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SERVICE MANUAL

Gearbox

128 axles series

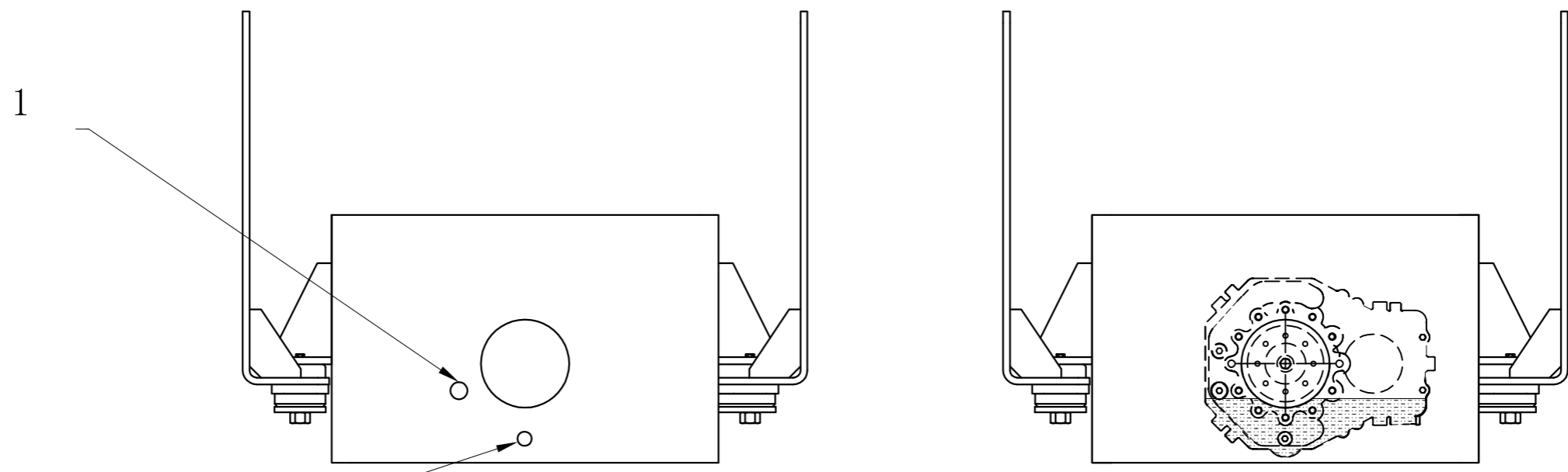
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| | |
| A02/18 | Update paragraph 3.1 |
| A03/13 | First issue |
| Release | Update description |

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8 7 6 5 4 3 2 1

D
C
B
A



1: Oil inlet cap Oil level cap
 2: Drain oil cap

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DRAWING NOT TO SCALE

| |
|----------|
| MATERIAL |
| ASSEMBLY |

UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN INCHES
 Dual dimensions are in mm
 Reference dimensions are in ()

TOLERANCES:
 Fractional: 1/8"
 Angular: MACH±0.5° BEND±2°
 Machined/Drilled Holes: ±0.01

All Others
 x.x ±0.10
 x.xx ±0.06
 x.xxx ±0.03

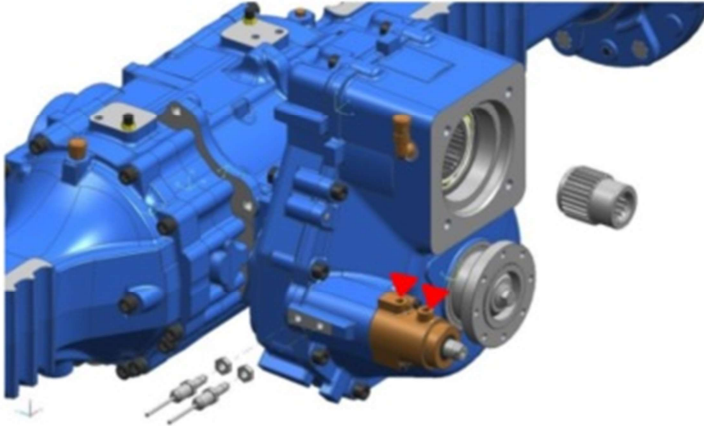
| | | | |
|-------------------------------------|--------------------|----------------|--------------|
| Part Description Gearbox Oil Cap | | Revision —0 | |
| Part Number C128 | | SCALE: 3:2 | |
| DRAWN BY JND | DATE 01/04/2020 | WEIGHT: | SHEET 1 OF 1 |

