

Order-no.: 5871 218 002

ZF-AXLE AP-9

ZF-differential carrier

Type: HK

Type: DK-7

Type: DKZ-7



ZF Passau GmbH

Donaustr. 25 - 71

D-94034 Passau

ZF – AXLE AP-9

ZF-DIFFERENTIAL CARRIER

Type: HK

Type: DK-7

Type: DKZ-7

Information:

Due to the great variety of ZF units it is necessary to limit disassembly and reassembly manuals to a current ZF production unit.

This documentation has been developed for specialized staff trained by ZF for repair work to be made on ZF units.

Continuous technical upgrading of the ZF units and extensions concerning design options may require both deviating work steps and differing setting and testing data.

This disassembly and reassembly manual is based on the design level of a ZF production unit at the time of issue of the manual.

ZF Passau GmbH reserves the right to replace this disassembly and reassembly manual by a successive edition at any time without advance notice. Upon request, ZF Passau GmbH will advise which edition is the latest one.

For maintenance work always observe the **lubrication and maintenance instructions** (ZF-order no: 5871 218 902) and **the ZF-list of lubricants TE-ML 05!**

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

- In all ZF-plants
- In all ZF-service organizations
- Internet <http://www.zf.com/> Service / Techn. Information

For service and maintenance work on the brake system always observe the brake manufacturer's and vehicle manufacturer's instructions.

ATTENTION:

Observe the vehicle manufacturer's instructions and specifications for the installation and commissioning of the unit!

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Dept.: ASDM

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Subject to technical modifications!

Konstruktionsstand / Design level : 2005/11

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PREFACE

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

This documentation describes a ZF series product with a design level valid at the date of edition

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

We would therefore recommend you to entrust masters and servicemen with the work on your ZF product whose practical and theoretical training is constantly updated in our training school.

The Service Stations established by ZF Friedrichshafen all over the world offer you:

1. Permanently trained staff
2. Specified equipment, e.g. special tools
3. State-of-the-art genuine ZF spare parts

All work is done there with utmost care and reliability.

In addition, repair work carried out by ZF Service Stations is covered by the ZF warranty within the terms of the currently applicable contractual conditions.

Any damage resulting from work which is done in an improper and unprofessional manner by third parties and any consequential costs incurred shall be excluded from this contractual liability.
This shall also be applicable if other than genuine ZF spare parts are used.

ZF Passau GmbH

Service Department

General

The Service Manual covers all work required for disassembly and the relating reassembly.

When repairing the unit, ensure utmost cleanliness and that the work is done in a professional manner. Dismantle the unit only if any damaged parts must be replaced. After removing screws or nuts, loosen lids and housing parts, which were installed with seals, by slight hammer blows with a plastic hammer. Use suitable pulling devices for removing parts being tightly installed on the shafts, such as bearings, bearing rings and similar.

Carry out disassembly and reassembly work on a clean working place. Use special tools which have been developed for this purpose. Prior to reinstallation of the parts, clean contact faces of housings and lids from residues of seals. Remove any burrs or similar irregularities with an oil stone. Clean housings and end covers, in particular corners and angles, with a suitable detergent. Damaged or heavily worn parts must be replaced, with an expert assessing whether parts subject to normal wear during operation, such as bearings, thrust washers etc. will be reinstalled.

Parts such as seal rings, locking plates, split pins etc. must generally be replaced. Radial seal rings with worn or broken sealing lip must also be replaced. In particular, ensure that no chips or other foreign bodies remain in the housing. Check the lube oil holes and grooves regarding unhindered passage.

Oil according to the relating List of Lubricants shall be applied to all bearings prior to their installation:

NOTE: Only a heating furnace (oil bath) or an electric drier is permitted to be used for heating up parts such as bearings, housings, etc.!
Parts fitted in heated state must be readjusted after cooling down to ensure a perfect contact.

CAUTION

When assembling the unit, exactly observe the tightening torques and setting data indicated in the manual. Tighten screws and nuts according to the enclosed standard table, unless otherwise specified. The use of fluid seals or Molykote is not permitted for the control part in transmissions – due to a possible malfunction.

Never wash discs having organic friction linings (e.g. paper discs - adverse effect on lining adhesion). Only dry cleaning is permitted (leather cloth).



DANGER

When using detergents, observe the manufacturer's instructions regarding their handling.

