

Document Title: General notes to be observe when working on power transmission assemblies	Function Group: 400	Information Type: Service Information	Date: 2014/3/26
Profile: CEX, EC27C [GB]			

General notes to be observe when working on power transmission assemblies

NOTE!

The following instructions are preventing from possible dangers of accident, injury or danger to life.

NOTE!

Special notes to improve operating, inspection and adjustment procedures as well as service work.

- Trained personnel
- Specified tools and testing equipment, such as test stand, flaw tester, special tools
- Genuine spare parts

All work to be performed should be executed with greatest care and conscientiousness!

The safety regulations must be observed and strictly applied!

Any regulations of the responsible liability association must be followed.

NOTE!

Before starting work on power transmission components the machine must be parked on level ground of sufficient load bearing capacity, secured against rolling away and the engine is to be shut down.

NOTE!

The complete system must be relieved from any pressure and the battery must be disconnected.

NOTE!

If running of the engine and a connected battery is required for certain test procedures, special precautions must be taken to rule out dangers for persons.

NOTE!

When removing and installing parts to be replaced or repaired strict cleanliness is the most important prerequisite.

Make sure that no dirt and other contaminating substances can enter into the system.

- Clean fittings, filler caps and their immediate surrounding area so that no dirt can fall in.
- Before disconnecting any hoses, pipes or similar shut down the engine and relieve the pressure in the system.
- Before starting repair work close all ports and openings with clean plugs or caps and do not forget to remove these parts before installation.
- Use only lint-free cloths to wipe out and clean hydraulic components.
- When filling up the hydraulic oil tank the oil must generally be passed through the filter, because even new oil from closed oil drums does not fulfilled the requirements demanded from a clean hydraulic oil.
- When assembling hydraulic parts grease must not be used as a sliding agent, use hydraulic oil instead.
- If metal chips and abrasion residuals are found in the hydraulic oil tank all hydraulic circuits must be thoroughly flushed and cleaned.

Repairs must generally be carried out with genuine spare parts.

Before disassembling marks all parts as a measure to help during later reassembly.

Generally use new seals when reassembling. Self-locking nuts must generally be replaced.

Perform all repair work only by using suitable tools and perform adjustments generally with the help of specified measuring equipment.

When installing new components the adjustments must be generally checked, i.e. diesel engine and new components must be adapted to each other.

- Check pressures and rotational speeds.
- Check fittings and flanges for leaks.
- Watch the oil level in the hydraulic oil tank, if necessary top up hydraulic oil.

NOTE!

The wheel motors contain parts that have been pressed in. These parts can normally not be disassembled and should not be removed with force.

Document Title: Travel motor, description	Function Group:	Information Type: Service Information	Date: 2014/3/26
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Travel motor, description

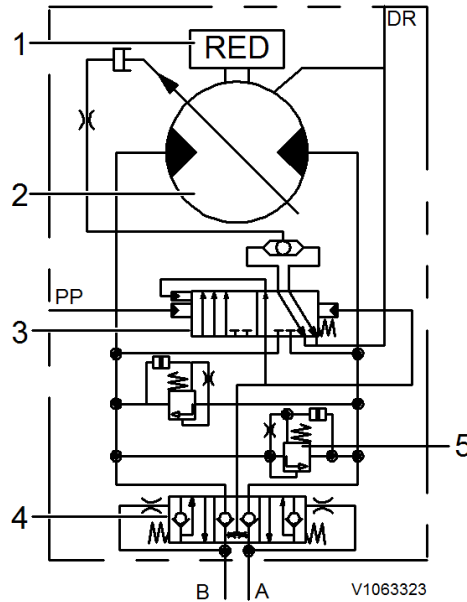


Figure 1
Hydraulic diagram, track motor

1. Reduction gear
2. Hydraulic motor
3. Automatic downshift valve
4. Compensation valve
5. Pressure limiting valve

Reduction gear

The reduction gear of the track motor is a planetary gear with two stages. The high starting speed and low torque of the hydraulic motor are converted into a low speed and high torque.

Hydraulic motor

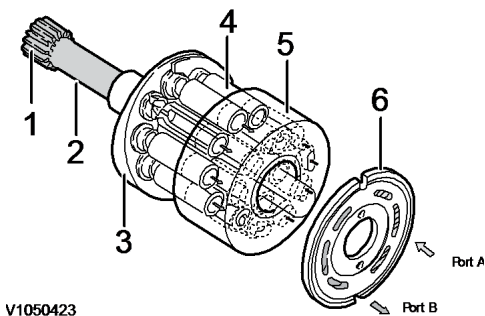


Figure 2
Hydraulic motor

1. Pinion
2. Shaft
3. Swivel plate
4. Piston
5. Cylinder block
6. Valve plate

The hydraulic motor is an axial piston motor which converts the hydraulic energy of the pump into a rotary movement. The cylinder block (5) is fitted with nine pistons (4) and connected via a valve plate (6) with two kidney-shaped control slots A and B (high and low pressure connections).

