This manual has instructions relevant to the parts of the rotating tools unit of the TSMA.....series turrets.

For further information on the standard a turret, please look the manual of the TS.....turrets.

USE INSTRUCTIONS

for

electromechanic turrets

TSMA series

36.0120

36.0160

36.0200

36.0250

Before of the setting at work, consult the use instructions and follow them!
It is allow only to experts,who examined the instructions, to work on the toolholder turret

Responsability and warranty are excluded when:

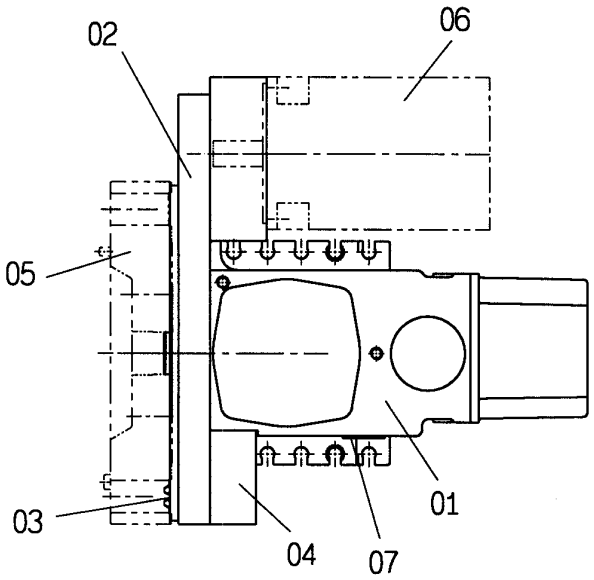
- warning and use instructions are not followed-
- turret is set at work in a wrong way
- turret maintenance is not followed correctly
- function modifications of every kind are introduced without the manufacturer authorization
- original spare parts are not used

Warning:

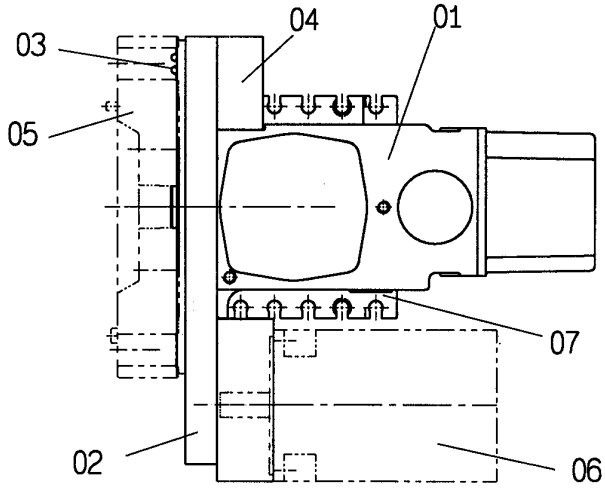
- This sign points out operations of special care
- a wrong process can cause damage to the turret
- wrong process cause wrong setting up
- wrong process can endanger the safety of the operator

1 Structure of the turret

1.1 Right version



1.2 Left version



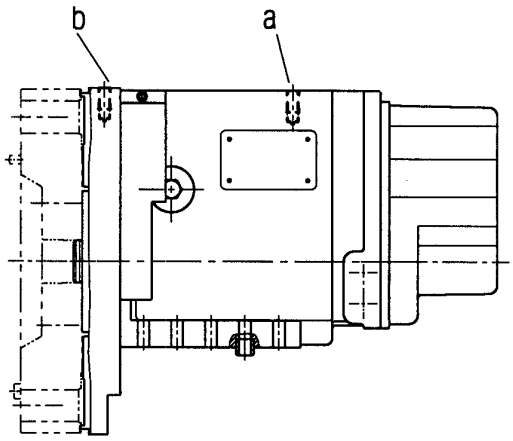
01 casing
02 housing transmission's gears
03 take power
04 housing for the take power's actuation
05 toolholder disk
06 motor for the rotating tools (not included in the supply)
07 data plate

1.3 Toolholder disk

The toolholder disk, if not included in the supply, it must be in conformity to the Baruffaldi technical indications

2 Setting at work

2.1 Advice during transportation

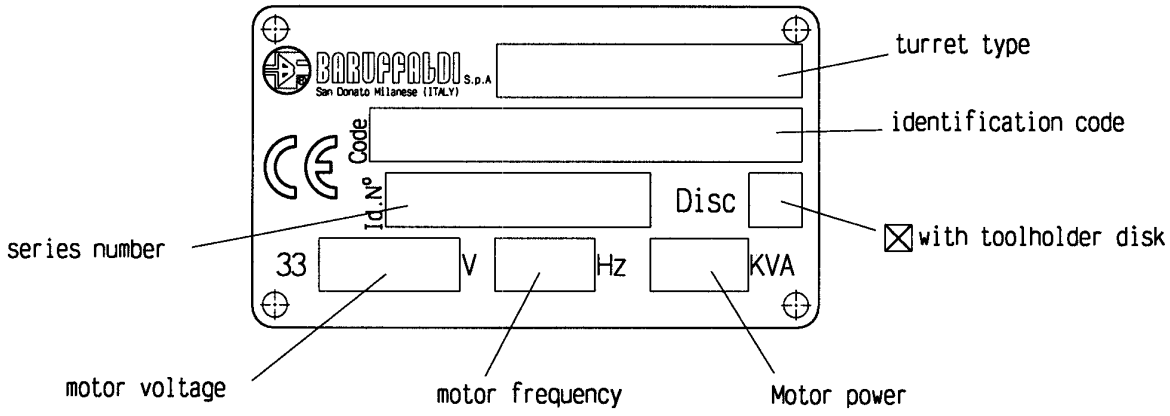


a-b holes for ring bolt

Schedule

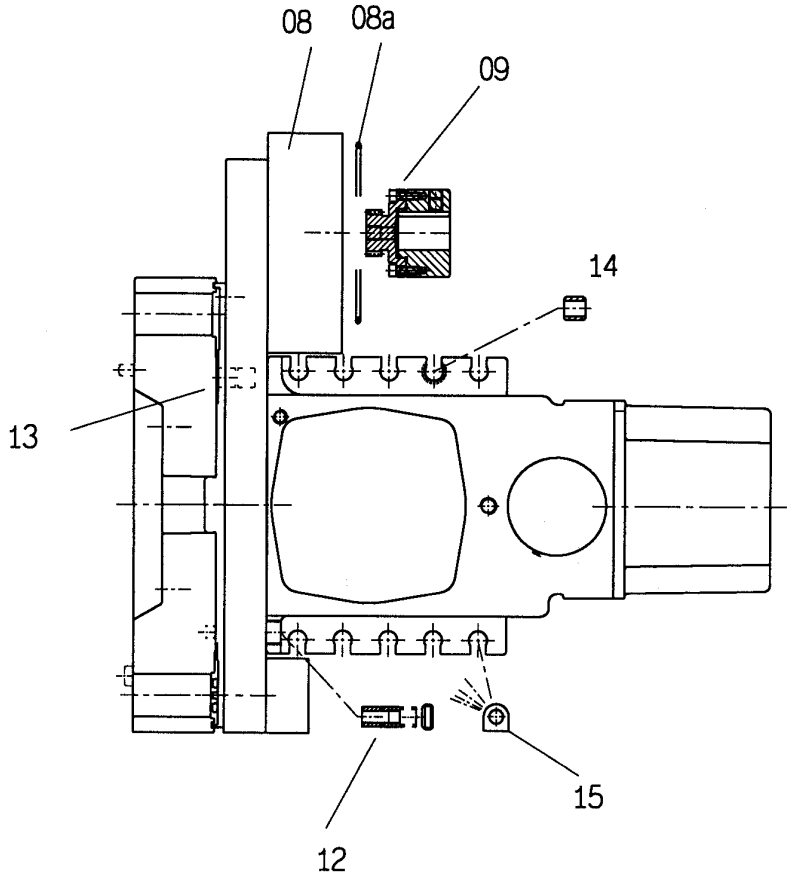
Size	TSM160		TSM200		TSM250	
Take power's pitch diameter	270	300	340	380	400	445,5
turret weight without toolholder disk						
Hole dimension	a = M12 b = M12		a = M12 b = M12		a = M16 b = M12	

