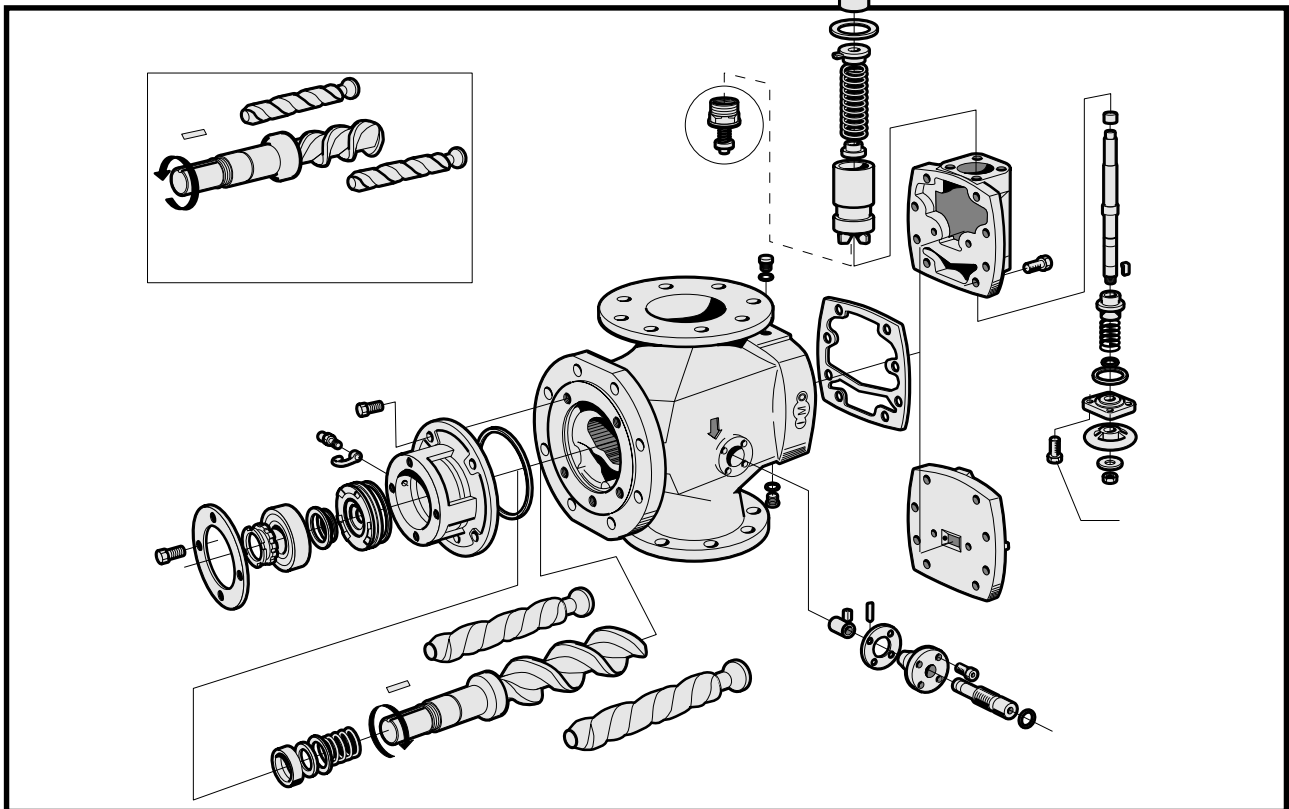




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# Screw pumps ACF/UCF

## Maintenance and Service Instruction



This instruction is valid for all ACF/UCF pump models shown on page 2

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# List of components

Valid for all ACF/UCF Generation 4 pumps with lead and sizes: 080, 090, 100 K4/N4; 110, 125L4/N4

with version codes:  $\left. \begin{matrix} I \\ N \end{matrix} \right\} \left. \begin{matrix} R \\ V \end{matrix} \right\} \left. \begin{matrix} B \\ F \end{matrix} \right\} \left. \begin{matrix} O \\ P \\ E \end{matrix} \right\}$  Also valid for pump options A101, A020, A084, A087.

Pos No	Denomination	Qty	Components included in Spare parts sets:							Note	Explanation:	
			G011	G012	G050	G053	G054	G057	G070			
113	Key	1										
1010	Power rotor (CCW-rot.)	1	x					(x)				
1020	Power rotor (CW-rot.)	1		x				x				
122	Ball bearing	1				x	x	x				
123	Locking washer	1				x	x	x				
124	Bearing nut	1				x	x	x				
130	Support ring	1				x	x	x				
132	Retaining ring	1				x	x	x				
201	Idler rotor (CCW-rot.)	2	x					(x)				
202	Idler rotor (CW-rot.)	2		x				x				
401	Pump body	1										
424	Sleeve	1										
424A	Gasket	1				x	x	x				
425	Screw	4										
429	Spindle	1										
429A	Pin	1										
430	Piston	1									1)	
432	Pin	1									1)	
437	O-ring	1				x	x	x				
451	Screw	4-6										
453	Screw	8										
455	Screw	8										
462	Plug	1										
462A	Sealing washer	1				x	x	x				
463	Plug	1										
463A	Sealing washer	1				x	x	x				
480	Valve housing	1									5)	
501	Front cover	1										
506	O-ring	1				x	x	x				
509A	Rotating ring	1			x	x	x				2)	
509C	Rubber ring	1			x	x	x					
509D	Washer	1			x	x	x					
509E	Spring	1			x	x	x					
511	Seat	1			x	x	x				2)	
511A	O-ring	1			x	x	x					
520	Bearing disc	1										
521	Screw	4										
526	Grease nipple	1										
526A	Protective cap	1										
551	Rear cover	1									3)	
556	Gasket	1				x	x	x				
601	Top cover	1								x	5)	
602	Gasket	2				x	x	x	x		5)	
605	O-ring	1				x	x	x	x		5)	
606	Bottom cover	1								x	5)	
608	Valve spindle	1								x	5)	
612	Regulating nut	1								x	5)	
613	Pin	1								x	5)	
6140	Valve piston	1								x	5)	
615	Spring	1					x			x	5)	
621	Wheel	1								x	5)	
622	Nut	1								x	5)	
622A	Key	1								x	5)	
623	Valve plate	1								x	5)	
636	Shock valve	0-2								x	4) 5)	
655	Washer	1								x	5)	
656	Sleeve	1								x	5)	
657	Spring	1								x	5)	
658	Distance sleeve	1								x	5)	

## Explanation:

ACF = Pump with DIN flanges

UCF = Pump with ANSI flanges

G011 = Rotor set CCW-rot.

G012 = Rotor set CW-rot.

G050 = Compl. shaft seal

G053 = Minor kit (G050+G057)

G054 = Major kit

G057 = Joint kit

G070 = Valve element

## Note:

1) Valid for sizes 100 - 125

2) Delivered only as shaft seal G050

3) Valid for pump xxxE, item no 601 - 658, 480 excluded

4) Number of shock valves: size 080-090 :0  
100-110: 1,  
125: 2

5) Valid for pump xxxO/xxxP



**Before commencing any work, read this instruction carefully! Failure to comply with these instructions may cause damage and personal injury!**

For more information about the pumps identification code, technical data and performance we refer to the ACF Product description. For more information about the pumps installation, Start-up and trouble shooting we refer to the IMO Installation and Start-up instruction for low pressure pumps.

