

ALFA-LAVAL

INSTRUCTION BOOK

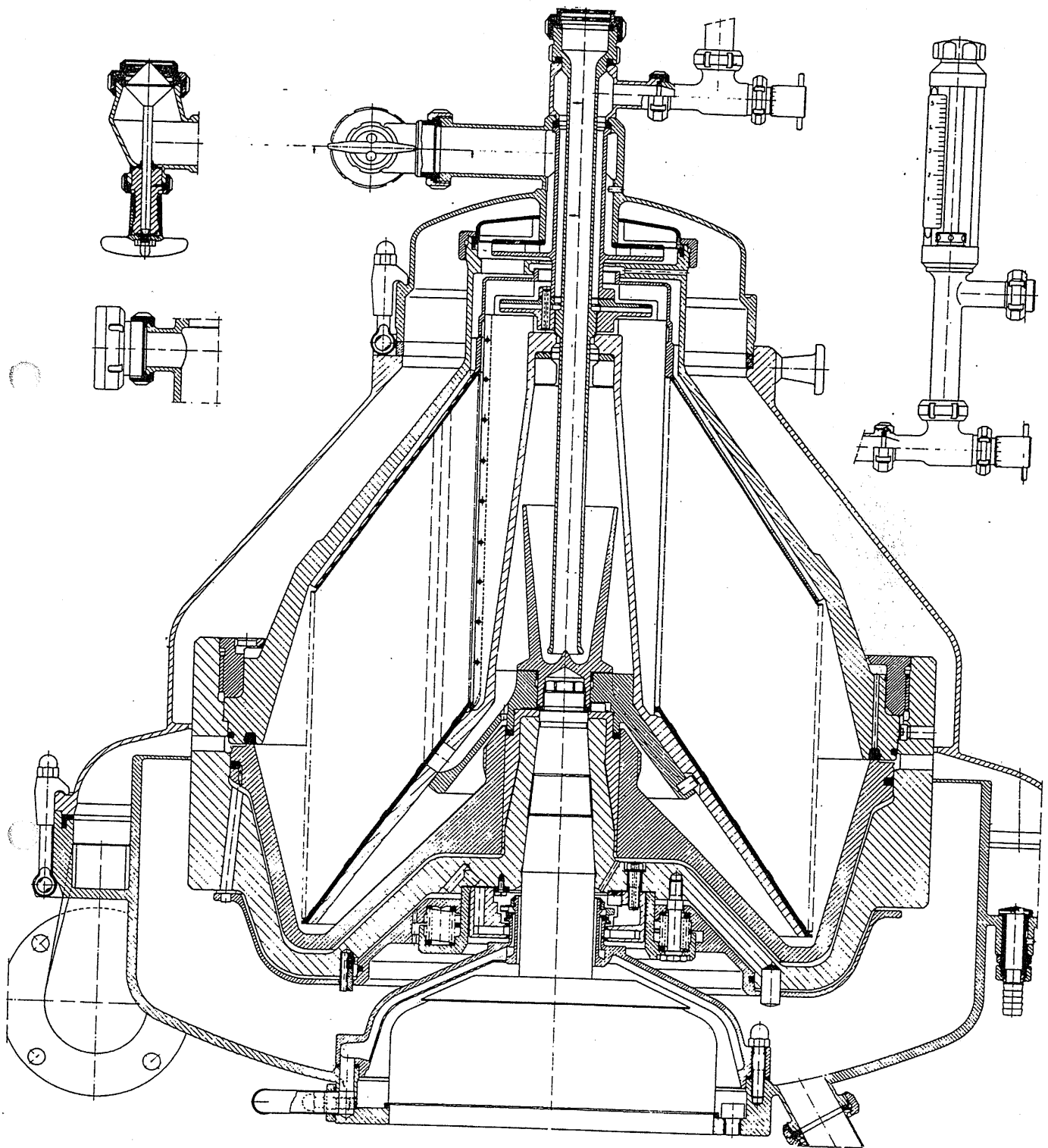
DAIRY SEPARATOR
TYPE MRPX 218T - 74

MANUFACTURING NUMBER: 9497009

In letters, wires, telex messages and calls state type and manufacturing No. of the machine.

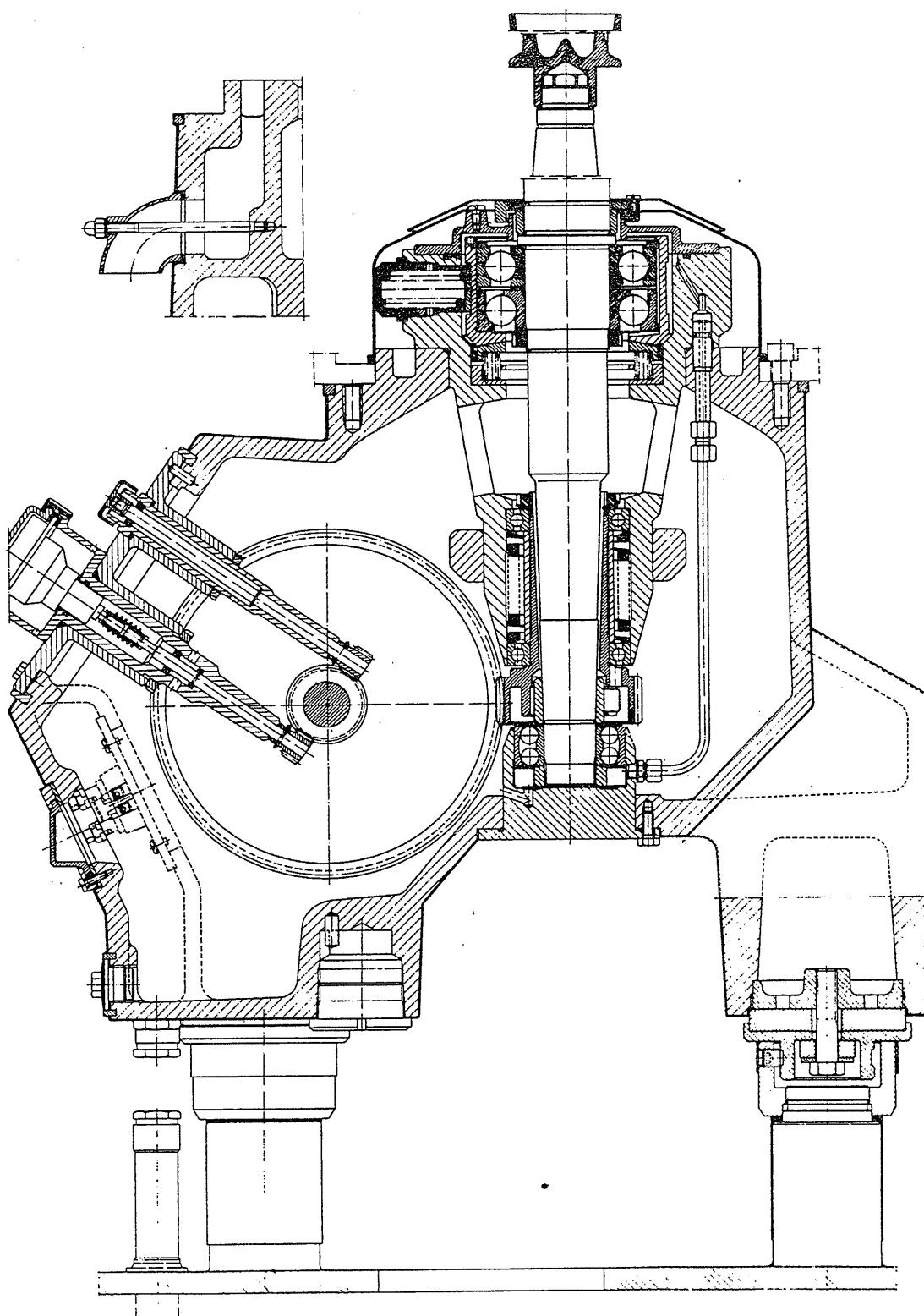
Unless the manufacturing No. has been filled in above, the book serves purposes of general information only and neither part Nos. nor operating instructions are unreservedly applicable.

ALFA-LAVAL

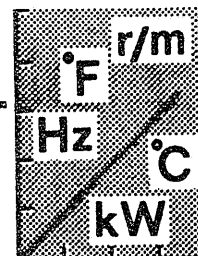


528316-Z (MRPX 218T)

ALFA-LAVAL



529363-Z (MRPX 218T)



DATA

Supplementary particulars (such as weight data) are contained in the technical information sent to you in connection with the purchase of the machine.

POWER REQUIRED

Suitable motor power: 30 kW (40 HP); note: special motor is required.

Starting current: approx. 1.5 times the rated current.

Working power (= motor output) at rated throughput: approx. 25 kW (34 HP).

SPEED

The prescribed speed of the worm wheel shaft, which must be strictly maintained, is stamped on the type plate of the machine.

The table below indicates r.p.m.

WORM WHEEL SHAFT	1420-1500	1700-1800
Drive (motor)	1420-1500	1700-1800
Tachometer	1420-1500	1700-1800
Revolution counter	118-125	142-150

RUNNING-UP TIME

13 - 15 minutes.

LUBRICATING OIL for
WORM GEAR HOUSING

Oil type: Depending on working and ambient temperature — see Lubrication chart in chapter H.

Required oil quantity for filling to operating level — see chapter H.

RATED THROUGHPUT

For cream separation: 22500 lit/h (5000 UK gal/h; 51500 lbs/h).

For standardization and remixing: 30000 lit/h (6600 UK gal/h; 68000 lbs/h).

BACK PRESSURE

Suitable skim milk pressure: 4.5 bar (64 psi).

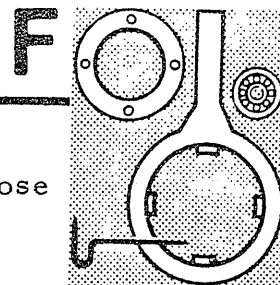
Maximum skim milk pressure: 5.5 bar (78 psi).

OPERATING LIQUID

For operating liquid system and pressure see chapter G.

COMPRESSING TOOL
for DISC SET

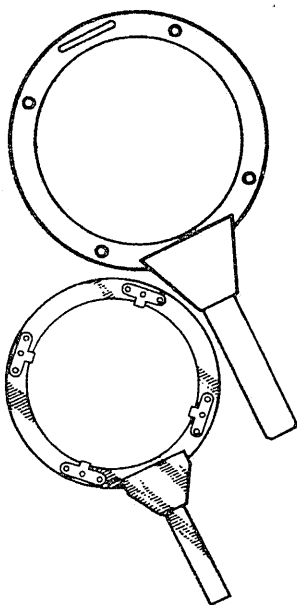
Required air pressure: 5 bar (71 psi).



SET OF TOOLS

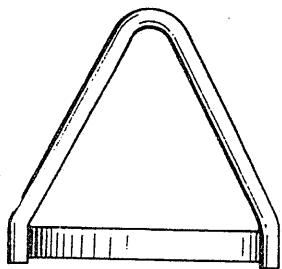
The special tools for the bowl are preferably hung up as close to the machine (or the cleaning place) as possible. If a tool is provided with left-hand thread or intended for a left-hand screwed joint, this has been specially pointed out in the dismantling and assembling instructions. Notification in this respect is not made where righthand thread is concerned.

SPECIAL TOOLS for BOWL

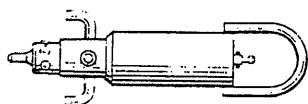


Spanner for
large lock ring
-- 528226-80

Spanner for
small lock ring
-- 32241



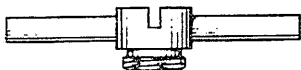
Lifting tool for
bowl hood
-- 528275-80



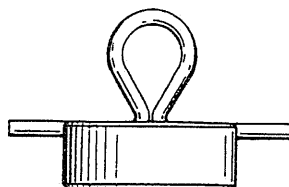
Lifting tool for
distributor
-- 529516-80 X



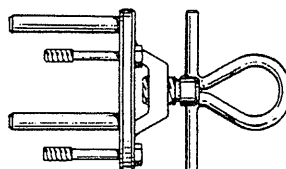
Lifting tool for
bowl disc
-- 528380-81



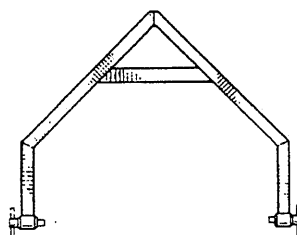
Lifting tool for
distributing cone
-- 524303-80



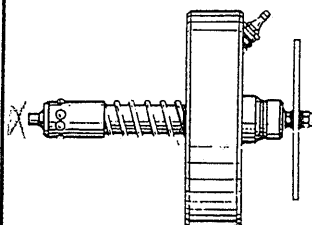
Lifting tool for
sliding bowl
bottom
-- 528278-80



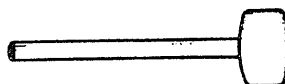
Lifting tool for
bowl body
-- 528341-80



Tilting tool for
bowl body
-- 528350-80 X



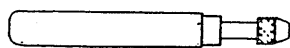
Compressing tool
for disc set
-- 528390-80
(see also special
page)



