



OPERATING INSTRUCTIONS

ZF AXLE

A-132

Version with US-hub

(ZF wheel head with compact bearing)

Preface

This documentation has been developed for specialized staff trained by ZF Friedrichshafen AG for repair and maintenance work to be done on ZF units.

Due to the continuous technical upgrading of the product, however, the maintenance of the unit at your disposal may require both deviating work steps as well as differing setting and testing data.

These operating instructions are based on the unit's state-of-the-art at the time of printing.

They were prepared with utmost care in order to avoid errors.

ZF Friedrichshafen AG, however, shall not be liable for any possible errors in figures or descriptions.

ZF Friedrichshafen AG reserves the right to replace these operating instructions by a successive edition at any time without advance notice. Upon request ZF Friedrichshafen AG will advise which edition is the latest one.

The owner and the user shall be responsible for complying with the safety instructions and for implementing any maintenance work according to the specified guidelines.

ZF Friedrichshafen AG shall not be liable for any incorrect installation, improper handling, insufficient maintenance, improperly and incompetently performed work and any consequential damage resulting thereof.

It is **imperative** to observe the relevant instructions and manuals of the vehicle manufacturer.

Important information regarding technical reliability and operational safety are highlighted by the following symbols:

| | |
|---|--|
|  INFO | This symbol serves as a reference to text passages in these operating instructions giving an INFO on special working procedures, methods, information, use of auxiliaries, etc. |
|  NOTE | This symbol identifies situations in which lacking care might lead to damage to the product . |
|  DANGER | This symbol identifies situations in which lacking care might lead to personal injury . |

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Subject to technical modifications!

This document is a translation of the German original.

Design level

2014/04

1 Oil quality

Approved oils for the ZF A-132 axle see ZF list of lubricants **TE-ML 12**.

The ZF list of lubricants is being continuously updated and can be obtained or viewed as follows:

- at all ZF plants
- at all ZF service organizations
- Internet: <http://www.zf.com> (example for search term: *TE ML 12*)

2 Oil change

Precondition for a correct oil change is the proper installation of the axle in each direction. Place the vehicle into a horizontal position.

Carefully clean all drain plugs, filler plugs and level check plugs prior to opening.

Only drain oil immediately after a longer operation period.

