Introduction

The repair instructions in this section regarding the disassembly and reassembly are general to the ZF-Portal axle (AV-132). Differing steps of other versions can be easily identified by qualified personnel. References may be the illustrations in the parts list.

Due to technical developments of the axle, the actual unit filled to the vehicle may differ from that covered in this section and may require different steps as well as other adjustments and testing specification.

It is recommended that repairs on the unit are referred to a ZF qualified technician.

Towing

It is possible to tow the vehicle, but to prevent damage to the differential and Gantry drive both stub shafts must be removed. To do this, remove the hub end caps and separate the shaft by using an M10 screw to withdraw the shaft. Replace the hub end cap.

The maximum towing distance is 30 miles (50 km). To tow for a greater distance the wheel bearings must be lubricated.

Maintenance

Check axle oil level ................................................................. .Monthly
Check security of axle .......................................................... .First A, B & C Service intervals
Check adjustment and lubrication of hub bearings ................. .First A, B & C Service intervals
Check hubs for signs of leaks .............................................. .First A, B & C Service intervals
Change the oil

- Mineral Oil .......................................................... 56,250-75,000 miles (90,000-120,000 km) or every 2 years
- Synthetic .................................................. 112,500 - 150,000 miles (180,000 - 240,000 km) or every 4 years

Oil Grade .............................................................................. .85W/140 API GL5
Recommended brand ............................................................ .Texaco Geartex EPB 140
Change grease (grease filled hubs)

- Lithium saponified, universal grease NLGI-class 2 mixable with mineral oil
- KP2K30 acc. to DIN 51825 and ISO-L-XCCHB2 acc. to ISO/DIS 6743-9

(ZF-list of lubricants TE-ML 12) ............................................. 312,500 miles (500,000 km) or every 4 years

Do not mix lubricant of differing grades

Check and clean, if required, the axle breather at each oil level check.
DRIVE AXLE

Topping Up - Hub
With the vehicle on level ground, carefully clean all drain fillers and level plugs prior to moving them. Rotate the hub until the oil filler is horizontal. Fill the hub until the oil overflows from the drain hole and replace plug and clean.

Draining - Hub
This is best done at the end of a journey when the oil is warm. Rotate hub until the oil filler plug / drain is at its lowest point, remove plug and drain into a suitable container.

Filling
Return the filler hole to the horizontal position and refill until the oil overflows. Replace the drain plug using a new copper washer and tighten plug to 35Nm.

Draining - Gantry
The oil in the axle housing and gantry drive is common but three drain plugs have to be removed. Each gantry drive has drain and level plugs and the housing one drain plug.

Remove plugs and drain, clean and refit plugs using new ‘O’ rings and tighten to 70 Nm.

Filling - Gantry
Remove filler plug and fill with the correct grade of oil until the oil overflows. Wait two minutes until the oil has settled, recheck and top up if necessary until the level is reached and remains constant.

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**OIL GRADE - 85W/140**
**CAPACITY - 0.7 L**

**OIL GRADE - 85W/140**
**CAPACITY - 19.5 L**
General Working Practices

During all operations, pay attention to cleanliness and skilled working.

Transmissions, removed from the vehicle, must be cleaned prior to open them.

We assume that the Special Tools, specified by ZF and listed, will be used.

After the disassembly, all components must be cleaned, especially corners, cavities and recesses of housing and covers.

The old sealing compound must be carefully removed.

Check lubricating holes, grooves and pipes for free passage. They must be free of residues, foreign material or protective compounds.

The latter refers especially to new parts.

Parts which have been inevitably damaged in a disassembly operation, must be generally replaced by new ones; for example: rotary seal rings, 'O' rings, U-section rings, cap boots, protective caps etc.

Components such as roller bearings, thrust washers, synchronising parts which are subject to normal wear in automotive operation, must be checked by skilled Service person, they will decide if the parts may be reused.

For the heating of bearings etc., hot plates, rod heaters or heating furnaces must be used.

Never heat parts directly with a naked flame. An auxiliary solution would be to immerse the bearing in a vessel filled with oil, which is then heated by a flame. In this way, damage to the bearings could be avoided.

Ball bearings, covers, flanges and parts like that must be heated to 90° to 100°C.

Hot-mounted parts must be reset after cooling in order to assure a proper contact.

Before pressing shafts, bearings etc. in position, both parts must be lubricated.

During the reassembly, all specified adjustments values, testing specifications and torque limits must be respected.

After the repair, ZF-Units are filled with oil.

After the oil filling, the oil level plugs and oil drain plugs must be tightened to the specified torque limits.
EXAMPLES OF GEAR-TOOTH-CONTACT PATTERNS

Ideal tooth-contact pattern i.e. pinion distance is correct is shown in Figure 1 and Figure 2.

Coast Side

Drive Side
Rear Axle

Contact pattern when distance must be increased is shown in Fig 3 and Fig 4.

Contact pattern when distance must be decreased is shown in Fig 5 and Fig 6.

Coast Side

Drive Side