Tin mallet
-- 64324



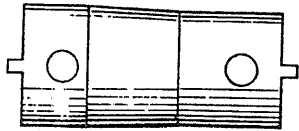
Brush
-- 1648



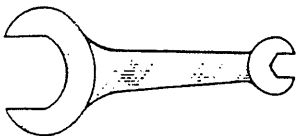
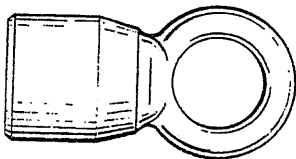
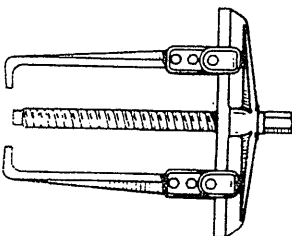
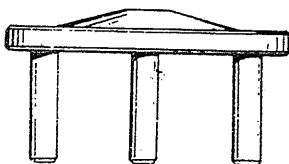
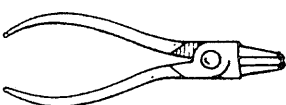
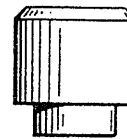
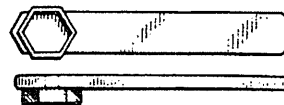
Handle for
cleaning wire
-- 61400

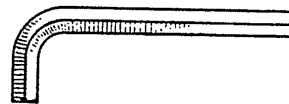
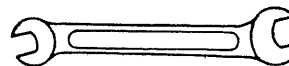


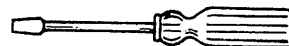
Driving-out pin
for seal ring of
bowl hood
-- 71194

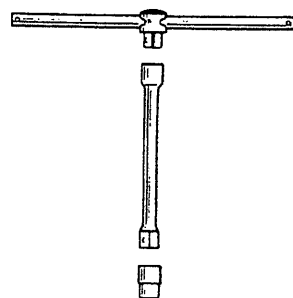
**SPECIAL TOOLS for
WORM WHEEL SHAFT**

 Pin spanner for
round nuts
-- 72719

 Dismantling
screw for seal
washer (2)
-- 2210935-16

**SPECIAL TOOLS for
BOWL SPINDLE**

 Screw spanner
for screw plugs
of top bearing
-- 521643-2

 Lifting tool for
bowl spindle
-- 70844 X

 Puller for worm
and self-aligning
ball bearing
-- 66401

 Puller tool for
ball bearings of
worm
-- 72205

 Mounting tongue
for snap ring
-- 527393-5

 Puller tool for
ball bearings of
top bearing
-- 528280-1

 Spanner for bowl
spindle
-- 70846

GENERAL TOOLS

 Hexagon wrench
-- 42348

 Screw spanner
(3/4", 15/16")
-- 42354

 Hook spanner
-- 69696

 Screw driver
-- 66772

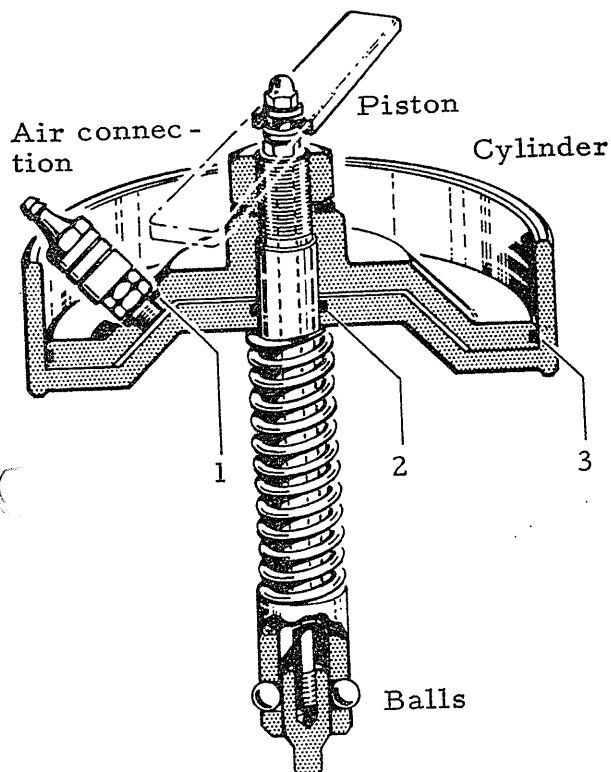
 Drift
large -- 37666
small -- 2279

 T-handle
-- 72243

 Extension rod
-- 72244

Socket:

- 9/16" -- 73376
- 3/4" -- 73377
- 15/16" -- 42384
- 1 1/8" -- 527354-6

COMPRESSING TOOL for DISC SET -- 528390-80



- 1 Seal ring
-- 32697
- 2 Seal ring
-- 223406-20
- 3 Seal ring
-- 223412-43

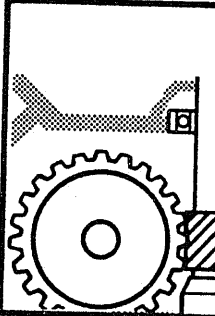
Take good care of the tool. If it is not to be used for a time, oil it.

For further information — see Bowl, chapter I.

SPECIAL SPARE PART
NUMBERS

Listed below are some spare part numbers which for practical reasons have not been inserted in the chapter where they properly belong.

Power trans-
mission
(comp. chapter P)

	50Hz		60Hz	
	Speed of worm wheel shaft in r.p.m.	1420 - 1500	1700 - 1800	
	Worm wheel	526178-92	526178-96	
	Worm	524297-7 534115-09	524297-11	

The speed of the worm wheel shaft is indicated on the type plate.

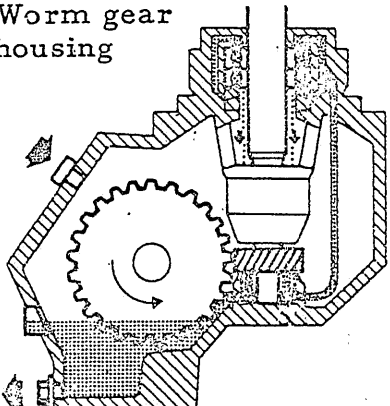
Always check that the old worm gear part and the new one have the same number of teeth.

With A.C. 50 c/s operate the machine at a speed of 1420 - 1500 r/m.

With A.C. 60 c/s operate the machine at a speed of 1700 - 1800 r/m.

Till now, EP-oils have been recommended for the worm gear housing of this type of machine. However, from now on a synthetic polyglycol type lubricating oil with the following properties is prescribed:

Viscosity at 100°C:	20-25 cSt 2.9-3.5°E
Viscosity at 0°C:	maximum 2000 cSt maximum 260°E
Viscosity index:	minimum 140
Pour point:	maximum -30°C
Heat resistance:	must stand utilization for at least 1000 hours at 120°C.

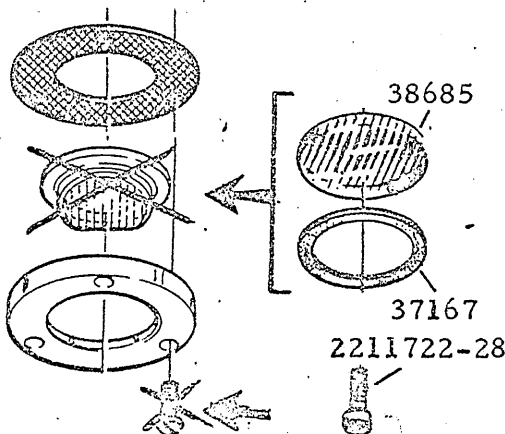
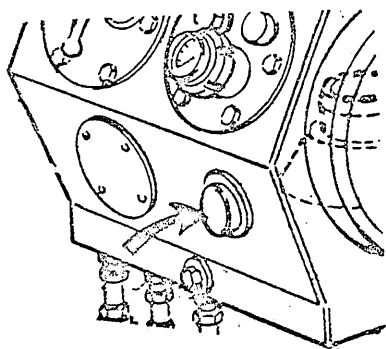
LUBRICATION POINT	LUBRICANT	WHEN
 Worm gear housing	Suitable oils (examples): Shell Tivela Oil 75 BP Energol GRS 260 Oil quantity required approx. 13 litres.	Filling before first start. First oil change after 300 hours operation, then after every operating period of 1500 hours. In seasonal operation before every operating period. Clean before refilling. Fill up when necessary (oil level in upper half of gauge glass).

Oil filling (MRPX-218TSV)

Before supplying oil of the new type drain off completely the old oil, flush out the worm gear housing with white spirit and wipe it clean with a rag.

Never mix a synthetic oil with a mineral oil. They are not miscible.

Oil gauge glass

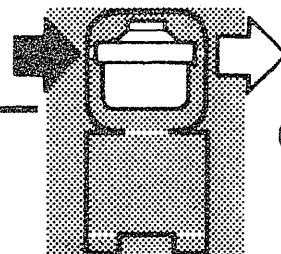


Acrylic plastic is susceptible to attacks from synthetic oil and must thus be replaced with glass.

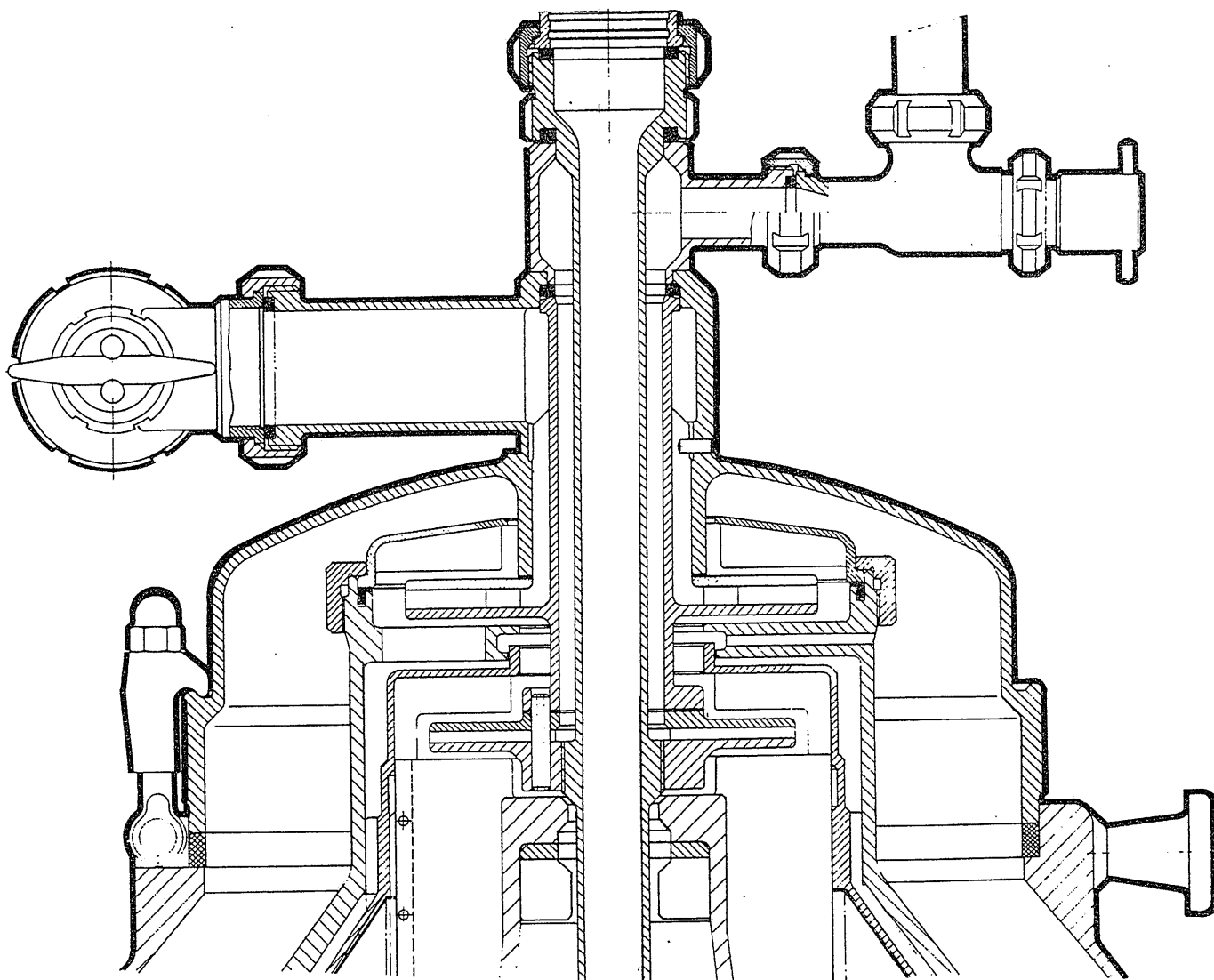
A packing must be inserted between the glass and the fixing ring. Furthermore, longer screws are required for this ring.

