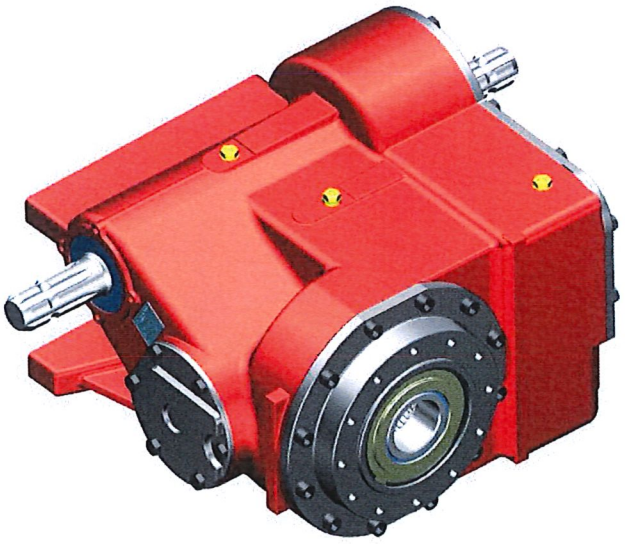
comer industries
Gearboxes

Quality System certified
UNI EN ISO 9001

Customer FALC

SERVICE MANUAL

Code
9.827.000.10



Issue Date 29-03-2017 Revision n° 0

Index

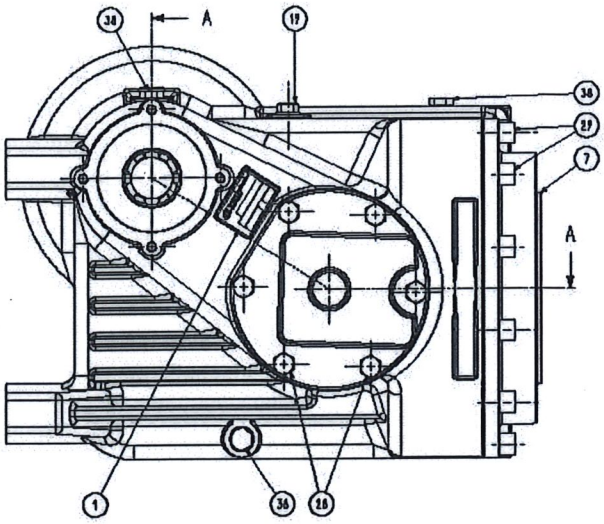
Introduction

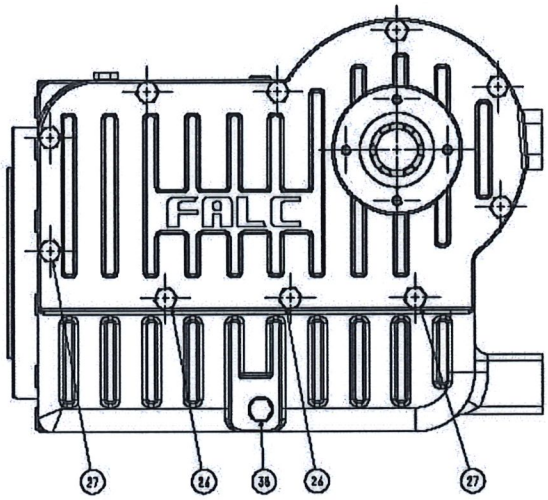
The information contained in this manual are only a general information.

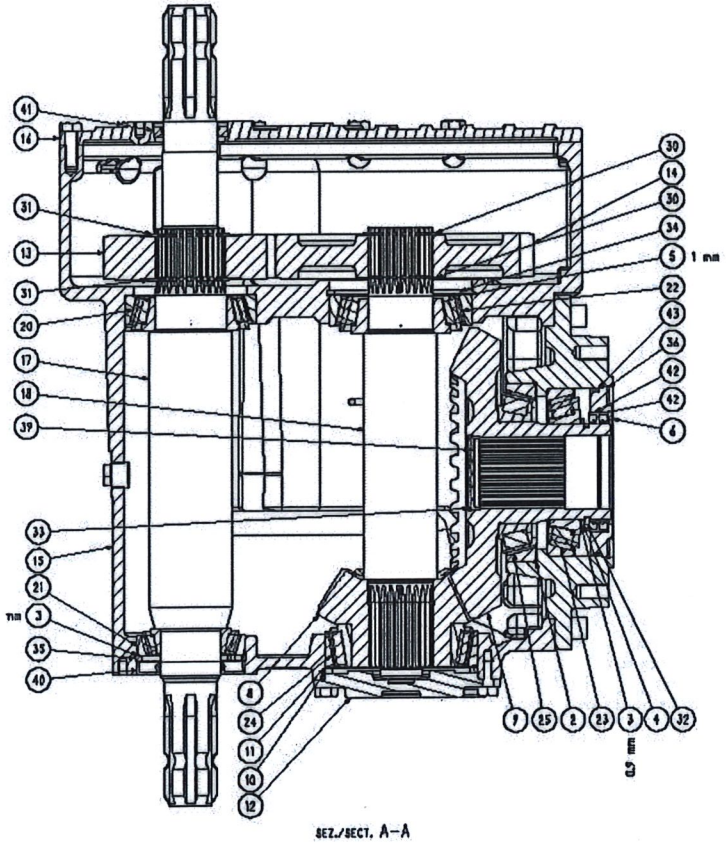
Comer Industries maintains the right of modifying or updating the content of this manual when requested without need of previous information.

