

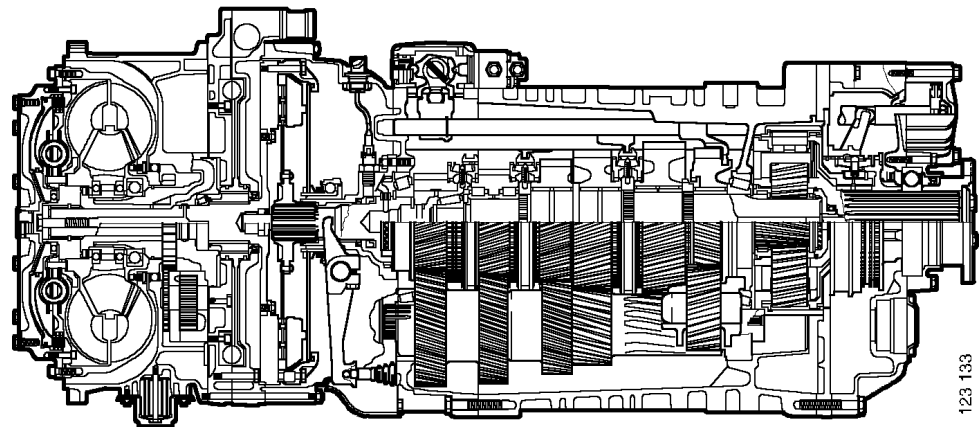
SCANIA

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Manual gearbox with torque converter, ZF

Function description



General

The purpose of this booklet is to provide information about a new gearbox which is being added to our gearbox programme. The gearbox is a 16 gear manual gearbox manufactured by ZF. The gearbox has an integrated torque converter and retarder and can be combined only with some of our 16 litre engines.

The gearbox is included in the ZF exchange system and its designation is ZF-Transmatic with torque converter WSK440. At the time of writing the gearbox has no Scania designation.

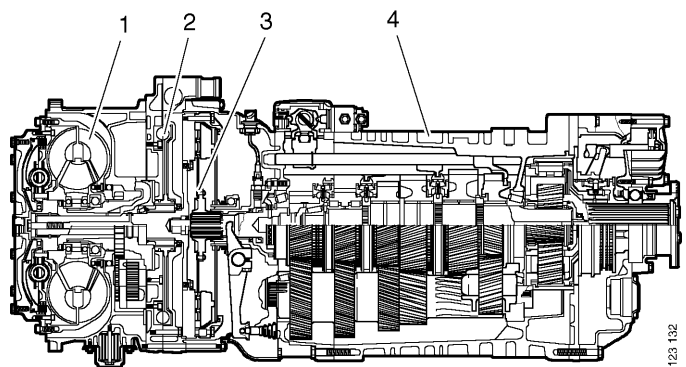
A complete functional description and a work description for its removal and installation will come later.

If we examine the gearbox, it has 4 main components.

- 1 ZF torque converter WSK440.
- 2 Integrated ZF primary retarder.
- 3 Disc coupling.
- 4 ZF Ecosplit gearbox 16S251.

All the parts, the gearbox with torque converter and retarder have a common oil lubrication system. An oil temperature sensor is located on the gearbox which:

- Controls the retarder braking effect so that the transmission oil operating temperature of 150°C is not exceeded.
- Warns if the oil temperature reaches 150°C by means of a buzzer and red lamp on the instrument panel.



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Torque converter

When the torque converter is in operation the engine torque will be limited to 700 Nm if the clutch pedal is depressed at the same time as a gear is engaged.

The torque converter has a lock-up clutch which is located between the torque converter and the flywheel in the torque converter housing.

The lock-up clutch is automatically engaged and disengaged at 950 rpm. It is controlled by a sensor which reads off the engine speed and torque converter turbine rotor speed.

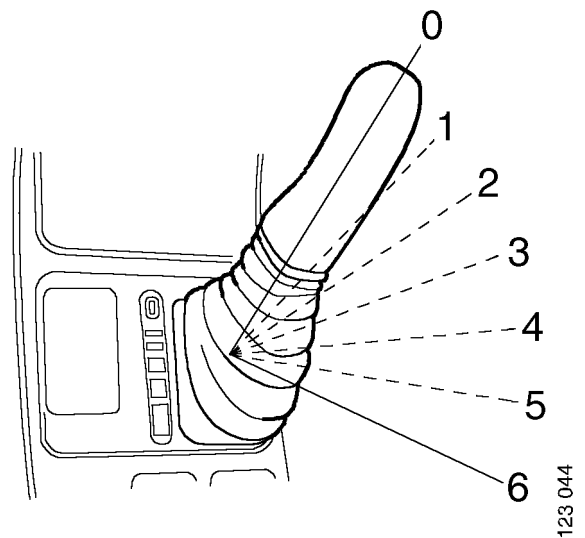
During a kick-down, the lock-up clutch is disengaged at 1100 rpm. The driver also has the option to manually prevent disengagement with a switch on the instrument panel.

Retarder

Unlike our retarders which are located at the rear of our gearboxes, this one is located at the front between the torque converter and clutch.

The retarder is activated in the usual way with a hand lever on the instrument panel. The lever has 6 positions and in position 6 the automatic exhaust brake can be obtained if the switch for this function is activated on the instrument panel.

The retarder function is interrupted immediately if the ABS system or clutch pedal upper contact is activated.



Clutch

The clutch is hydraulic and self-adjusting. It has two main components, a pneumatically powered master cylinder, known as a servomaster, and a pull-type slave cylinder of the same type as the one located on vehicles with EK power take-off.

Gearbox

The gearbox comprises a 4 gear main gearbox with a splitter gear and a planetary gear (range gear).

Overrevving protection

To prevent overrevving, the gearbox is equipped with 2 types of overrevving protection.

- Range interlock: Prevents low range from being engaged if the speed is too high.
- Gate interlock: Prevents 1st and 2nd gear from being engaged on the low range if the speed is too high. This is carried out by means of an air cylinder which prevents side travel on the gear lever.

The speed signal for the overrevving protection is taken from the tachograph.

Specifications

Number of gears	16 forward 2 reverse
Gear ratio	13.80 - 0.84
Total weight	595 Kg
Oil volume	43 l
Oil type	Monograde, viscosity SAE 30
Lock-up clutch closing pressure	10.5 bar \pm 0.5
Torque converter return pressure	5.5 - 6.0 bar
Maximum torque input	2700 Nm
Retarder, performance	1600 Nm
Retarder, return pressure	2.0 \pm 0.5 / 600 rpm
Retarder, output pressure	maximum 4.5 bar \pm 0.5

