



comer industries

Gearboxes

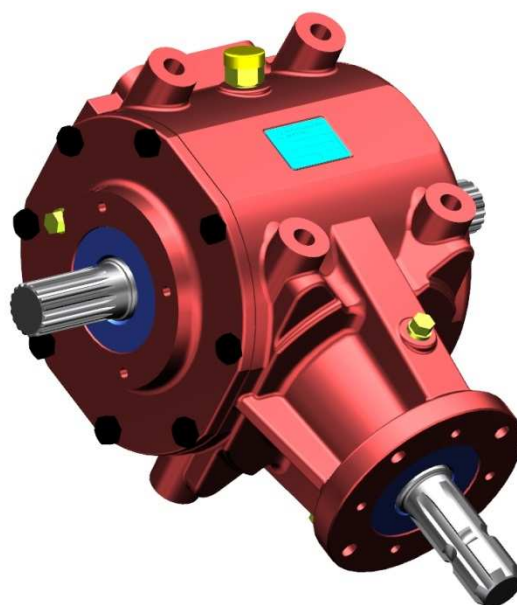
Quality System certified

UNI EN ISO 9001

SERVICE MANUAL

Code

9.290.621.00



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Revision n°0



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Introduction

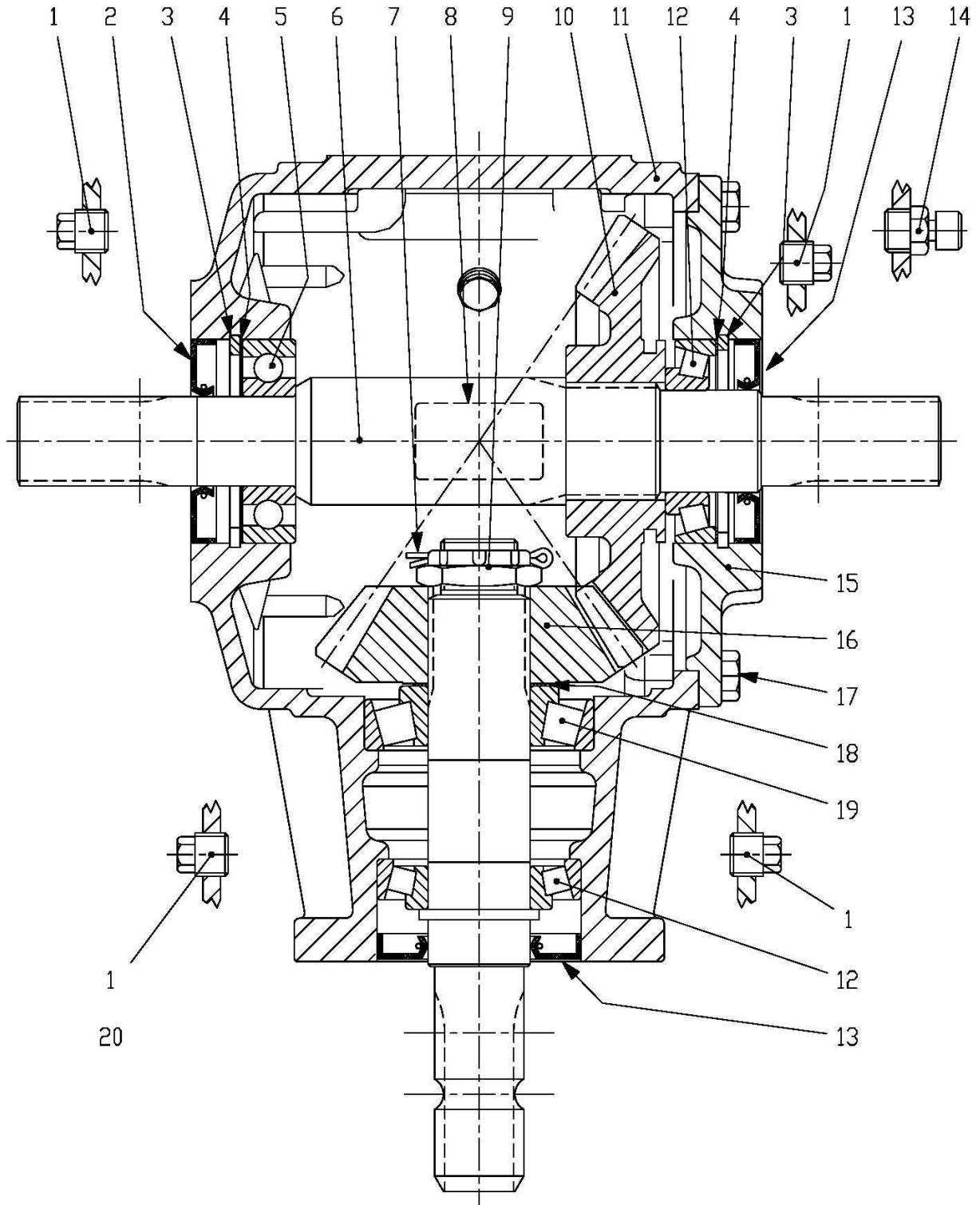
The information contained in this manual are only a general information.