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







Spessorazione teorica
- 2 — 1.15 mm
- 3 — 1 / 09 mm
- 6 — 1 mm
- 11 — 1.10 mm

PC NO	PART NAME	QTY	SAP MATERIAL DESC
1	0.124.7101.00	1	TARGHETTA "COMER"
2	0.309.7500.00	1	SPES.REG. 135.5x149.5
3	0.702.7300.00	2	SPES.REG. 80.3x89.7
4	0.702.7320.00	1	SPES.REG. 80.3x89.7x2
5	0.719.7500.00	1	SPES.REG. 108.0x118.0
6	0.733.1317.00	1	COPERCHIO PER PARAOLIO
7	0.733.1323.00	1	FLANGIA DI USCITA
8	0.733.4003.00	1	PIGNONE CONICO Z14 M9,34
9	0.733.4004.00	1	CORONA CONICA Z26 M9,34
10	0.733.7114.00	1	DISTANZIALE 117x129.7x4.9
11	0.733.7300.00	1	SPES.REG. 139.5x115
12	0.821.1704.00	1	COPERCHIO CHIUSO
13	0.826.5003.00	1	INGRANAGGIO CIL.IND. Z27 M5 R=1.59
14	0.826.5004.00	1	INGRANAGGIO CIL.IND. Z43 M5 R=1.59
15	0.827.0301.00	1	SCATOLA
16	0.827.1300.00	1	COPERCHIO CAMBIO
17	0.827.3000.00	1	ALBERO PASS.ENTRATA 1"3/4
18	0.827.3000.00	1	ALBERO INTERMEDIO
19	0.827.7100.00	1	TAPPO GONI.TV.ES.EST 1/2"Gas
20	8.0.9.00579	1	CUSC.RULL. CON.CLA 32212
21	8.0.9.00688	1	CUSC.RULL. CON.CLA 30210
22	8.0.9.01033	1	CUSC.RULL. CON.CLA 30311
23	8.0.9.01681	1	CUSC.RULL. CON.CLA 30216
24	8.0.9.02053	1	CUSC.RULL. CON.CLA 33017
25	8.0.9.02683	1	CUSC.RULL. CON.CLA 30217
26	8.1.1.00054	2	VITE TE M10x20 UNI5739 8.8
27	8.1.1.00073	8	VITE TE M10x30 UNI5739 8.8
28	8.1.1.01719	4	VITE TE M10x22 UNI5739 Zn 8.8
29	8.1.2.01704	12	TCEI UNI5931M12X3512.9 DCRT32D
30	8.5.1.00595	2	ANELLO EL.SIC. x ALB 35 UNI7435
31	8.5.1.00602	2	ANELLO EL.SIC.X ALB 55 UNI7435
32	8.5.1.02085	1	ANELLO EL.SIC. x ALB 80 S-4
33	8.5.2.00007	1	ANELLO EL.SIC. x FORO 62 UNI7437
34	8.5.2.00509	1	ANELLO EL.SIC. x FORO 120 UNI7437
35	8.5.2.01884	1	ANELLO EL.SIC. x FORO 90 H=4 UNI7438
36	8.5.3.01381	1	ANELLO DI SPAL. x ALLOG. SB143
37	8.6.0.02073	1	SOTTOTAPPO d=62
38	8.6.5.00263	4	TAPPO CON.ESAG.EST. 1/2"Gas
39	8.7.0.01359	1	CAPPELLOTTO DI CHI. 62x7
40	8.7.1.01107	1	AN.TEN.LAB.PAR.RAUDSL 80x90x10
41	8.7.1.01307	1	AN.TEN.LAB.PAR.BASL 45x62x8
42	8.7.1.02084	2	AN.TEN.LAB.PAR.BASL 80x100x7/8
43	8.7.4.01847	1	GUARN.TEN.O-RING 132.94x3.53

1. Disassembly

Tools
Fork wrench n° 17-22, chisel, hammer, allen screw wrench n° 10, snap ring pliers, pliers, pipe, extractor.

