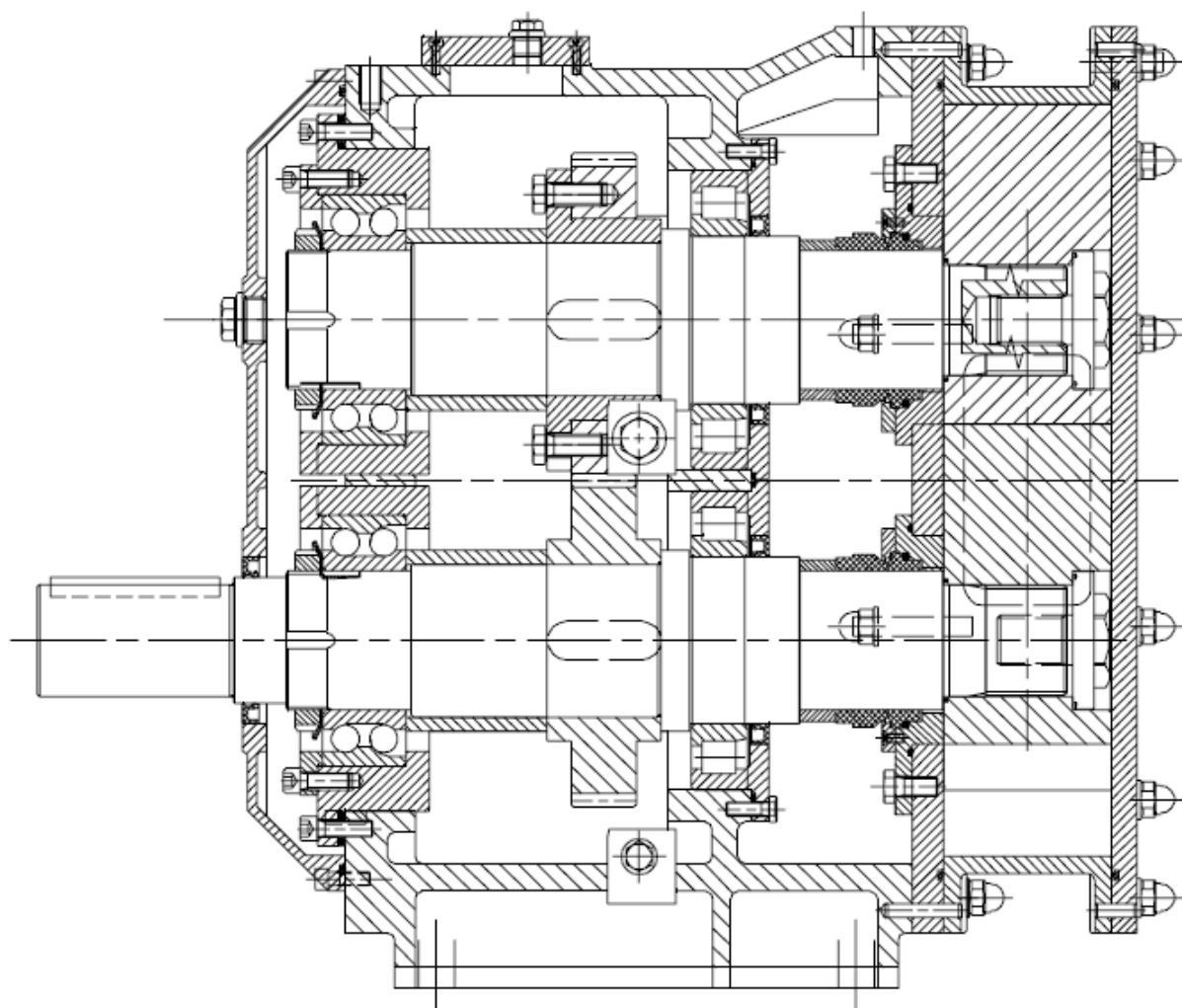


Fig. 16: Cross section type B6

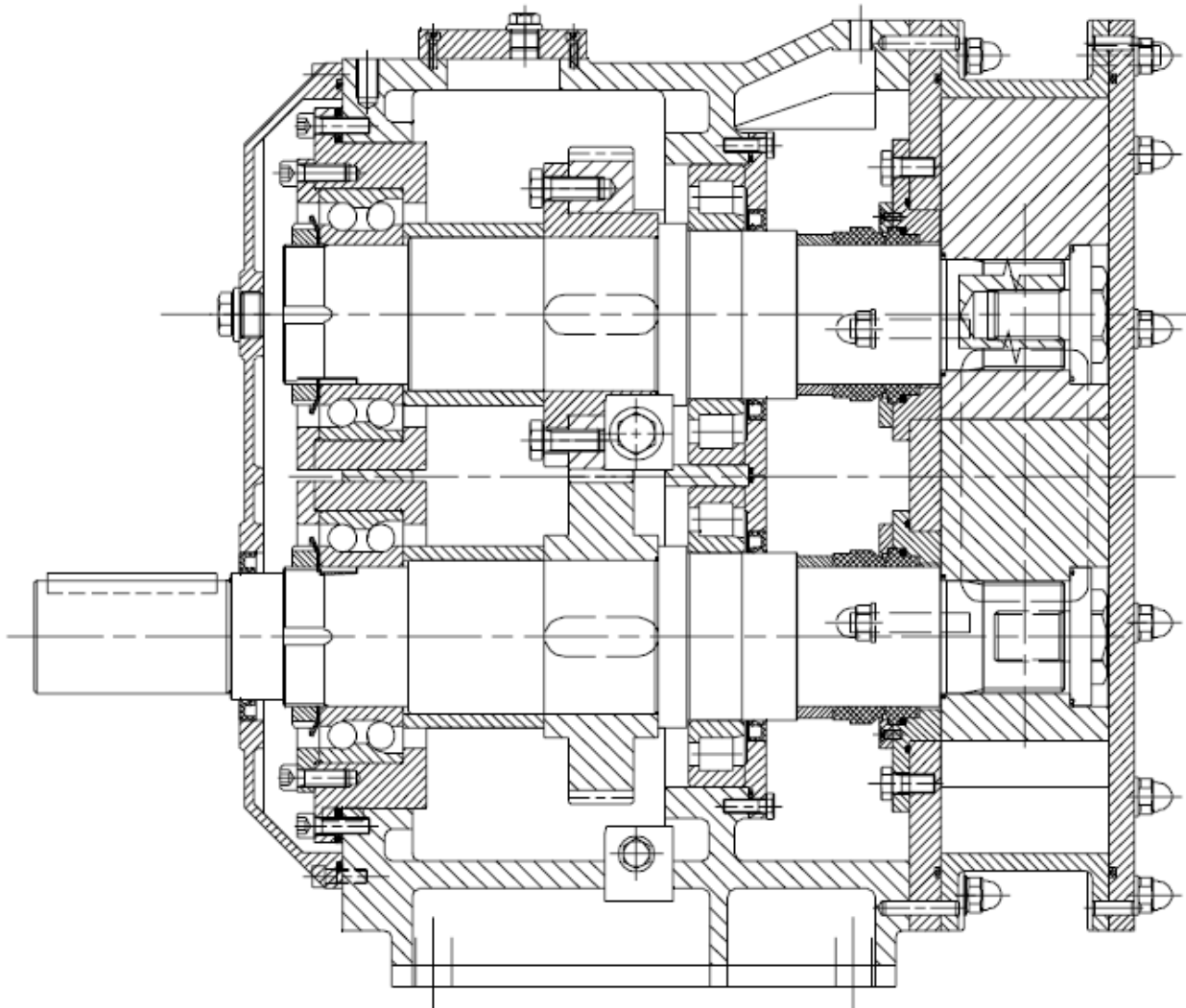
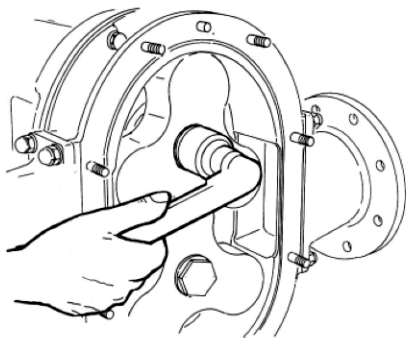
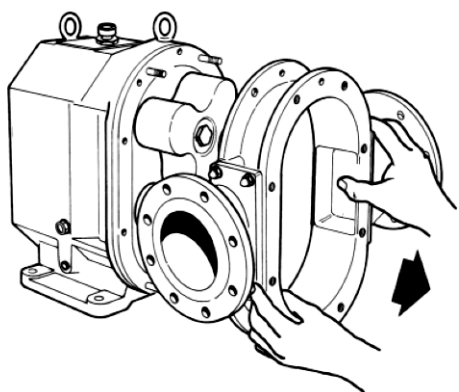


Fig. 17: Cross section type B550

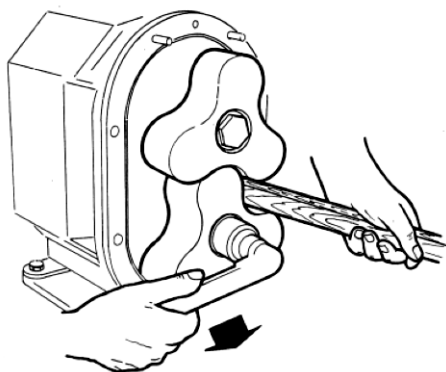
10.1 Rotor case disassembly



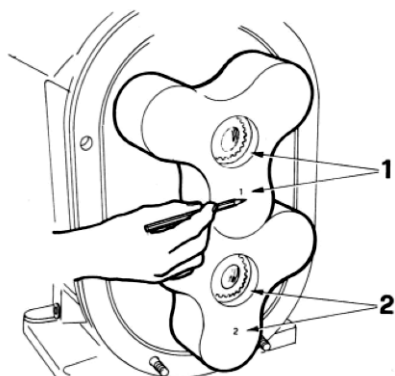
1. Remove the end cover and untighten the two locking nuts of the rotors.



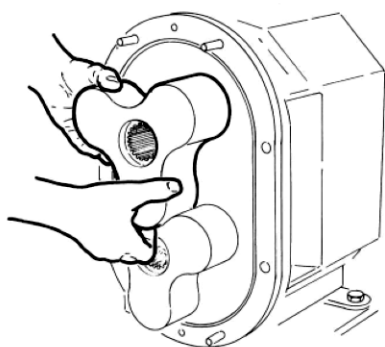
2. Untighten the back nuts and remove the rotor case.



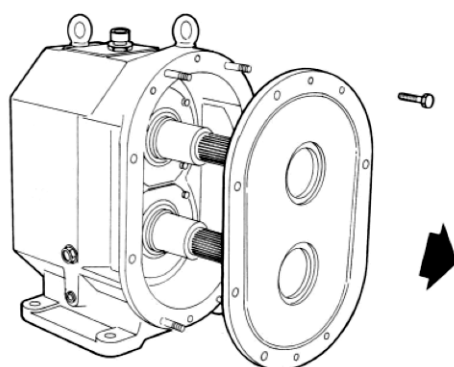
3. Unscrew anticlockwise the rotor nuts, interposing non metal element between the rotors, making them stop rolling.



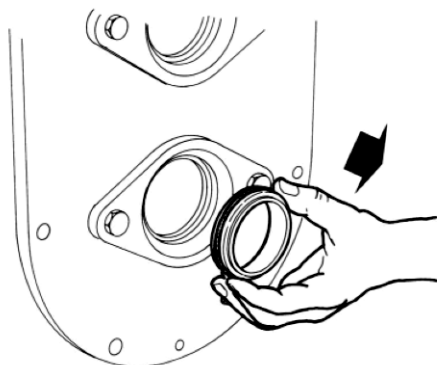
4. Take care of the reference marked on rotors and shaft (1-2) so that you will set them rightly while reassembling.



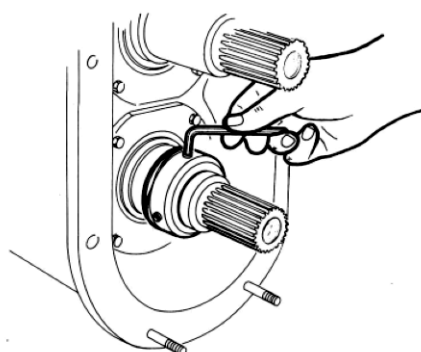
5. Extract the rotors, taking care you don't damage by means of metal tools.