2.2 Data plate



2.3 Delivery terms

The turret is provided with:
- Instruction manual
- Test certificate
- Cooling bush (12) complete with o-ring and spring
- Plug for coolant block (13) complete with o-ring and spring
- Reference bush (14)
- Lock washer (15)
- Flange(08) for the motor for the actuation of the rotating tools(as for order specifications) O-Ring (08a)
- Gear (09) for the above mentioned motors(as for order specifications)
- The turret is provided with lubricant oil and closed in the position one



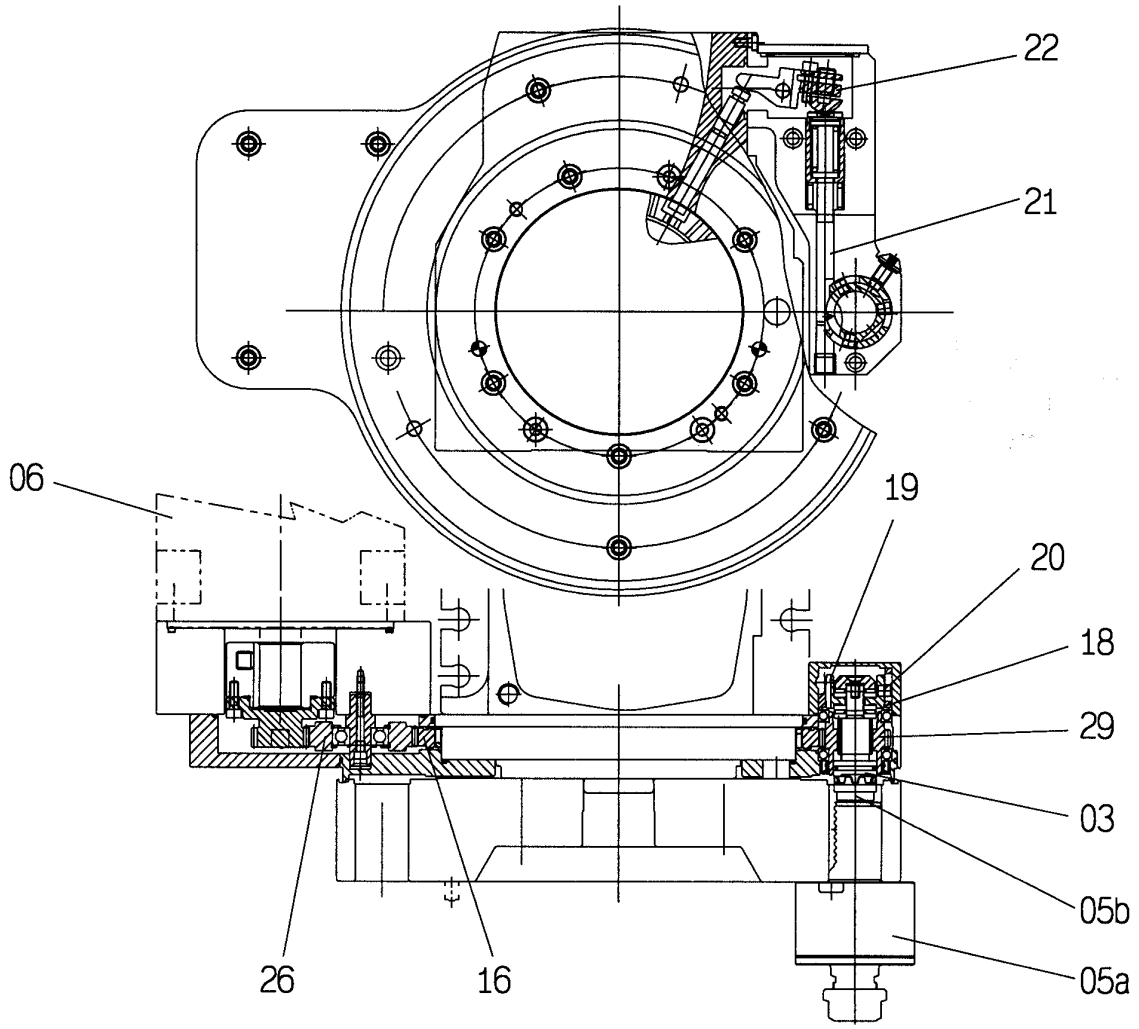
2.4 Technical data

Size		TSMA160	TSMA200	TSMA250
Moment of inertia of carriable masses (disk included) Kgm2	Versione 0	2	4.5	7.5
	Versione 1	1.4	3.5	5
Max permissible weight to be carried (disk included) Kp		40	120	160
Unbalancing moment during rotation Nm		15	40	60
Max tangential torque (locked turret) Nm		1850	3500	6900
Max overturning torque in pressing direction Nm		1600	5100	11000
Max overturning torque in lifting direction Nm		690	2300	4600
Indexing frequency Maneuvers/h		750	750	750
Indexing precision		±6°	±6°	±6°
Accuracy of repeability		±2°	±2°	±2°
Max power(motor for rotating tools) (S3 40% ED 10min) Kw (the real value depends on the utilized motor)		5	9	12
Max torque Nm (the real value depends on the utilized motor)		20	50	55
Max.motor speed rpm/min (the real value depends of the utilized motor)		6000	5000	5000

2.5 Functioning description

- Starting conditions
- Locked turret with rotating toolholder (05a) in a working position
- Take power (03) engaged with relevant toolholder's clutch (05b)
- The movement from motor (06) is transfered through the gears (26), (16)and(29) to the take power (03) and then to the toolholder (05a).