8 7 6 5 4 3 2 1

PRELIMINARIES

1. PRELIMINARIES

1.1. GEARBOX TYPE



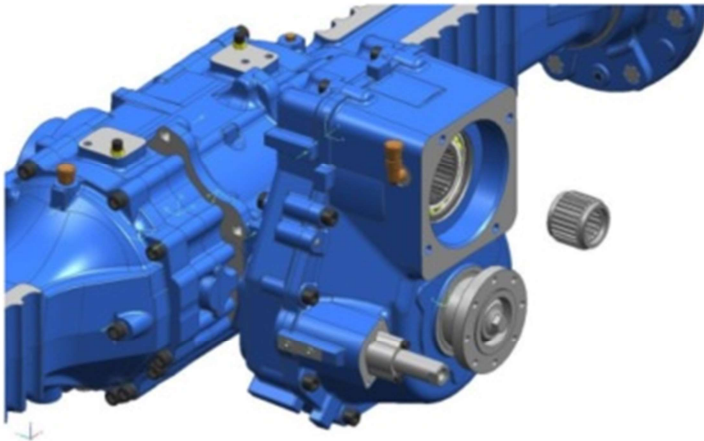
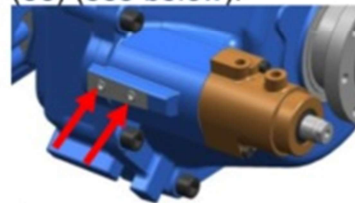
Hydraulic Shift Control

Once you remove the engine, take out motor sleeve (13).

▲ Disconnect hydraulic circuit from the cylinder gear shift (2) (if included with gearbox).

Disconnect the gear position sensor (4) (if included with gearbox).

If sensor is not included with gearbox, the holes are closed with set screws (53) (see below).



Manual Shift Control

Once you remove the engine, take out motor sleeve (13).

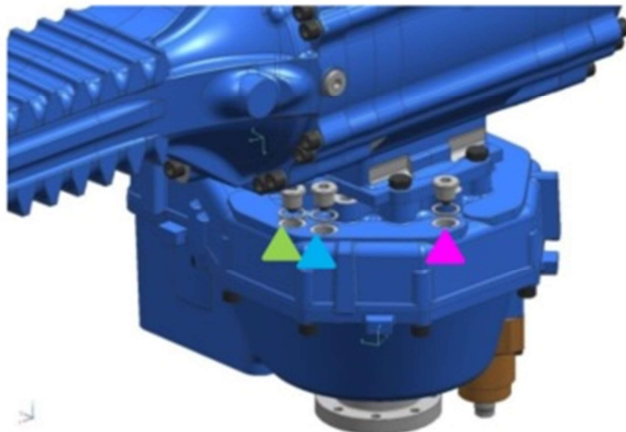
PRELIMINARIES

1.2. DRAIN OIL




Remove all caps to drain out oil of the gearbox assembly.



Remove breather cap (6) with its pipe (7) from the gearbox cover (41). Oil caps position is different depending on the mounting orientation of the gearbox.



Remove socket head caps with their own washer (23 and 24) from the gearbox housing (26).