Hydraulic oil is supplied via connection A. This oil flows into the cylinder bores connected with control slot A. Before the piston (4), pressure builds up which is converted into a rotary movement by the swivel plate (3). The rotary movement is passed via the pinion (1) to the shaft (2). The oil expelled from the cylinder bores flows out through the control slot B.

Selecting drive gear

1st Gear

The swivel plate (5) is mounted on two steel balls (2) which are attached to the housing 2 (3).

In 1st gear, the surface I (1) is pressed under oil pressure and the spring force exerted by the spring (8) in the cylinder block, onto the housing 2 (3). The swivel plate (5) has angle α (Q_{max}).

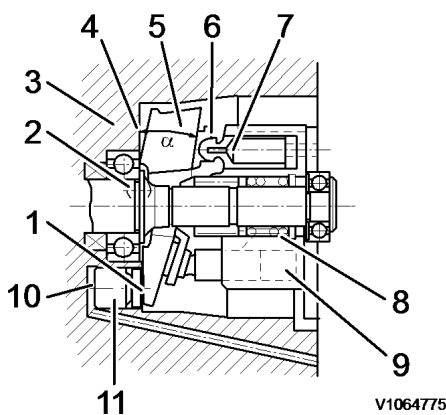


Figure 3
Position 1st gear

1. Surface I
2. Ball
3. Housing 2
4. Surface II
5. Swivel plate
6. Shoe
7. Piston
8. Spring
9. Cylinder block
10. Control chamber
11. Control piston

2nd Gear

When 2nd gear is selected, the oil under pressure flows into the control chamber (10). The control piston (11) extends and swivels the swivel plate (5) out until the surface II (4) lies on the housing 2 (3) and the swivel plate (5) is at angle β (Q_{min}).

When the machine stops, the oil can flow from the control chamber (10) into the tank and the swivel plate (5) is swivelled into the position of the 1st gear (angle α) by the spring force of the spring (8) in the cylinder block (9).

The start position is always the first gear position (angle α).

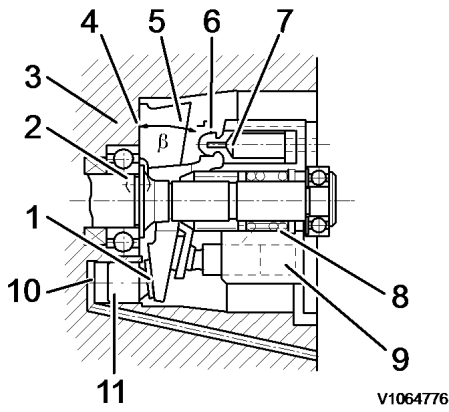


Figure 4
Position 2nd gear

1. Surface I
2. Ball
3. Housing 2
4. Surface II
5. Swivel plate
6. Shoe
7. Piston
8. Spring
9. Cylinder block
10. Control chamber
11. Control piston

Automatic downshift valve

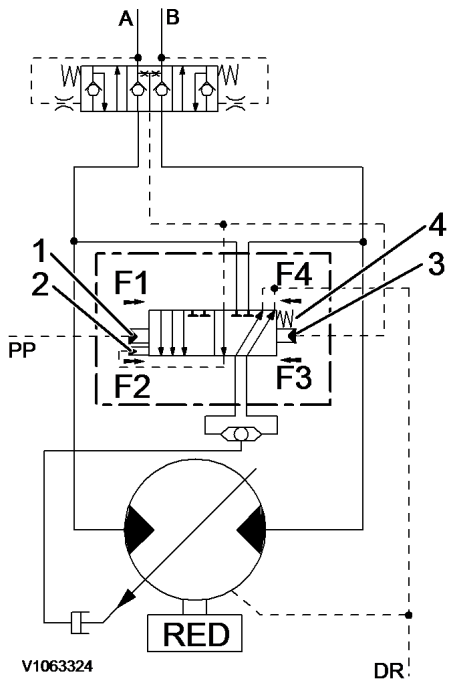


Figure 5
Automatic downshift

When the switch for 2nd gear is selected, the precontrol pressure for 2nd gear is applied at PP (1) and generates force F1. The slider of the automatic downshift valve is pushed to the right because force F1 is greater than the spring force F4. The motor shifts to 2nd gear. Otherwise the operating pressure of the compensation valve, connection A or B, is present at the hydraulic precontrol (2)

and (3) and generates force F_2 and F_3 . Force F_3 is greater than force F_2 because the area of F_3 is greater than that of F_2 . When the operating pressure rises, the difference between F_2 and F_3 also rises. When the operating pressure is greater than the set pressure, in order to shift from 2nd gear to 1st gear, the total of forces F_1+F_2 is less than the sum of forces F_3+F_4 . The slider of the automatic downshift valve is pushed to the left and the motor changes from 2nd gear to 1st gear. If the operating pressure is greater than the set pressure, in order to shift from 1st gear to 2nd gear, the total of forces F_1+F_2 is greater than the sum of forces F_3+F_4 . The slider of the automatic downshift valve is pushed to the right and the motor changes from 1st gear to 2nd gear.