ALFA-LAVAL

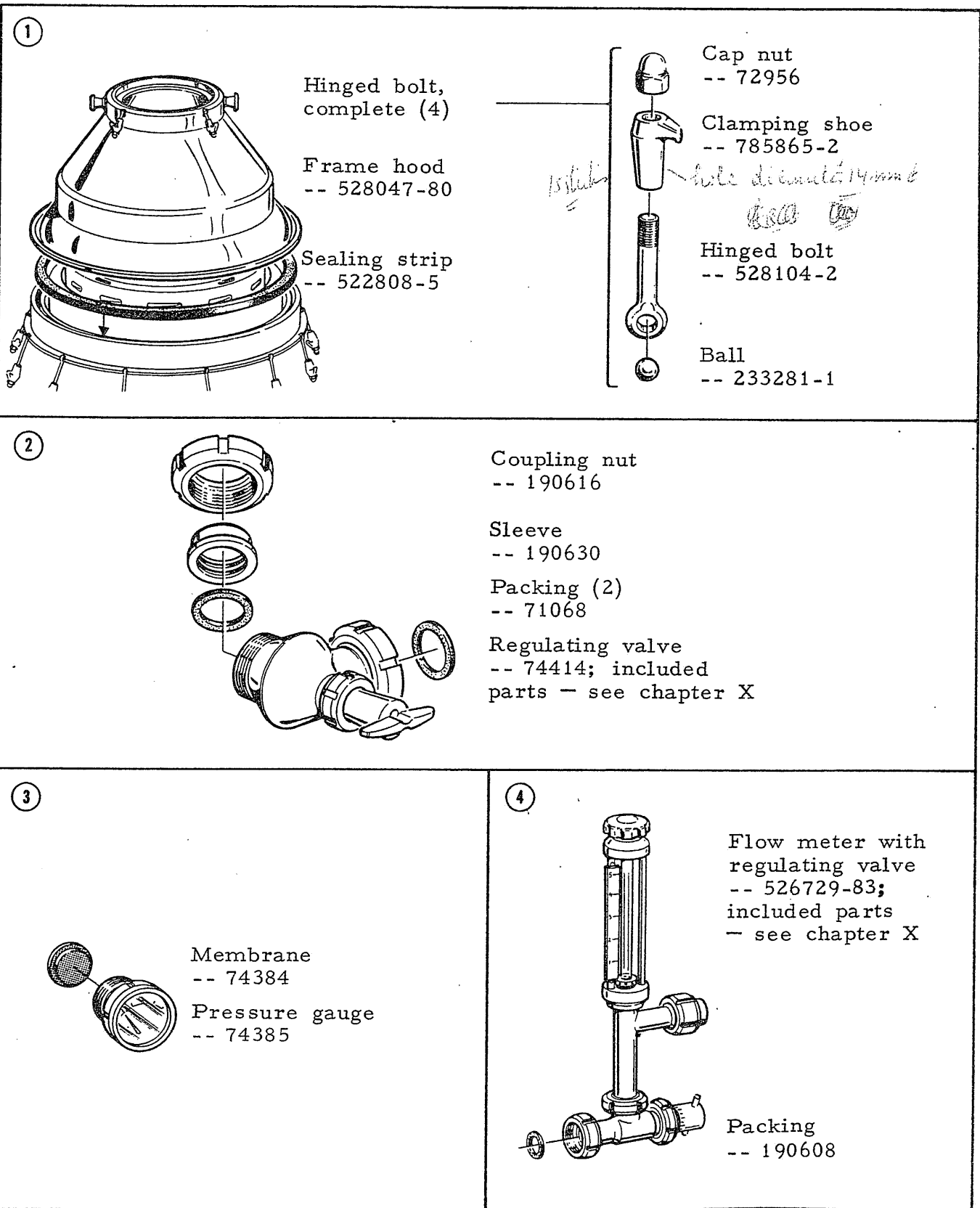
INLET. OUTLET. BOWL

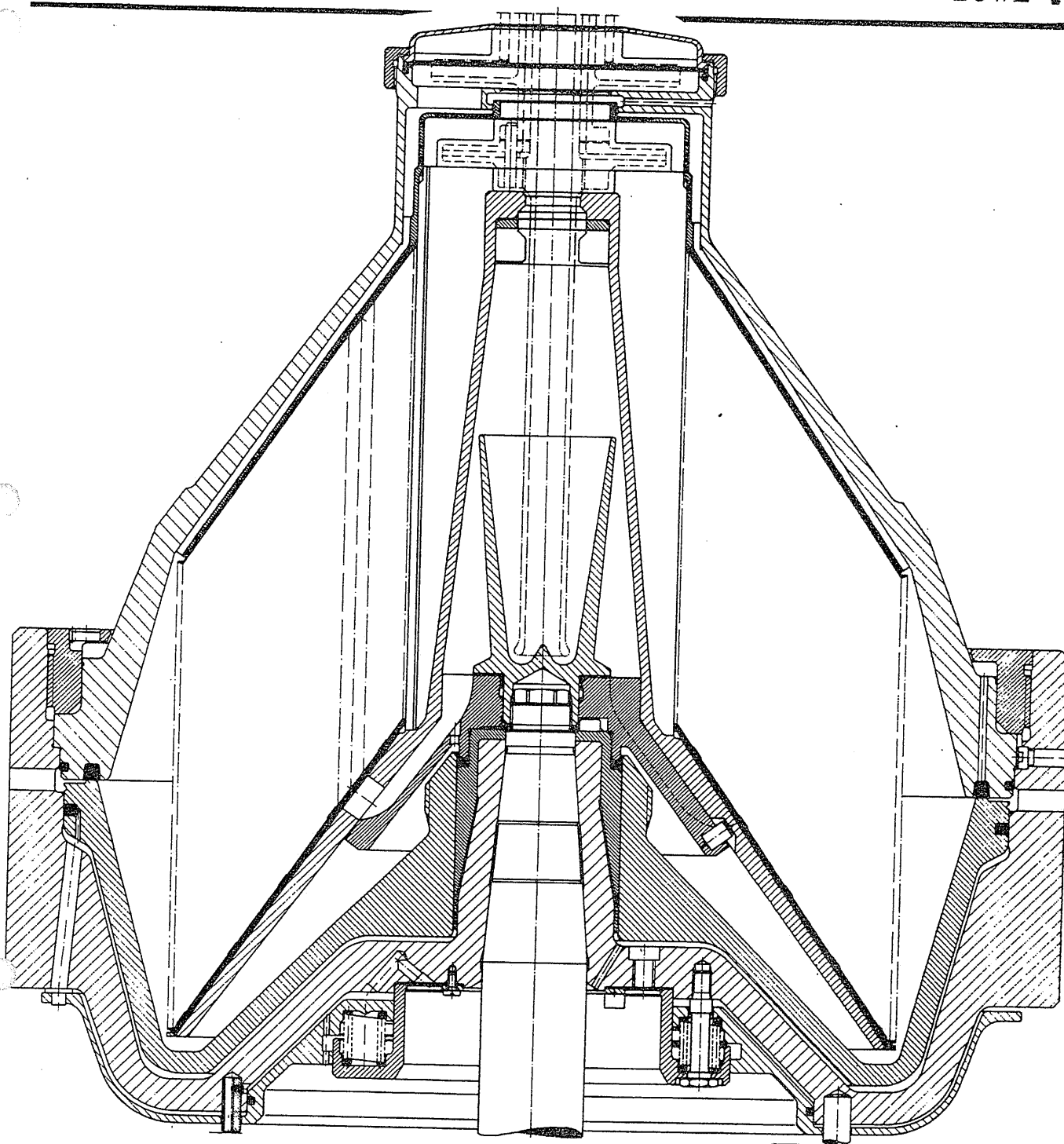


INLET. OUTLET

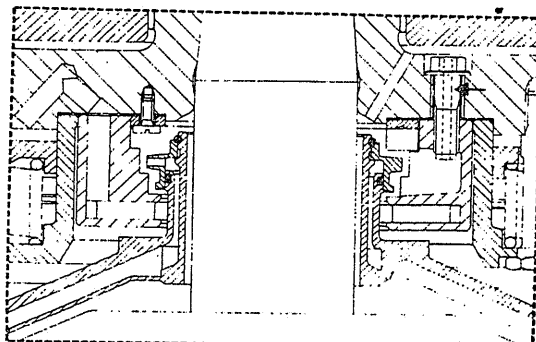


(Inlet. Outlet, page 2)

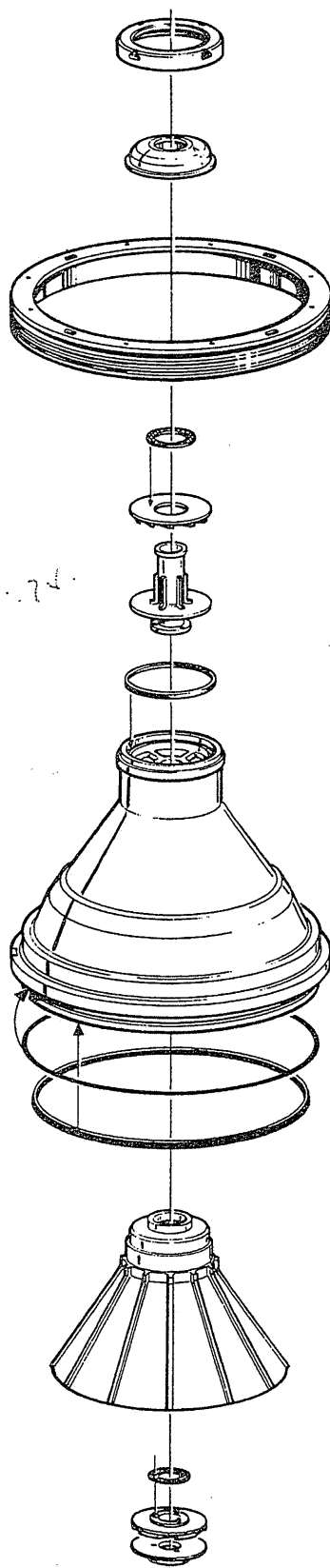




Paring disc device — see chapter S



BOWL for COMBINED PROGRAMME -- 528186-81



Small lock ring
-- 528018-1
(left-hand thread)

Paring chamber
cover
-- 528016-2

Large lock ring*
-- 528151-1
(left-hand thread)

Packing**
-- 516281-14

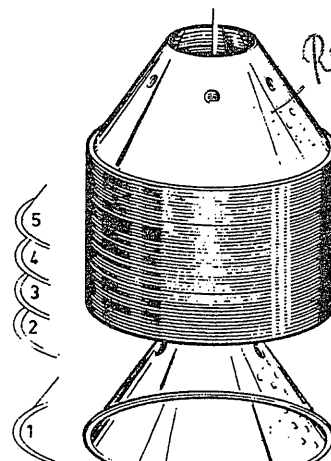
Paring disc,
top part**
-- 528221-1
Paring disc,
bottom part**
-- 528229-1
Packing
-- 528087-1

Bowl hood*
-- 528085-2

Rubber ring
-- 521863-2
Seal ring
-- 528086-1
54317001

Top disc*
-- 529413-2

Packing**
-- 528220-1
Paring disc,
top part**
-- 528218-80
Paring disc,
bottom part**
-- 538317-1

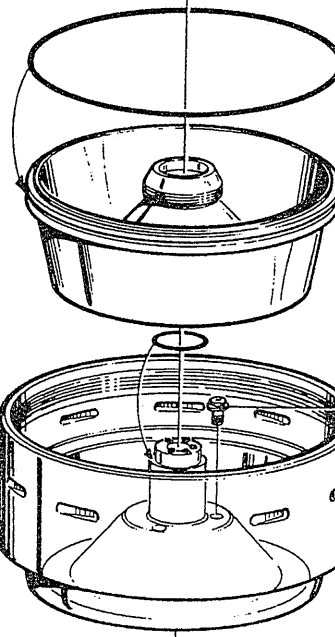


Bowl disc
(approx. 195)
-- 529378-3

Bottom disc
-- 529378-4

Distributor*
-- 529417-81

Cyclone nut**
(cap nut)
-- 528244-1
(left-hand thread)
Packing
-- 516281-15
Distributing cone*
-- 528021-80

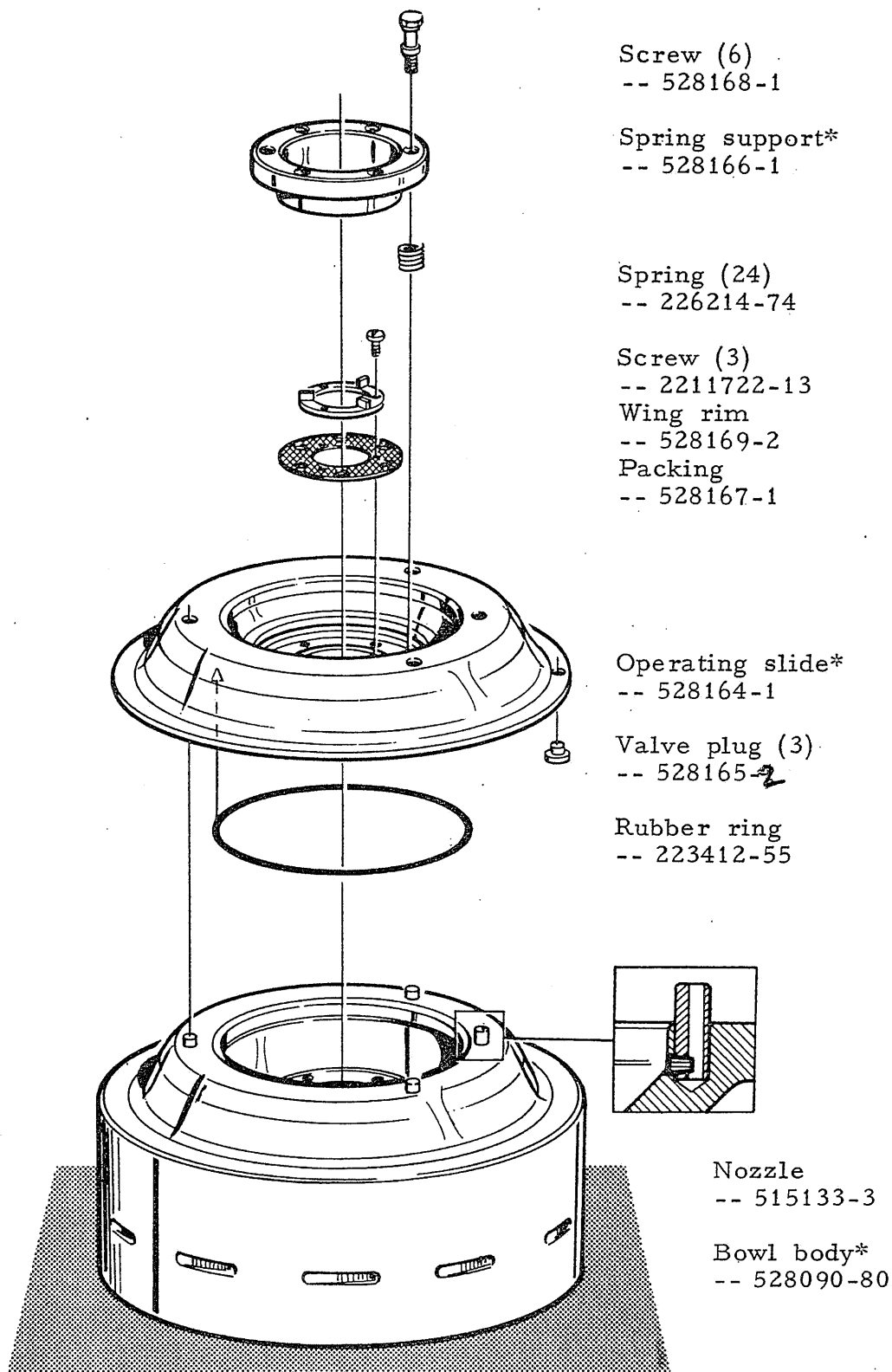


Rubber ring
-- 523116-4

Sliding bowl
bottom
-- 528044-1

Rubber ring
-- 223416-35
Screw/nozzle
(3)**
-- 526648-1

(Bowl for combined programme, page 2)



* Exchange necessitates rebalancing — send the COMPLETE bowl to an authorized ALFA-LAVAL/DE LAVAL representative.