Comer Industries maintains the right of modifying or updating the content of this manual when requested without need of previous information.

In consideration of the attention and care needed for disassembly/re-assembly operations, the success and the safety of the intervention are exclusively under operator's responsibility.



Spare part drawing



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00.0000



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Spare part list

DESIGNATION GEAR BOX TV-290H

CODE N° 9.290.621.00

POS.	DRG. N.	PIEC	DESCRIPTION
1	8.6.5.00006	4	PLUG 3/8"GAS
2	8.7.3.00081	1	OIL SEAL 35X80X10
3	8.5.2.01370	2	SNAP RING 80 UNI7438
4	0.267.7500.00	2	SHIM 79.9
5	8.0.1.00049	1	BALL BEARING 6307
6	0.290.3216.00	1	SHAFT 35x31 DIN 5482
7	8.4.7.01111	1	COTTER PIN B4X55
8	0.124.7101.00	1	PLATE
9	0.132.7106.00	1	NUT M30X1.5
10	0.272.5001.00	1	CROWN WHEEL Z28 M6.22
11	0.290.0308.00	1	CASING
12	8.0.9.00024	2	BEARING 30208
13	8.7.3.00027	2	OIL SEAL 40X80X10
14	8.6.7.00161	1	OIL FILLER PLUG 3/8"GAS
15	0.290.1367.00	1	COVER
16	0.272.6001.00	1	PINION Z19 M6.22
17	8.1.1.00061	8	BOLT M10X25 8,8
18	0.244.7500.00	1	SHIM KIT 40.3x51.5
19	8.0.9.00128	1	BEARING 30308
20	0.290.2001.00	1	SHAFT



1. Disassembly

NOTES

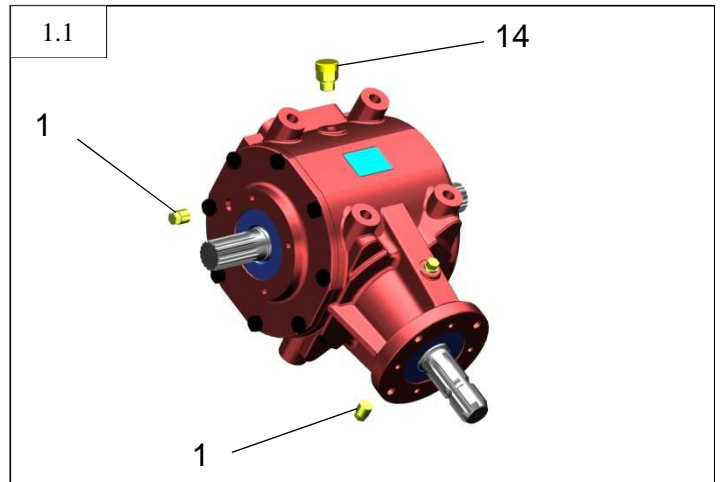
Warning : Disassembled shims if not damaged, must to be assembled in the same positions.



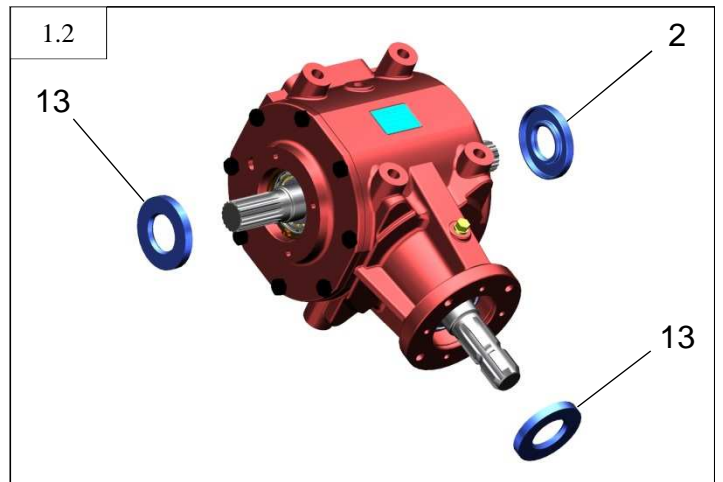
1. Disassembly

Tools : Fork wrench n°13-17-19, chisel, hammer, snap ring pliers, pipe.