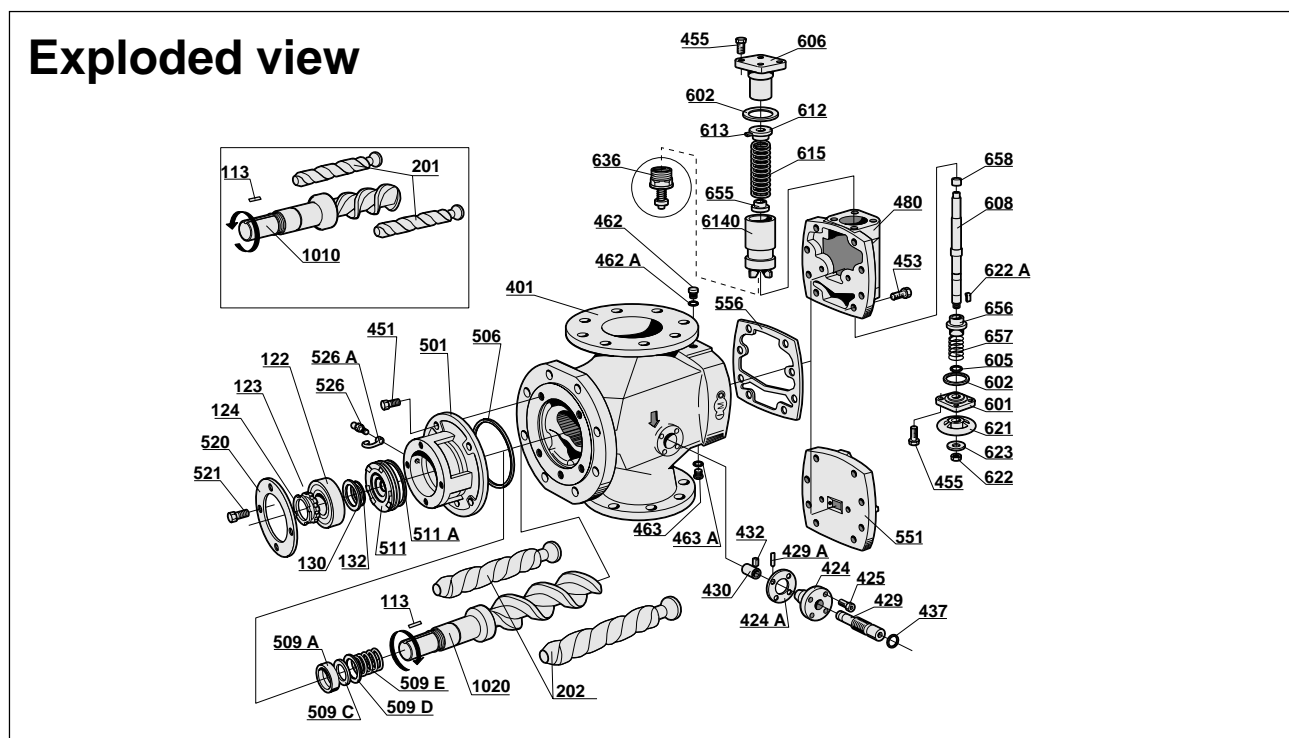


Fig. 1

## Ordering code

Spare parts sets Pos No		Pump size				
		080	090	100	110	125
G011 Rotor set	N-lead	188661	171249	175638		
	CCW K-lead	189665	189666	189667		
	" L-lead					
G012 Rotor set	N-lead	105411	105429	105437	105445	105460
	CW	187518	187526	187534		
	" L-lead				105452	105478
G050 Shaft seal	xRxx	105486	105494	105502	105502	105502
	xVxx	175562	183467	175570	175570	175570
G057 Joint kit *	xRxx	183335	183350	183376	183392	183418
	xVxx	183343	183368	183384	183400	183426
G070 Valve element	IxxO	066092	066092	066704	066704	067363
	" IxxP	189662	189662	189663	189663	189664
615 Valve Spring	xxxO	021451	021451	021766	021766	022061
	xxxP	021352	021352	021774	021774	022079

\* not valid for A084 and A087

## Service intervals

The intervals for inspection and replacement of wear parts vary greatly with the properties of the pumped liquid and can only be determined by experience. Except for the ball bearing, all internal parts of the ACF-pump are lubricated by the pumped liquid. Pumping liquid which contain abrasive materials, or liquid that is corrosive, will significantly reduce service life and call for shorter service intervals.

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## Recommended spare parts kits

Every shutdown for service of a plant is costly. The time for repair should therefore be limited to a minimum which can be accomplished by keeping a spare pump. The changed pump can later be repaired at a suitable place and can then be used as a spare pump.

For maintenance the following spare parts kits are recommended:

Kit	Contents	To be used for
G057	Gaskets, ballbearing, etc.	Dismantling of the pump
G053	G057 + shaft seal G050	Normal scheduled inspection
G054	G053+complete rotor set G012 (for CW rotation) + valve spring, item 615	Repair after damage or greater wear

Wear in the pump will normally show as unnormal:

- Vibration
- Noise
- Loss of capacity
- Reduction in flow/pressure
- Leakage

We recommend planned inspection and overhaul at regular intervals, not exceeding 3 years. It is recommended always to have the spares included in minor spare part kit G053 available.

# Changing ball bearing

The ACF-pump is fitted with an external grease lubricated ball bearing. When delivered from IMO AB, the ball bearings are filled with grease of type B. Whenever the ball bearing is removed, it is recommended to exchange it for a new one. Fit the new ball bearing properly greased and re-grease it after one hour of running, while the pump is operating.

Use an appropriate type of grease, as per table and grease gun suitable for grease nipple (pos 473) according to DIN 71412 (ISO 6392). On vertical mounted units the greasing intervals are reduced to half. Installed in dusty or dirty premises or in a corrosive environment it should be lubricated at more frequent intervals. If using others than these recommended greases check if it is possible to mix them with each other, otherwise clean before using a new grease.

## Lubrication intervals

Pump size	Grease amount gram	Temp max °C	Grease type	Speed, rpm				Recommended greases:
				1750	1450	1150	950	
080 and 090	15	70	A	10 000	10 000	10 000	10 000	<b>Type A</b> BP Energrease LS3 Esso Beacon 3 Mobil Mobilux 2 Shell Alvania G3 Texaco Multifak EP 2 <b>Type B</b> BP Energrease, HTG2 Chevron Industrial Grease Heavy Esso Unirex N3 Mobil Mobiltemp, SHC 100 Shell Darina 2 Texaco Hytex EP 2 <b>Type C</b> Mobilith SHC 460
		90	A	3 900	4 700	5 300	5 900	
		90	B	7 900	9 500	10 000	10 000	
		110	B	3 100	3 700	4 200	4 700	
		130	B	1 200	1 500	1 600	1 800	
155	C	450	600	650	650			
100, 110 and 125	23	70	A	9 000	10 000	10 000	10 000	
		90	A	3 500	3 900	4 700	5 300	
		90	B	7 100	7 900	9 500	10 000	
		110	B	2 800	3 100	3 700	4 200	
		130	B	1 100	1 200	1 500	1 600	
155	C	300	450	600	600			

## Inspection of rotors

To reach the idler rotors in a quicker way than described in the dismantling section, loosen the rear cover (480) with valve. Screw out the idler rotors backwards.

Internal clearances in the pump, which are vital for its proper function, may have been affected by wear. Acceptable wear can be determined only by experience of the actual application. As a rule of thumb the following max clearance values may apply:

- Between rotor and bores: 0.2 mm
- Between rotor flanks: 0.4 mm

For light duties (low pressure, medium viscosity) even bigger clearances may be acceptable but for low visc./high pressure duties the limit will be lower. Also watch if there are major scratches on these parts.



If the pumps operating temperature exceeds 60°C let the pump cool off before any service, maintenance or dismantling work is commenced to avoid burn injury.



All work carried out on the pump has to be performed in such a manner that risks for personal injury are observed!



When handling liquids that may harm skin use gloves and/or protective clothing.

## Inspection of shaft seal

As the seal faces of a mechanical shaft seal are lubricated by the fluid a certain leakage will always be present. Ten drops per hour can be considered as acceptable.

An external visual inspection of the pump is advisable at least every two days to assure that the shaft seal is not leaking too much. Excessively leaking shaft seals should be changed without delay, as the leakage normally will grow worse and cause additional damage. Follow the instructions in the dismantling/reassembly session.