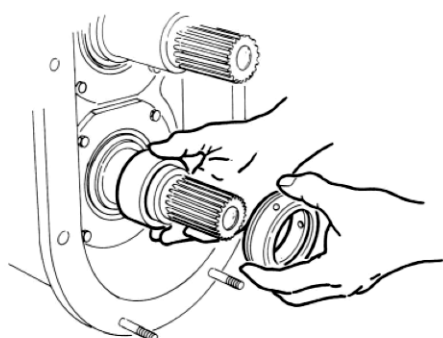
6. Untighten the two security screws and remove the seal flange.



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



8. Untighten the socket head screws on mechanical seal.



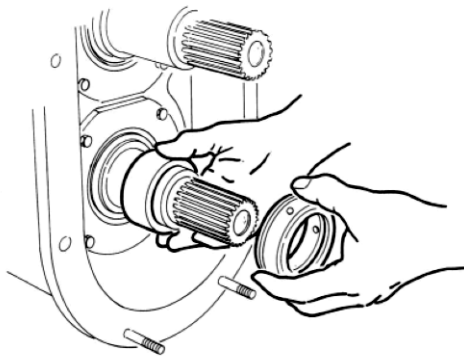
9. Extract the rotating part of the seal from the shaft.

10.2 Rotor case assembly

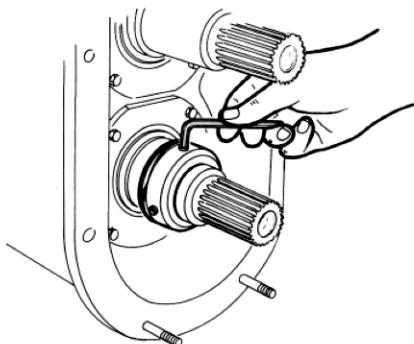


10. IMPORTANT!

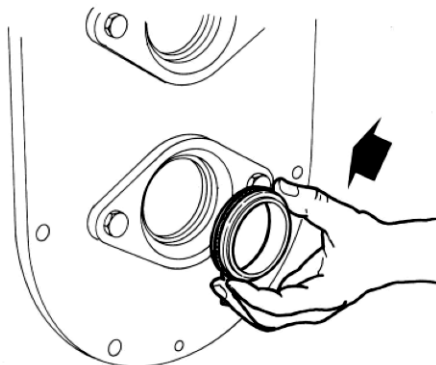
During the following operations, take care you don't damage the lapped seal surfaces; don't lay them on the bench and handle them with clean hands.



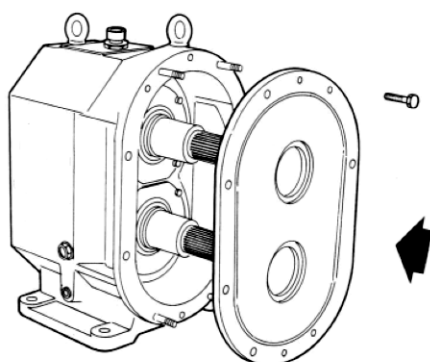
11. Clean carefully the shafts. Be sure the spacers for the seals are set (295). Lubricate lightly the O-rings and insert the rotating part of the seals on the shafts. Exert pressure only with hands; avoid using metal tools.



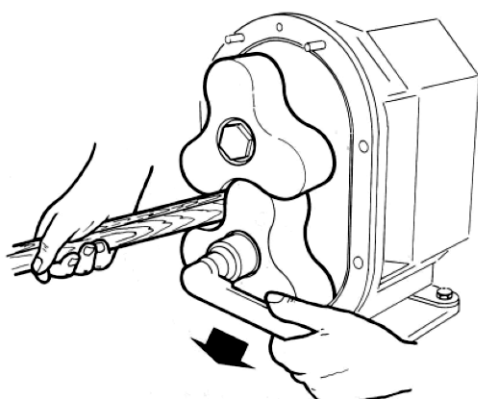
12. Be sure the mechanical seals stand on the shaft shoulder and tighten by the socket head screws. We suggest you should use a thread locking adhesive in order their untightening on work.



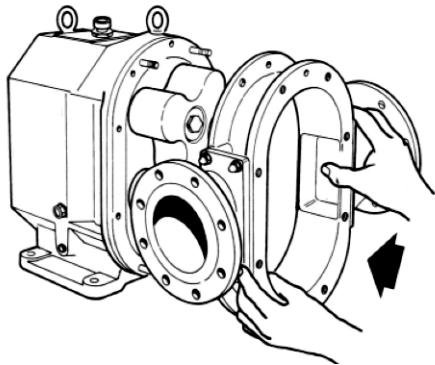
13. Assemble the stationary part of the seals on supports, taking care to align the slot with the retainer pin. Assemble these supports on seal flange, setting the O-ring.



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.

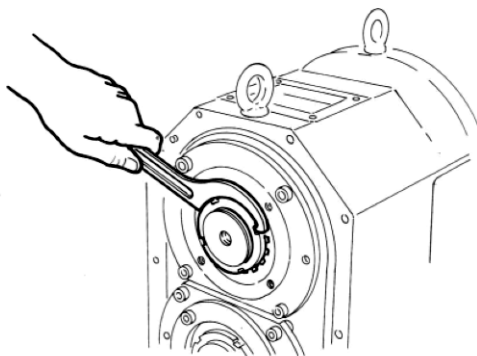


16. Assemble the rotor case, setting the O-ring.

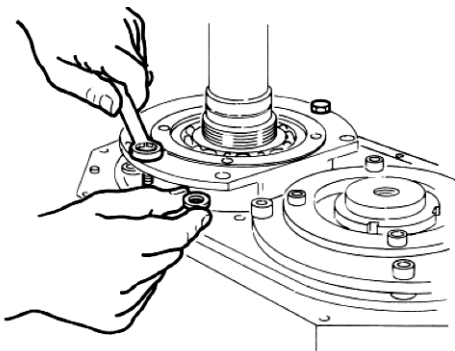
10.3 Bearing housing disassembly



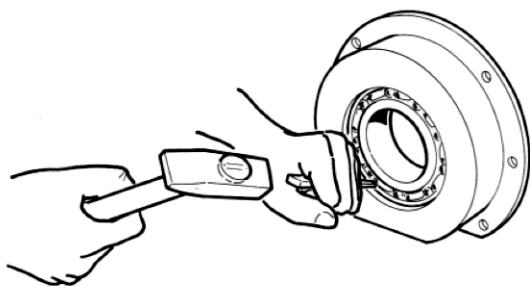
17. After disassembling the rotor case remove the oil and drive key on shaft.



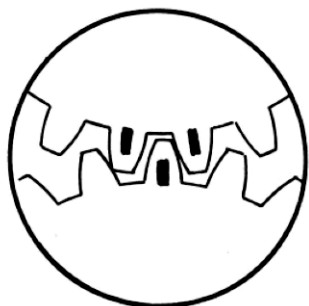
18. Remove the gear cover, disconnect the retainer keys of the lock washer and unscrew the ring nuts.



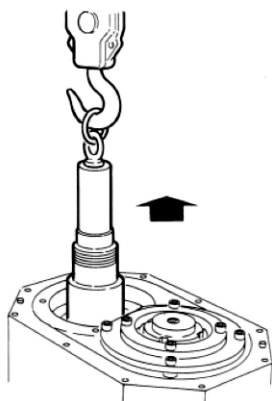
19. Stand the pump upright and extract the two bearing supports, making use of the threaded holes for removal. Doing so you will remove the spacers for axial adjustment too, which should be marked and separated for a right re-setting while assembling.



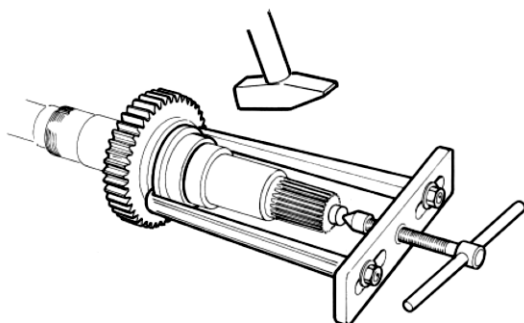
20. Remove the ball bearing from its support, taking away the bull ring.



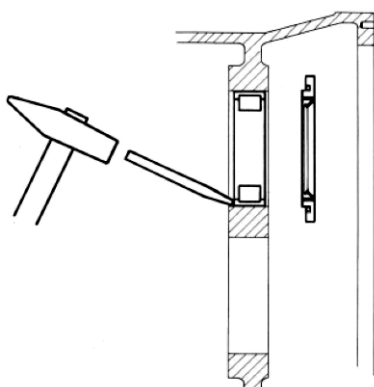
21. Mark the gears in order to set them rightly while reassembling.



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

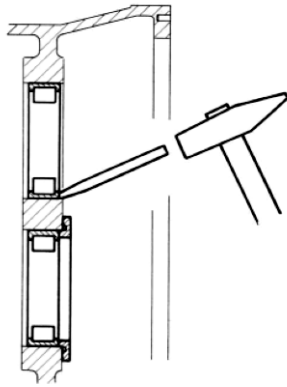


23. Remove the inside ring of the roller bearing by means of an extractor. Remove the gear taking care not to damage the toothing outline.

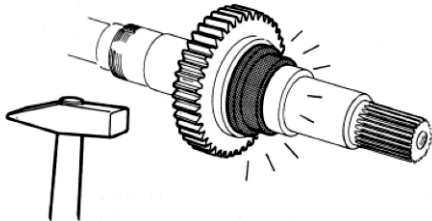


24. Remove the ring and extract the outside ring of the roller bearing from the bearing housing.

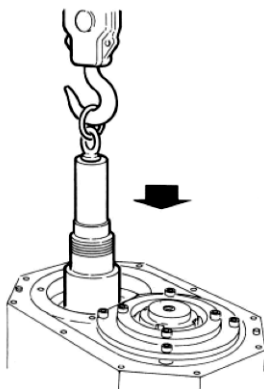
10.4 Bearing housing assembly



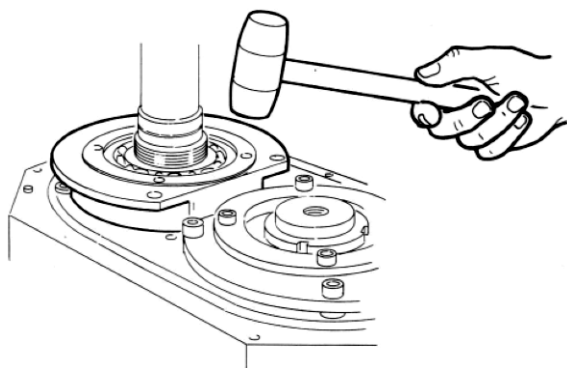
25. Assemble the outside rings of the roller bearings on the bearing housing, using a retaining ring to set them axially, because no counter boring is arranged. Assemble the retaining rings without seal rings.



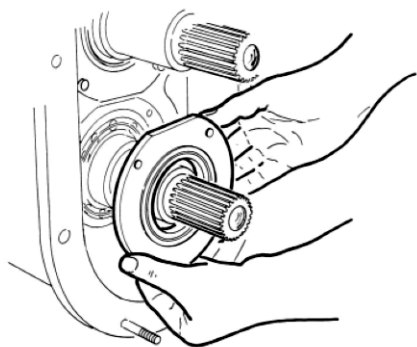
26. The inside ring of the roller bearing is assembled with a interference, therefore we suggest a shrink fitting, heating the ring in 90 °C oil bath, in order to avoid any seizure. Insert the gear keys in their seats with a lightly forced connection. **IMPORTANT:** Assemble the adjustable gear on the shaft, which will be set up on the pump.



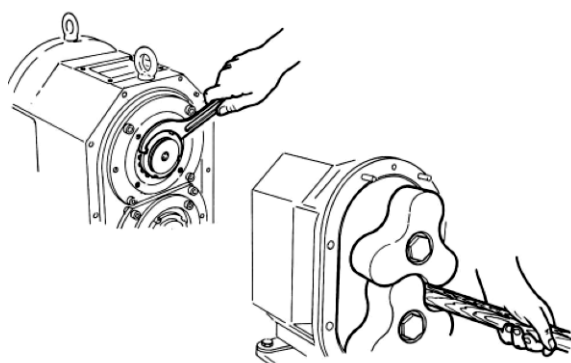
27. Assemble the shaft. If the gears haven't been removed from the shafts, respect the timing previously marked while re-assembling.