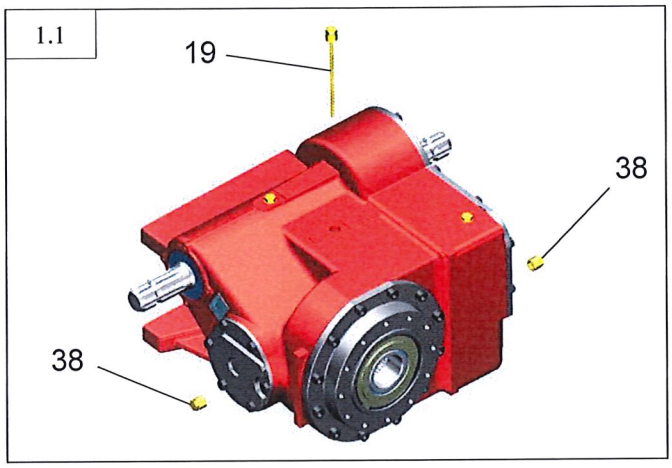
NOTES

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

1. Disassembly

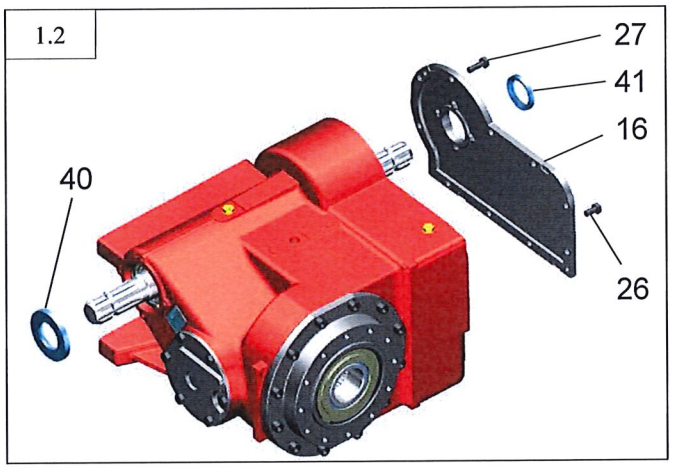
- Unscrew plugs (19,(38) and empty the gearbox from oil.

1.1



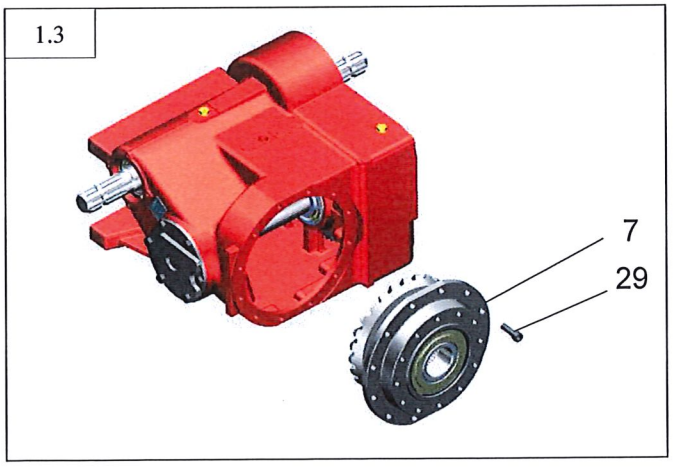
- Disassemble oil seal (40), using chisel and hammer.
- Unscrew bolts (26),(27), disassemble cover (26), using chisel and hammer.
- Disassemble oil seal (41) from cover (16), using chisel and hammer.

1.2



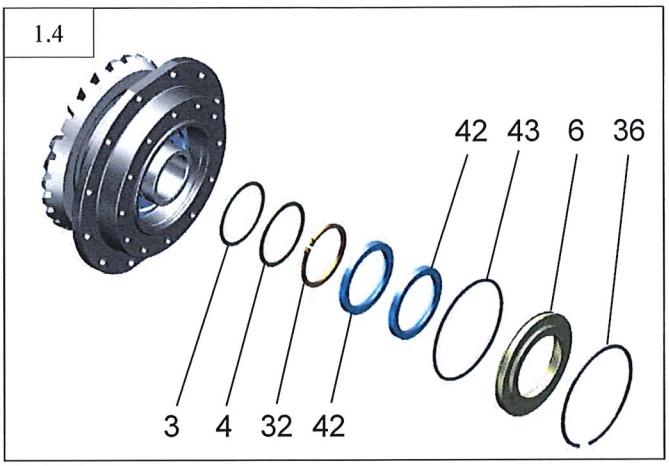
- Unscrew the bolts (29), disassemble flange (7), using chisel and hammer.

