



**INSTRUCTIONS 201 e**

Section

Effective

Replaces

April 2007

November 2005

Translation of the  
original instructions

# ***Pumps***

## ***P40B - P60B - P100B***

### ***with bushings***

***INSTALLATION***

***OPERATION***

***MAINTENANCE***

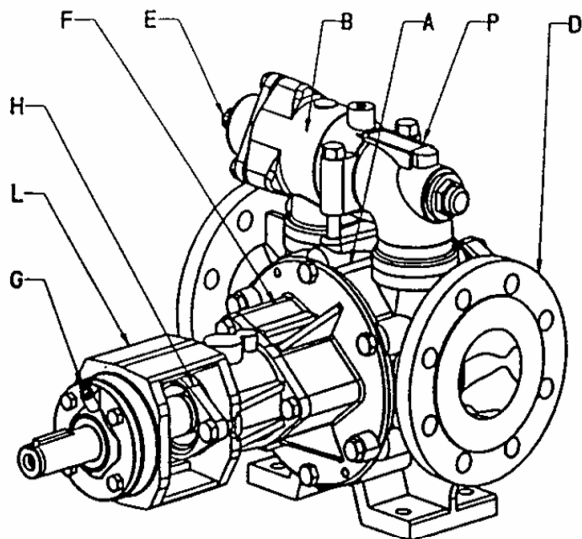
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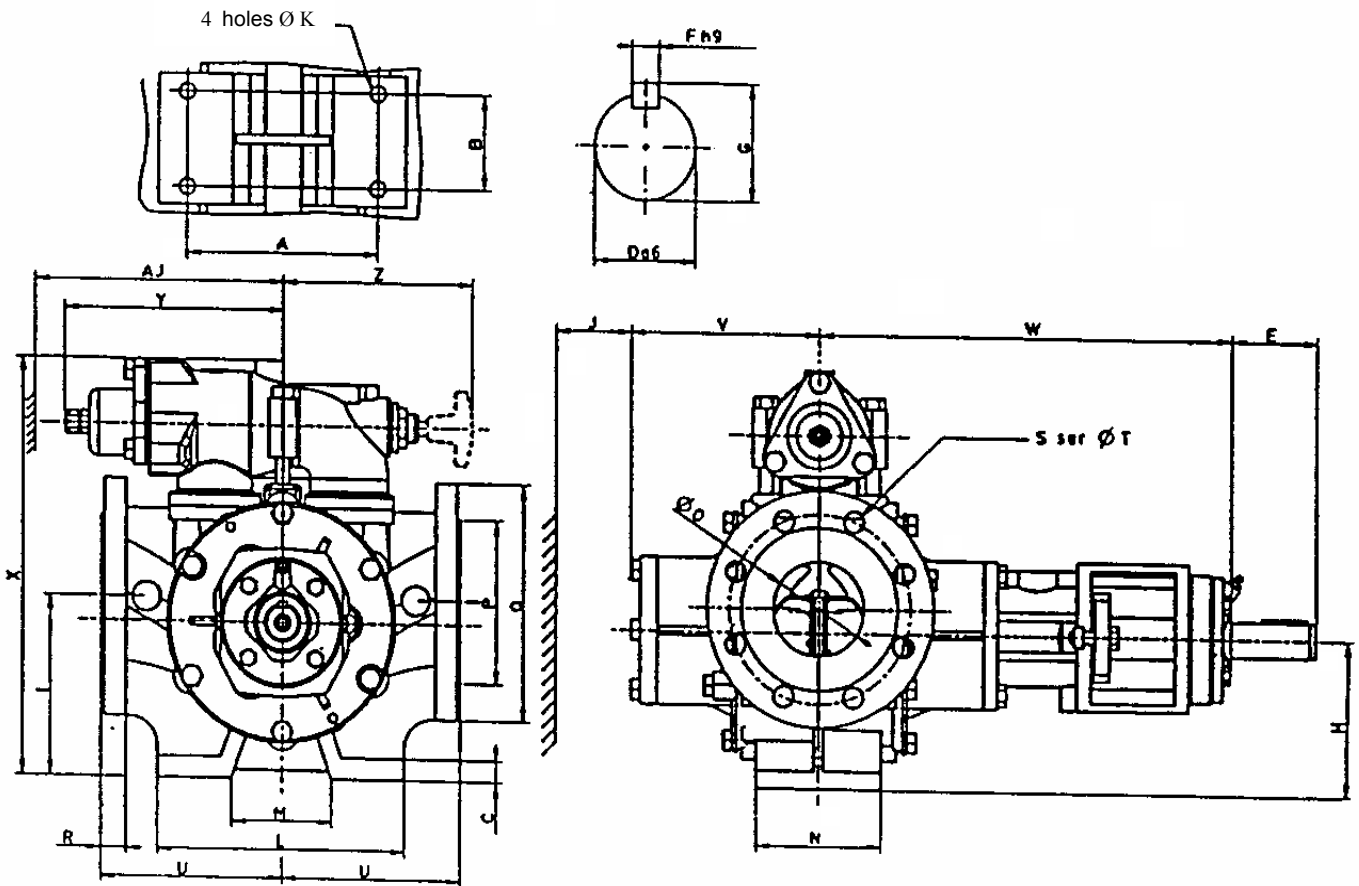
e-mail : [contact@blackmer-mouvex.com](mailto:contact@blackmer-mouvex.com)