When working with a shaft seal, cleanliness is of utmost importance. Avoid touching the seal faces. If necessary, the seal faces should be cleaned immediately prior to assembly, using a dust free cloth and clean solvent.

For lubrication of shaft seal read instructions in fig 22.



When handling liquids which may involve fire hazards appropriate precautions to avoid danger are to be taken.



In case of failure for a system with elevated pressure, fluid jets may cause injury and/or damage.



Oil leakage may make the floor slippery and cause personal injury.

# List of tools necessary for dismantling and reassembly

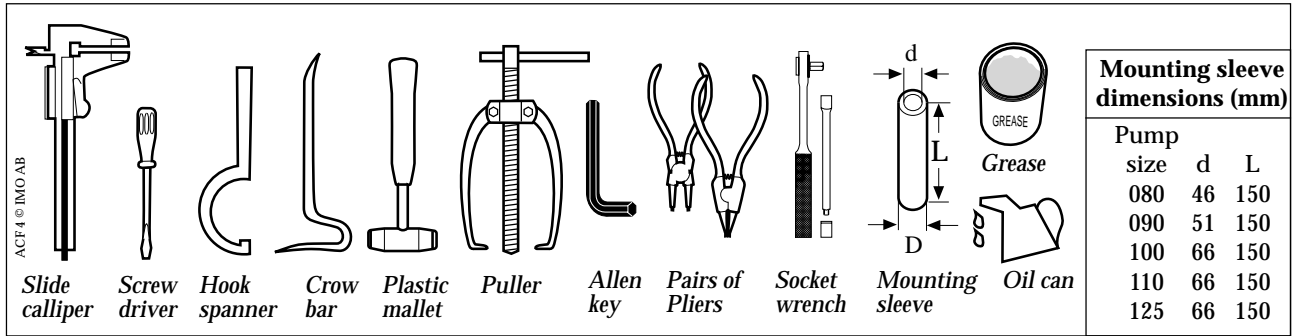


Fig. 3

## Sectional view

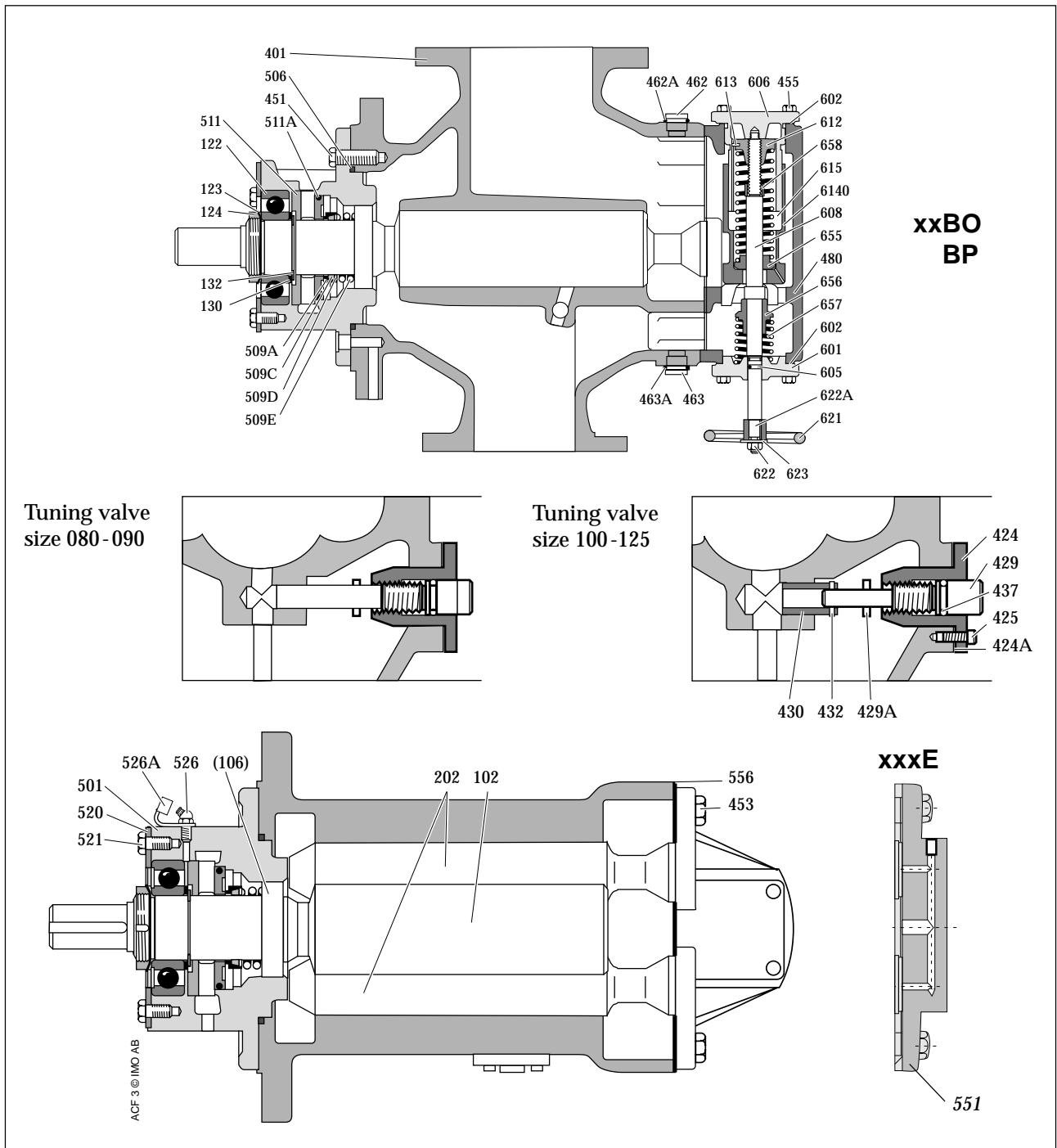


Fig. 4

# Shaft seal - assembly drawing

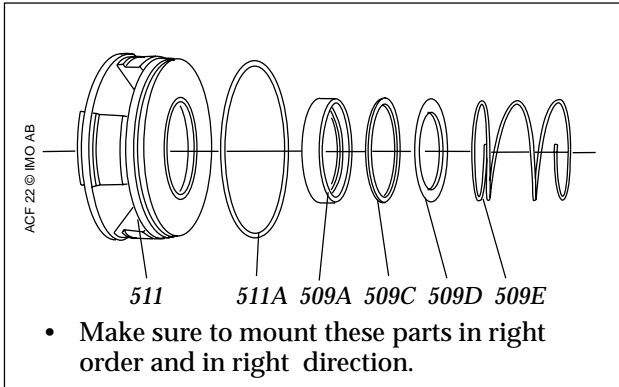


Fig. 5

**!** Before any maintenance work, ensure that the driver is deenergized and the pump hydraulically isolated.

**!** Connecting and disconnecting of electric cables must be done only by personnel authorized to do such work.

## Dismantling

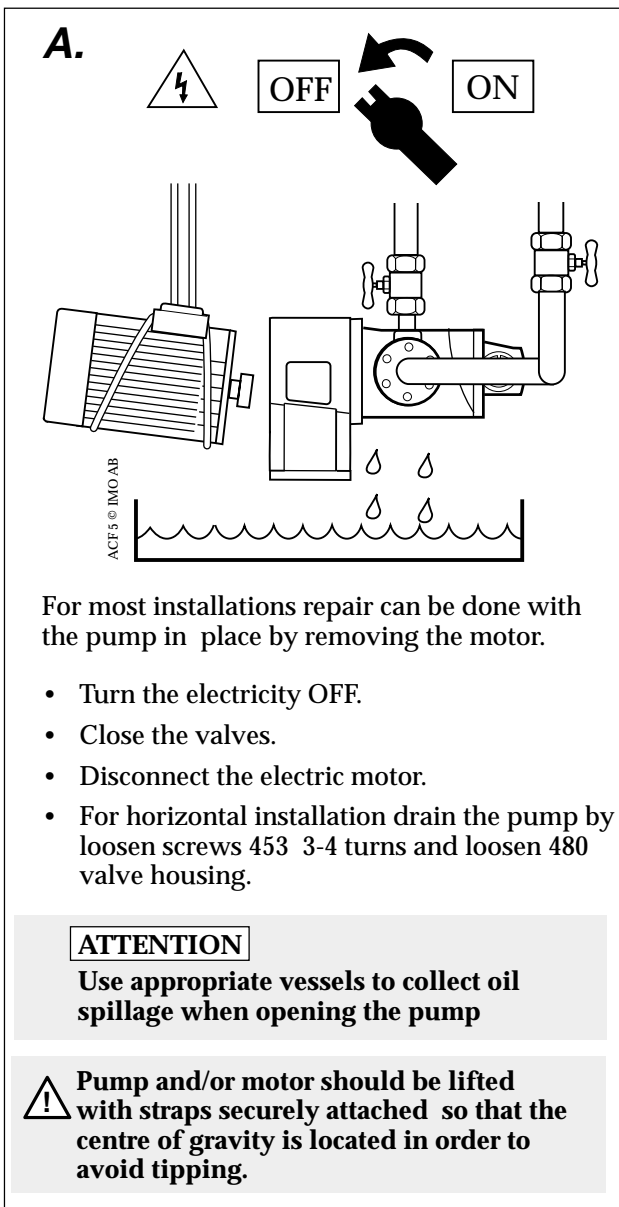