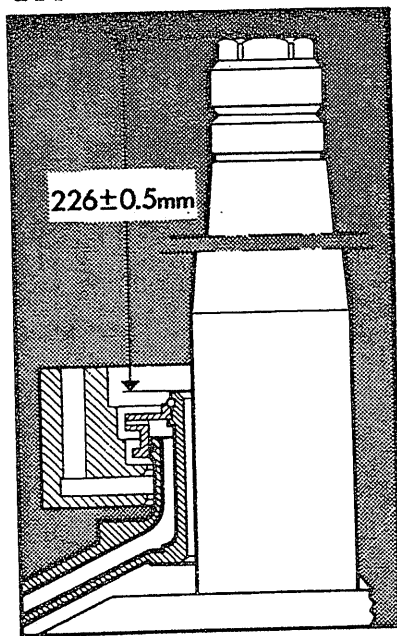
** Not included in the complete-unit number of the bowl.

HEIGHT ADJUSTMENT

Checking should be done both in connection with the yearly overhaul and after exchange or mounting of parts which can affect the height position.

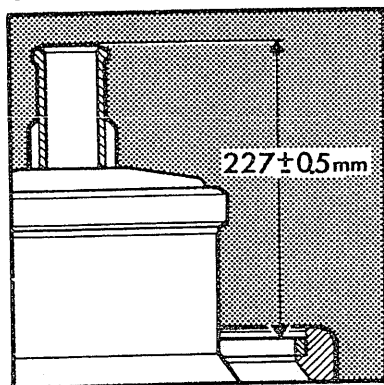
The tolerances are narrow and it is essential, therefore, that all parts are clean and free from burrs.

Control paring disc



The distance between the upper rim of the distributing cover and the spindle top should be as indicated in the figure. The height position of the paring disc is adjusted by means of height adjusting rings under the distributing cover. See also chapter S "Paring disc device".

Paring discs of bowl



Check

Assemble the bowl. Put on the frame hood and clamp it with the hinged bolts. Insert the height adjusting ring.

The distance between the height adjusting ring and the upper edge of the upper paring disc should be as indicated in the figure. If this is not the case, replace the inserted height adjusting ring by a ring with more suitable thickness. For height adjusting rings see chapter I "Inlet. Outlet".

After every height adjustment of the control paring disc the bowl spindle should be revolved by hand (with bowl body put on the spindle). If scraping noise is audible, the adjustment is probably wrong — readjust.

If a scraping noise is audible in the inlet and outlet after the machine has been started, stop the machine at once and recheck the adjustment. The listening for scraping noise must be done as near the inlet and outlet as possible and in immediate connection with the start.

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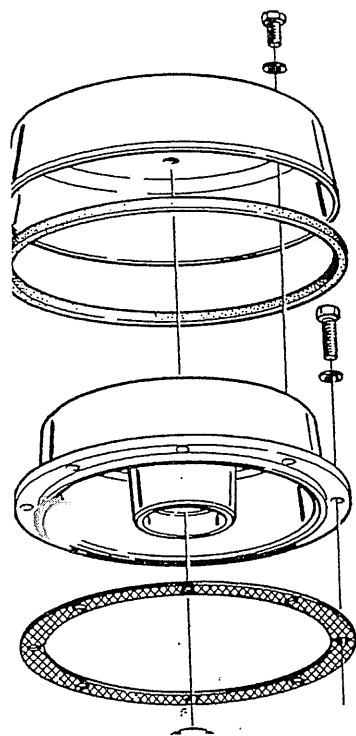
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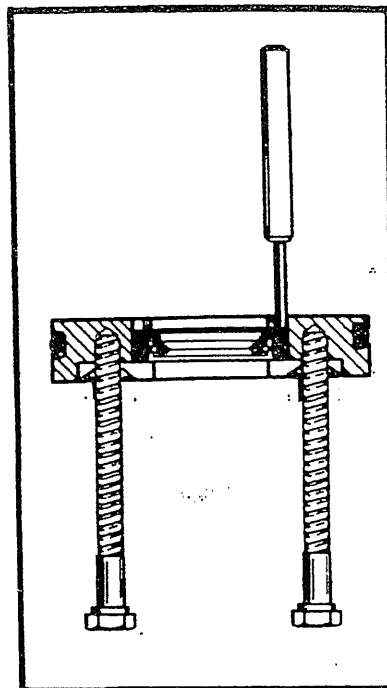
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Dismantling, Assembly, page 2)

at in worm gear housing



- Screw (3)
-- 73373
- Washer (3)
-- 223101-34
- Protecting cap
-- 528709-1
- Sealing strip
-- 43630
- Screw (8)
-- 72530
- Washer
-- 223101-34
- Bearing shield
-- -2
- Packing
-- 43626



Use the two special tools
— see chapter F — to draw
out the seal washer. When
assembling, make sure
that the lipseal ring is
turned as shown in the
illustration and that the
seal washer is mounted
with its screw holes facing
the worm gear housing.

* Take.

1231019, 1231070

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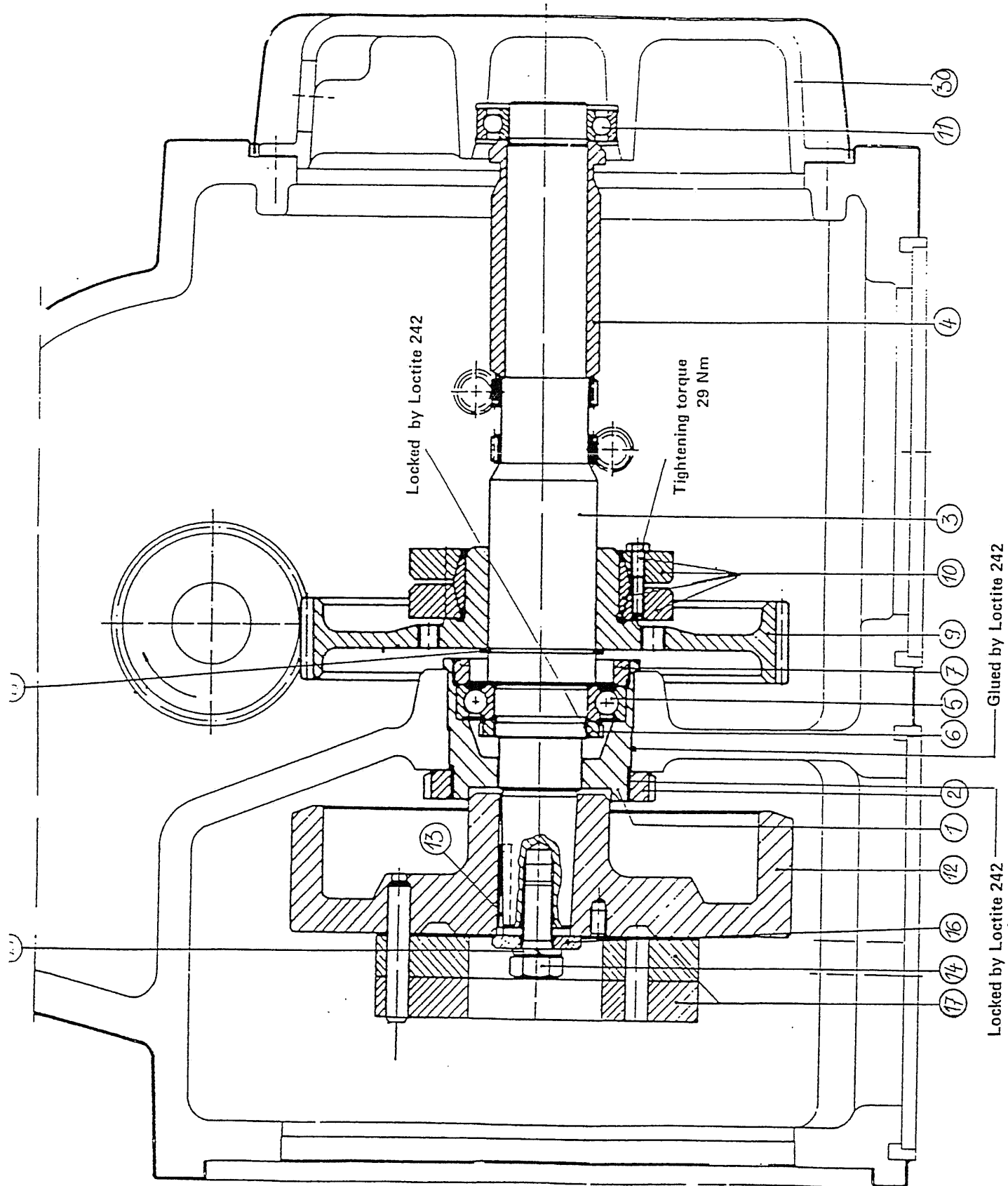
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PARTS FOR THE HORIZONTAL SHAFT:

Ref. Fig. 1A.	Part No.	Description	Qty	Remarks
1	544786-01	Bearing housing	1	
2	541985-01	Nut	1	
3	544785-80	Worm wheel shaft	1	
4	543495-01	Sleeve	1	
5	233211-96	Ball bearing	1	or p/n 233211-94
6	67478	Lock nut	1	
7	544789-01	Lock ring	1	
8	223641-19	Retaining ring	1	
9	544950-03	Worm wheel	1	
10	541988-01	Clamping ring	1	
11	8379	Ball bearing	1	
12	541989-81	Conveyor pulley	1	
13	223610-32	Key	1	
14	260001-39	Screw	1	
15	223107-28	Washer	1	
16	541991-01	Washer	1	
17	60571	Elastic plate	2	
				f
30	543494-80	Bearing shield	1	
	544465-02	Loctite 242	1	

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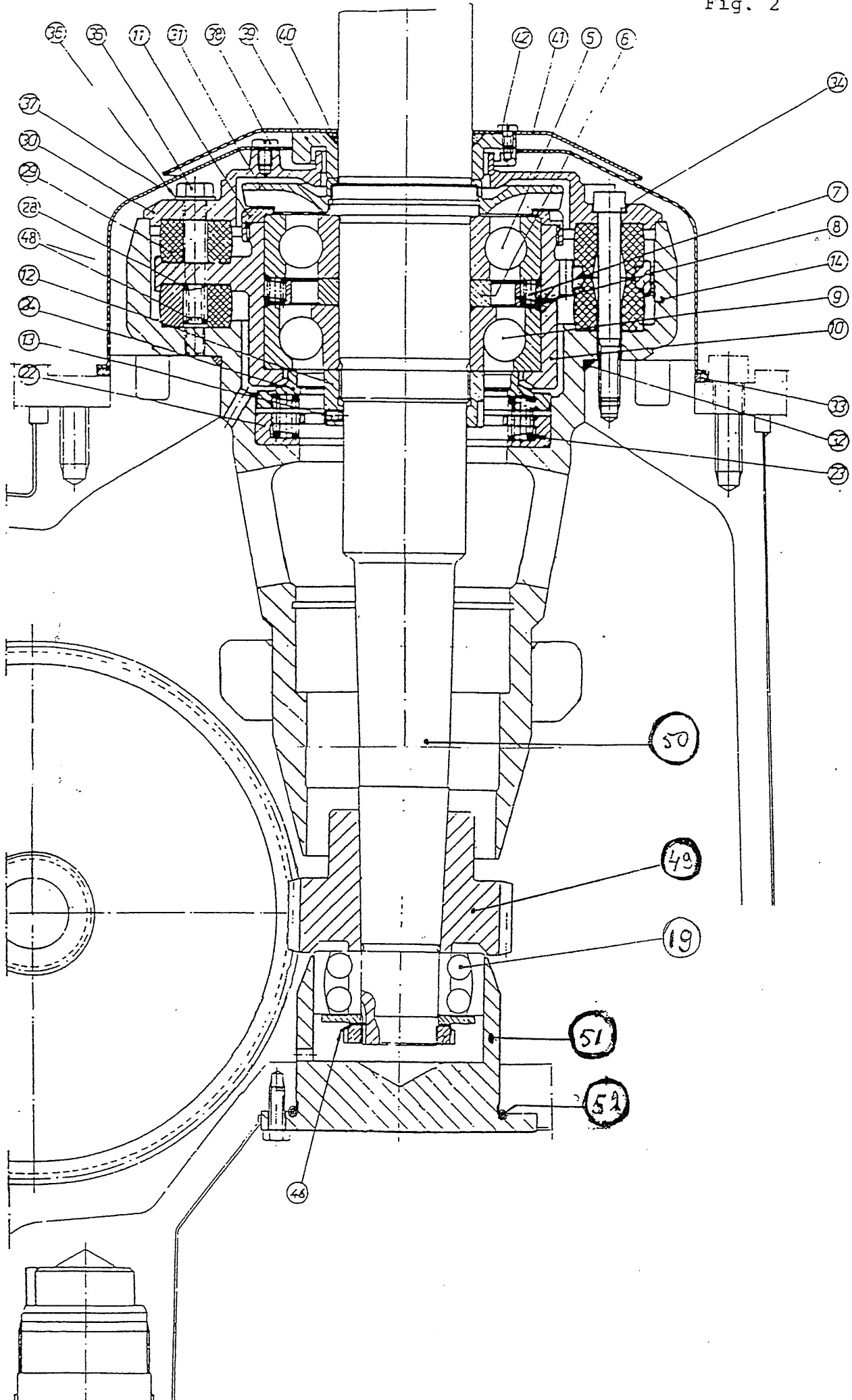
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Fig. 2



