

USE INSTRUCTIONS

For two speed gearbox
CE series
23.12.....
23.14.....

Before the setting at work, follow carefully this guide !



It is allow only to experts, who examined the instructions,
to work on the gearbox

Responsability and warranty are excluded when:


- Warning and use instructions are not followed
- The gearbox is set at work in a wrong way
- The gearbox maintenance is not followed correctly
- Function modifications of every kind are introduced without the manufacturer authorization
- Original spare parts are not used

NOTE:



- The sign points out operations of special care
- A wrong process can cause damage to the gear box
- Wrong process can endanger the safety of the operator



INDEX	Gearbox Type CE	OE001-e
		PAGE
1.	Gearbox structure	2
1.1	Version for splash lubrication	2
1.2	Variations for oil forced lubrication	3
1.3	Outlet shaft bearing	4
2.	Setting at work	5
2.1	Advices for transportation	5
2.2	Data number plate	5
2.3	Conditions at delivery	6
2.4	Technical data	7
2.5	Operation running condition	8
2.6	Main motor specification	10
2.7	Assembling positions and lubrications	11
2.8	Gearbox motor connection and assembly	15
2.9	Electrical section	19
3.	Maintenance	21
3.1	Lubrication and control	21
3.2	Failures research and repairs	22
3.3	Disassembly/assembly	24
3.4	Spare parts list	32
July 1998	 BARUFFALDI S.p.a. San Donato Milanese	PAGE 1/34
	ITALY	

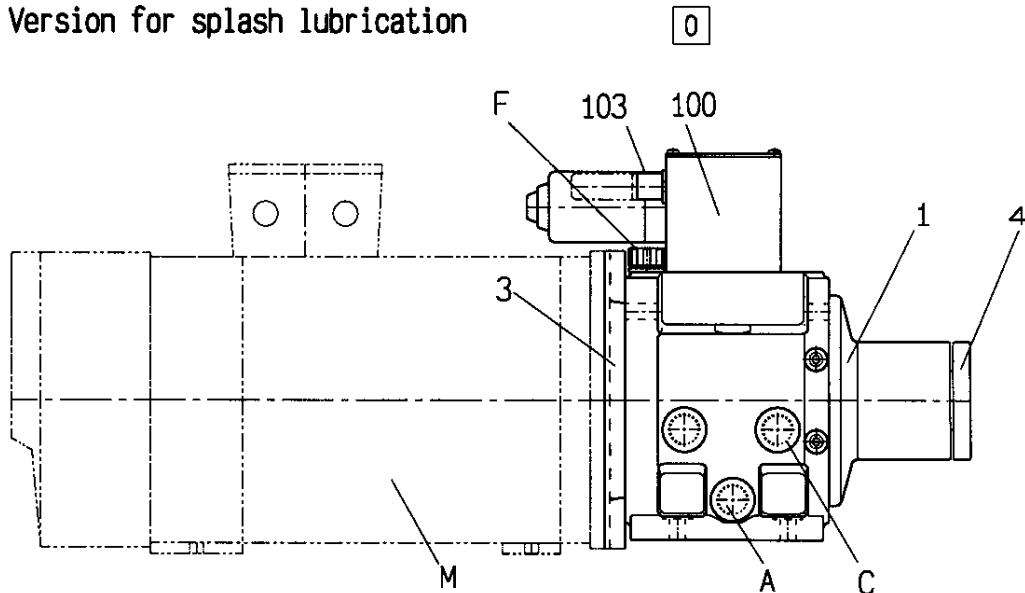
1. Gearbox structure

Gearbox
type CE

CE001-e

1. Gearbox structure

1.1 Version for splash lubrication



Code:

		1	0	
--	--	---	---	--

4 = Output shaft [1]

4a = Output shaft [2]

1 = Casing

3 = Flange

100 = Actuator and data number plate

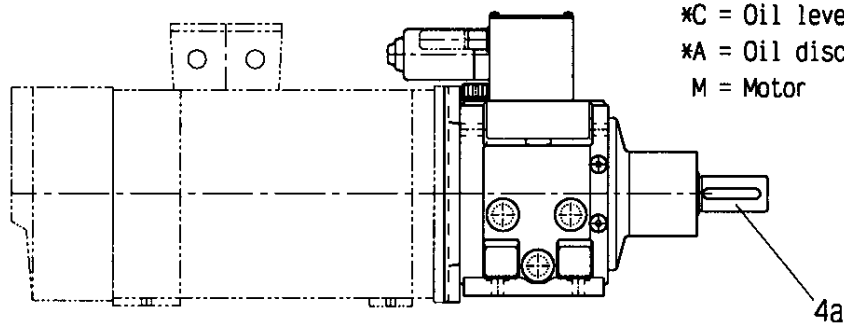
103 = Electrical connector

*F = Oil loading plug and vent valve

*C = Oil level warning light

*A = Oil discharge

M = Motor



Code:

		2	0	
--	--	---	---	--

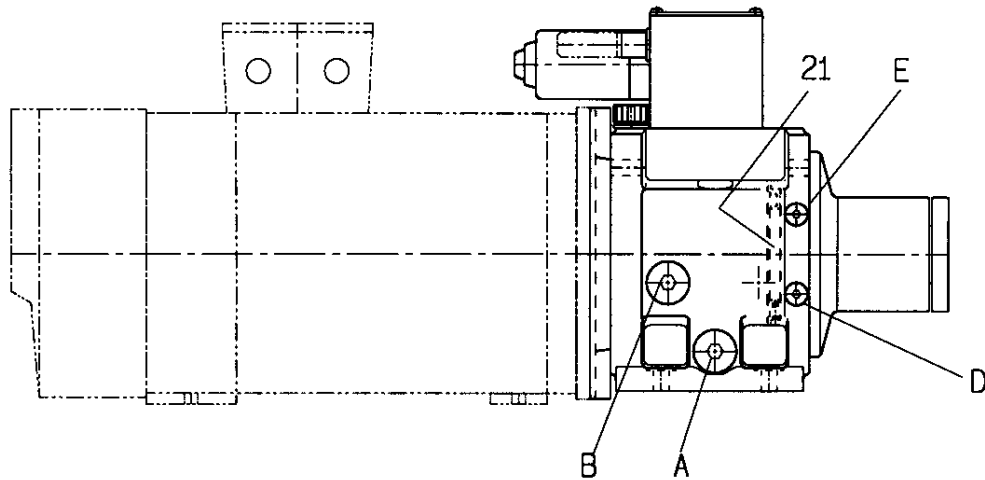
The motor(M) is fixed on the gearbox casing (1) through the interposition of the flange(3); for some versions, this constitutes only a center square element, therefore is not visible. The casing (1) is normally fixed on the machine. On the output shaft (4) or (4a) is normally fixed the pulley for the motion transfer. The electrical connection has to be made on the connector (103)

The indicated function with(*), must be made only for OPP orizontal assembly position. For other assembly position see chapter 2.7.



1.2 Variations for forced lubrication

1



Code:

		1	1	
--	--	---	---	--

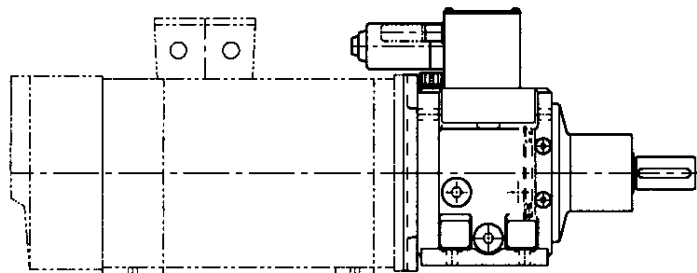
21 = Distributor (inside)

*B = Oil feedeng choke for elements
lubrication in inlet

*E = Oil feeding for central unit lubrication

*D = Oil feedeng for elements lubrication
in outlet

*A = Oil discharge



Code:

		2	1	
--	--	---	---	--

The indicated function with(*), must be made only for OPP horizontal assembly positions.
For other assembly positions see chapter 2.7



1.3 Output shaft bearings

In the table 1 are indicated the bearings mounted on the output shaft with the related loading capacity values.

These elements, added to the data on table 2, allow to determinate the bearings life in function of the resulting load F_a of its position and of the r.p.m.

Table 1

Gearboxes	Bearings X		Bearings Y	
	Type	Basic load ratings dynamic N	Type	Basic load ratings dynamic N
CE 12	NUP208ECP	53900	NU2208ECP	70400
CE 14	NUP211ECP	84200	NU2211ECP	99000

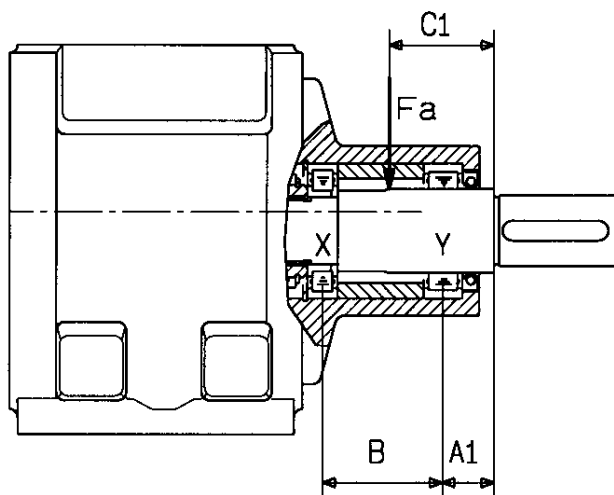
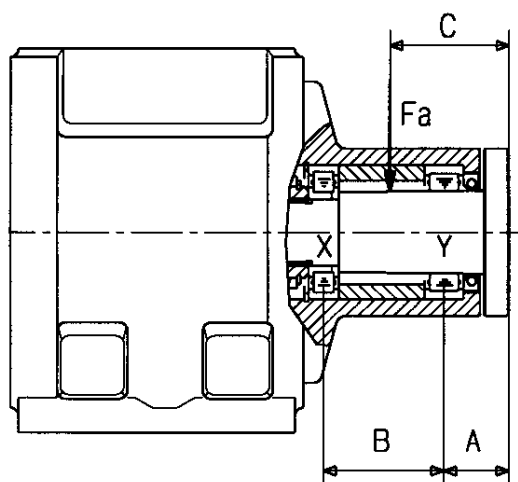


Table 2

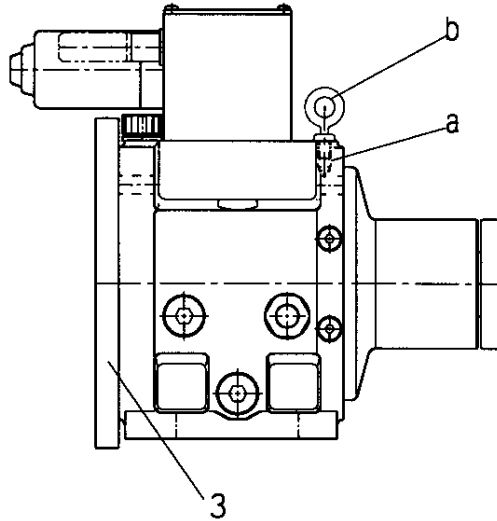
mm	CE12	CE14
A	39	47.5
A1	24	27.5
B	71.5	87
C	48-70	57-87
C1	33-55	37-67

F_a = Resulting radial force
in the other words belt-pull

C e C1 indicate the suggested
position of F_a force

2. Setting at work

2.1 Advices for the transportation

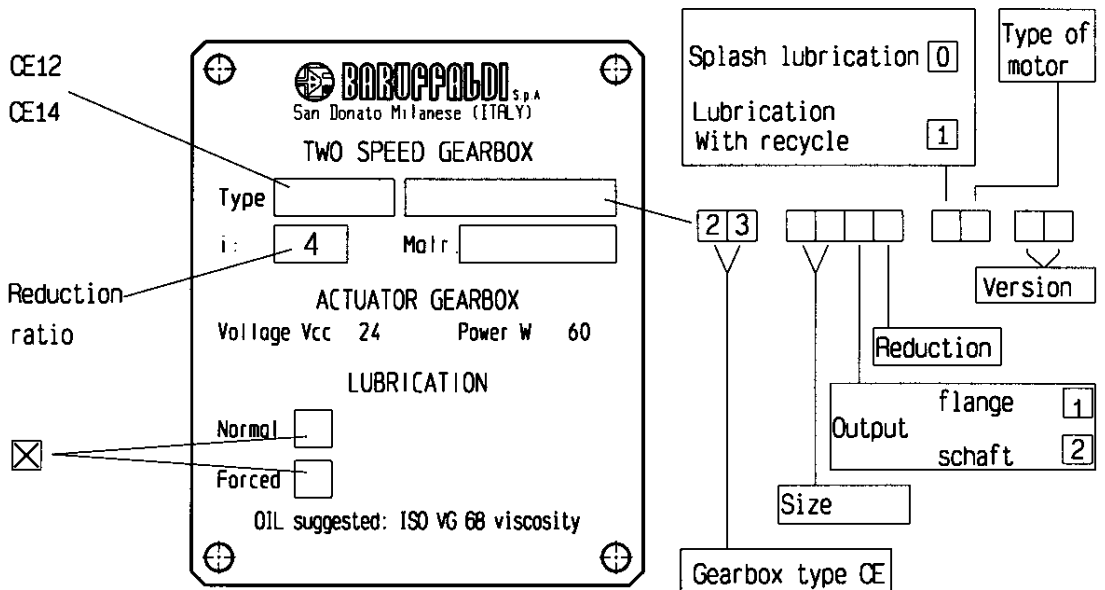


a = Hole for eyebolt
b = Eyebolt (excluded for the supply)
3 = Flange

Table 3

Gearboxes	Dimension hole for eyebolt	Weight of the gearbox Kg.
CE 12	M 10	47
CE 14	M 12	90

