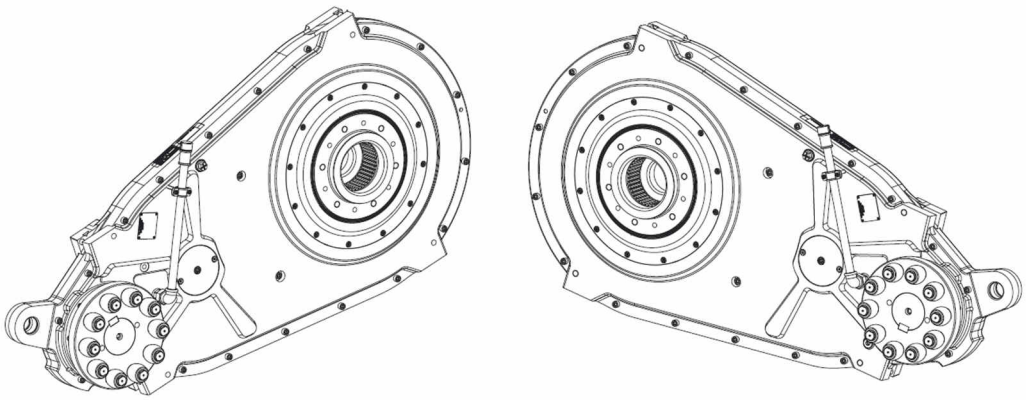
Installation instructions

Intermediate gear box ZGS / ZGS 2

January 2023



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Edition 1: 2023-01

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1. Declaration of incorporation

1.1 ZGS

Declaration of incorporation of an incomplete machine

According appendix II section 1.B of the machine directive 2006/42/EC

1. Name of manufacturer

OMS Antriebstechnik

Bahnhofstrasse 12
D-36219 Cornberg

2. Authorized person for managing the relevant technical documents

René Hering

Bahnhofstrasse 12
D-36219 Cornberg

3. Information about the incomplete machine

3.1 Description

Intermediate gear box with one spur gear stage

3.2 Identification

Type plate at the gear box

3.3 General designation

Intermediate gear box for escalators and moving walkways according EN 115:2017

3.4 Function

Transmission of power from the drive unit to the escalator or moving walkway

3.5 Type

ZGS

3.6 Serial number

OMS-No.:

3.7 Trade name

ZGS

4. Explanations

4.1 Declaration about the basic requirements from the directive 2006/42/EC which have been employed:

Appendix I

1.1.2; 1.1.3; 1.1.5
1.3.1; 1.3.2; 1.3.4
1.5.4; 1.5.5; 1.5.6; 1.5.8; 1.5.9; 1.5.13
1.6.1; 1.7.1; 1.7.3

4.2 The relevant technical documents according appendix VII part B are made.

4.3 The incomplete machine is also according to the directives listed in the official journals as follows:

Low voltage- directive 2014/35/EU – official journal L 96/357 from 29.03.2014
EMC- directive 2014/30/EU – official journal L 96/79 from 29.03.2014

5. Obligation to provide the relevant documents.

We hereby commit ourselves to provide the competent authorities of EU- Member States, upon the reasoned request, the relevant information on this incomplete machine.

The document will be sent by usually CD.

6. Annotation

The machine may only be operated, if it´s sure that the complete machine, which the incomplete machine is installed, is according to the machine directive 2006/42/EC.

Cornberg, June 24, 2022
(Place, date)

i.V. René Hering
(Signature of the authorized person)

Details of the person authorized to do this declaration in the name of the manufacturer.
René Hering, technical director of OMS Antriebstechnik

1.2 ZGS 2

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   D-36219 Cornberg

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2. Basic information

2.1 Notes on the manual

This manual is to be understood as "installation instructions for an incomplete machine" within the meaning of Directive 2006/42/EC Annex VI. The manual refers to escalator drives of the "intermediate gear box" series for use in electrically operated escalators and moving walkways, hereinafter referred to as "intermediate gear box".

These instructions have been prepared in accordance with the product-specific and application-related requirements of laws, ordinances, regulations, technical standards and directives. The declaration of incorporation serves as proof of this. In addition, the local accident prevention regulations and general safety regulations for the area of application of the system apply.

This installation instruction helps the operator to familiarize himself with the design and function of the drives. Figures and illustrations in this instruction are for basic understanding and may differ from the actual design of the plant.

Before the intermediate gear box is integrated into a complete system, the following must be observed:

NOTE

The installation instructions must be read carefully before commissioning and must always be available at the plant!

The intermediate gear box is only intended for the purpose specified in the documentation. Warranty claims resulting from improper operation and insufficient maintenance will not be accepted. Damage caused by improper operation will result in the loss of the warranty claim.

In addition to this documentation, all operating instructions and data sheets of the installed components (↗ applicable documents) apply. The instructions on safety, setup and installation, operation, maintenance, disassembly and disposal of the components contained in the above-mentioned manufacturer's documents must be followed without restriction by the operating personnel of the plant.

2.2 Design of the safety instructions

The safety instructions in this document are identified by safety symbols and are designed according to the SAFE principle. They contain information on the type and source of the danger, on possible consequences and on how to avert the danger.

DANGER

Warns of an accident that will occur if the instructions are not followed. The accident will result in serious, possibly life-threatening injuries or death,
e.g. by touching electrical units under high voltage.

WARNING

Warns of an accident that can occur if the instructions are not followed. The accident may result in serious, possibly life-threatening injuries or death,
e.g. by touching electrical units under high voltage.

CAUTION

Warns of an accident that may occur if the instructions are not followed. The accident may result in minor injuries,
e.g. burns, skin injuries or bruises.

CAUTION

Warns of possible damage to property.

NOTE

Important general note.

NOTE

Important note on environment protection.

2.3 Symbols used

Symbol	Meaning
	Warning of a general danger
	Warning of electric voltage; electric shock
	Hot surface warning
	Warning against hand injuries
	Warning against counter-rotating rolling
↗	Cross reference, see „xx“
*	Equipment is optionally available
	Assembly or component covered or located on the rear side

Tab. 1: Symbols used

2.4 Up-to-dateness at printing

All technical data and dimensional or weight specifications apply to the date of release of these instructions. They may deviate in detail from the respective design of the device without fundamentally changing the factual information and losing their validity.

Any claims arising from this cannot be asserted. Possible deviations from text and image statements depend on the technical development, equipment and accessories of the product.

2.5 Intended purpose

The intermediate gear box is used in electrically operated escalators and moving walks for passenger transportation. The intermediate gear box transmits the power of the drive unit to the escalator or moving walks.

2.6 Intended use

The intermediate gear box is intended exclusively for use in electrically operated escalators and moving walks in accordance with DIN EN 115. Any use beyond this is considered improper.

Furthermore, the intended use includes:

- The drive is designed exclusively for use inside enclosed spaces.
- The drive is intended for commercial use only.
- Work on the drive may only be carried out by authorized persons.
- The safety and operating instructions as well as the inspection and maintenance conditions of the installation instructions must be observed.

2.7 Reasonably foreseeable misuse

Any use that is not part of the intended use or the following applications/scenarios are considered misuse:

- Improper use with unsuitable parameters (technical data)
- Use of unsuitable frequency converters
- Outdoor use
- Use in damaged condition
- Use outside the defined limits
- Use in potentially explosive areas
- Failure to follow the installation instructions
- Use by insufficiently trained and instructed personnel
- Use of non-approved operating materials and supplies
- Insufficient or improper maintenance and servicing
- Unauthorized modifications
- Manipulation of protective equipment

2.8 Warranty and liability

- # The manufacturer of the intermediate gear box guarantees proper, safe operation of the drive only within the scope of the design data enclosed with each drive and when the intermediate gear box is properly assembled (installed), maintained, tested and operated in accordance with the installation instructions and the procedure prescribed herein.
- # If the permissible limit values are exceeded during operation, maintenance or testing activities, the warranty becomes void.
- # The person placing the complete system on the market (operator) is liable for the proper assembly (installation), maintenance, testing and operation of the intermediate gear box and ensures that demonstrably trained and qualified personnel are available.
- # If defects are detected in the escalator or moving walk system, including the intermediate gear box, the system must be taken out of operation immediately, otherwise the operator is solely liable for all personal injury and property damage, regardless of the legal grounds.
- # Incorrect installation or improper operation of the equipment, especially with improper procedures described above, will result in a complete exclusion of liability by the manufacturer of the intermediate gear box, regardless of the legal reason.
- # The manufacturer will refuse any warranty and liability claims if the operator, installer and/or maintenance company cannot provide complete proof of the described permissible procedure/use of the system including the intermediate gear box.

2.9 Customer service

The manufacturer's customer service is available for technical information.

In addition, the manufacturer's employees are constantly interested in new information and experience resulting from the application, which can be valuable for the improvement of the products.

Contact information:

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3. Safety

3.1 Standards and directives

Applied guidelines:

Document No.	Title
2006/42/EG	Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery and amending Directive 95/16/EC (recast)
2014/30/EU	Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to electromagnetic compatibility (recast)

Tab. 2: Applied guidelines

Applied standards:

Type-C-standard	Title
EN 115-1:2017	Safety of escalators and moving walkway - Part 1: Design and installation
Type-B-standard	**Title**
EN ISO 13732-1:2008	Ergonomics of the thermal environment - Evaluation methods for human responses to contact with surfaces - Part 1: Hot surfaces (ISO 13732-1:2008)
EN 1032:2003+A1:2008	Mechanical vibration - Test methods for mobile machines for the purpose of determining the vibration emission value
EN ISO 13849-1:2015	Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design (ISO 13849-1:2015)
EN 60204-1:2018	Safety of machinery - Electrical equipment of machines. Part 1: General requirements (IEC 60204-1:2016, modified)

Type-A-standard	Title
EN ISO 12100:2010-11	Safety of machinery - General design principles General design principles - Risk assessment and risk reduction (ISO 12100:2010)
Standard	**Title**
EN 61000-6-2:2005/AC:2005	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity and industrial environments
EN 61000-6-4:2007/A1:2011	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards; Emission for Industrial areas

Tab. 3: Applied standards

3.2 Labeling

The following labels are attached to the intermediate gear box as well as the nameplates:

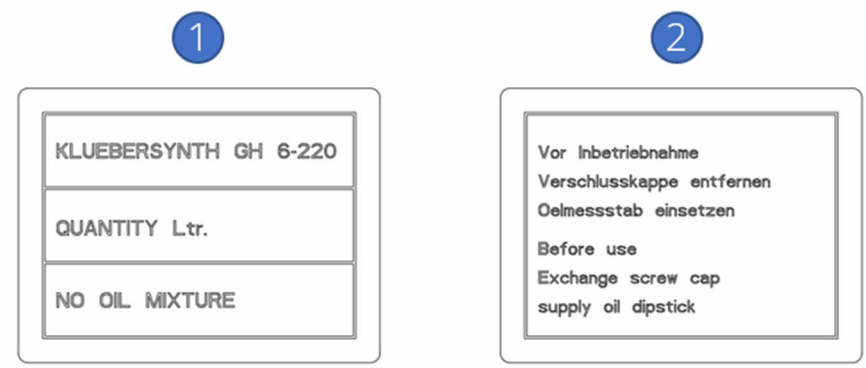

Fig. 1: Labels on intermediate gear box

1 Sticker: oil type, oil quantity

2 Sticker: sealing screw / oil dipstick

Nameplate:

The nameplate shows the most important key data of the intermediate gear box supplied.