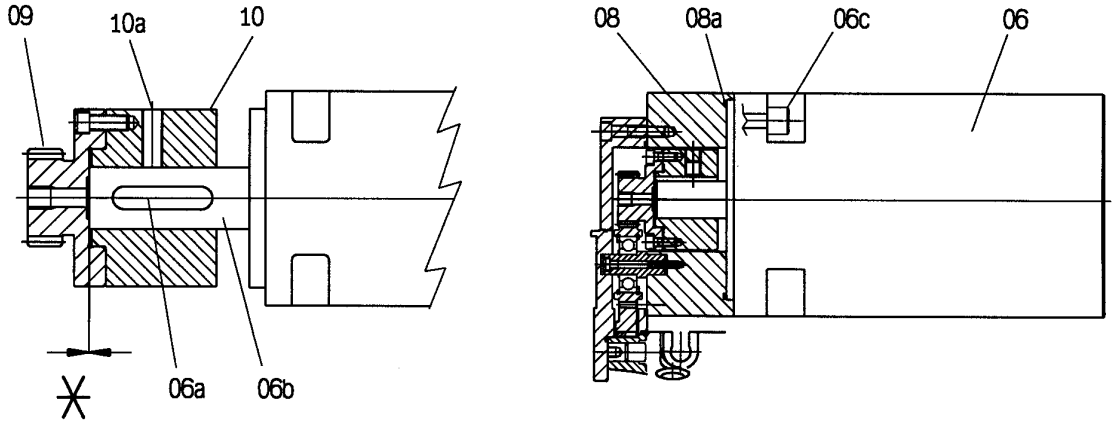
Sequence of take power's disengaging from the rotating toolholder and new engaging with another rotating tool holder in a new position.
During positioning changing, when the shortcircuiting ring pulls back, in combination with the leverage(22), the arm (21), the reel (19) and the pins (20) let the take power's(03) pulling back disengage the take power from the toolholder's clutch.
During locking, the movement of the shortcircuiting ring, combinated with the above mentioned elements, permit the putting forward of the take power (03) and the engagement with the new rotating toolholder.



2.6 Assembly procedure of the motor for the rotating tools

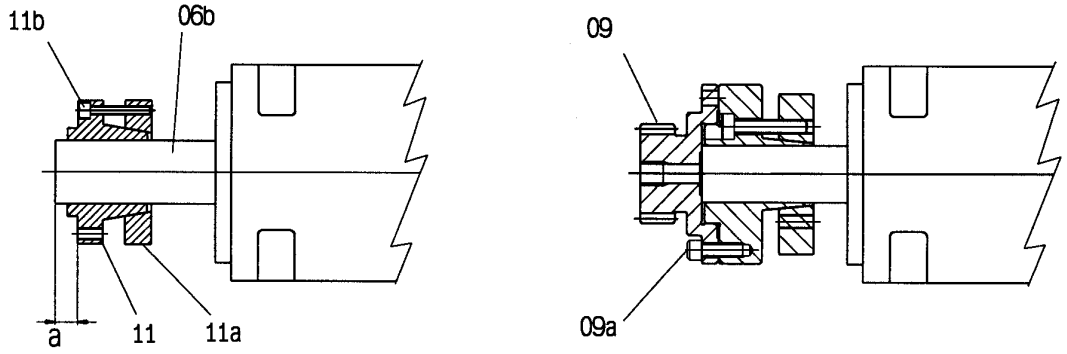
Procedure for motors with shaft with keyway

- insert the key (06a) on shaft's seat (06b)
- Assembly the motor's gear complete with hub on the shaft,till the planes (*)are in contact
- Lock till end the dowel (10a) using loctite
- Verify that the O ring is in good conditions and well seated
- Assembly the motor(06) on the flange (08), using the relevant screws



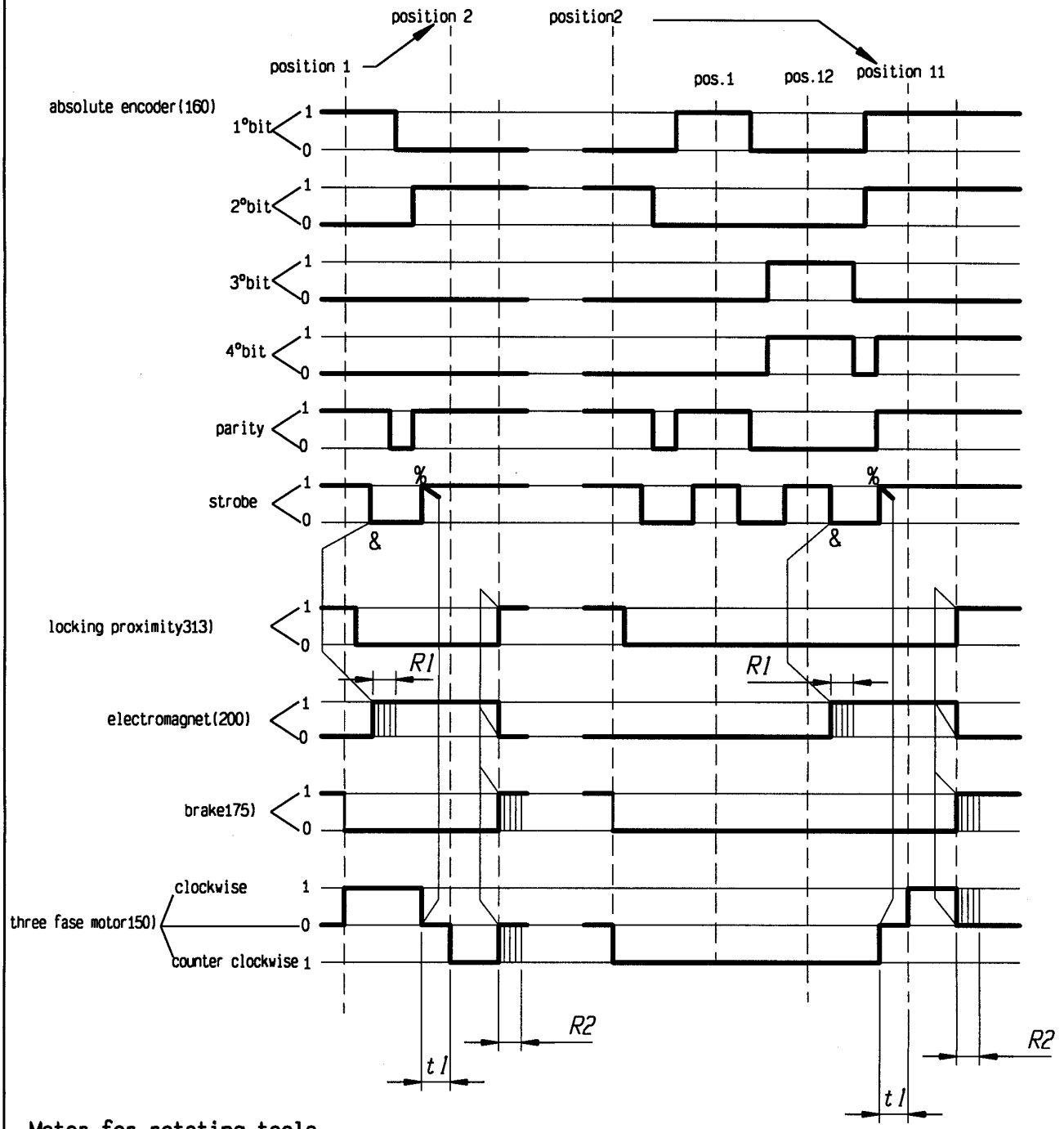
Procedure for motors with shaft without key way

- Assembly the elements(11) and(11a) on the motor shaft(06b)till the dimension on the data sheet
- Lock the screws (11b) till the end
- Assembly the gear(09)and fix it with the screws (09a)
- Verify that the O Ring (08a) is well seated
- Assembly the motor (06) on the flange(08), using the relevant screws.