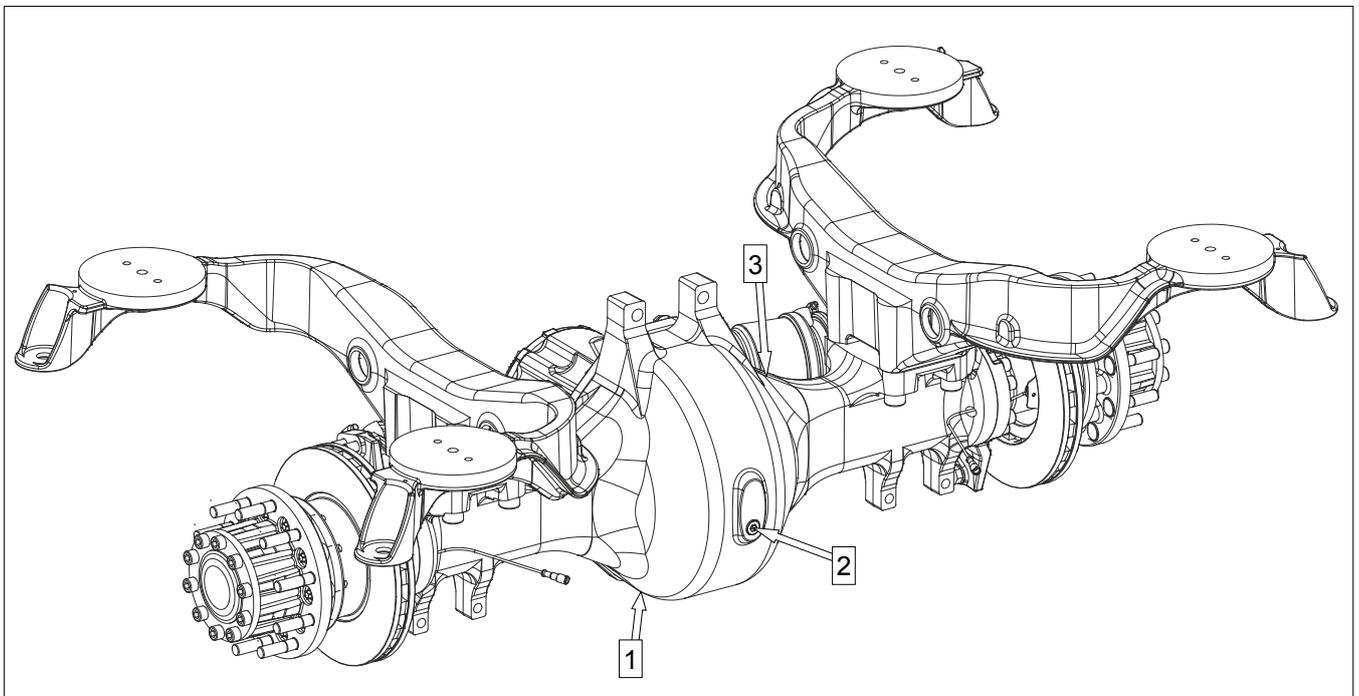


Fig. 1

Legend:

| | | | |
|---------------------------------|----------------------------------|-------------------|---|
| 1 = Oil drain hole | M36 x 1.5 Axle housing | Tightening torque | $M_A = 130 \text{ Nm}$ $= 96 \text{ lbf.ft}$ |
| 2 = Oil filler hole (oil level) | M24 x 1.5 Axle housing | Tightening torque | $M_A = 70 \text{ Nm}$ $= 52 \text{ lbf.ft}$ |
| 3 = Breather | M10 x 1 Axle housing (rear side) | Tightening torque | $M_A = 5.5 \text{ Nm}$ $= 4 \text{ lbf.ft}$ |

2.1 Oil drain

Loosen drain plug (1) and drain oil.



The oil temperature may be extremely high! Risk of burn injuries!



Waste oil to be disposed of ecologically and according to the legal provisions!

2.2 Oil filling

Clean magnetic insert of drain plug (1), fit new O ring and install insert.

Tightening torque $M_A = 130 \text{ Nm}$
 $= 96 \text{ lbf.ft}$

Fill in oil at the oil filler hole (2) until overflow.

Oil fill quantity approx. 18.5 liters = 4.9 gal

Check oil level after some minutes and refill oil until the specified level is reached and remains **constant**.



Repeat procedure until the oil level remains constant!

Provide oil filler/level check plug with a new O-ring and mount it.

Tightening torque $M_A = 70 \text{ Nm}$
 $= 52 \text{ lbf.ft}$

3 Oil change interval

See specifications in ZF list of lubricants **TE-ML 12**.

4 Oil level check

Check oil level at least once a year, in particular, however, when a vehicle has been put into service with new or repaired axles or axle parts.

5 Breather

When putting the unit into operation and during servicing, check breather for proper function and replace it if required. The breather must always be replaced in case of oil change.

6 Check of compact bearing (hub bearing)

6.1 Check interval

Check the bearing once a year or every 100,000 miles/160,000 km whichever occurs first. Furthermore, the bearing must be checked in case of brake disk change, ABS fault message and rising noise level at increasing speed.

6.2 How to check the axial play

Remove the wheels. Loosen screws on the flange shaft and pull out flange shaft.