Fig. 2: Nameplate

3.3 General safety instructions

DANGER

Danger due to electric shock.

- All work may only be carried out by qualified personnel in the disconnected condition and secured against reconnection.
- The regulations of the motor manufacturer must be observed.
- After completion of the work in the junction box, it must be closed again.
- Observe the safety rules for working on electrical equipment.
- Use insulated tools.

DANGER

Danger from contact with live parts due to fault conditions.

- All work may only be carried out by qualified personnel in the disconnected condition and secured against reconnection.
- Observe the safety rules for working on electrical equipment.
- Fix loose connections, replace damaged cables immediately.
- Cables must not be pinched or crushed. Cables must be laid in such a way that they cannot trip over or be damaged.
- Periodically inspect electrical equipment in accordance with the applicable national regulations (e.g. DGUV regulation 3 in Germany).

DANGER

Danger when lifting the drive.

- The intermediate gear box only be lifted using suitable lifting devices. Tapped holes for eyebolts (4x M16) are provided at the gear box housing.

WARNING

Danger due to loss of stability.

- The intermediate gear box only be put in operation if it has been fastened to the main shaft via the radial spherical plain bearing in the gear box housing in the truss and via involute spline of the output shaft.

CAUTION

Danger during work on the intermediate gear box.

- Depending on the size of the components, use load-bearing or auxiliary equipment if necessary.
- Assembly work may only be carried out by adequately qualified personnel.
- Ensure a healthy body posture during all work.

CAUTION

Danger of structural failure due to corrosion/vibration.

- Check the intermediate gear box regularly for damage. Do not operate the intermediate gear box if there is damage.
- Replace damaged corrosion protection immediately.
- Replace wear parts regularly.
- Use the intermediate gear box only as intended.

NOTE

Special note on intermediate gear box:

Due to the design, the intermediate gear box has no self-locking. This means that the escalator starts moving immediately (downward direction) when the brake is opened and the steps are loaded.

3.4 Personnel requirements

Commissioning, maintenance or carrying out repairs on parts of the machine may only be carried out by trained and qualified personnel.

Qualified personnel:

Qualified personnel are persons who, on the basis of their training, experience, instruction and knowledge of the relevant standards and regulations, accident prevention regulations and operating conditions, have been authorized by the person responsible for the safety of the plant to carry out the activities required in each case and are able to recognize and avoid possible dangers in the process (definition for skilled personnel according to IEC 364).

Usage disclaimer:

The intermediate gear box is not intended for use by consumers or physically or mentally impaired persons.

4. Technical description

4.1 Structure

The intermediate gear box consisting of the following assemblies.

- Housing
- Drive shaft
- Intermediate wheel
- Output shaft
- Coupling
- Oil pipe

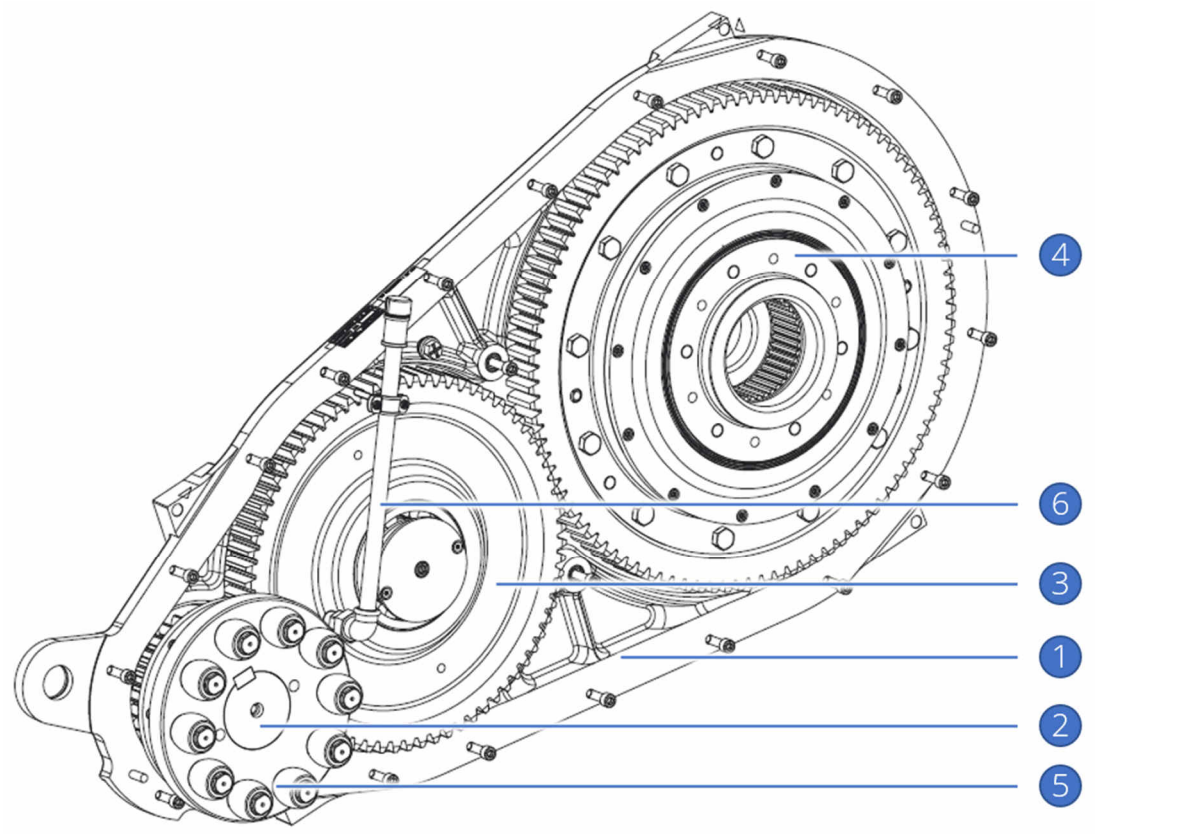

Fig. 3: General overview, version left

1	Housing	2	Drive shaft
3	Intermediate wheel	4	Output shaft
5	Coupling	6	Oil pipe

Options:

The intermediate gear box is available in different versions:

- Version left
- Version right

Ratio:

The intermediate gear boxes are available in different ratios:

- ZGS i= 3,417:1
- ZGS 2 i= 3,846:1

Spare parts:

Following assemblies, components are replaceable:

- Intermediate gear box, complete
- Coupling, coupling bolts, coupling buffer
- Oil dipstick
- Gear oil

Intermediate gear box versions:

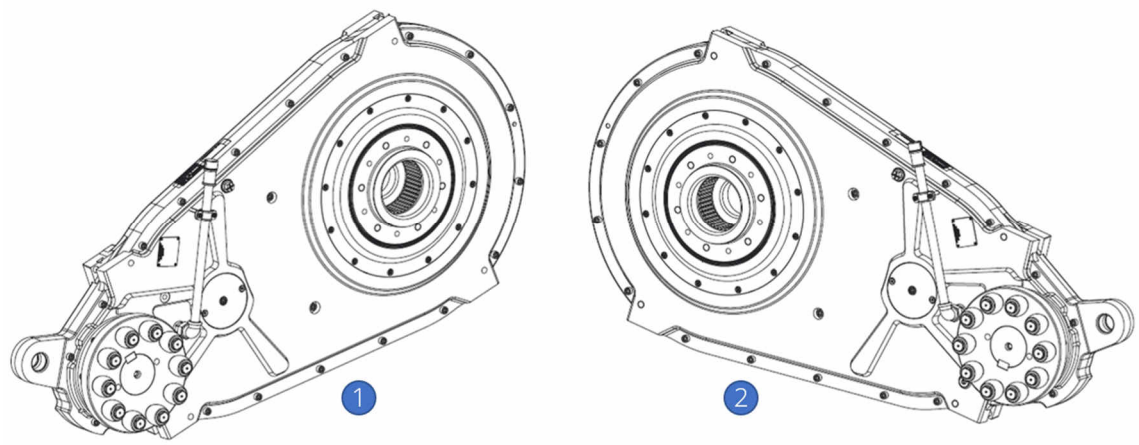

Fig. 4: Intermediate gear box versions

1	Version right	2	Version left

4.2 Technical data

For technical data, please refer to the respective data sheets or dimension sheets (↗ applicable documents).

4.3 Noise emission

The A-weighted emission sound pressure level LpA in dB(A) according to DIN EN ISO 11200 is measured at a distance of 1m from the surface. The drive is operated directly on the mains on a load test bench in the sound measurement room.

At 25% partial load (referred to P_{nom}= xxkW), the intermediate gear box meet the noise emission characteristics according to data sheet
(↗ applicable documents).

5. Transport / storage

5.1 Transport

Delivery:

All intermediate gear boxes have left the factory in perfect condition after inspection. Please check the intermediate gear box for external damage after delivery.

If you find any defects resulting from the transport, a damage report must be issued in the presence of the carrier. If necessary, the commissioning of this intermediate gear box must be excluded.

Transport preparation:

The intermediate gear box must be sealed oil-tight for transport. This has been done at the factory on delivery. The intermediate gear box must be closed again for subsequent transports.

⇨ To do this, remove the oil dipstick and replace it with the originally enclosed sealing cap. If this is no longer available, you can request a new sealing cap from the manufacturer.

Lifting the intermediate gear box:

WARNING

Danger when lifting the intermediate gear box.

- The intermediate gear box may only be lifted using high-strength eyebolts.

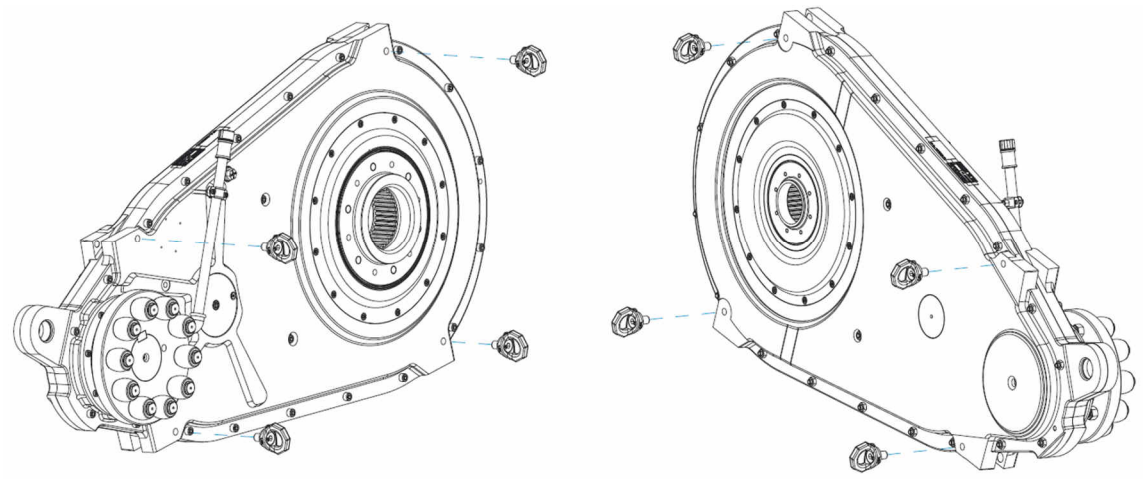

Fig. 5: Suspension points, Front and back side

NOTE

When selecting lifting devices and slings, consider the total weight of the intermediate gear box. Please refer to the relevant technical data sheet for the applicable total weight.