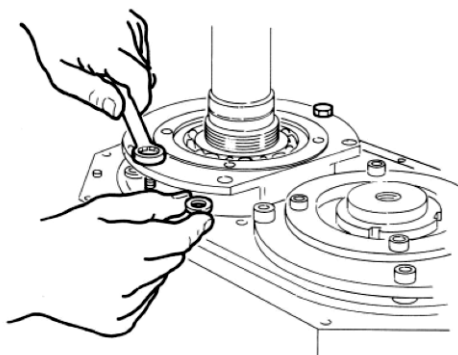
28. Insert the spacers (10) on the shafts and assemble the supports (75) with the ball bearings already connected. Set the spacers for axial adjustment (11) and tighten the screws.



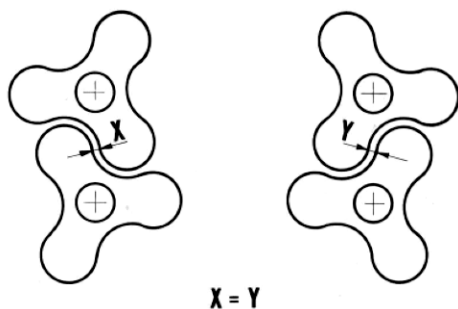
29. Assemble the seal rings (18) on retainers (9).



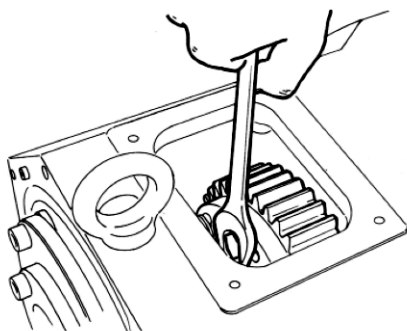
30. Assemble the rotor case as previously described; tighten the retainer ring nut with the corresponding lock washers and set rightly the retainer keys. In order to avoid turning during operation insert a non metal wedge between rotors.



31. If clearance are not included in tolerances as 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.

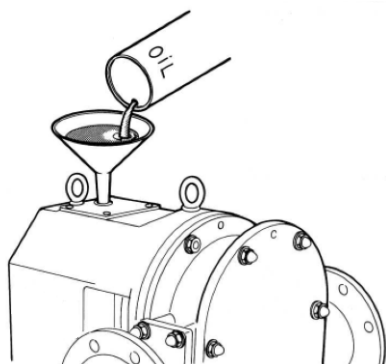


32. Time perfectly the rotors and tighten the screws of the adjustable gear gradually checking the rotor timing. You can reach the adjustable gear through a window arranged on the top of the bearing housing.



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.

11 Driving shaft inversion

- 1 - To invert the drive shaft position it's necessary to remove the shafts from bearing, as previously described.
IMPORTANT: 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 tab. 13.