**There is oil behind the flange shaft which comes out during disassembly.
Waste oil to be disposed of ecologically and according to the legal provisions!**

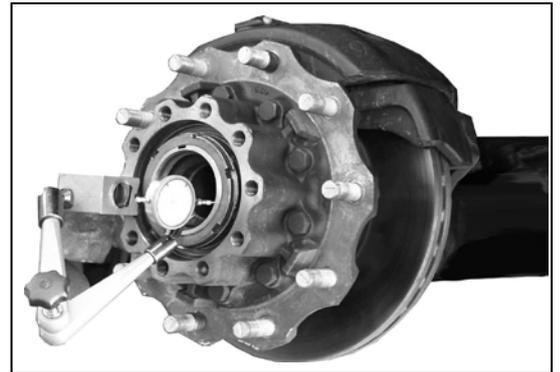


Fig. 2

1. Fix magnetic stand to the hub and position dial indicator at the circular ring area at front side of hub carrier.
2. Push hub towards the axle with both hands (do not tilt) and rotate by 20° to 30° in both directions until the dial indicator pointer remains fix.
3. Set dial indicator to 0.
4. Use both hands to pull hub away from the axle (do not tilt) and rotate it by 20° to 30° in both directions until the dial indicator pointer remains fix.
5. The difference corresponds to the axial play. Repeat measurements 3 times and calculate the average value. Rotate the wheel several times between the measurements.



**If the measured value exceeds 0.20 mm (= 0.0079 in), the compact bearing is worn and must be replaced.
For further information see Repair Manual (ZF order No. 5871.207.002).
Refill drained oil prior to putting the unit into operation.**

6.3 How to check grease overflow

Check shaft seal at brake disk side for grease overflow.



A small quantity of grease (slight grease collar) is permitted and not to be regarded as leakage.

7 Grease lubrication of hub bearing

7.1 Grease quality

Approved grease types for the ZF A-132 axle see ZF List of Lubricants **TE-ML 12**.

The ZF list of lubricants is being continuously updated and can be obtained or viewed as follows:

- at all ZF plants
- at all ZF service organizations
- Internet: <http://www.zf.com> (example for search term: *TE ML 12*)

7.2 Grease change interval

The grease must be changed every 500,000 miles/800,000 km or every 6 years, whichever occurs first.

7.3 Grease change in the hub

 A complete check of the compact bearing including grease change is also required outside the maintenance interval if the following criteria apply:

- Grease leakage at the shaft seal on brake disk side. Shaft seals must always be checked when changing the brake disk.
- Overheated brake parts (e.g. burnt bellows on pressure pieces).

Also see chapter 6.

Legend:

- 1 = Hub carrier
- 2 = Screen sheet
- 3 = Shaft seal (with impulse disk)
- 4 = cpl. bearing unit (incl. retaining ring and O-ring)
- 5 = Hub
- 6 = Shaft seal
- 7 = Slotted nuts
- 8 = Locking plate
- 9 = Flange shaft

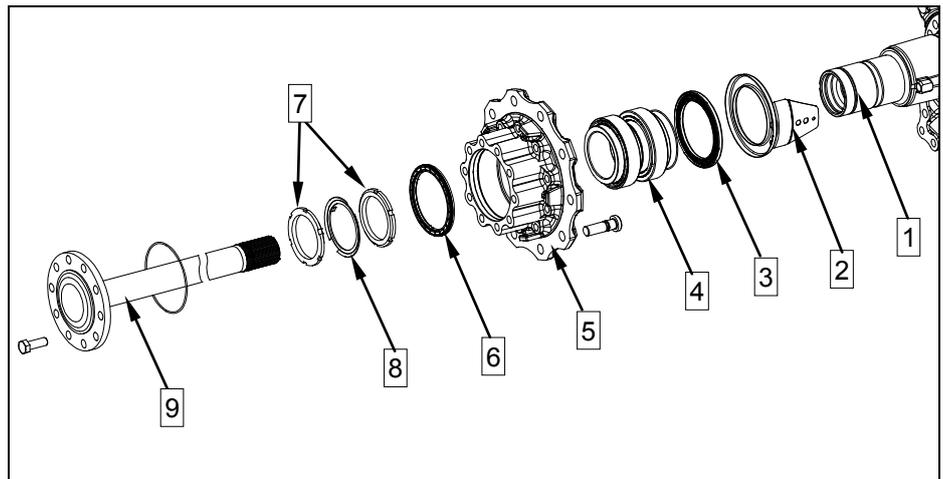


Fig. 3

 **When changing grease within the maintenance interval, it is necessary to remove the complete compact bearing. Detailed information on the required operations see Repair Manual ZF order No. 5871.207.002.**

