VOLVO

Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Power transmission, description	**400**	**Service Information**	**2014/5/5 0**
Profile: **EXC, EW210D [GB]**			

Power transmission, description

Hydraulic system:

- Main pump directly driven by the diesel engine supplies the working -, travel - and swing hydraulic system with oil.
- Main pump is electronically controlled by the V-ECU (Vehicle Electronic Control Unit), that means the maximum available hydraulic power is matched to the engine speed.
- Servo -, brake - and steering systems are supplied with oil from separate pumps.
- Machine is driven by a travel motor which acts directly on the gearbox.
- The superstructure is slewed by a swing motor with automatic swing brake and anti-rebound valve. The swing ring connects the superstructure with the undercarriage and is lubricated with grease.
- A centre passage connects the superstructure and undercarriage hydraulically and electrically.

Brake system

- Service brake with two separate brake circuits.
- Service brake is also used for digging brake with mechanical lock system.
- The two circuit travel brakes are supplied with two accumulators in the event of failure in the brake system.
- Parking brake is a negative brake system in the gear housing, spring applied and pressure released.

Drive train:

- Gearbox with two gears distributes the force via propeller shafts to the front and rear axle.
- Front axle with automatic or operator controlled oscillation lock.
- Front and rear axle with self adjusting wet multi discs in the hub reductions.

Document Title:	Function Group:	Information Type:	Date:
Travel gearbox, description	**431**	**Service Information**	**2014/5/5 0**
Profile: **EXC, EW210D [GB]**			

Travel gearbox, description

General

In the gearbox there is a planetary gear **2:b** with a planetary gear stage and gear drive **4**. The gears engage (mesh) via the multi-disc clutch **LK** and multi-disc brake **LB**. Both clutch and brake are negative, which means that they are compressed by the cup springs **1**. The clutch and brake are released with hydraulic pressure which compresses the springs. The internal locking function prevents low gear from engaging at high speed before the rotation speed has dropped, this is controlled by the transmission lubrication pump **9:1a**.