CONVERSION KIT FOR RUBBER DAMPED TOP BEARINGS

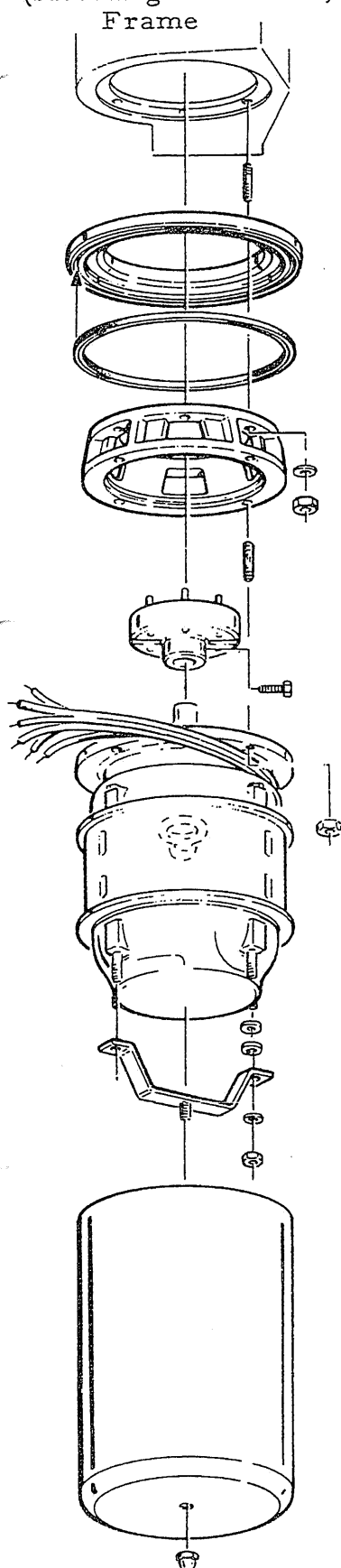
Ref. Fig. 2.	Part No.	Description	Qty	Remarks
5	233211-40	Ball bearing	1	
6	533415-01	Sleeve	1	
7	533412-01	Spring holder	1	
8	62763	Spring	12	
9	233215-03	Angular contact bearing	1	
10	544147-01	Ball bearing housing	1	
11	533413-01	Lock ring	1	
12	533416-01	Ring	1	
13	221545-02	Screw	2	
14	542961-80	Top bearing support	1	
22	533418-01	Spring holder	1	
23	70714	Spring	20	
24	542960-01	Wear ring	1	
28	70714	Spring	12	
29	529639-02	Rubber buffer	2	
30	536016-04	Cover	1	
31	533414-02	Deflector	1	
32	223412-42	O-ring	1	
33	223412-51	O-ring	1	
34	2217767-07	Screw	6	
35	221045-35	Screw	6	
36	223101-49	Washer	6	
38	221136-02	Screw	6	
40	223412-18	O-ring	1	
42	2211722-24	Screw	3	
46	66076	Washer	1	
48	543974-01	Guide washer	12	
49	541661-03	Worm	1	
50	540374-01	Spindle	1	
51	519330-02	Bottom Bearing Bushing		
52	38411	Rubber ring		
10	548746-04	BALL BEARING	1	

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Dismantling. Assembly

When dismantling first disconnect the electric cables from the terminal strip in the frame, then dismantle the parts according to the figure. If the coupling pulley should be loosened see "Coupling pulley" in this chapter.

To assemble push first the elastic plate (see chapter P, Coupling. Worm wheel shaft) on the coupling pulley of the machine. Fit the parts according to the figure. Remove the brake cap and check that there is a play at the elastic plate.

* When ordering follow directions given in chapter A.

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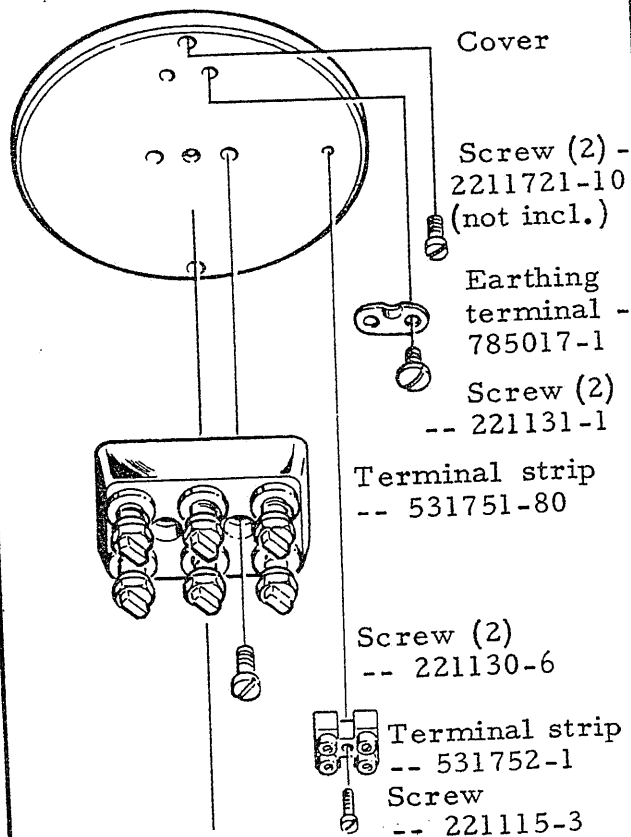
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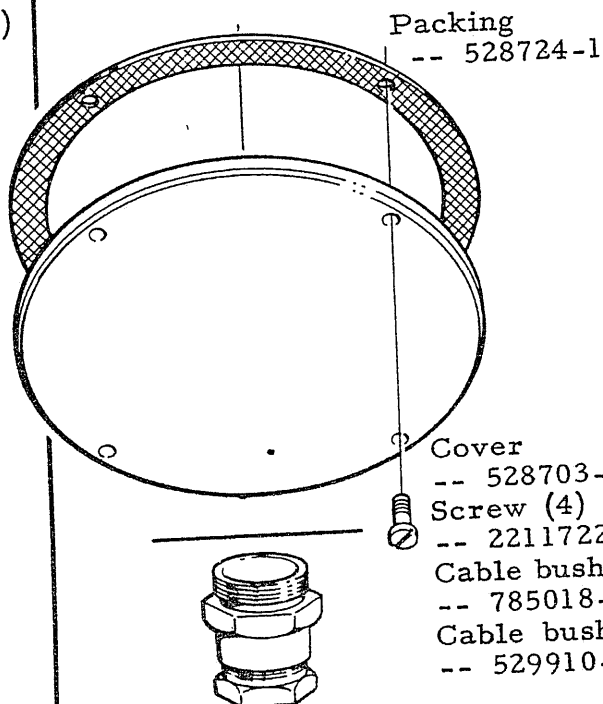
BRATION DAMPER (3) and FOUNDATION PLATE

ELECTRIC CONNECTION

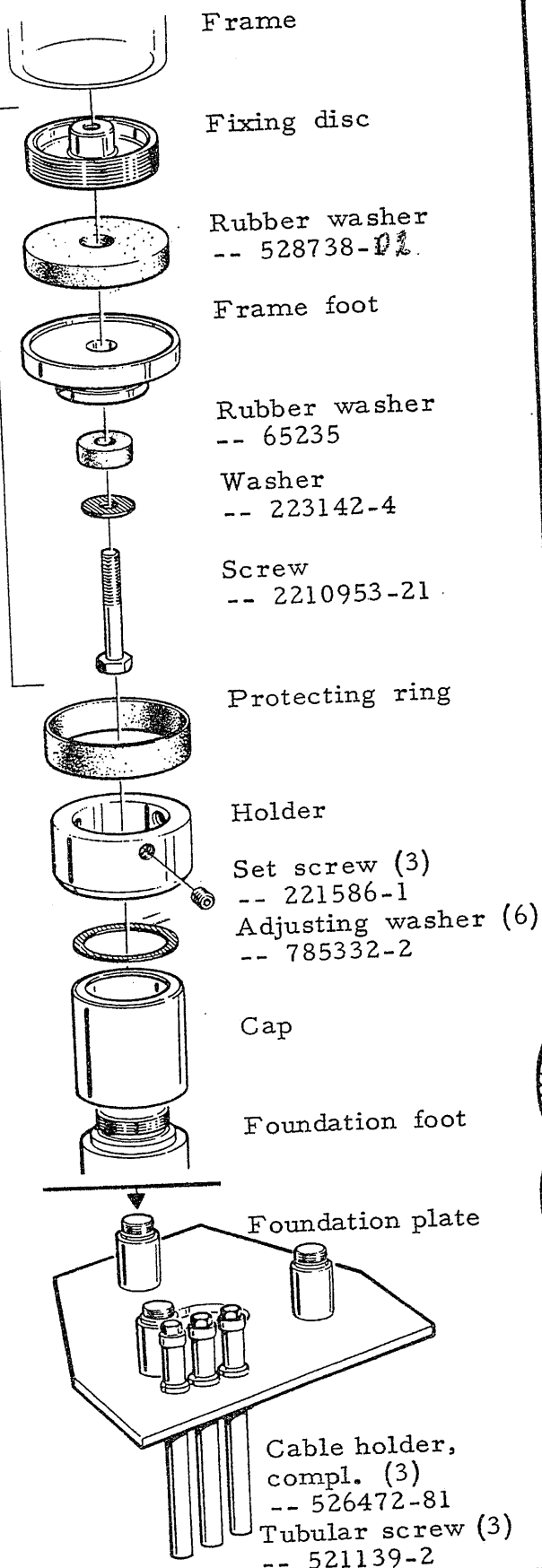
Cover (with terminal strips)
-- 528702-80



External cover, cable inlet

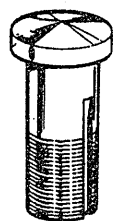


Mounted on machine before delivery



1231020, 1231064-A

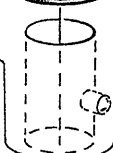
FLUSHING DEVICE for SLUDGE COVER



Nozzle
-- 785868-1



Packing
-- 516281-10



Frame ring



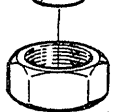
Nut
-- 785877-1



Packing
-- 68937

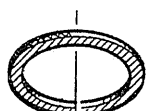


Hose nipple
-- 252613-12

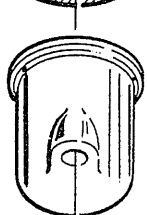


Nut
-- 521136-1

VENTILATION BEND



Packing
-- 71068



Bend



Stud bolt

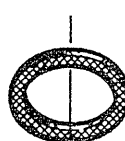


Washer
-- 223101-34

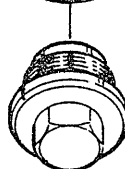


Cap nut
-- 72947

OIL DRAIN

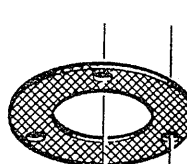


Packing
-- 223316-5



Screw
-- 526189-1

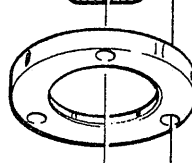
OIL GAUGE GLASS



Packing
-- 528723-1



Glass
-- 528727-1



Fixing ring
-- 523215-2



Screw (3)
-- 2211722-16

HINGED BOLT (12)