| Removal | | | |
|---------|--|---|---|
| 1 | Remove hub (1) | | |
| 2 | Remove grease from hub (1), clean hub and bearing inner rings/bearing outer rings (4). |  | Remove just the inner rings of the tapered roller bearings from the hub! |

| Reinstallation | | | |
|----------------|---|---|---|
| 3 | Check condition and wear of tapered roller bearings (inner and outer rings) (4). |  | Replace worn or damaged tapered roller bearings by a new bearing unit. |
| 4 | Thoroughly grease tapered roller bearings (4) and fill them with the specified grease quantity. |  | Fill quantity per hub 125 g (= 4,4 oz) |
| 5 | Wet bearing areas on the hub carrier with compact bearing grease. | | |
| 6 | Install hub |  | Fit new shaft seals and O-rings. |
| 7 | Fit wheel head |  | Fit new locking plate (8). |

8 Wheel studs and wheel nuts

We recommend to replace heavily corroded wheel studs.



**Tightening torque see vehicle manufacturer's specifications.
Further information see Service Infos in ZF-Service-Line.**



Do NOT wet threads with friction-reducing lubricants including Cu-, MoS2-additives or GL5 oil.

9 Towing

If both flange shafts are removed before towing, the driveline is disconnected.



**There is oil behind the flange shaft which comes out during disassembly.
Waste oil to be disposed of ecologically and according to the legal provisions!**

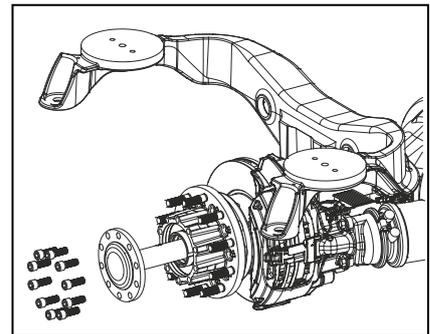


Fig. 4



If the flange shafts are removed, plug both hubs to be oil-tight using the following parts!

| | |
|------------------|--|
| 1x cover | 4472.235.021 |
| 1x O-ring | 0634.303.940 |
| 2x hexagon screw | 0636.021.250 (similar to bolted flange shaft connection) |

Tightening torque (M18x1.5/10.9) with mounted cover $M_A = 100 \text{ Nm}$
= 74 lbf.ft

Tightening torque (M18x1.5/10.9) with mounted flange shaft $M_A = 440 \text{ Nm}$
= 325 lbf.ft



**When towing, observe the vehicle manufacturer's specifications and comply with the legal provisions!
Refill drained oil.**

10. Lifting jack points

Ensure that the contact surface of the lifting jacks is at least 55 cm^2 , e.g. $5 \text{ cm} \times 11 \text{ cm}$ or $\text{Ø } 8.4 \text{ cm}$ ($= 8.53 \text{ in}^2$, e.g. $1.97 \text{ in} \times 4.33 \text{ in}$ or $\text{Ø } 3.31 \text{ in}$). Furthermore, do NOT position the lifting jacks on other points than those indicated below:

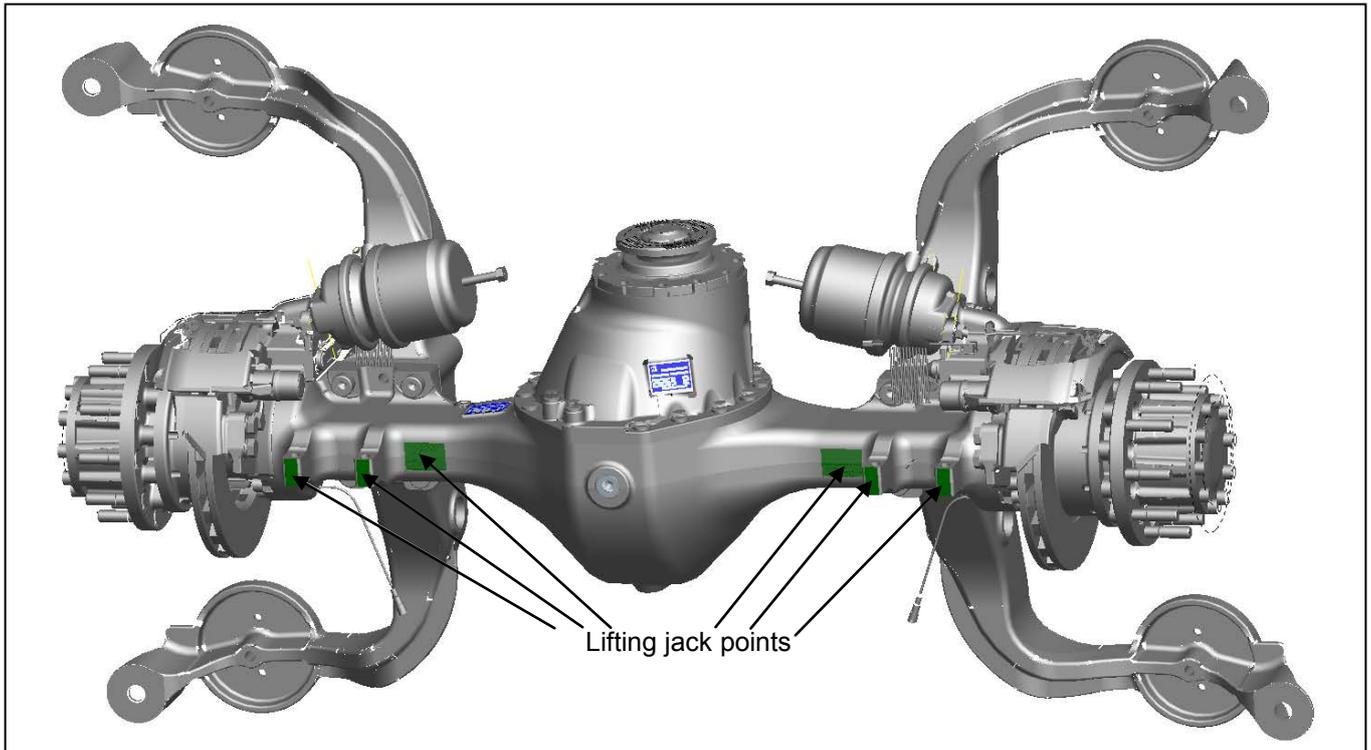


Fig. 5

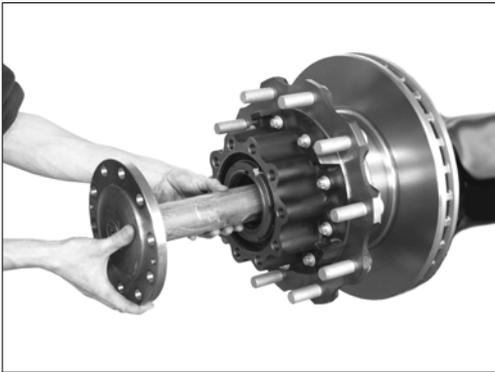


Fig. 6

11 Replacement of axle insert

Loosen screws on the flange shaft. Pull flange shaft out of the axle. Remove opposite flange shaft.

i Releasing oil to be disposed of ecologically and according to the legal provisions!

