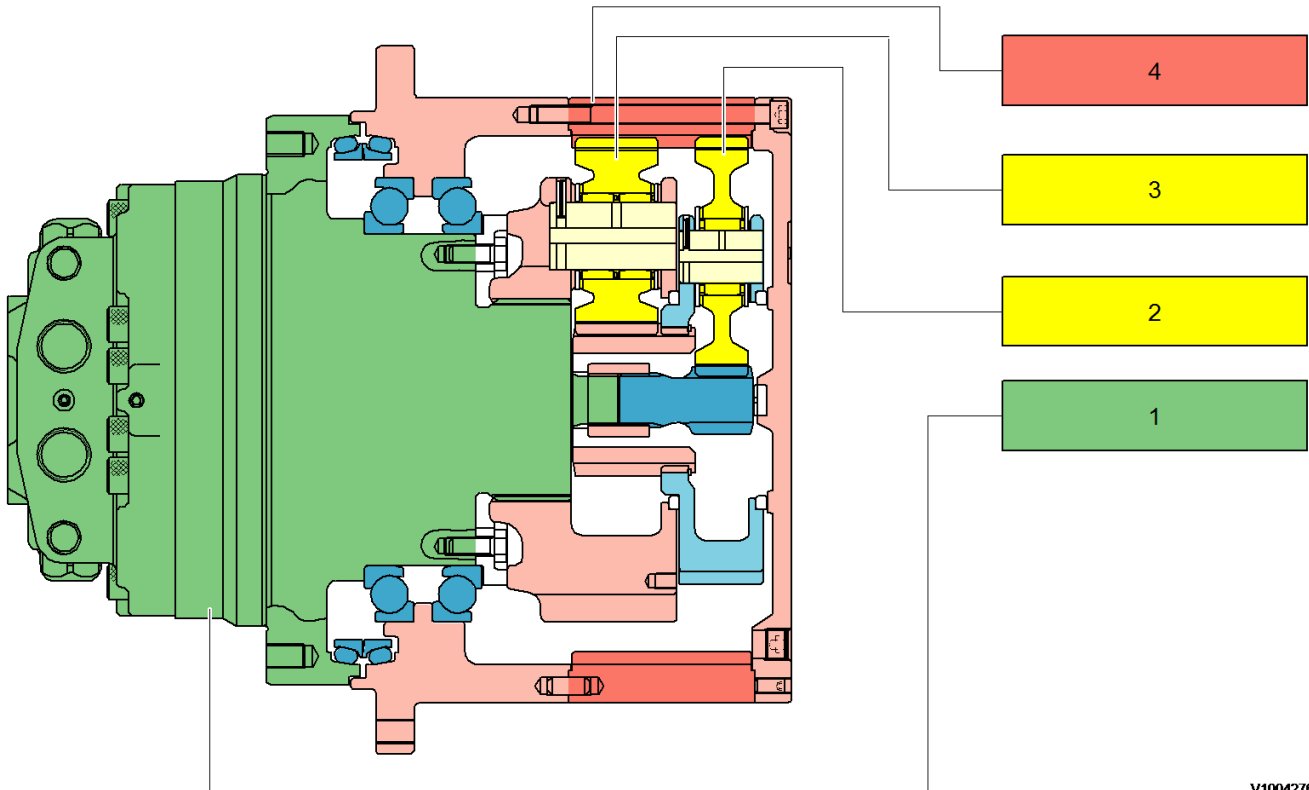


Document Title: Track gearbox, description	Function Group:	Information Type: Service Information	Date: 2015/3/12
Profile: EXC, EC180B LC [GB]			