1.3

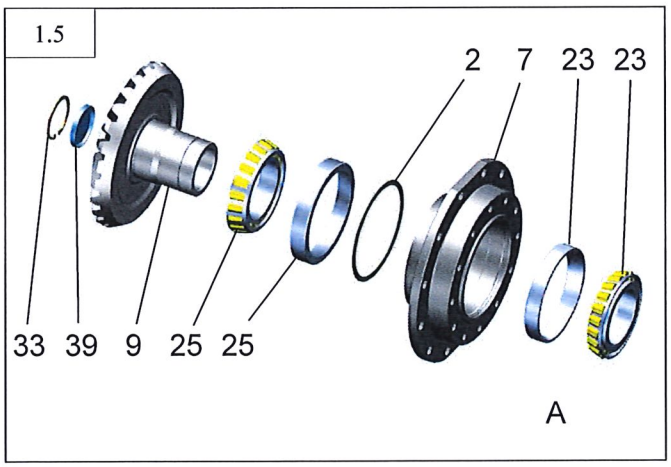


1. Disassembly

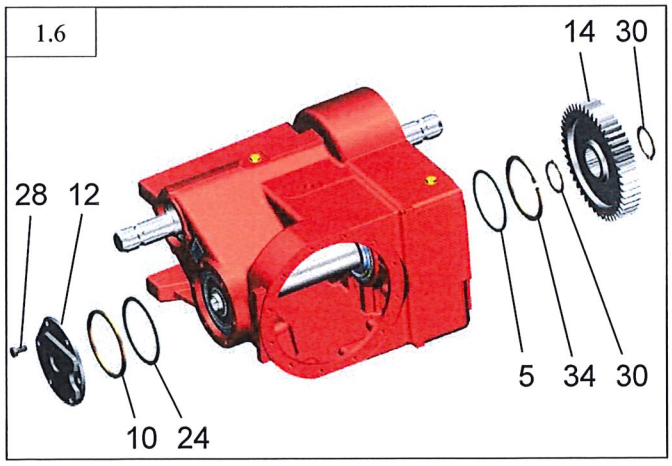
• Disassemble snap ring (36), cover (6), o-ring (43), oil seals (42), using chisel and hammer.
• Disassemble snap ring (32), take away shims (3),(4).



• Hit the crown wheel (9) from side (A), using chisel and hammer, in order to disassemble it from flange (7), paying attention not damage the crown wheel (9) surfaces, pick up inner ring bearing (23).
• If necessary disassemble snap ring (33), cap (39), from crown wheel (9), using pipe and hammer.
• Disassemble inner ring bearing (25), from crown wheel (9), using an extractor.
• Disassemble outer rings bearing (23),(25) from flange (7), using an extractor, take away shim (2).



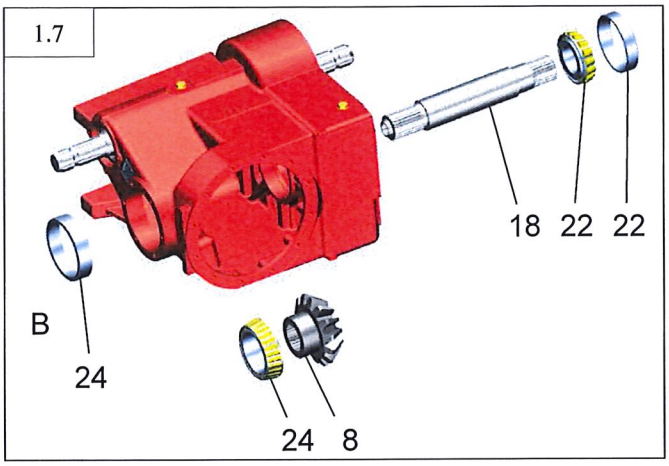
• Unscrew bolts (28), disassemble cover (12), using chisel and hammer.
• Take away spacer (10), shim (24).
• Disassemble snap ring (30), gear (14), snap rings (30),(34), take away shim (5).



1. Disassembly

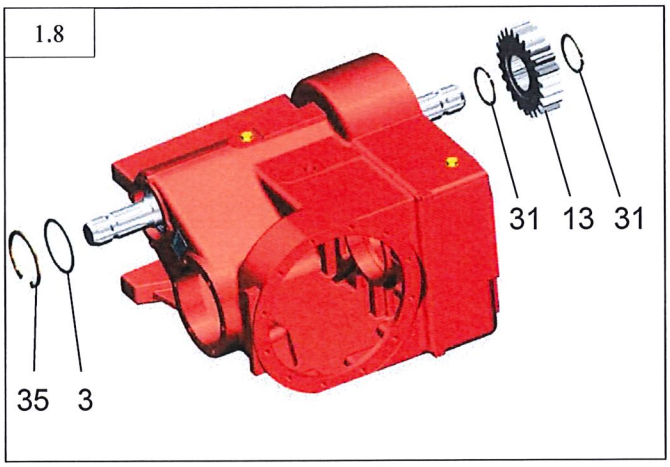
• Hit the shaft (18) from side (B), using chisel and hammer, in order to disassemble it from housing, paying attention not damage the shaft (18) surfaces, pick up outer ring bearing (22), inner ring bearing (24) and pinion (8).
• Disassemble inner ring bearing (22), from shaft (18), using an extractor.
• Disassemble outer ring bearing (24), from housing using pipe and hammer.