Balancing valve

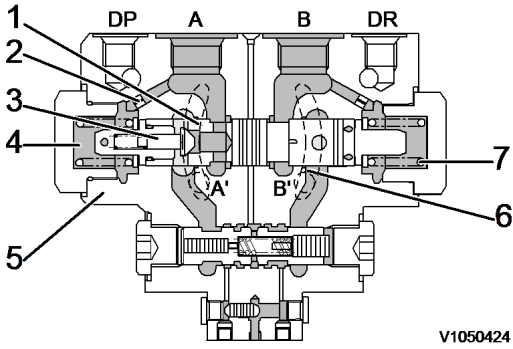


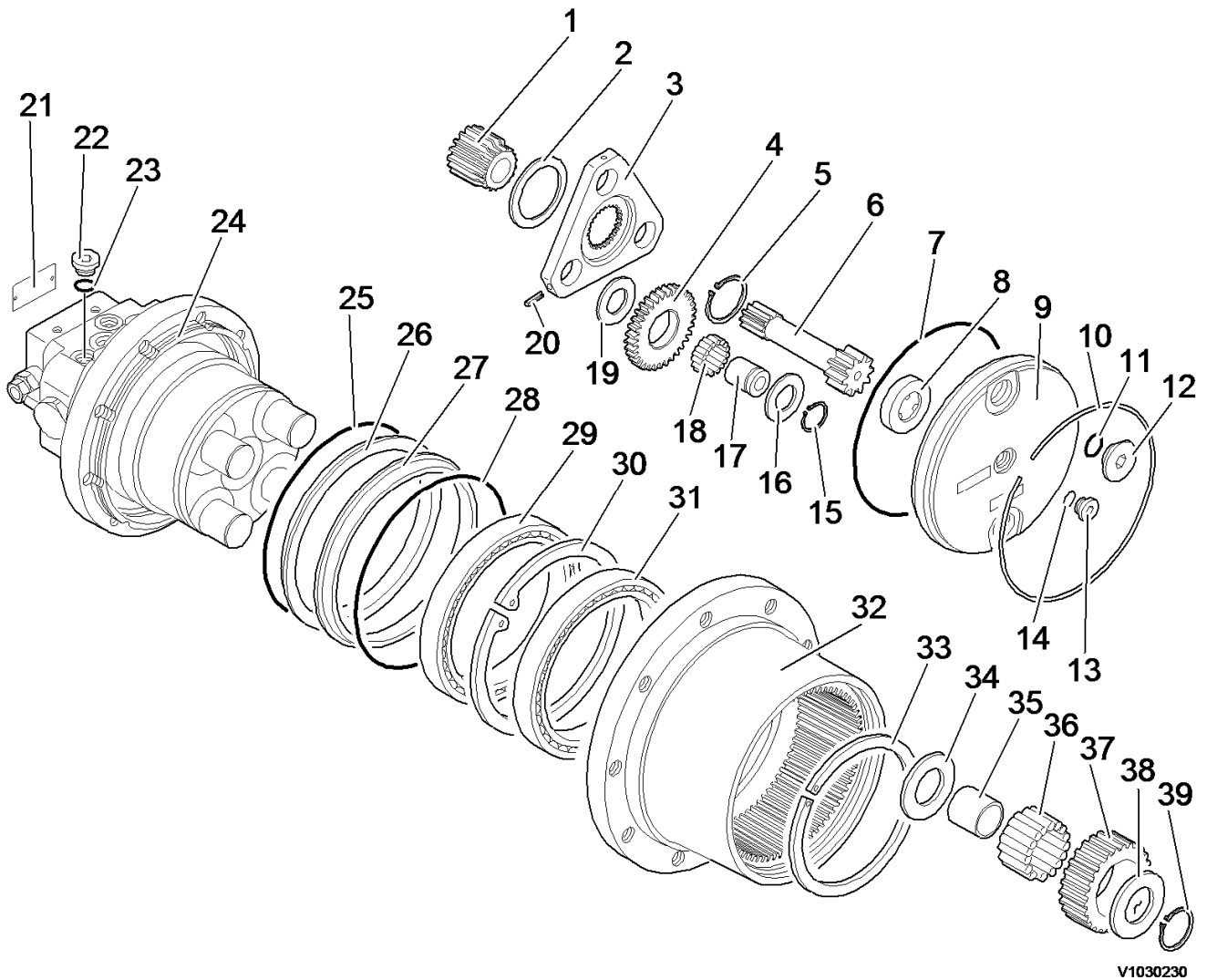
Figure 6
Balancing valve

- 1. Valve spool
- 2. Diaphragm L
- 3. Check valve
- 4. Chamber L
- 5. Housing
- 6. Chamber E
- 7. Spring R