Cap nut
-- 72956



Clamping shoe
-- 785865-2

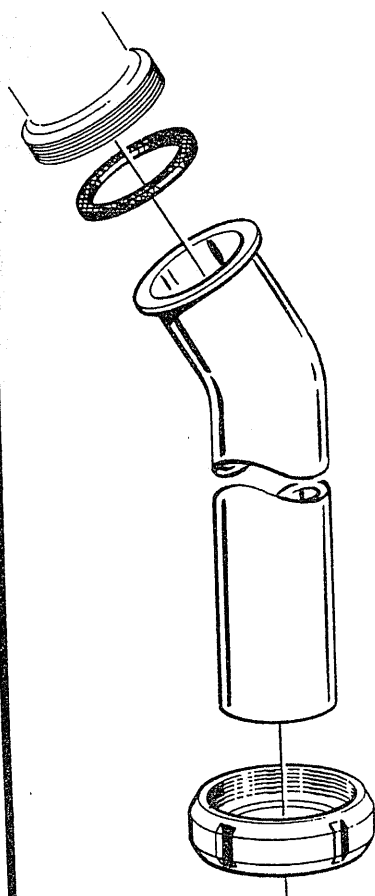


Hinged bolt
-- 528104-1



Ball
-- 233281-1

DRAIN TUBE

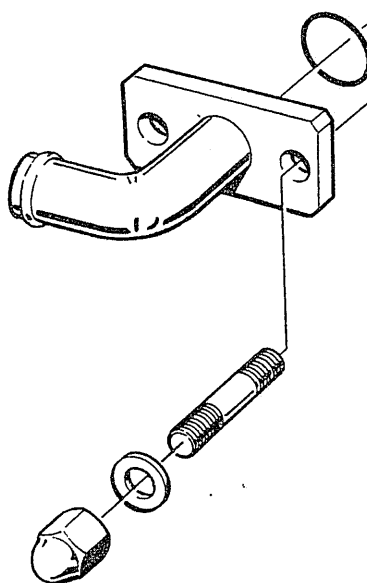


Packing
-- 71068

Tube
-- 528192-80

Coupling
nut
-- 190616

**INLET BEND for OPERATING
LIQUID**



Rubber ring
-- 74067

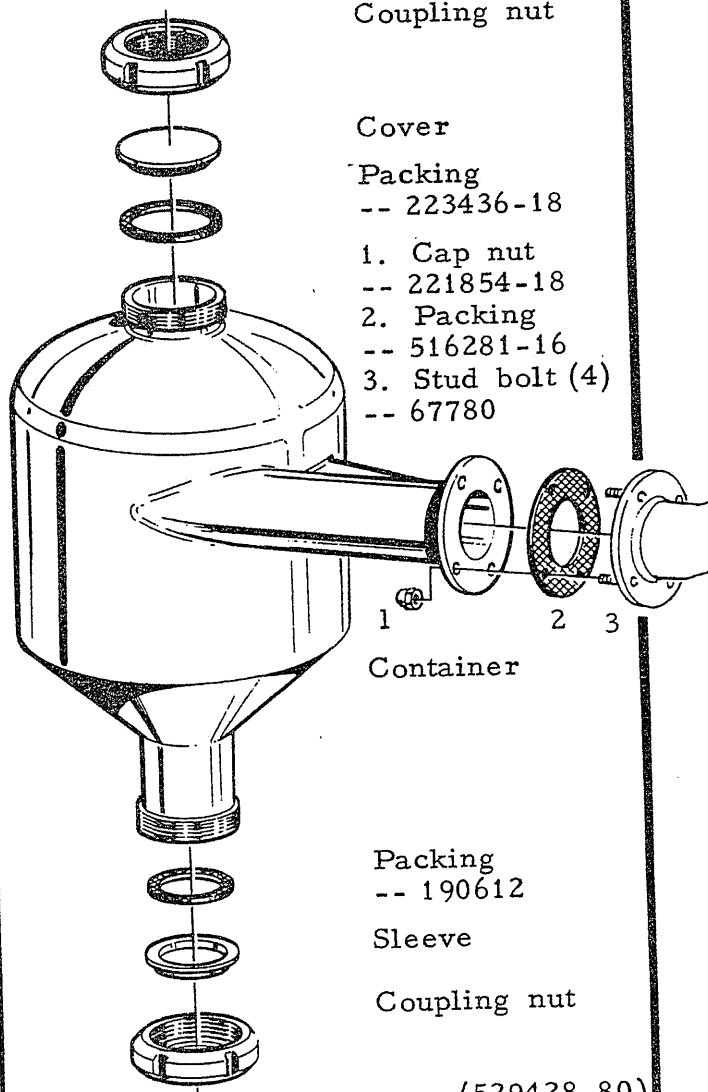
Bend
-- 528359-80

Stud bolt (2)
-- 2216261-25

Washer (2)
-- 223101-62

Cap nut (2)
-- 72956

CYCLONE



Coupling nut

Cover

Packing
-- 223436-18

1. Cap nut
-- 221854-18

2. Packing
-- 516281-16

3. Stud bolt (4)
-- 67780

Container

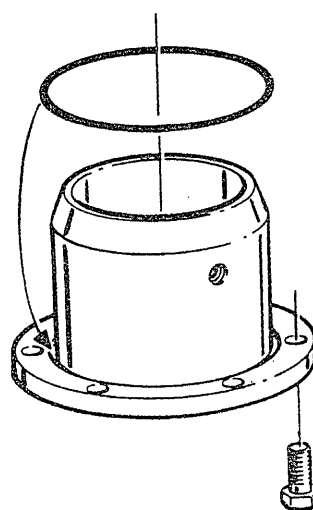
Packing
-- 190612

Sleeve

Coupling nut

(529428-80)

BOTTOM BEARING HOUSING

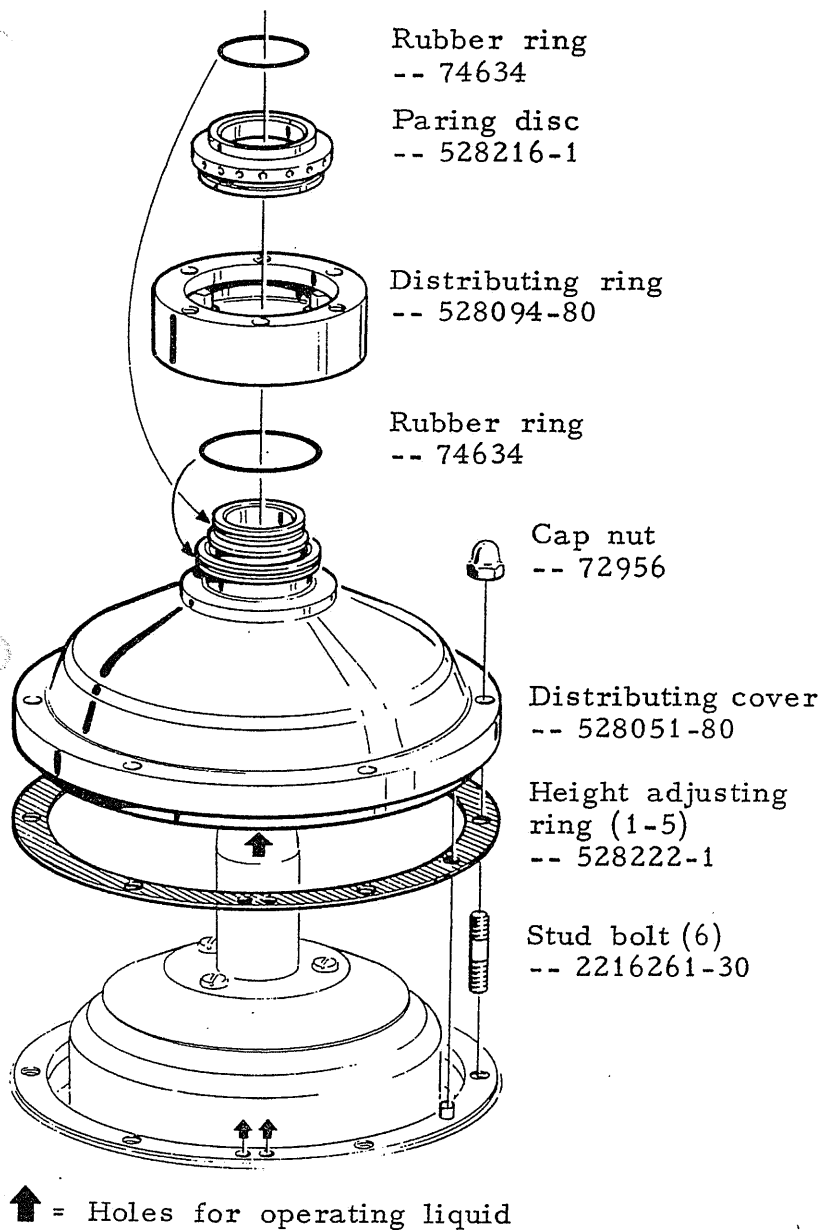


Rubber ring
-- 38411

Housing
-- 529463-1

Screw (6)
-- 72927

PARING DISC DEVICE for OPERATING LIQUID



The distributing ring rotates, the other parts are non-moving.

Dismantling

For dismantling the bowl see chapter I. The distributing ring is fastened to the bowl body by screws. These screws must be removed before the bowl body can be lifted off from the spindle.

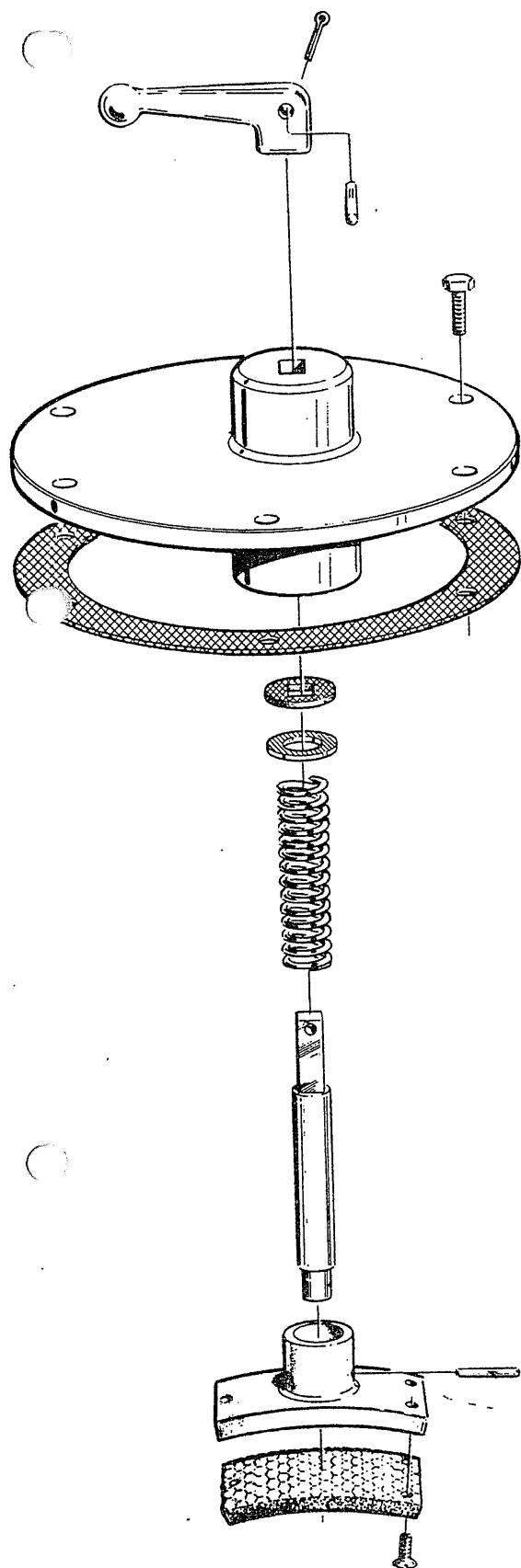
Take out the distributing cover and dismantle the parts in the sequence appearing from the illustration.

Cleaning

Make sure the parts (particularly all holes and channels) are carefully cleaned — for cleaning agents see chapter L.

Assembling

Check the height position of the paring disc after assembling — see chapter L. Supply operating liquid and check throughflow according to directions in chapter L.



Split pin
-- 222210-19

Handle
-- 785956-2

Pivot
-- 222137-10

Screw (6)
-- 72927

Cap

Packing
-- 528732-1

Packing
-- 528720-1
Washer
-- 223101-37

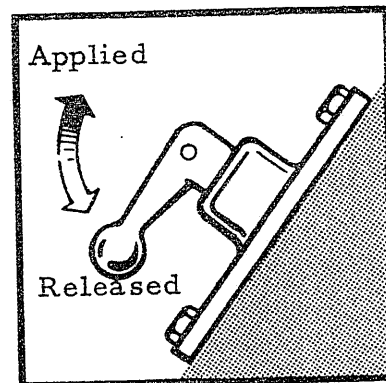
Spring
-- 39096

Brake shoe,
complete
-- 67803:

Spindle
-- 65461

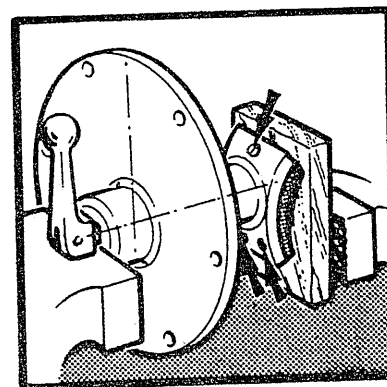
Slotted pin
-- 67960
Brake shoe
Lining
(with screws)
-- 65227