5.2 Storage

The intermediate gear box must not be stored outdoors or exposed to the weather without protection.

Preservation measures are necessary if the intermediate gear box is not used for a longer period of time or is put into operation at a later date. The extent of the preservation measures depends on the storage time.

Storage time <3 months:

No special preservation measures are required.

Storage time <18 months:

For a longer storage time from the beginning (option when ordering), the intermediate gear box is preserved at the factory and packed in a moisture-repellent (yellow) foil.

If this is not the case, perform the following activities:

⇨ Fill the intermediate gear box with oil up to the upper screw plug after 6 months of storage at the latest.

ATTENTION

Only refill oil of the same type. The oil type can be found on the yellow sticker.

⇨ After filling, pack the intermediate gear box in moisture-repellent foil (available from the manufacturer).

⇨ Store the intermediate gear box in dry conditions.

Observe the following notes before installing the intermediate gear box:

⇨ Reduce the oil level. Drain the oil to the prescribed level.

⇨ Turn the intermediate gear box by hand at the drive shaft.

Storage time >18 months:

If the intermediate gear box is not preserved at the factory, the same activities as described under "Storage time <18 months" must be performed.

⇨ Store the intermediate gear box in dry conditions.

Observe the following notes before installing the intermediate gear box:

⇨ Change the gear oil completely. Observe the oil type and fill level.

⇨ Turn the intermediate gear box by hand at the drive shaft.

NOTE

If the intermediate gear box is stored for a longer period of time, the manufacturer's warranty may be terminated. If further warranty is desired, the intermediate gear box can be returned to the manufacturer for a fee required overhaul (possibly replacement of bearings, etc.) and for the above measures to be carried out.

Damage that has occurred due to improper handling is not subject to liability for defects.

6. Set up / assembly

6.1 Basics

Basically, it must be ensured that the escalator truss in which the intermediate gear box is installed must be checked by calculations.

The escalator truss must have sufficient rigidity to counteract possible bending and torsional forces throughout the load range.

The following explanations always apply to both versions of the intermediate gear boxes ZGS and ZGS 2. Otherwise, separate reference is made to them.

6.2 Installing of intermediate gear box

Assembly of bolt in coupling flange:

The bolts are factory-supplied installed in the coupling flange and lightly tightened.

The nuts on the back side of the coupling must be tightened to a torque of 120Nm before assembly with the primary drive machine. The nuts are self-locking.

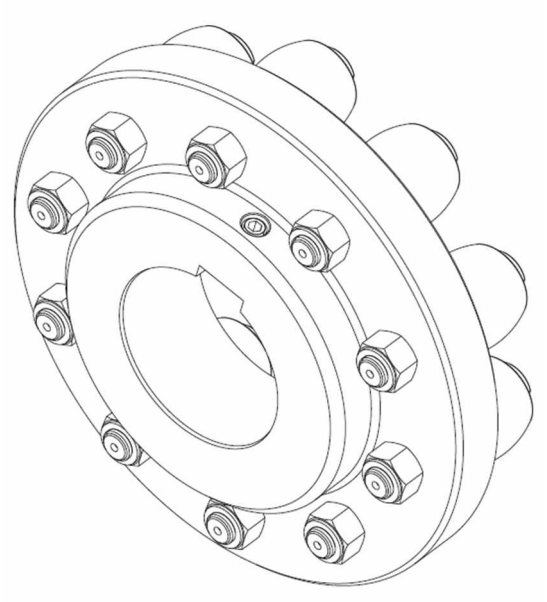

Fig. 6: Coupling flange with bolts

Assembly intermediate gear box with main shaft:

Slide the involute spline from the intermediate gear box onto the involute spline of the main shaft of the escalator. Grease the involute spline with high-temperature paste before sliding it on (recommendation: KLUEBER – UNIMOLY HTC METALLIC). Ensure exact alignment of the two involute splines with each other and exact alignment of the shaft axes to avoid damage when sliding on. Screw the main shaft to the intermediate gear box using the threaded holes (6x M20 for ZGS / 6x M16 for ZGS 2) provided for this purpose. In addition, the intermediate gear box is pinned to the main shaft. The holes are predrilled to Ø12mm (6 pieces). Drill out these holes to Ø16mm and mount the corresponding dowel pins.

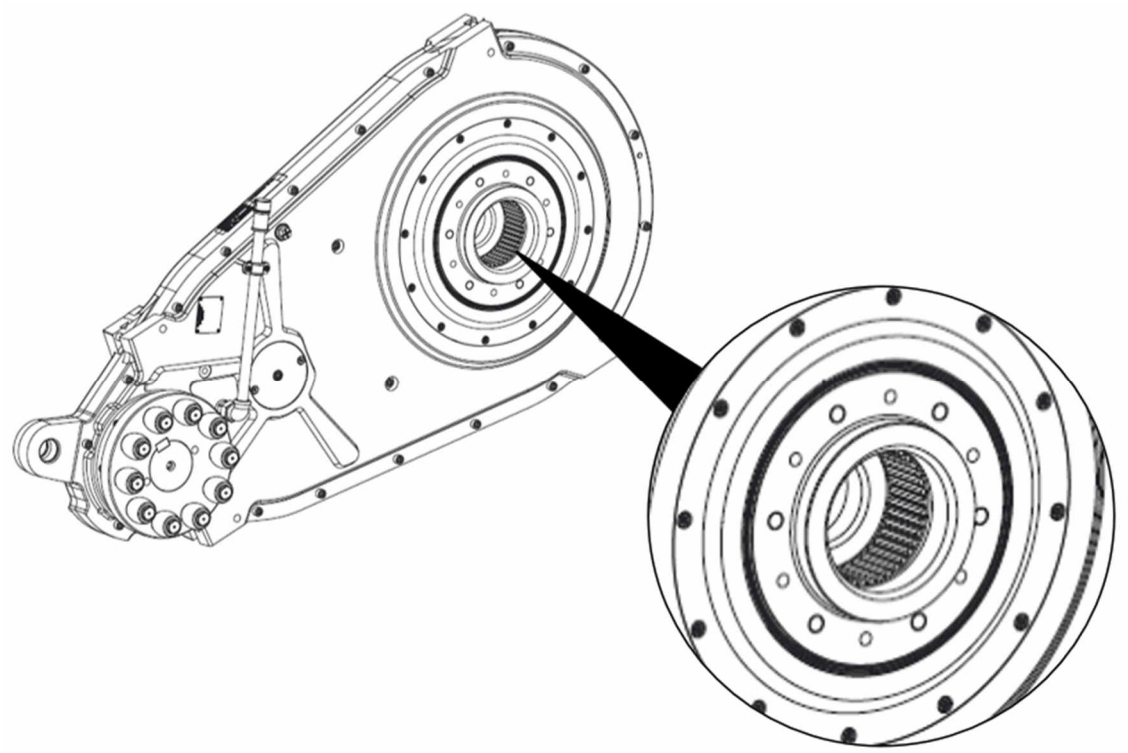

Fig. 7: Involute spline of the intermediate gear box

Assembly of the intermediate gear box with radial spherical plain bearing:

A radial spherical plain bearing must be mounted in the bore on the housing (GE 25). This bearing is used to absorb / support the torque and for axial movement compensation.

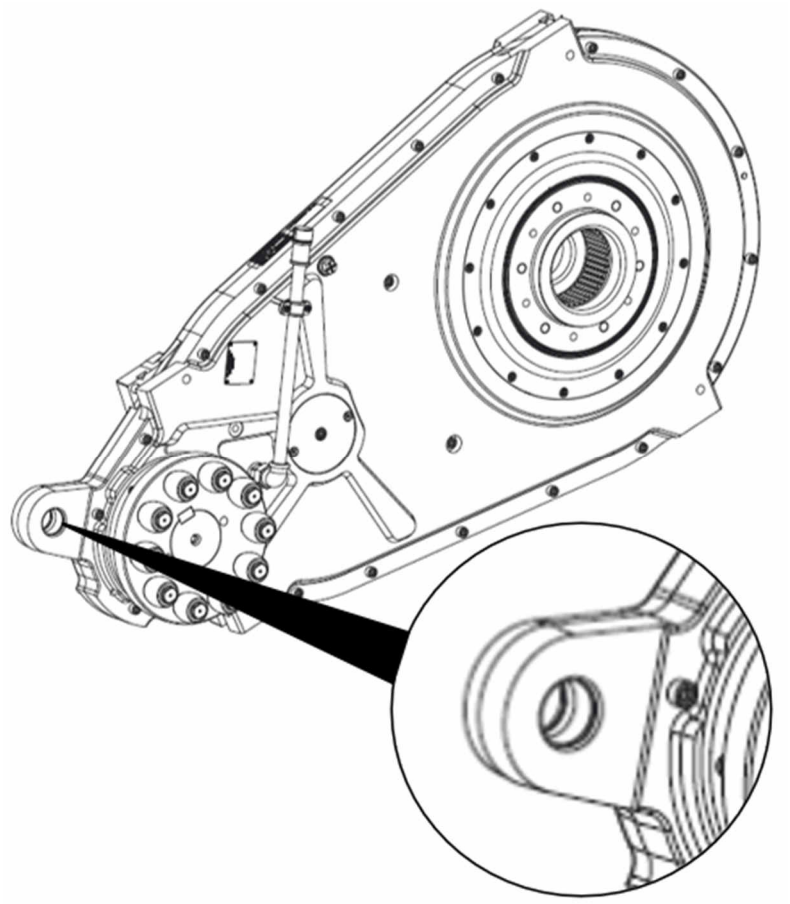

Fig. 8: Assembly radial spherical plain bearing

Assembly intermediate gear box with primary drive machine:

When assembling the primary drive machine and the intermediate gear box by means of the coupling flanges, make sure that they are neither braced within themselves nor against each other. When aligning the two coupling flanges, the coupling tolerances must be observed. The distance between the coupling flanges is min. 1.5mm / max. 6mm (dimension X).