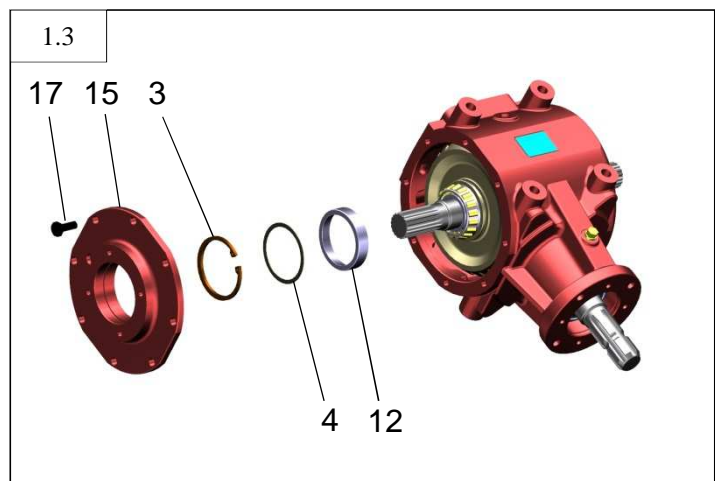
- Unscrew plugs (1),(14) and empty the oil from gearbox.



- Disassemble oil seals (2),(13) using chisel and hammer.



- Unscrew bolts (17) and disassemble cover (15), using chisel and hammer.
- Disassemble snap ring (3) and shims (4), from cover (15).
- Disassemble outer ring (12) from cover (15), using pipe and hammer.

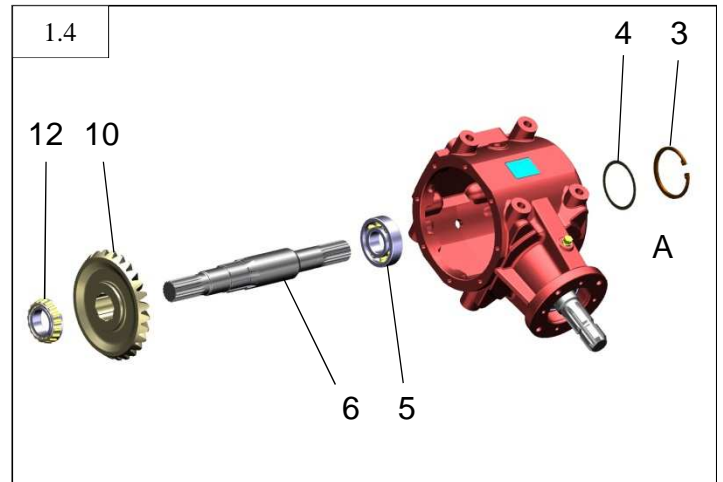




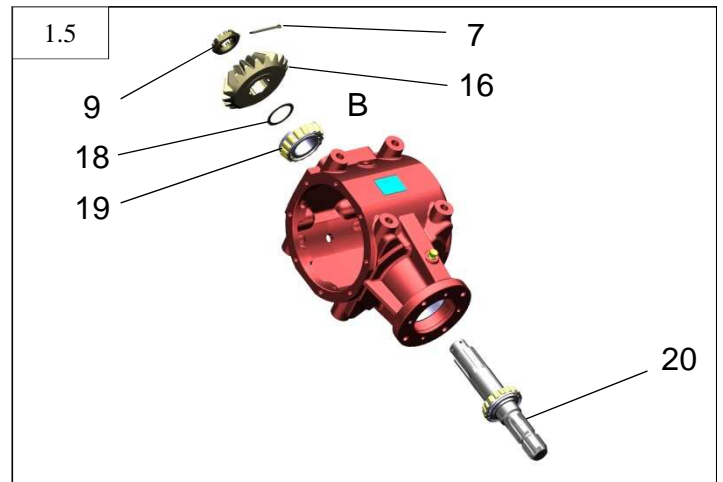
1. Disassembly

Tools : Hammer, pipe, extractor, chisel, snap ring pliers, pliers, adjustable wrench.