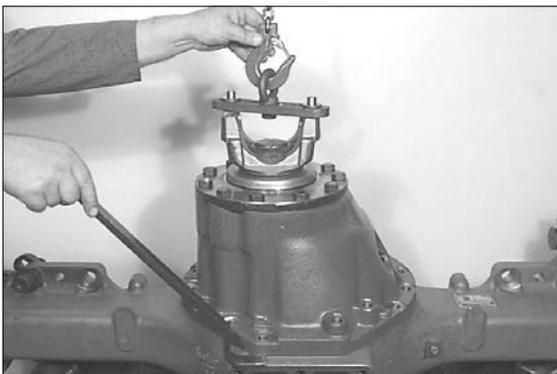


Fig. 7

Loosen bolted connection and separate axle insert from the axle housing using the lifting device.

i Mark installation position of axle insert (e.g. input flange off-center left).

| | |
|------------------------|--------------|
| (S) Lifting device | 5870.281.044 |
| (S) Assembly lever set | 5870.345.036 |

👉 For transport and storage of the axle insert it is imperative to observe the procedure described in the following chapter.

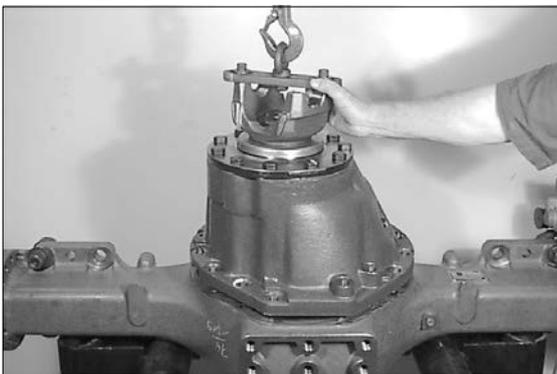


Fig. 8

Wet mounting face with Loctite 574.

Fit two locating pins (S). Use the lifting device to install axle insert into the axle housing until contact.

Ensure correct installation position of the axle insert. See „Disassembly“.

Wet threads of **new** locking screws with Loctite 574. Fix axle insert with locking screws.

| | |
|----------------------------------|--|
| Tightening torque (M16x1.5/12.9) | $M_A = 385 \text{ Nm}$ $= 284 \text{ lbf.ft}$ |
|----------------------------------|--|

| | |
|--------------------|--------------|
| (S) Locating pins | 5870.204.040 |
| (S) Lifting device | 5870.281.044 |

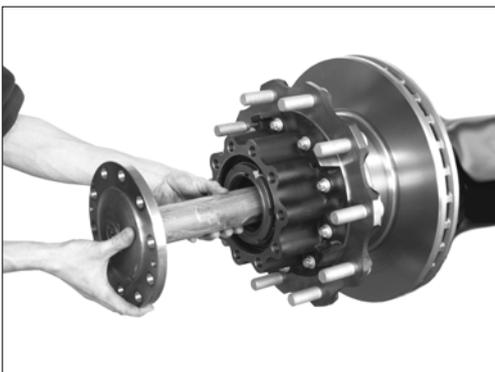


Fig. 9

Insert flange shaft with O-ring into the hub carrier and bring it into contact position with the hub.

Fix flange shaft with cylindrical screws/hexagon screws.

| | |
|----------------------------------|--|
| Tightening torque (M18x1.5/10.9) | $M_A = 440 \text{ Nm}$ $= 325 \text{ lbf.ft}$ |
|----------------------------------|--|

Mount opposite flange shaft analogously.

12 Transport and storage of axle insert



The following points must be observed for storage and transport of the axle insert:

- **Support axle insert only at the axle drive housing!**
Otherwise the crown wheel may get damaged and generate operating noise.
Furthermore, hits onto the input flange may damage the input pinion bearing.
- **Secure axle insert against falling forwards, backwards or to the side!**