SIZE	TSMA160	TSMA200	TSMA250
dimension a mm.	6.5	6.5	6.5

2.6 Electrical cutaway view



Motor for rotating tools

To simplify the engagement of the take power with the elevant toolholder's teeth clutch, during the turret's indexing, the motor for the rotating tools can run at 800/1000

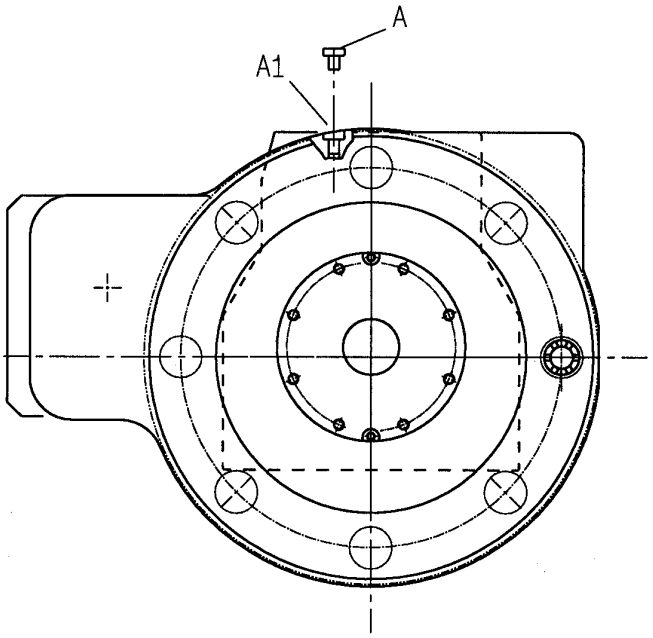
For more details or the flow chart please look at the TS manual

3 Maintenance

Any kind of maintenance or disassembly must take place with locked gears,cold surfaces and de-energized motor

3.1 Lubrication

The use of new lubricant can be made through the filling hole().
The lubricant, with viscosity 805W90, must be compatible with rubber and teflon.
In the data sheet underneath is indicated the max quantity of oil which can be filled



Turret size	Quantity
TSMA160	0,150 l
TSMA200	0,200 l
TSMA250	0,250 l

Attention: After filling oil,close the hole (A1) with the relevant plug

3.2 Breackdown search an repair

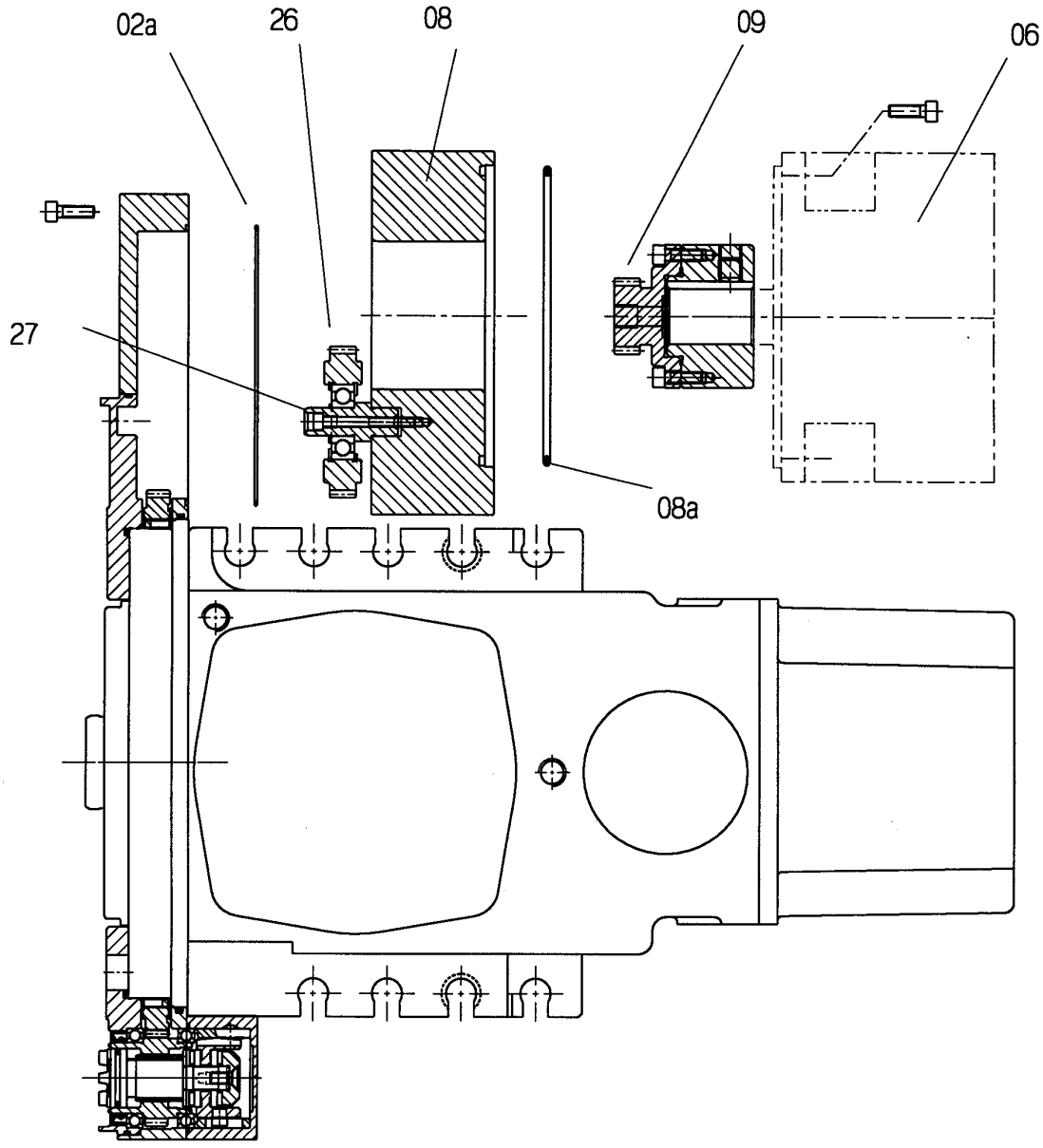
Any kind of maintenance or disassembly must take place with locked gears, cold surfaces and de-energized motor