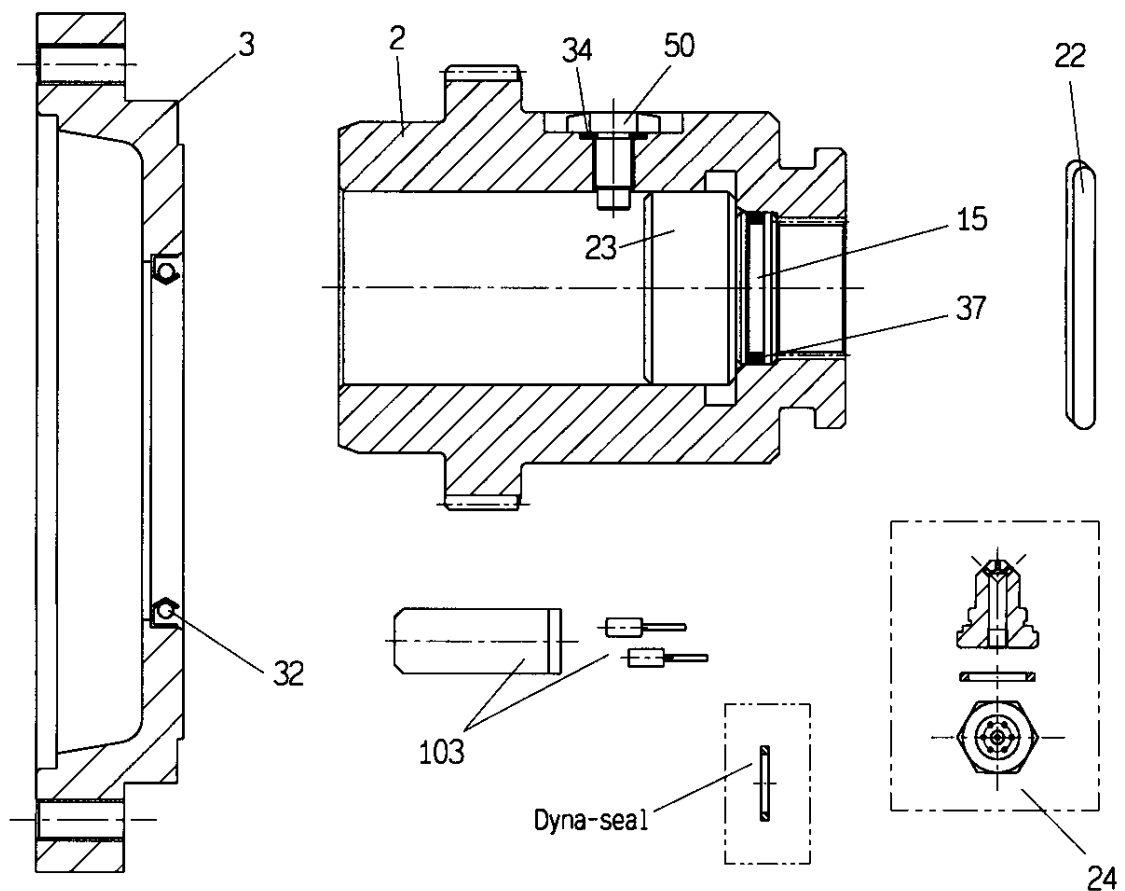
2.2 Data plate



2.3 Conditions at delivery

Further to the instruction manual the gearbox is delivered with:

- Flange(3) corresponding to the ordered motor complete with rotating seal (32)
- Pinion (2) corresponding to the ordered motor
- Locking screw (50)
- O-ring (34)
- Seeger ring (40)
- Plug (15)
- O-ring (37)
- insert for balancing (22)
- Electrical connector (103) complete with the plug and corresponding pins
- Choke (24) complete with washer: it is delivered only with version prepared for forced lubrication
- Spacer only if required
- Washer (Dyna-seal): only for special versions (see 2.8.2 pic. 8a)



At the delivery the gearbox is engaged with the second speed

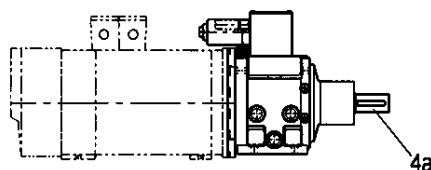


The gearbox is delivered without oil: before the put in function provide to fill it or to install the forced lubrication as described in chapter 3,1.

2.4 Technical data

Size	CE 12		CE 14	
	(i = 4)	(i = 5)	(i = 4)	(i = 5)
Nominal rating KW	22	22	50	50
Nominal torque inlet Nm	140	140	325	280
Max torque (S6) inlet Nm	160	160	400	325
Nominal torque (S1) outlet = 1:1 Nm	140	140	325	325
Nominal torque outlet Nm	i=4	X	1300	X
	i=5	X	700	1400
* Max number of revolution inlet (RPM)	9000	9000	7000	7000
Moment of inertia of the masses referred to the inlet Kgc ^m 2	i = 1	215	215	750
	i = 4	32	X	115
	i = 5	X	X	X

* See chapter 2.7 (assembly position and lubrications)

The outlet shaft (4a) of the gearboxes type 2
is balanced with half key

Codice:

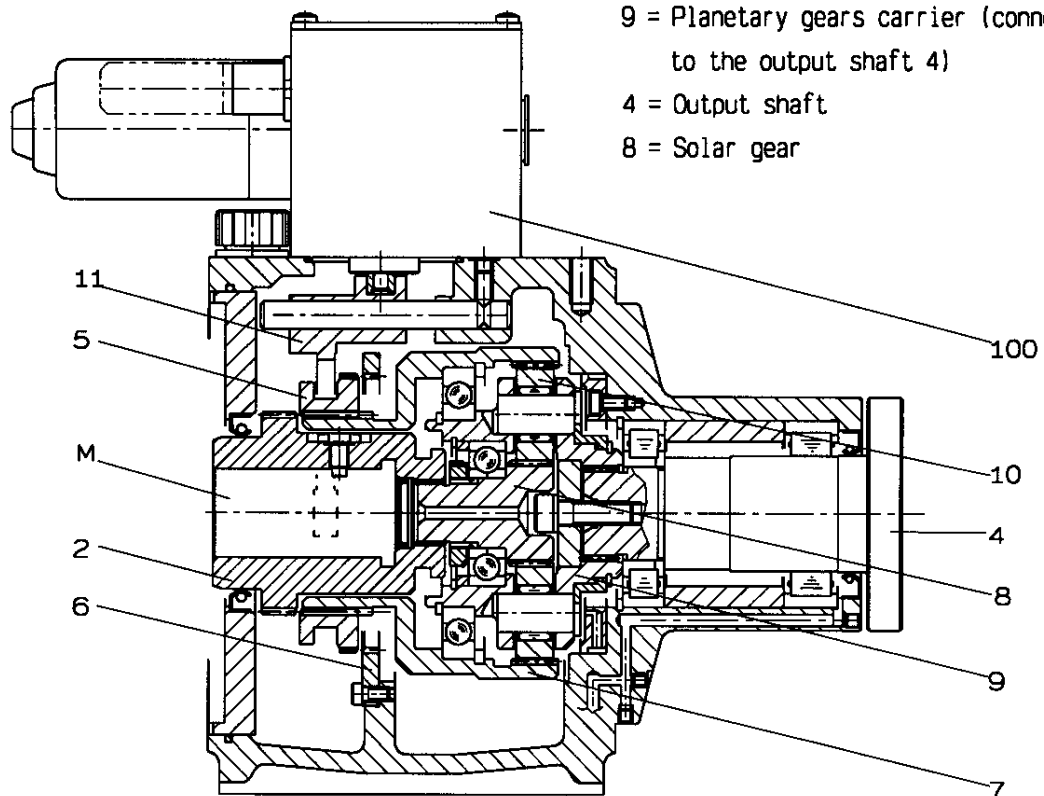
		2		
--	--	---	--	--

2.5 Operating running condition

The actuator (100), through the fork (11), has the function to move the sliding sleeve(5) to engage or the pinion (2) or the fixed crown (6). The ratio is fixed by the position of the sliding sleeve.

- M = Motor
- 2 = Pinion (connected to the motor M)
- 5 = Sliding sleeve
- 11 = Fork
- 6 = Fixed crown
- 100 = Actuator
- 7 = Gear
- 10 = Planetary gears
- 9 = Planetary gears carrier (connected to the output shaft 4)
- 4 = Output shaft
- 8 = Solar gear

Picture 1



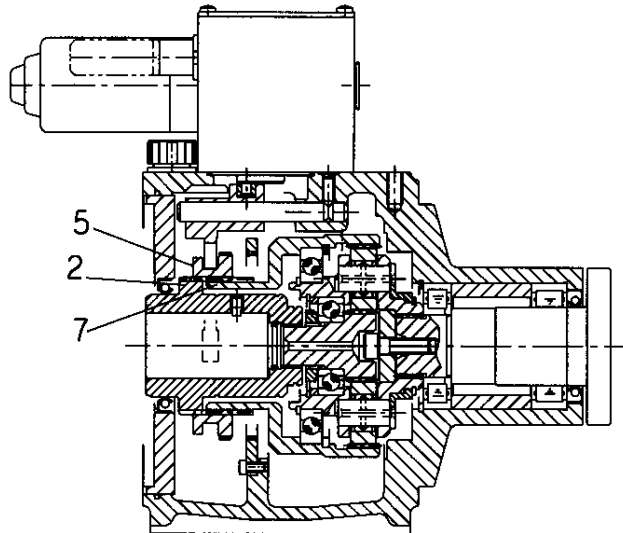
2.5.1 Gearbox in neutral position pic.1

The sliding sleeve in central position, disengaged either from the pinion(2) or from the crown(6). The motor (M), through the pinion (2), transmits the rotation to the solar gear (8) which through the planetaries(10) , brings in rotation the gear (7) while the planetary gears carrier (9) and the output shaft (4) are non interested in the rotation except a limited dragging due to the frictions.

2.5.2 Gearbox in ratio 1:1 (pic2)

Sliding sleeve (5) engaged with the pinion (2).

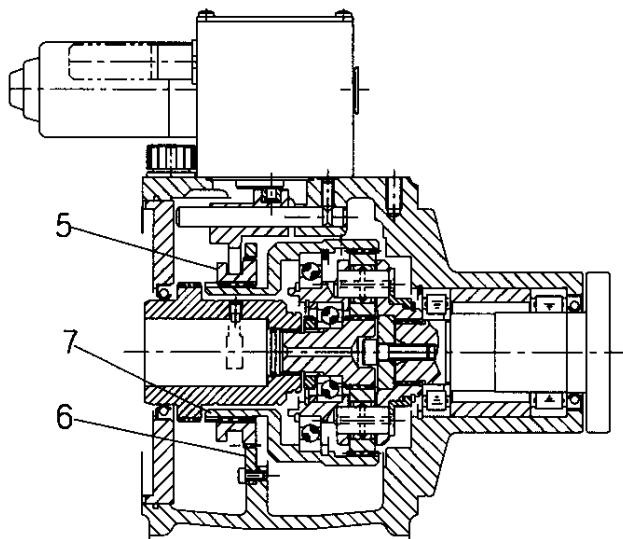
The pinion (2), connected to the solar (8) and integral, through the sliding sleeve (5), to the gear (7), transmits the motor rotation (M) to the planetary gears carrier (9) and thus to the output shaft (4) with ratio 1:1.



Pic.2

2.5.3 Gearbox in reduction (pic.3)

The sliding sleeve (5) engaged with the fixed crown (6) stops the rotation of the gear (7). The motor (M) through the pinion (2) and the solar gear (8), brings in rotation the planetary gears (10), which by rotating in the internal tothing of the locked gear (7) put the planetary gears carrier (9) in rotation and thus the output shaft with ratio in reduction.

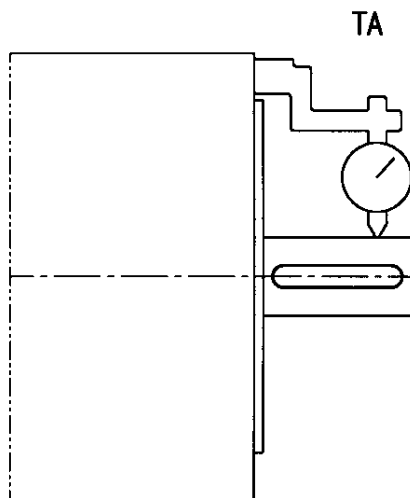


Pic.3

2.6 Main motor specifications

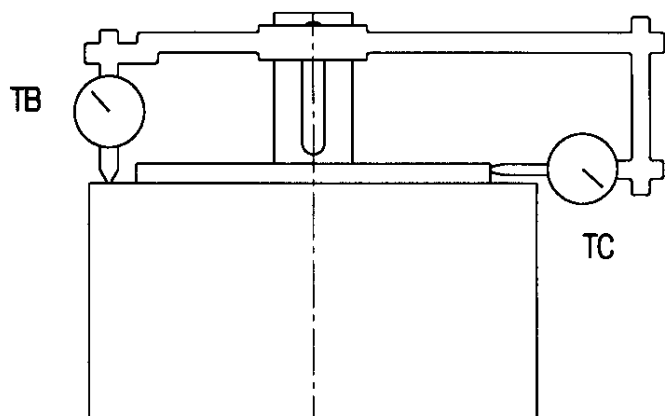
The motor which has to be applied to the gearbox has to be in accordance with the following specifications:

- Dimensions and power admitted by the gearbox
- Motor form B3/B5 for horizontal assembly positions (in order to reduce flexions and vibrations the motor has to be supported in the back side)
- Motor form V1/V3 for vertical assembly positions
- Motor without seal on the shaft
- Tolerances TA/TB/TC as per DIN 42955R
- Vibration level R.