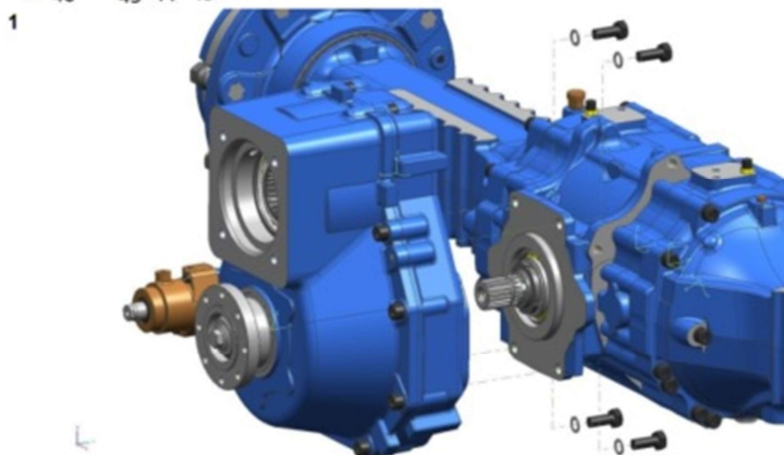
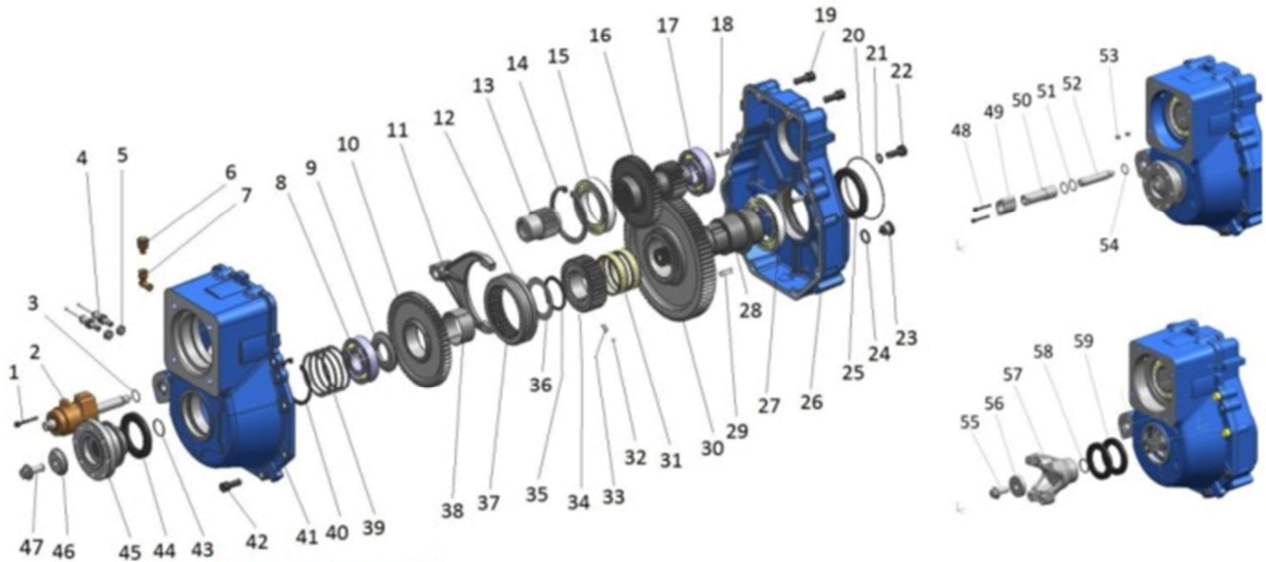
-  Oil inlet cap
-  Oil level cap
-  Drain oil cap

The oil caps position is different depending on the mounting orientation of the gearbox.

2. EXTRAORDINARY JOBS

2.1. GEARBOX

2.1.1. DISASSEMBLY



Before loosen the screws, fix the axle to an appropriate support equipment.

Unscrew the screws (22) with the own washers (21). Remove all gearbox assembly.

2



SHIFT CONTROL

Hydraulic Control

Loosen the screws (1), then unscrew the cylinder rod (2) from the shifter fork (11).

Extract all cylinder shift (2).

Finally recover o-ring (3) from the gearbox cover (41).