Fig. 6

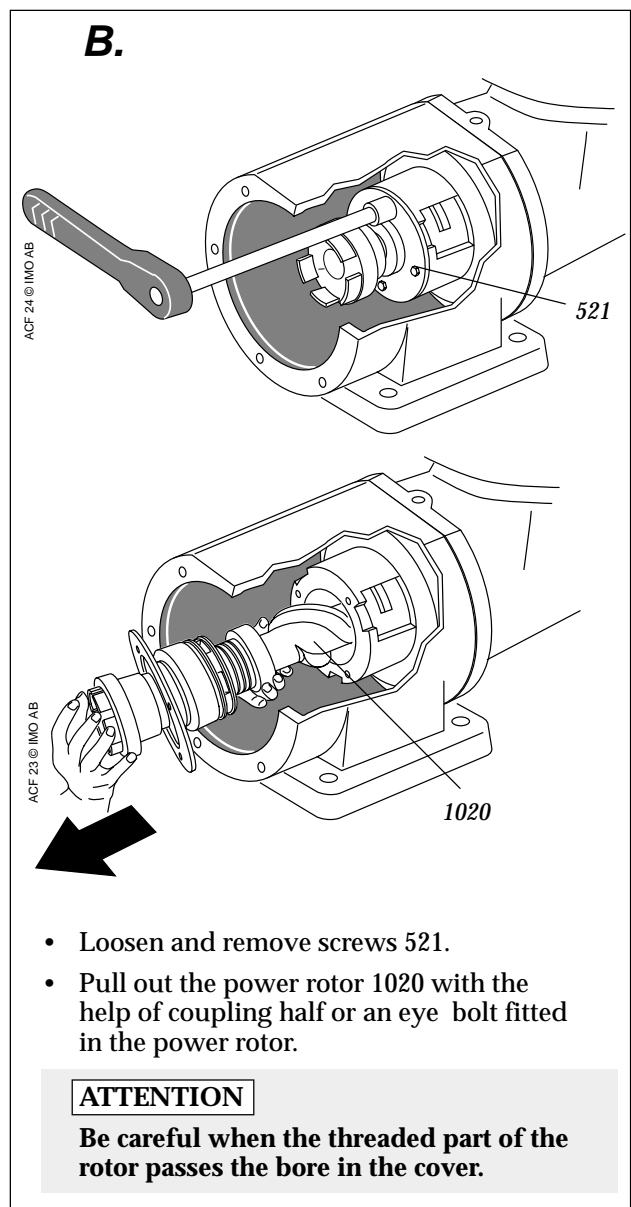


Fig. 7

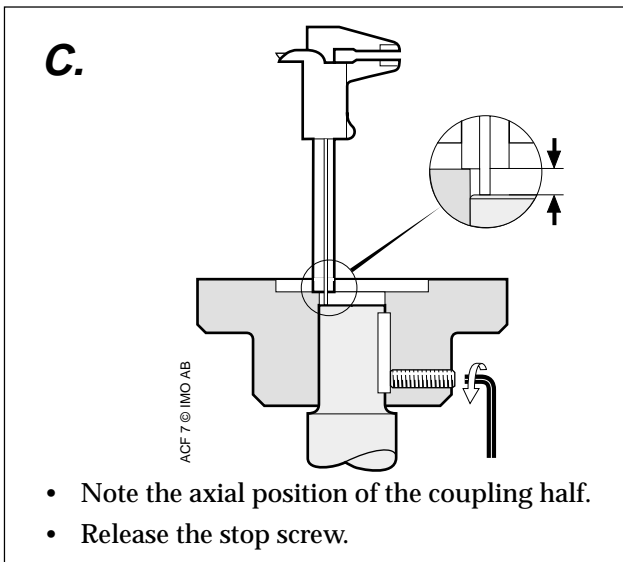


Fig. 8

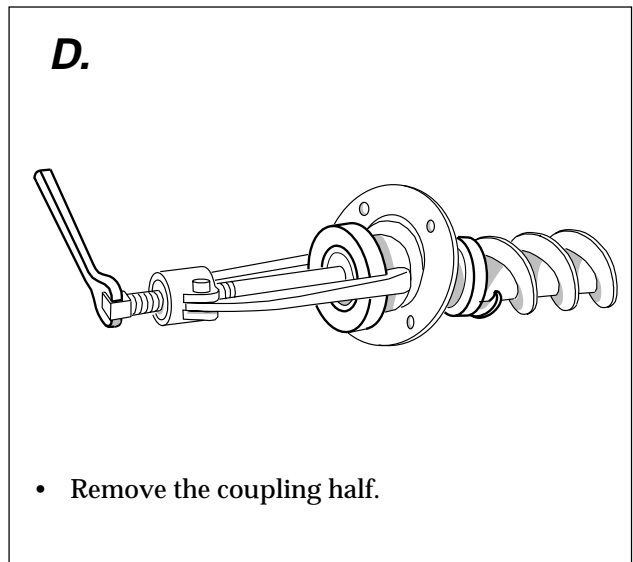


Fig. 9

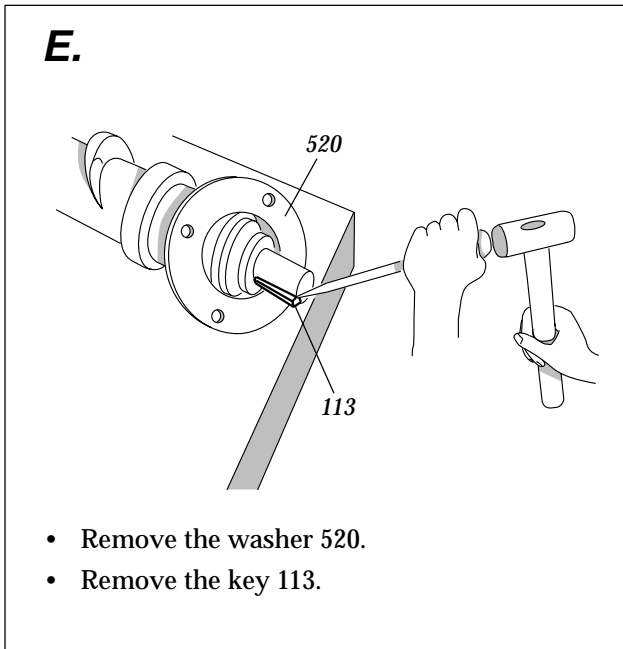


Fig. 10

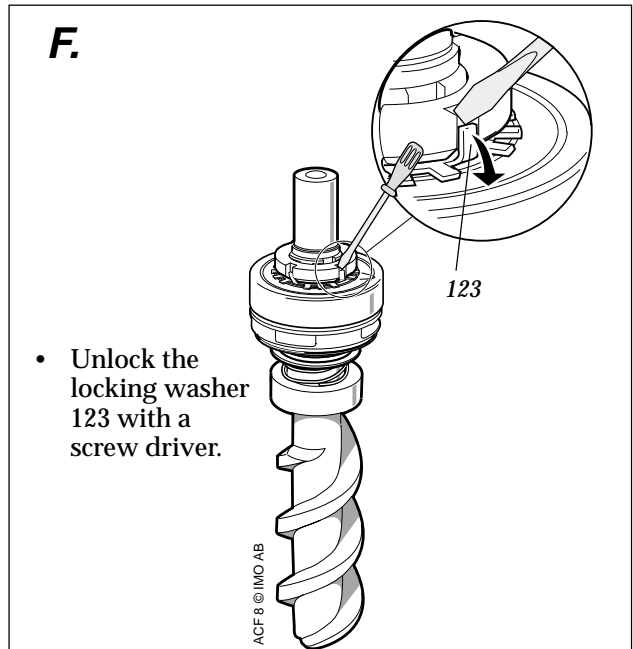


Fig. 11

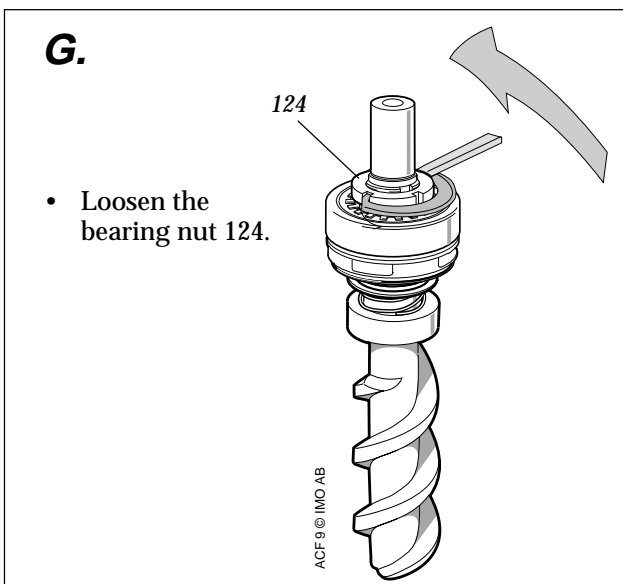


Fig. 12

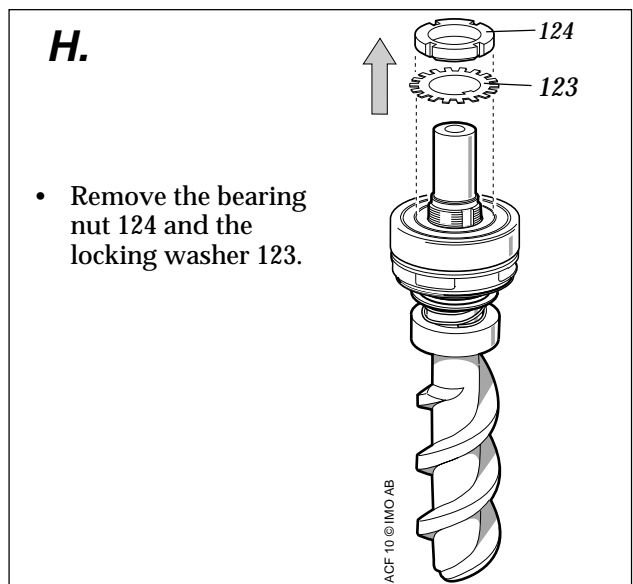


Fig. 13

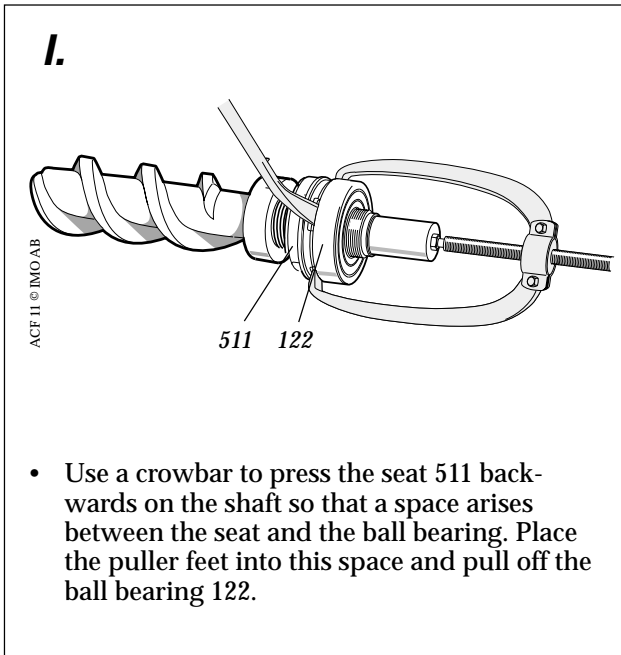


Fig. 14

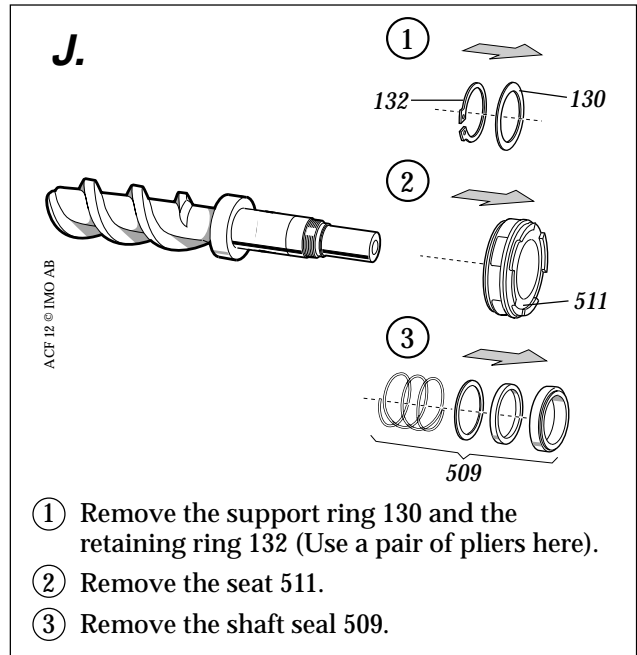


Fig. 15

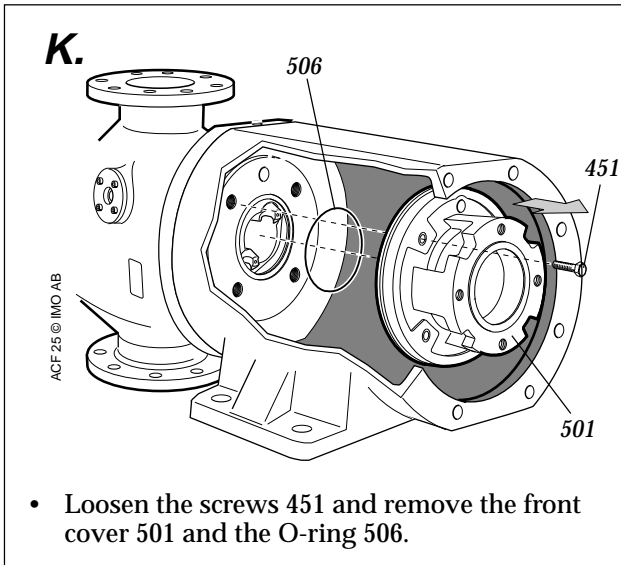


