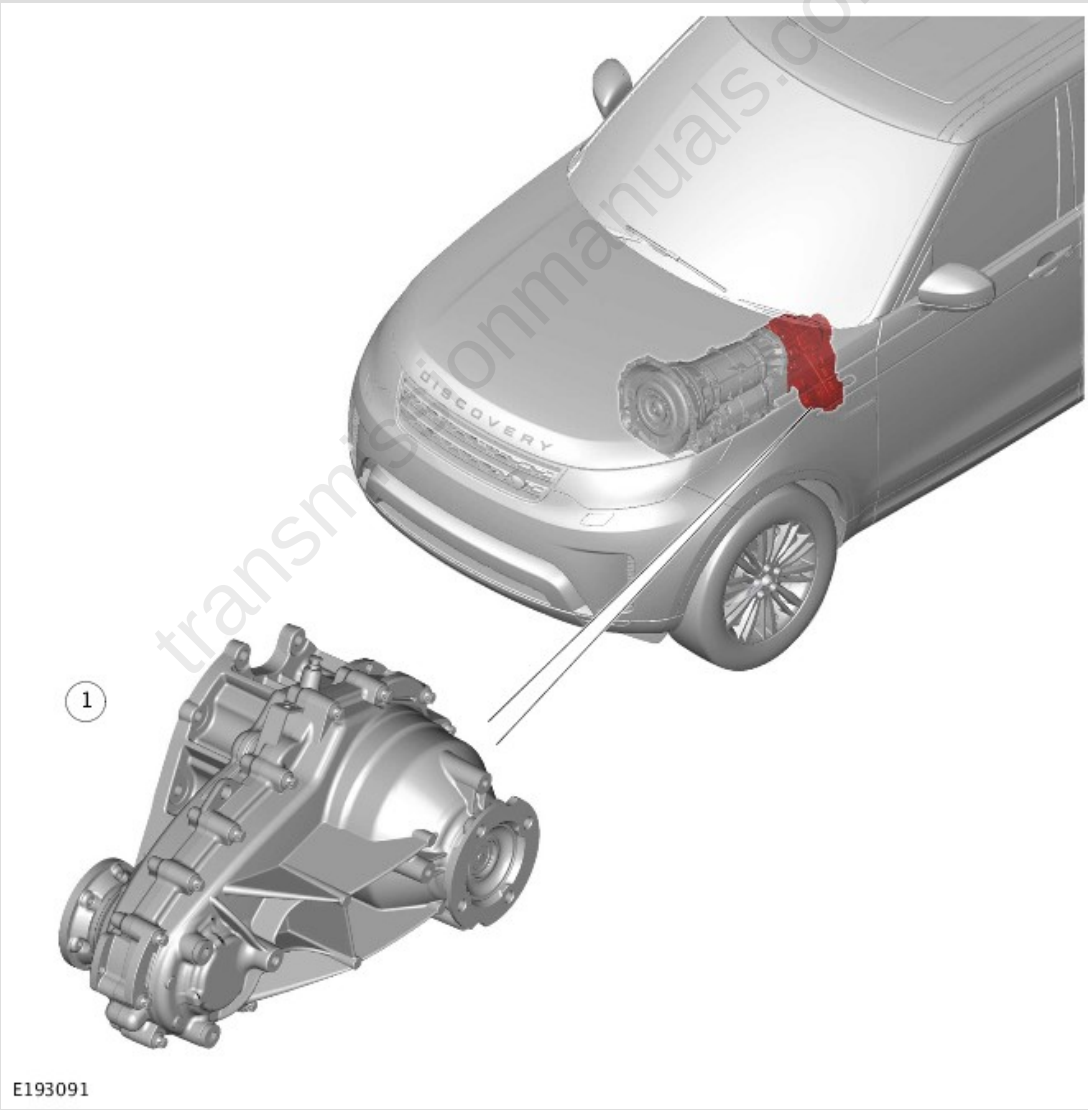
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TRANSFER CASE - [+] SINGLE SPEED TRANSFER CASE

DESCRIPTION AND OPERATION

COMPONENT LOCATION



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ITEM	DESCRIPTION
1	Single speed transfer case

OVERVIEW

The Single speed transfer case is full time, permanent four-wheel-drive unit, with 40 /60 torque distribution to the front and rear driveshafts.

Common components with Twin-speed Transfer Case:

- Front and Rear Flanges
- Main Seals
- Main Bearings
- Fill/Drain Plugs
- Fixings and Torques
- Breather
- Tachograph encoder (optional).