When the control valve is actuated, hydraulic oil is supplied from connection A, where part of this oil opens the non-return valve (3) and releases a connection to the inlet of the axial piston motor (connection A). The remainder of the oil supplied flows through the choke bore of diaphragm L (2) into chamber L (4), overcomes the spring force R (7) and pushes the valve slider (1) to the right. The oil flowing back from the hydraulic motor flows through connection B into chamber E (6) and turns the motor in the opposite direction. Although oil is no longer supplied at connection A, the motor because of its mass inertia still tries to execute a rotary movement. When the oil supply at connection A is interrupted, the valve slider (1) because of the spring force (7) tries to return to the left. Before oil can drain from chamber L (4) via connection A, it must pass the diaphragm L (2). The choke effect of the diaphragm L (2) reduces the speed of the slider. The diaphragm L (2) and notch shape of the valve slider (1) gradually control the oil back flow and the motor is gently braked.

Document Title: Travel motor, exploded view	Function Group:	Information Type: Service Information	Date: 2014/3/26
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Travel motor, exploded view



V1030230

Figure 1
Travel motor, exploded view

1	Pinion	14	O-ring	27	Loose seal
2	Stop ring	15	Snap ring	28	O-ring
3	Planet carrier	16	Thrust washer	29	Roller bearing
4	Washer	17	Roll pin	30	Snap ring
5	Snap ring	18	Needle	31	Roller bearing
6	Pinion	19	Pinion	32	Housing
7	O-ring	20	Pin	33	Snap ring
8	Sliding ring	21	Plate	34	Thrust washer

9	Cover	22	Screw plug	35	Ring
1 0	Snap ring	23	O-ring	36	Needle
1 1	O-ring	24	Hydraulic motor	37	Pinion
1 2	Screw plug	25	O-ring	38	Thrust washer
1 3	Screw plug	26	Loose seal	39	Snap ring

Document Title: Track motor, removing	Function Group:	Information Type: Service Information	Date: 2014/3/26
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Track motor, removing

Remove one track motor

Op nbr 441-113

Hoist or crane

Lifting device

WARNING

The work involves handling heavy components - failure to stay alert may result in severe crushing injuries.

1. Place the machine on level ground.
2. Turn the swing ring gear through 90° in the direction of the track motor to be dismantled.
3. Lay the bucket on the ground, activate boom until the track unit has been raised.

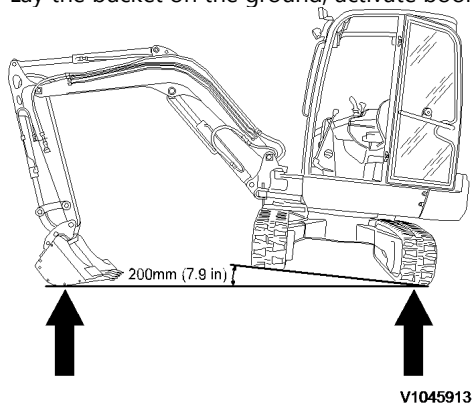


Figure 1
Raise, machine

WARNING

High pressure grease in track adjuster cylinder. Do not remove grease fitting or nut and valve assembly to release grease.

4. Unscrew the grease nipple (1) of the track adjustment cylinder 1 turn.

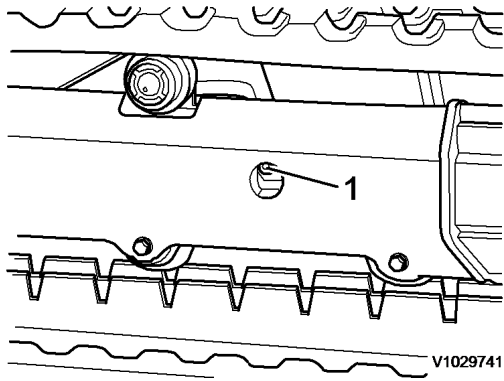


Figure 2
Release pressure on track adjustment cylinder.

1. Lubrication nipple
5. Release pressure on track adjustment cylinder and catch any emerging grease.

NOTICE

Do the work in an environmentally safe manner.

6. Remove the rubber track
- NOTE!**
 To remove the rubber track, you will need the help of another person.
7. Support the machine on the underframe with suitable supports.
 8. Release and unscrew the bolts (2) of the track motor cover (1).