**Your distributor :**



- A - Pump cylinder
- B - Bypass
- D - PN16
- E - Bypass adjustment
- F - Cover
- G - Lubricator
- H - Shaft seal casing
- L - Outboard bearing
- P - Pump plate

**OVERALL DIMENSIONS - mm**



PUMP TYPE	FIXING BRACKETS						SHAFT END						ISO PN 16 FLANCHE																
	A	B	C	K	L	M	N	D	E	F	G	O	P	Q	R	S	T	U	H	I	J	V	W	X	Y	Z	AJ	KG	
P40	170	80	18	14	220	90	10	30	75	8	33	80	138	200	22	80	18	160	160	132	152	150	166,5	359	354	195	170	250	65
P60	170	80	18	14	220	99	10	30	75	8	33	100	158	220	22	80	18	180	180	160	185	160	181,5	374	409	180	180	210	85
P100	200	90	18	18	260	129	130	40	80	12	41	125	188	250	24	80	18	210	200	180	210	150	196	405	513	283	250	400	175

Bypass positioned for anticlockwise-rotation pump. For clockwise rotation, re-position the bypass.

## ASSEMBLY AND DISASSEMBLY

Before any disassembly, make sure that the pump has been drained and take all the necessary precautions to prevent it from starting up. The pump must not start up, even accidentally.

### TOOLS REQUIRED

Flat spanners of sizes 13 - 17 24  
Tubular socket spanner of size 17  
Opening circlip pliers  
Screwdriver  
Extractor (e.g. FACOM U-35L)  
Where necessary, torque wrench.

### TIGHTENING TORQUES:

| M10 ---> 3347 da N.mm  
| M 8 ---> 1684 da N.mm  
| M 6 ---> 687 da N.mm

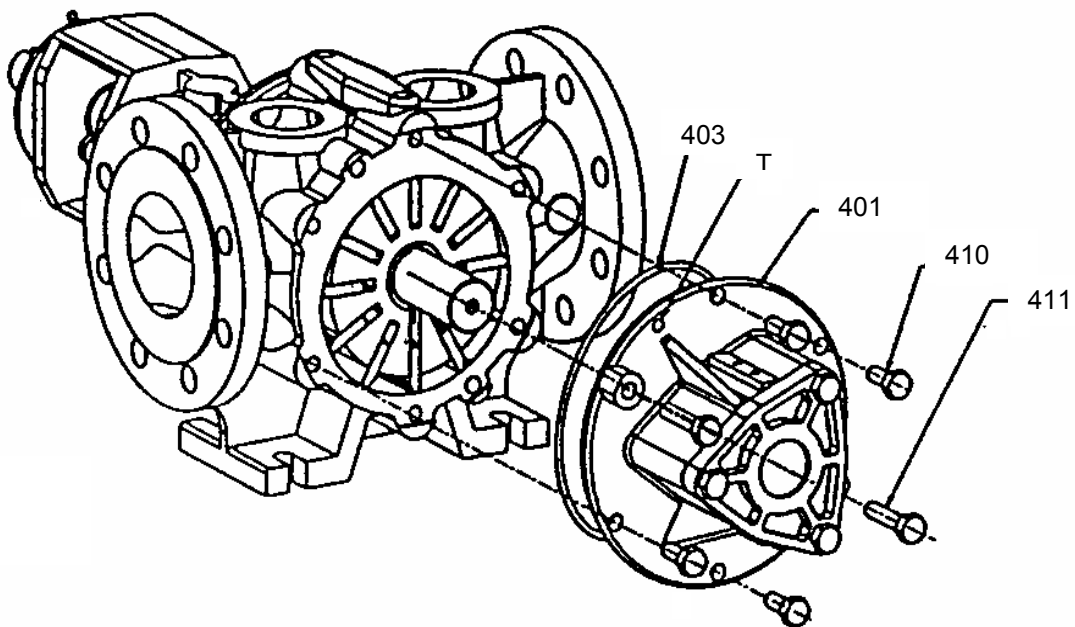
### OPENING UP OF THE PUMP AT NON-DRIVE SIDE

Loosen the 4 bolts **410**.