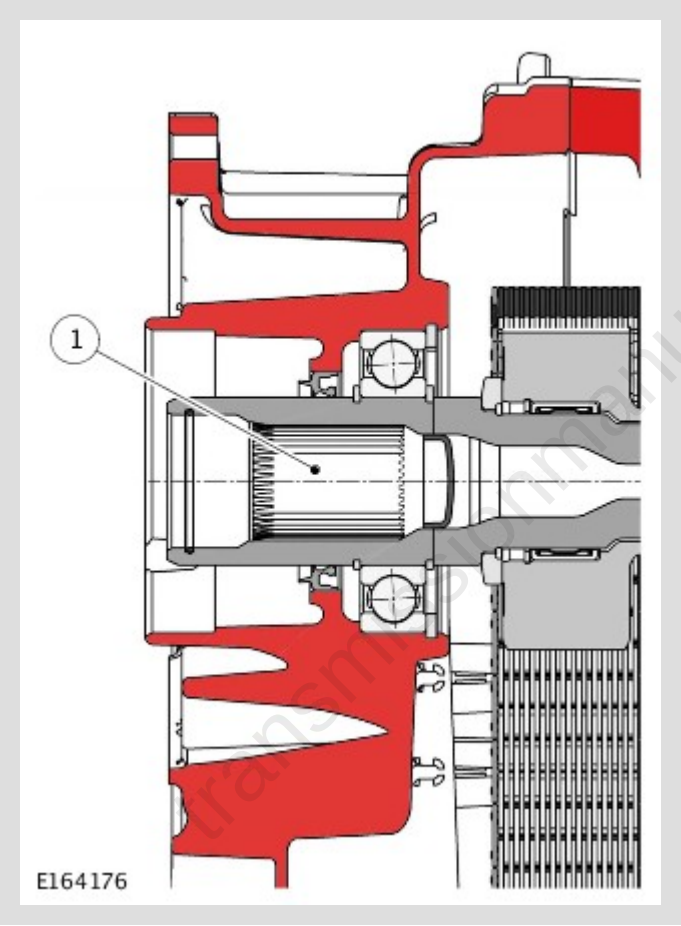
The improvements of the new Single speed Transfer Case are the following:

- Different oil specification - Castrol BOT850 with friction modifier
- Reduced Complexity
- No electronic controls
- Optimized dynamic vehicle behavior.

The Single speed TC consists of 25 components, the weight and inertia were reduced for improved economy.

A unique type of grease, Weicon anti-seize montagepaste grau TL 7391, must be applied to the transfer case input shaft spline when installing the transfer case.

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ITEM	DESCRIPTION
1	Input shaft spline

SYSTEM OPERATION

The torque input from the transmission is passed to the transfer case input shaft. The input shaft connected directly to the differential coupling. The differential coupling connects to the housing which splits the torque between the internal gear and the sun gear by the six planetary gears. The internal gear is connected and passes the torque

to the rear output flange. The sun gear is connected to the chain drive sprocket and passes the torque to the front output flange via the chain.

The center differential responds to the torque changes at the axles. The basic torque distribution between the front and rear axles is 40/60% at normal drive conditions. If an axle loses traction, the driving torque is redirected instantaneously to the other axle between 65/35% Front/Rear and 20/80% Front/Rear.