Screw (3)
-- 8341

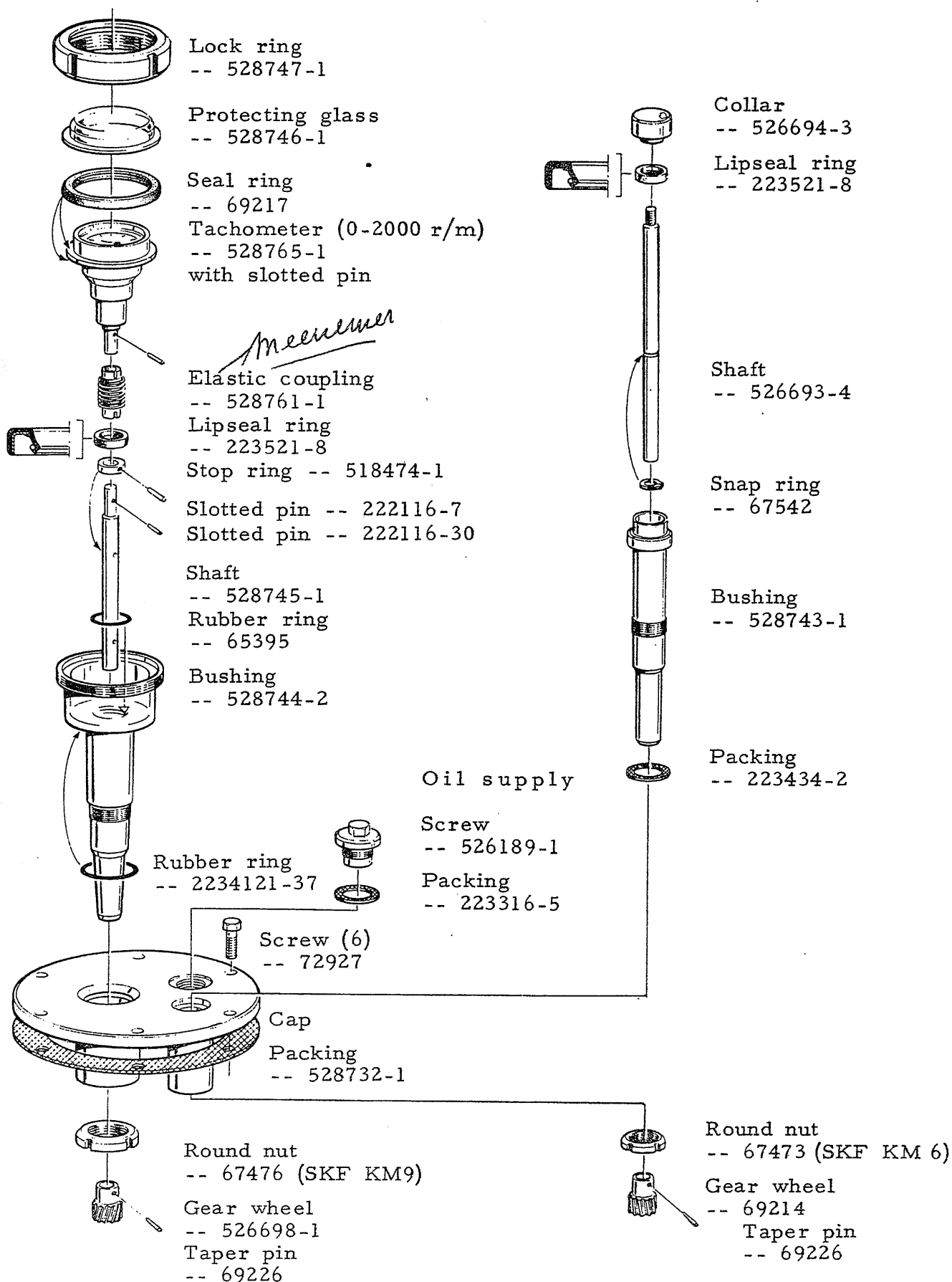


Exchange of lining
Release the brake and re-
move the cap. Note that
the screws are slotted at
both ends (use an angle
driver). Fasten the cap to
the machine with the handle
pointing downward.

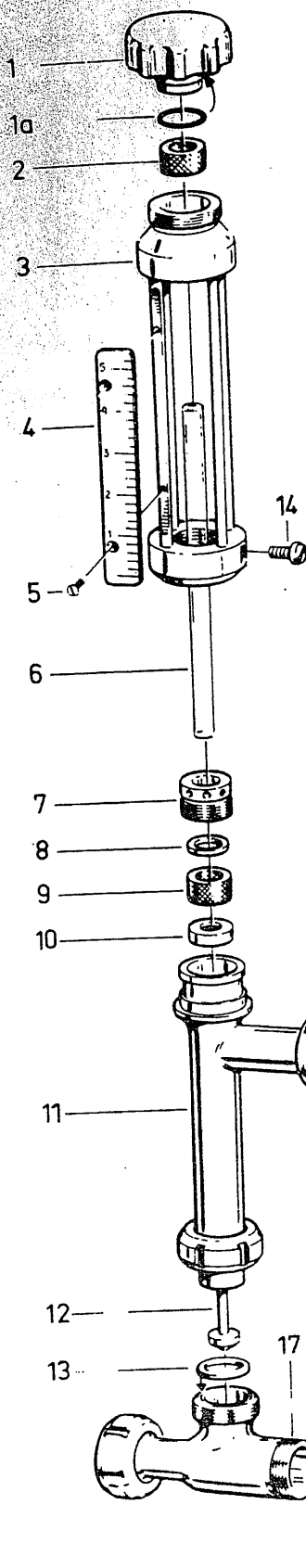
Dismantling. Assemb-
ling



Clamp the cap in a screw
vice, apply the brake, and
remove the handle. See that
cap, handle, and brake shoe
are turned as shown by the
arrows in the figure. Fasten
the cap to the machine with
the handle pointing downward.

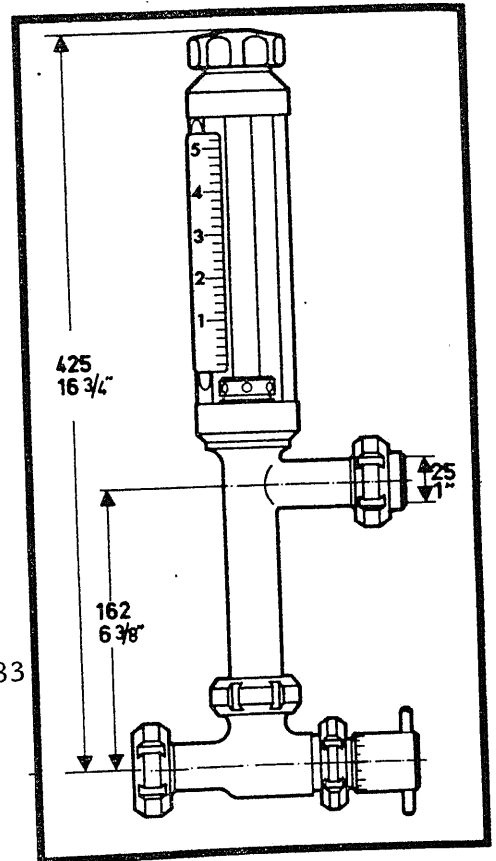


FLOW METER with regulating valve, of stainless steel -- 526729-83
(for connection to unthreaded pipes)

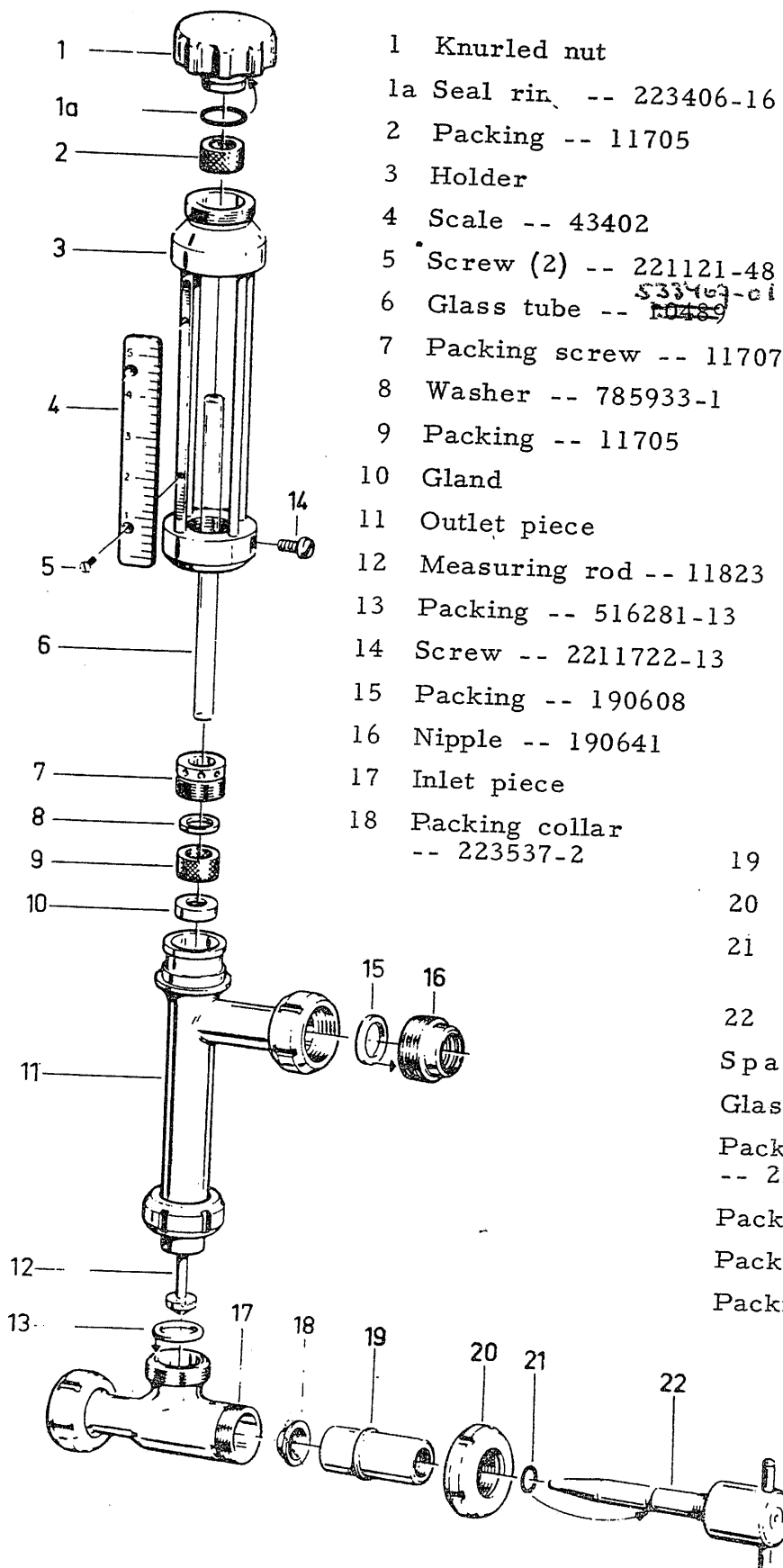


- 1 Knurled nut
- 1a Seal ring -- 223406-16
- 2 Packing -- 11705
- 3 Holder
- 4 Scale -- 43402
- 5 Screw (2) -- 221121-48
- 6 Glass tube -- 10489
- 7 Packing screw -- 11707
- 8 Washer -- 785933-1
- 9 Packing -- 11705
- 10 Gland
- 11 Outlet piece
- 12 Measuring rod -- 528345-83
- 13 Packing -- 516281-13
- 14 Screw -- 2211722-13
- 15 Packing -- 190608
- 16 Nipple -- 190641
- 17 Inlet piece
- 18 Packing collar -- 223537-2

- 19 Screw sleeve
- 20 Coupling nut
- 21 Seal ring -- 223404-4
- 22 Valve spindle
- Spare parts
- Glass tube (2) -- 10489
- Packing collar (2) -- 223537-2
- Packing (2) -- 11705
- Packing (2) -- 190608
- Packing -- 516281-13



FLOW METER with regulating valve, of stainless steel -- 526729-84
(for connection to unthreaded pipes)



- 1 Knurled nut
- 1a Seal rin. -- 223406-16
- 2 Packing -- 11705
- 3 Holder
- 4 Scale -- 43402
- 5 Screw (2) -- 221121-48
- 6 Glass tube -- 10489
- 7 Packing screw -- 11707
- 8 Washer -- 785933-1
- 9 Packing -- 11705
- 10 Gland
- 11 Outlet piece
- 12 Measuring rod -- 11823
- 13 Packing -- 516281-13
- 14 Screw -- 2211722-13
- 15 Packing -- 190608
- 16 Nipple -- 190641
- 17 Inlet piece
- 18 Packing collar -- 223537-2

- 19 Screw sleeve
- 20 Coupling nut
- 21 Seal ring -- 223404-4
- 22 Valve spindle
- Spare parts
- Glass tube (2) -- 10489
- Packing collar (2) -- 223537-2
- Packing (2) -- 11705
- Packing (2) -- 190608
- Packing -- 516281-13

(Flow meter with regulating valve ..., page 2)

The scale of the flow meter is graduated neither in percent nor in volume per hour. Such a graduation would — since the deviation is influenced by the viscosity — only apply to a certain composition and temperature of the measured liquid.

Values corresponding to the graduation must be determined by tests. To ensure that these values remain correct, the output, the composition of the separated liquid and the temperature must of course be almost constant. The values thus obtained will be valid only for the meter they have been measured on.