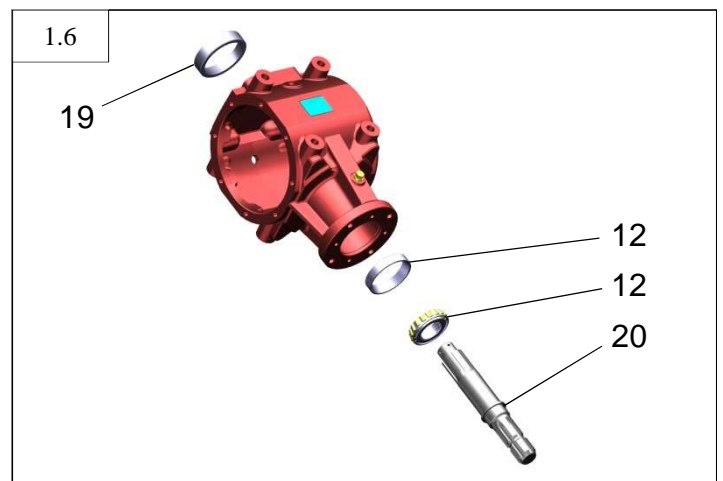
- Hit the shaft (6) from side (A) in order to extract it from housing.
- Disassemble bearing (5) from shaft (6), using a pipe and hammer or extractor.
- Disassemble crown wheel (10), using pipe or chisel and hammer, pick up inner ring (12).
- Disassemble snap ring (3) and take away shims (4).



- Unbend cotter pin (7) and disassemble it.
- Unscrew castle nut (9) and disassemble it.
- Hit the shaft (20) from side (B) in order to extract it from housing, pick up gear (16), shim (18) and inner ring (19).



- Disassemble inner ring (12) from shaft (20), using an extractor or pipe and hammer.
- Disassemble outer rings (9),(14) from housing, using a chisel or pipe and hammer.





2. Assembly

NOTES

Clean all the components from remaining grease and silicone.

Replace any particular damaged.

When assembling the ball bearings and taper roller bearings, pay attention to not make any pressure on the cages in order to avoid any damage.

When assembling oil seals avoid contact with cutting parts in order to prevent any damage to the inner lip.

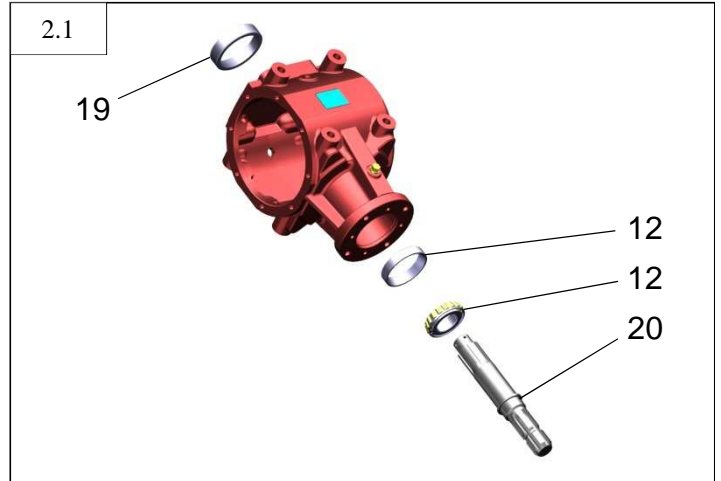
Insert oil seals taking care or greasing the zone of contact between oil seal and shaft.



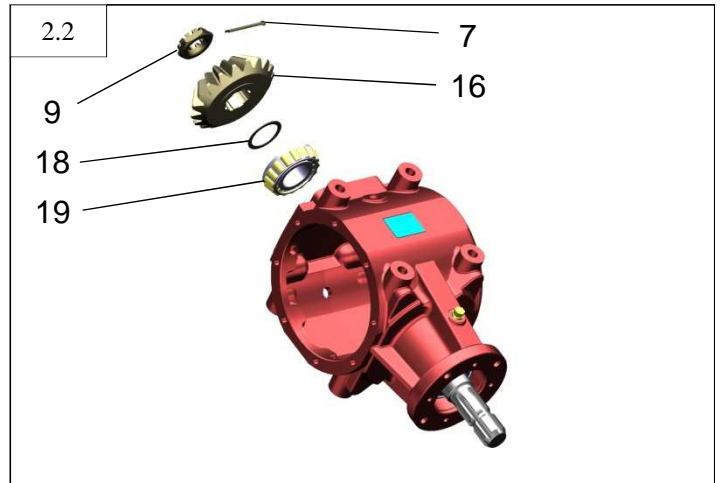
2. Assembly

Tools : Pipe, hammer, adjustable wrench, torquemeter, pliers, snap ring pliers.