Fig. 16

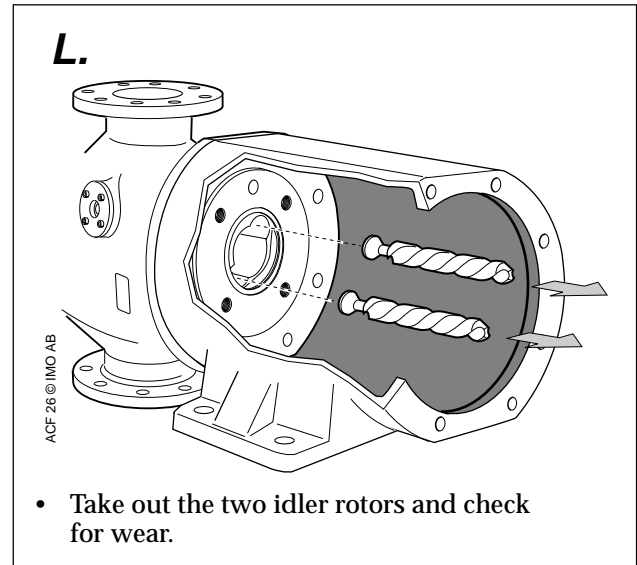


Fig. 17

## Reassembly

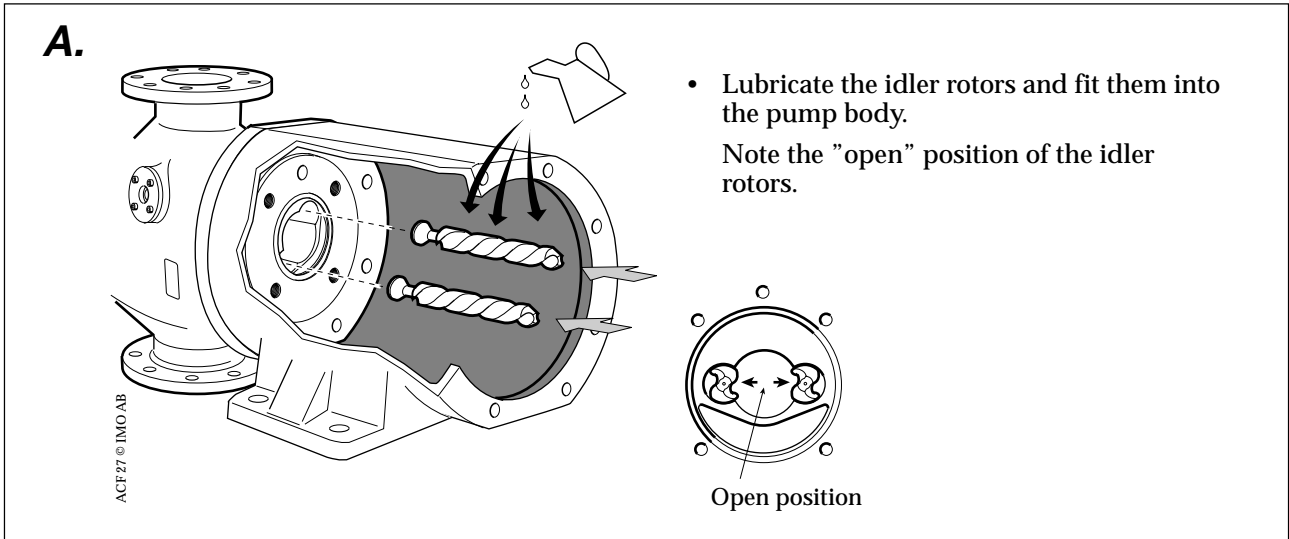


Fig. 18



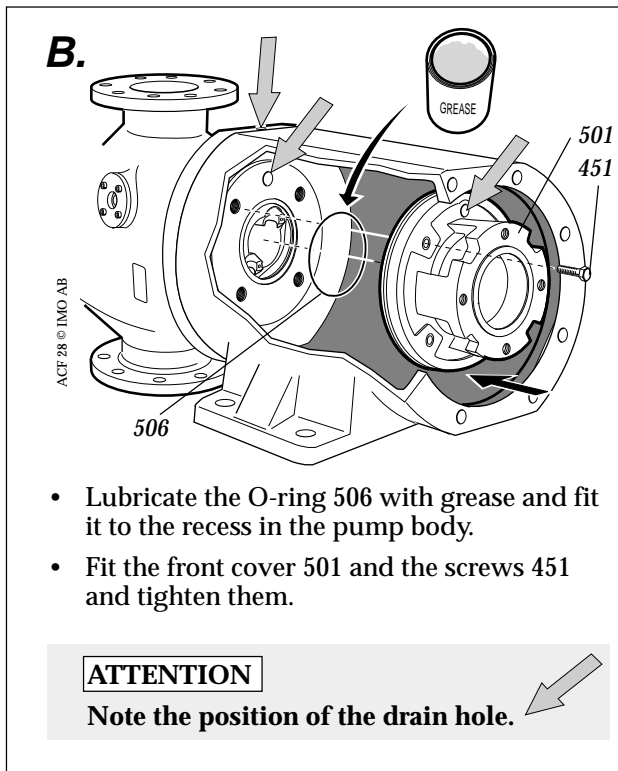


Fig. 19

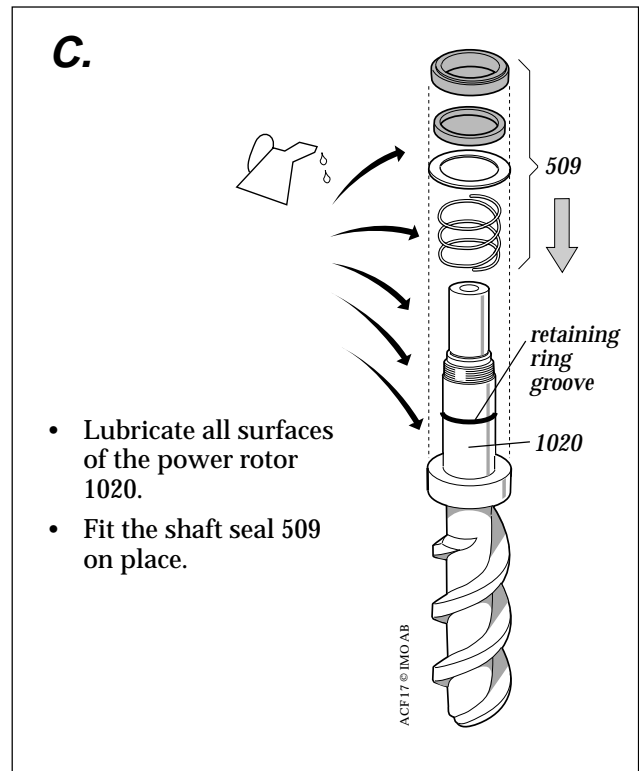


Fig. 20

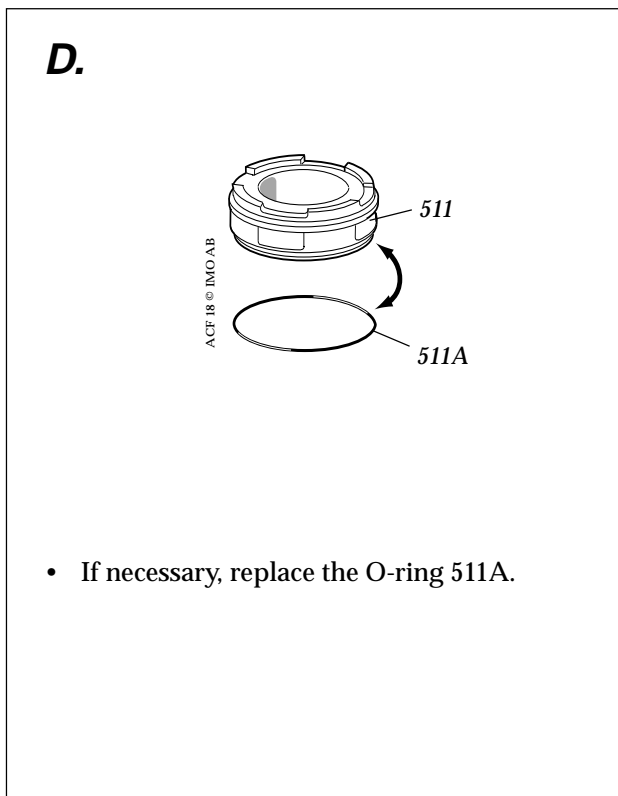


Fig. 21

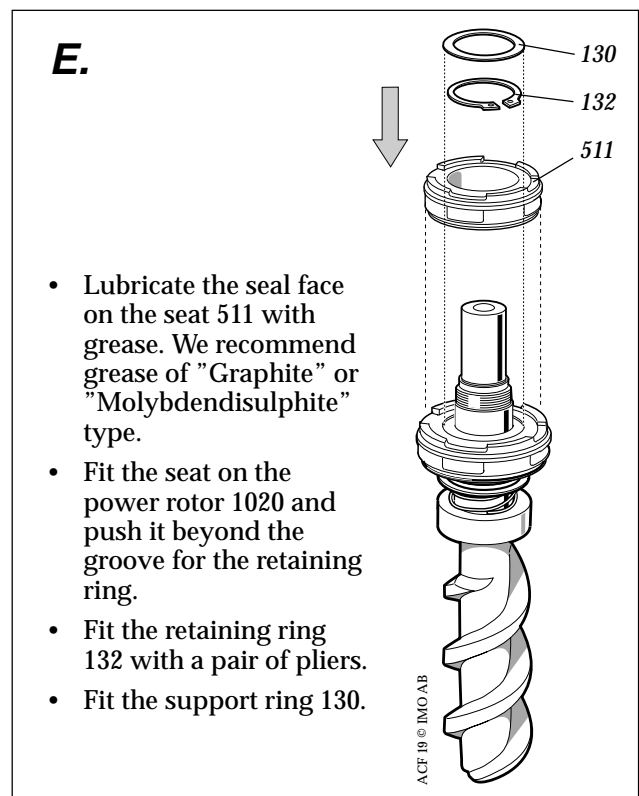


Fig. 22

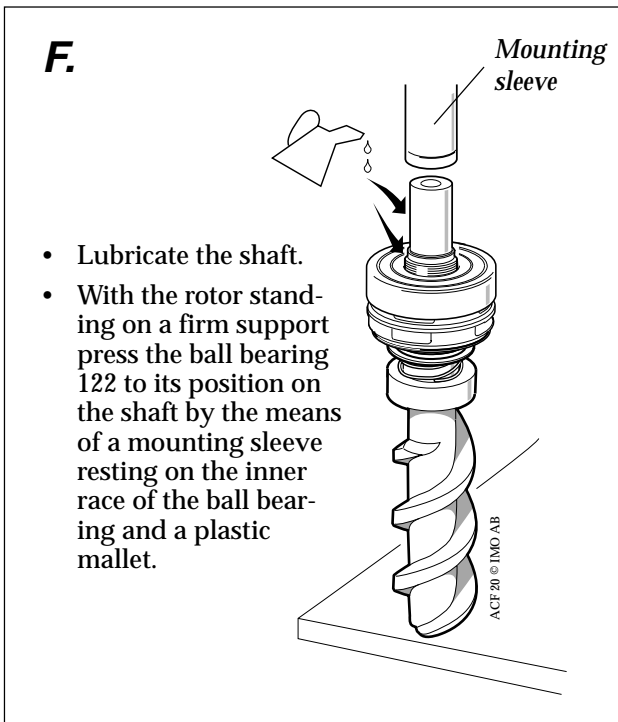


Fig. 23

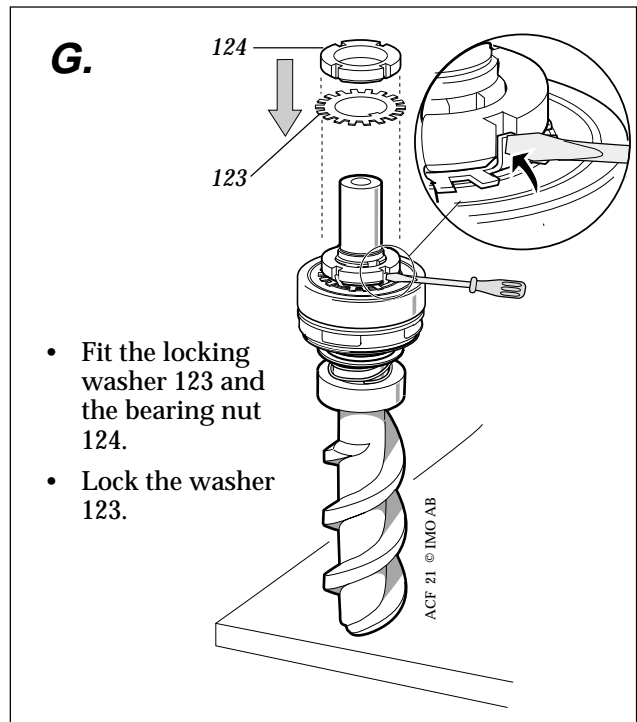


Fig. 24

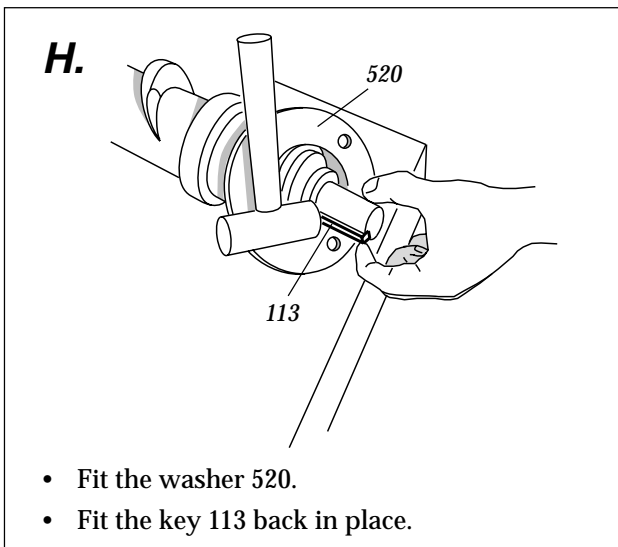


Fig. 25

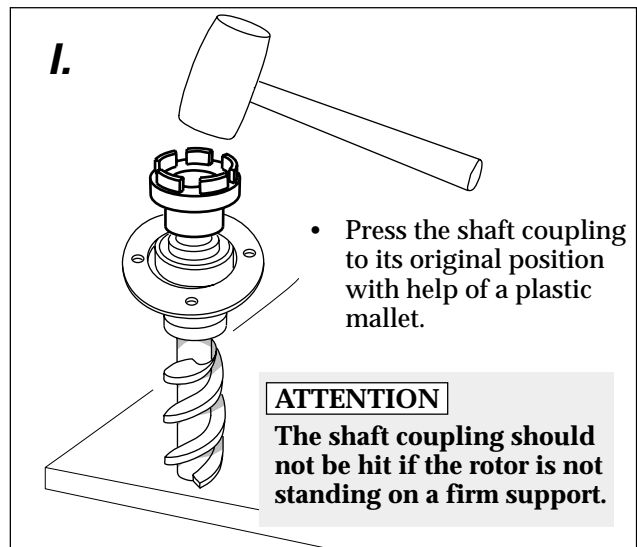