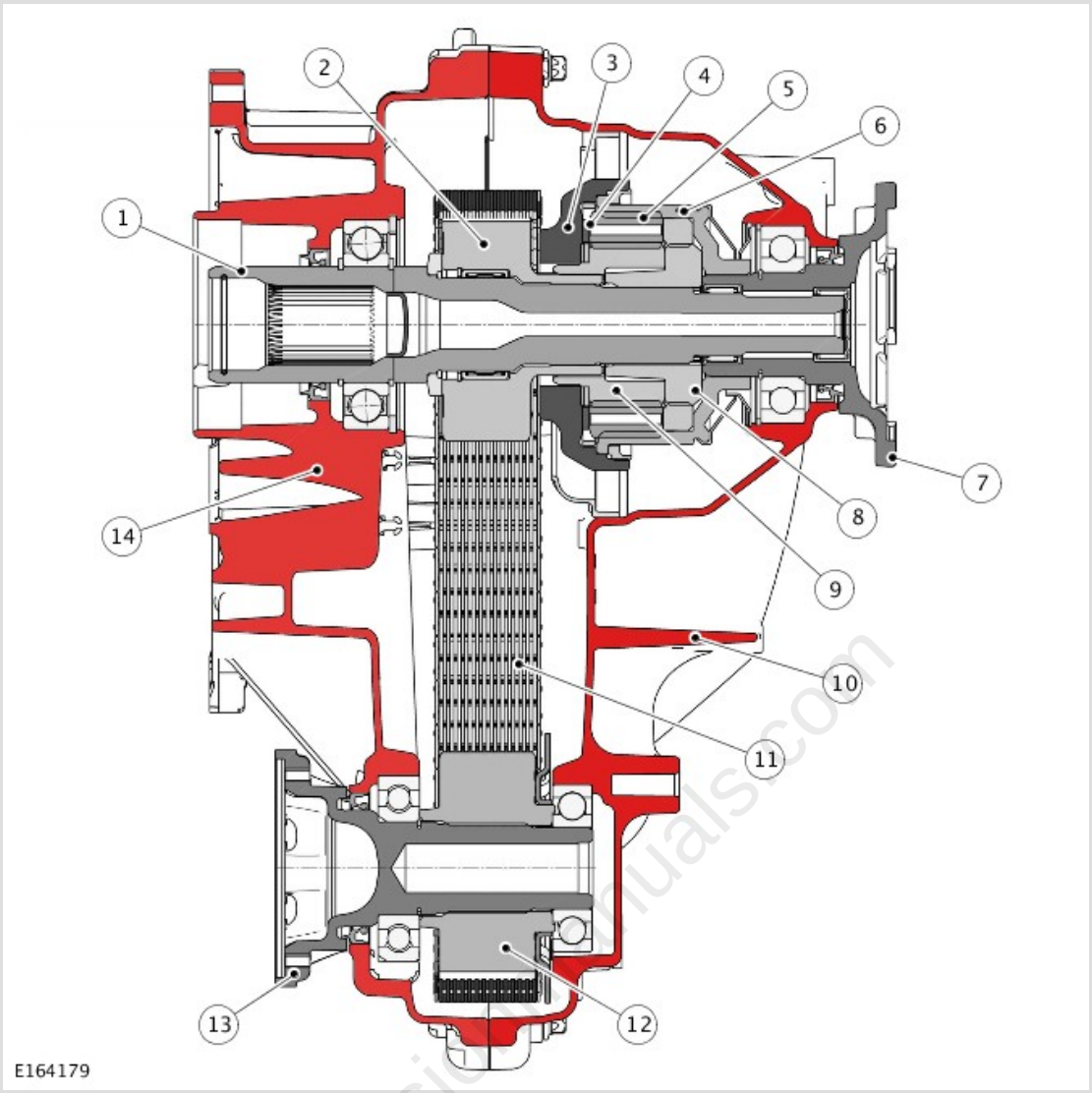
DESCRIPTION

TRANSFER CASE - SECTIONAL VIEW

NOTE:

Some variation in the illustrations may occur, but the essential information is always correct.