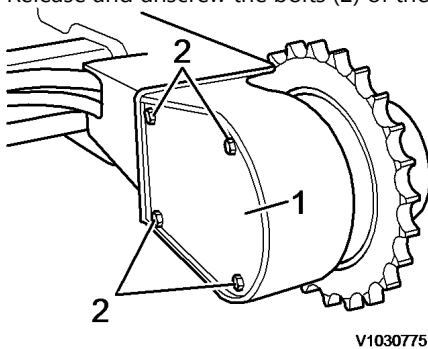


Figure 3
Track motor, cover

1. Cover
2. Screw
9. Remove cover (1).
10. Remove the hydraulic connections (1) on the track motor.

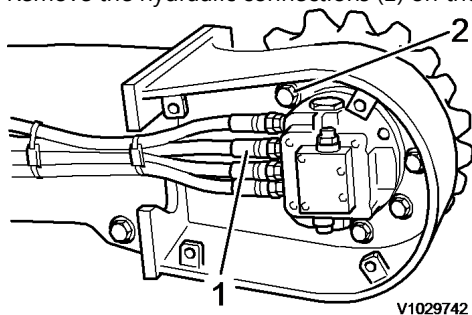


Figure 4
Track motor, hydraulic connections and fixing bolts

1. Hydraulic connection
2. Fixing bolts, track motor

NOTICE

When a hose has been disconnected, plug both the hose and the connection immediately. The hoses should be marked for correct connection.

11. Release and unscrew bolts (1) on the drive wheel (2).

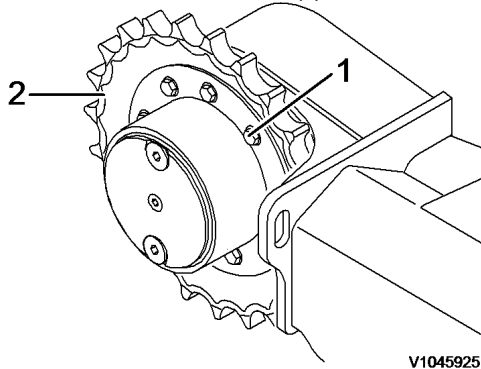


Figure 5
Driving gear

1. Retaining screw
2. Driving gear

12. Remove drive wheel (2).
13. Position the lifting tool below the track motor and take up slack.

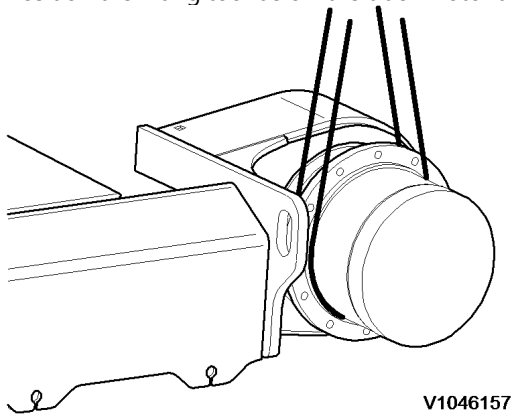


Figure 6
Position, lifting tool

14. Loosen and unscrew the track motor fixing bolts (2).

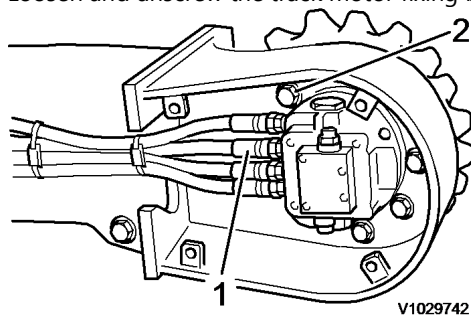


Figure 7

Track motor, fixing bolts

1. Hydraulic connection
2. Fixing bolts, track motor



Risk of personal injury. Very heavy object.

15. Remove the track motor from the undercarriage using the lifting gear.

Document Title: Track motor, installing	Function Group:	Information Type: Service Information	Date: 2014/3/26
Profile: CEX, EC27C [GB]			

Track motor, installing

Install one drive motor

Op nbr 441-114

Hoist or crane

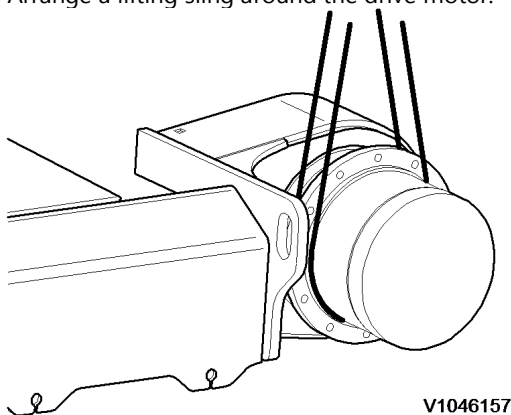
Lifting device



WARNING

The work involves handling heavy components - failure to stay alert may result in severe crushing injuries.