Track gearbox, description

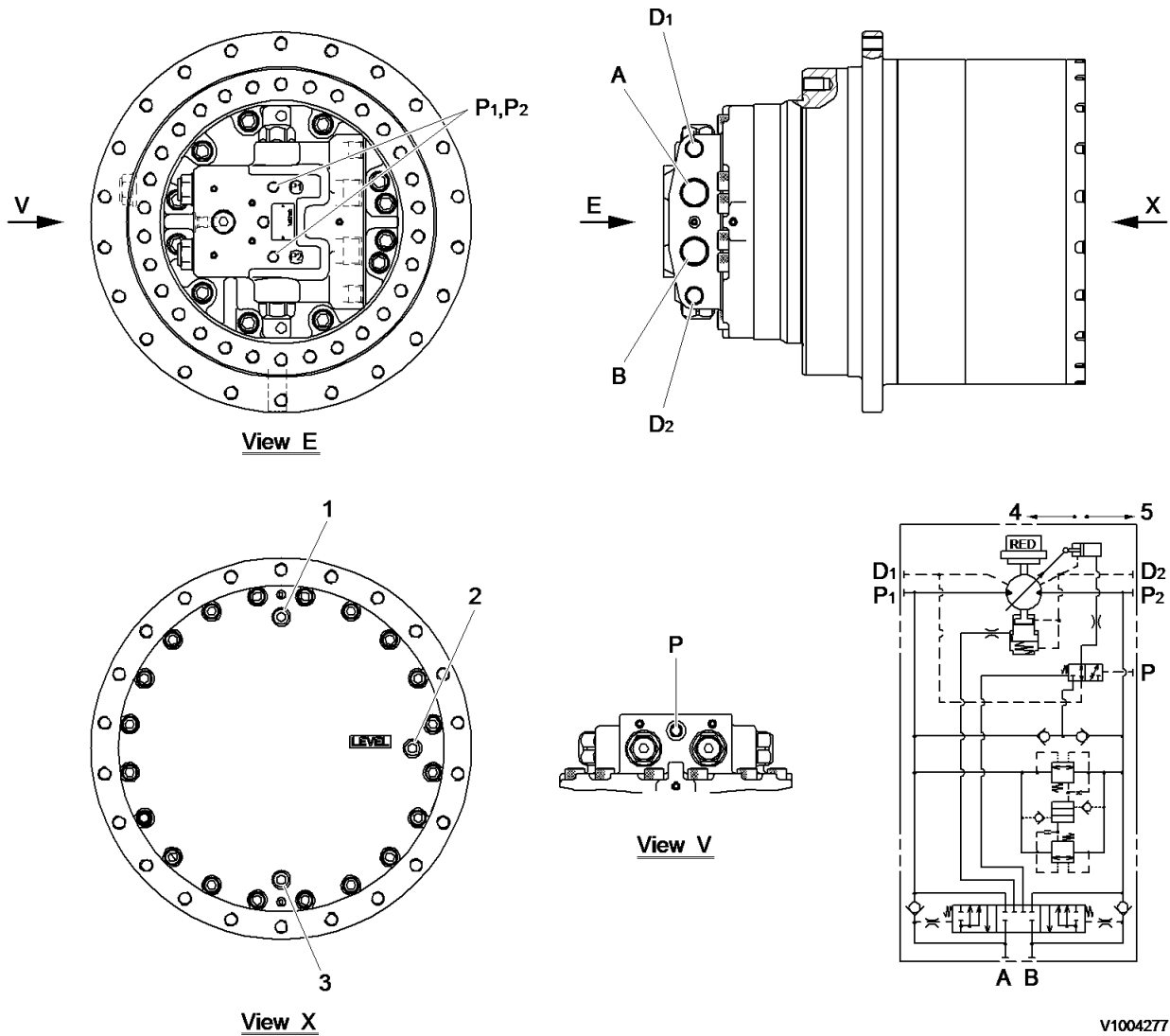
Track gearbox consists of a two stage planetary mechanism that converts the high speed rotation of the hydraulic motor, into low speed, high torque rotating force at the sprocket hub.



V1004276

Figure 1
2 stage planetary gearbox

1. Track motor
2. No.1 planetary gear assembly
3. No.2 planetary gear assembly
4. Ring gear



V1004277

Figure 2
Port connections

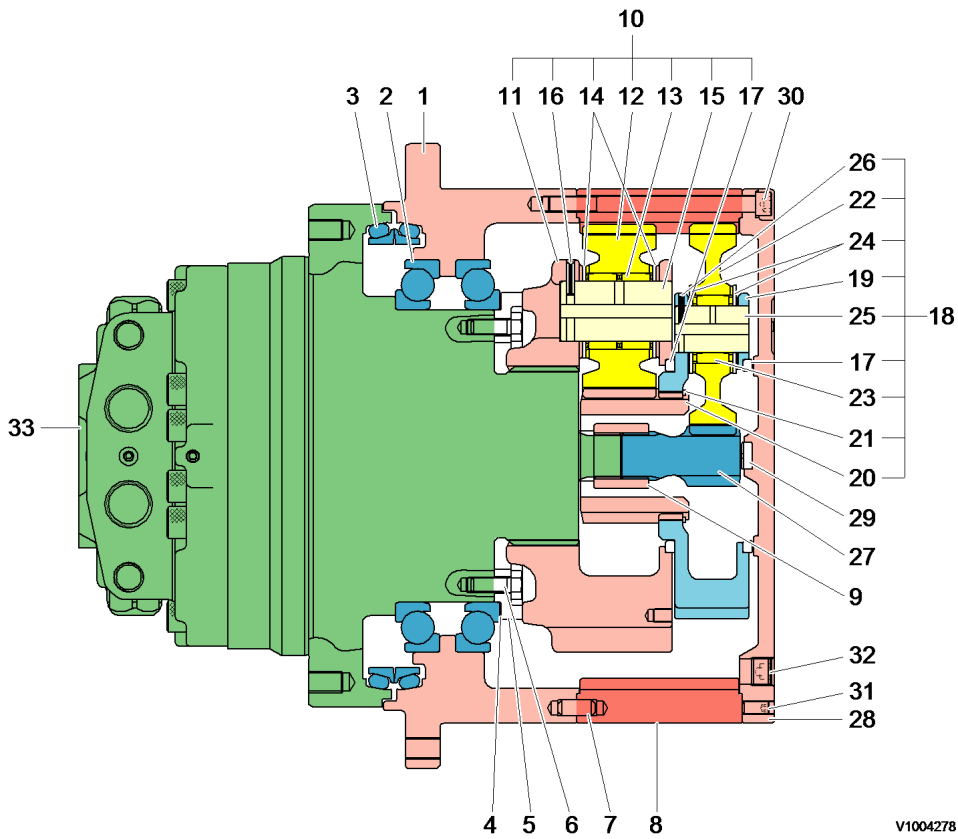
1. Oil filling port (PT 1/2)
2. Oil level check port (PT 1/2)
3. Oil drain port (PT 1/2)
4. High speed
5. Low speed