EXTRAORDINARY JOBS



Manual Control

Loosen the screws (48), then remove shift rod flange (49) and shift rod extension (49).

Remove copper washer (51).

Unscrew shift rod (51) from the shifter fork (11) and remove o-ring (54).

3



OUTPUT FLANGE

Cardan Flange

Loosen the screws (47). Remove pinion washer (46) with flange (45).

Recover o-ring (43) then, by using a screwdriver, remove oil seal (44).



End-Yoke Flange

Loosen the screws (55). Remove pinion washer (56) with end-yoke flange (57).

Recover o-ring (58) then, by using a screwdriver, remove oil seals (59).

EXTRAORDINARY JOBS

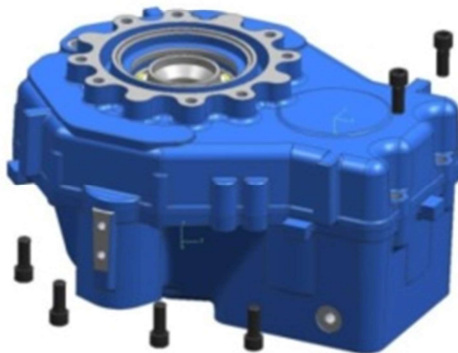
4



Reverse the gearbox.

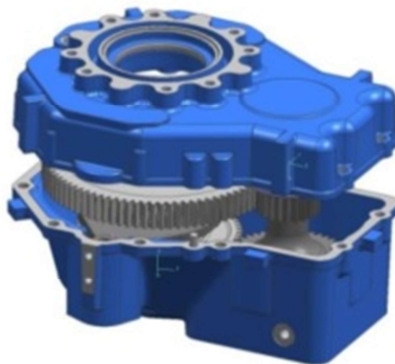
Recover o-ring (20) then, by using a screwdriver, remove oil seal (25).

5



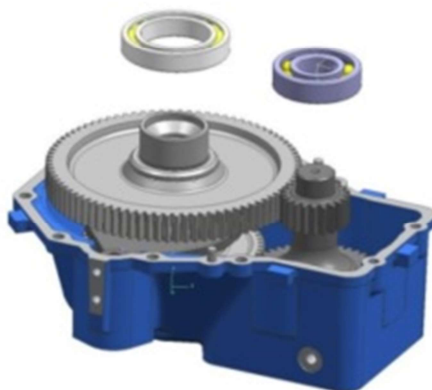
Loosen the screw (19).

6



Remove gearbox housing (26).

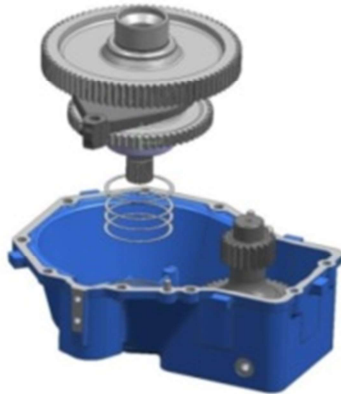
7



Remove ball bearings (17 and 27) by using an extractor.

EXTRAORDINARY JOBS

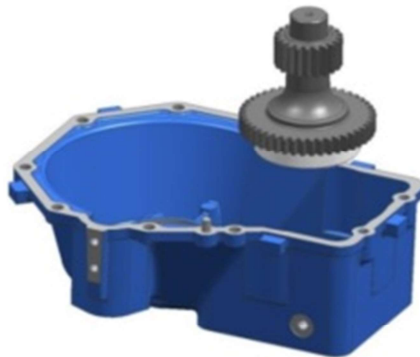
8



Retrieve the driven shaft (28) with all gear (10 and 30), shift fork (11), selector sleeve (37) and ball bearing (8) from the gearbox cover (41).