Fig. 26

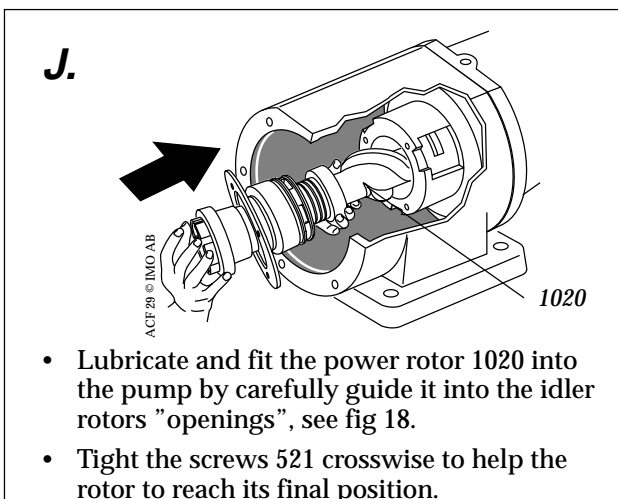


Fig. 27

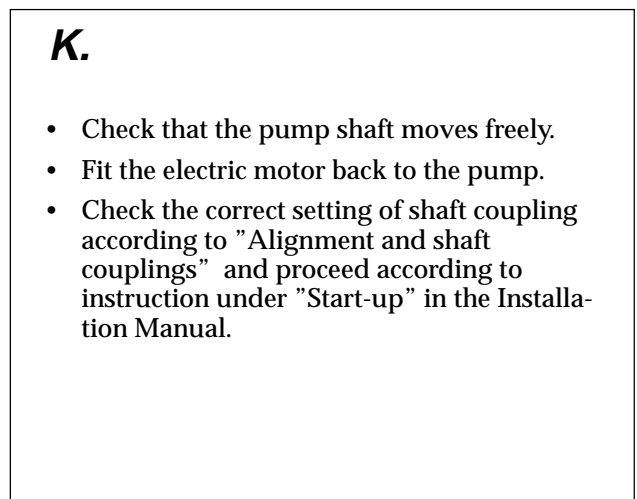


Fig. 28

# Tuning valve

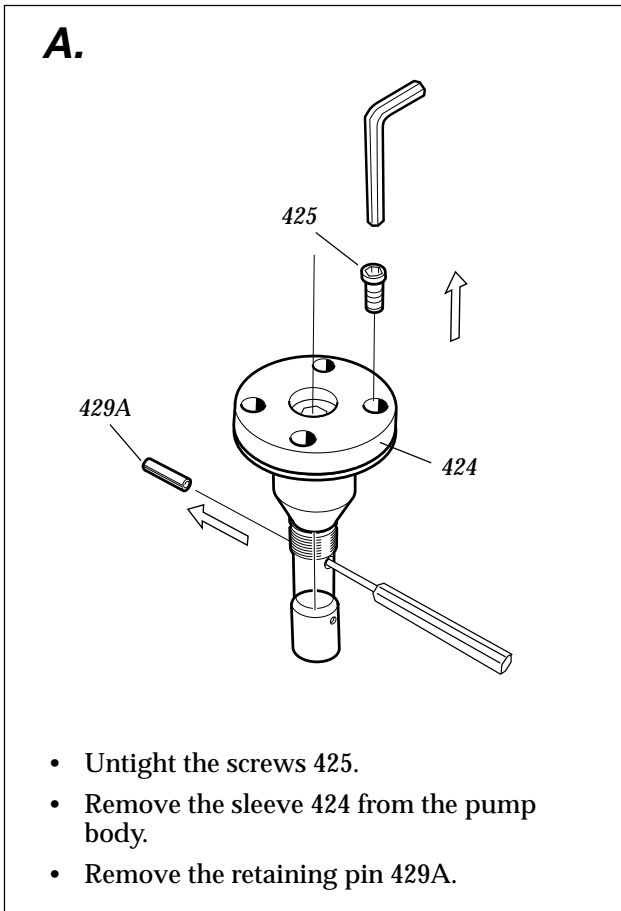


Fig. 29

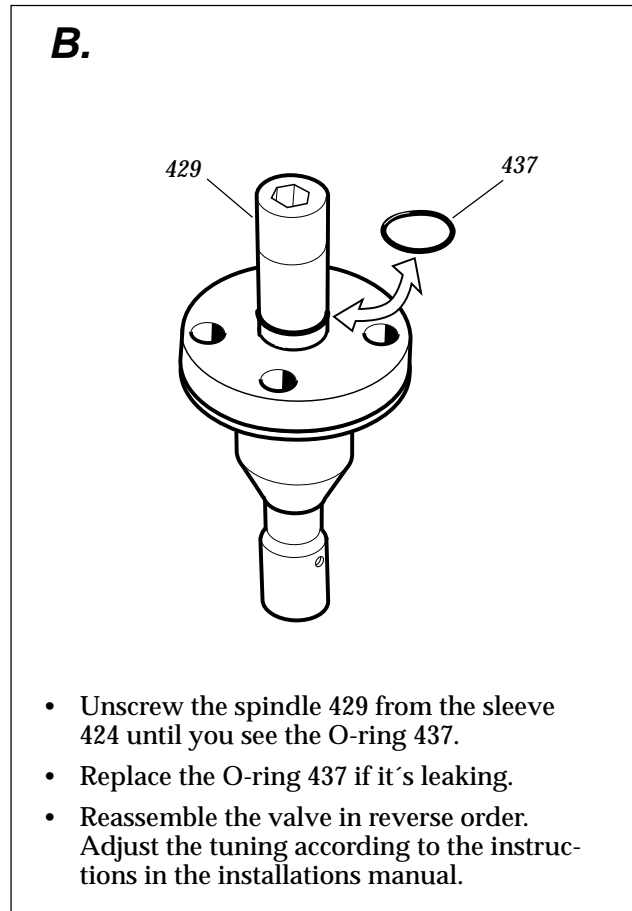


Fig. 30

# Pressure relief valve

- Remove the nut 622 and the valve plate 623.
- Pull off the hand wheel 621 and remove the key 622A.
- Remove the screws 455 and the cover 601.
- Take out the spring 657.
- Remove the old O-ring 605 (if it's leaking) with a small screw driver. Before fitting the new O-ring lubricate it and the valve sprindle 608 with engine oil.