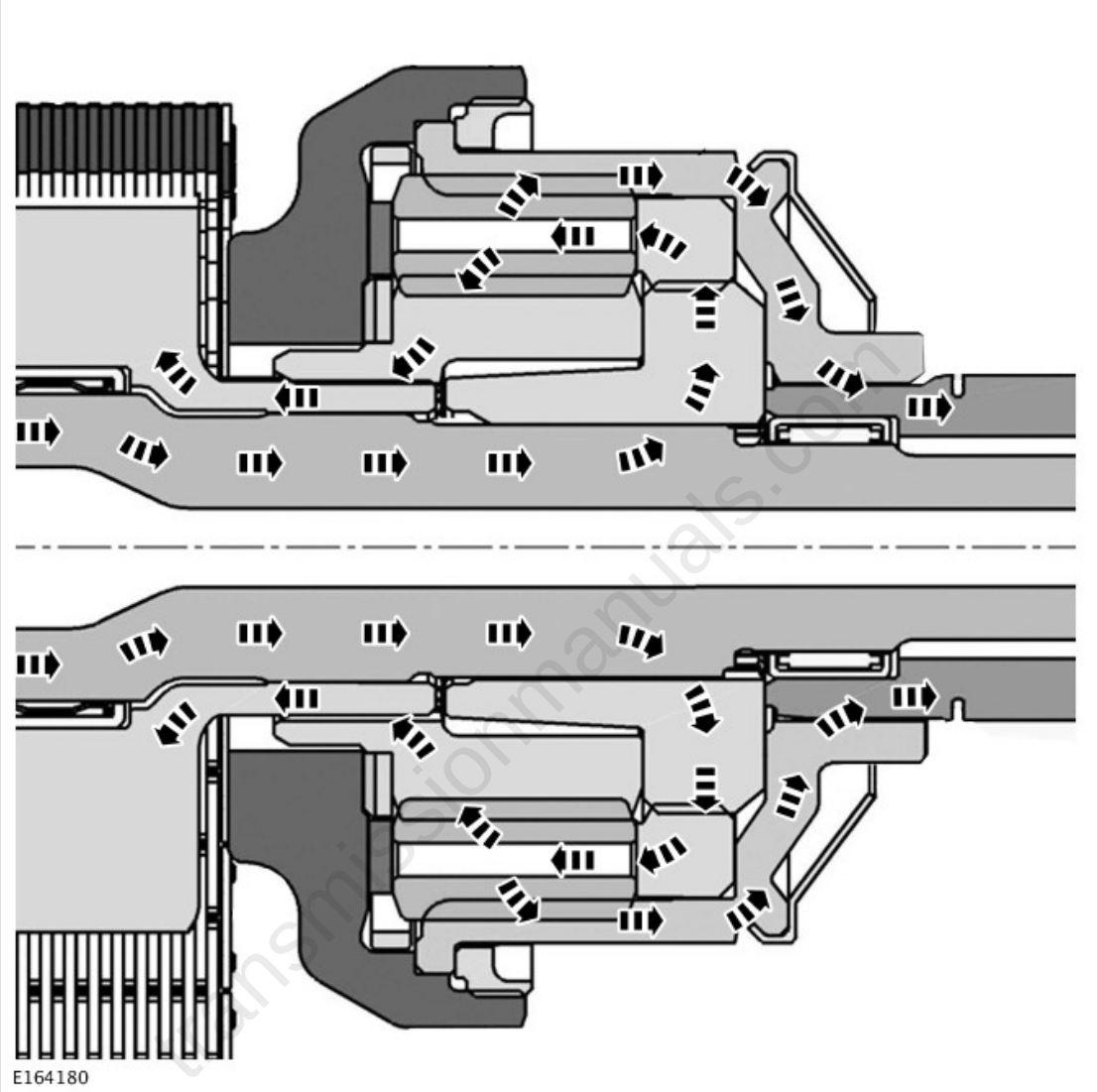
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ITEM	DESCRIPTION
1	Input shaft
2	Drive chain sprocket
3	Center differential cap
4	Friction washer
5	Planetary gear (6 off)
6	Center differential internal gear
7	Rear output flange
8	Center differential coupling
9	Center differential sun gear
10	Rear housing assembly
11	Drive chain
12	Drive chain sprocket - Front output

13	Front output flange
14	Front housing assembly

TRANSFER CASE POWER FLOW



Input torque from the transmission is transferred to the input shaft of the transfer case and then onto the differential coupling. The coupling is connected to the differential housing. The planetary gears are held in place by the differential housing, which are connected to the differential internal gear, and the sun gear. The torque is then distributed to both the differential internal gear, and the sun gear, which are connected to the outputs of the transfer case. The internal gear is connected directly to the rear output flange, the sun gear is connected directly to the drive chain sprocket and therefore to the chain drive, which provides front output flange rotation.

Front Casing Assembly

The front casing assembly provides the location for the input shaft bearing and the front output flange bearing. It is also equipped with threaded holes to mount the

chassis mounting bush, 2 lifting eyes and a breather cartridge for the transfer case breather pipe. The breather pipe allows equalization between atmospheric and internal transfer case pressure.

The front casing has an additional boss cast on the inside. The boss is used to mount two snubbers - one on drive side of the chain and one on the coast side - which are secured with 2 screws. The snubbers are suppressing chain vibrations which can occur under medium acceleration conditions, therefore improving Noise, Vibration and Harshness (NVH) issues. During normal operation the chain does not contact the snubbers.

Rear Casing Assembly

The rear casing assembly provides the location for the rear output flange bearing, the oil fill and drain plug. Fins are cast into the rear casing assembly to improve heat dissipation. The part number & serial number are printed on a bar code label.