Rotational direction

View from E axis	Inlet	Outlet
Clockwise	A	B
Counterclockwise	B	A

Port connections

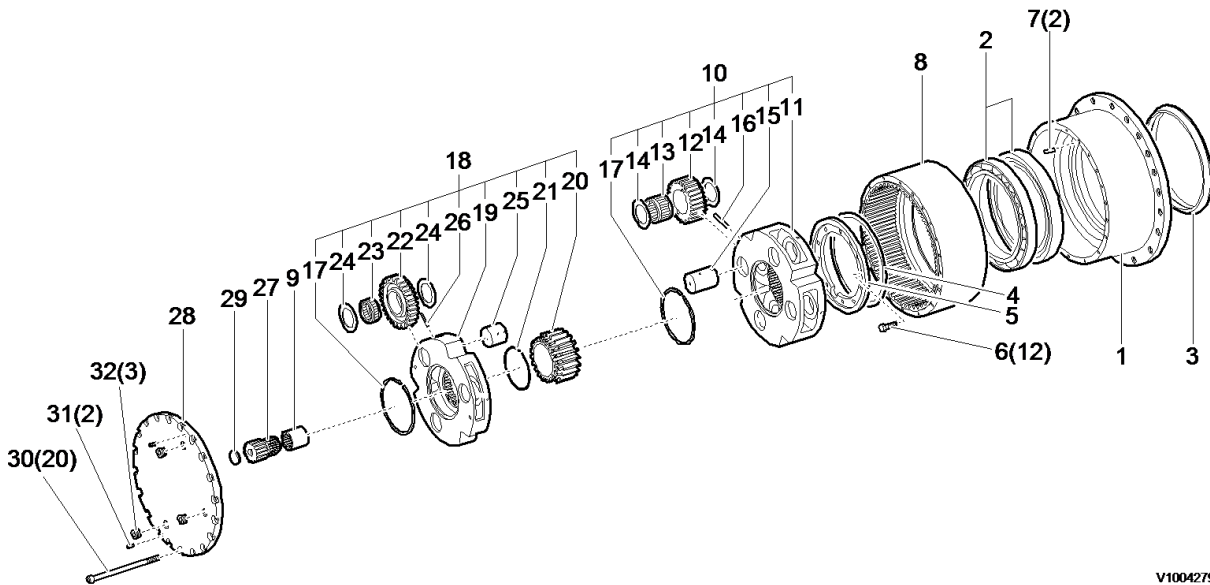
Port symbol	Port size	Port
(A) (B)	PF 1	Oil supply (Return)
(P1) (P2)	PT1/4	Pressure check
(P)	PF1/4	Displacement changeover valve oil supply
(D1) (D2)	PF1/2	Drain