Loosen the 2 bolts **411** and place them in the 2 tapped holes T

Detach the cover of the cylinder by screwing the 2 bolts **411** at the same time.

When the cover is free on the shaft, withdraw it manually while supporting it.



## INSPECTION OF THE VANES

Disassemble the pump at the non-drive side.

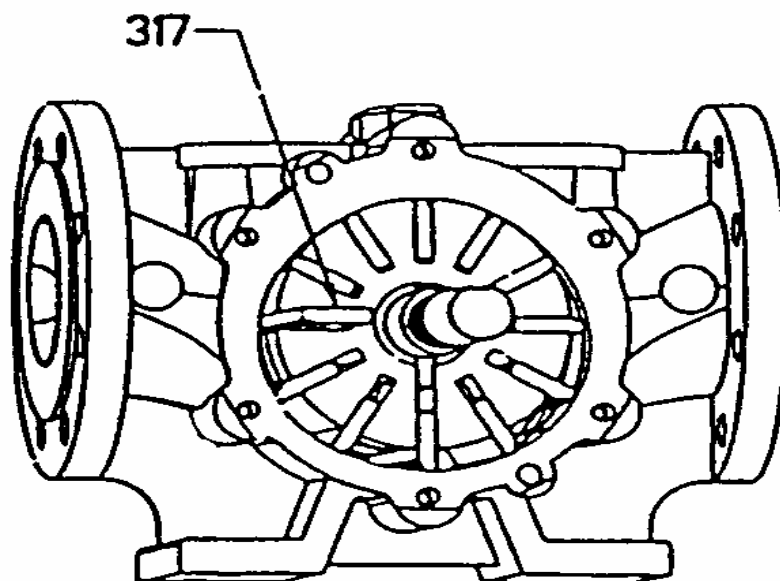
Remove a vane **317** situated in an horizontal plane.

Check it for wear (see the section on maintenance).

In the case of abnormal wear, check the surface state of the cylinder and bottom faces.

Replace the vane (with a new one if necessary) making sure it is fitted in the right direction and making sure it slides properly in its slot.

Then proceed in the same way for each vane.



## CHANGING THE BEARINGS

### Disassembly

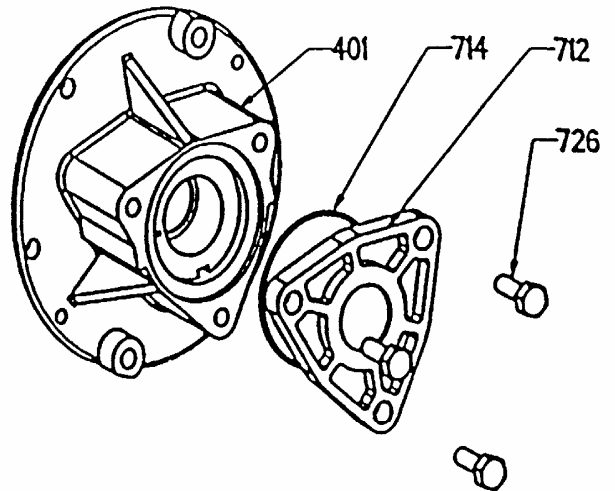
Dismantle the base on the side opposite the drive, as indicated in the section "Opening up of the pump at non-drive side".

Unscrew the 3 bolts **726**.  
Remove the cover **712** and its seal **714**.

Dismantle the base at the drive side as indicated in the section "inspection of the pushrods".

Unscrew the 3 bolts **726** and remove the base **401** from the outboard bearing **725** ; this will then be placed on its small face.

Extract the ring **407** with its insrt **408** by pressing it home with a sleeve-tube.



### Re-assembly

Place the base **401** vertically on its large face.  
Position the ring **407** with its insert **408** by aligning the slots of the insert facing the 2 base holes **401**.

Refit the seal **415** (pump P60 only).

Mount the ring and its insert by pressing the latter home with a sleeve-tube. The faces of the ring and the insrt must be aligned with that of the non-drive as indicated in the section "reassembly of pump at non-drive side".