Chain Drive

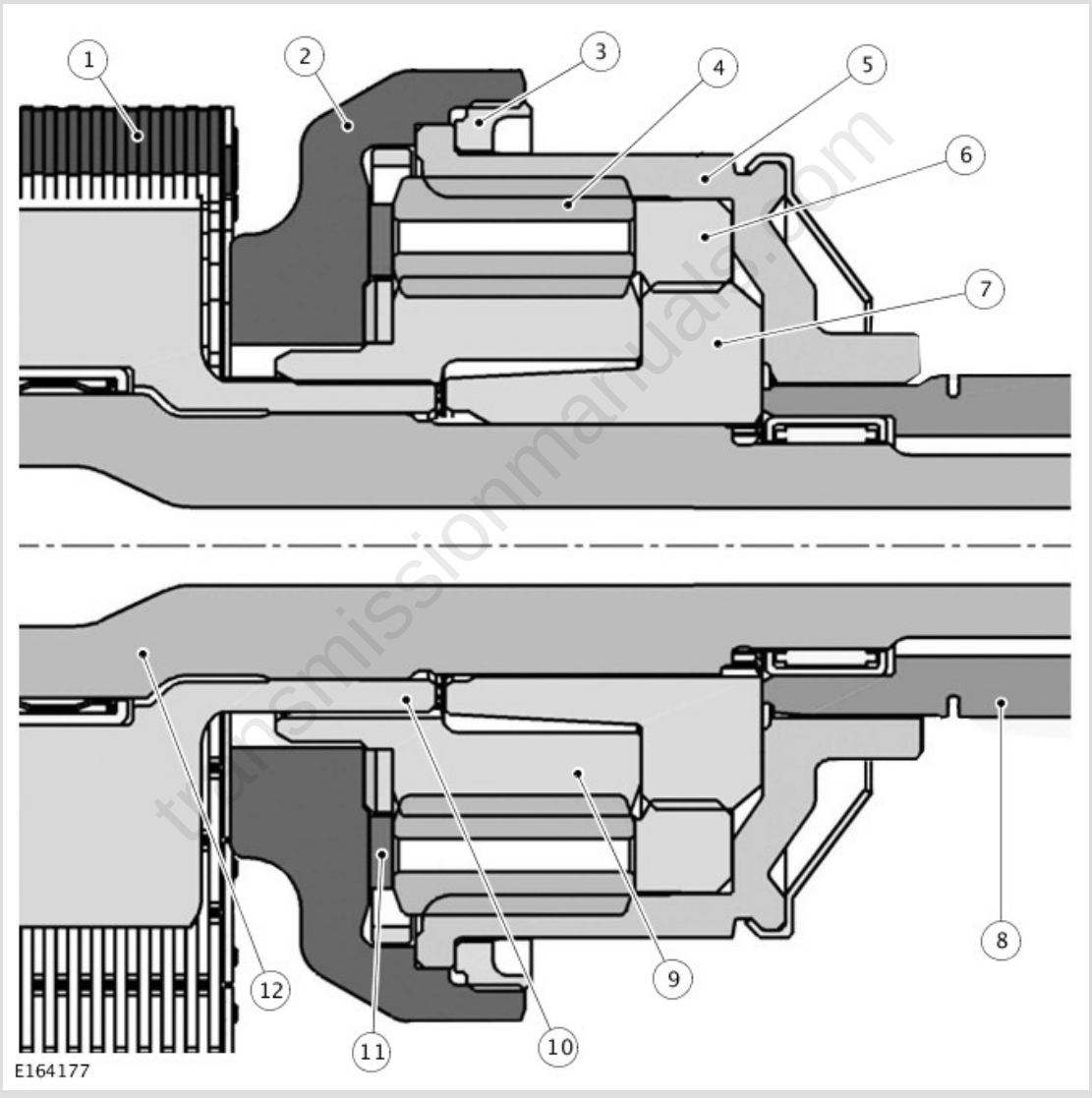
The chain-drive transfers drive from the center differential to the front output flange. A 3/8" pitch chain connects the sprocket on the transfer case input shaft with the sprocket on the front output flange. As both sprockets have the same number of teeth, the rotational speed of both sprockets is identical. During the vehicle operation the chain delivers the oil upwards and provides the lubrication for the input shaft, the output flange bearings, and the center differential assembly.

NOTE:

When installing or replacing the chain, the BLUE guide links must be facing the center differential, towards the rear output flange.

Center differential

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ITEM	DESCRIPTION
1	Drive chain
2	Center differential cover
3	Fixing nut
4	Planetary gear (6 off)

5	Center differential internal gear
6	Center differential housing
7	Coupling
8	Rear output shaft
9	Center differential sun gear
10	Drive chain sprocket
11	Friction washer
12	Input shaft

The center differential assembly is the primary feature of the transfer case. Torque is transmitted through the center differential coupling and housing, and distributed by the planetary gear set to the differential gears and the front and rear output flanges.

The assembly comprises 6 planetary gears, which are equally spaced within the center differential housing. The planetary gears are supported in both directions by the differential casing and the differential cap.

The different basic torque distribution results from the different circle diameters of the internal gear and the sun gear. If an axle loses traction, the bias between the casing, the planetary gears and the cap generates internal friction inside the differential, and the torque directed to the other axle.

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