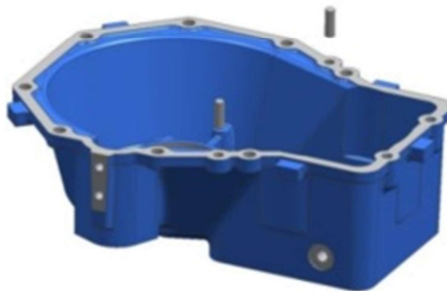
Then recover shims (39) of the driven shaft from gearbox cover.

9



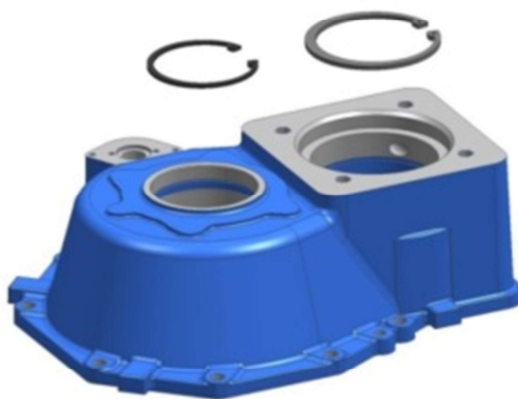
Remove drive gear (16) with ball bearing (15).

10



Recover cylindrical pin (18).

11



Disassemble snap-rings (14 and 40).

EXTRAORDINARY JOBS

12



Remove shifter fork (11) and recover ball bearing (8) by using an extractor from the driven shaft (28).

13



Recover ball bearing (15) from drive gear (16).

14



Remove shoulder ring (9), then remove 2nd driven gear (10) with its roller bearing (38).

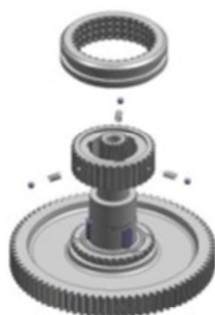
EXTRAORDINARY JOBS

15



Remove axial coupling (36)
and unmount snap ring (35).

16



Take out selector sleeve (37)
with the hub switch (34)
including balls (32) and springs
(33) inside.

Separate selector sleeve from
the hub selector .

NOTE: once you separate
sleeve and hub selector, balls
are pushed out by springs
inserted in hub selector:
retrieve all balls and springs.

17



Extract 1st driven gear (38)
than recover roller bearing
(31).

18



Remove the keys (29) from the
driven shaft (28).

2.1.2. ASSEMBLY

1



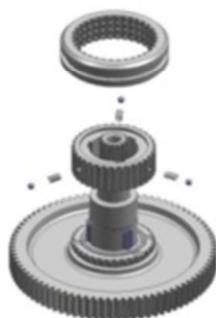
Pitch the keys (29) into the respective solts placed on driven shaft (28).

2



Insert roller bearing (31) in its seat on driven shaft (28), then mount 1st driven gear (30) on driven shaft.

3



Insert springs first (33) and then the balls (32) in its holes placed on the hub selector (34).

Keeping the balls in their respective holes, slide the sleeve (37) on the hab selector.

4



Mount the assembly obtained onto the drive shaft (28).

NOTE: pay attention to the phase between slots and keys.

Assemble snap ring (35) then insert the axial coupling (36).

EXTRAORDINARY JOBS

5



Insert the roller bearing (38) in its seat on driven shaft (28).

Insert 2nd gear (10) on roller bearing.

Insert shoulder ring (9).

6



Mount ball bearing (15) in its seat on the drive gear (16).

7



Mount ball bearing (8) in its seat on the drive shaft (28), then insert the shift fork (11) on sleeve selector (37).

NOTE: before mounting the shift fork, check the coupling with thread rod shifter (2 or 52).

8

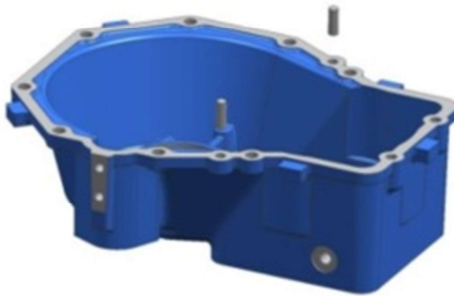


Assemble snap rings (14 and 40).