12 Spare parts choice

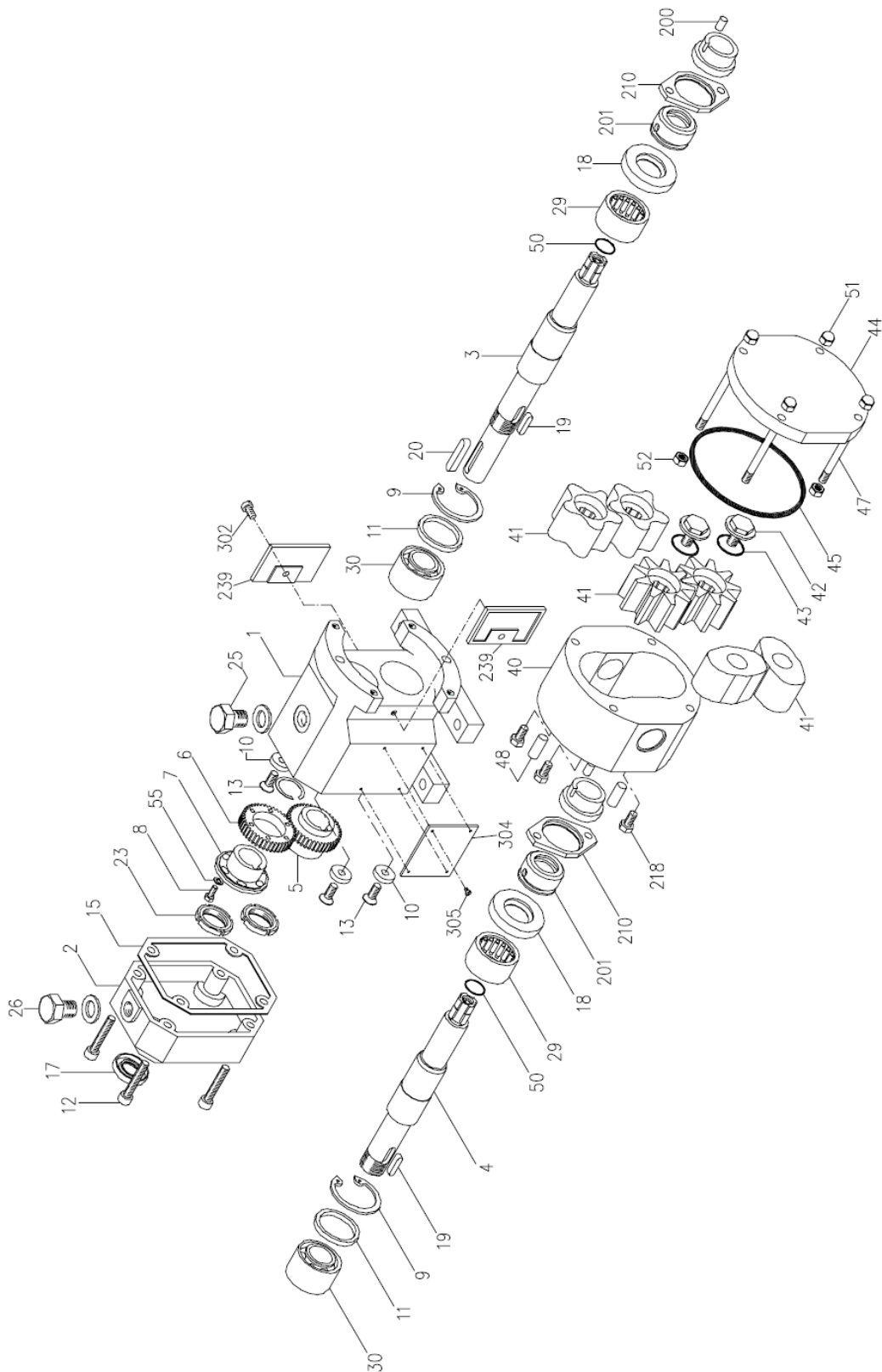


Fig. 18: Pump type B100

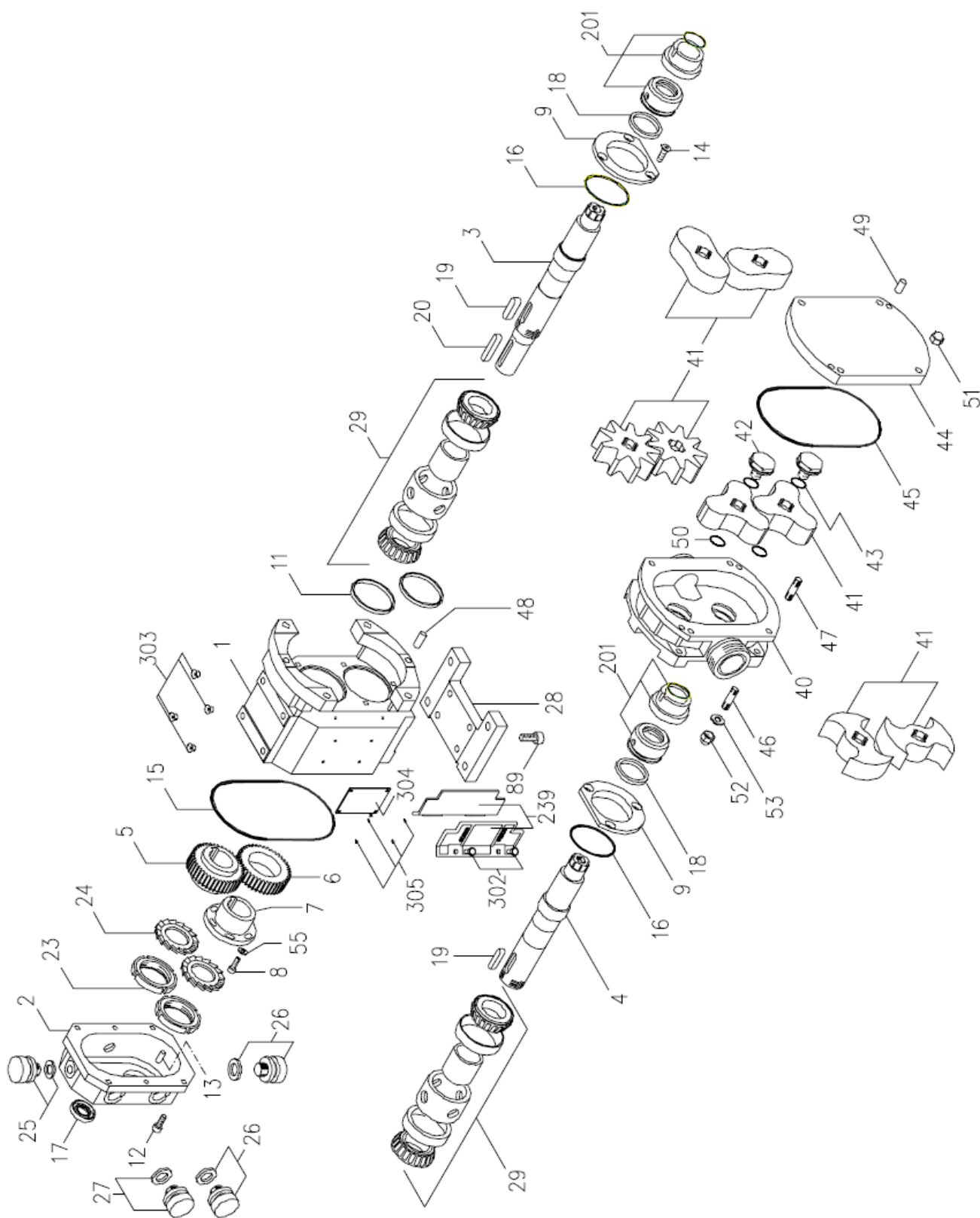


Fig. 19: Pumpe type B1

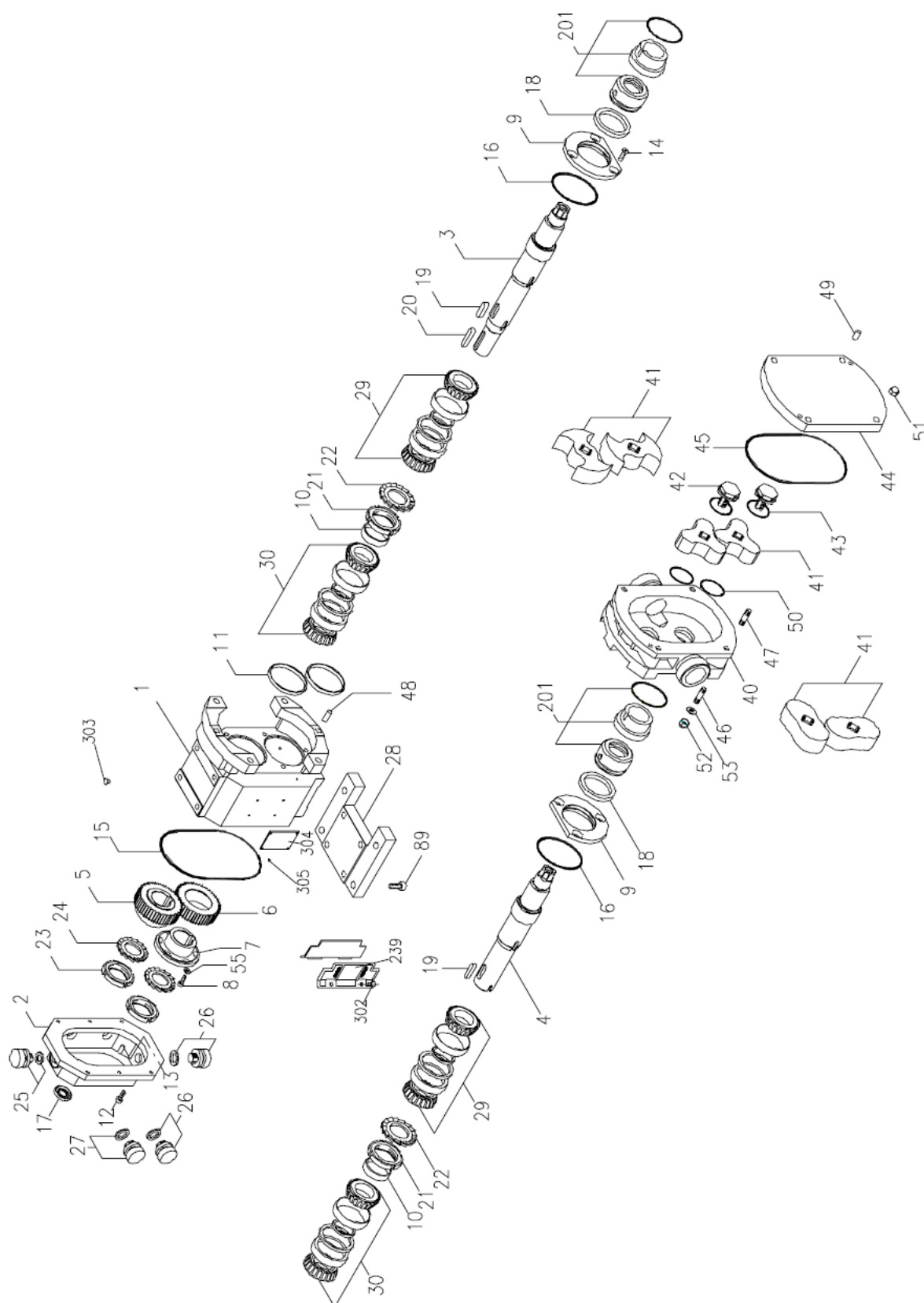


Fig. 20: Pump type B2-B4

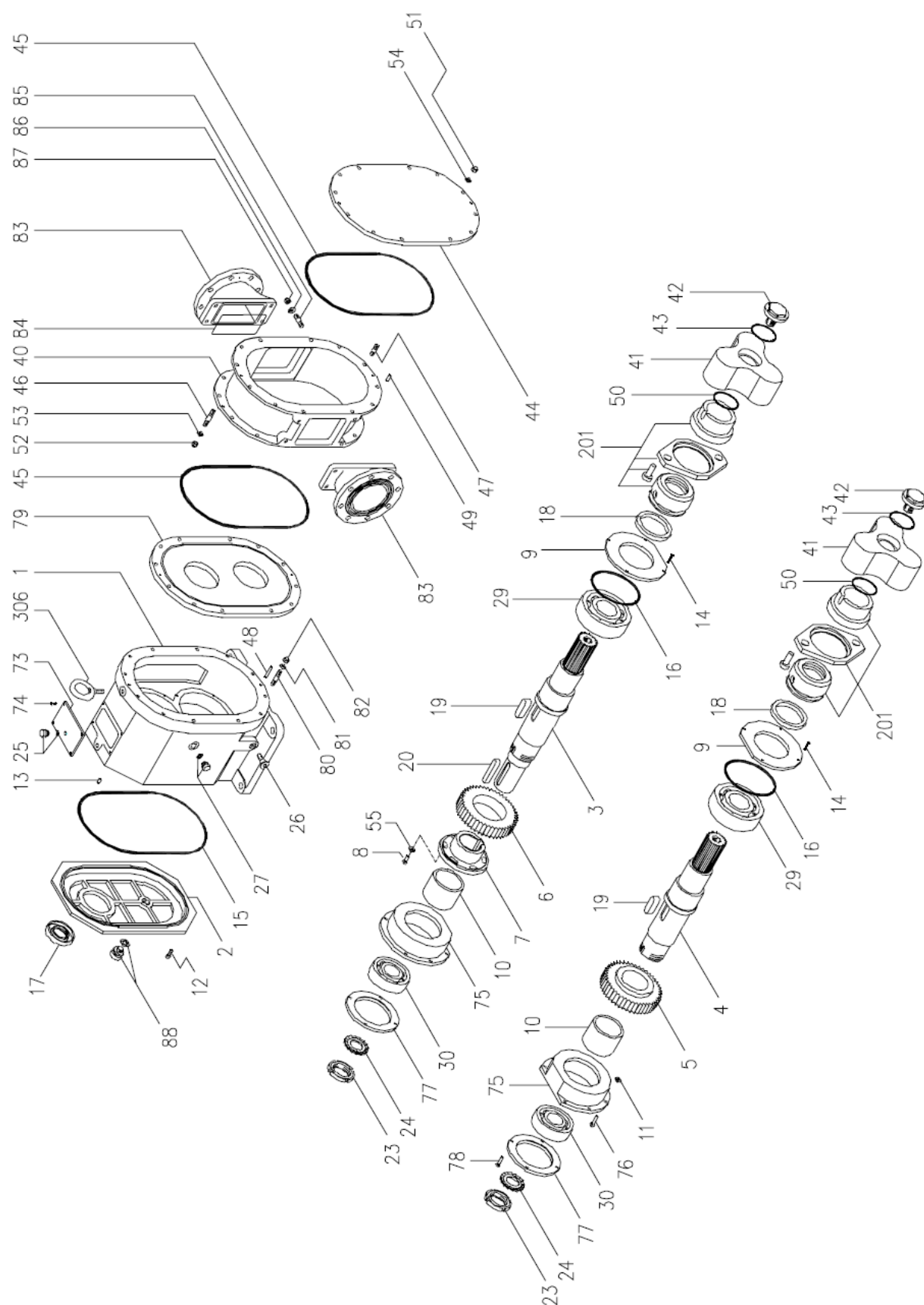


Fig. 21: Pump type B5-B6

12.1 Special options

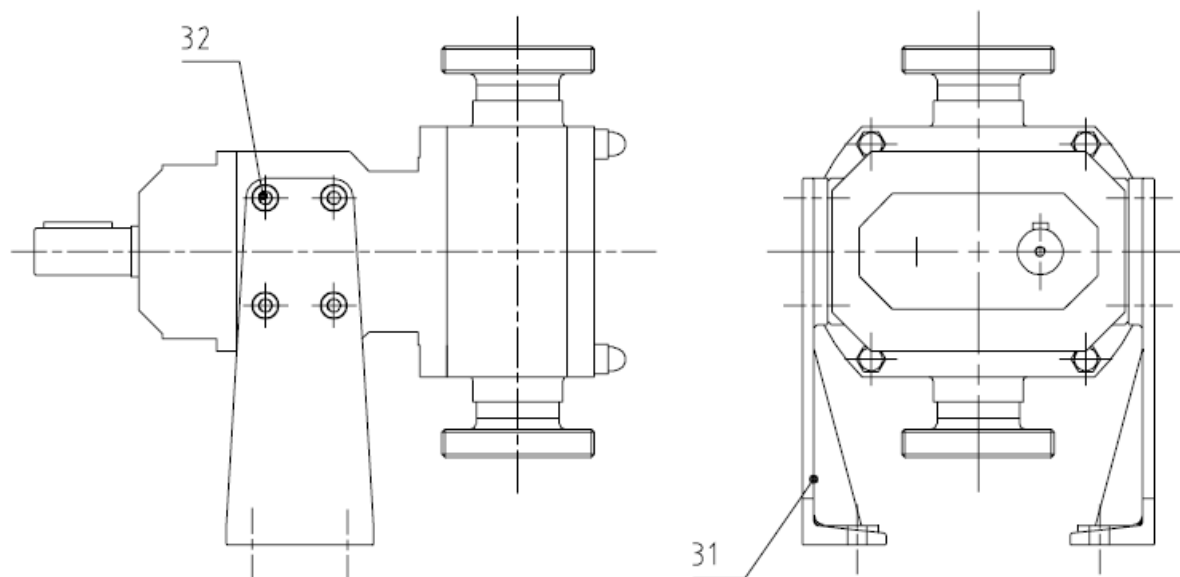


Fig. 22: Pump with vertical feet

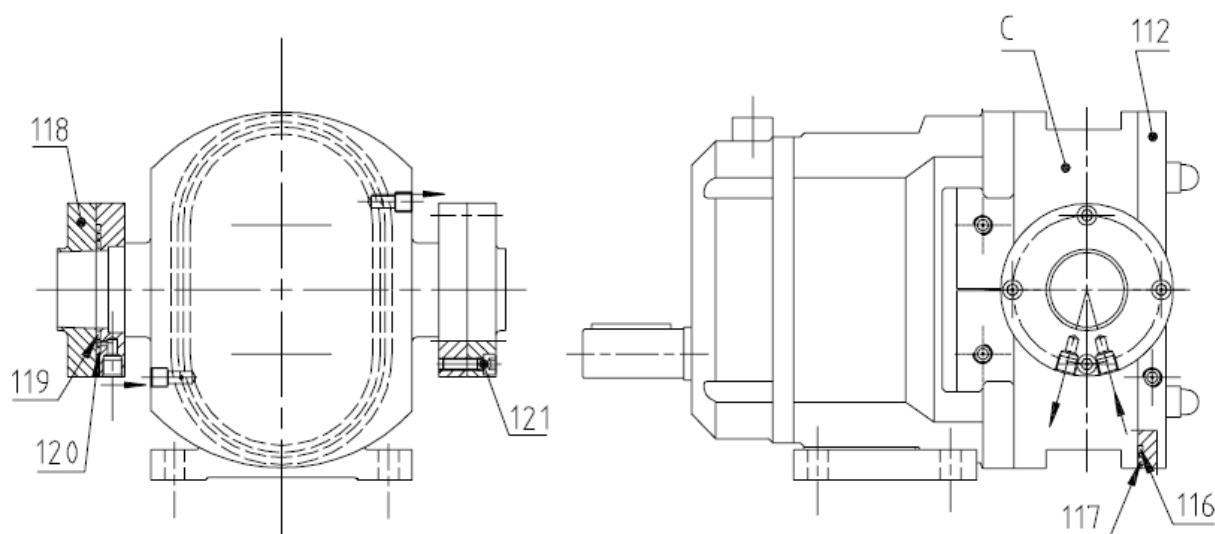


Fig. 23: Aseptic pump

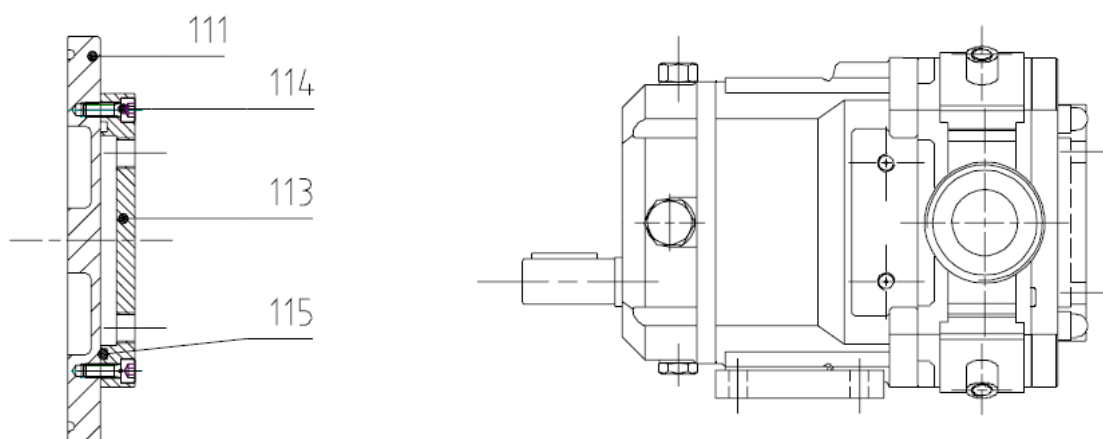


Fig. 24: Heated cover

12.2 Seals for pump B100

Lip seal

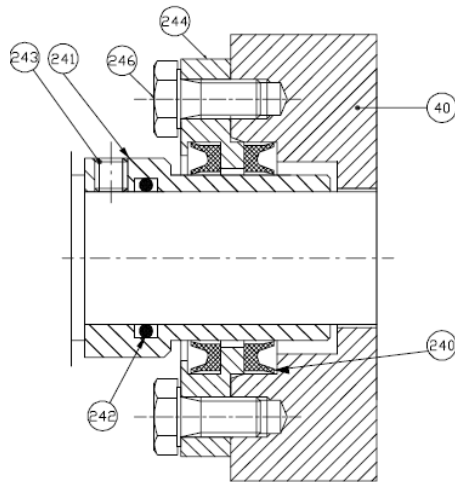


Fig. 25: Code 0

single mechanical seal "U7K"