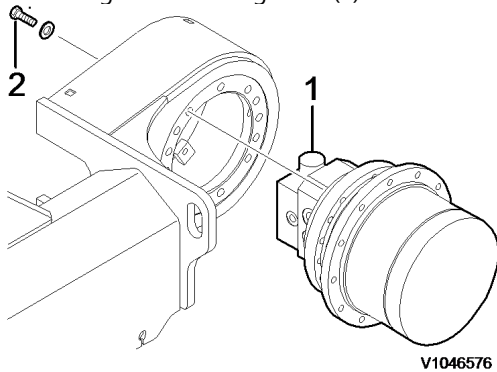
1. Arrange a lifting sling around the drive motor.



V1046157

Figure 1
Position drive motor.

2. Raise drive motor and position on undercarriage.
3. Fit and tighten the fixing bolts (2) for the drive motor (1).



V1046576

Figure 2
Drive motor, fit bolts

1. Travel motor
2. Attaching screws

NOTICE

Use locking compound on the bolts.

NOTE!

Use Loctite 243!

4. Tighten bolts (2) with a torque wrench. For tightening torques, see [4411 Track motor. tightening torques](#)

NOTE!

Tighten screws crosswise!

5. Connect the hydraulic hose lines (1) to the drive motor (2).

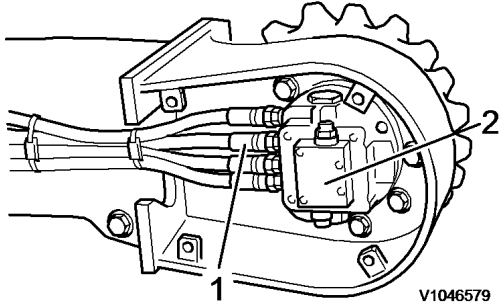


Figure 3

Fit the hydraulic connections

1. Hose assembly
2. Travel motor

NOTICE

Collect draining oil.

NOTICE

Always handle oils and other environmentally hazardous fluids in an environmentally safe manner.

6. Insert drive motor cover (1) and screw in fixing bolts (2).

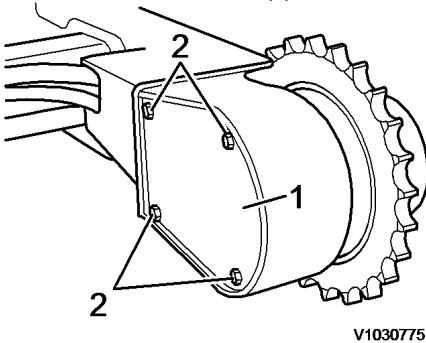


Figure 4

Fit drive motor cover

1. Cover
2. Mounting screw

7. Tighten the mounting screws (2).
8. Clean drive wheel seat (1).

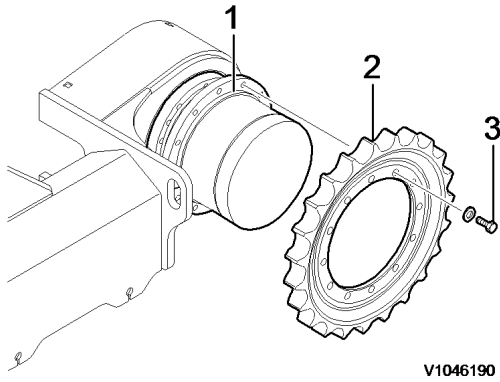


Figure 5
Fit drive wheel

1. Drive wheel seat
2. Driving gear
3. Screws

9. Position new drive wheel (2)
10. Screw in bolts (3) of drive wheel (2).

NOTICE

Use locking compound on the bolts.

NOTE!

Use Loctite 243!

11. Tighten bolts (3) with a torque wrench. For tightening torques, see [4411 Track motor, tightening torques](#).

NOTE!

Tighten screws crosswise!

12. Raise the machine from the support and remove support.
13. Position the rubber track parallel to the undercarriage
14. First lay the rubber track on the drive wheel
15. Lay the rubber track on the upper support roller and guide wheel.
16. Tighten the rubber track, see [173 Track tension, adjusting](#) and check tension, see [173 Track tension, checking](#).

Document Title: Travel motor, assembly	Function Group:	Information Type: Service Information	Date: 2014/3/26
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Travel motor, assembly

Op nbr

1. Press bearing (1) into housing (2).

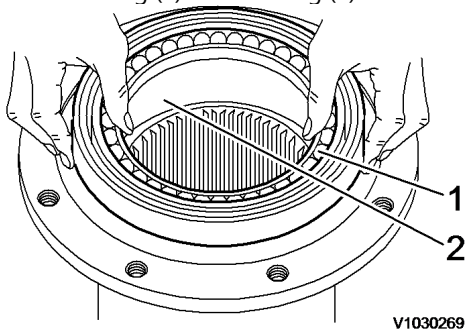


Figure 1

1. Bearing
2. Housing

NOTE!

Observe the direction of the roller bearings.