V1004278

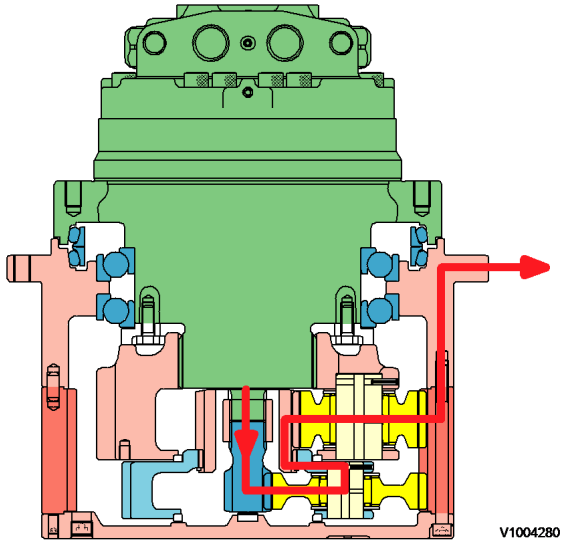
Figure 3
Track gearbox, sectional view

1	Housing	12	No.2 planetary gear	23	No.1 needle bearing
2	Angular bearing	13	No.2 needle bearing	24	Thrust washer
3	Seal	14	Thrust washer	25	No.1 pin
4	Shim	15	No.2 pin	26	Spring pin
5	Retainer	16	Spring pin	27	No.1 sun gear
6	Screw	17	Thrust ring	28	Cover
7	Parallel pin	18	No.1 planetary gear assembly	29	Pad (thrust)
8	Ring gear	19	No.1 carrier	30	Screw
9	Coupling	20	No.2 sun gear	31	Screw
10	No.2 planetary gear assembly	21	Retaining ring gear	32	Plug
11	No.2 carrier	22	No.1 planetary gear	33	Name plate



V1004279

Figure 4
Track gearbox, exploded view



V1004280

Figure 5
Track gearbox, torque flow

The power transmitted from the hydraulic motor output shaft is transmitted to the 1st stage sun gear (27) → spline of 1st carrier (19) → 2nd sun gear (20) → 2nd planetary gear (12) → ring gear (8).
At this time, the reduction ratio of reduction gear is as follows:

(1) 1st reduction ratio

$$i = ((Zs1 + Zr) \cdot (Zs2 + Zr) / (Zs1 \cdot Zs2)) - 1$$

- Zs1 = No. of tooth of 1st sun gear
- Zs2 = No. of tooth of 2nd sun gear
- Zr No. of tooth of ring gear

Document Title: Track gearbox, precautions for operation	Function Group:	Information Type: Service Information	Date: 2015/3/12
Profile: EXC, EC180B LC [GB]			

Track gearbox, precautions for operation

Installation

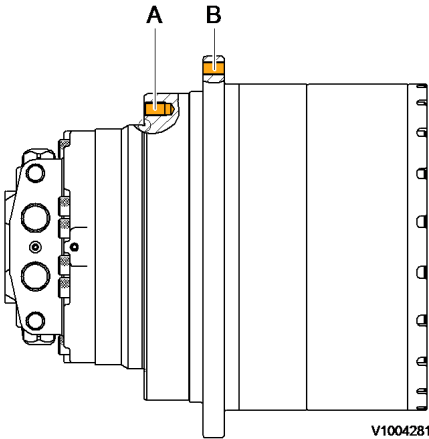


Figure 1
Mounting location

- A. Main body mounted area
- B. Sprocket mounted area

- Check that the mating mount surfaces are clean.
- Check that the motor is positioned correctly in the frame.
- If the gearbox to frame fit is tight, draw the assembly into the frame evenly with the mounting screws.
- Tighten the screws in a crisscross pattern in several stages to the specified torque.
- Apply these same precautions when mounting the sprocket.

Tightening torque

Tightening torque

Item	Quantity	Thread	Torque, Nm (kgf m) (lbf ft)
Reduction screw (A)	30	M16 (P2.0)	265 (27 ±3) (195 ±22)
Sprocket screw (B)	22	M16 (P2.0)	265 (27 ±3) (195 ±22)

NOTE!

The screws must be 10.9 KS strength classification or above.

Lubricating oil

NOTICE

Prior to operating the travel function, fill the gearbox with the specified oil to the correct level.

NOTE!

Gear oil specification

Use a gear oil equivalent to SAE 90 or 140, API classification GL4 or GL5.

Gear oil replacement period

- First (initial) oil replacement: 500 operating hours
- Subsequent oil replacement: 2000 operating hours
- After maintenance (initial): 250 operating hours

NOTE!

Regardless of the operating hours the gear oil must be replaced at least once per year.

NOTE!

Do not mix different types, classifications or brands of oil.

NOTE!

Drain the gear oil while it is still warm to flush out any contaminants.

Gear oil replacement procedure

- Rotate the gearbox until the drain plug and the fill plug are on the vertical axis.
- Remove the 3 plugs on the cover and drain the oil into a suitable container.
- Refill the gearbox through the fill port until oil exits from the level check port.
- Ensure that the O-ring on each plug is not damaged, then install the plugs and torque to specification.