Structure of the Service Manual

The structure of this repair manual reflects the sequence of the work steps for completely disassembling the dismantled unit.

Special tools required for carrying out the repair work are listed in the current text as well as in chapters “W” (List of special tools) and “WB” (illustrated tables).

Important information on industrial safety

As a basic principle, the workshop carrying out the repair or maintenance of ZF units shall be fully responsible for industrial safety.


The observance of all valid safety regulations and legal requirements is a prerequisite for avoiding any damage to persons and products during maintenance and repair work.


Repair workshops must familiarize themselves with these regulations prior to starting any work.

A suitably trained and skilled staff is required for a proper repair of these ZF products.

The repair workshop shall be responsible for the training.

The following safety references are used in this manual:

 CAUTION	This symbol serves as a reference to special working procedures, methods, information, use of auxiliaries etc... indicated in this repair manual.
--	--

 DANGER	This symbol identifies situations in which lacking care may lead to personal injury or damage to the product .
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NOTE:	Thoroughly study this manual before starting any tests or repair work.
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<u>NOTE:</u>	Figures, drawings and parts in this manual do not always represent the original; they show the working procedure. Since the figures, drawings and parts are not shown to scale, do not draw any conclusions on size and weight (not even within one and the same illustration.) Carry out work according to the legend.
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NOTE:	After repair work and tests, the expert staff must verify that the product is perfectly functioning again.
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TRAGBILDBEISPIELE ZUR GLEASONVERZÄHNUNG

EXAMPLES OF GEAR-TOOTH-CONTACT PATTERNS FOR THE GLEASON GEAR-TOOTH SYSTEM

EXEMPLES POUR LA DENTURE GLEASON

Ideales Tragbild d.h. die Ritzeldistanz stimmt

Ideal tooth-contact pattern i.e. pinion distance is correct

L'engrènement idéal, c'est-à-dire, la distance du pignon est correcte

Bild / Figure 1/3/5

Schubflanke (Konkav)

Coast side (concave)

Côté poussé (concave)

Bild / Figure 1



Bild / Figure 2/4/6

Zugflanke (Konvex)

Drive side (convex)

Côté entraîné (convexe)

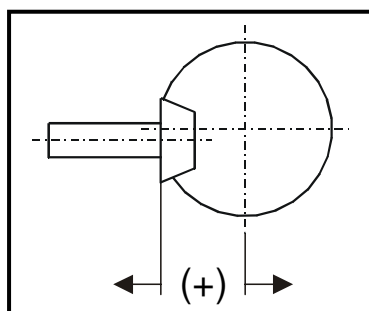
Bild / Figure 2



Ritzeldistanz muß größer werden

Pinion distance must be increased

La distance du pignon doit être augmentée



Ritzeldistanz muß kleiner werden

Pinion distance must be decreased

La distance du pignon doit être diminuée

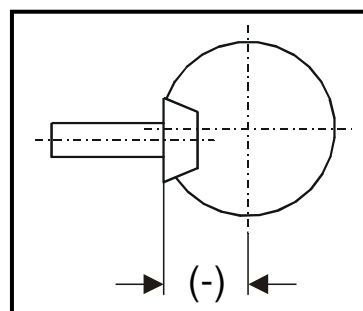


Bild / Figure 3



Bild / Figure 5



Bild / Figure 4



Bild / Figure 6





VERGLEICHSTABELLE FÜR MASSEINHEITEN
CONVERSION TABLE
TABLEAU DE CONVERSION

25,40 mm	=	1 in (inch)
1 kg (Kilogramm)	=	2.205 lb (pounds)
9,81 Nm (1 kpm)	=	7.233 lbf x ft (pound force foot)
1,356 Nm (0,138 kpm)	=	1 lbf x ft (pound force foot)
1 kg / cm	=	5.560 lb / in (pound per inch)
1 bar (1,02 kp/cm ²)	=	14.5 psi (pound force per square inch lbf/in ²)
0,070 bar (0,071 kp/cm ²)	=	1 psi (lbf/in ²)
1 Liter	=	0.264 Gallon (Imp.)
4,456 Liter	=	1 Gallon (Imp.)
1 Liter	=	0.220 Gallon (US)
3,785 Liter	=	1 Gallon (US)
1609,344 m	=	1 Mile (land mile)
0° C (Celsius)	=	+ 32° F (Fahrenheit)
0 ° C (Celsius)	=	273.15 Kelvin