Tolerance DIN 43955R

Dimension motor	TA mm	TB mm	TC mm
112	0.025	0.050	0.050
132	0.025	0.063	0.063
160	0.030	0.063	0.063




2.7 Assembly positions and lubrications

The different assembling positions define also the ways of lubricating. The splash lubrication (standard) is foreseen only for horizontal assembling positions (OPP-OPD-OPS) and RPM limited as per data table 4.

Table 4

SIZE	Maximum RPM input for splash lubrication
CE 12	4500 RPM
CE 14	4000 RPM

For Horizontal assembling positions with higher RPM and for all vertical assembling positions the lubrication must be forced. 

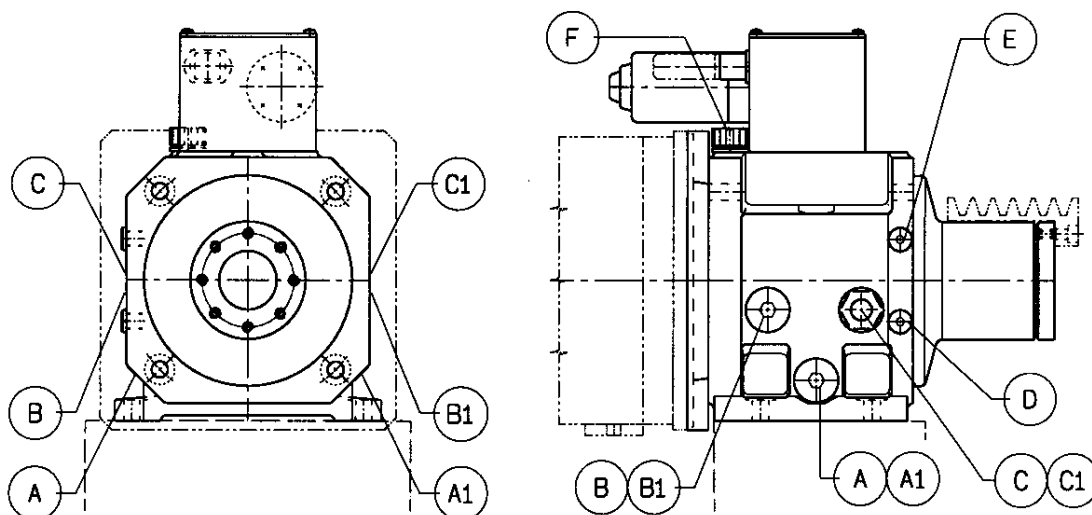
The use of the forced lubrication for any assembling position helps to take out the heat from the gearbox.

If the use foresees low temperature levels the forced lubrication could be integrated with the installation of a heat exchanger in order to cool the oil outside the gearbox.

To define better the measurements necessary to the loss of heat we suggest to analyse the problem during the test of the machine, because the heat which is generated it depends from the speed and the time of functioning.

The gearbox can stand, without troubles, temperatures up to 100° (oil 190°)

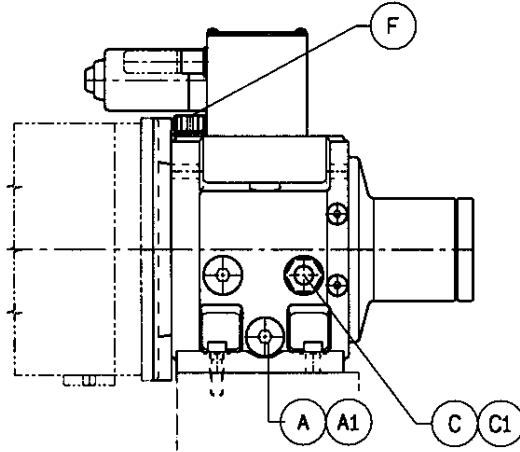
2.7.1 Service holes



SIZE	A/A1	B/B1	C/C1	D	E	F
CE 12	3/4" G	3/4" G	3/4" G	1/4" G	1/4" G	3/8" G
CE 14	3/4" G	3/4" G	3/4" G	1/4" G	1/4" G	3/8" G

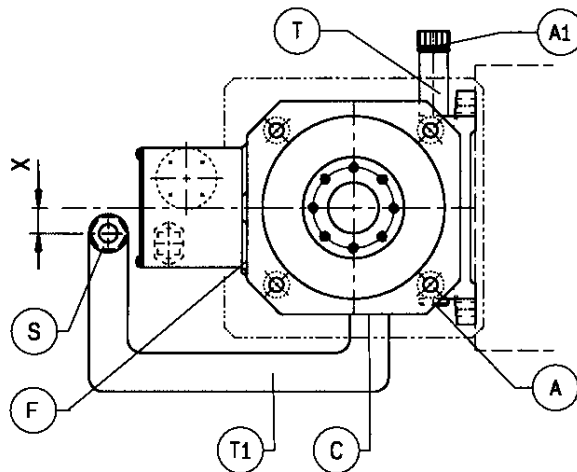
2.7.2 Horizontal assembling positions and splash lubrication

- Assembling position OPP



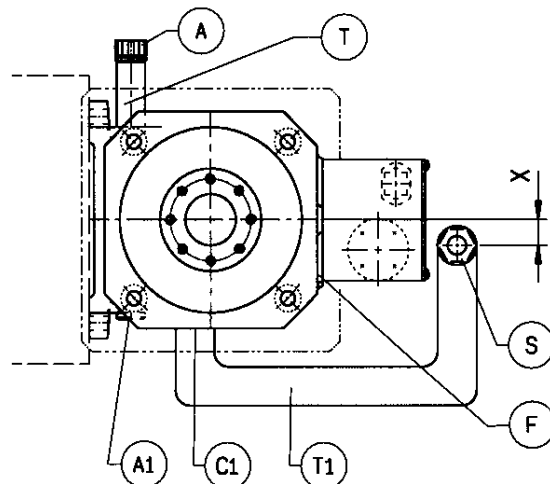
F = Oil loading plug/vent valve
C/C1 = Oil level
A/A1 = Oil drain plug

- Assembling position OPD



A1 = Oil loading plug/vent valve
S = Oil level: it must be located at a dimension X and in communication with the hole C with proper pipes T1
A = Oil drain plug
X = Oil level dimension
(CE12 = 25 mm - CE14 = 40 mm)
F = To be plugged
T = Pipe

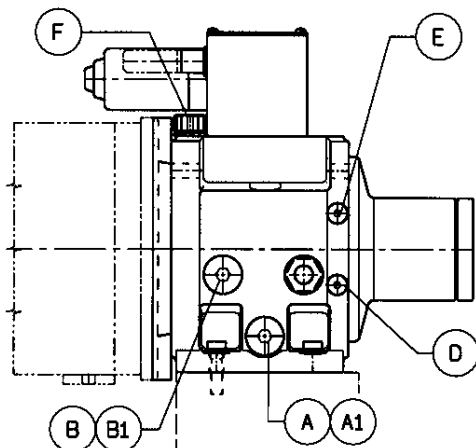
- Assembling position OPS



A = Oil loading plug/vent valve
S = Oil level: it must be located at a dimension X and in communication with the hole C1 with proper pipes T1
A1 = Oil drain plug
X = Oil level dimension
(CE12 = 25 mm - CE14 = 40 mm)
F = To be plugged
T = Pipe

2.7.3 Horizontal assembling positions and forced lubrication

- Assembling position OPP

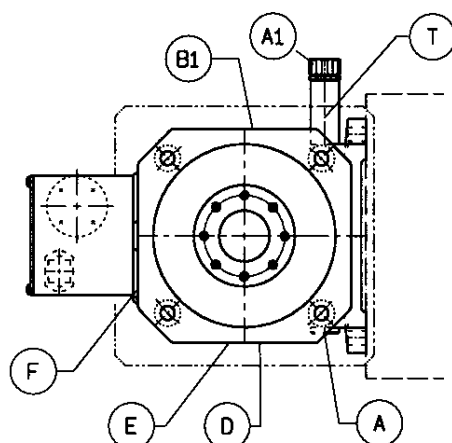


A/A1 = Oil drain plug
B/B1 = Forced lubrication input for elements
in inlet using a choke (24) (0,4-0,5) lt/min

E = Forced lubrication for the central
group (0,4-0,5 lt/min)

D = Forced lubrication for elements
in outlet (0,4-0,5 lt/min)

F = Vent valve



A = Oil drain plug

A1 = Vent valve

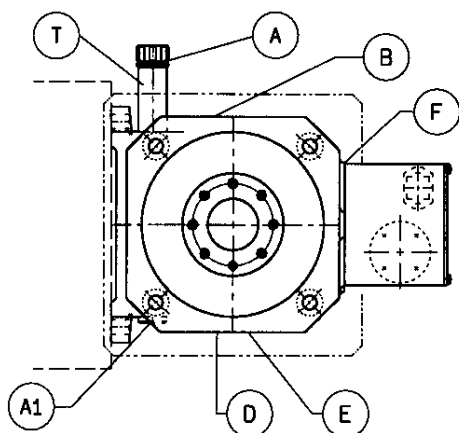
T = pipe

B1 = forced lubrication input
for elements in inlet using
a choke (24) (0.4-0.5 lt/min)

E = Forced lubrication for the central
group (0.4/0.5 lt/min)

D = Forced lubrication for elements in
outlet (0.4/0.5 lt/min)

F = To be plugged



A1 = Oil drain plug

A = Vent valve

T = pipe

B = Forced lubrication input
for elements in inlet using
a choke (24) (0.4-0.5 lt/min)

E = Forced lubrication for the central group
(0.4-0.5 litri/min)

D = Forced lubrication for elements
in outlet (0.4-0.5 lt/min)

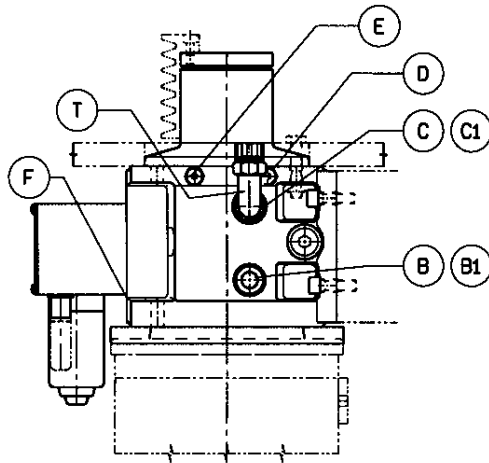
F = To be plugged

The pipe to be connected to the oil drain hole A/A1 has to have smooth internal surfaces in order to permit the oil to flow without difficulty and without creating an oil head in the gearbox (it is suggested to use a transparent pipe with internal diameter of 20 mm minimum).



2.7.4 Vertical assembling positions and forced lubrication

- Assembling position VFA/VPA (motor below and output to the high)



E = Forced lubrication for the central group
(0.6-0.7 lt/min)

D = Forced lubrication for elements
in outlet (0.6-0.7 lt/min)

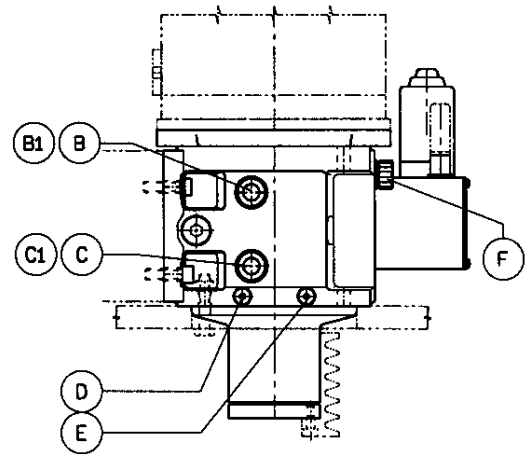
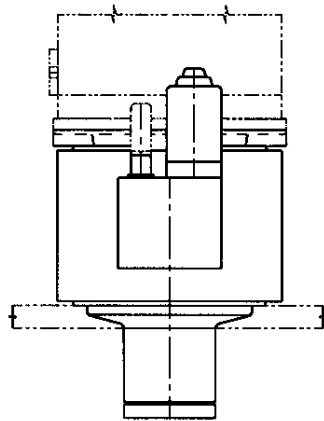
C/C1 = Vent valve

T = Pipe for the vent valve

B/B1 = Oil drain plug

F = To be plugged

- Assembling positions VPB/VFB (motor on the top and gearbox output below)



B = Forced lubrication for the elements in inlet with use of a choke (24)
(0.6-0.7 lt/min)

B1 = Forced lubrication for the elements in inlet with use of a choke (24)
(0.6-0.7 lt/min)

C/C1 = Oil drain plug

F = Vent valve

D = Oil suction in case of cooling circuit

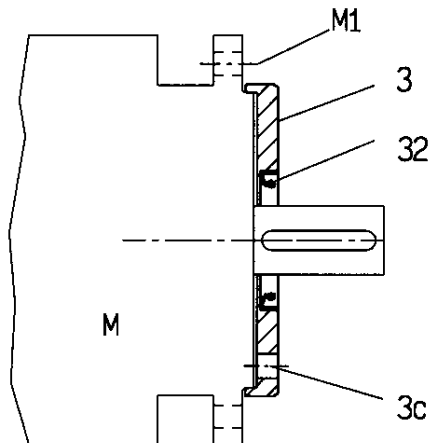


The pipe to be connected to the oil drain hole B/B1-C/C1 has to have smooth internal surface in order to permit the oil to flow without difficulty and without creating an oil head in the gearbox (it is suggested to use a transparent pipe with internal diameter of 20 mm. minimum).