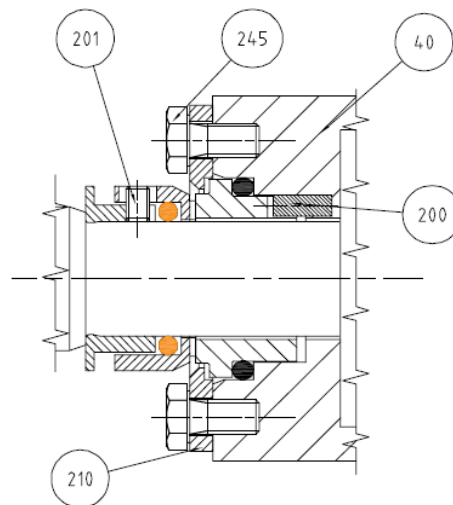


Fig. 26: Code 3-5-5-85-8

S1 Lip seal

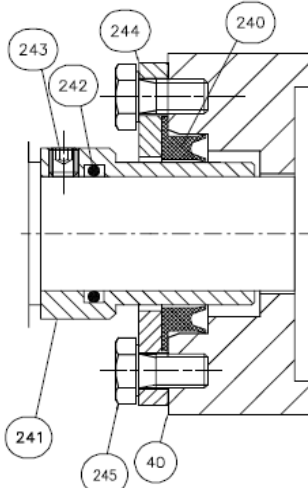


Fig. 27: Code 0-S

Packing gland

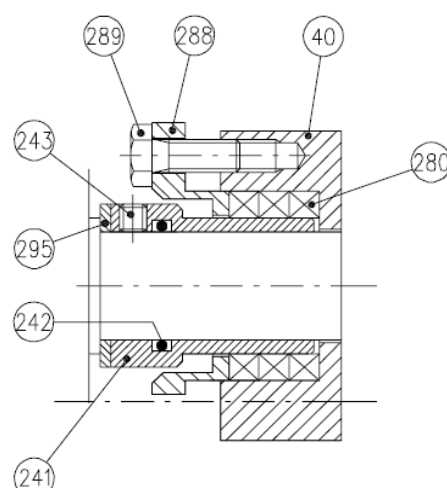


Fig. 28: Code 1

HN Lip seal

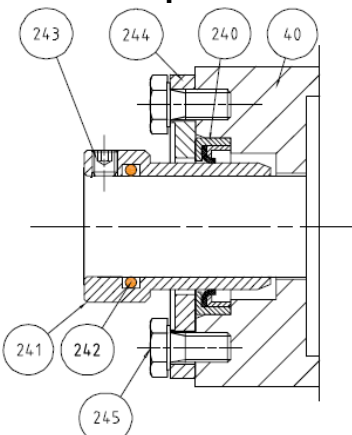


Fig. 29: Code 0-S

12.3 Seals for pump type B1- B5

Lip seal

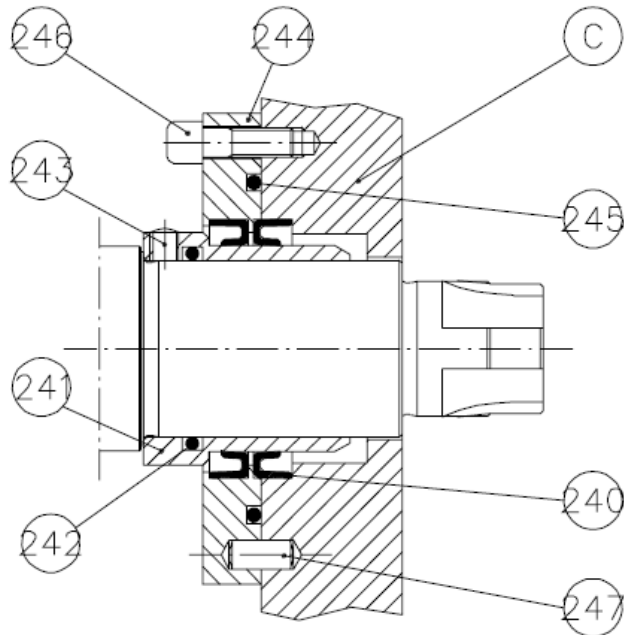


Fig. 30: code 0

S1 Lip seal

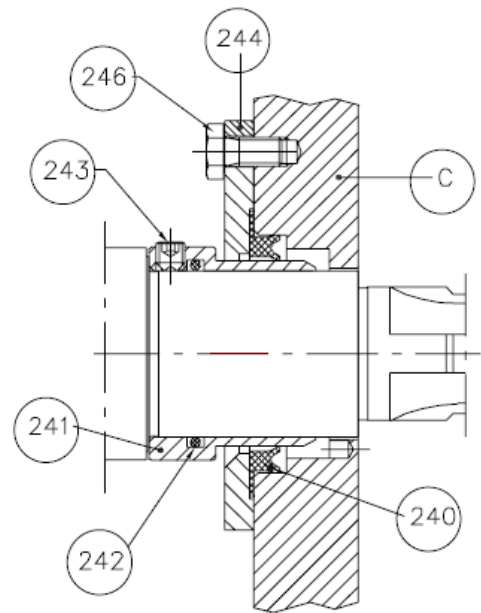


Fig. 31: code 0-S

Packing gland

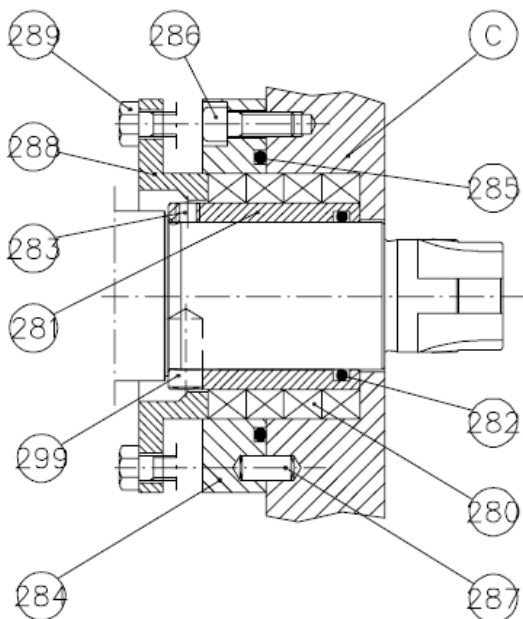


Fig. 32: Code 1

Packing gland with liquid barrier

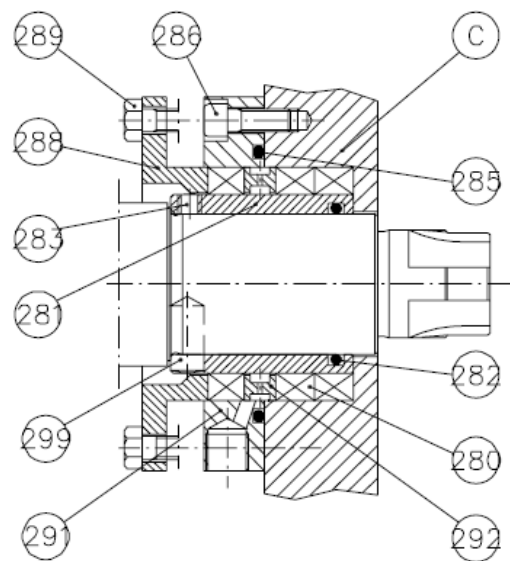


Fig. 33: Code 2

Single mechanical seal “KL2A”

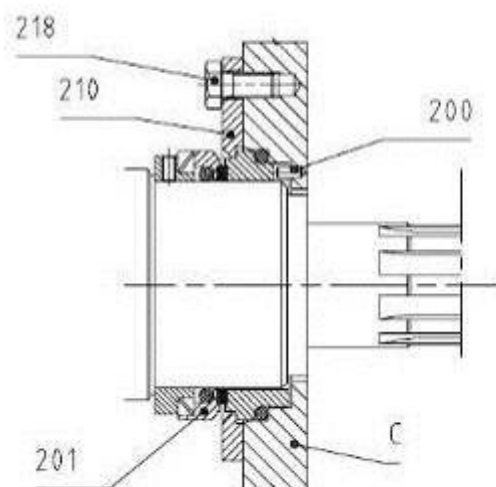


Fig. 34: KL2A

Single mechanical seal “UTK”

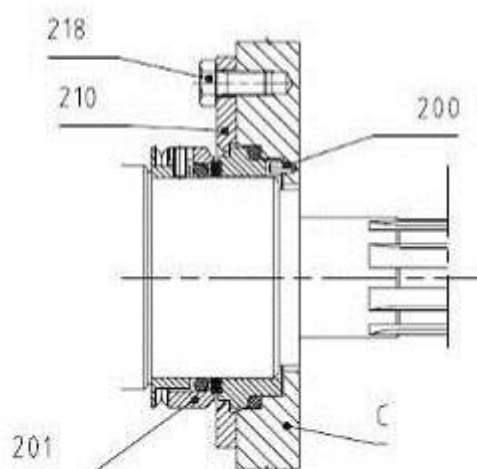


Fig. 35: U7K

Single mechanical seal “C5E”