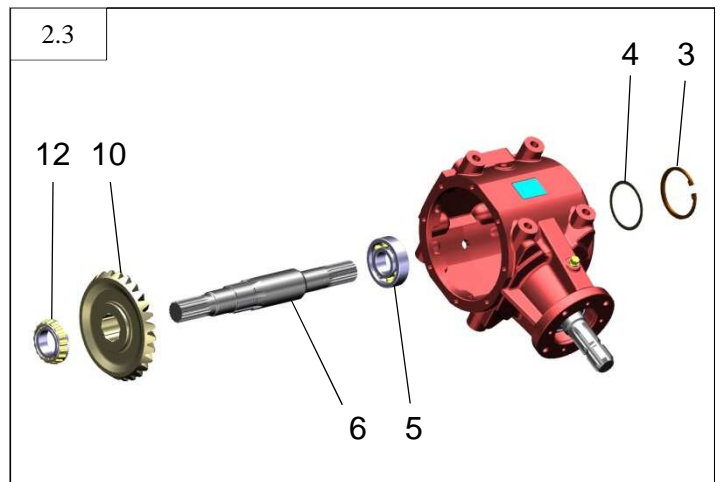
- Assemble outer rings (12),(19), using pipe and hammer inside housing.
- Assemble inner ring (12) on shaft (20), using pipe and hammer.
- Assemble pre-mounted shaft (20).



- Assemble inner ring (19) shim (18), gear (16), and castle nut (9) and tighten in order to obtain a bearings axis preload value, major of 8 kgcm.
- Hit the shaft from both sides in order to set the axis.
- Check the assembled axis preload, the value must be 3÷8 kgcm, if the value is different screw or unscrew the castle nut (9), in order to obtain the right value.
- Insert cotter pin (7) and bend it.



- Assemble snap ring (3), shim (4) inside housing.
- Assemble bearing (5) on shaft (6), using pipe and hammer.
- In order to test the right mesh between the gears, use a color like prussian blue on the gear's teething.
- Assemble crown wheel (10), inner ring (12), using pipe and hammer on shaft (6).
- Assemble pre-mounted shaft (6).