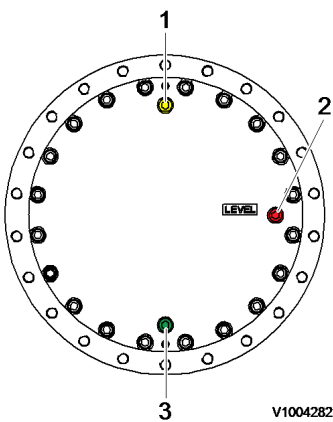


Figure 2
Oil replacement location

1. Fill port
2. Level check port
3. Drain port

NOTE!

Oil capacity: 5.8 Liter (1.5 US gal)

Operating checks

- Check the oil level prior to operating the travel function.
- Check for oil leakage on the gearbox assembly.
- Check for loose mounting screws.
- Check for abnormal sound or vibration while rotating.
- Check for any abnormal temperature increase after operating for a short time.



The temperature of the case is high just after running. Use a thermometer to measure. Do not touch directly by hand to prevent a burn injury.

NOTE!

The temperature of the case must be lower than 90 °C, during continuous operation.

Document Title: Track gearbox, troubleshooting	Function Group:	Information Type: Service Information	Date: 2015/3/12
Profile: EXC, EC180B LC [GB]			

Track gearbox, troubleshooting

Track gearbox troubleshooting

Gearbox does not rotate.	Motor overloaded.	Reduce the load.
	Gearbox is damaged.	Replace the gearbox.
Oil leakage from mating joint surfaces.	Liquid gasket improperly applied.	Disassembly and re-apply.
	Mating surface damaged.	Repair or replace.
	Loosen screws.	Tighten to specified torque.
	Loosen plug.	Tighten to specified torque.
Casing leakage.	Cracks or pin holes.	Replace the housing.
	Cover damaged.	Replace the cover.
Floating seal leakage.	Sliding surface worn.	Replace the floating seal assembly.
	O-ring distorted.	
Abnormal operating temperature.	Insufficient gear oil.	Refill to specified level.
	Gear or bearing damaged.	Replace the gearbox.

Document Title: Track gearbox, removal	Function Group:	Information Type: Service Information	Date: 2015/3/12
Profile: EXC, EC180B LC [GB]			

Track gearbox, removal

Op nbr 00000

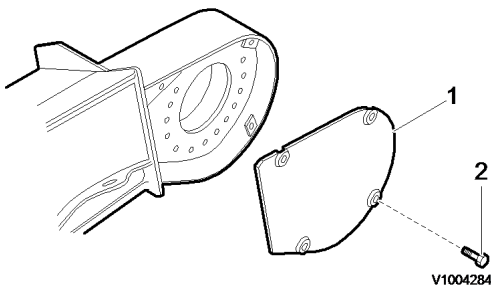


Figure 1
Removal, cover

1. Remove cover screw (2), and remove cover (1).
2. Remove the track.
3. Place a wooden block on the track, and place the lower roller on the block to raise the sprocket off the track.
4. Disconnect the hydraulic hoses at the track motor. Plug the pipe ends and ports to prevent the outflow of oil and the entry of contamination.
5. Remove the track motor mounting screws from the undercarriage.

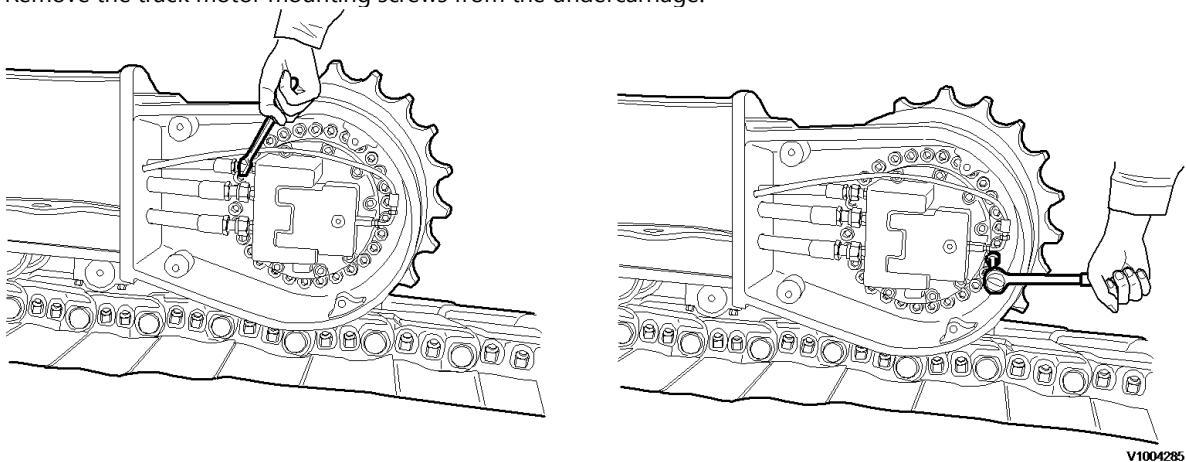


Figure 2
Removal, hydraulic hoses and screws

6. Pass a wire rope around the gearbox, and lift it. Remove the track motor as an assembly. Then, using screws in the threaded holes of the undercarriage, force out the gearbox.