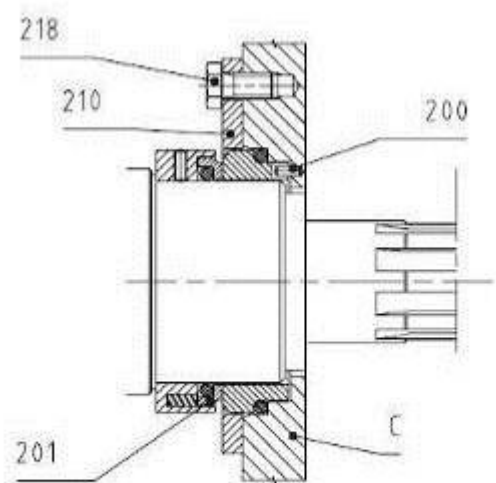


Fig. 36: C5E

HN Double lip

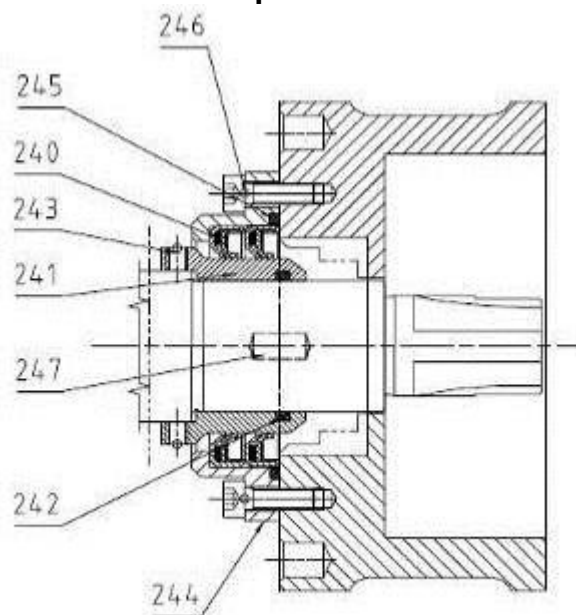


Fig. 37: HN double lip seal

Single flushed mechanical seal

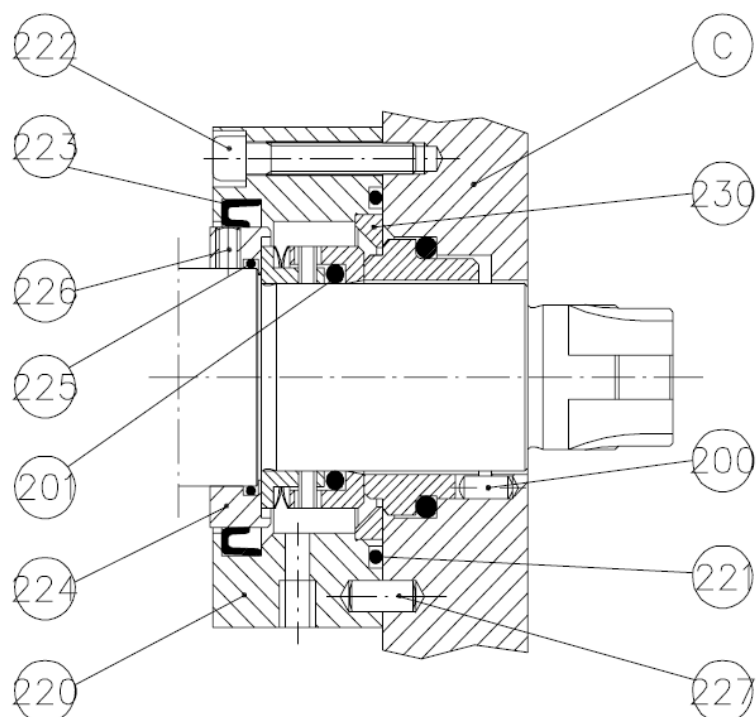


Fig. 38: Code C

Double mechanical seal

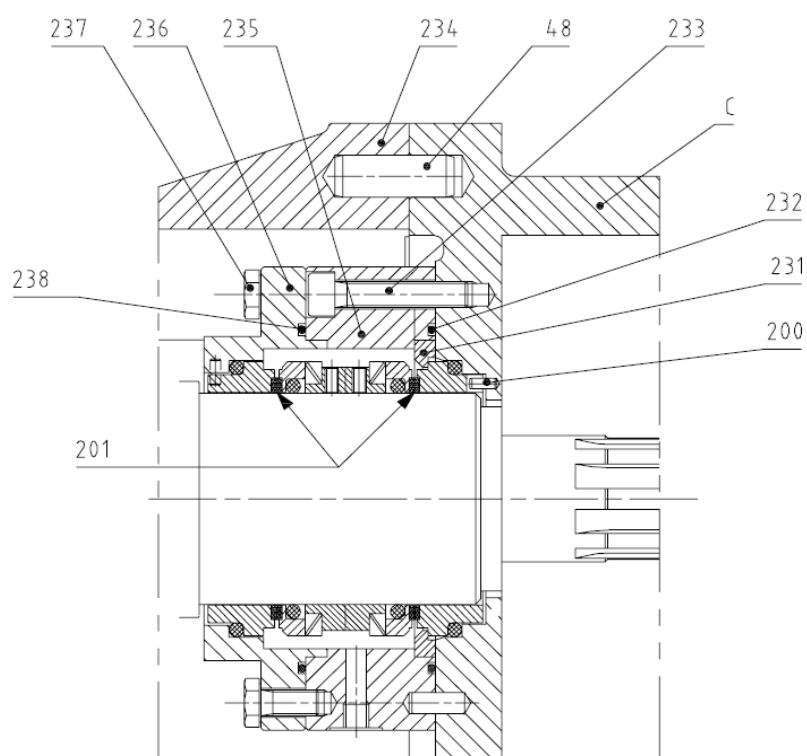


Fig. 39: code Q

12.4 Seals for pump type B6

Lip seal

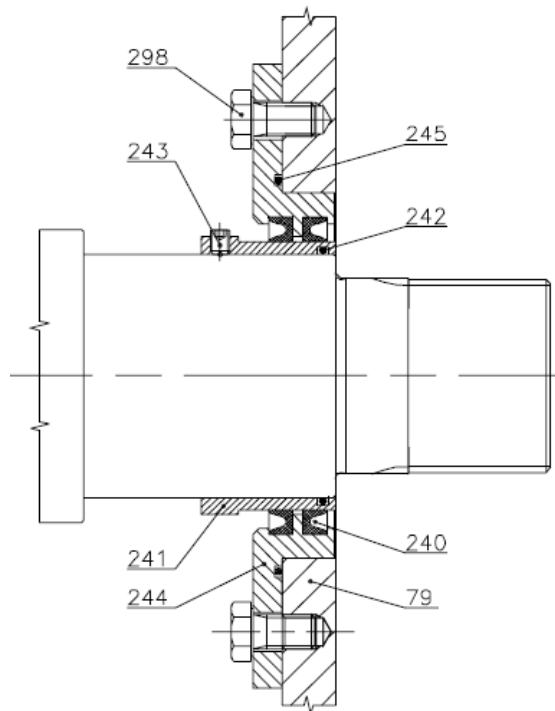


Fig. 40: Code 0

Packing gland with liquid barrier

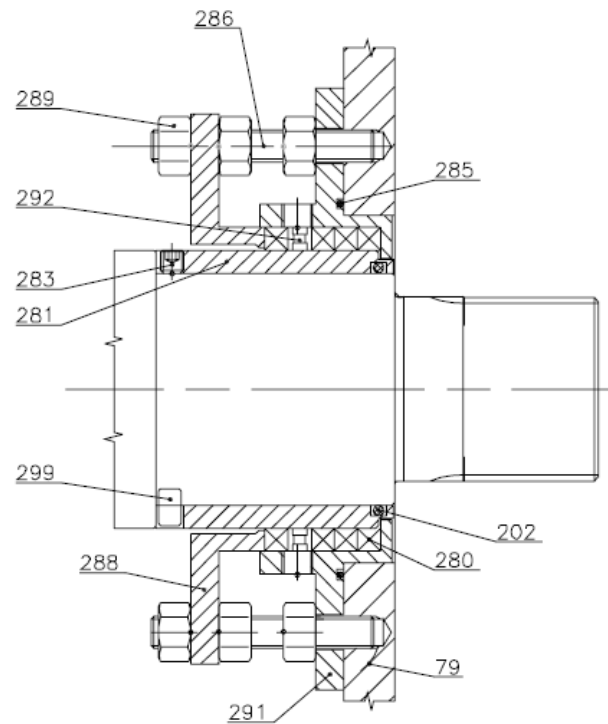


Fig. 41: code 2

Packing gland

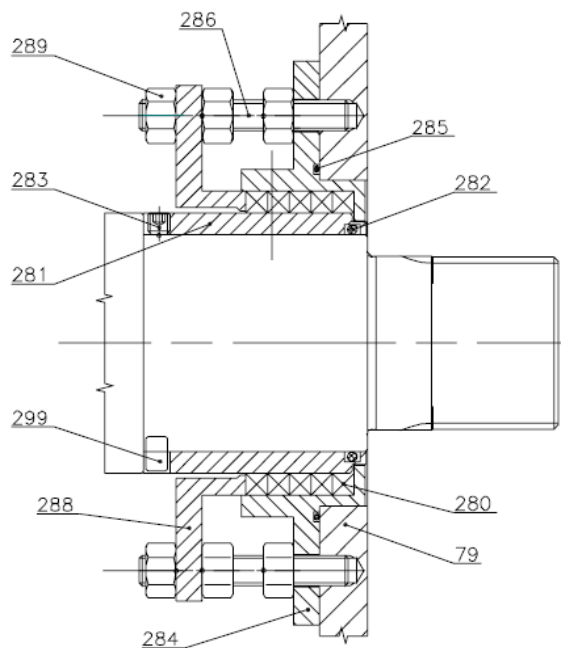


Fig. 42: Code 1

Single mechanical seal

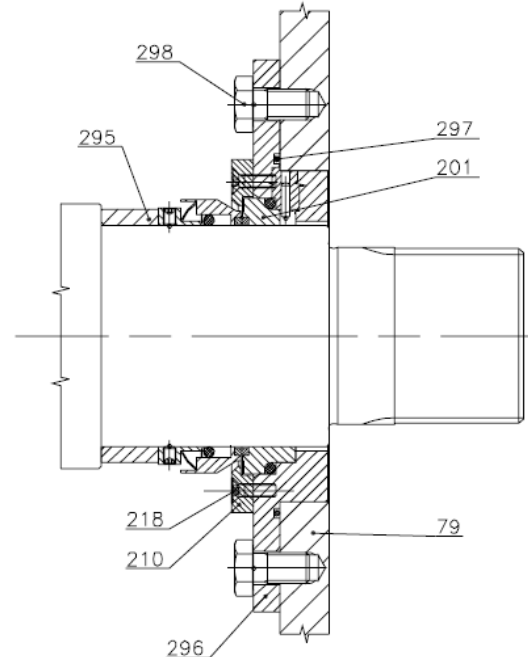


Fig. 43: Code 2

Single flushed mechanical seal “U7K” – “KL2A” – “C5E”

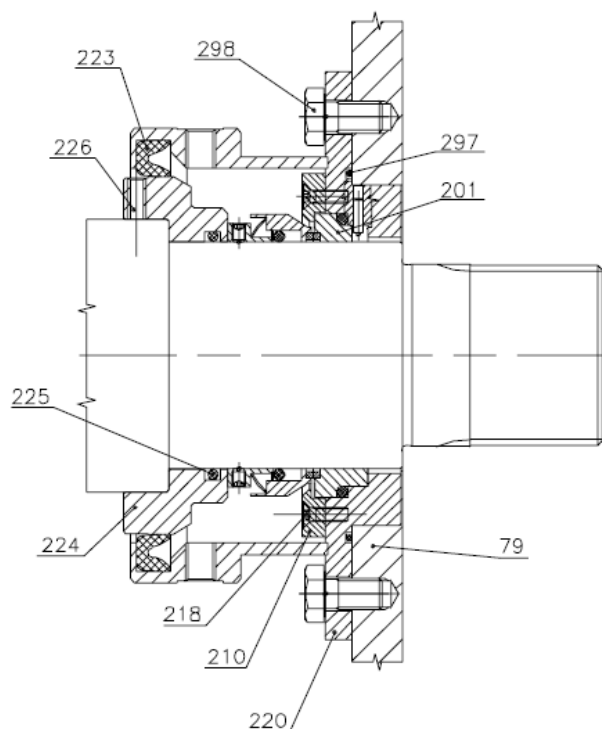


Fig. 44: Code C

Double mechanical seal

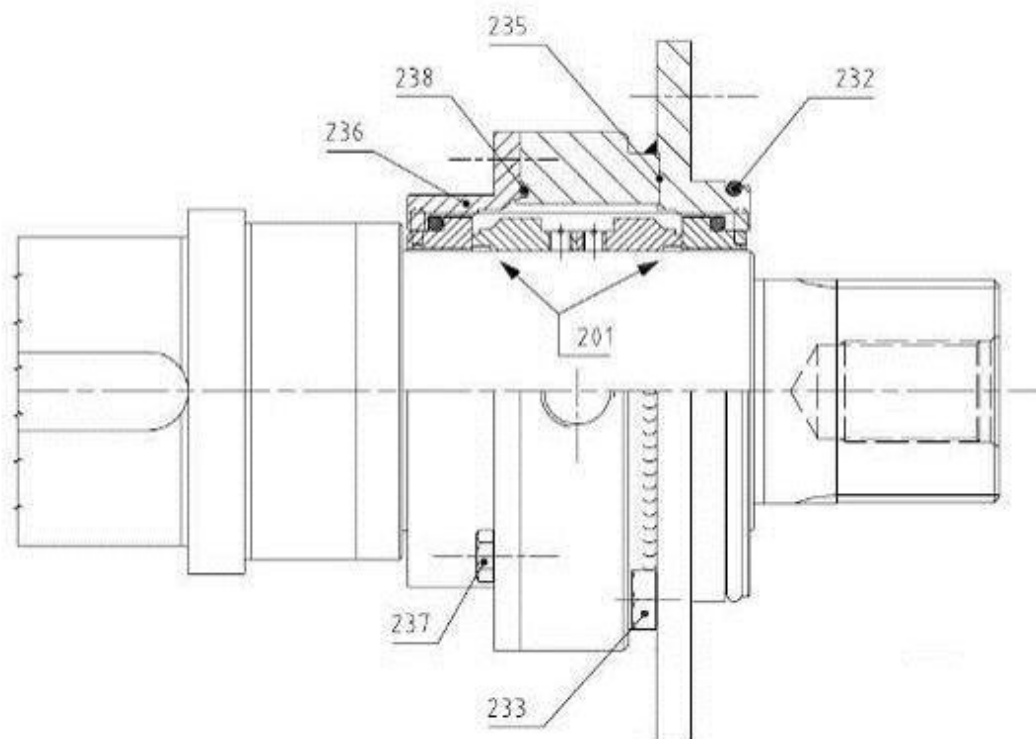


Fig. 45: Code Q

12.5B 100 PARTS LIST

Pos.	Descriptions	Q.tà	Codice
Key No.		No. Req.	Part. No.
1	Bearing Housing G26	1	2001G007
2	Gear cover	1	2001L037
3	Standard driving shaft	1	2004B061
4	Standard driven shaft	1	2004B062
5	Fixed gear	1	2008M013
6	Adjustable gear	1	2008M017
7	Adjustable gear bush	1	2008M038
8	Screw	6	410F04x10
9	Split ring	2	421F371
10	Plane washer	4	412F06G17
11	Axial adjustment spacer	2	2014M030
12	Screw	4	411A06x35
13	Screw	4	411F06x12Z
15	Gear cover seal	1	404T100
17	Oil seal ring	1	403Y18307D
18	Oil seal ring	2	403Y25377D
19	Key	2	418F06x18
20	Key	1	418A06x30
23	Gear ring nut	2	415F20ALUT
25	Oil cap vent	1	407L148
26	Oil cap	1	407L14T
29	Front bearing	2	2019M020
30	Rear bearing	2	406FNATB5904
40	Rotor case	1	23 B14
41	316 S.S. gear rotor ST	2	2005B086
41	316 S.S. 2 lobe ST	2	2005B089
41	Rubber coated 316 S.S. 6 lobe	2	2005B098
41	S.S. anti-seizure alloy gear rotor	2	2005B089
41	S.S. anti-seizure alloy 2 lobe	2	2005B089
42	Locking nut for rotor	2	2004B107
43	O-ring	2	404T3075
44	Standard end cover	1	2006B007
45	Cover O-ring	1	404T4337
47	Stud	4	419A06X80
48	Pin	2	417A08X16
50	O-ring	2	404T2056
51	Cap nut	4	414A06
52	Nut	2	413A06
55	Plane washer	6	412F04
111	End cover for heating version	1	2006B058