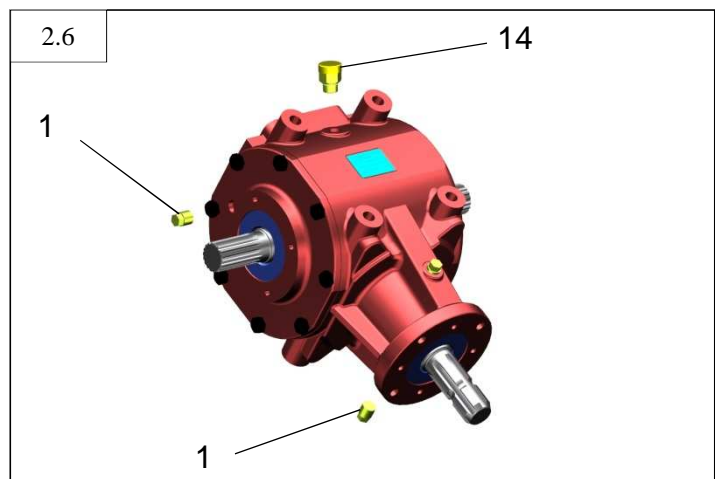
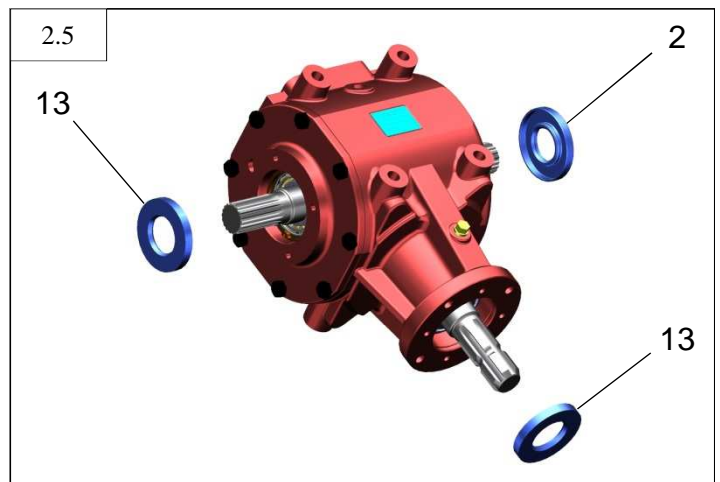
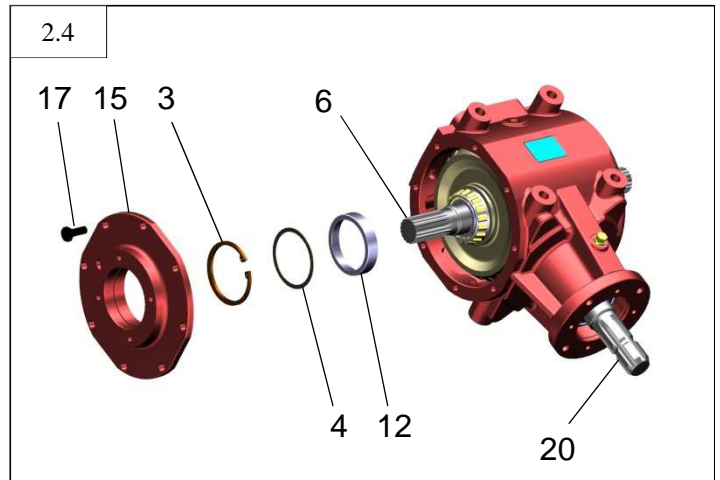
2. Assembly

- Assemble snap ring (3), outer ring (12) inside cover (15), using pipe and hammer.
- Assemble the pre-mounted cover (15), bolts (17) and tighten manually.
- Check axis preload value (K), using a torquemeter.
- Disassemble bolts (17), cover (15) and outer ring (12).
- Assemble shim (4), outer ring (12) inside cover (15), using pipe and hammer.
- Assemble pre-mounted cover (15), bolts (17) and tighten manually.
- Hit the shaft, from both sides in order to set the axis.
- Check axis preload value (W), using a torquemeter.
- The difference between value (W) and value (K) must be 0÷3 kgcm.
- In order to have the correct preload value change shims setting (4).
- Rotate manually the shaft (20) in the work direction and lock shaft (6), verify the gear's mesh. (See technical specifications on page 11).
- In order to have the correct backlash value 0.19÷0.50, change shims set (4) fig.(2.4) and/or (18) fig.(2.2), (pls be aware that when you change the shim set, you will also have to re-set the preload).
- Disassemble bolts (17), cover (15), put a Silicone film between cover and housing contact surfaces.
- Assemble pre-mounted cover (15), bolts (17) and tighten to 5÷6.4 kgm.

- Assemble oil seals (2),(13) using pipe and hammer.

- Assemble oil plugs (1) and tighten 3 kgm max.
- In order to prevent any leak of oil, make the following test: insufflate from the hole plug (14) to pressure bar 0.32 and put the gearbox in a tank; if you prefer you can verify any pressure drop with a manometer assembled on hole plug (1),(scale about 0.6 bar) for 10 minute
- Fill the gearbox with oil SHELL OMALA S2G 320.
- Assemble plug (14) and tighten to 3 kgm. max.

Tools : Snap ring pliers, pipe, hammer, fork wrench n°13-17-19, torquemeter, dynamometric wrench, caliper, comparator.



3. Technical specifications

ASSEMBLY AND MAINTANANCE

A) The contact of crown wheel and pinion must be located like in Fig. A (mark obtained without load on crown wheel and pinion)

Use the shims in order to obtain the right contact.

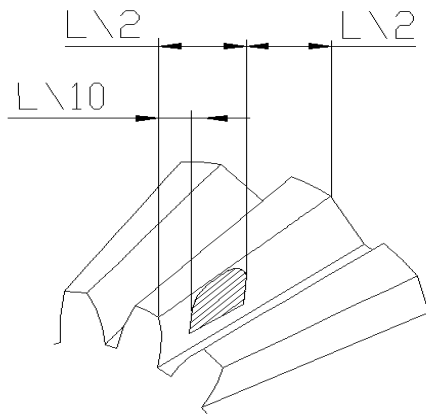


Fig. A

B) Gearbacklash must be respect the following relation:

(0.03 / 0.08) x module

(if module $m=5$ gear backlash must be 0.15 / 0.40 mm)

C) Tightening of bolts must be carried out making use of torquemeter wrench.