The throughput can be regulated during separation by means of the regulating valve of the flow meter. The table below shows the approximate flow through the meter in tests with water:

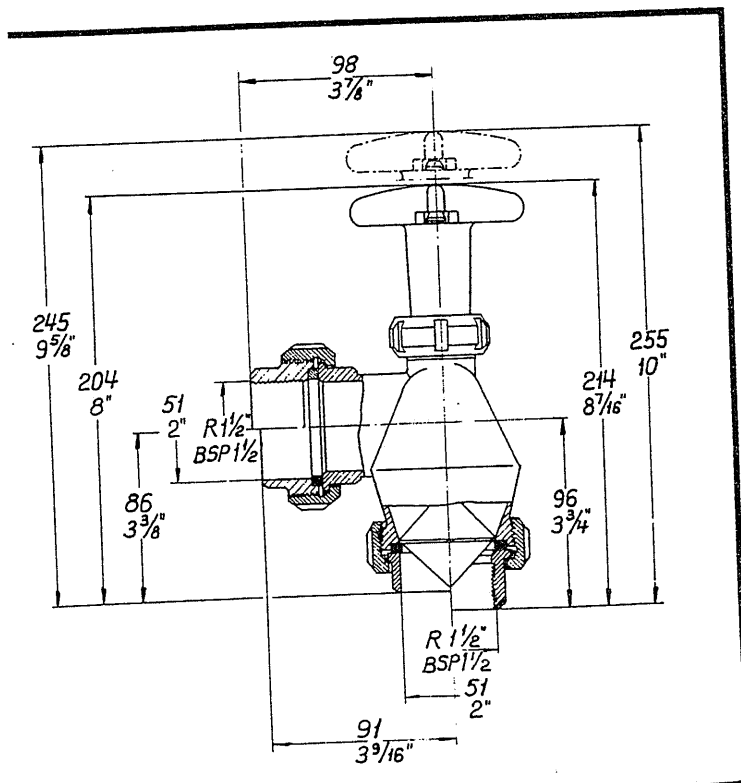
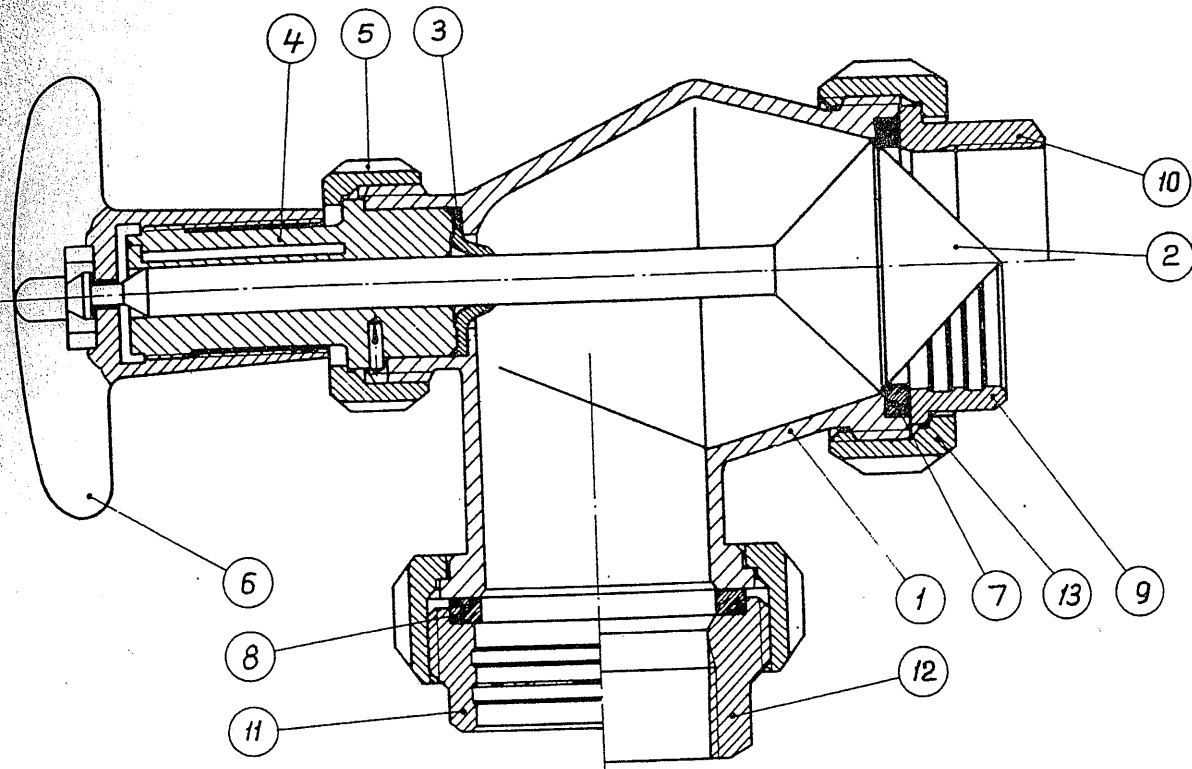
Flow meter
-- 526729-83

Meter graduation	Flow	
	lit/h	UK gal/h
1	1500	330
2	2000	440
3	2500	550
4	2900	640
4, 6	3400	750

1	200	44
2	260	57
3	330	73
4	380	84
4, 6	450	100

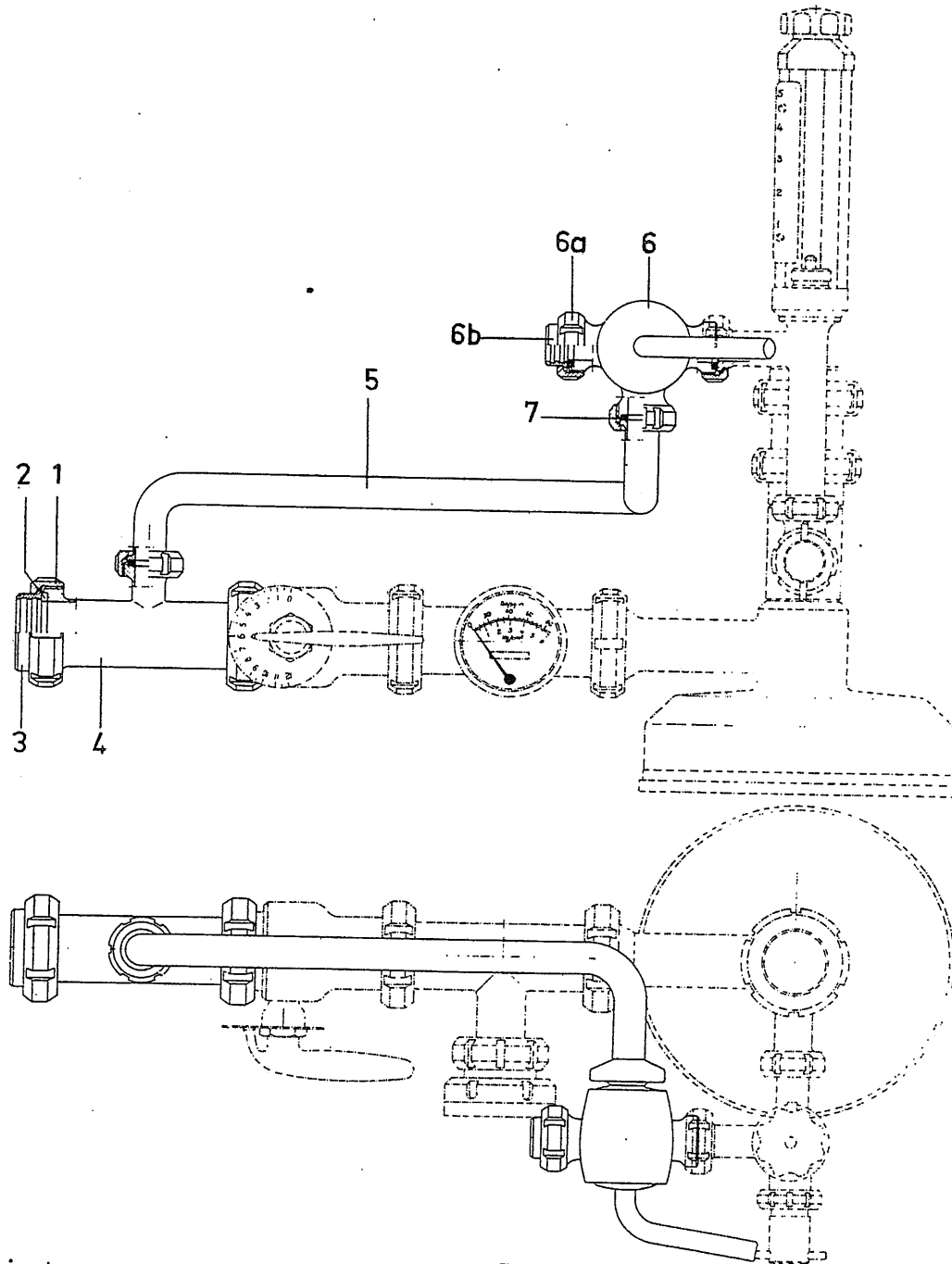
Flow meter
-- 526729-84

REGULATING VALVE of STAINLESS STEEL (without connection parts) -- 74414



- 1 Valve housing
 - 2 Valve cone
 - 3 Packing collar -- 74494
 - 4 Valve bushing 74425
 - 5 Coupling nut
 - 6 Hand wheel 74425-03
 - 7 Packing -- 71068
 - 8 Packing -- 71068
 - 9 Sleeve (plain pipes) -- 190630
 - 10 Sleeve (threaded pipes) -- 72234
 - 11 Nipple (plain pipes) -- 190644
 - 12 Nipple (threaded pipes) -- 72226
 - 13 Coupling nut -- 190616
- Spare parts:
- Packing collar -- 74494
 - Packing (2) -- 71068

REMIXING DEVICE - 526763-80



Parts list

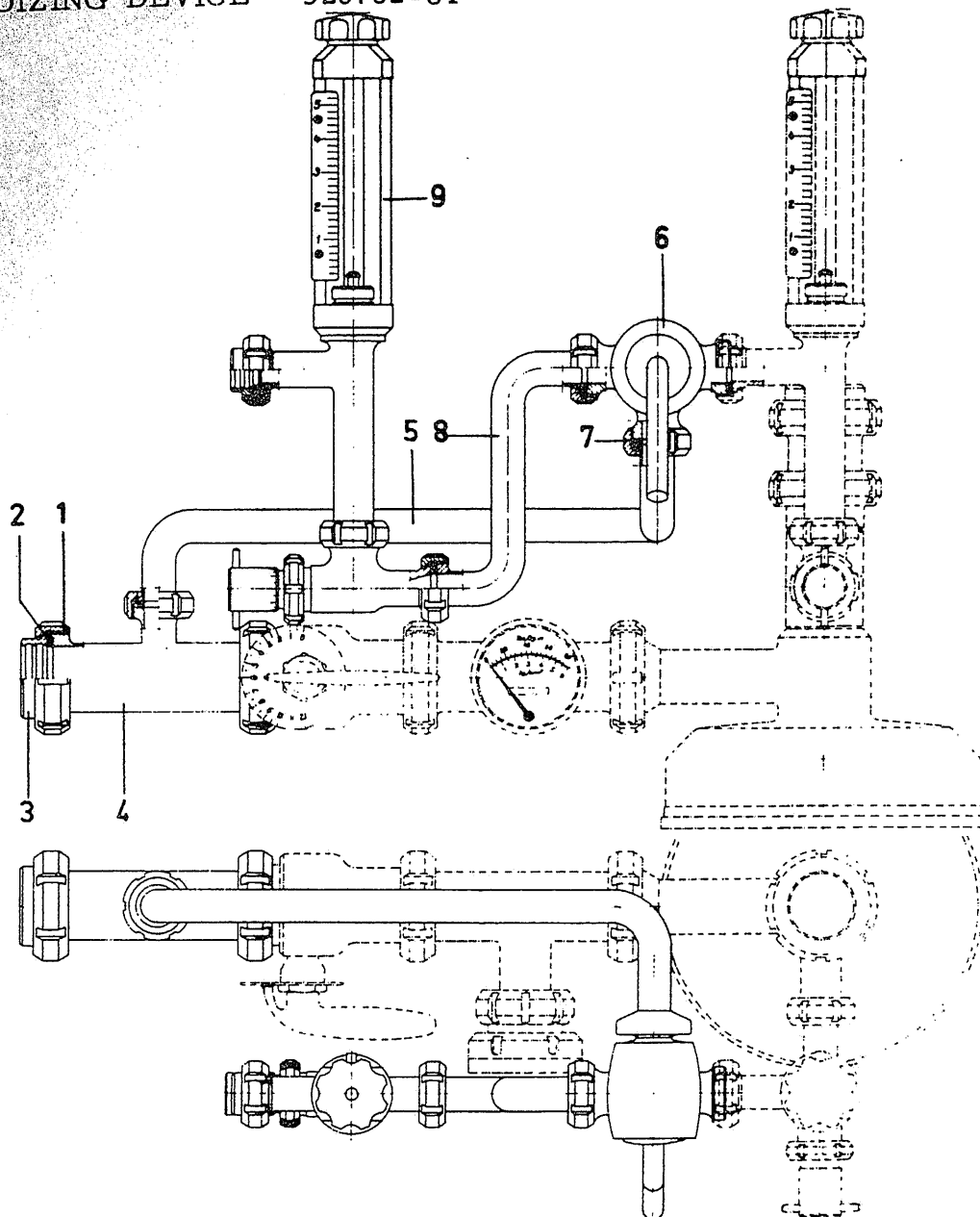
1. Coupling nut - 190616
2. Packing - 71068
3. Sleeve - 190630
4. T-piece - 526741-80
5. Return pipe - 526749-80
6. Three-way cock - 191631
- 6a. Coupling nut - 190613
- 6b. Sleeve - 190627
7. Packing (4) - 190608

Spare parts

2. Packing - 71068
7. Packing (4) - 190608

See MILK CLEANING in chapter K.

STANDARDIZING DEVICE — 526762-81



Parts list

- 1-6 see Remixing Device
- 7. Packing (5) — 190608
- 8. Double-elbow — 526746-80
- 9. Cream flow meter — 526729-84
(for single parts see chapter X)

Spare parts

- 2. Packing — 71068
- 7. Packing (5) — 190608

See STANDARDIZATION chapter K.

Adjust by means of the valves of the cream flow meters.

Quantity of remixed cream = the difference between the total cream quantity and the quantity of cream carried off.

Keep the throughput constant.

Always check the fat content of the standardized milk.