Pos.	Descriptions	Q.tà	Codice
Key No.		No. Req.	Part. No.
113	End cover jacket	1	2006B167
114	Screw	4	411A06X16
115	O-ring	1	404T176
200	Retainer pin	2	2014B200
201	Mechanical seal UNITEN 7K-X7X27+HX	2	4U020U7KX27
201	Mechanical seal UNITEN 7K-XYX2Y+HX	2	4U020U7KX2Y
201	Mechanical seal UNITEN 7K-XPX25+HX	2	4U020U7KX25
201	Mechanical seal UNITEN 7K-X7327+HX	2	4U020U7K327
201	Mechanical seal UNITEN 7K-XY32Y+HX	2	4U020U7K32Y
201	Mechanical seal UNITEN 7K-XP325+HX	2	4U020U7K325
201	Mechanical seal UNITEN 7K-X7337+HX	2	4U020U7K337
201	Mechanical seal UNITEN 7K-XY33Y+HX	2	4U020U7K33Y
201	Mechanical seal UNITEN 7K-XP335+HX	2	4U020U7K335
201	Mechanical seal UNITEN 7K-XYDKXY+HX	2	4U020U7KDKY
210	Balancing ring for seal	2	2014B015
218	Screw	4	410A06x12
239	Seal protection	2	4034Y005
240	Viton® seal ring	4	402V35255
240	EPDM seal ring	4	402U35255
240	SINTEK H-TPU/polymer lip seal	2	402Q35255
240	HN Elring lip seal	2	402HNQ5357
241	Stuffing box - SINTEK H-TPU / HN ELRING - UM seal bush	2	2004B170
242	Bush O-ring	2	404T3081
243	Screw	6	420A05X05
244	Seal ring support	2	2014B058
244	SINTEK H-TPU / HN ELRING lip seal support	2	2014B055
245	Screw	4	410A06X12
246	Screw	4	410A06X14
280	Packing ring kit	1	205P25355
288	Register	2	2014B108
289	Screw	4	410A06x16
295	Spacer	2	2014B045
302	Screw	2	410A05X10
304	Name plate	1	44301026
305	Rivet	4	44301027

12.6 PART LIST – B1 – B6

POS No.	DESCRIPTION	PART No. BY MODEL															
		B1'05	B1'10	B1'15	B2'15	B2'20	B3'25	B3'30	B3'30	B4'30	B4'40	B4'70	B4'80	B5'50	B6'60	B6'80	
1	BEARING-HOUSING	2001G001	2001G001	2001G001	2001G002	2001G002	2001G003	2001G003	2001G003	2001G004	2001G004	2001G008	2001G008	2001G005	2001G006	2001G006	
2	GEAR COVER	2001L031	2001L031	2001L031	2001L032	2001L032	2001L033	2001L033	2001L033	2001L034	2001L034	2001L038	2001L038	2001G035	2001G036	2001G036	
3	STANDARD DRIVING SHAFT	2004B001	2004B001	2004B002	2004B003	2004B004	2004B005	2004B006	-	2004B007	2004B008	2004B063	2004B065	2004B010	2004B011	2004B012	
4	DUPLEX DRIVING SHAFT	2004D001	2004D001	2004D002	2004D003	2004D004	2004D005	2004D006	2004D006	2004D007	2004D008	2004D009	2004D010	-	2004D011	-	
5	STANDARD DRIVEN SHAFT	2004B029	2004B029	2004B030	2004B031	2004B032	2004B033	2004B034	-	2004B035	2004B036	2004B084	2004B086	2004B038	2004B039	2004B040	
6	DUPLEX DRIVEN SHAFT	2004D029	2004D029	2004D030	2004D031	2004D032	2004D033	2004D034	2004D034	2004D035	2004D036	2004D037	2004D038	-	2004D039	-	
7	DOUBLE FLUSH MECH SEAL DRIVEN SHAFT	2004D045	2004D045	2004D046	2004D047	2004D048	2004D049	2004D050	-	2004D051	2004D052	2004D053	2004D054	-	-	-	
8	FIXED GEAR	2008M001	2008M001	2008M001	2008M002	2008M002	2008M003	2008M003	2008M003	2008M004	2008M004	2008M014	2008M014	2008M005	2008M008	2008M006	
9	ADJUSTABLE GEAR	2008M007	2008M007	2008M008	2008M008	2008M008	2008M009	2008M009	2008M009	2008M010	2008M010	2008M015	2008M015	2008M011	2008M012	2008M012	
10	ADJUSTABLE GEAR BUSH	2008M031	2008M031	2008M032	2008M032	2008M032	2008M033	2008M033	2008M033	2008M034	2008M034	2008M037	2008M038	2008M035	2008M036	2008M036	
11	SCREW	411F05X14	411F05X14	411F05X14	411F06X16	411F06X16	411F08X20	411F08X20	411F08X20	411F10X25	411F10X25	411F10X30	410F12X35	410F16X45	410F16X45	410F16X45	
12	BEARING RETAINER	2001C051	2001C051	2001C052	2001C052	2001C052	2001C053	2001C053	2001C053	2001C054	2001C054	2001C057	2001C058	2001C056	2001C056	2001C056	
13	BEARING SPACER	-	-	-	2014M021	2014M021	2014M026	2014M026	2014M026	2014M027	2014M027	2014M044	2014M044	2014M028	2014M029	2014M029	
14	AXIAL ADJUSTMENT SPACER	2014M024	2014M024	2014M024	2014M025	2014M025	2014M026	2014M026	2014M026	2014M027	2014M027	2014M044	2014M044	2014M028	2014M029	2014M029	
15	SCREW	41T1A06X18	41T1A06X18	41T1A06X18	41T1A08X20	41T1A08X20	41T1A08X25	41T1A08X25	41T1A08X25	41T1A10X30	41T1A10X30	41T1A10X30	41T1A10X30	41T1A08X28	41T1A10X30	41T1A10X30	
16	GEAR COVER PIN	41T1A06X14	41T1A06X14	41T1A06X14	41T1A06X14	41T1A06X14	41T1A06X16	41T1A06X16	41T1A06X16	41T1A06X16	41T1A06X16	41T1A08X16	41T1A08X16	41T1A08X16	41T1A10X30	41T1A10X30	
17	SCREW	41T1A06X16S	41T1A06X16S	41T1A06X16S	41T1A08X20S	41T1A08X20S	41T1A08X20S	41T1A08X20S	41T1A08X20S	41T1A10X25S	41T1A10X25S	41T1A10X25S	41T1A10X25S	41T1A08X28	41T1A10X30	41T1A10X30	
18	GEAR COVER O-RING	404T14437	404T14437	404T14437	404T14562	404T14562	404T14675	404T14675	404T14675	404T14675	404T14675	404T181050	404T181050	404T181050	404T181050	404T181050	
19	BEARING RETAINER O-RING	404T13218	404T13218	404T13218	404T13268	404T13268	404T14312	404T14312	404T14312	404T14312	404T14312	404T1437	404T1437	404T14562	404T14675	404T14675	
20	BEARING SEAL RING	403Y26377	403Y26377	403Y26377	403Y32457	403Y32457	403Y37528	403Y37528	403Y37528	403Y37528	403Y37528	403Y6985100	403Y6985100	403Y9012012	403Y9012012	403Y9012012	
21	OIL SEAL RING	403Y35527D	403Y35527D	403Y35527D	403Y45080	403Y45080	403Y45080	403Y45080	403Y45080	403Y45080	403Y45080	403Y45080	403Y45080	403Y45080	403Y45080	403Y45080	
22	KEY	418F08X30M	418F08X30M	418F08X30M	418F10X30M	418F10X30M	418F12X40M	418F12X40M	418F12X40M	418F18X50M	418F18X50M	418F20X80M	418F20X80M	418F28X80M	418F28X80M	418F28X80M	
23	WASHER	418F08X40	418F08X40	418F08X40	418F08X40	418F08X40	418F10X50	418F10X50	418F10X50	418F14X70	418F14X70	418F16X90	418F16X90	418F16X90	418F22X120	418F22X120	
24	WASHER	415F30	415F30	415F30	415F35	415F35	415F40	415F40	415F40	415F50	415F50	415F60	415F60	415F60	415F60	415F60	
25	OIL CAP	407L14S	407L14S	407L14S	407L14S	407L14S	407L14S	407L14S	407L14S	407L14S	407L14S	407L14S	407L14S	407L14S	407L14S	407L14S	
26	OIL CAP	407L14T	407L14T	407L14T	407L14T	407L14T	407L14T	407L14T	407L14T	407L14T	407L14T	407L14T	407L14T	407L14T	407L14T	407L14T	
27	OIL LEVEL	407L38L	407L38L	407L38L	407L12L	407L12L	407L12L	407L12L	407L12L	407L12L	407L12L	407L12L	407L12L	407L12L	407L12L	407L12L	
28	FOOT	2001G101	2001G101	2001G101	2001G102	2001G102	2001G103	2001G103	2001G103	2001G103	2001G104	2001G105	2001G105	2001G105	2001G105	2001G105	
29	ASSEMBLED FRONT BEARING	2019M001	2019M001	2019M001	2019M002	2019M002	2019M003	2019M003	2019M003	2019M004	2019M004	2019M008	2019M008	406FNJ2216E	406FNJ224	406FNJ224	
30	ASSEMBLED REAR BEARING	2019M001	2019M001	2019M001	2019M002	2019M002	2019M003	2019M003	2019M003	2019M004	2019M004	2019M004	2019M004	406F3224	406F3220	406F3220	
31	VERTICAL FOOT	2001A301	2001A301	2001A301	2001A302	2001A302	2001A303	2001A303	2001A303	2001A304	2001A304	2001A305	2001A305	2001A305	2001A305	2001A305	
32	SCREW	411A08X20	411A08X20	411A08X20	411A10X20	411A10X20	411A12X25	411A12X25	411A12X25	411A14X30	411A14X30	411A20X40	411A20X40	411A20X40	411A20X40	411A20X40	
33	COUNTERFLANGE FOR ENLARGED INLET PORT	-	-	-	2006B045	2006B045	2006B046	2006B046	2006B046	2006B046	2006B046	2006B046	2006B046	2006B046	2006B046	2006B046	
34	O-RING	1	-	-	404T13281	-	-	-	-	-	-	-	-	-	-	-	
40	ROTOR CASE Ø	1	23 ... 01	23 ... 02	23 ... 03	23 ... 04	23 ... 05	23 ... 06	23 ... 07	23 ... 08	23 ... 09	23 ... 10	23 ... 11	23 ... 12	23 ... 13	23 ... 13	
41	316 STAINLESS STEEL 3 LOBE ST	2	-	2005B002	2005B003	2005B004	2005B005	2005B006	2005B007	2005B008	2005B009	2005B010	2005B011	2005B012	2005B013	2005B013	
42	316 STAINLESS STEEL 2 LOBE ST	2	-	2005B002	2005B003	2005B004	2005B005	2005B006	2005B007	2005B008	2005B009	2005B010	2005B011	2005B012	2005B013	2005B013	
43	316 STAINLESS STEEL 3 LOBE ST	2	-	2005B014	2005B015	2005B016	2005B017	2005B018	2005B019	2005B020	2005B021	2005B022	2005B023	2005B024	2005B025	2005B025	
44	316 STAINLESS STEEL 2 LOBE SM	2	-	2005B039	2005B040	2005B041	2005B042	2005B043	2005B044	2005B045	2005B046	2005B047	2005B048	2005B049	2005B050	2005B050	
45	RUBBER COATED 316 S.S. 3/64 LOBE	2	2005B099	2005B050	2005B051	2005B052	2005B053	2005B054	2005B055	2005B056	2005B057	2005B058	2005B059	2005B060	2005B061	2005B061	
46	RUBBER COATED 316 S.S. 2 LOBE	2	-	2005B082	2005B083	2005B084	2005B085	2005B086	2005B087	2005B088	2005B089	2005B090	2005B091	2005B092	2005B093	2005B093	
47	ANTI-SEIZURE ALLOY DUAL WING ROT. PISTON	2	2005B087	2005B074	2005B075	2005B076	2005B077	2005B078	2005B079	2005B080	2005B081	2005B082	2005B083	2005B084	2005B085	2005B085	
48	ANTI-SEIZURE ALLOY 3 LOBE	2	2005B002	2005B003	2005B004	2005B005	2005B006	2005B007	2005B008	2005B009	2005B010	2005B011	2005B012	2005B013	2005B013	2005B013	
49	316 STAINLESS STEEL GEAR ROTOR	2	2005B001	-	-	-	-	-	-	-	-	-	-	-	-	-	
50	ANTI-SEIZURE ALLOY GEAR ROTOR	2	2005B001	-	-	-	-	-	-	-	-	-	-	-	-	-	
51	LOCKING NUT FOR STANDARD ROTOR	2	2004B101	2004B101	2004B102	2004B102	2004B103	2004B103	2004B103	2004B104	2004B104	2004B104	2004B104	2004B105	2004B106	2004B106	
52	O-RING	2	404T13100	404T13100	404T13118	404T13118	404T13162	404T13162	404T13162	404T13200	404T13200	404T13200	404T13200	404T13225	404T13260	404T13260	
53	STANDARD FRONT COVER	2	2006B009	2006B009	2006B002	2006B002	2006B003	2006B003	2006B003	2006B004	2006B004	2006B006	2006B006	2006B005	2006B005	2006B005	
54	COVER O-RING	404T201	404T14525	404T14525	404T14625	404T14625	404T14750	404T14750	404T14750	404T181025	404T181025	404T181175	404T181175	404T181175	404T181175	404T181175	
55	BACK STUD	4	419A08X31	419A08X31	419A10X39	419A10X39	419A12X46	419A12X46	419A12X46	419A12X46	419A12X46	419A12X46	419A12X46	419A12X46	419A12X46	419A12X46	