EXTRAORDINARY JOBS

9



Reverse gearbox cover (41).

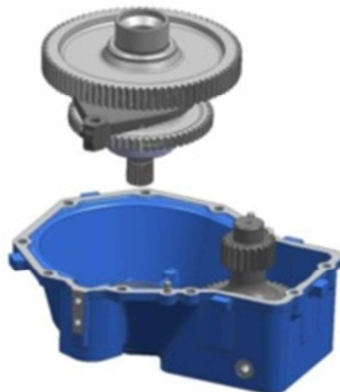
Pitch cylindric pin (18) in its seat on gearbox cover.

10



Mount dirve gear (16) with balls bearing (15) in its seat placed with gearbox cover (41).

11



Mount the driern shaft assembly (see chapter 2.1.2 operation 7) in its seat placed on gearbox cover (41).

12

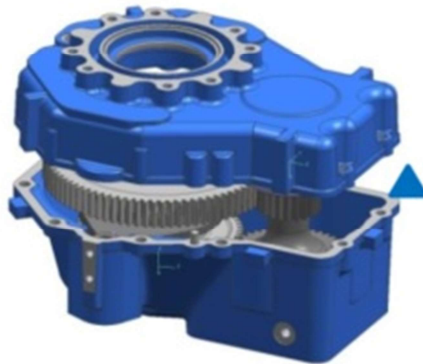


Mount ball bearing (17) in its seat on the drive gear (16).

Mount ball bearing (27) in its seat on the driven shaft (28).

EXTRAORDINARY JOBS

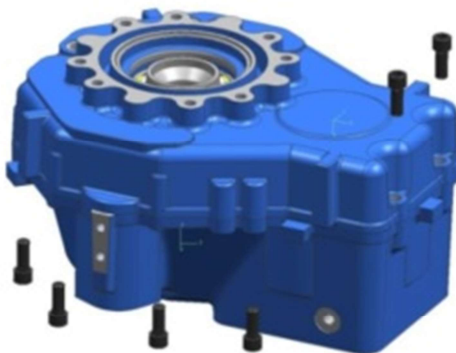
13



Install gearbox housing (26) on gearbox cover (41) centering the reference pins (18).

▲ Sprinkle the coupling surface with liquid sealant.

14



Tighten screws (19) at 8.5+10.9 torque daNm.

15



Insert oil seal (25), then insert o-ring (20) in its seats placed on gearbox housing (26).

NOTE: Oil with mineral oil all o-rings before its installation.

16



Rotate gearbox assembly.

Remove the snap ring (40) in the driven shaft axis.

EXTRAORDINARY JOBS

17



Insert thickness (39) and mount snap ring (40).

Insert the thickness required to reset the backlash.

18



OUTPUT FLANGE

Cardan Flange

Insert oil seal (44) in its seat on gearbox cover (41) and grease oil lip seal with Polymer 400.

Insert o-ring (43) on driven shaft collar (28).

Mount cardan flange (45) on driven shaft, and place pinion washer (46) on it.

Tighten pinion screw (47) at 20+24 torque daNm with Loctite 270.

End-Yoke Flange

Insert two oil seals (59) in its seat on gearbox cover (41) and grease oil lip seal with Polymer 400.

Insert o-ring (58) on driven shaft collar (28).

Mount end-yoke flange (57) on driven shaft and place pinion washer (56) on it.

Tighten pinion screw (55) at a torque of 20+24 daNm with Loctite 270.

NOTE: Oil with mineral oil all o-rings before its installation.

19

SHIFT CONTROL

Hydraulic Control

Insert o-ring (2) in its seat placed on the gearbox cover

EXTRAORDINARY JOBS



(41).

Insert cylinder shift (2) in the gearbox cover.

Tighten the cylinder rod to the shift fork (11) at a torque of 3.5 daNm with Loctite 270.

Tighten screws (1) at 1.8+2.2torque daNm.