Anomalies	Probable causes	Cheking	Remedies
The rotating tools do not rotate	The feeding of the supplementary motor is missing	Verify under machine manufacturer indications	Restore the motor feeding
	the supplementary motor is broken	Verify under machine manufacturer indications	Change/restore the motor
	Does not engage the take power with the toolholder	Verify the presence of chips/dirty in the area of the take power	Clean and oil the area of the take power
		Verify the good functioning of the mechanical rotating tools system	Restore the good functioning of the mechanical system
		Verify the allignement at toolholders seats	Restore the disk allignement
The disk cannot rotate	The take power does not come back during station change	Verify the presence of chips/dirty in the area of the take power	Clean and oil the area of the take power
		Verify the good functioning of the mechanical rotating tool system	Restore the good functioning of the mechanical system

3.3 Disassembly/assembly of the supplementary motor/support and motor gear

Operations:

- remove the supplementary motor (06) complete with gear (09)
- remove the flange (08) complete with the intermediate gear (26) and pin



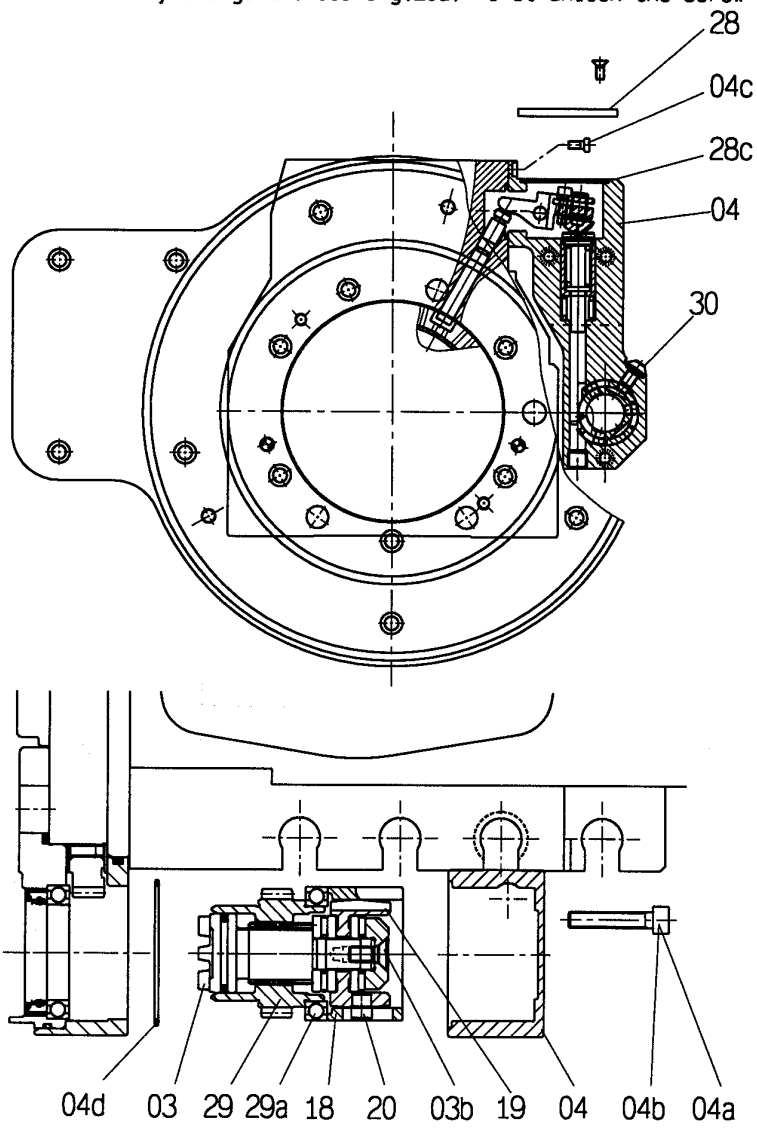
When re-assembling:

Verify presence and integrity at the O rings.

3.4 Disassembly/assembly of the take power's housing

Operations

- Take away the screws (04a) (04b)
- remove the cover (28)
- take away the screws (04c)
- remove all the housing (04) complete with gear (29); in order to make easier the extraction of it, hit the extremity with a plastic hammer
- withdraw the pin,remove the leverage
- unlock the screw (30) withdraw the gear (29) complete with clutch (03),ring (18),reel(19) ,pins(20) and bearing
- In case it would be necessary change the bearing(29a) first unlock the screw (03b)