2.8 Gearbox motor connection and assembly

2.8.1 Motor flange assembly

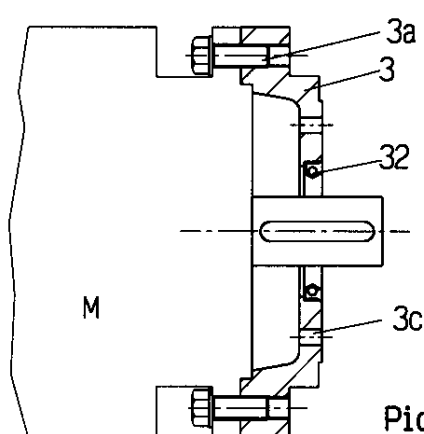
The motor has to be assembled to the gearbox through a flange (3).
For some motors with fixing holes diameter coincident with those of the gear box, the flange is only a centering element, therefore the flange has to be assembled on the motor as per pic. 4



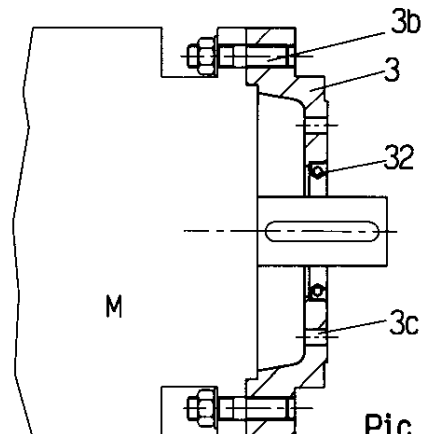
3 = Flange
M = Motor
32 = Rotating seal
M1 = Fixing holes

Pic. 4

For motors with fixing holes diameter not coincident with those of the gearbox the flange has to be assembled to the motor as per indications in pic. 5 o pic. 6



Pic. 5



Pic. 6

3 = flange
3a = Screws
32 = Rotating seal

M = Motor
3b = Stud with its nut
3c = Drain hole

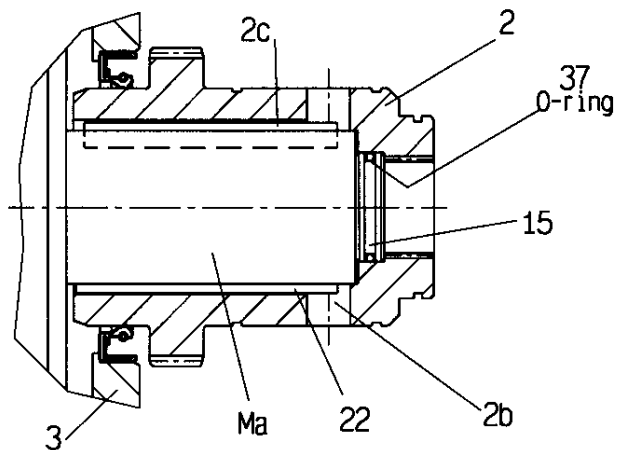
For horizontal assembling position the drain hole (3c) on the flange(3c) has to be put on the bottom



2.8.2 Assembly of the pinion to the shaft

Key the pinion (2) to the motor shaft (Ma) as per pictures
7, 8, or 8a

Picture 7



Ma = motor shaft

2 = Pinion

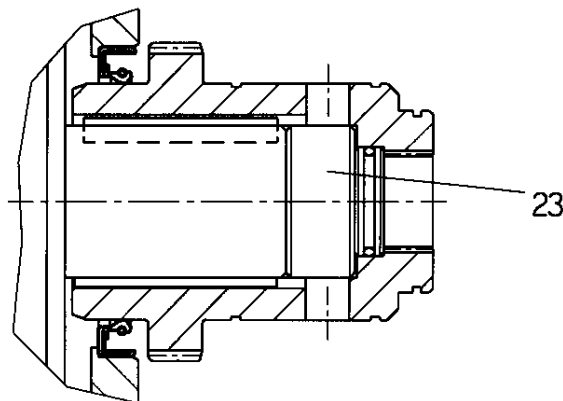
3 = Flange

15 = Plug complete with its O ring

2b = Inspection and extraction holes

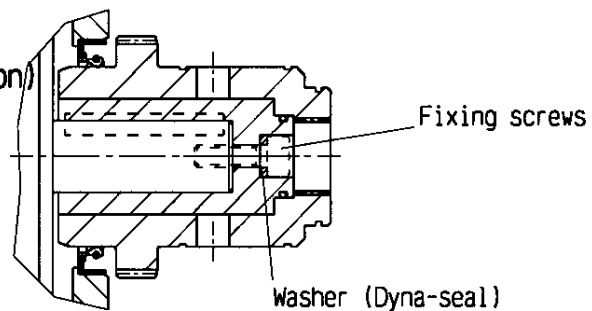
2c = Key

Picture 8

22 = Balancing key (use only for motors
with balanced shaft with half key)

23 = Spacer (only by request)

Picture 8a (special version)



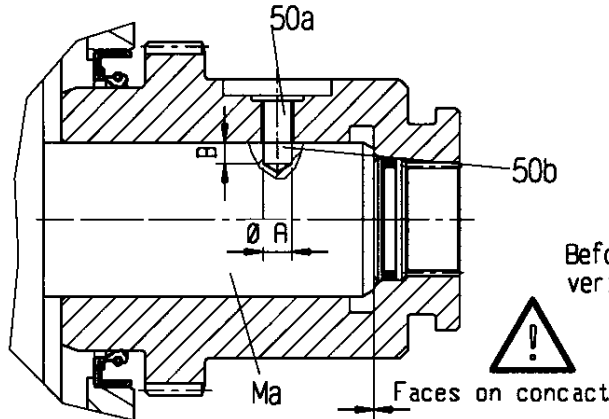
Verify through the holes (7b), that the plug (15) remains in its location



2.8.3

With the pinion against the end of the motor shaft (pic 9), make a hole on the same (50b), as per data table 5.
(This operation has not be done with the special version in pic.8a-chapter 2.8.2.)

Pic. 9



50a = Threaded hole
50b = Hole to be done on the motor shaft
Ma = Motor shaft

Before to drill the hole on the motor shaft verify the mounting dimension Y

Mounting dimension	Y +/- 0.5 mm
CE12	101.5 mm
CE14	138 mm

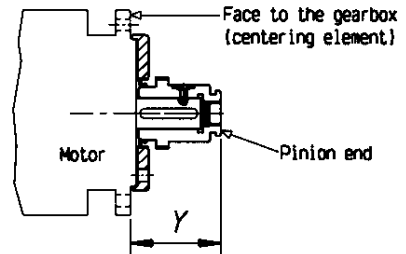
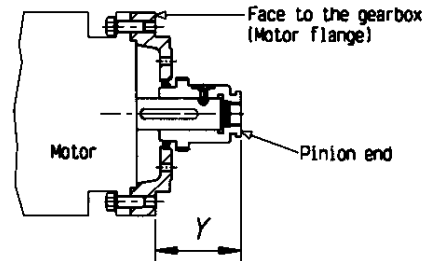


Table 5

Size	Ø A mm	B mm
CE12	6.75	4
CE14	8.5	5

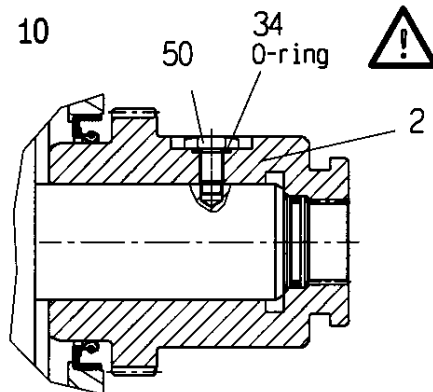


Position the o-ring on the pinion spot-facing.

Tighten the locking screw and verify that the head is in contact with the pinion spot-facing



Pic. 10



2 = Pinion
50 = Locking screw
34 = O-ring



2.8.4 Gearbox assembly to the motor

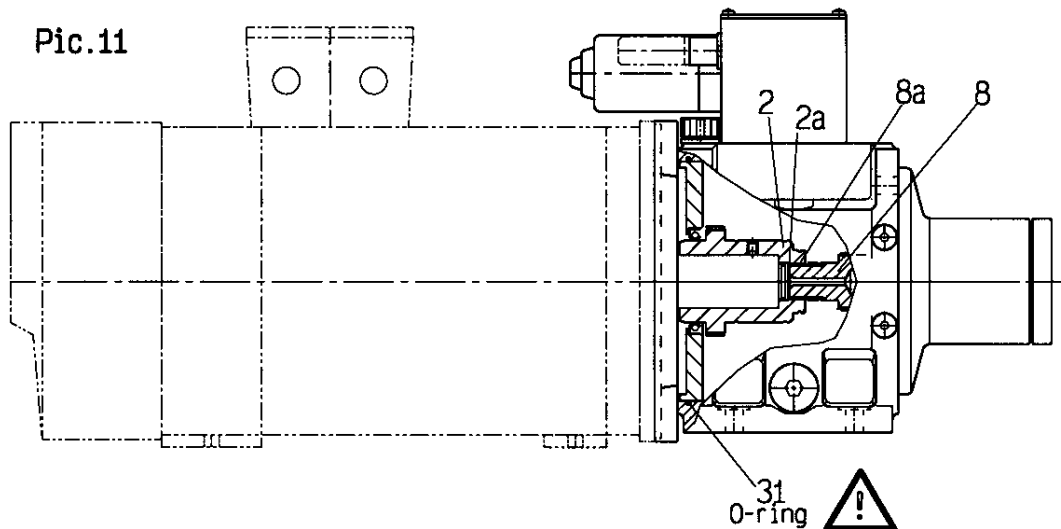
Verify the presence of the O-Ring (31).

Assembly the group motor-flange-pinion so that the extremity part of the pinion(2), which is broached, fits the correspondent part of the solar gear (8) (pic 11).

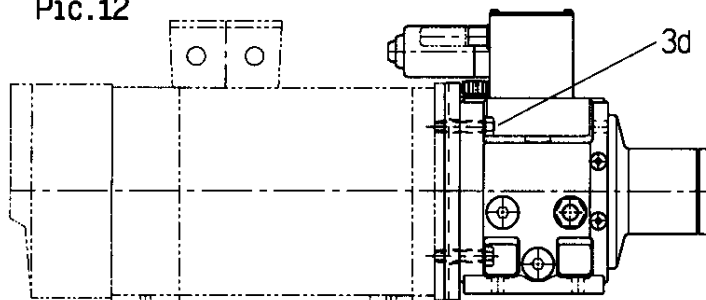
Fix everything through screw (pic12) or through studs and nuts (pic13).

For horizontal assembling positions, in order to reduce flexions and vibrations support the motor in the rear side.