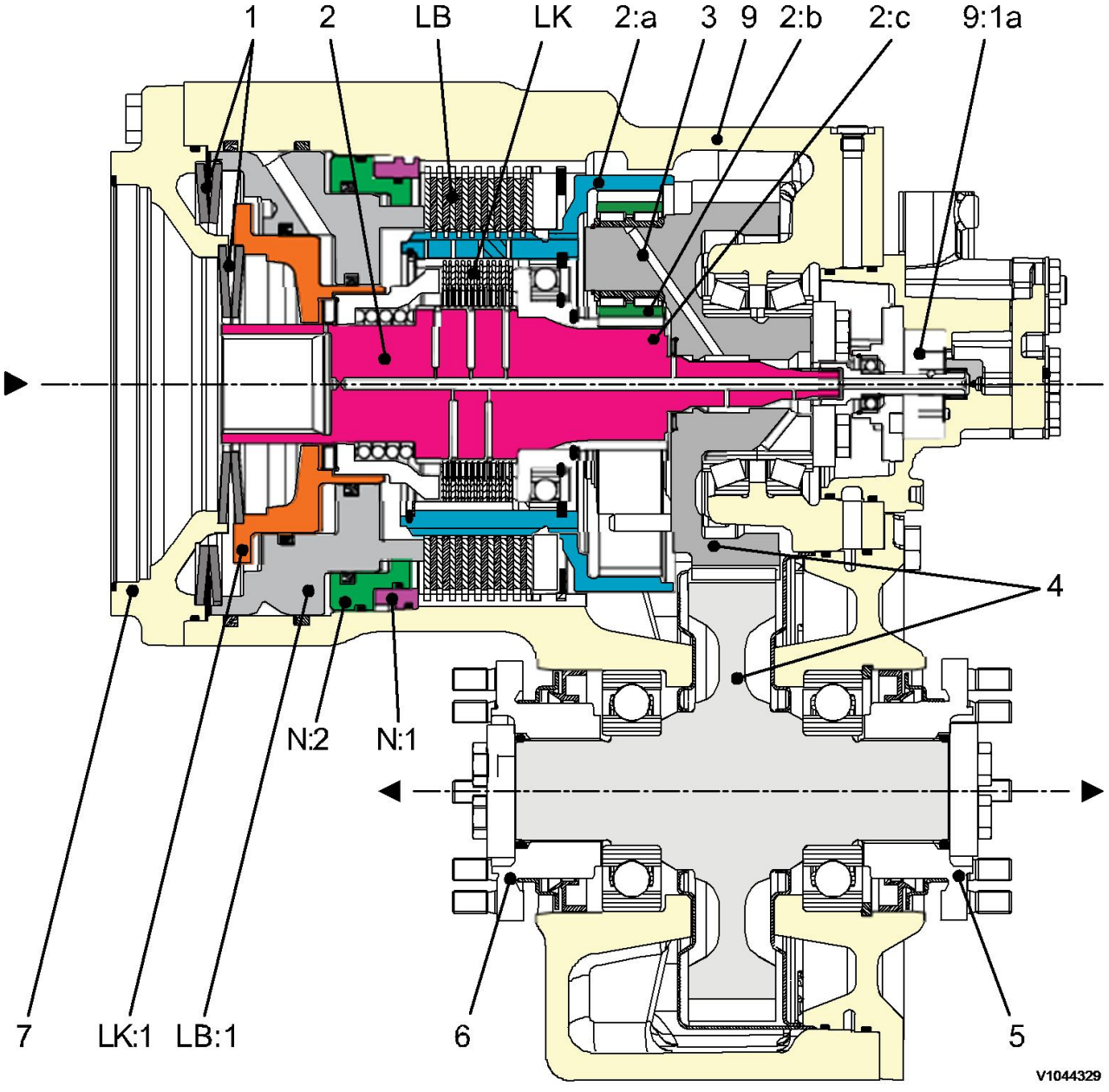

Figure 1
Gearbox 2 HL 250/270/290, cut-away view

1	Cup springs for multi-disc brake and clutch	4	Spur gear drive	LB:1	Brake piston
2	Input shaft	5	Out put flange – Rear axle	LB	Multi-disc brake
2:a	Ring gear	6	Out put flange – Front axle	LK	Multi-disc clutch
2:b	Planetary gear	7	Attachment Hydro-motor	LK:1	Clutch piston
2:c	Sun gear	9	Transmission housing	N:1	Ring emergency actuation
3	Planetary drive (carrier)	9:1a	Lube oil pump	N:2	Pressure ring emergency actuation

Shifting, mechanical action

Off-road gear (creep- and low speed)

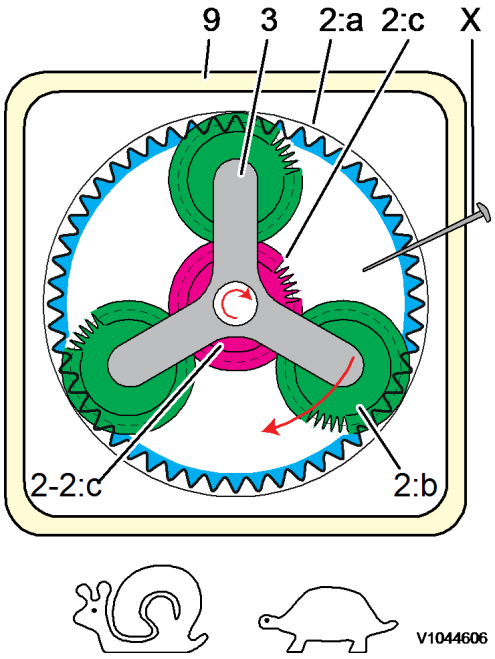

Figure 2
Off-road gear (creep- and low speed)

3	Planetary drive carrier
9	Transmission housing
2:a	Ring gear
2:b	Planetary gear
2:c	Sun gear
X	Symbol, nail
2-2:c	Input shaft and sun gear

The multi-disc brake **LB** (see fig. Gearbox 2 HL 250/270/290, cut-away view) is applied which means that the ring gear **2:a** is locked to the transmission housing **9** (symbolized by the nail X). The sun gear **2:c** has the same rotation speed as the hydraulic motor. Thus, the sun gear **2:c** drives the planetary gear **2:b** which in turn wanders on the locked ring gear **2:a**. Thus, the planetary drive carrier **3** will rotate at a lower rotation speed than the input shaft and sun gear **2–2:c**.