2. Assemble snap ring (1).

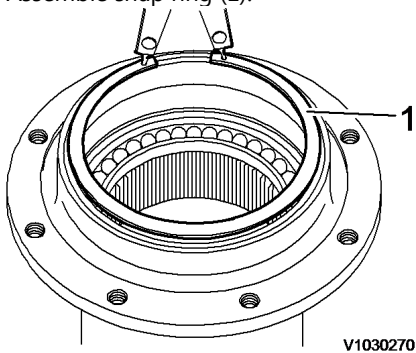


Figure 2

1. Snap ring

3. Press in roller bearing (1).

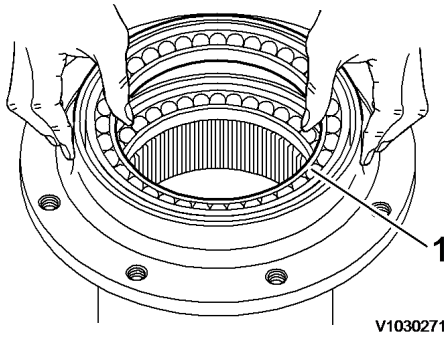


Figure 3

1. Bearing

4. Assemble the loose seal with the O-ring to the housing.

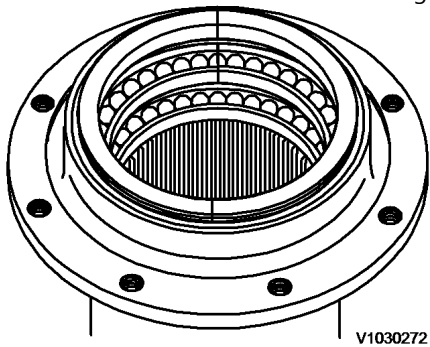


Figure 4

NOTE!

Apply some grease to the O-ring to facilitate the assembly process. Then wipe off the grease from the surface of the seat.

5. Fit the loose seal with the O-ring to the hydraulic motor.

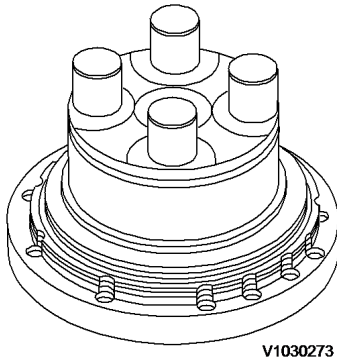


Figure 5

NOTE!

Apply some grease to the O-ring to facilitate the assembly process. Then wipe off the grease from the surface of the seat.

6. Attach the housing to the hydraulic motor and fasten it with the snap ring.

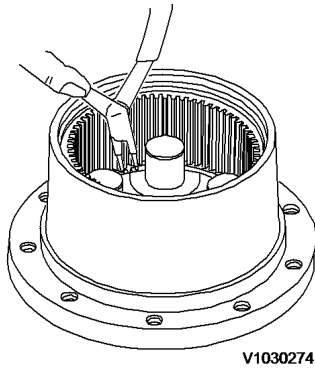


Figure 6

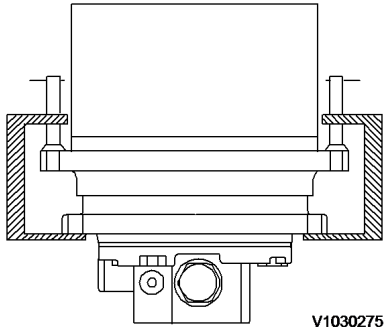


Figure 7

NOTE!

Pull the flange of reduction gear and motor together using C-clamps or a hydraulic press (see illustration).

A snap ring (one thickness) can be used to adjust the pre-load of the roller bearings.

7. Assemble ring, compression disc, pinion, needles and compression disc in this sequence to housing (2) and fasten with Snap ring (1).

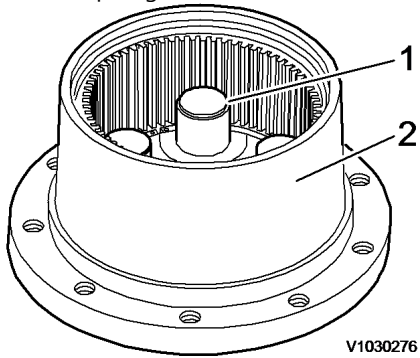


Figure 8

1. Snap ring
2. Housing

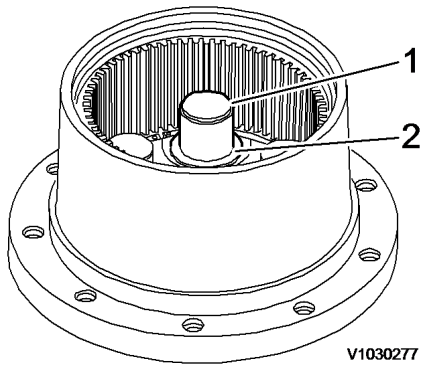


Figure 9

1. Snap ring
2. Compression disc

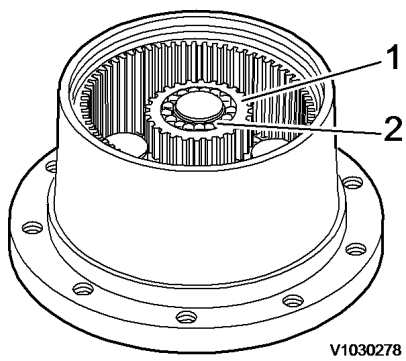


Figure 10

1. Pinion
2. Bearing

NOTE!