Pic.11

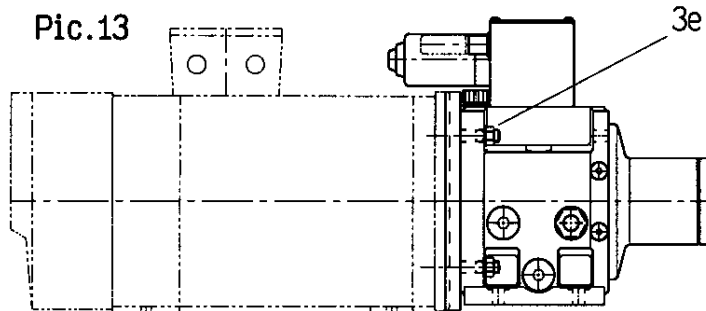


Pic.12



- 2 = Pinion
- 2a = broached extremity
- 8 = solar gear
- 8a = Splined part
- 31 = O-ring
- 3d = Screws
- 3e = Studs and nuts

Pic.13



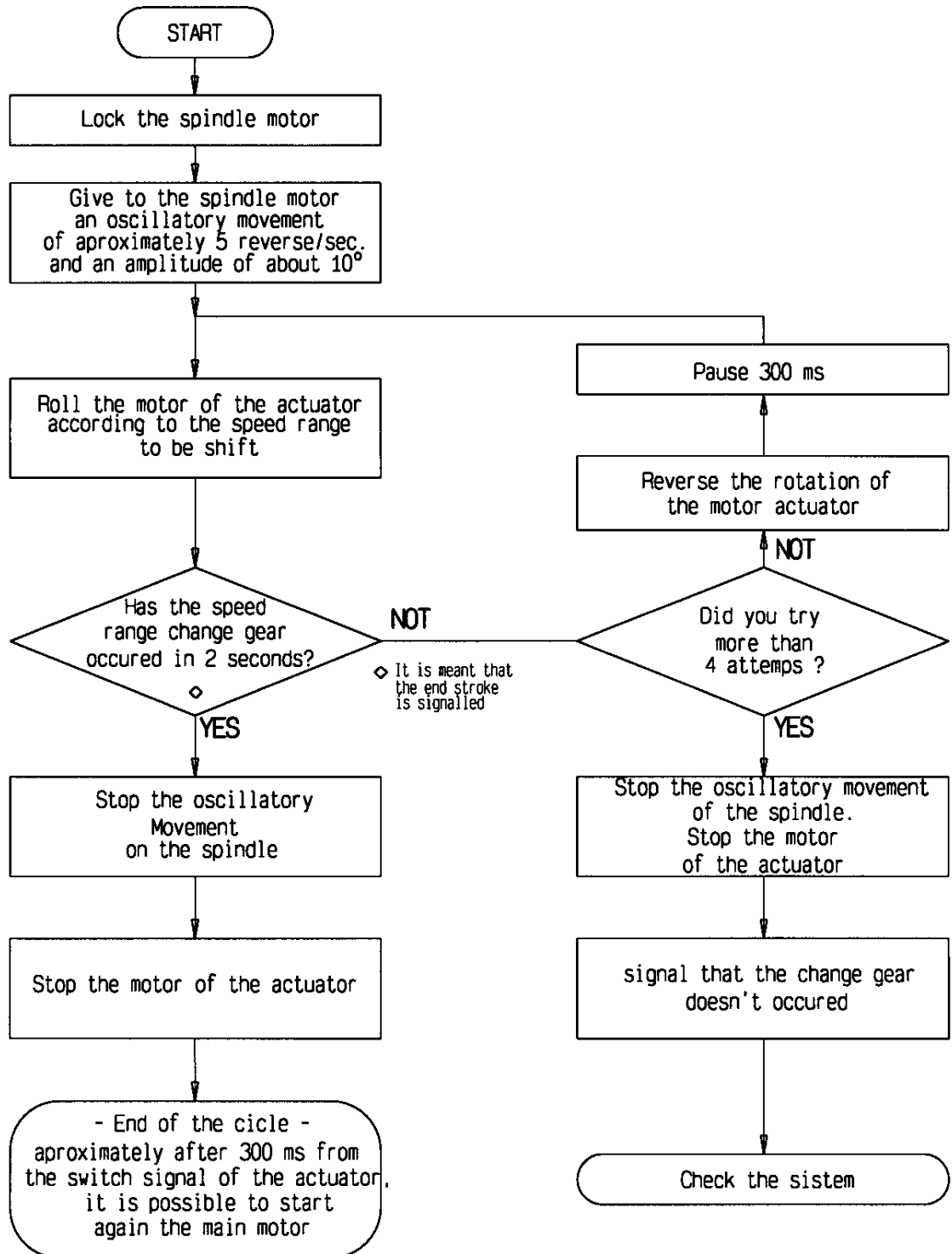
It is suggested the utilisation of keys as per UNI 6741 (DIN 3113)

When the assembly is finished, control that the output shaft rotates free



2.9 Electrical section

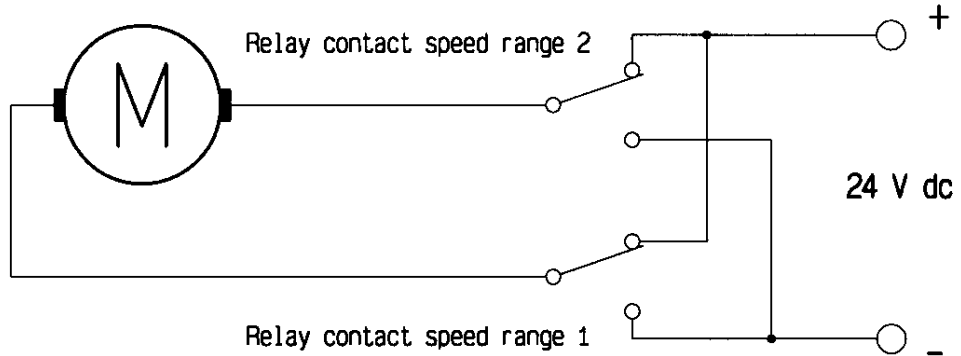
2.9.1 Change gear flow cart



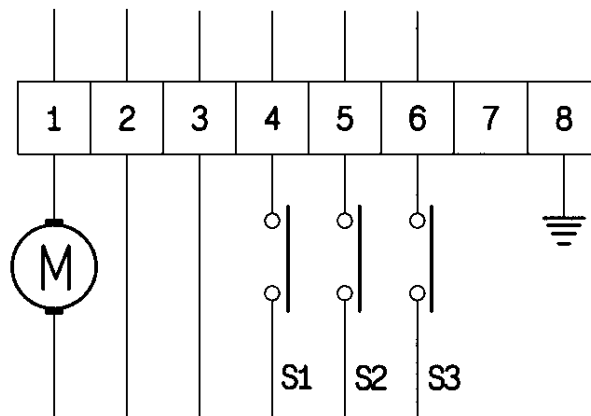
NOTE: If the speed range change gear has not occurred in the prefixed time a safety coupling of motor actuator slips.

2.9.2 Electrical wiring diagram

- Diagram of speed range change gear actuator: this solution avoid the lags due to the inertia of the motor actuator



- Connections on the connector (103) of the actuator (100)

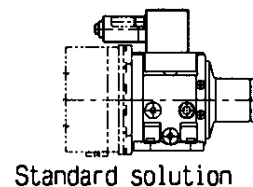


M = Motor actuator (24 Vcc 60 W)

S1 = limit switch range 1

S2 = limit switch range 2

S3 = free wheel position



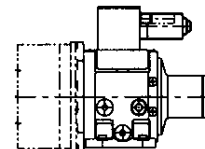
Actuator rotated of 180° respect standard solution

M = Motor actuator (24 Vcc 60 W)

S1 = limit switch range 2

S2 = limit switch range 1

S3 = free wheel position



3.1 Lubrication and control

The gearbox is supplied without oil: before working it is necessary to provide to fill the gearbox with oil.



The oil has to have an ISO VG 68 viscosity compatible with the seals and a good resistance against the corrosion and wear.

Tab.6 Table of lubricant

Mobil	Agip	Esso	IP	BP
DTE oil Heavy Medium	OSO 68	TERESSO 68	TONNA oil T 68	ENERGOL HLP D 68

3.1.1 Horizontal assembling position type OPP and standard lubrication

The necessary quantity of oil is indicated in tab.7

Tab.7

Size	Oil quantity *
CE12	1.1 l
CE14	3 l

These are just fiducial values, because it's necessary to check that the oil arrives ad the middle of the oil level light. It is suggested to control the oil when the gearbox is not in function and if necessary provide to refill the same. Change the oil every 5000 hours and clean the magnetic plug which is on one of the discharge holes (A/A1).



3.1.2 Forced lubrication

The necessary oil flow is of 0,9-1,1 l/min. (20° C) at 2-3 bar

It is advised to use a oil-meter to secure the right flow

Tank volume 25 litres.

Sistematically check the oil deflux. It must be regular not to increase the quantity of oil inside the gear box. (The oil level must not exceed the middle of the outlet hole).



3.2 Failures research and repair

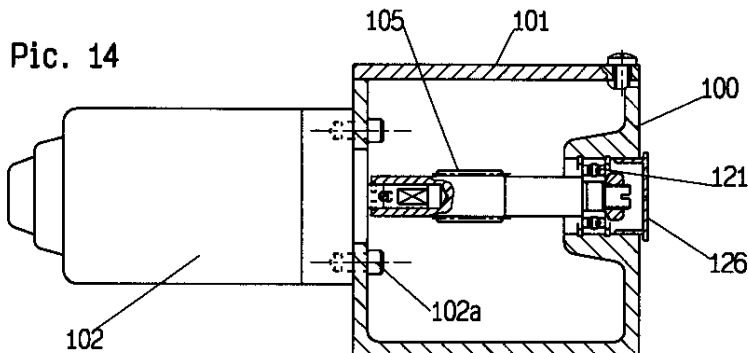
Each operation must be done with gearbox stopped and cold oil and surfaces



Irregularity	Possible cause	Inspection	Remedy
The signal of change of the speed doesn't arrive	Microswitch 125 broken	Verify manually that the microswitch changes status (open-closed)	Change the micro
	Worn micro push road 125	Verify that the micro is operated by the cam 112	Change the micro
	Operating cam backward		Approach the cam to the micro see chapter 3.2.3.
There is no change	Actuator motor (102) broken	Verify the integrity of the motor	Change the motor see chapter 3.2.1.
	No input to the motor (102)	Verify the correct input to the motor (24 V dc)	Restore the electrical input
	During a change the motor (M) hunting is missing	Verify that all phases of diagram are made 2.9.1	Restore all as per diagram at chapter 2.9.1.
	The torque of the safety coupling is not enough to make the change	With feeded motor (102) at (24 V dc) verify that after a phase of rotation of the gear (106) follows a phase at a slower speed	Restore the calibration of the safety joint; see chapter 3.2.2.
	The torque of safety joint is too high		



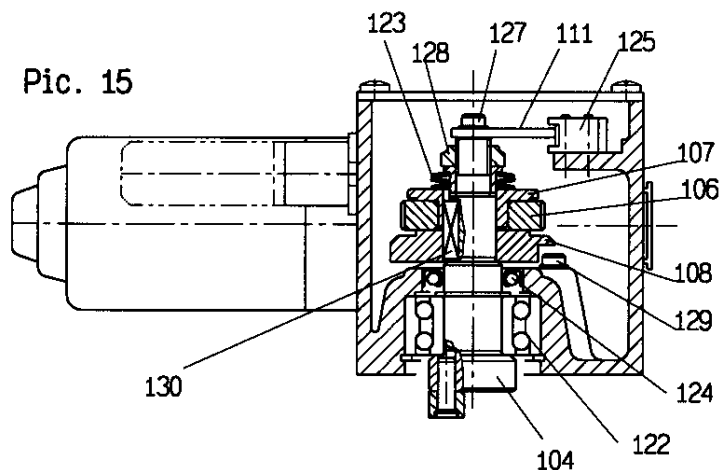
3.2.1 Change of the motor (102)



The motor (102) is fixed to the housing(100) with n°4 screws(102a). In order to get the screws it is necessary to remove:

- The worm screw (105)
- the gear (106)
- and all necessary parts which can be found in Pic 14 and Pic 15.

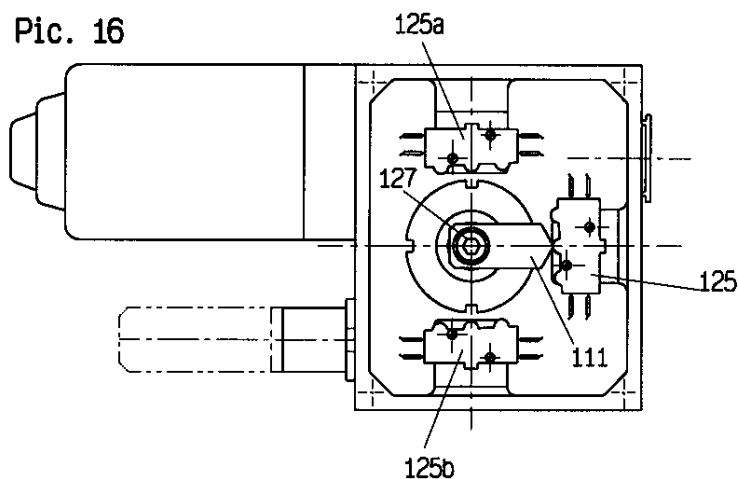
3.2.2 Safety joint calibration (belleville washers 123)



Feed the motor (102). Verify that the gear (106) at the beginning rotates quickly, during the change, rotates quickly. At completed exchange the gear will be slowed down, therefore its movement will be slower (anyway it must slowly rotate till the motor is feeded). The calibration of the joint is made changing the pre-load of the belleville washers (123) (actuating the nut 128):

- the screwing of the nut determines the torque of the joint;
- the unscrew of the nut determines the reduction of the joint's torque