On-road gear (high speed)

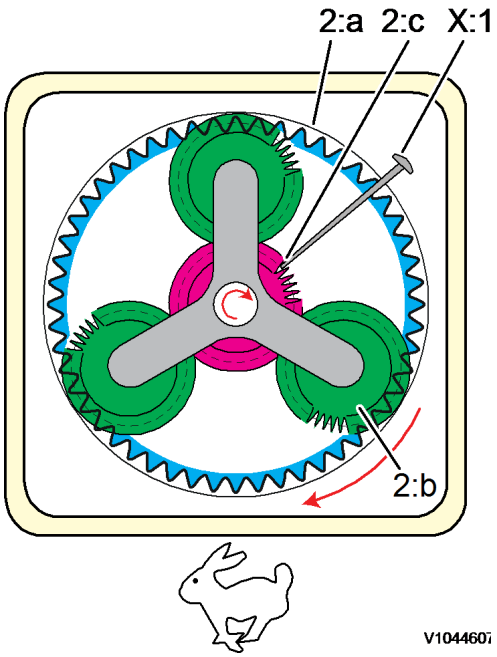

Figure 3
On-road gear (high speed)

4	Output shaft and spur gear drive
2:a	Ring gear
2:b	Planetary gear
2:c	Sun gear
X:1	Symbol, nail

The multi-disc clutch **LK**, see (Gearbox 2 HL 250/270/290, cut-away view), is applied. The sun gear **2:c** is locked to the ring gear **2:a** (symbolized by the nail X:1). This means that the entire planetary gear **2:b** assembly is locked as a unit. Thus, the input rotating speed for the sun gear **2:c** is the same as the output rotating speed for the shaft **4**.

Parking brake hydraulic system

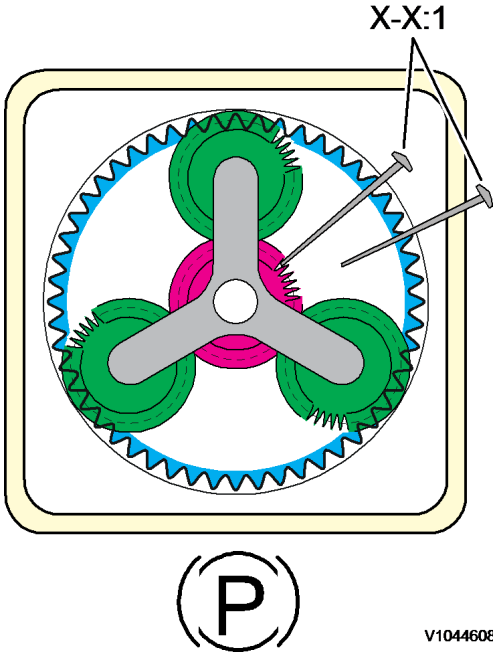

Figure 4
Parking brake hydraulic system

X	Symbol, nail
X:1	Symbol, nail

Both the multi-disc brake and clutch **LB, LK**, see (Gearbox 2 HL 250/270/290, cut-away view) are applied (symbolized by the nails X and X:1).

Shifting, hydraulic and electrical action

Off-road gear (creep speed)

When the control pressure is actuated the pressure valve **75:a** the valve shifts position so that the middle symbol engages. The control pressure continues to the gearshift valve **75:b** and when the solenoid valve (low gear) **MA4302** receives voltage, the valve shifts position so that the left symbol engages. The control pressure passes the valve and via the centre passage **70** to the gear shift spool **9:d**. The pressure passes the spool, but acts on the spring side of the spool at the same time to keep the left symbol in. The pressure continues and release the multi-disc clutch **LK**.

The pressure valve **75:a** protects the transmission from a too low control pressure. It does not allow a pressure lower than 2.6 MPa (26 bar, 377 psi) to the gearshift valve. If the control pressure is lower than 2.6 MPa the pressure valve shift to the right symbol and control pressure being drained to tank and the machine stops and the parking brake is activated.

If the control pressure exceeds 3.5 MPa (35 bar, 508 psi) it will reduced to 3.2 MPa (32 bar, 464 psi) by the integrated pressure reducing function.

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