(3) FOR B470-B490-B570

(1) FOR B6 (2) FOR B1-B2

(4) FOR B3-B430

(3) FOR B6

(2) FOR B440-B470-B490

(1) FOR B470-B490-B570

Pos. No.	DESCRIPTION	Qty	PART No. BY MODEL															
			B105	B110	B115	B215	B220	B325	B330	B350	B430	B440	B470	B490	B550	B660	B680	
241	SEAL RING BUSH FOR HN ELRING	2	2004B191	2004B191	2004B191	2004B192	2004B192	2004B193	2004B193	2004B193	2004B194	2004B194	-	-	-	-	-	
242	BUSH O-RING	2	404T3118	404T3118	404T3118	404T3137	404T3137	404T4200	404T4200	404T4200	404T168	404T168	404T168	404T181	404T168	404T4400	404T4400	
242	HN ELRING BUSH O-RING	2	404T3118	404T3118	404T3118	404T149	404T149	404T4237	404T4237	404T4237	404T168	404T168	-	-	-	-	-	
243	SCREW	6	420A05X05	420A05X05	420A05X05	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A08X10	420A08X10	420A06X06	420A08X10	
243	HN ELRING SCREW	6	420A05X05	420A05X05	420A05X05	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	-	-	-	-	
244	HN ELRING SUPPORT	2	2014B051	2014B051	2014B051	2014B052	2014B052	2014B053	2014B053	2014B053	2014B054	2014B054	2014B057	2014B057	2014B054	2014B056	2014B056	
244	S1 SEAL RING SUPPORT	2	2014B061	2014B061	2014B061	2014B062	2014B062	2014B063	2014B063	2014B063	2014B064	2014B064	2014B066	2014B066	2014B064	-	-	
244	HN ELRING SEAL RING SUPPORT	2	2014B111	2014B111	2014B111	2014B112	2014B112	2014B112	2014B113	2014B113	2014B114	2014B114	-	-	-	-	-	
245	O-RING	2	404T3218	404T3218	404T3218	404T168	404T168	404T4312	404T4312	404T4312	404T4437	404T4437	404T4437	404T4500	404T4437	404T4625	404T4625	
245	HN ELRING O-RING	2	404T3218	404T3218	404T3218	404T168	404T168	404T4312	404T4312	404T4312	404T4437	404T4437	-	-	-	-	-	
246	SCREW	6	410A05X14	410A05X14	410A05X14	410A06X12	410A06X12	410A06X25	410A06X25	410A06X25	410A10X25	410A10X25	410A10X25	410A10X30	410A10X30	410A10X25	410A14X20	
246	SCREW	6	410A05X10	410A05X10	410A05X10	410A06X12	410A06X12	410A06X14	410A06X14	410A06X14	410A10X25	410A10X25	410A10X25	410A10X16	410A10X16	410A10X25	-	
246	SCREW	6	410A05X16	410A05X16	410A05X16	410A06X20	410A06X20	410A06X20	410A06X20	410A06X20	410A10X25	410A10X25	410A10X25	-	-	-	-	
247	UM SEAL RING PIN	4	-	-	-	-	-	417A06X16	417A06X16	417A06X16	417A08X16	417A08X16	417A08X16	417A08X16	417A08X16	417A08X15	-	
247	HN ELRING SEAL PIN	4	417A06X10	417A06X10	417A06X10	417A06X12	417A06X12	417A06X16	417A06X16	417A06X16	417A08X16	417A08X16	-	-	-	-	-	
280	PTFE PACKING RING KIT	1	205P3806	205P3806	205P3806	205P4576	205P4576	205P6078	205P6078	205P6078	205P9098	205P9098	205P10012010	205P10012010	205P9098	205P11013412	205P11013412	
281	STUFFING BOX SEAL BUSH	2	2004B161	2004B161	2004B161	2004B162	2004B162	2004B163	2004B163	2004B163	2004B164	2004B164	2004B169	2004B169	2004B164	2004B165	2004B165	
282	BUSH O-RING	2	404T3118	404T3118	404T3118	404T1437	404T1437	404T4200	404T4200	404T4200	404T168	404T168	404T168	404T181	404T168	404T4400	404T4400	
283	SCREW	6	420A05X05	420A05X05	420A05X05	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A06X06	420A08X08	420A08X08	420A06X08	420A08X10	
284	STUFFING BOX SEAL SUPPORT	2	2014B071	2014B071	2014B071	2014B072	2014B072	2014B073	2014B073	2014B073	2014B074	2014B074	2014B074	2014B083	2014B074	2014B076	2014B076	
285	SUPPORT O-RING	2	404T3218	404T3218	404T3218	404T168	404T168	404T4312	404T4312	404T4312	404T4437	404T4437	404T4437	404T4500	404T4500	404T4625	404T4625	
286	SCREW	-	411A05X14	411A05X14	411A05X14	411A06X16	411A06X16	411A06X20	411A06X20	411A06X20	411A10X16	411A10X16	411A10X25	411A10X25	411A10X16	419A14X110	419A14X110	
287	PIN	4	417A06X08	417A06X08	417A06X08	417A06X10	417A06X10	417A06X10	417A06X10	417A06X10	417A08X12	417A08X12	417A08X12	417A08X12	417A08X12	417A08X12	-	
288	PACKING GLAND	2	2014B101	2014B101	2014B101	2014B102	2014B102	2014B103	2014B103	2014B103	2014B104	2014B104	2014B107	2014B107	2014B104	2014B106	2014B106	
289	SCREW	-	410A05X16	410A05X16	410A05X16	410A06X20	410A06X20	410A06X20	410A06X20	410A06X20	410A10X25	410A10X25	410A10X25	410A10X25	410A10X25	413A14	413A14	
290	PTFE FLUSHED PACKING RING NUT KIT	1	201P3806	201P3806	201P3806	201P4576	201P4576	201P6078	201P6078	201P6078	201P8098	201P8098	201P10012010	201P10012010	201P9098	201P11013412	201P11013412	
291	FLUSHED STUFFING BOX SEAL SUPPORT	2	2014B077	2014B077	2014B077	2014B078	2014B078	2014B079	2014B079	2014B079	2014B080	2014B080	2014B084	2014B084	2014B080	2014B082	2014B082	
292	HYDRAULIC RING	2	2014B121	2014B121	2014B121	2014B122	2014B122	2014B123	2014B123	2014B123	2014B124	2014B124	2014B126	2014B126	2014B124	2014B125	2014B125	
293	SPACER	2	-	-	-	-	-	-	-	-	-	-	-	-	2014B131	2014B132	2014B132	
296	MECHANICAL SEAL SUPPORT	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2014B092	2014B092	
297	SUPPORT O-RING	2	-	-	-	-	-	-	-	-	-	-	-	-	-	404T4625	404T4625	
298	SCREW	4	-	-	-	-	-	-	-	-	-	-	-	-	-	410A14X20	410A14X20	
299	PIN	2	430A05X10	430A05X10	430A05X10	430A06X12	430A06X12	430A06X12	430A06X12	430A06X12	430A08X18	430A08X18	430A08X20	430A08X20	430A08X18	430A08X18	430A08X18	
302	SCREW	4	410A05X10	410A05X10	410A05X10	410A06X10	410A06X10	410A06X10	410A06X10	410A06X10	410A06X10	410A06X10	410A06X10	410A06X10	410A06X16	410A06X16	410A06X16	
303	PLUG	4	44301020	44301020	44301020	44301022	44301022	44301022	44301023	44301023	44301024	44301024	44301025	44301025	-	-	-	
304	NAME PLATE	1	44301028	44301028	44301028	44301026	44301026	44301026	44301026	44301026	44301028	44301028	44301028	44301028	44301028	44301028	44301028	
305	RIVET	4	44301027	44301027	44301027	44301027	44301027	44301027	44301027	44301027	44301027	44301027	44301027	44301027	44301027	44301027	44301027	
306	FLUORIT	2	-	-	-	-	-	-	-	-	-	-	-	-	432E16	432E16	432E16	

13 CE-KONFORMITÄTSERKLÄRUNG

(Gem. Richtlinie 2006/42/EC)

Hiermit erklären wir, dass die in dieser Betriebsanleitung beschriebenen

Drehkolbenpumpen der Serie B

in Ausführung mit freiem Wellenende und Fabrikationsnummer nach Leistungsschild den EG- Vorschriften 2004/108/EG, 2006/42/EG, 2006/95/EG entsprechen.

CONFORMITY DECLARATION OF MACHINERY

(Directive 2006/42/EC)

We SIVAG Pumpen Ges.m.b.H. declare that our

lobe pumps range B,

with pump type and serial number as shown on the name plate, are constructed in accordance with Directives 2004/108/EC, 2006/42/EC, 2006/95/EC and assume full responsibility for conformity with the standards laid down therein.

SIVAG PUMPEN GmbH
Aumühlgasse 12-14
A-2020 Hollabrunn

Werner Gössl (Geschäftsleitung)

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[illegible]

[illegible]

SIVAG Pumpen GmbH

A-2020 Hollabrunn
Aumühlgasse 12-14
Tel.: +43/(0)2952/3144-0
Fax.: +43/(0)2952/3144-4
Mail: office@sivag-pumpen.at
www.sivag-pumpen.at