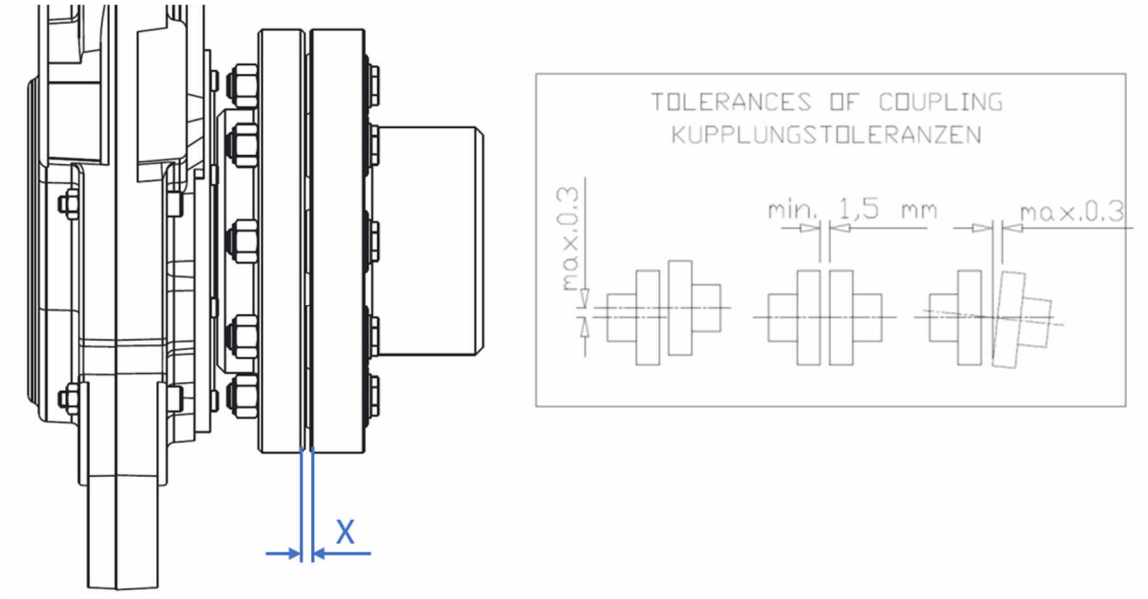

Fig. 9: Tolerances of coupling flanges

CAUTION

The intermediate gear box may only be put into operation if it has been locked in place via the radial spherical plain bearing in the truss of the escalator and fastened to the main shaft via involute spline.

Replacing sealing screw with venting screw – installation angle 25,6° to 38,2°:

NOTE

The intermediate gear box is sealed oil-tight for transport. The intermediate gear box is not vented when the sealing screw is fitted. If it is put into operation sealed in this way, overpressure can occur in the housing, with the possible consequence of leakage and oil leakage at the radial shaft seals. The oil dipstick does not function as a seal for the intermediate gear box.

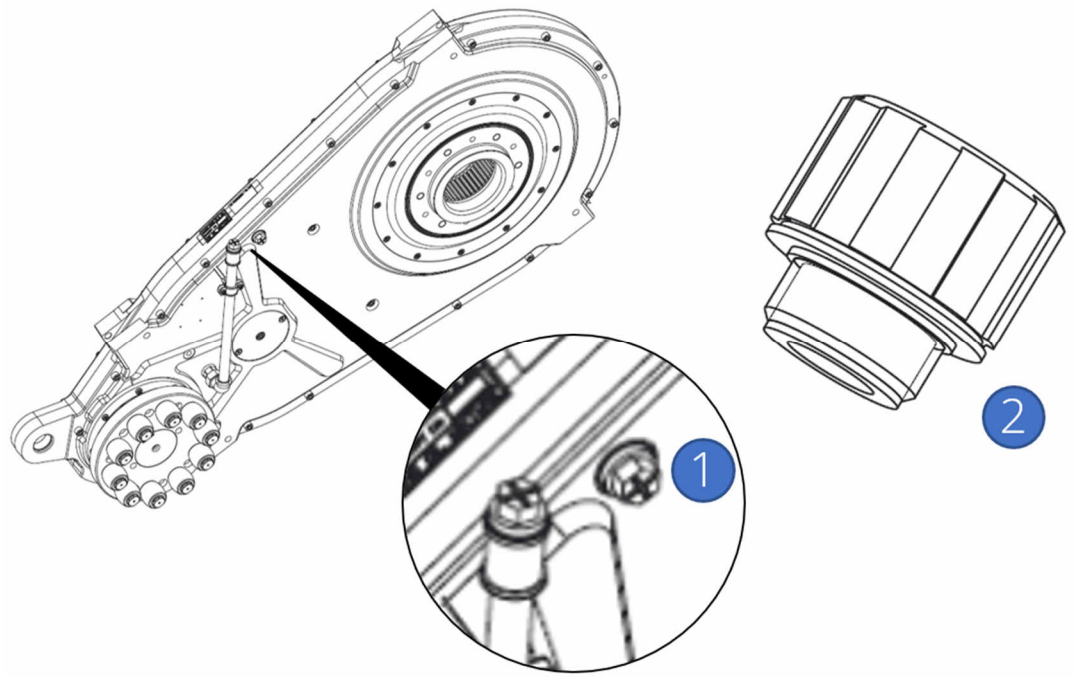

Fig. 10: Replacing sealing screw – installation angle 25,6° to 38,2°

1	Sealing screw	2	Venting screw

⇨ Unscrew the sealing screw (1) and screw in the venting screw (2) hand-tight.

⇨ Keep the sealing screw (1) for possible later transport.

Replacing sealing screw with oil dipstick – installation angle 25,6° to 38,2°:

Either a mechanical or an electrical oil dipstick is available for the different installation angles of 25° to 38° of the intermediate gear box. The length compensation for the different installation angles is adapted via corresponding oil pipe extensions. The two oil dipsticks can be used for all installation angles between 25° and 38°. The different oil pipe adapters are described below.

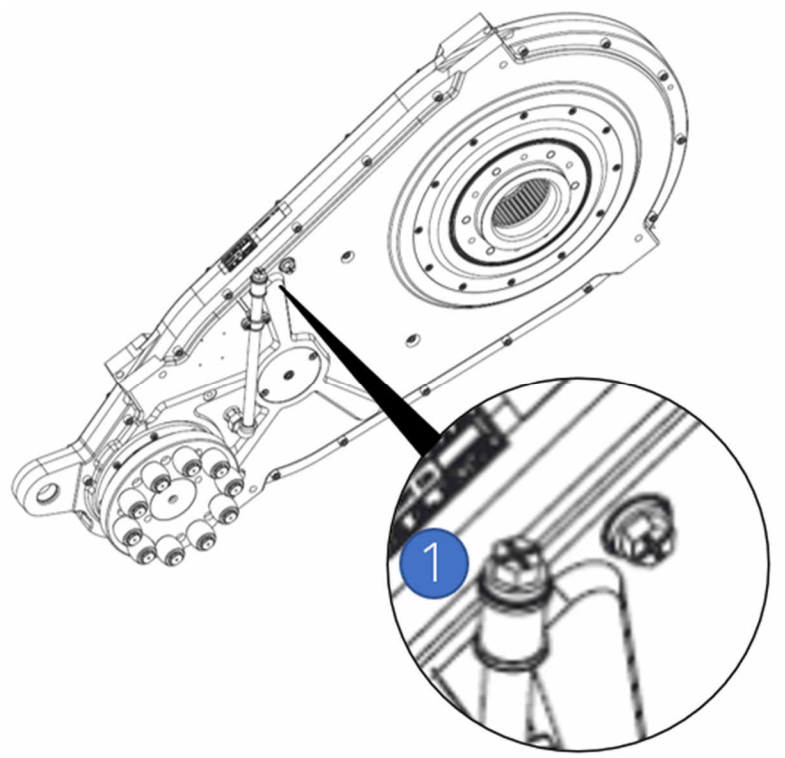

Fig. 11: Replacing sealing screw with oil dipstick – installation angle 25,6° to 38,2°

1 Sealing screw

⇨ Unscrew the sealing screw (1)

⇨ Assemble the mechanical or electrical oil dipstick + accessories, depending on the installation angle, as described below.

⇨ Keep the sealing screw (1) for possible later transport.

Installation angle 25,6° to 26,9° – mechanical oil dipstick:

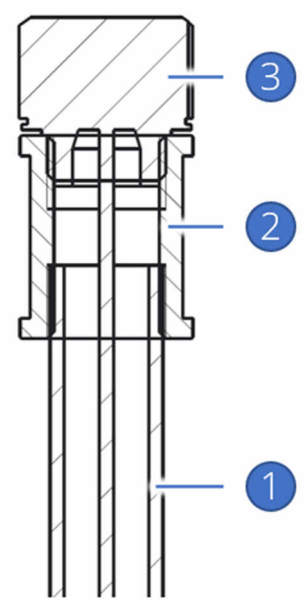

Fig. 12: mechanical oil dipstick – installation angle 25,6° to 26,9°

1	Oil pipe	2	Socket
3	Mechanical oil dipstick		

⇨ Screw the oil dipstick (3) hand-tight into the socket (2).

Installation angle 28,3° – mechanical oil dipstick:

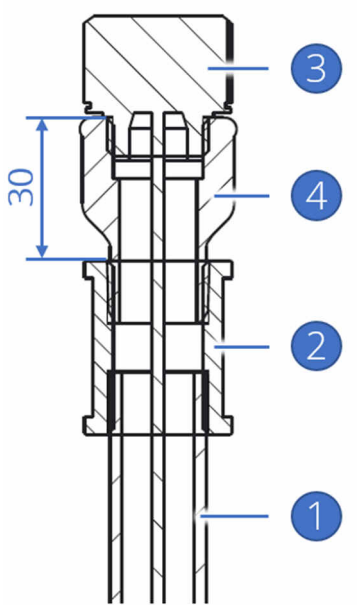

Fig. 13: mechanical oil dipstick – installation angle 28,3°

1	Oil pipe	2	Socket
3	Mechanical oil dipstick	4	Oil pipe extension

⇨ Wet the external thread of the oil pipe extension (4) with LOCTITE 270 (green).

⇨ Screw the oil pipe extension (4) into the socket (2), dimension 30 ±1mm.

⇨ Screw the oil dipstick (3) hand-tight into the oil pipe extension (4).

Installation angle 32,7° – mechanical oil dipstick:

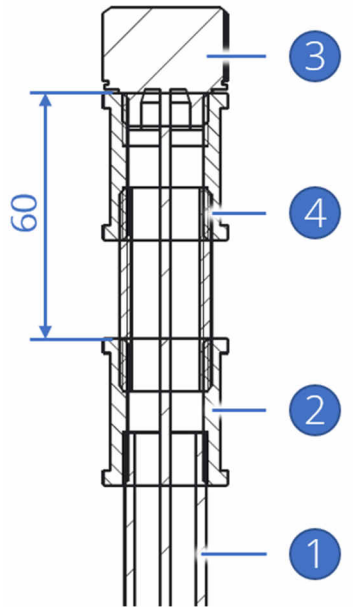

Fig. 14: mechanical oil dipstick – installation angle 32,7°

1	Oil pipe	2	Socket
3	Mechanical oil dipstick	4	Oil pipe extension

⇨ Wet the external thread of the oil pipe extension (4) with LOCTITE 270 (green).

⇨ Screw the oil pipe extension (4) into the socket (2), dimension 60 ±1mm.

⇨ Screw the oil dipstick (3) hand-tight into the oil pipe extension (4).

Installation angle 34,1° to 35,6° – mechanical oil dipstick:

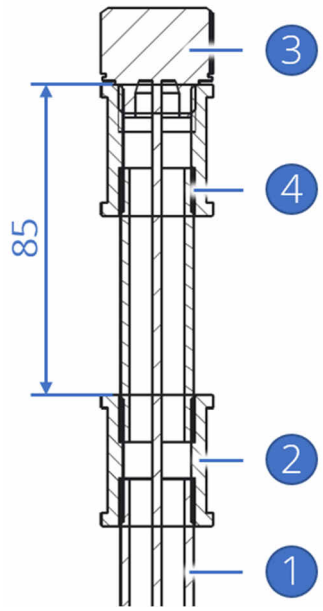

Fig. 15: mechanical oil dipstick – installation angle 34,1° bis 35,6°

1	Oil pipe	2	Socket
3	Mechanical oil dipstick	4	Oil pipe extension

⇨ Wet the external thread of the oil pipe extension (4) with LOCTITE 270 (green).