3.2.3 Adjustment of the cam which actuates the micro (111)



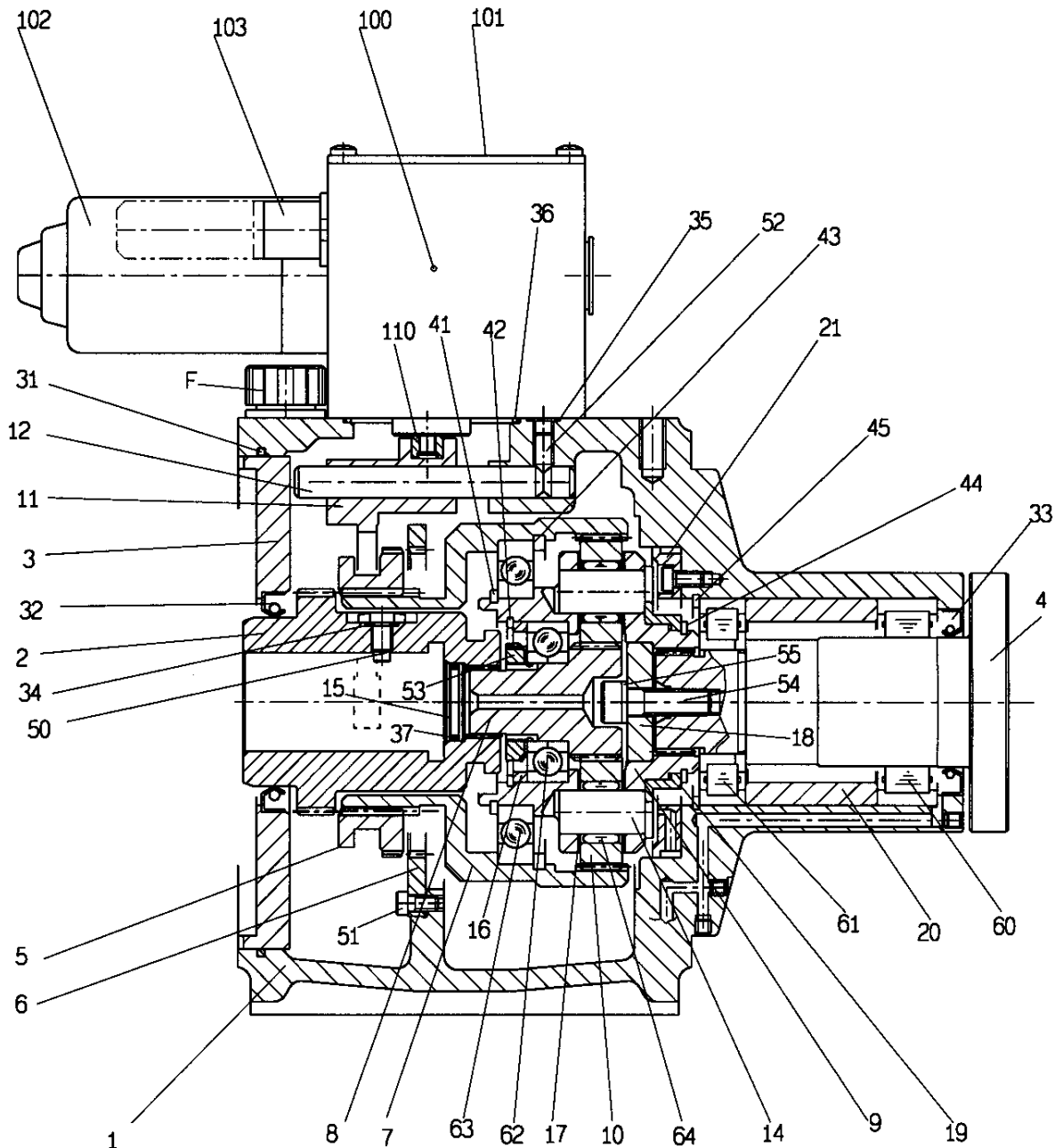
125 = Micro of neutral position
 125a = Micro 1 st speed (1/1)
 125b = Micro 2nd speed (1/4)
 111 = Cam
 127 = Cam locking screw

3.3 Assembly/disassembly

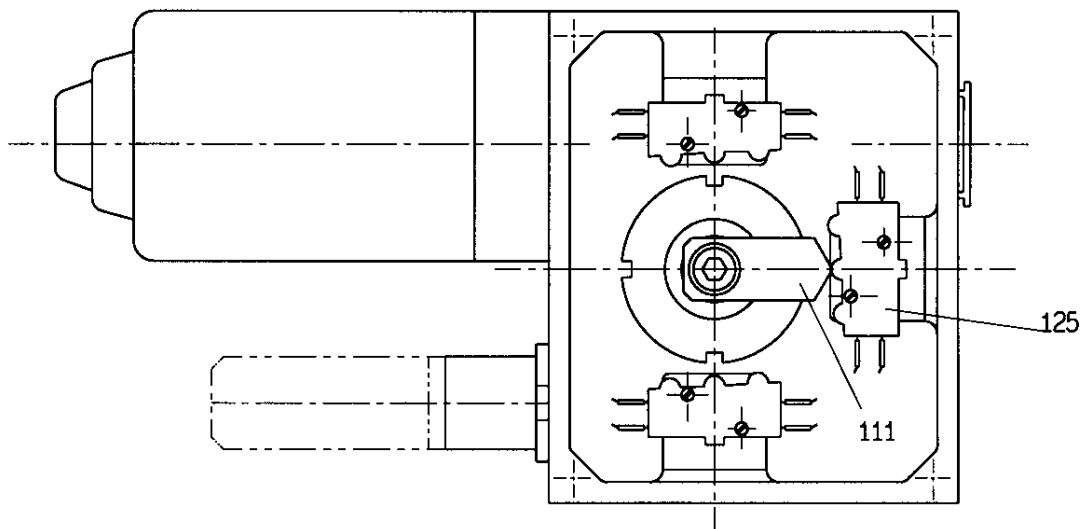
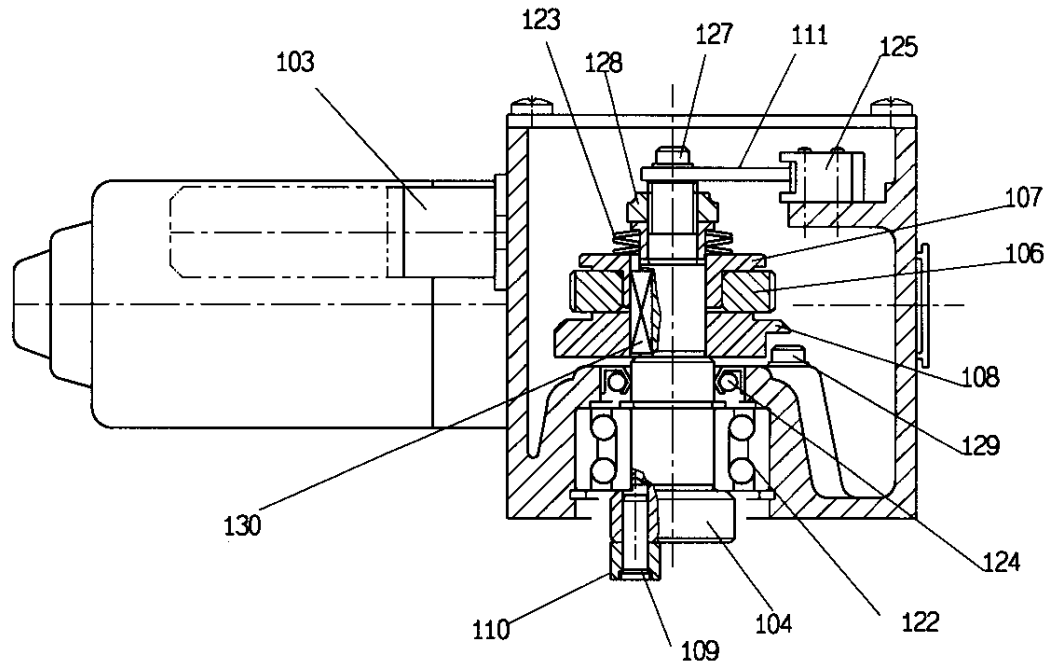
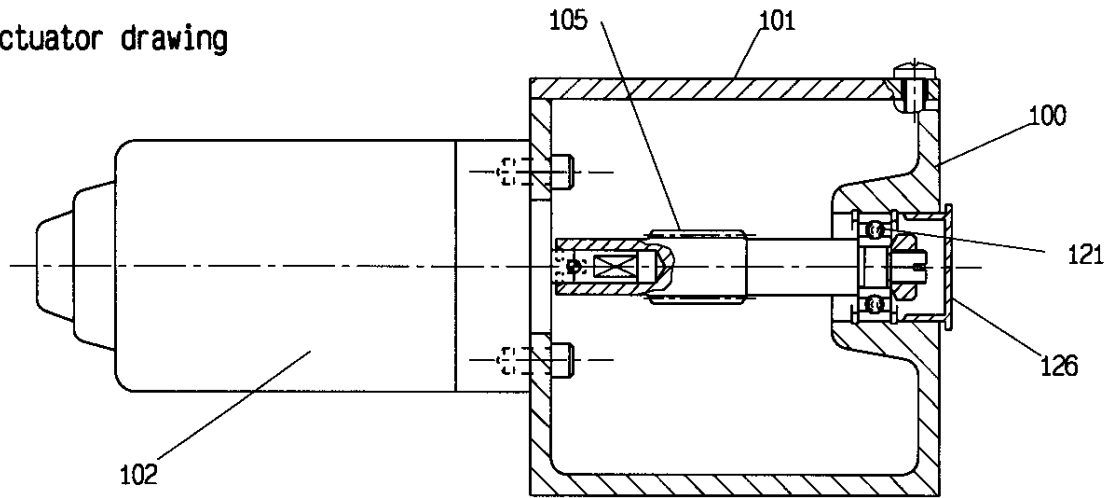
Any kind of disassembly operation has to be made with the gearbox is stillstand and with cold oil and cold surfaces



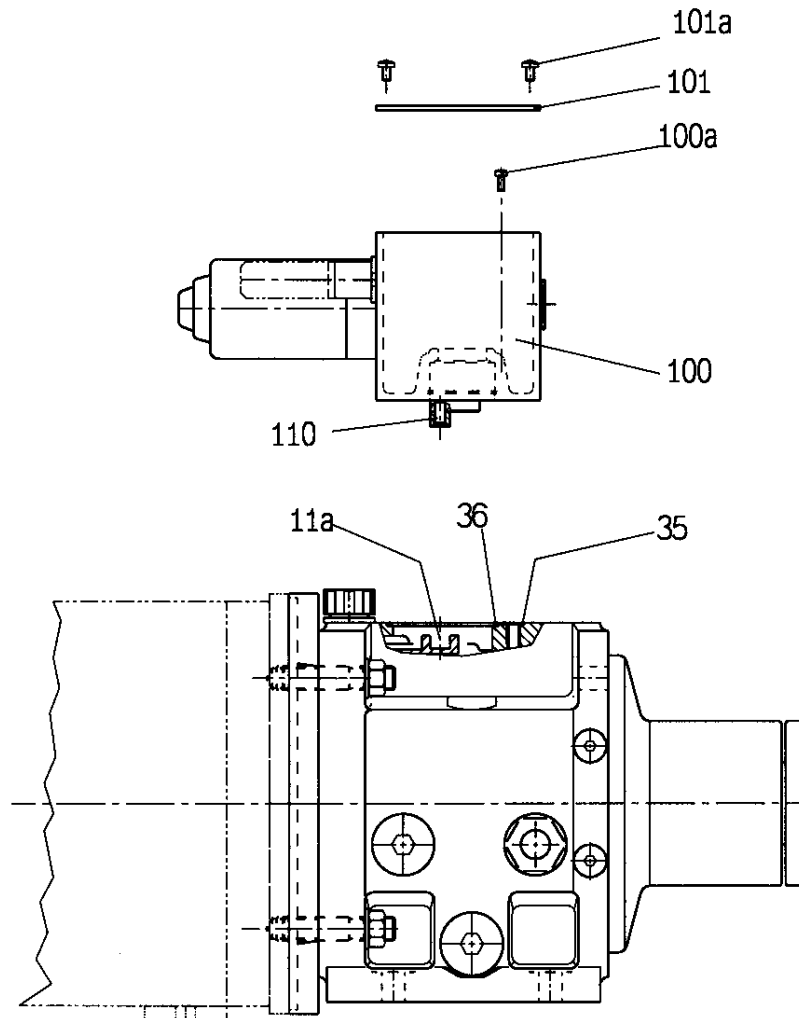
3.3.1 Gearbox-drawing



3.3.2 Actuator drawing



3.3.3 Disassembly/assembly of the actuator



Disassembly phases

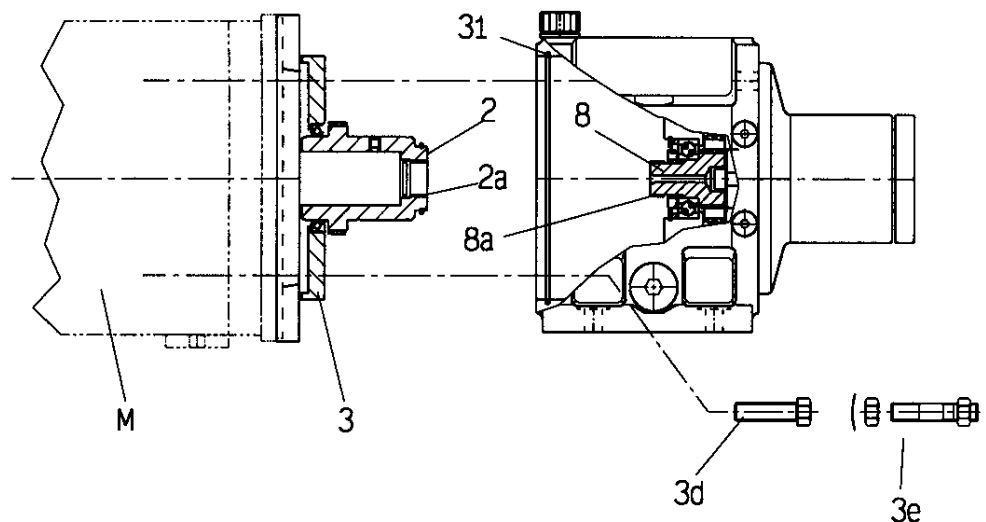
- remove the screws (101a) and the cover (101)
- Unscrew the 4 screws (100a).
- Remove the complete actuator (100).