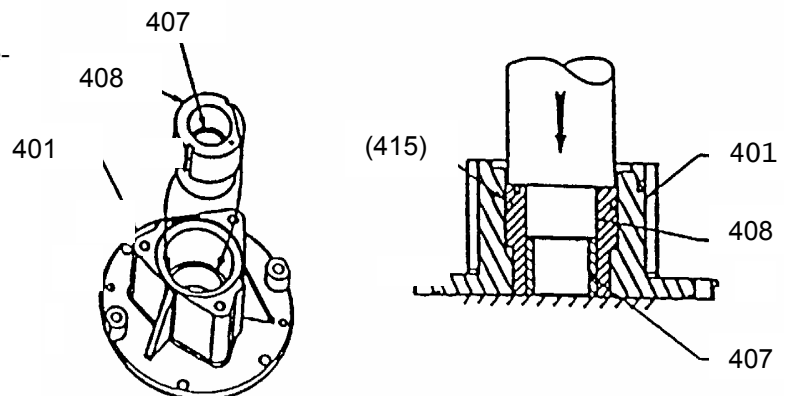
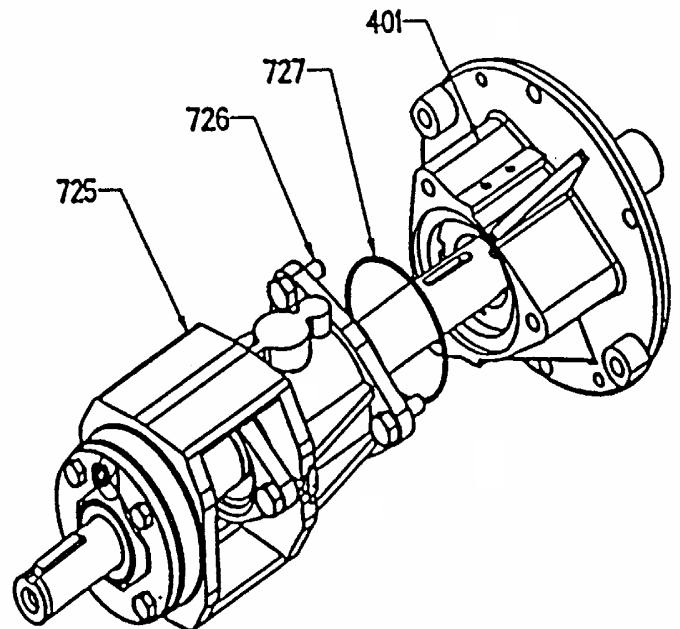
Replace the cover **712** and its seal **714** (fit a new one where necessary).

Tighten the 3 bolts **726**.

At the drive side, refit the base on the outboard bearing **725** after replacing its seal **727** (a new one if necessary).

Tighten the 3 bolts **726**.

Re-assemble the unit as indicated in the section "re-assembly of vanes and pushrods".



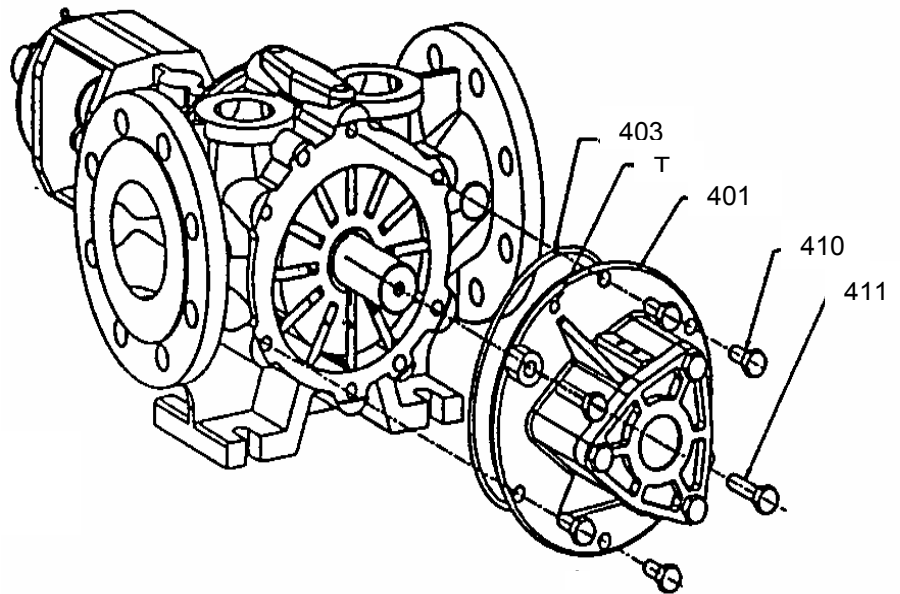
## RE-ASSEMBLY OF THE PUMP AT NON-DRIVE SIDE

In this assembly operation, check and replace, as necessary, the cover O-ring **403** and fit it with a suitable lubricant.