Manual Control

Insert o-ring (54) in its seat placed on the gearbox cover (41).

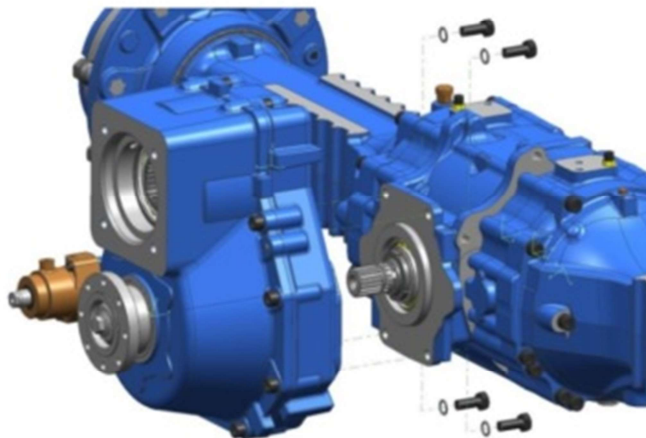
Loosen shift rod (52) to the shift fork (11) at a torque of 3.5 daNm with Loctite 270.

Place copper washer (51) on gearbox cover.

Place shift rod extension (50) on gearbox cover then put shift rod cover (49) on it.

Tighten screws (48) at 1.7+2.2 torque daNm.

20



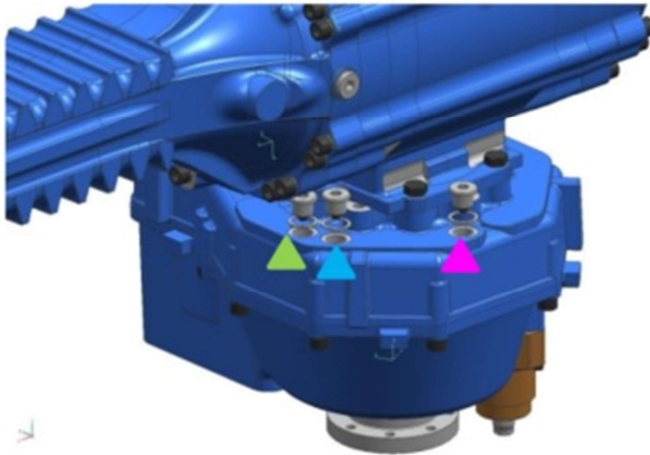
NOTE: Oil with mineral oil all o-rings before its installation.

Assemble all gearbox assembly on central housing of the axle.

Tighten the screws (22) with its washer (21) at 11.9+15.3 torque dNm.

3. FINAL INSTRUCTIONS

3.1. OIL FILLING



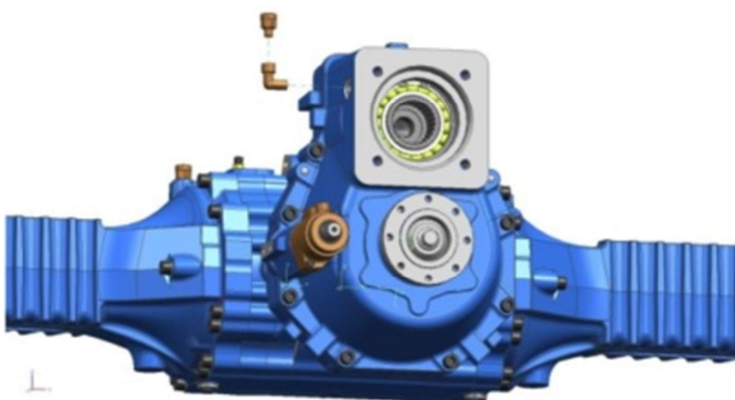
Mount the drain oil cap (23) with its washer (24). ▲

Fill the gearbox chambers oil until it reaches the level.