When re-assembling:

- Be sure to keep the O-rings (35) and (36)
- Engage the key(110) in the seat (11a) of the fork



3.3.4 Disassembly /assembly of the motor flange



Disassembly:

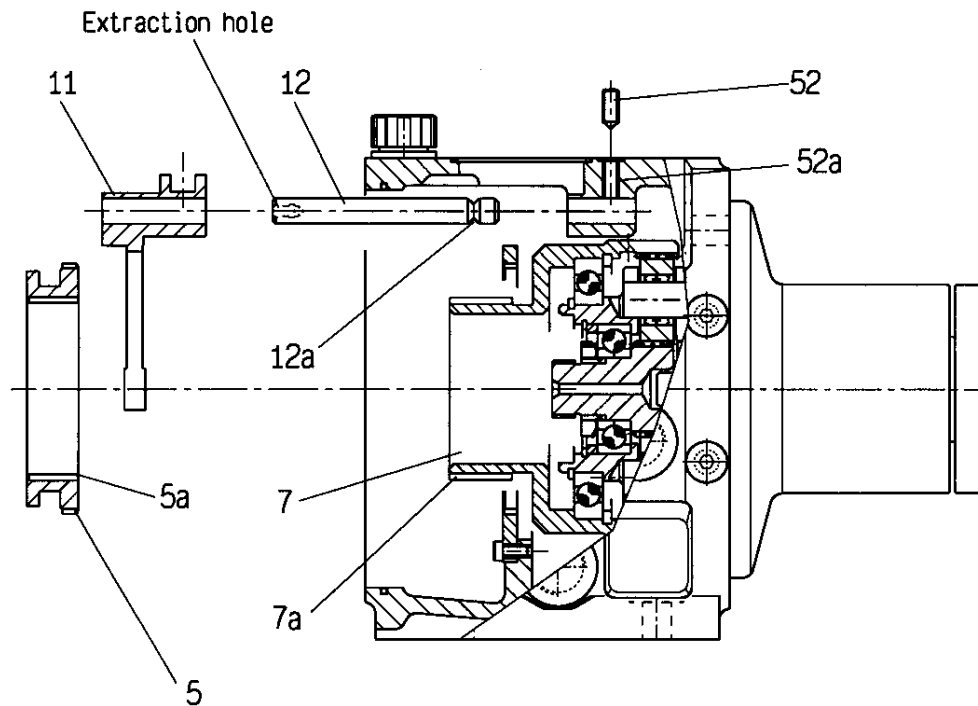
- remove the screw (3d) or the stud and nuts (3e)
- Take off the motor (M)-flange(3) unit

Assembly

- Check the following points:
 - The O-ring, must be in the right place
 - The position of the fork and of the collar must be at slow speed (see chapter 2.5.3)
- Introduce the motor flange unit so that the broached end of the pinion fits the grooved part of the solar gear.



3.3.5 Disassembly/assembly of the fork



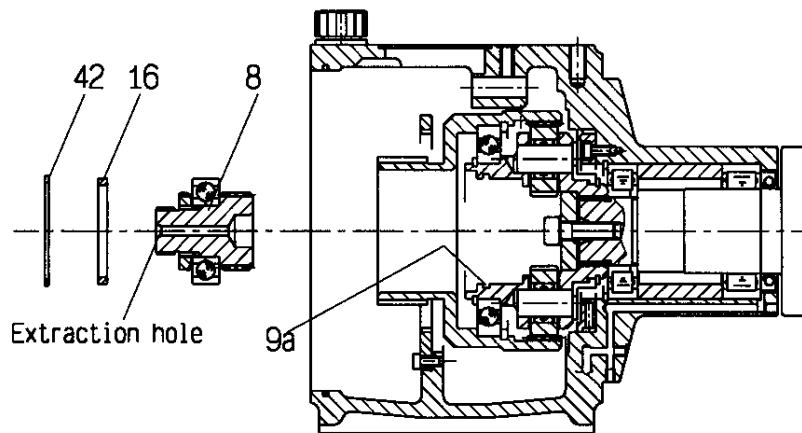
Disassembly

- unscrew the lock bolt (52)
- Take off the pivot (12)
- Remove the fork (11) and the collar (5)

Assembly:

- Insert the fork (11) on the collar (5). Engage the broached hole (5a) of the collar with the grooved part (7a) of the planetary gear (7)
- Insert the pivot (12) so that the groove (12a) reaches the hole (52a).
- Lock completely the bolt (52) using loctite.

3.3.6 Disassembly/assembly of the solar gear



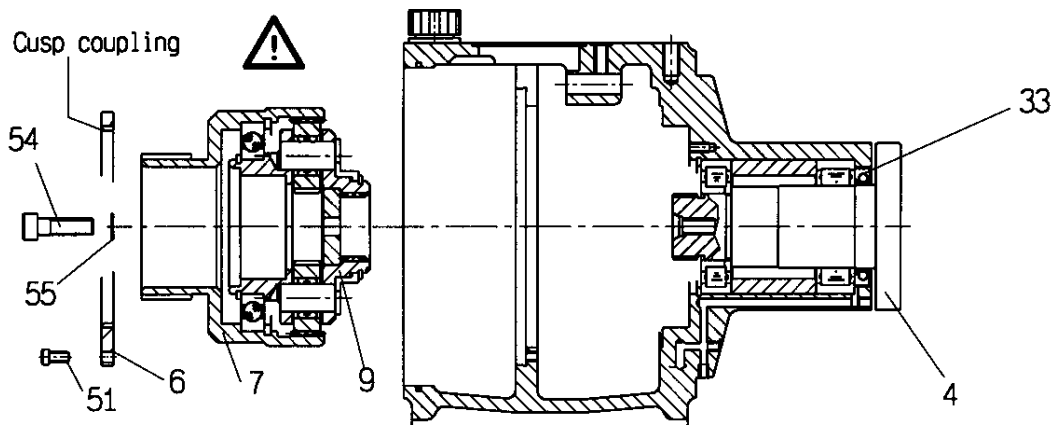
Disassembly:

- Take off the circlip (42) and the spacer (16)
- Remove the solar gear (8) and the bearing

Assembly:

- Check the circlip (42) fits the seat (9a) correctly

3.3.7 Disassembly/assembly of the planetary gear unit and of the driven shaft



Disassembly:

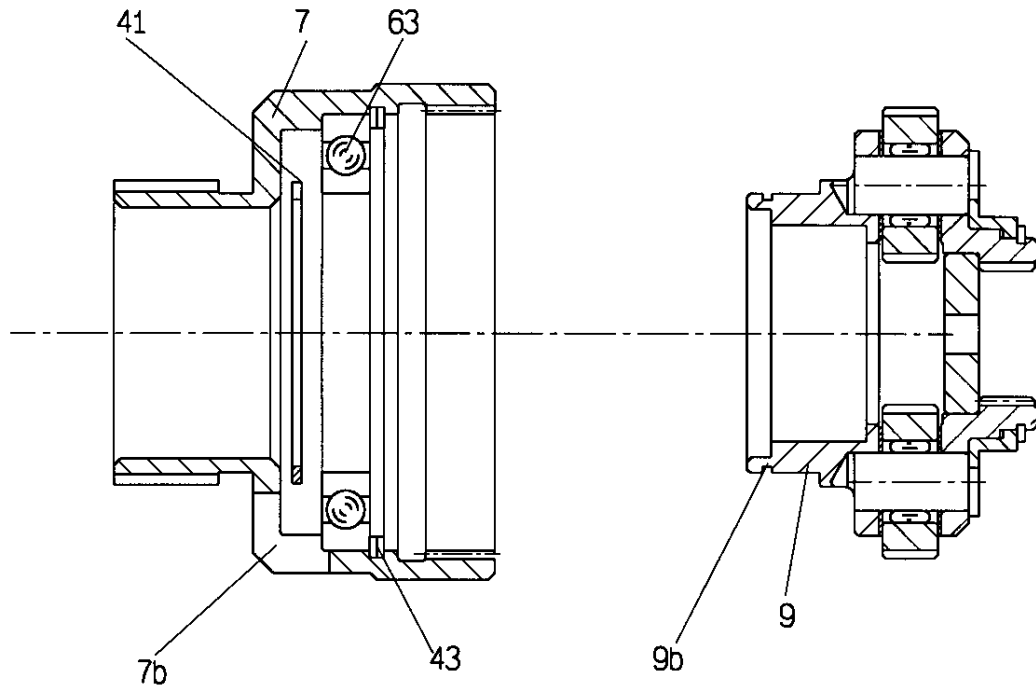
- Release the screw (51).
- Take off the crown (6).
- Release the screw (54), take off the washer (55), take off the unit (7-9)
- Take off the driven shaft (4)

Assembly:

- Be careful not to damage the shaft seal (33).
- Assemble correctly the crown: the cusp coupling must be turned towards the spindle motor (M)
- Lock completely the screw (54) using loctite 270 after removing, the grease from the screw and from the threaded hole



3.3.8 Disassembly/assembly of the planetary gear



Disassembly

- Trough the slots (7b), mark the position and then take off the circlip (41)
- Take off the planetary (7) gear together with the bearing (63) and the circlip (43).
- In case you have to disassemble the 2 circlips (43) mark the position between them and the planetary gear (7)

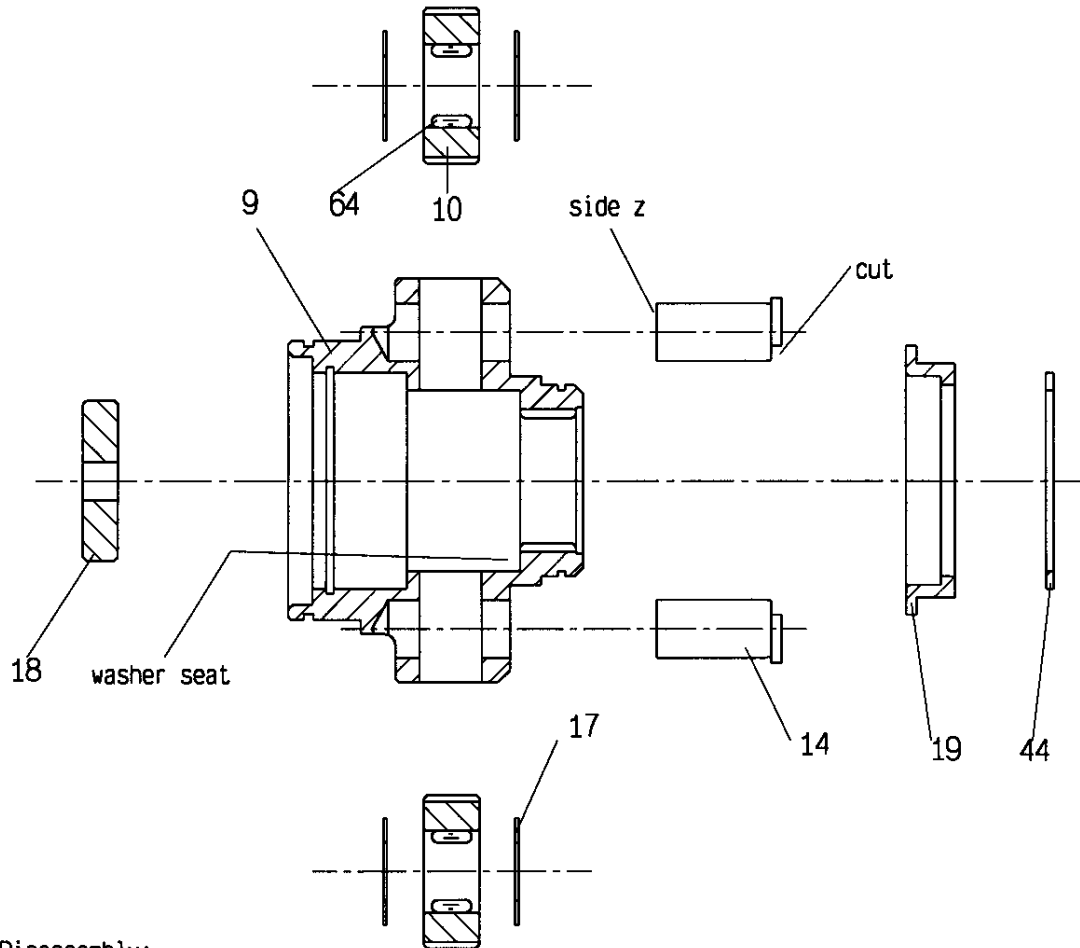
Assembly:

- The circlip (41) must be placed in the space between the bearing (63) and the planetary gear shoulder (7).
- The circlip must be assembled (41) on the corresponding place of the planet-wheel carriage (9b).

The circlips must be reassembled following the original position



3.3.9 Disassembly/assembly of the planetary gears



Disassembly:

- Mark the position and then take off the circlip (44) and the spacer (19)
- Take off the pivot (14) from the planetary gears (9) by pushing them through the z side
- Take off the planetary gears (10) the rollers (64) and the thrust blocks (17).
- Take off the washer (18).

Assembly:

- before the assembly of the planetary gear, put the washer (18) in proper place
- Grease the roller using thick grease
- Turn the pivot (14) so that the cut on the head of the pivots must be towards the centre of the planetary gears (9).