When assembling the snap ring make sure that the rim points up.

Do not open the snap ring too wide. Replace snap rings if their tension is not correct.

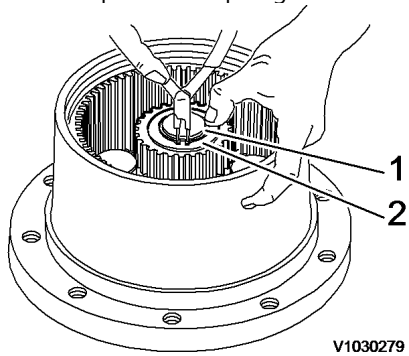


Figure 11

1. Snap ring
2. Pressure disc

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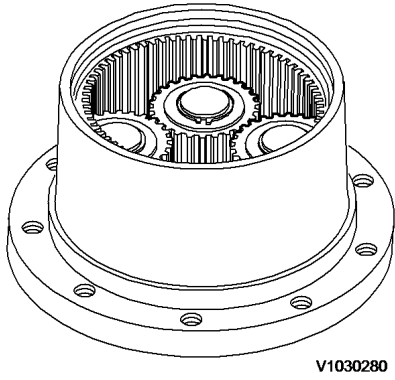


Figure 12

8. Press bolts (1) and spring pins (2) onto planet carrier (3).

NOTE!

The parts cannot be disassembled.

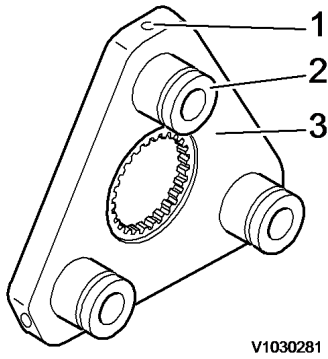


Figure 13

1. Bolt
2. Spring pin
3. Planet carrier

9. Mount pinion (1) to planet carrier (2) and locate it with snap ring.

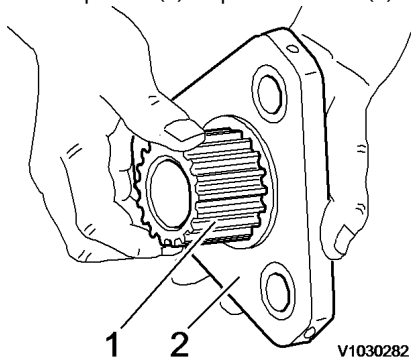


Figure 14

1. Pinion
2. Planet carrier

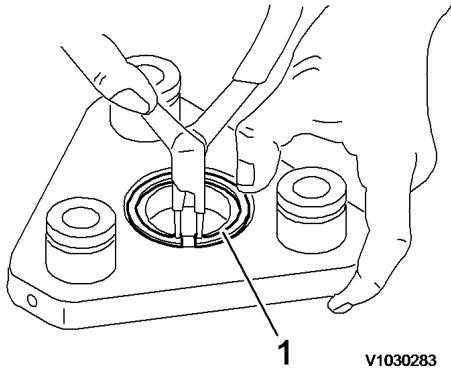


Figure 15

1. Snap ring

NOTE!

When assembling the snap ring make sure that the rim points up.

Do not open the snap ring too wide. Replace snap rings if their tension is not correct.

10. Assemble pressure disc, pinion, needles in this sequence to the planet carrier and secure them with snap ring.

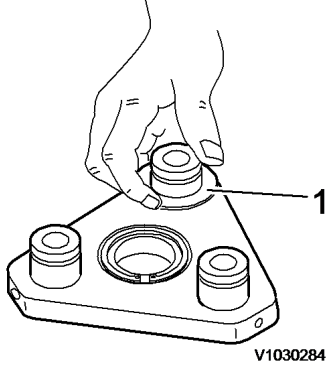


Figure 16

1. Pressure disc

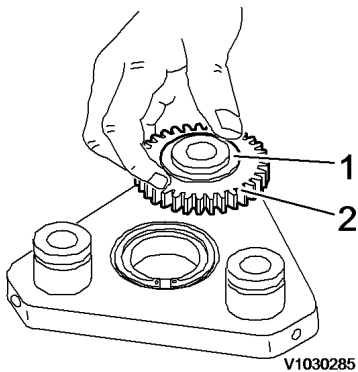


Figure 17

1. Pressure disc
2. Pinion