- Fit the spring 657.
- Remove the old gasket 602 from the top cover 601. Make sure it is removed completely. Fit the new gasket.
- Lubricate the bore in the cover 601 and put back in place, make sure the O-ring 605 is not damaged. Tighten the screws 455 crosswise.
- Fit the key 622A and the wheel 621.
- Fit the washer 623 and the nut 622.

**ATTENTION**

**Spring tension.**

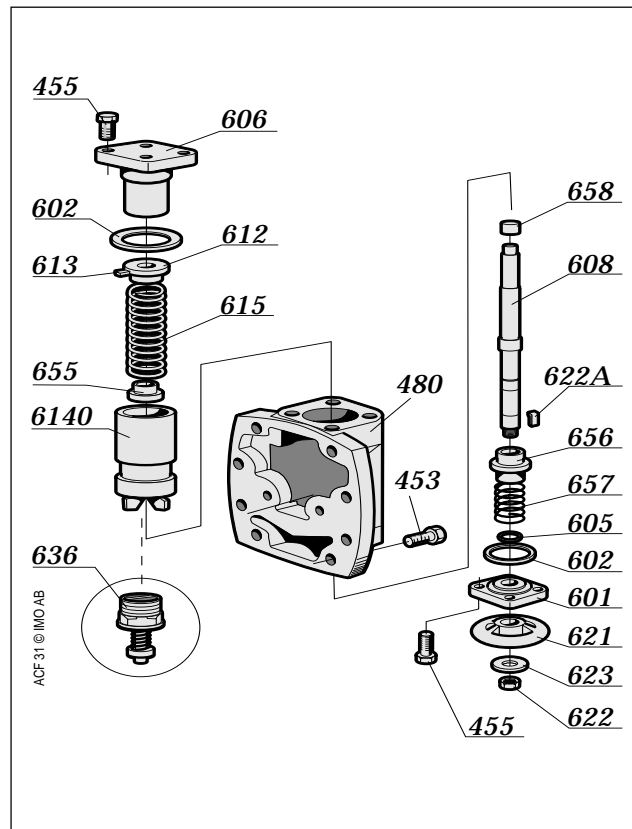


Fig. 31



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