D) Insert oil seals taking care or greasing the zone of contact between oil seal and shaft.

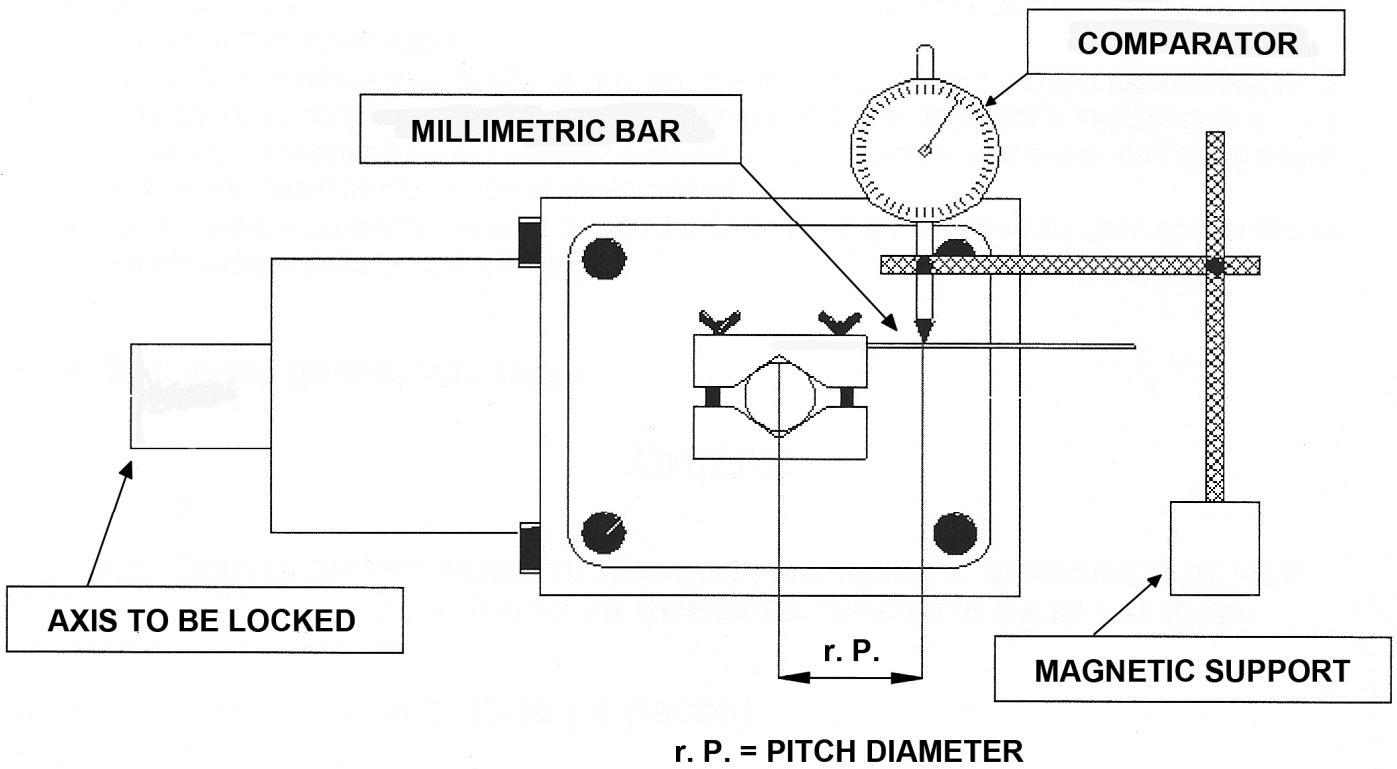
E) Gearbox operators with lubricating oil.



3. Technical specifications

Backlash control

The figure shown how check the backlash





4. Maintenance

Lubrication

- Gearbox operates with oil lubrication
- The type of oil recommended is : SAE 90EP
- Oil Quantity 2.3 Litres

Oil change :

- First oil change is recommended after the first **50 hours of work** other change after 600 hours and / or once per year at least.