⇨ Screw the oil pipe extension (4) into the socket (2), dimension 85 ±1mm.

⇨ Screw the oil dipstick (3) hand-tight into the oil pipe extension (4).

Installation angle 38,2° – mechanical oil dipstick:

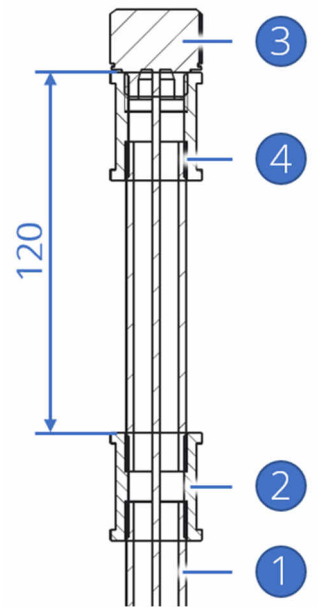

Fig. 16: mechanical oil dipstick – installation angle 38,2°

1	Oil pipe	2	Socket
3	Mechanical oil dipstick	4	Oil pipe extension

⇨ Wet the external thread of the oil pipe extension (4) with LOCTITE 270 (green).

⇨ Screw the oil pipe extension (4) into the socket (2), dimension 120 ±1mm.

⇨ Screw the oil dipstick (3) hand-tight into the oil pipe extension (4).

Installation angle 25,6° to 26,9° – electronical oil dipstick:

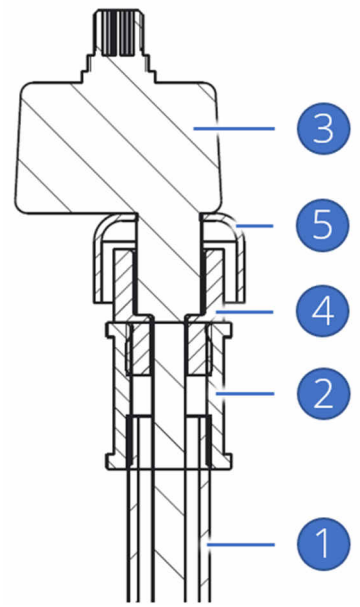

Fig. 17: electronical oil dipstick – installation angle 25,6° to 26,9°

1	Oil pipe	2	Socket
3	Electronical oil dipstick	4	Adapter-socket
5	Oil pipe cover		

⇨ Wet the external thread of the adapter-socket (4) with LOCTITE 270 (green).

⇨ Screw the adapter-socket (4) into the socket (2) until it stops on the plane surface.

⇨ Push the oil pipe cover (5) onto the oil dipstick (3) until it stops.

⇨ Insert the oil dipstick (3) into the adapter-socket (4) until it stops on the plane surface. Make sure that the oil pipe cover (5) is pushed onto the hexagon of the adapter-socket (4).

Installation angle 28,3° – electronical oil dipstick:

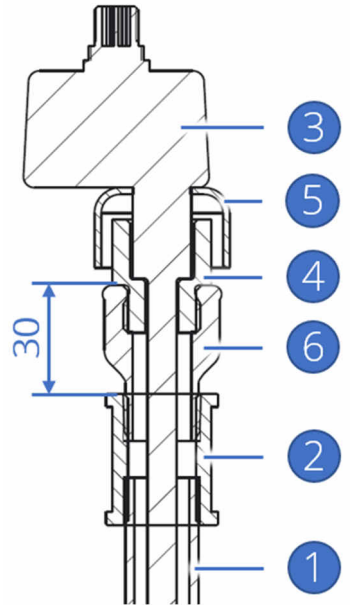

Fig. 18: electronical oil dipstick – installation angle 28,3°

1	Oil pipe	2	Socket
3	Electronical oil dipstick	4	Adapter-socket
5	Oil pipe cover	6	Oil pipe extension

- ⇨ Wet the external thread of the oil pipe extension (6) with LOCTITE 270 (green).
- ⇨ Screw the oil pipe extension (6) into the socket (2), dimension 30 ±1mm.
- ⇨ Wet the external thread of the adapter-socket (4) with LOCTITE 270 (green).
- ⇨ Screw the adapter-socket (4) into the oil pipe extension (6) until it stops.
- ⇨ Push the oil pipe cover (5) onto the oil dipstick (3) until it stops.
- ⇨ Insert the oil dipstick (3) into the adapter-socket (4) until it stops on the plane surface. Make sure that the oil pipe cover (5) is pushed onto the hexagon of the adapter-socket (4).

Installation angle 32,7° – electronical oil dipstick:

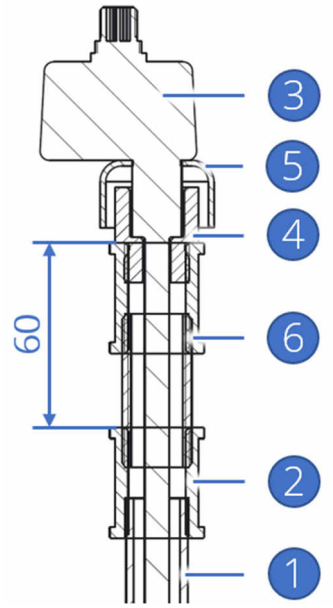

Fig. 19: electronical oil dipstick – installation angle 32,7°

1	Oil pipe	2	Socket
3	Electronical oil dipstick	4	Adapter-socket
5	Oil pipe cover	6	Oil pipe extension

- ⇨ Wet the external thread of the oil pipe extension (6) with LOCTITE 270 (green).
- ⇨ Screw the oil pipe extension (6) into the socket (2), dimension 60 ±1mm.
- ⇨ Wet the external thread of the adapter-socket (4) with LOCTITE 270 (green).
- ⇨ Screw the adapter-socket (4) into the oil pipe extension (6) until it stops.
- ⇨ Push the oil pipe cover (5) onto the oil dipstick (3) until it stops.
- ⇨ Insert the oil dipstick (3) into the adapter-socket (4) until it stops on the plane surface. Make sure that the oil pipe cover (5) is pushed onto the hexagon of the adapter-socket (4).

Installation angle 34,1° bis 35,6° – electronical oil dipstick:

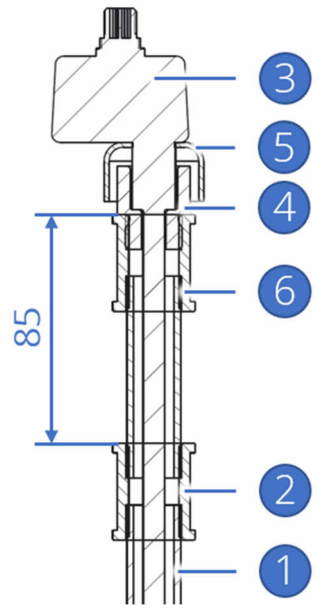

Fig. 20: electronical oil dipstick – installation angle 34,1° bis 35,6°

1	Oil pipe	2	Socket
3	Electronical oil dipstick	4	Adapter-socket
5	Oil pipe cover	6	Oil pipe extension

- ⇨ Wet the external thread of the oil pipe extension (6) with LOCTITE 270 (green).
- ⇨ Screw the oil pipe extension (6) into the socket (2), dimension 85 ±1mm.
- ⇨ Wet the external thread of the adapter-socket (4) with LOCTITE 270 (green).
- ⇨ Screw the adapter-socket (4) into the oil pipe extension (6) until it stops.
- ⇨ Push the oil pipe cover (5) onto the oil dipstick (3) until it stops.
- ⇨ Insert the oil dipstick (3) into the adapter-socket (4) until it stops on the plane surface. Make sure that the oil pipe cover (5) is pushed onto the hexagon of the adapter-socket (4).

Installation angle 38,2° – electronical oil dipstick:

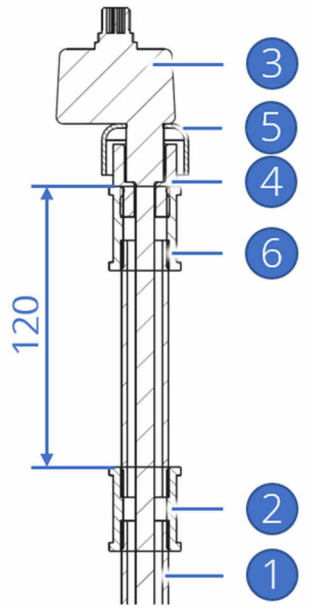

Fig. 21: electronical oil dipstick – installation angle 38,2°

1	Oil pipe	2	Socket
3	Electronical oil dipstick	4	Adapter-socket
5	Oil pipe cover	6	Oil pipe extension

- ⇨ Wet the external thread of the oil pipe extension (6) with LOCTITE 270 (green).
- ⇨ Screw the oil pipe extension (6) into the socket (2), dimension 120 ±1mm.
- ⇨ Wet the external thread of the adapter-socket (4) with LOCTITE 270 (green).
- ⇨ Screw the adapter-socket (4) into the oil pipe extension (6) until it stops.
- ⇨ Push the oil pipe cover (5) onto the oil dipstick (3) until it stops.
- ⇨ Insert the oil dipstick (3) into the adapter-socket (4) until it stops on the plane surface. Make sure that the oil pipe cover (5) is pushed onto the hexagon of the adapter-socket (4).

Replacing sealing screw with venting screw – installation angle 78°:

NOTE

The intermediate gear box is sealed oil-tight for transport. The intermediate gear box is not vented when the sealing screw is fitted. If it is put into operation sealed in this way, overpressure can occur in the housing, with the possible consequence of leakage and oil leakage at the radial shaft seals. The oil dipstick does not function as a seal for the intermediate gear box.

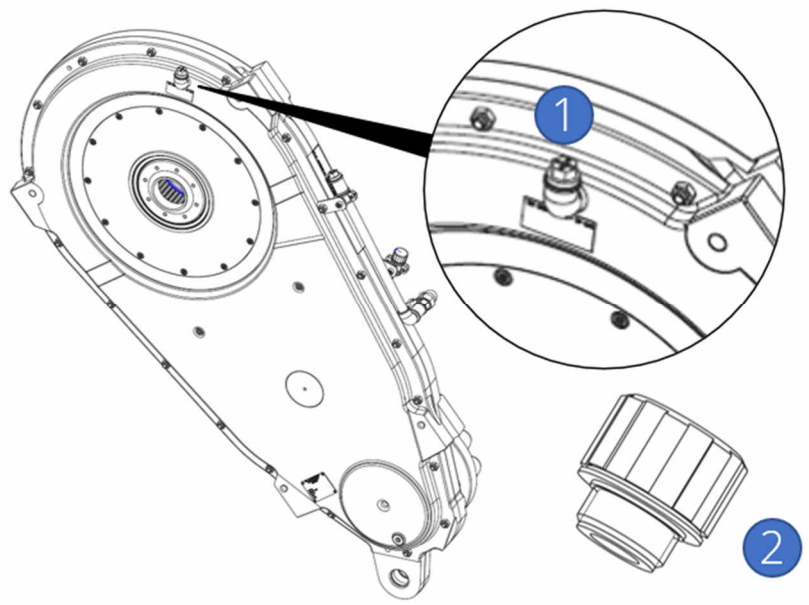

Fig. 22: Replacing sealing screw – installation angle 78°

1 Sealing screw

2 Venting screw

⇨ Unscrew the sealing screw (1) and screw in hand-tight the supplied venting screw (2).