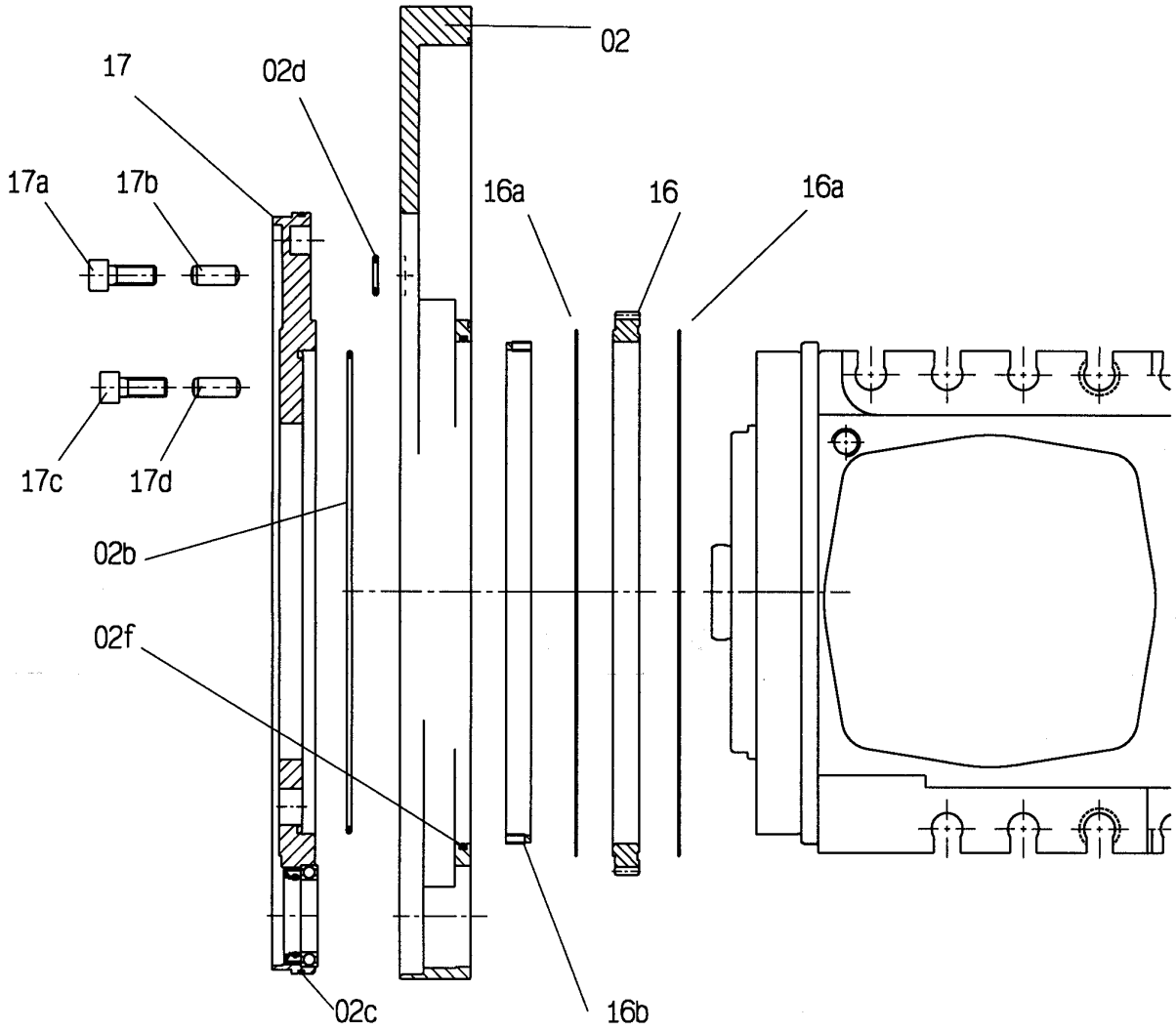


When reassembly:

- Verify the oring integrity
- grease all the oring with thick grease and place them correctly
- lock till the end the screw(03b), and fix with loctite

3.5 Disassembly/assembly

- take away the pins (17b) and (17d), the screws (17a) and (17c)
- remove the flange (17), the gear (16), the bearing (16b), complete of rollers and thrust (16a)
- remove the counter thrust of the gears transmission (02)

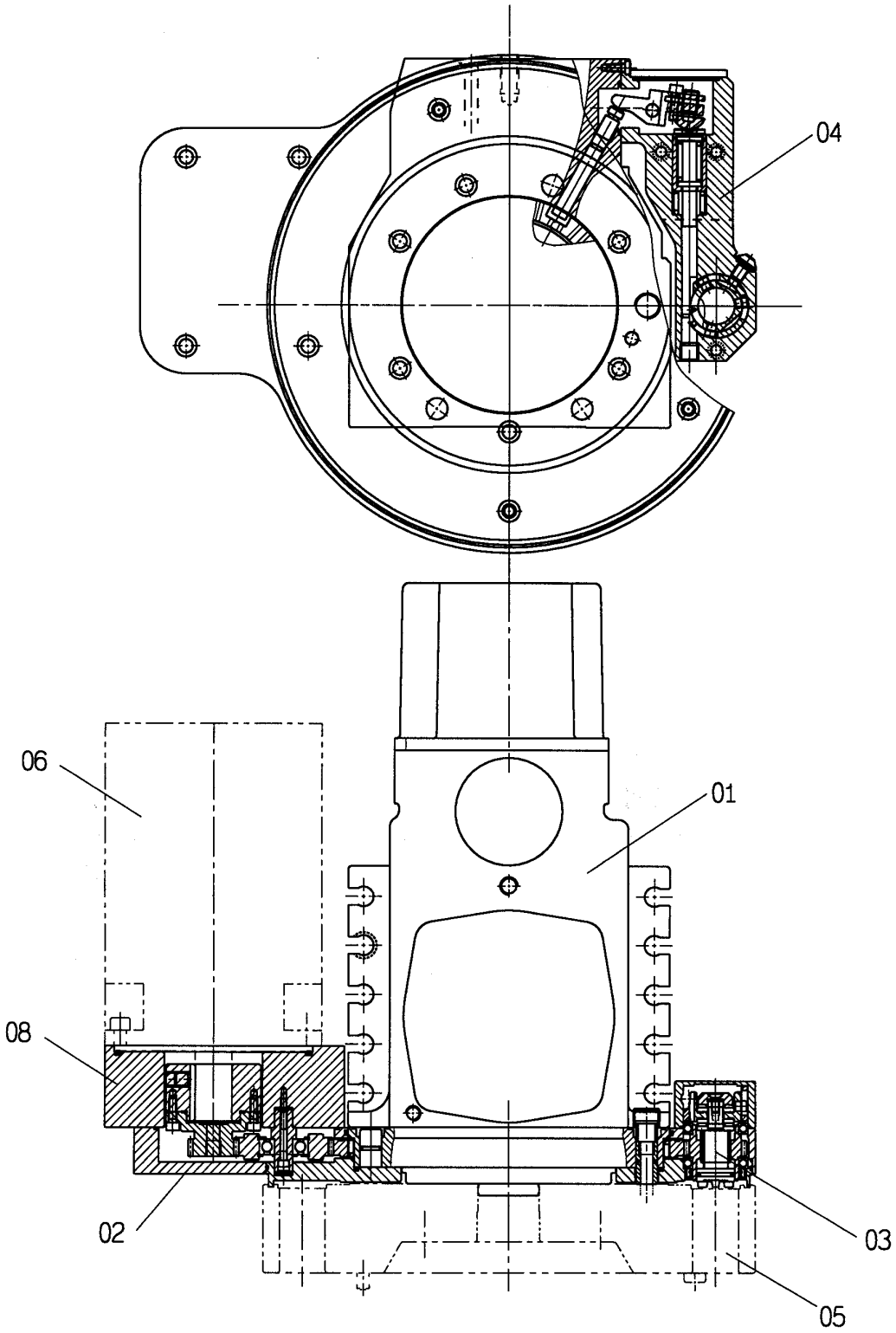


When reassembly:

