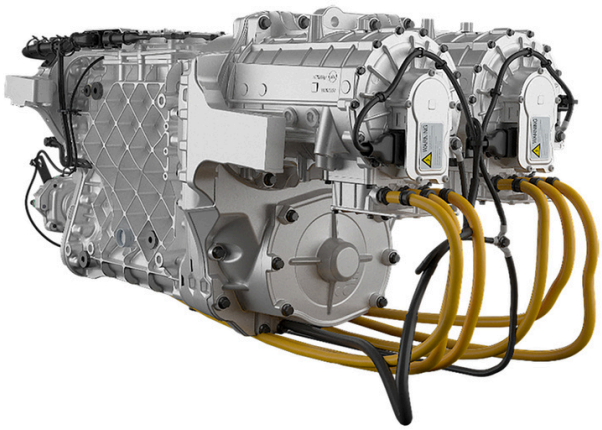
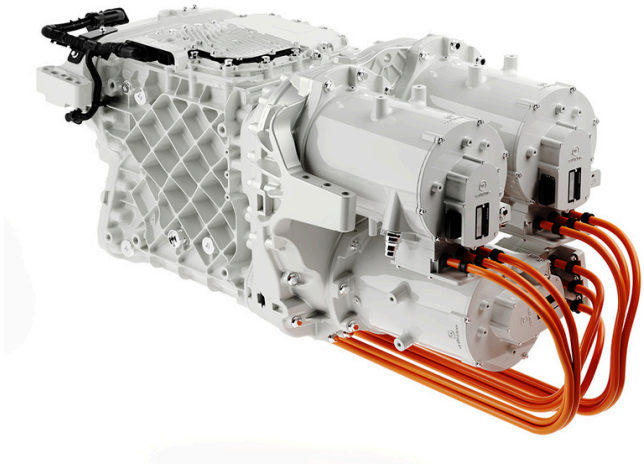
FACT SHEET

ELECTRIC DRIVE UNIT



EPT2412, NEM2 with two electric motors.



EPT2412, NEM3 with three electric motors.

Volvo electric drive unit EPT2412

The electric propulsion transmission (EPT) 2412 consists of two or three electric motors, with an in-house 12-speed I-Shift gearbox.

EPT2412 is available in different power versions – NEM2 equipped with two motors and NEM3 equipped with three motors.

The two or three electric motor solution gives a high total torque. Each motor has a torque of 800 Nm, giving the setup with two motors (NEM2) a total electric traction of 1600 Nm and the setup with three motors (NEM3) a total electric traction of 2400 Nm.

Trucks towing a trailer should always have three motors, mainly due to retardation reasons. When using the auxiliary brake of an electric truck, the electric motors work as generators giving a good retardation while also increasing the operating range of the truck.

Sales variants
Electric drive unit

EPT2412	Electric propulsion transmission

Number of electrical motors

NEM2	Two electrical motors
NEM3	Three electrical motors

Permanent-magnet synchronous machine

Volvo electromobility uses a permanent-magnet synchronous machine (PMSM) type where the magnets are embedded in the rotor. The design is reliable contributes to high productivity. The characteristics of the machine mean fast acceleration and high driveability.

PRODUCTIVITY

- Full electrical traction of 1600/2400 Nm.
- In-house I-Shift 12-speed gearbox.
- The driver can recuperate the braking energy back to traction batteries and thereby extend the driving range.

PCE4

FACT SHEET

ELECTRIC DRIVE UNIT

12-speed gearbox for torque and speed optimization

A standard I-Shift gearbox is used. The 12-speed I-Shift gearbox is designed by Volvo and ensures excellent performance and efficiency at both low and high speeds.

I-Shift is characterised by a fast and smooth gear-changing system featuring minimum interruption in torque delivery during gear changing.

The electric motors are mounted to a reduction gear to get the correct revolution and no clutch is used.

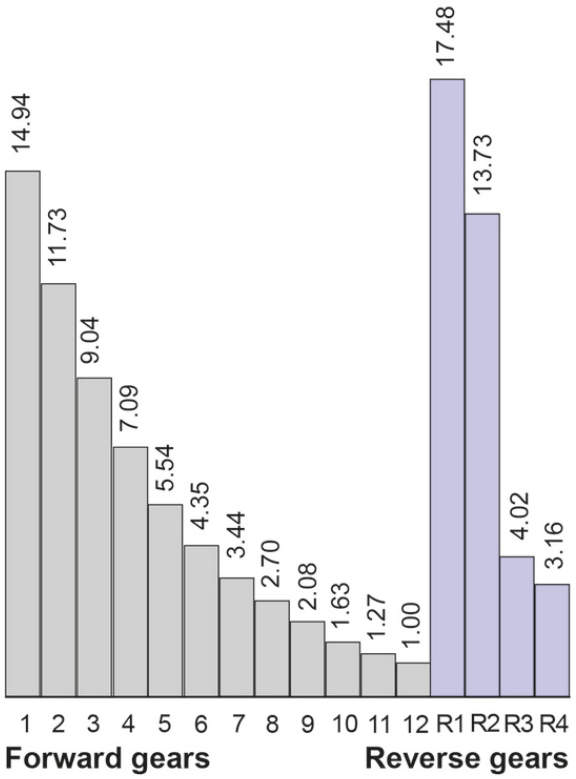
Under normal driving condition only high range gear will be used. However, under tough conditions the gearbox will choose a low range gear. Under normal driving conditions gear 7-12 will be used which will give smooth ride.

A completely new gear shift strategy has been developed to optimise the driveline for electric trucks.

Alternator recuperates energy back to traction batteries

The electric drive unit also acts an alternator, with some amount of energy being recuperated back to the traction batteries when the auxiliary brake is used.

The performance of the auxiliary brake is dependent on the state of charge of the traction batteries. If the traction batteries are fully charged, the recuperation (and hence the effect of the auxiliary brake) is very limited.



Ratios I-Shift 12-speed gearbox

SPECIFICATION

Type designation..... EPT2412

NEM2 - Two electric motors

Max power.....330 kW
Max torque.....1600 Nm

NEM3 - Three electric motors

Max power .....490 kW
Max torque.....2400 Nm

Gearbox

Transmission in-house gearbox..... I-Shift 12 speed
Oil-change volume gearbox..... approx. 16 l