⇨ Keep the sealing screw (1) for possible later transport.

Replacing sealing screw with oil dipstick – installation angle 78°:

Either a mechanical or an electrical oil dipstick is available for the installation angle of 78° of the intermediate gear box.

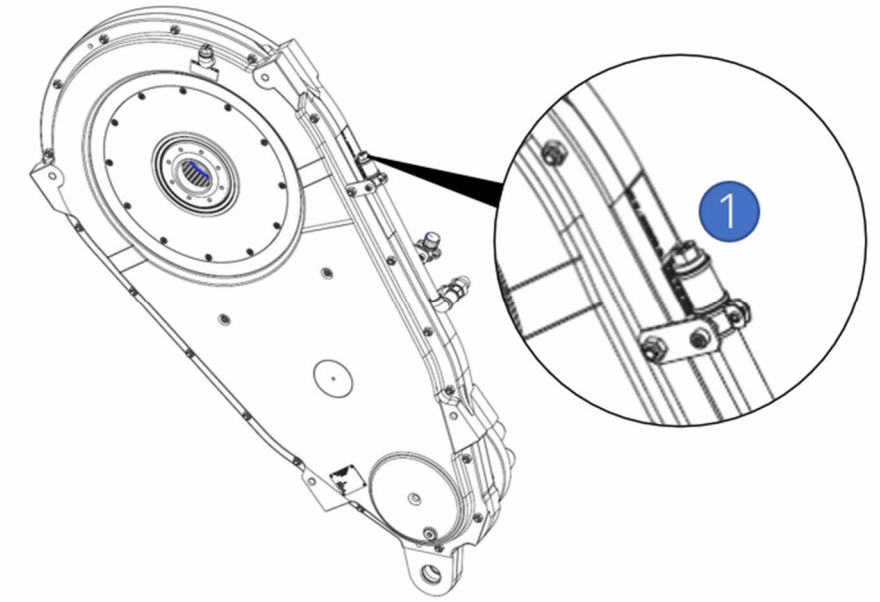

Fig. 23: Replacing sealing screw with oil dipstick – installation angle 78°

1 Sealing screw

⇨ Unscrew the sealing screw (1)

⇨ Assemble the mechanical or electrical oil dipstick + accessories, as described below.

⇨ Keep the sealing screw (1) for possible later transport.

Installation angle 78° – mechanical oil dipstick:

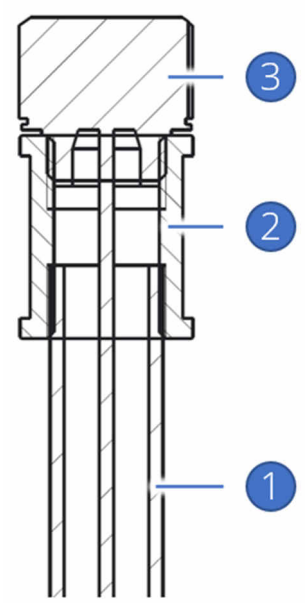

Fig. 24: mechanical oil dipstick – installation angle 78°

1	Oil pipe	2	Socket
3	Mechanical oil dipstick		

⇨ Screw the oil dipstick (3) hand-tight into the socket (2).

Installation angle 78° – electronical oil dipstick:

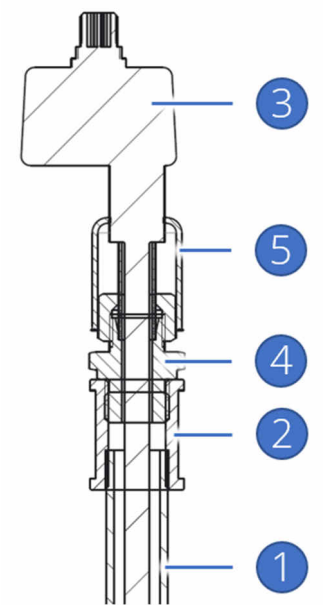

Fig. 25: electronical oil dipstick – installation angle 78°

1	Oil pipe	2	Socket
3	Electronical oil dipstick	4	Adapter
5	Oil pipe cover		

⇨ Wet the external thread of the adapter (4) with LOCTITE 270 (green).

⇨ Screw the adapter (4) into the socket (2) until it stops.

⇨ Push the oil pipe cover (5) onto the oil dipstick (3) until it stops.

⇨ Insert the oil dipstick (3) into the adapter (4) until it stops on the plane surface. Make sure that the oil pipe cover (5) is pushed onto the hexagon of the adapter (4). Slide on oil pipe cover (5) until hexagon is at least half covered.

7. Operation

WARNING

The regulations for operation, maintenance and inspection in accordance with the valid safety regulations for escalator construction, as well as other relevant regulations, must be strictly observed.

The correct operation of the intermediate gear box in terms of safety is the sole responsibility of the escalator operator.

8. Servicing / maintenance

8.1 Overview maintenance work / troubleshooting

Maintenance work:

Activity	Interval
Check oil level	3 months
Oil change	40.000 operation hours, but after 5 years at the latest
Checking the bearings (acoustic)	according to the maintenance interval of the escalator, but at least 1x per year
Cleaning of the intermediate gear box	as needed, but at least 1x per year
Checking the safety equipment (presence, function etc.)	according to the maintenance interval of the escalator, but at least 1x per year
Checking the coupling buffers	every 2 years
Replacing the coupling buffers	every 4 years

Tab. 4: Maintenance work

Malfunctions/Troubleshooting:

Störung	mögliche Ursache	Lösung
unusual, irregular running noises	# Noise rolling/grinding: → Bearing damage # Noise knocking: → Irregularities in the toothing	Contact customer service
Oil leaking	# Seal defective	Contact customer service

Tab. 5: Malfunctions

8.2 Intermediate gear box

Check oil level:

DANGER

Risk of burns from hot surfaces and hot oil.
The intermediate gear box and gear oil can cause severe burns if they come into contact with the skin at operating temperature.

Check the oil level at every service. To do this, proceed as follows (mechanical resp. electronical oil dipstick):

- ⇨ Unscrew resp. pull out the oil dipstick and clean it.
- ⇨ Screw resp. insert the clean dipstick into the gear box up to the stop.
- ⇨ Unscrew resp. pull out the oil dipstick.
- ⇨ Check the oil level. The oil level must be between the two marks. If the oil level is below the MIN mark, fill up with oil.

Check oil condition:

Check the condition of the oil at regular intervals.

Inspection interval:

after 10.000 operating hours
after 20.000 operating hours
after that every 5.000 operating hours

To do this, proceed as follows:

⇨ Unscrew resp. pull the oil dipstick and put an oil drop on a white paper.

⇨ Compare the color of the oil with the colors on the oil check card.

Fig. 26: Oil check card

ATTENTION

If the oil is discolored dark brown to black, the gear oil must be changed immediately.

Oil change – installation angle 25,6° to 38,2° and 78°:

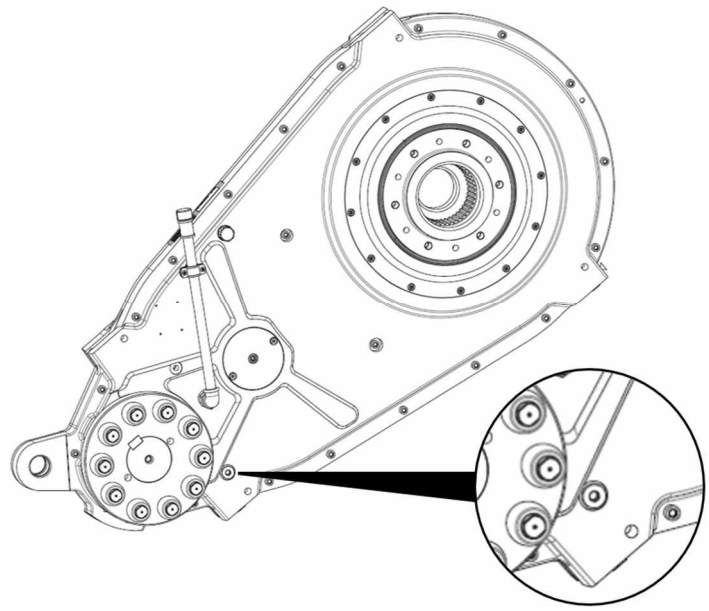

Fig. 27: Oil drain screw – installation angle 25,6° to 38,2°

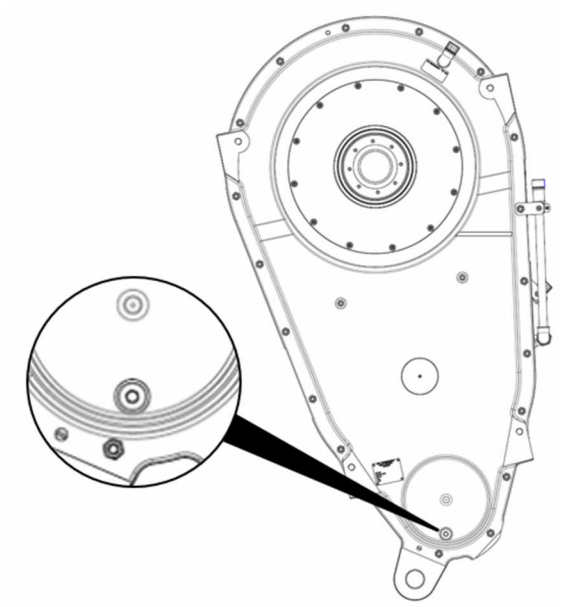

Fig. 28: Oil drain screw – installation angle 78°

If an oil change is necessary, proceed as follows:

⇨ Place a suitable, sufficiently large container under the oil drain screw (oil quantity varies depending on installation angle, see table below).

⇨ Carefully open the oil drain screw.

⇨ Clean the oil drain screw thoroughly.

⇨ After all the oil has drained, screw the oil drain plug firmly back into the drain hole.

⇨ Fill in the oil via the hole for the oil dipstick. Observe the fill level.

⇨ Filling quantity varies depending on installation angle, see table below.

⇨ Close the filler hole with the oil dipstick.

Installation angle	25,6° bis 26,9°	28,3°	32,7°	34,1° bis 35,6°	38,2°	78°
Oil quantity [Liter]	8,0	8,3	8,6	8,8	9,0	11,2

Tab. 6: Oil quantity ZGS

Installation angle	28,3°	35,6°
Oil quantity [Liter]	8,3	8,8

Tab. 7: Oil quantity ZGS 2

Oil type according to manufacturer's recommendation:

Kluebersynth GH 6-220

ATTENTION

Fill only with the specified type of oil. Other oils may only be used after consulting the manufacturer.
Do not mix different oils with each other.

NOTE

Waste oil must never be allowed to enter the ground or water. Remove leaked oil immediately.