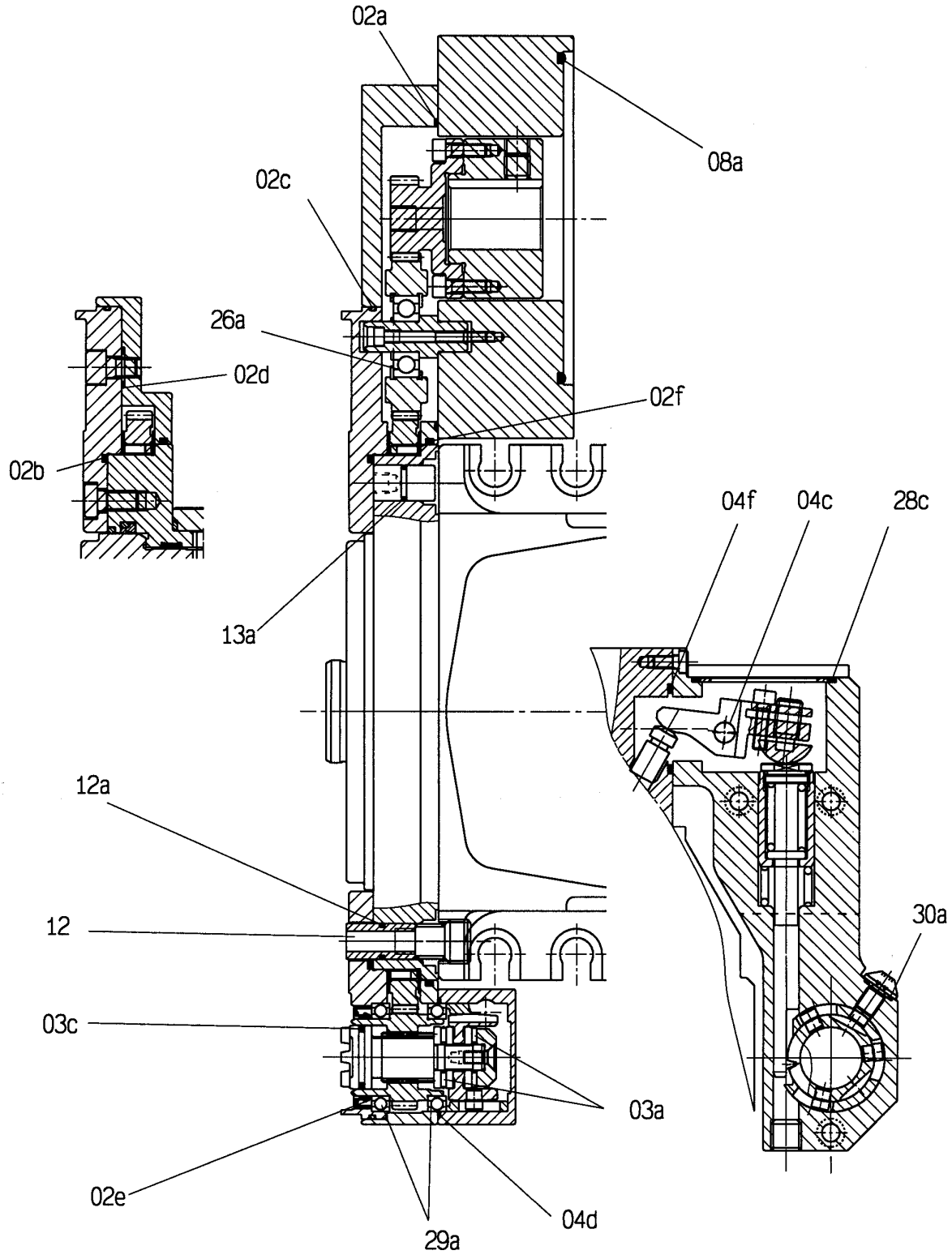
- verify the o-rings integrity
- grease all the o-rings with thick grease an place them correctly

4 Spare part list

4.1 Reference numbers



4.2 Reference numbers



4.4 Spare parts for TSMA 160(see frame of reference chapter 4/1 and 4/2)

For model 01 (pcd 270 mm) and similar

Rif.	Code	Denomination	Type	Qtt.y
02a	999.223.03437	O-Ring	O-ring048	1
04d	999.223.05181	O-Ring	O-ring030	1
04e	999.223.02083	O-Ring	O-ring111	1
30a	999.223.00792	O-Ring	O-ring012	1
12a	999.223.00792	O-Ring	O-ring012	1
13a	999.223.00792	O-Ring	O-ring012	1
04f	999.223.02153	O-Ring	O-ring122	1
02f	999.223.05858	O-Ring	O-ring172	1
02b	999.223.07334	O-Ring	O-ring170	1
02d	999.223.00561	O-Ring	O-ring014	7
03c	999.305.07458	seal gly-ring	S550460250A46N	1
02e	999.263.07359	seal (viton)	MIM 30x40x7	1
29a	999.149.07494	Bearing	61806	2
26a	999.149.03539	Bearing	6201	1
12	36.0160.02701	Cooling bush	Baruffaldi	1
03a	999.149.04059	cage	AXK 1024	2

For model 01 (PCD 270 mm) and similar

28c	999.223.03892	O-Ring	O-ring130	1
02c	10.0160.065.05	seal	Baruffaldi	1

For model 04 (PCD 300 mm) and similar

28c	999.223.01987	O-Ring	O-ring136	1
02c	10.0160.065.06	seal	Baruffaldi	1

4.4 Spare parts list for TSMA200 (see frame of reference chapter 4/1and4/2)

For model 01 (pcd 340 mm) and similar

Rif.	Code	Denomination	Type	Qtt.y
02a	999.223.04886	O-Ring	O-ring160	1
04d	999.223.03451	O-Ring	O-ring034	1
04e	999.223.02083	O-Ring	O-ring111	1
30a	999.223.04988	O-Ring	O-ring013	1
12a	999.223.00792	O-Ring	O-ring012	1
13a	999.223.00792	O-Ring	O-ring012	1
04f	999.223.02153	O-Ring	O-ring122	1
02f	999.223.00097	O-Ring	O-ring178	1
02b	999.223.04087	O-Ring	O-ring176	1
02d	999.223.00561	O-Ring	O-ring014	9
03c	999.305.07451	seal glyd-ring	S550460300A46N	1
02e	999.263.07363	seal (viton)	MIM 35x47x5	1
29a	999.149.07484	Bearing	61907	2
26a	999.149.07546	Bearing	6302	1
12	36.0200.02701	Cooling bush	Baruffaldi	1
03a	999.149.05265	cage	AXK 1226	2

For model 01 (PCD 340 mm) and similar

28c	999.223.04121	O-Ring	O-ring138	1
02c	10.0200.065.13	seal	Baruffaldi	1

For model 06 (PCD 380 mm) and similar

28c	999.223.05593	O-Ring	O-ring145	1
02c	10.0200.065.04	seal	Baruffaldi	1

4.5 Spare parts list for TSMA 250 (see frame of reference chapter 4/1-a/2)

For model 01 (pcd 400 mm) and similar

Rif.	Codice	Denomination	Type	Quant.
02a	999.223.02707	O-Ring	O-ring163	1
04d	999.223.00470	O-Ring	O-ring037	1
04e	999.223.02083	O-Ring	O-ring111	1
30a	999.223.04988	O-Ring	O-ring013	1
12a	999.223.00561	O-Ring	O-ring014	1
13a	999.223.00561	O-Ring	O-ring014	1
04f	999.223.02153	O-Ring	O-ring122	1
02f	999.223.01020	O-Ring	O-ring277	1
02b	999.223.01020	O-Ring	O-ring277	1
02d	999.223.01928	O-Ring	O-ring015	9
03c	999.305.02700	seal glyd-ring	02A010350A24N	1
02e	999.263.07361	seal (viton)	MIM 40x52x7	1
29a	999.149.07503	bearing	61908	2
26a	999.149.07545	bearing	6303	1
12	36.0250.02701	cooling bush	Baruffaldi	1
03a	999.149.05265	Cage	AXK1226	2