Position the cover **401** on the shaft and advance it as far as possible by hand.

Tighten the four bolts **410**.

Screw the 2 bolts **411** into the 2 bosses of the cover **401**.



## DEMONTAGE DU FOND COTE OPPOSE A L'ENTRAINEMENT

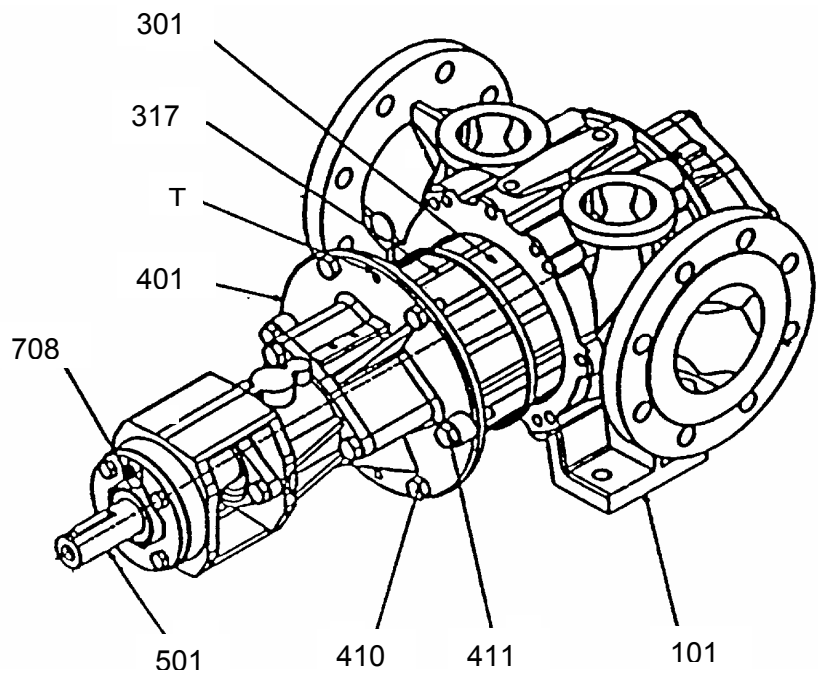
Loosen the 4 bolts **410**.

Loosen the 2 bolts **411** and place them in the 2 tapped holes T.

Detach the cover of the cylinder by screwing the 2 bolts **411** at the same time.

Withdraw the cover **401** in such a way as to release the rotor **301** from a little more than half of the pump cylinder **101**.

Hold the vanes **317** in place by means of suitable straps (elastic, bracelets, ...).



## INSPECTION OF THE PUSHRODS

Uncouple the pump by removing the coupling sleeve.

**Disassembly of the drive-side base.**

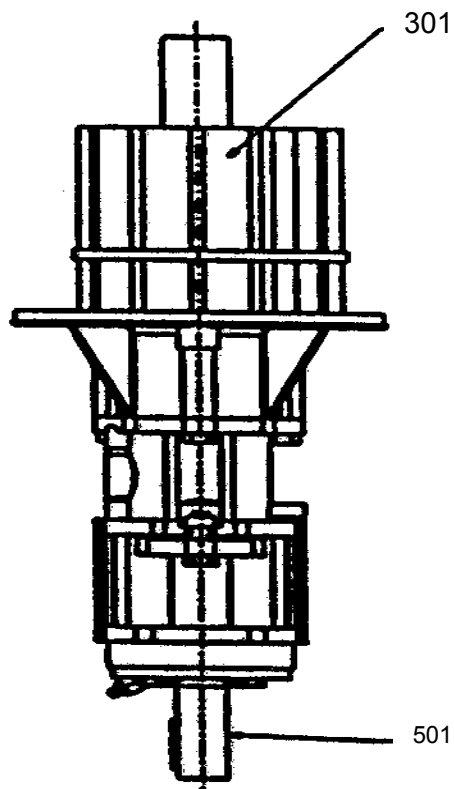
Place the cover, rotor assembly on a bench, remove the straps and the vanes.

Pull out the pushrods **318** by pushing them, if necessary, with a screwdriver.

Pull out the rotor **301**.

Check the pushrods **318** for wear (See the section on maintenance) and change them as necessary.

Check the wear of the keyways and of the 2 keys **536**.