Disassembly coupling flange ZGS:

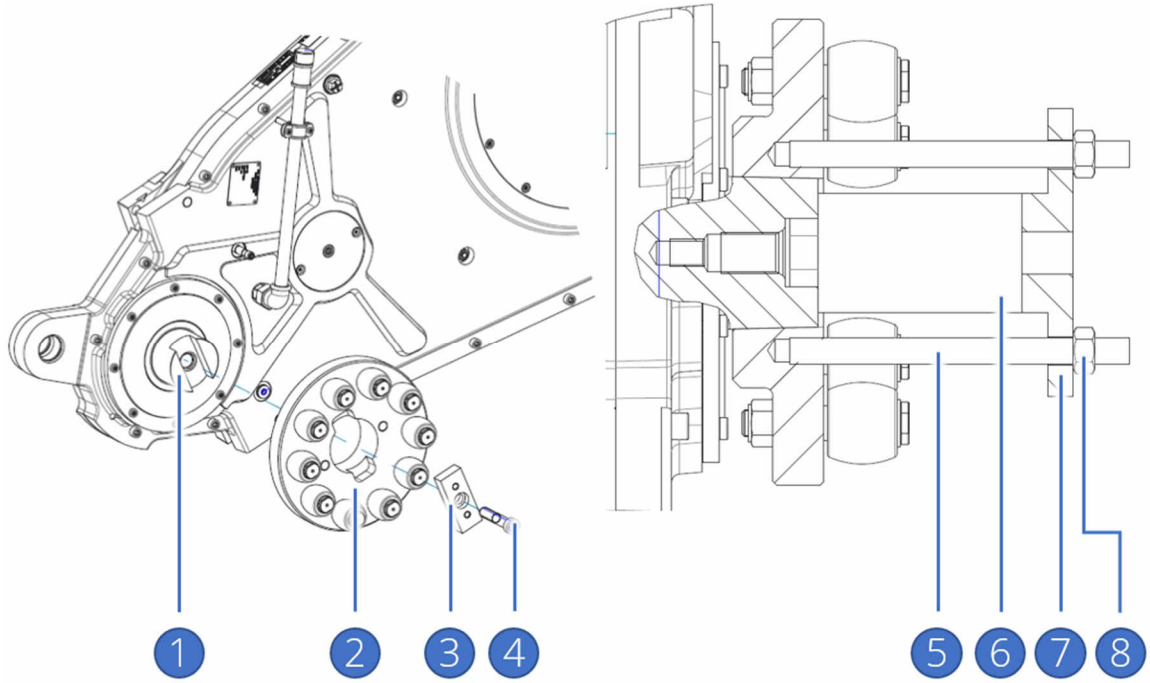

Fig. 29: Disassembly coupling flange ZGS

1	Drive shaft	2	Coupling flange
3	Latch	4	Cylinder head screw
5	Threaded rod M16	6	Hydraulic cylinder
7	Plate	8	Nut M16

The drive shaft of the ZGS is tapered and additionally mechanically secured with a latch. To disassemble, proceed as follows.

- ⇨ Unscrew the cylinder head screw M16 and remove the latch from the coupling flange.
- ⇨ Screw the M16 threaded rods into the threaded holes provided for this purpose in the coupling flange and tighten with 100Nm.
- ⇨ Position the hydraulic cylinder between the threaded rods.
- ⇨ Push the plate onto the threaded rods and screw on the M16 nuts.
- ⇨ Tighten the M16 nuts until the plate presses against the hydraulic cylinder.
- ⇨ Apply pressure to the hydraulic cylinder until the coupling flange is released from the drive shaft.

Disassembly coupling flange ZGS 2:

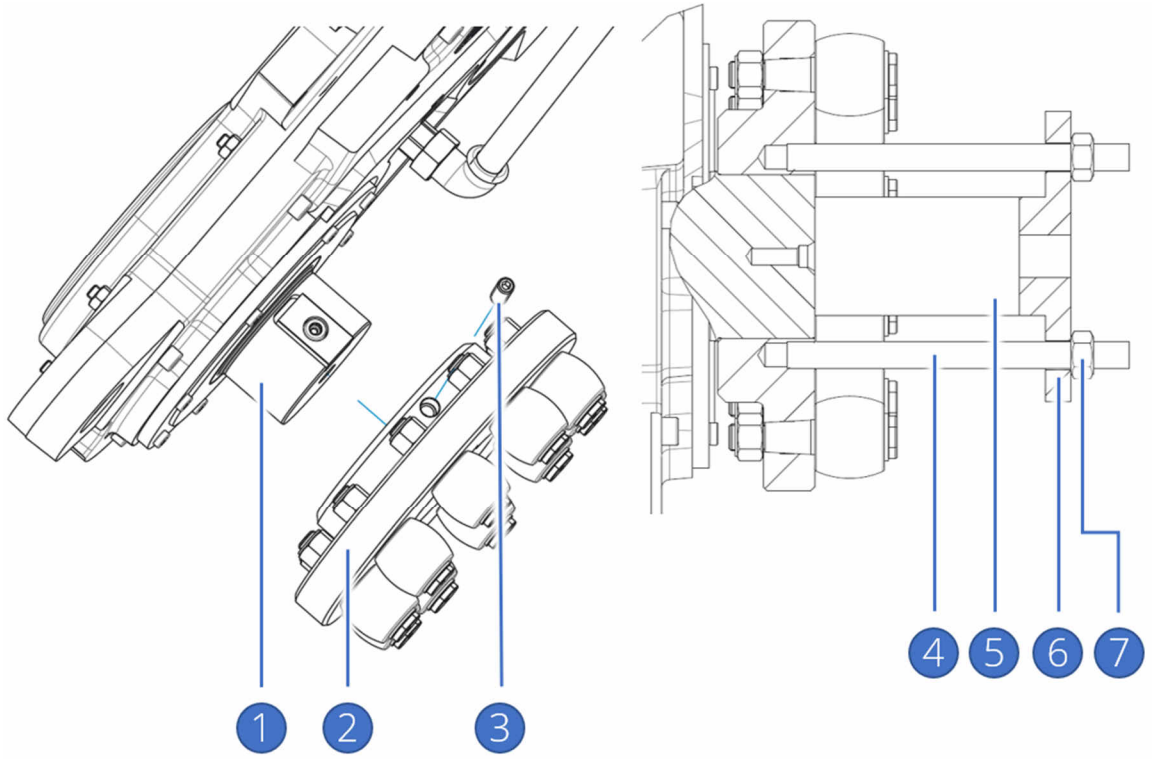

Fig. 30: Disassembly coupling flange ZGS 2

1	Drive shaft	2	Coupling flange
3	Threaded pin DIN 913 M12x30	4	Threaded rod M16
5	Hydraulic cylinder	6	Plate
7	Nut M16		

The drive shaft of the ZGS 2 is cylindrical with feather key connection.
Proceed as follows for disassembly:

- ⇨ Loosen and unscrew threaded pin M12.
- ⇨ Screw the M16 threaded rods into the threaded holes provided for this purpose in the coupling flange and tighten with 100Nm.
- ⇨ Position the hydraulic cylinder between the threaded rods.
- ⇨ Push the plate onto the threaded rods and screw on the M16 nuts.
- ⇨ Tighten the M16 nuts until the plate presses against the hydraulic cylinder.
- ⇨ Apply pressure to the hydraulic cylinder until the coupling flange has been completely pulled off the drive shaft.

Assembly coupling flange ZGS:

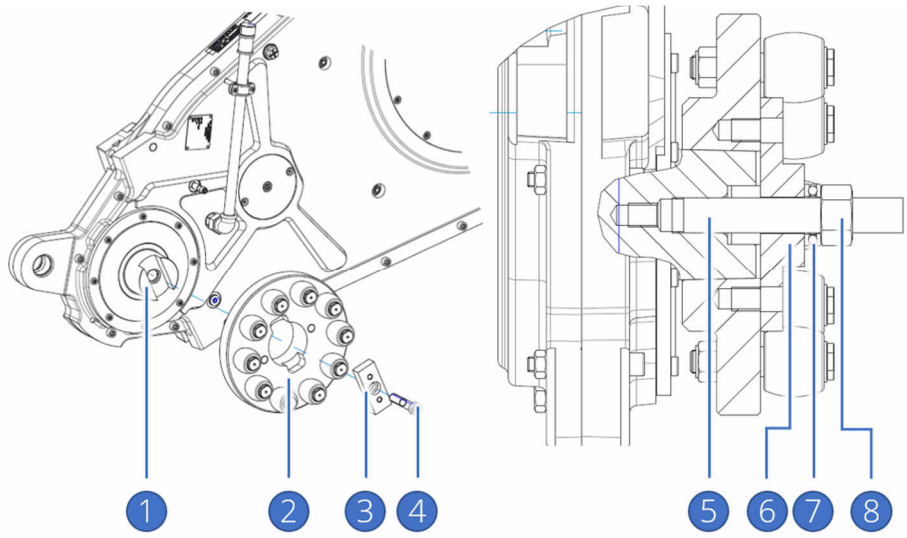

Fig. 31: Assembly coupling flange ZGS

1	Drive shaft	2	Coupling flange
3	Latch	4	Cylindrical head screw
5	Threaded rod M24	6	Plate
7	Axial bearing	8	Nut M24

Proceed as follows for assembly:

- ⇨ Clean the drive shaft and the coupling flange.
- ⇨ Screw the threaded rod M24 into the drive shaft and tighten with 100Nm.
- ⇨ Slide the coupling flange onto the taper of the drive shaft. When sliding it on, make sure to the position of the cutouts on the drive shaft and coupling flange. The surfaces must be aligned with each other so that the latch can be mounted after the coupling flange has been pulled on.
- ⇨ Push the plate and the axial bearing onto the threaded rod.
- ⇨ Screw the M24 nut onto the threaded rod and tighten it to 350Nm.
- ⇨ Then loosen the nut again and remove the axial bearing, plate and threaded rod from the drive shaft.
- ⇨ Place the latch in the cutouts on the coupling flange and drive shaft.
- ⇨ Screw the cylindrical head screw into the drive shaft and tighten it to 120Nm.
- ⇨ After completing the assembly, grease the drive shaft in the area of the coupling flange and gear box housing (corrosion protection).