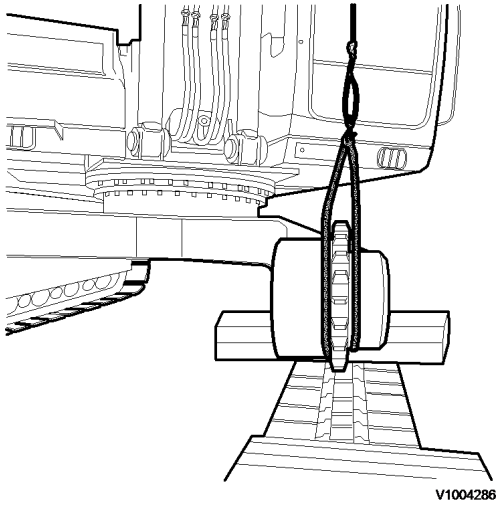


Figure 3
Removal, track gearbox

NOTE!

Lift the gearbox as close to the sprocket as possible to maintain balance.

NOTE!

The gearbox mounting screws may be used in the threaded frame holes.

NOTE!

Putting match-marks on the track frame and track gearbox will facilitate reassembly.

Document Title: Track gearbox, installation	Function Group:	Information Type: Service Information	Date: 2015/3/12
Profile: EXC, EC180B LC [GB]			

Track gearbox, installation

Op nbr 00000

NOTE!

Carefully check the mating surface of the undercarriage and the gearbox for burrs, dirt and rust scale.

1. Pass a wire rope around the gearbox, lift and install the gearbox to the undercarriage.

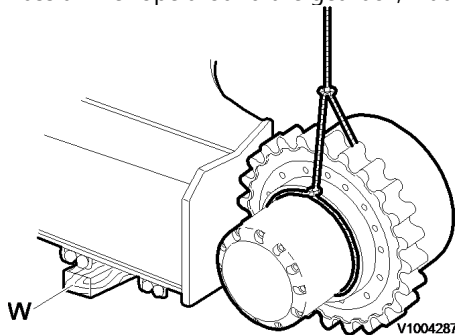


Figure 1
Install, track gearbox

2. Apply Loctite 277 to the gearbox mounting screws, and tighten them to the specified torque.

NOTE!

Tightening torque: 27 ± 3 kgf·m (195 ± 22 lbf·ft)

3. Connect the hydraulic hoses at the track motor.
4. Install the track motor cover.
5. Check the gear oil level of gearbox if necessary.

Document Title: Track gearbox, maintenance standard	Function Group:	Information Type: Service Information	Date: 2015/3/12
Profile: EXC, EC180B LC [GB]			

Track gearbox, maintenance standard

The parts are precision finished and must be handled carefully.

Keep the parts of the planetary carrier (s) together, do not mix the bearings, gears, pins and thrust washers.

Seals

Replace the seals, oil seal and O-ring, although they appear not damaged.

Part replacement criteria

Replace all parts that appear damaged or are not within the allowable value.

Replace some parts in sets, i.e.gears, bearings, pins and thrust washers.

Remove air in the track motor before operating.

1. Check that the gearbox axis is horizontal. Rotate the gearbox housing until the drain plug is on the bottom of the vertical axis of the end cover.

The gearbox is supplied with oil plugs (draining, filling and level) equipped with an hole that allows the air to bleed.

NOTE!

Remove the oil plugs with care. When the gearbox is warm, the air inside can be pressurized and this can cause their strongly expulsion towards the worker.

2. Loose with caution the plugs (2~3 rounds) counterclockwise.
3. Clean the plug to be sure that the air bleed hole is not obstructed.
4. Wait a few seconds to allow the pressurized air to bleed from the gearbox.
5. Remove the plugs and let the oil flow in a large enough container; in order to facilitate the draining must be oil still warm.
6. Wait a few minutes until all the oil is drained and then proceed to screw on the plugs.
7. Proceed with the oil fill-up following the procedures given.

NOTE!

Never mix mineral oils with synthetic oils and vice versa.

Do not dispose of the oil in the natural environment but be careful to eliminate it in compliance with the relative rules and regulations that govern locally.

Tightening torque plug. See track gearbox, description.

Part replacement criteria

Item No.	Part	Condition	Allowable value
8 12 20 22 27	Ring gear No.2 planetary gear No.2 sun gear No.1 planetary gear No.1 sun gear	The tooth surface is pitted or non uniformly worn. The gear is cracked.	Area rate: within 5%
23	Needle bearing	Fitting/flaking of the balls, rollers or races.	