**RE-ASSEMBLY OF THE VANES AND PUSHRODS**

(Version with pushrods)

Position the shaft **501** vertically with the cover facing down.

Position the O-ring **401**, securing it if necessary with suitable lubricant.

Fit the keyways **536**.

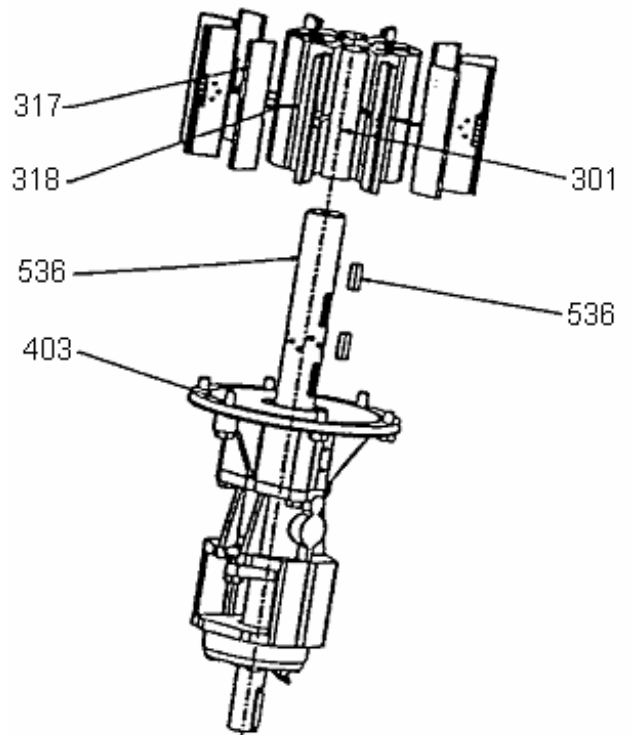
Insert the rotor **301** on to the shaft **501**. Check that the holes of the shaft coincide with the pushrods holes of the rotor; if they do not, re-insert the rotor in the other direction.

Insert the pushrods **318** using orthogonal matings, see figure opposite.

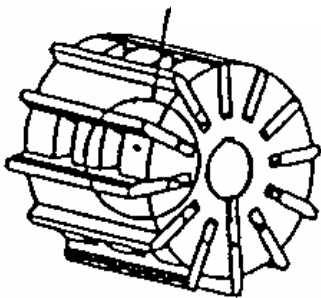
Insert the vanes making sure they are fitted in the right direction (see detail A) and check that they slide freely. Hold them in place using suitable straps (elastic, bracelets...).

Insert this assembly into the cylinder **101**, removing the straps at an opportune moment.

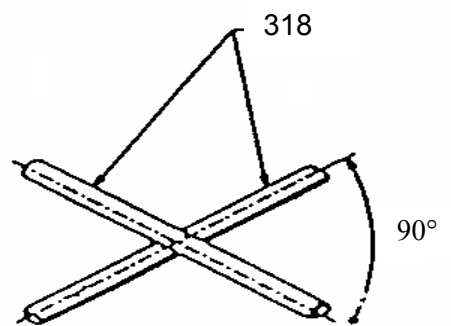
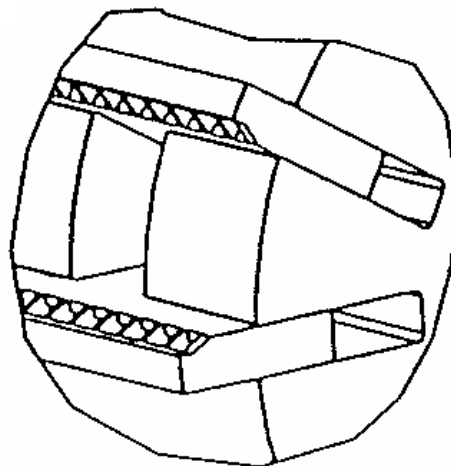
Orientate the cover **401** with the lubricator pointing up and fix it to the cylinder of the pump. Check that the pump rotates freely when turned by hand.



SEE DETAIL A



DETAIL A



## CHANGING OF THE BALL BEARING

### Disassembly

Uncouple the pump by removing the coupling sleeve.

Remove the key **508**.