1.7



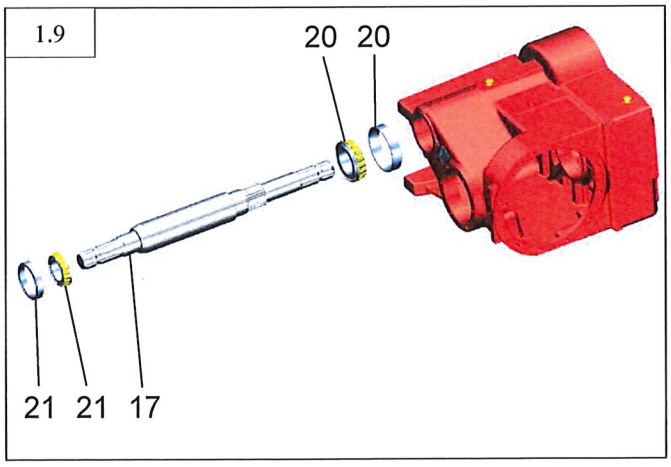
• Disassemble snap ring (35), take away shim (3).
• Disassemble snap ring (31), gear (13), snap ring (31).

1.8



• Extract the shaft (17), take away outer ring bearing (21).
• Disassemble inner ring bearings (20),(21) from the shaft (17), using an extractor.
• Disassemble outer ring bearing (20) from housing, using an extractor.

1.9



2. Assembly

Tools
Fork wrench n° 17-22, chisel, hammer, allen screw wrench n° 10, snap ring pliers, pliers, pipe, extractor, dynamometric wrench, torquemeter, caliper, comparator.

NOTES

Clean all the components from remaining grease and silicone.

Replace any particular damaged.

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

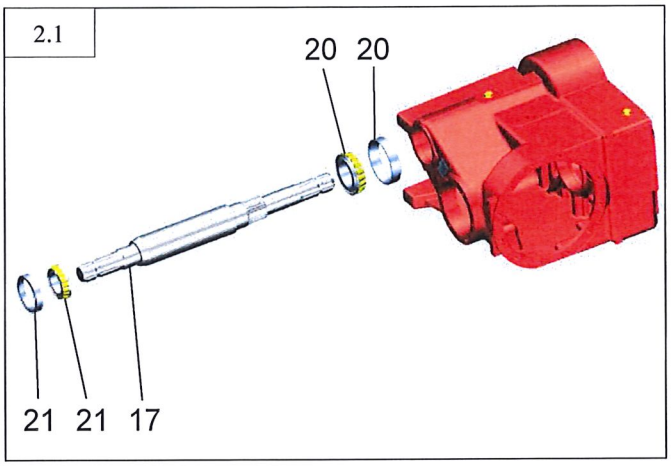
When assembling oil seals avoid contact with cutting parts in order to prevent any damage to the inner lip.

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

2. Assembly

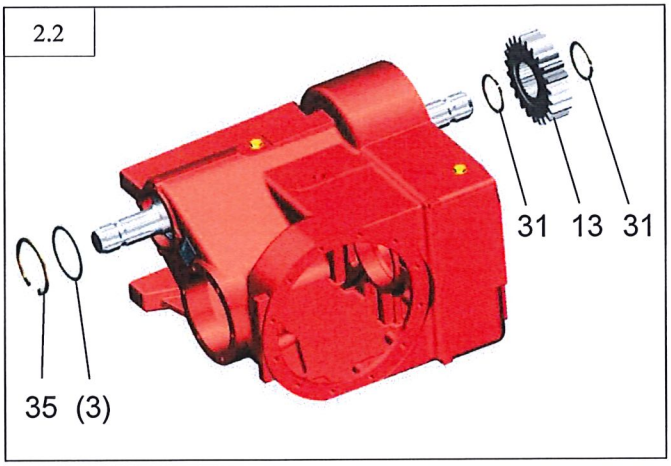
- Assemble inner ring bearings (20),(21) on shaft (17), using pipe and hammer.
- Assemble outer ring bearing (20), inside housing, using pipe and hammer.
- Insert pre-mounted shaft (17) inside housing, assemble outer ring bearing (21), using pipe and hammer.

2.1



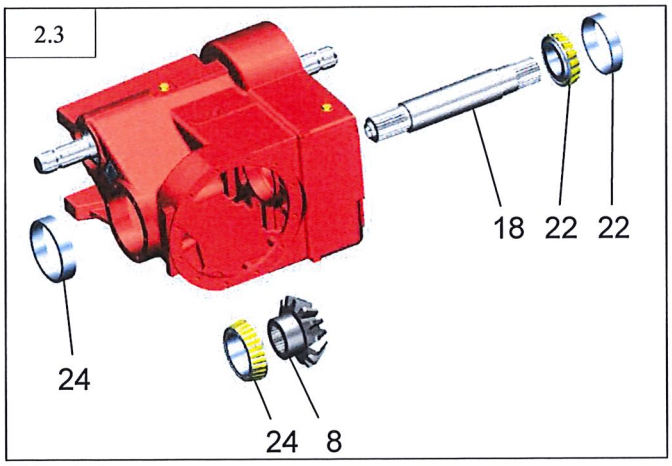
- Assemble snap ring (35).
- Check the rolling torque axis, value (K).
- Disassemble snap ring (35), assemble shim (3), snap ring (35).
- Hit the shaft from both side, in order to set the bearings.
- Check the rolling torque axis, value (W).
- The difference between value (W) and value (K) must be 1÷9 Kgcm.
- If the value is not correct change shim setting (3) in order to obtain the right value.
- Assemble snap ring (31), gear (13), snap ring (31).