13 2	Needle bearing Angular bearing	Does not rotate smoothly by hand.	
3	Seal	Rust or damage on sliding face. O-ring distorted or damaged.	
15 25	No.2 pin No.1 pin	The pin is cracked, galled or pitted.	
24 14	Thrust washer	Excessively worn on the face area.	

General tools

General tools

No.	Description	Size	Quantity
1	Socket wrench	19 mm	1
2	L wrench	5 mm 10 mm	1
3	Torque wrench	400 ~ 1800 kgf cm	1
4	Eye bolt	PT 1/2 M10 M12	2
5	Plastic hammer	Approximately L = 300 ~ 500 mm	1
6	Screwdriver	Approximately L = 200 mm	1
7	Depth gauge (Vernier calliper)	Range approximately 300 mm Min.scale 0.01 mm	1

Special tools

Special tools

No.	Description	Size	Quantity
1	Bearing shim adjust fixture	8932-00290 Measuring plate	1

Document Title: Track gearbox, disassembly	Function Group:	Information Type: Service Information	Date: 2015/3/12
Profile: EXC, EC180B LC [GB]			

Track gearbox, disassembly

Op nbr 00000

Precautions

- Thoroughly clean the gearbox assembly prior to disassembly.
- Select a clean work area.
- Match mark attached components to indicate proper positioning during reassembly.
- Take care not to mix parts of sub assemblies i.e. planetary bearings, gears and thrust washers.
- Thoroughly clean all parts and the inside of the casings.
- Inspect and analyse all failures.– Determine the root cause!

1. Place the oil fill port and the oil drain port on the vertical axis. Remove plug (32) and drain the gear oil.

- Tools: L wrench 10 mm (PT 1/2) 8 liter pan

NOTE!

Drain oil into a clean container and check thoroughly for contamination.

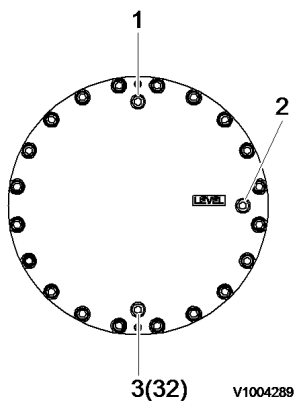


Figure 1

Removal, plug

1. Fill port
2. Level check port
3. Drain port

2. Remove screws (30) and remove cover (28).

- Tools: L wrench 10 mm, 5 mm

NOTE!

Install a screw (31) and carefully lift the cover off.

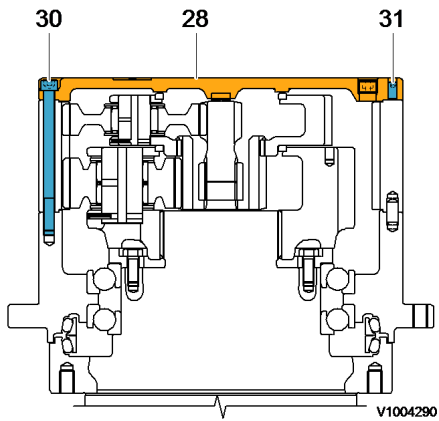


Figure 2
Removal, screw and cover

3. Remove No.1 planetary gear assembly (18) from No.2 planetary gear assembly (10).
 Disassemble No.1 planetary gear assembly.

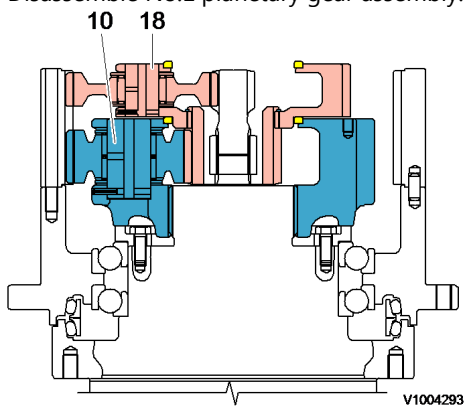


Figure 3
Removal, No. 1 planetary gear assembly

- Tap spring pin (26) into No.1 pin (25).
- Remove thrust washer (24), No.1 planetary gear (22) and needle bearing (23) from No.1 carrier (19).
- Remove thrust ring (17).
- Remove retaining ring (21), then No.2 sun gear (20).
- Remove thrust ring (17).