Check the number of the rollers (64) the planetary gear. The number must be the same established in chapters 3.4.1 and 3.4.2 (spare parts schedule)

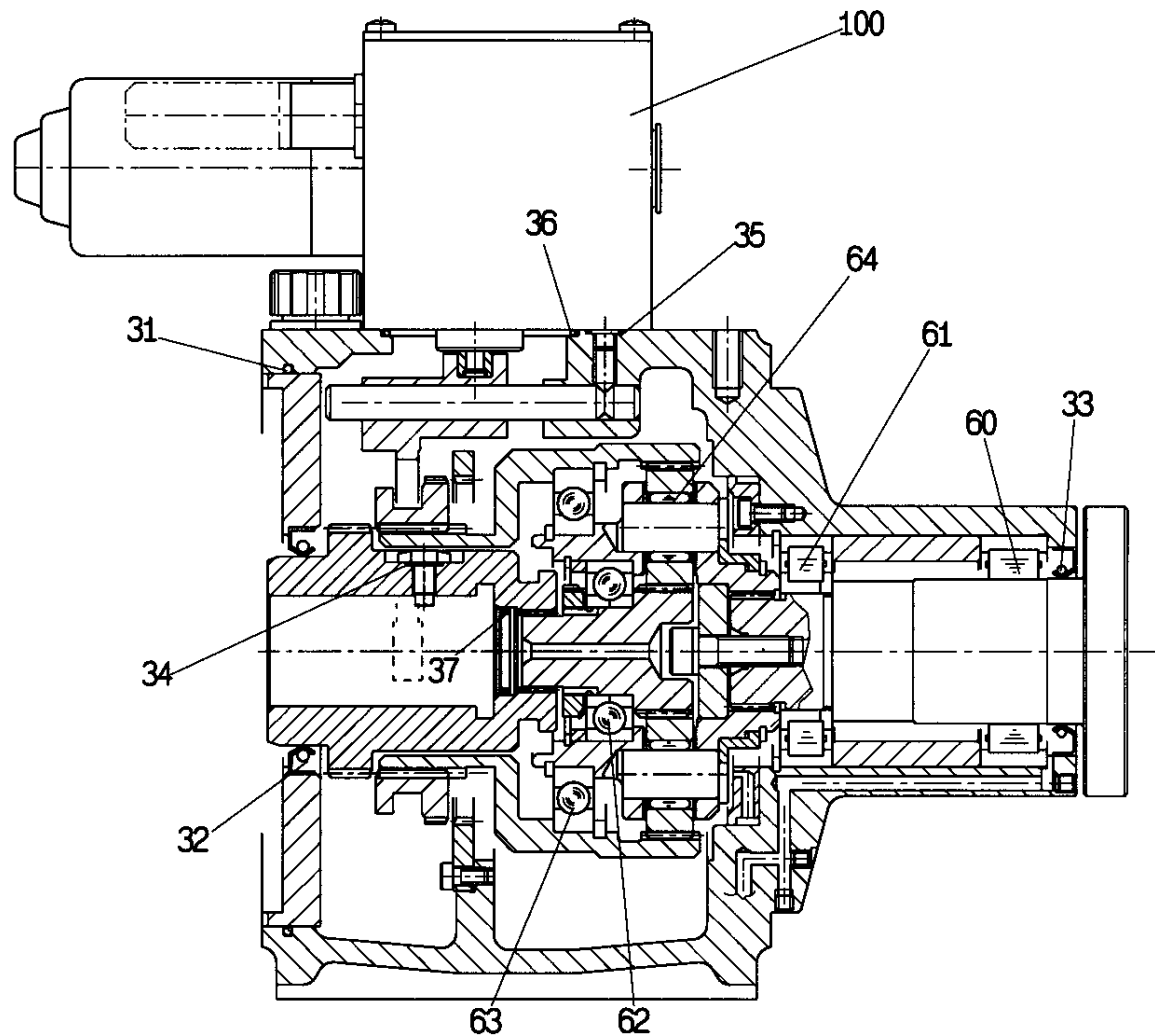


The circlips must be reassembled following the original position



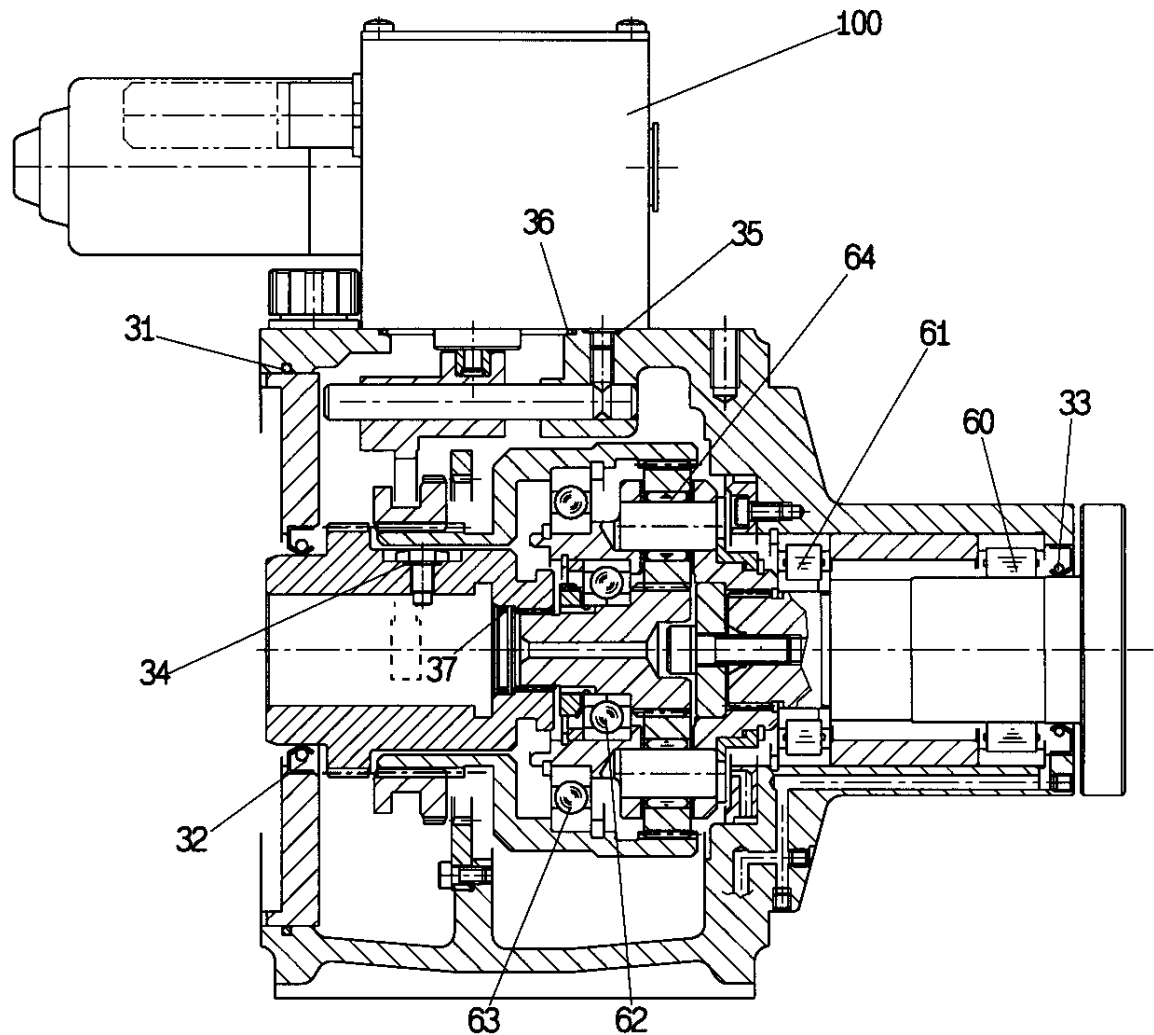
3.4 spare-parts schedule

3.4.1 spare parts schedule CE 12



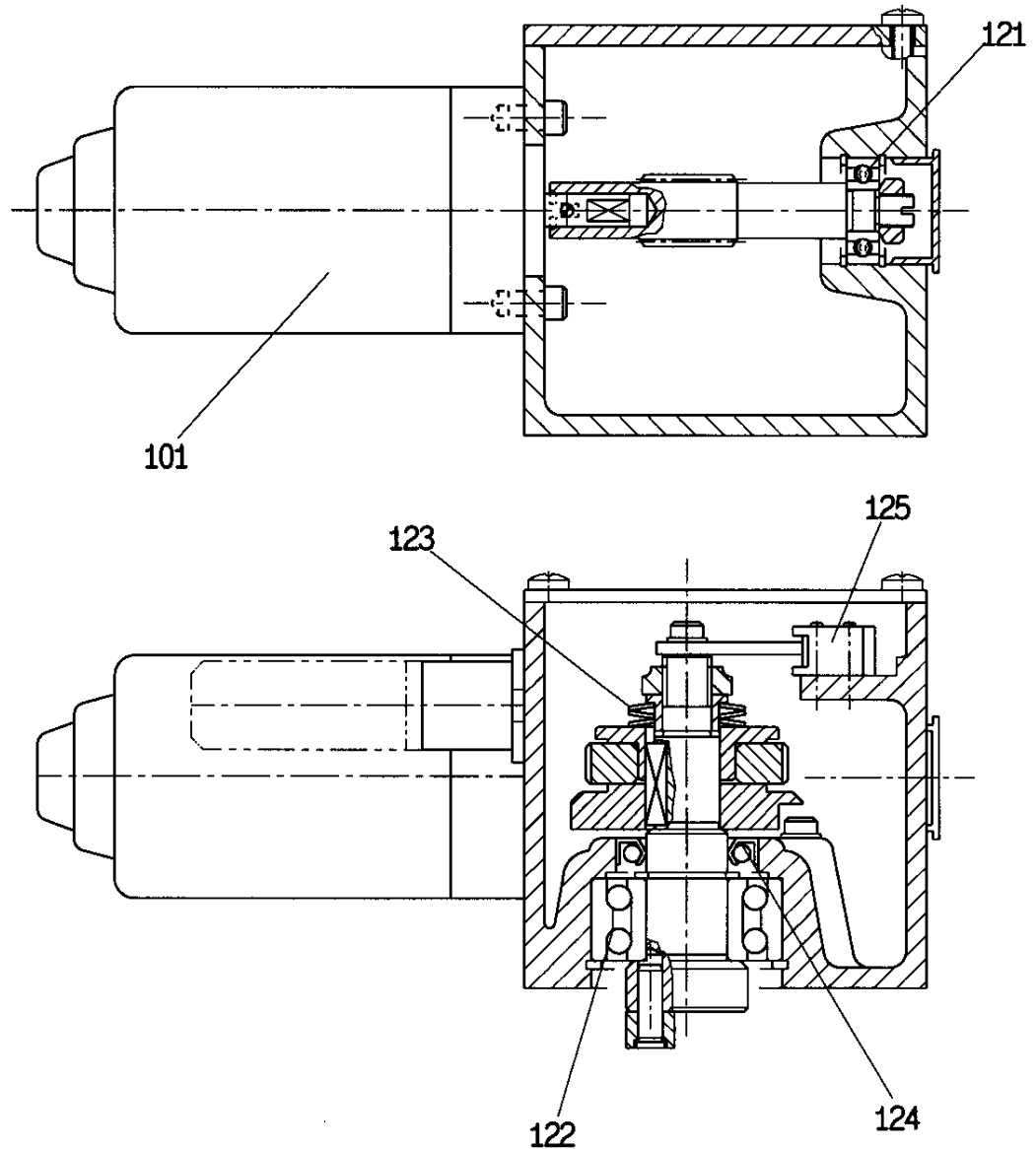
NO	Code	Description	Type	Q.ty
31	999.223.02692	O-ring	OR 264	1
32	999.224.07318	Shaft seal	A 658510 Viton	1
33	999.224.07321	Shaft seal	A 50728 Viton	1
34	999.223.00792	O-ring	OR 012	1
35	999.223.00792	O-ring	OR 012	1
36	999.223.06431	O-ring	OR 144	1
37	999.223.05287	O-ring	OR 120	1
60	999.148.06879	Bearing	NJ 2208 ECP (no ralla int.)	1
61	999.149.07569	Bearing	NJP 208 ECP	1
62	999.149.07570	Bearing	QJ 206	1
63	999.149.00867	Bearing	16016	1
64	999.149.07574	Rollers	NRA 3.5x15.8 G2 -3-5	18x4
100	23.0000.100.01	Drive unit		1

3.4.2 Spare part schedule CE 14



NO	Code	Description	Type	Q. tty
31	999.223.02108	O-ring	OR 275	1
32	999.263.07374	Shaft seal	A 8010010 Viton	1
33	999.224.07319	Shaft seal	A 709010 Viton	1
34	999.223.04988	O-ring	OR 013	1
35	999.223.00792	O-ring	OR 012	1
36	999.223.06431	O-ring	OR 144	1
37	999.223.05610	O-ring	OR 126	1
60	999.149.07239	Bearing	NU 2211 ECP (no ralla int.)	1
61	999.149.07572	Bearing	NUP 211 ECP	1
62	999.149.07571	Bearing	QJ 208	1
63	999.149.07272	Bearing	16020	1
64	999.149.07573	Rollers	NRA 5x23.8 G2 -3-5	16x4
100	23.0000.100.01	Drive unit		1

3.4.3 Drive unit spare-parts schedule CE12 - CE14



NO	Code	Description	Type	Q. tty
101	23.0000.114.01	Engine		1
121	999.148.07229	Bearing	6000	1
122	999.149.03651	Double bearing	3204	1
123	999.210.01933	Belleville washers	34x16.3x1.5	3
124	999.226.07497	Shaft seal	A 20357	1
125	999.295.06893	Micro switch	83106-OCW3 Crouzet	3