2.2



- Assemble inner ring bearing (24) on pinion (8), using pipe and hammer.
- Insert pre-mounted pinion (8) inside housing.
- Assemble inner ring bearing (22), on the shaft (18), using pipe and hammer.
- Insert pre-mounted shaft (18) inside housing, paying attention to fit the pinion (8).
- Assemble outer ring bearings (22), (24), using pipe and hammer.

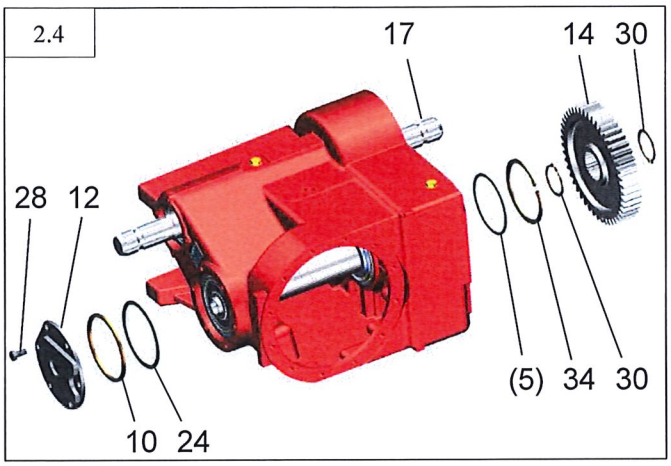
2.3



2. Assembly

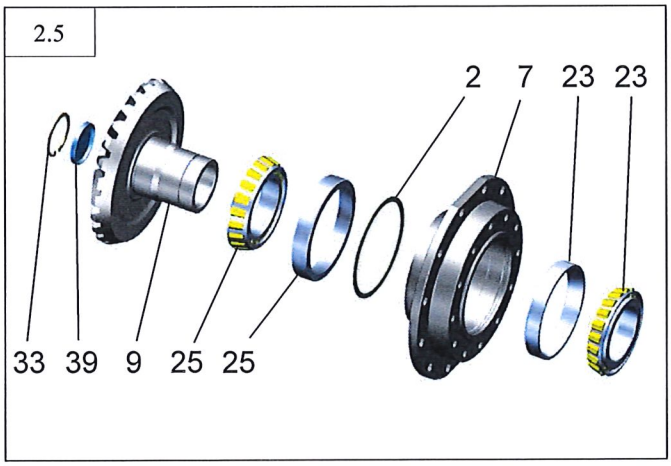
- Assemble spacer (10), shim (24), cover (12), bolts (28) and tighten manually.
- Assemble snap ring (34).
- Check the rolling torque axis, value (K).
- Disassemble snap ring (34), assemble shim (5), snap ring (34).
- Hit the shaft from both side, in order to set the bearings.
- Check the rolling torque axis, value (W).
- The difference between value (W) and value (K) must be 3÷9 Kgcm.
- If the value is not correct change shim setting (5),(24), in order to obtain the right value.
- Assemble snap ring (30), gear (14), snap ring (30).
- Unscrew bolts (28) and disassemble cover (12).
- Apply a Silicone film on housing and cover contact faces.
- Assemble cover (12), bolts (28) and tighten to 5÷6.5 kgm.

2.4



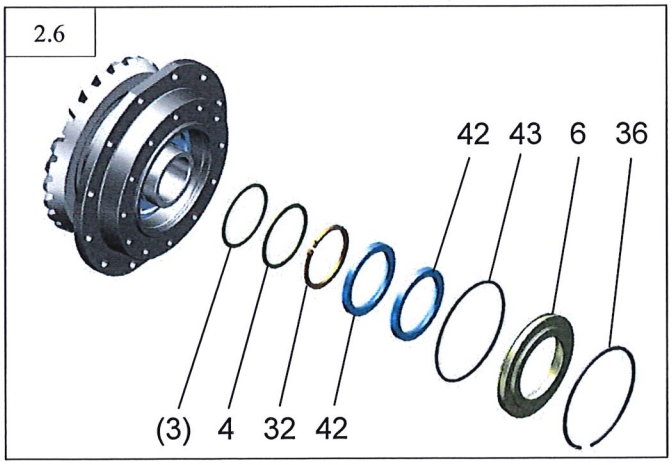
- Assemble cap (39), snap ring (33), inside crown wheel (9).
- Assemble inner ring bearing (25) on crown wheel (9), using pipe and hammer.
- Assemble shim (2), outer ring bearing (25), inside flange (7), using pipe and hammer.
- Assemble pre-mounted crown wheel (9), inside flange (7).
- Assemble taper roller bearing (23), 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 pre-mounted flange (7) on housing, crew manually n°4 bolts (29), figure 2.7.
- Rotate manually in the work direction, the shaft (17) and lock the crown wheel (9).
- Verify the right gears' mesh, see technical specifications on page 12.
- In order to have the correct backlash value 0.28÷0.75, change shim set (2),(24), (please be aware that when you change the shims set, you will also have to re-set the preload).
- Unscrew bolts (29) and disassemble flange (7).