For model 01 (pcd 400 mm) and similar

28c	999.223.06431	O-Ring	O-ring144	1
02c	10.0250.06504	seal	Baruffaldi	1

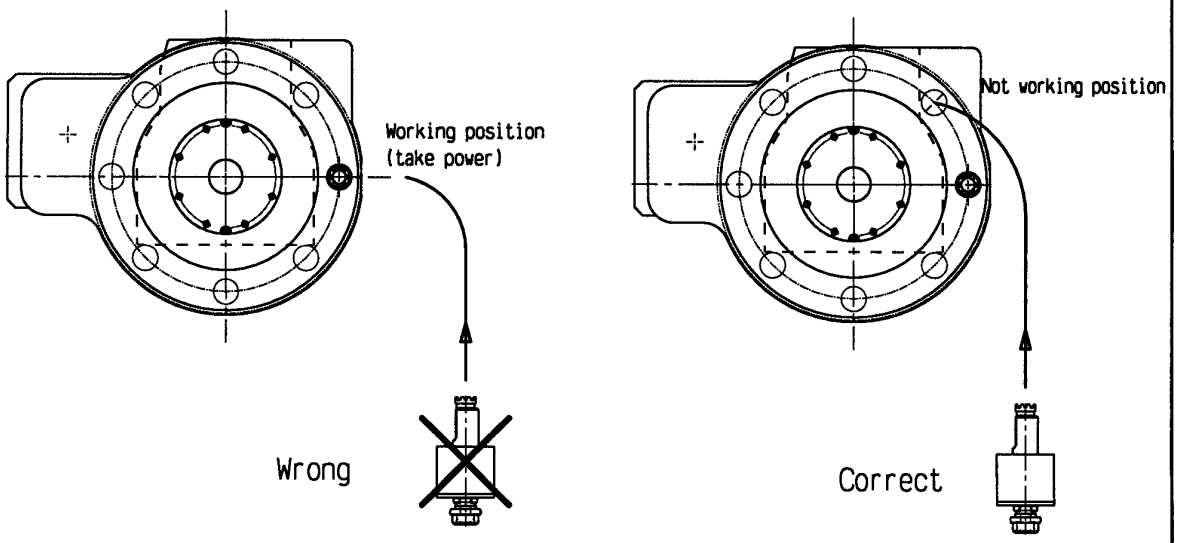
For model 01 (pcd 444,5 mm) and similar

28c	999.223.04539	O-Ring	O-ring151	1
02c	10.0250.06506	seal	Baruffaldi	1

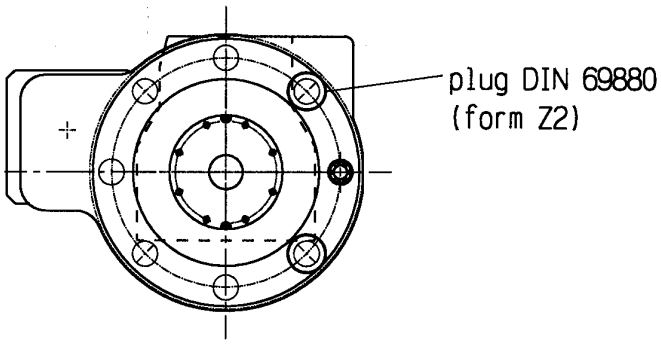
5 Use advices

5.1 Assembly of the rotating toolholders on the disk

When equipping the disk, the fixing of the rotating toolholder it must not be made in the working position (where there is the clutch, but in another position)



At the end of the equipment, all the DIN 69880 seats, witch are not occupied, by fixed or rotating toolholders, must be closed with plugs DIN 69880 (Z2) and with its looking screws



It's complusory to avoid that chips, go through the VDI or it's screws seats.
Before remove the toolholders from the disk, clean the area with air
if these rules are not followed, it could be damaged the correct functioning of the turret

5.2 Rotating toolholders regulation

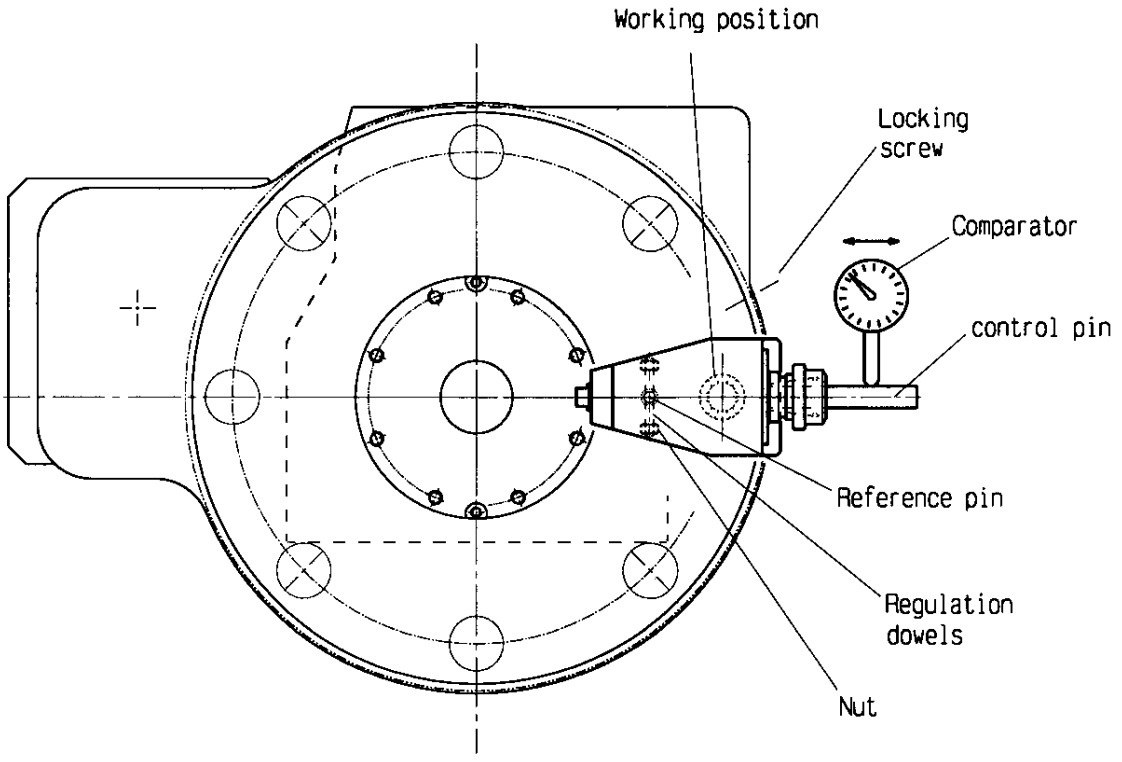
- Verify on the toolholder disk, the presence of the reference pins, in the positions,where is intended to use the rotating toolholder.On the Baruffaldi disk the reference pins are assembled, normally, in all the positions thought to be used with rotating toolholders.

- Loose the dowels and assembly the radial toolholder in a position nearly the working one, and tighten the DIN 69880 screw (it's not possible to assembly the rotating toolholder directly in the working position).

- Rotate the disk till the radial toolholder is in the working position

- Assembly a control pin in the toolholder's collet, so that it comes out 40/50mm;lock the sing nut

- Using a comparator verify the pins allignement



- In case of an angular run out bigger than requested, use the two dowels in order to obtain. the requested allignement.(Both dowels have to touch the reference pin).

- When the allignement is finished, tighten the nuts (), lock the DIN 69880 screws and verify the correct allignement ot the comparator

- Remove the control pin from the toolholder and assembly the requested tool.