Mount oil level cap (23) with its washer (24). ▲

Mount oil inlet cap (23) with its washer (24). ▲

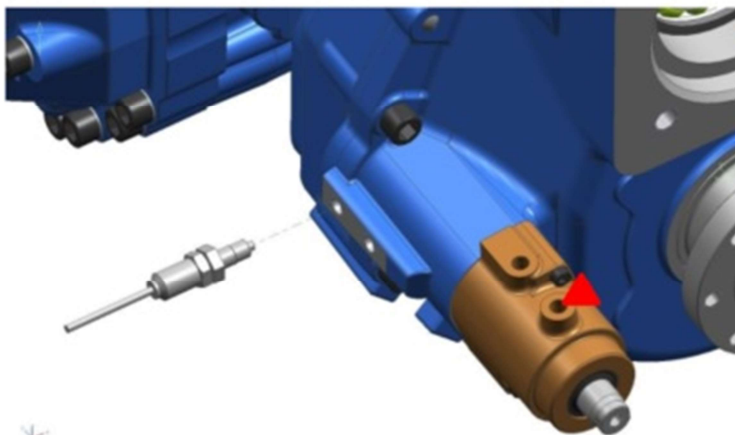
Tighten the oil caps at a torque of 5.0÷6.3 daNm.



Mount oil breather cap (6) with its pipe (7).

Tighten breather oil cap at a torque of 1.3÷1.7 daNm.

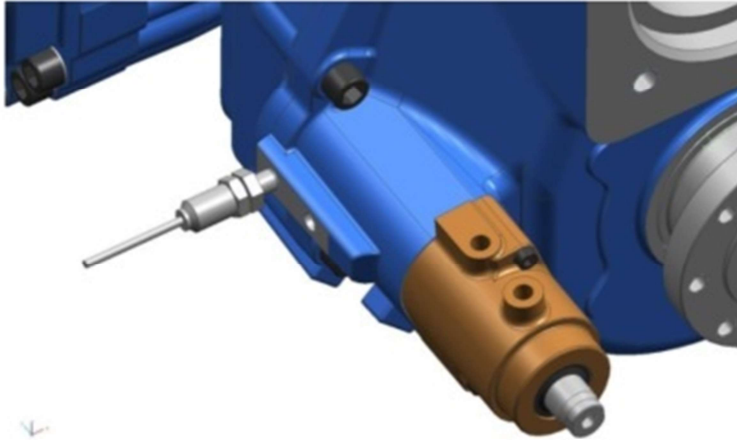
3.2. GEAR SENSOR: ASSEMBLY AND ADJUSTMENT



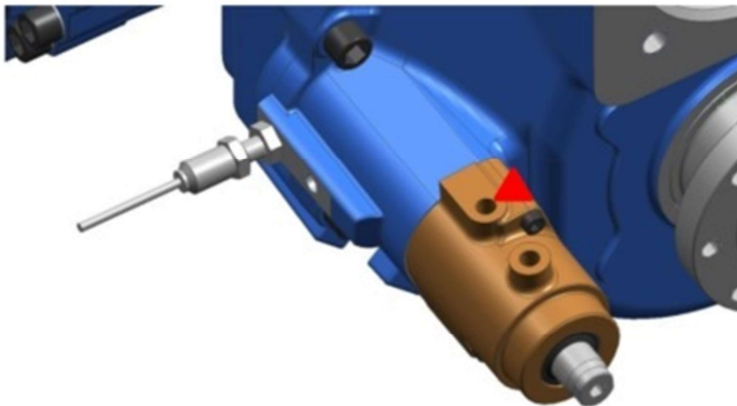
▲ Engage one of the two gears sending pressure to the piston (20 bar).

Maintain the pressure to hold in position rod (2) and shift fork (11).

FINAL INSTRUCTIONS



Screw the sensor (4) with Loctite 243, until does not detect the signal change (checking with a tester: the switch opens if was normally closed or the switch is closed if it was normally open).



Screw the sensor (4) further half turn then tighten the lock nut (5) to lock the sensor at 2.5 torque daNm.

▲ Repeat for the other gear.