○ Tools: Eye bolt (M10), Plastic hammer

⚠ WARNING

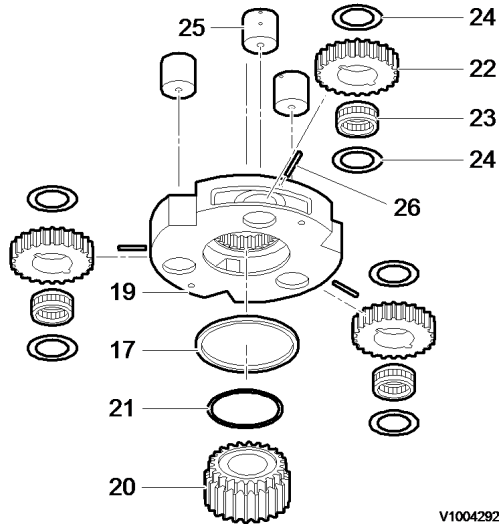
The parts are heavy. Take appropriate safety precautions.

NOTE!

Match mark gears (22), pins (25) and carrier (19).

NOTE!

Do not mix the gears, bearings, thrust washers, and pin assemblies.



V1004282

Figure 5
Removal, spring pins

NOTE!

Do not reuse spring pins (26).

NOTE!

If there are any flakes at the surface of No.1 pin, replace No.1 pin, No.1 carrier (28), No.1 planetary gear (33) and needle bearing (34) simultaneously.

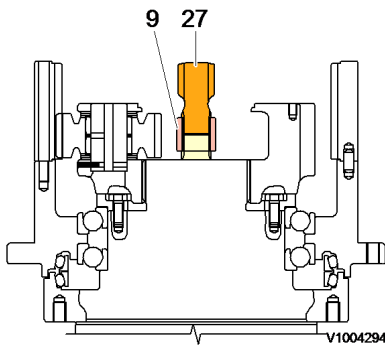
4. Remove No.1 sun gear (27) and coupling (9).

NOTE!

Remove No.1 carrier (19) and then remove No.2, No.1 sun gear (20, 27).

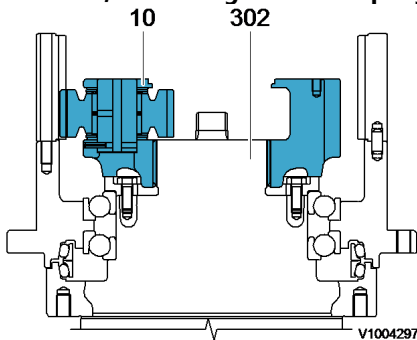


The parts are heavy. Take appropriate safety precautions.



V1004294

Figure 6
Removal, No.1 sun gear and coupling



V1004297

Figure 7
Removal, No.2 planetary gear assembly

5. Remove No.2 planetary gear assembly (10) from spindle (302).

Disassembling No.2 planetary gear assembly

- Tap spring pin (16) into No.2 pin (15).
- Remove thrust washer (14), No.2 planetary gear (12) and needle bearing (13) from No.2 carrier (11).

○ Tools: Eye bolt (M10), Plastic hammer

NOTE!

Match mark gears (12), pins (15) and carrier (11).

NOTE!

Do not mix the gears, bearing, thrust washers, and pin assemblies.

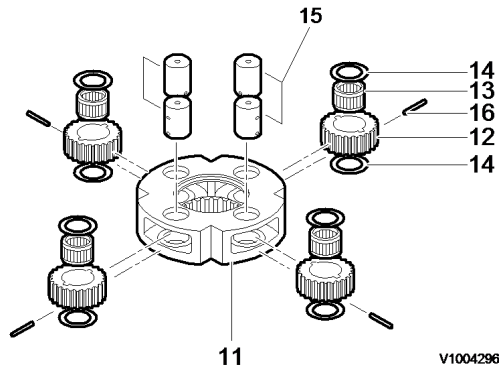


Figure 9
Removal, spring pins

NOTE!

Do not reuse spring pins (16).

6. Screw the eye bolts into ring gear (8), and remove ring gear.

○ Tools: Eye bolt (M12), Plastic hammer

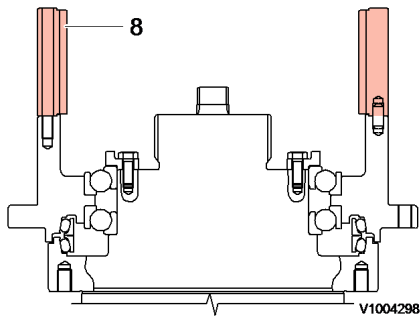


Figure 10
Removal, ring gear

7. Remove screw (6), retainer (5) and shim (4).

○ Tools: 19 mm socket (M 12)

NOTE!

Do not reuse the screws.

Thank you very much for reading.

This is part of the demo page.

GET MORE:

Hydraulic

System, Setting

Instructions, Functional

Description, Electrical

System And more.....

Click Here BUY NOW

Then Instant Download

the Complete Manual.