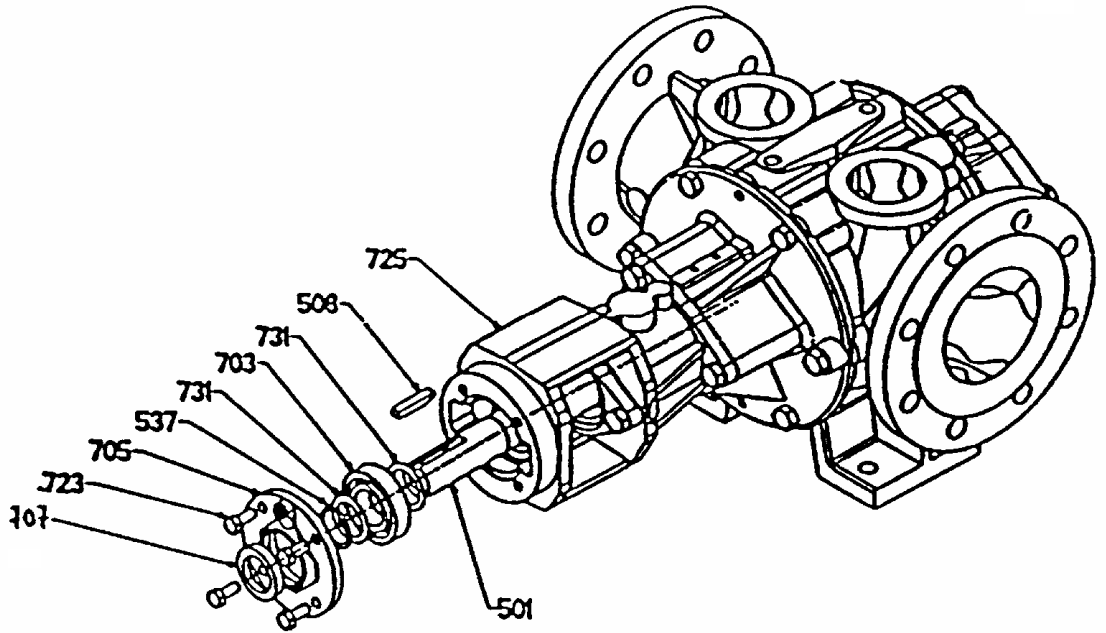
Carefully clean the shaft end to remove any traces of paint, oxidation, burrs...

Loosen the bolts **723** and remove the cover **705** taking care not to damage the seal **707**.

Remove the circlips **537**.

Remove the washer **731**.

Remove the ball bearing **703** using the extractor : pass the grippers behind the ball bearing while sliding them into the holes of the strainer **725**, using the shaft end **501** as a support.



### Re-assembly

Couple the ball bearing **703** on to the shaft by hand, supported against the washer **731** (according to the diagram opposite).

**FAILURE TO FOLLOW THIS PROCEDURE CAN SERIOUSLY DAMAGE THE INTERIOR OF THE PUMP.**

In no case must the ball bearing be pushed on to the shaft without support for the shaft.

Place the second washer **731** against the ball bearing.

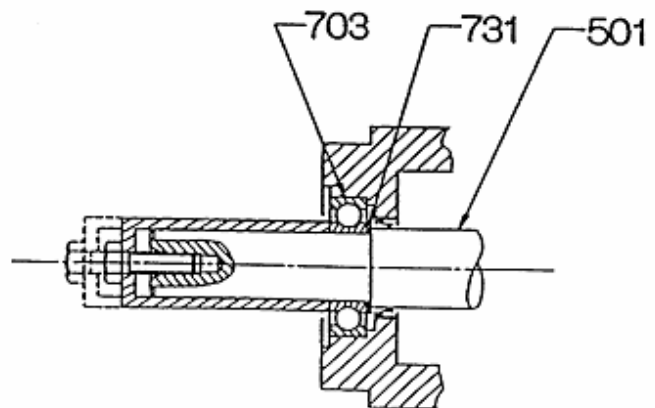
Fit the circlips **537**.

Clean the sides of the cover **705** and of the strainer **725** with a clean rag.

Fit the cover **705** with its seal **707** after applying sealing paste to the surface in contact with the strainer.

Tighten the 4 bolts **723**.

Check that the pump rotates freely when turned by hand.



## MAINTENANCE

Lubrication of the ball bearing:

Use a good-quality ball bearing grease.

- For pumps working at ambient temperature and protected from the weather, lubricate every 1000 operating hours
- In all other cases : lubricate every 500 operating hours

For pumps operating at elevated temperatures (in principle, from 100°C), choose a grease with a high drop point.