2.5



- Assemble shim (4), snap ring (32).
- Check the rolling torque axis, value (K).
- Disassemble snap ring (32), assemble shim (3), snap ring (32).
- Hit the shaft from both side, in order to set the bearings.
- Check the rolling torque axis, value (W).
- The difference between value (W) and value (K) must be 10÷22 Kgcm.
- If the value is not correct change shim setting (3), in order to obtain the right value.
- Fill with Shell Gadus S2 V220D 2 grease, the space between the taper roller bearing (23), figure 2.5 and the two oil seals (42).
- Assemble oil seals (42), using pipe and hammer.
- Grease the o-ring groove on cover (6), assemble o-ring (43) on cover (6) .
- Assemble pre-mounted cover (6), snap ring (36).

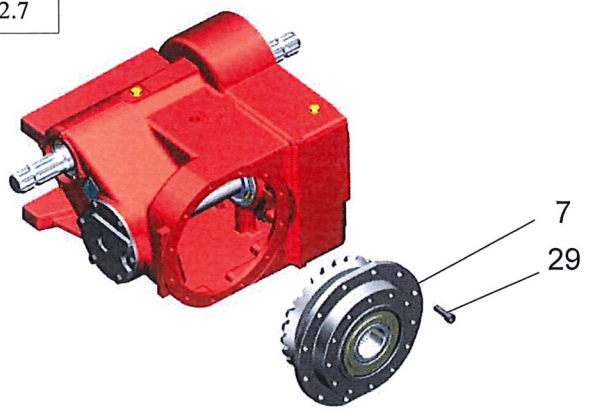
2.6



2. Assembly

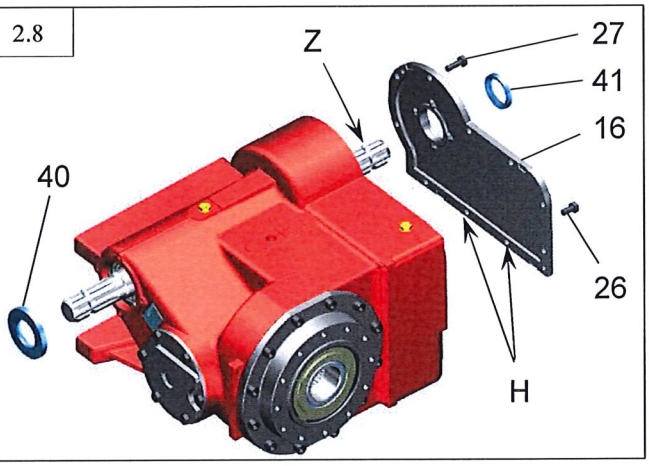
- Apply Silicone film on housing and flange contact faces.
- Apply Loctite 243 on thread bolts (29).
- Assemble flange (7), bolts (29) and tighten to 12÷14 kgm.

2.7



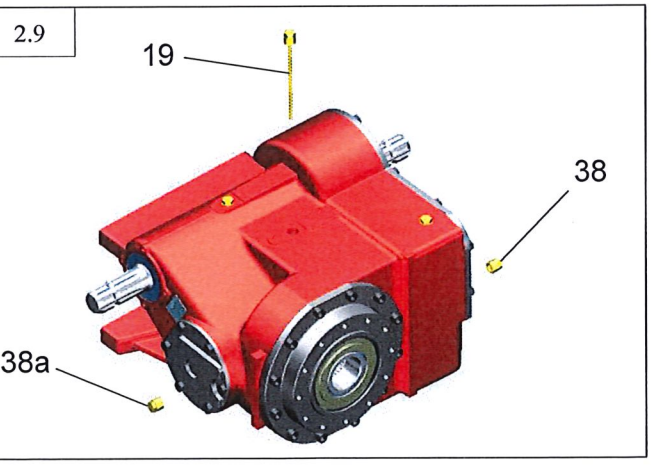
- Apply Silicone film on housing and cover contact faces.
- Assemble cover (16), n°2 bolts (26) position (H), bolts (27) and tighten to 5÷6.5 kgm.
- Apply adhesive tape on splined shaft area (Z) position, in order to avoid any oil lip seal damage.
- Assemble oil seals (40),(41), using pipe and hammer.