### Topping up the lubricant reservoir

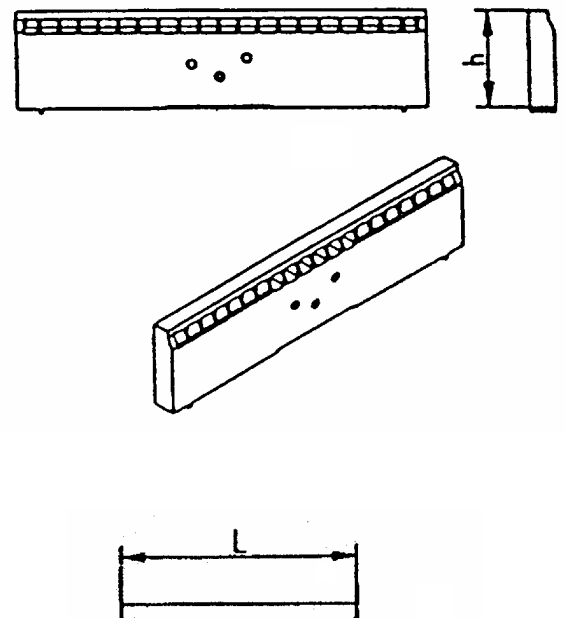
Every 500 operating hours the lubricant reservoir must be filled to overflowing by means of the valve **643**.

### Checking of the condition of the vanes and pushrods

It is recommended that the condition of the vanes and the pushrods should be checked every 700 hours.

In the case of excessive wear the pushrods and vanes should be replaced by a complete set.

DIMENSIONS OF THE VANES		
PUMP	Original height "h"	Change when "h" <
P 40	31	29
P 60	35,3	33,3
P 100	42,5	40
DIMENSIONS OF THE PUSHRODS		
PUMP	Original length "L"	Change when "L" <
P 40	82,5	82
P 60	85,4	84,5
P 100	103,5	103



LEGEND: ° = Assemblies and parts able to be supplied as spares.

The reference designates only one unit of the part or assembly ref.

example: 1 x ref. 317 = 1 vane - 1 x ref. 309 = 1 set of 12 vanes

Ref	No	DESIGNATION
°	098	1 SET OF BOLTS (410+411+642+723+726+729+730)
°	099	1 SET OF PUMP O-RINGS (403+707+714+602+716+727)
°	101	1 CYLINDER, COMPLETE
°	300	1 ROTOR, COMPLETE
	301	1 Rotor
	317	12 Vane
	318	6 Pushrods
°	309	1 SET OF 12 VANES 317
°	325	1 SET OF 6 PUSHRODS 318
°	400	2 COVER, COMPLETE
	401	2 Cover
	403	2 Cover O-ring (see 099 or 409)
	407	2 Cover bushing (see 098)
	408	2 Cover insert
	410	8 Cover bolt (see 098)
	411	4 Cover dismantling bolt (see 098)
°	409	1 SET OF 2 COVER O-RINGS 403
°	420	1 SET OF 2 COVER BUSHINGS 407
°	500	1 SHAFT, COMPLETE
	501	1 Shaft
	508	1 Shaft end key
	536	1 Sliding rotor
	537	1 Retaining ring
°	599	1 SET OF KEYS, COMPLETE
°	600	1 BLOCDIR GASKET. COMPLETE (see Instructions)

°	609	1	SHAFTSEAL HOLDER	
<hr/>				
°	700	1	COVER	
	712	1	Cover	
	714	1	Cover O-ring	(see 715)
	726	3	Cover bolt	(see 098)
<hr/>				
°	715	1	SET OF OUTBOARD BEARING SEALS (511*+537+602+646+647+707+716)	
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°	720	1	OUTBOARD BEARING, COMPLETE	
	703	1	Ball bearing of outboard bearing	
	716	1	Lip seal	(see 099 or 715)
	725	1	Outboard bearing	
	726	3	Outboard bearing bolt	(see 098)
	727	1	Outboard bearing joint	(see 099 or 715)
	731	2	Roller bearing support washer	
<hr/>				
°	704	1	BALL BEARING KIT	
<hr/>				
°	740	1	OUTBOARD BEARING COVER	
	705	1	Outboard bearing cover	
	707	1	Lip seal	
	723	4	Cover bolt	(see 098)
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<b>V A R I A N T</b>				
<hr/>				
°	640	1	LUBRICANT RESERVOIR, COMPLETE	
	643	1	Snifter valve	
	644	1	Lubricator	
	645	1	Shaftseal holder cover	
	646	1	Cover O-ring	(see 649)
	647	1	Lip seal	(see 649)
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\* Only for P40

To order spare parts, please indicate:

- TYPE and SERIAL NO. of the pump (stamped on pump plate)
- NT 201.
- REFERENCES and DESIGNATIONS of the desired parts. Only those parts or assemblies whose reference is preceded by (°) can be supplied.