2.8



- Assemble plug (38) and tighten 3 kgm max.
- In order to prevent any leak of oil, make the following test: insufflate from the hole plug (19) to pressure bar 0.32 and verify any pressure drop with a manometer assembled on hole plug (38a), for 6 minute. Pressure drop admitted 0.001 bar.
- Fill the gearbox with oil SAE 90 EP
- Assemble plug (19),(38a) and tighten to 3 kgm max.

2.9



3. Technical specifications

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

Use the shims in order to obtain the right contact.

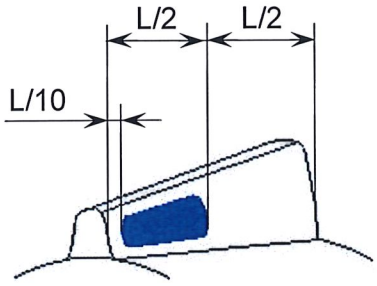
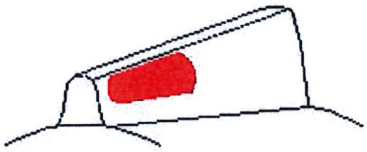


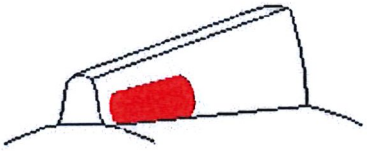
Fig. A

Right contact

High contact



Low contact



Pinion low contact	Crown wheel high contact	Pinion high contact	Crown wheel low contact
add shims	take away shims	take away shims	add shims

Note : If the right contact is obtained, but the bachlash is out of the request range, move the crown wheel by adding or taking away shims.
The pinion movement, alteration the contact area.
The crown wheel movement, alteration the bachlash.
The Ratio 1:1 does not follow the previous table, first adjust the teeth contact and later move both the gears in order to increase or decrease the backlash.

B) Gear backlash 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)

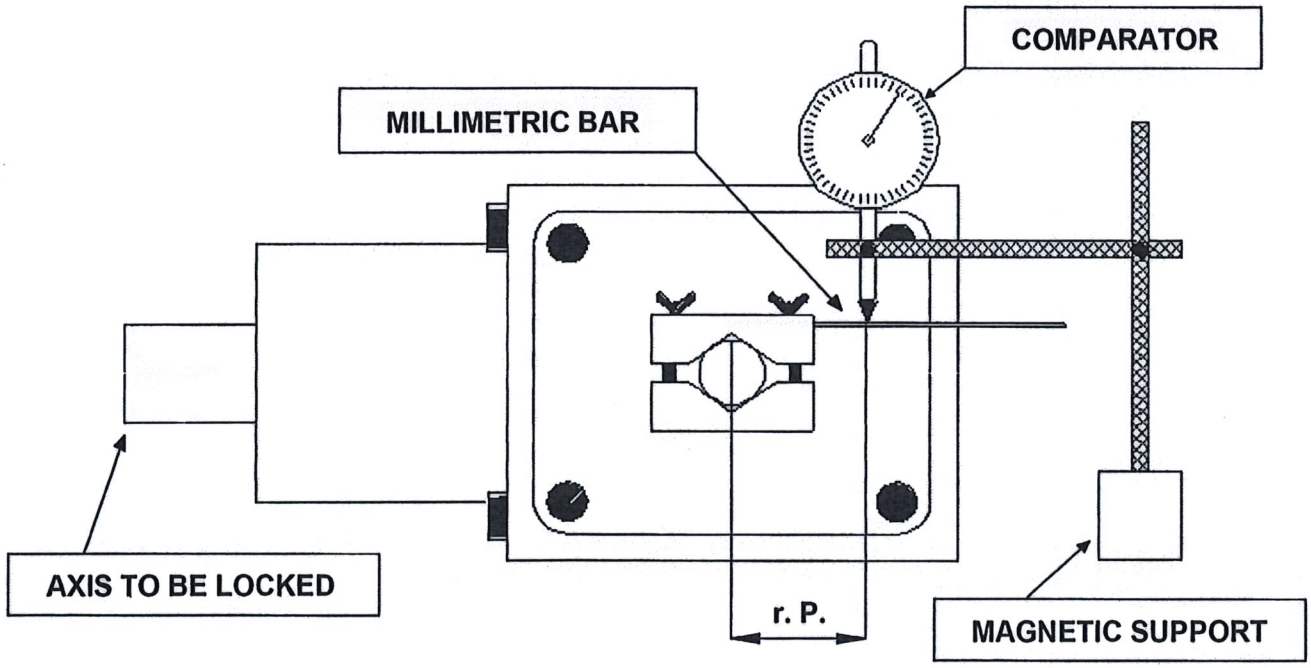
C) Tightening of bolts must be carried out making use of torquemeter wrench.

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

E) Gearbox operators with lubricating oil.

Backlash control

The figure shown how check the backlash



r. P. = PITCH DIAMETER

Lubrication

- Gearbox operates with oil lubrication

- The type of oil recommended is : SAE 90EP

- Oil Quantity 10 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.