Assembly coupling flange ZGS 2:

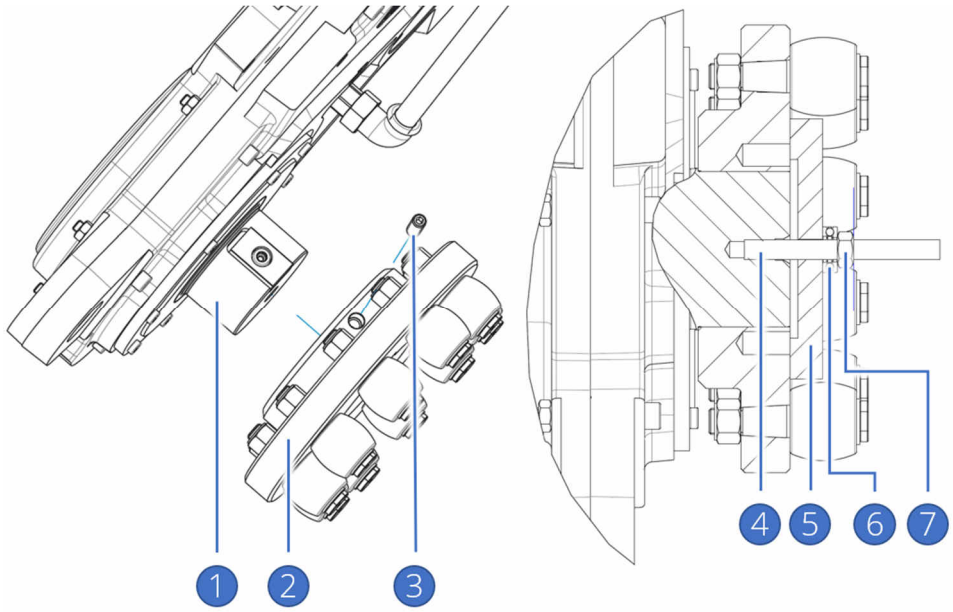

Fig. 32: Assembly coupling flange ZGS 2

1	Drive shaft	2	Coupling flange
3	Threaded pin DIN 913 M12x30	4	Threaded rod M12
5	Plate	6	Axial bearing
7	Nut M12		

Proceed as follows for assembly:

- ⇨ Clean the drive shaft and the coupling flange.
- ⇨ Heat the coupling flange to 100°C.
- ⇨ Push the coupling flange onto the drive shaft until it stops.
- ⇨ *[ALTERNATIVE W/O HEATING:*
- ⇨ *Screw the threaded rod into the drive shaft and tighten with 80Nm.*
- ⇨ *Position the coupling flange on the drive shaft. The axes of two parts must be aligned. Furthermore, make sure to the positioning of the groove from the coupling flange to the feather key of the drive shaft.*
- ⇨ *Push the plate and axial bearing onto the threaded rod.*
- ⇨ *Slide the coupling flange onto the drive shaft until it stops by tightening the nut.*
- ⇨ *Then loosen the nut again and remove the axial bearing, plate and threaded rod from the drive shaft.]*
- ⇨ Screw the threaded pin into the coupling flange and tighten it to 80Nm.

9. Disassembly / disposal

Disassembly intermediate gear box:

⇨ Replace the oil dipstick and the venting screw with the supplied sealing screws. The gear box is not sealed oil-tight with the oil dipstick and the venting screw.

⇨ For disassembly, proceed in reverse order of assembly.

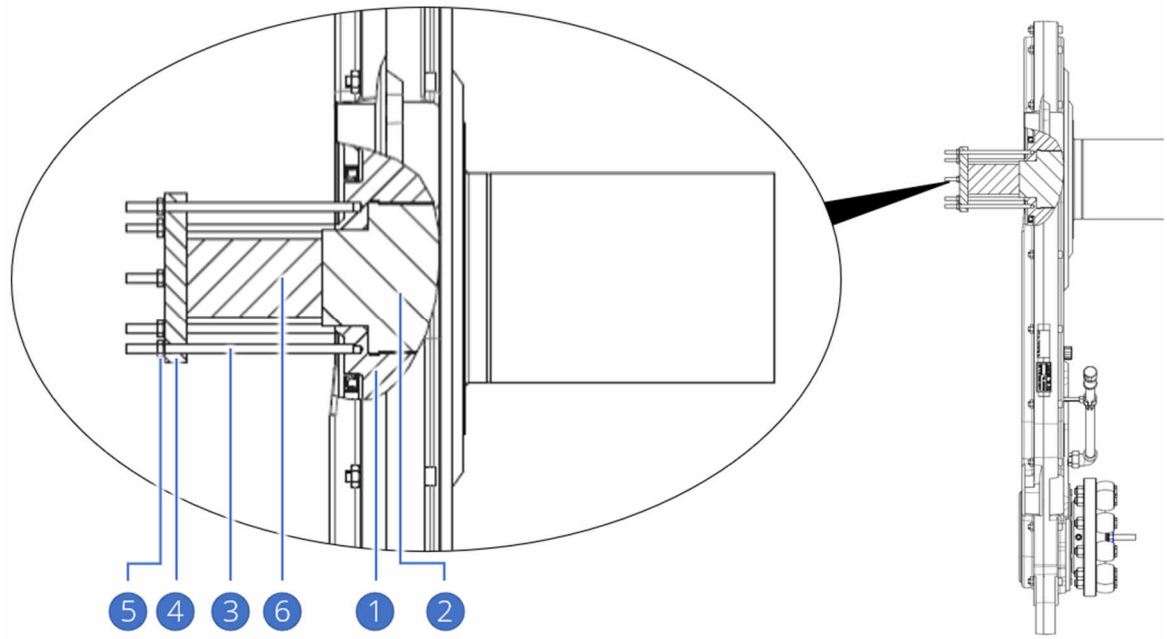

Fig. 33: Disassembly intermediate gear box

1	Output shaft	2	Main shaft (escalator)
3	Threaded rod M8	4	Plate
5	Nut M8	6	Hydraulic cylinder

Proceed as follows for assembly:

⇨ Screw the threaded rods into the output shaft.

⇨ Position the hydraulic cylinder between the threaded rods.

⇨ Push the plate onto the threaded rods and screw on the M8 nuts.

⇨ Tighten nuts uniformly.

⇨ Apply pressure to the hydraulic cylinder until the intermediate gear box has been completely pulled off the main shaft.

Disposal:

Dispose of all components correctly. Observe the respective country-specific regulations for disposal.

NOTE

Waste oil must never be allowed to enter the ground or water.

Appendix

A1 Applicable documents

The following documents also apply to the intermediate gear box considered in these installation instructions:

- Technical data sheet ZGS
- Technical data sheet ZGS 2
- Safety data sheet Kluebersynth GH 6-220

Technical Data – ZGS

Technical changes reserved – Status 2022-11

Input torque, max.	$T_{max.}$=	3.650 Nm
Ratio	i=	3,417
Oil quantity	V =	See table below
Oil change intervals	t =	40.000 operating hours
Service life gearing		Durable
Bearing lifetime with equivalent load	t = $p_{equiv.}$ =	>146.000 operating hours 0,62 x nominal power
Sound pressure level	L_p =	63 dB (A)
Weight	m =	approx. 450 kg
Versions		Left and right version, suitable for escalators and moving walks
Connection to main shaft		Involute spline DIN 5480 N130x3,0x30x42x9H
Connection to primary drive		Bolt coupling

Installation angle	25,6° bis 26,9°	28,3°	32,7°	34,1° bis 35,6°	38,2°	78°
Oil quantity [Liter]	8,0	8,3	8,6	8,8	9,0	11,2

Technical Data – ZGS 2

Technical changes reserved – Status 2022-11

Input torque, max.	$T_{max.}$ =	3.550 Nm
Static torque, max.	$T_{stat.}$ =	17.000 Nm
Ratio	I =	3,846
Oil quantity	V =	See table below
Oil change intervals	t =	40.000 operating hours
Service life gearing		Durable
Bearing lifetime with equivalent load	t = $p_{equiv.}$ =	>200.000 operating hours 0,78 x nominal power
Sound pressure level	L_p =	63 dB (A)
Weight	m =	approx. 450kg
Versions		Left and right version, suitable for escalators and moving walks
Connection to main shaft		Involute spline DIN 5480 N130x3,0x30x42x9H
Connection to primary drive		Bolt coupling

Installation angle	28,3°	35,6°
Oil quantity [Liter]	8,3	8,8

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name : Klübersynth GH 6-220

Article-No. : 012161

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture : Lubricating oil

Recommended restrictions on use : Restricted to professional users.

1.3 Details of the supplier of the safety data sheet

Company : Klüber Lubrication München
Geisenhausenerstr. 7
81379 München
Deutschland
Tel: +49 (0) 89 7876 0
Fax: +49 (0) 89 7876 333
info@klueber.com

E-mail address of person responsible for the SDS : mcm@klueber.com
Material Compliance Management

National contact : Klüber Lubrication Deutschland
Geisenhausenerstraße 7
81379 München
Deutschland
Tel.: +49 89 7876 0
Fax: +49 89 7876 565
customer.service.de@klueber.com
www.klueber.com

1.4 Emergency telephone number

Emergency telephone number : +49 89 7876 700 (24 hrs)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Not a hazardous substance or mixture.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Not a hazardous substance or mixture.

Additional Labelling

EUH210 Safety data sheet available on request.

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Chemical nature : polyalkylene glycol oil

Components

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	specific concentration limit M-Factor Notes Acute toxicity estimate	Concentration (% w/w)
Reaction mass of 3-methylphenyl diphenyl phosphate, 4-methylphenyl diphenyl phosphate, bis(3-methylphenyl) phenyl phosphate, 3-methylphenyl 4-methylphenyl phenyl phosphate and triphenyl phosphate	945-730-9 01-2119511174-52-XXXX	Aquatic Acute1; H400 Aquatic Chronic3; H412	M-Factor: 1/	>= 1 - < 2,5

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

If inhaled	:	Remove person to fresh air. If signs/symptoms continue, get medical attention. Keep patient warm and at rest. If unconscious, place in recovery position and seek medical advice. Keep respiratory tract clear. If breathing is irregular or stopped, administer artificial respiration.
In case of skin contact	:	Remove contaminated clothing. If irritation develops, get medical attention. In case of contact, immediately flush skin with plenty of water. Wash clothing before reuse. Thoroughly clean shoes before reuse.
In case of eye contact	:	Rinse immediately with plenty of water, also under the eyelids, for at least 10 minutes. If eye irritation persists, consult a specialist.
If swallowed	:	Move the victim to fresh air. If unconscious, place in recovery position and seek medical advice. Keep respiratory tract clear. Do NOT induce vomiting. Rinse mouth with water. Never give anything by mouth to an unconscious person.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms	:	No information available.
Risks	:	None known.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment	:	No information available.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	:	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Unsuitable extinguishing	:	High volume water jet

media

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products : Carbon oxides
Nitrogen oxides (NOx)

5.3 Advice for firefighters

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment. Exposure to decomposition products may be a hazard to health.

Further information : Standard procedure for chemical fires.
Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Evacuate personnel to safe areas.
Use personal protective equipment.
Ensure adequate ventilation.
Refer to protective measures listed in sections 7 and 8.

6.2 Environmental precautions

Environmental precautions : Do not allow contact with soil, surface or ground water.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

6.4 Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Avoid inhalation of vapour or mist.
Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the ap-

plication area.
Wash hands and face before breaks and immediately after handling the product.
Do not ingest.
Do not repack.
Do not re-use empty containers.
These safety instructions also apply to empty packaging which may still contain product residues.
Keep container closed when not in use.

Hygiene measures : Wash face, hands and any exposed skin thoroughly after handling.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Store in original container. Keep container closed when not in use. Keep in a dry, cool and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Store in accordance with the particular national regulations. Keep in properly labelled containers.

Storage class (TRGS 510) : 10, Combustible liquids

7.3 Specific end use(s)

Specific use(s) : Specific instructions for handling, not required.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Contains no substances with occupational exposure limit values.

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Exposure routes	Potential health effects	Value
bis(4-(1,1,3,3-tetramethyl-butyl)phenyl)amine	Workers	Inhalation	Long-term systemic effects	4,11 mg/m3
	Workers	Skin contact	Long-term systemic effects	1,17 mg/kg bw/day
Reaction mass of 3-methylphenyl diphenyl phosphate, 4-methylphenyl diphenyl phosphate, bis(3-methylphenyl) phenyl phosphate, 3-methylphenyl 4-methylphenyl phenyl phosphate and triphenyl phosphate	Workers	Inhalation	Long-term systemic effects	3,5 mg/m3

	Workers	Inhalation	Acute systemic effects	28 mg/m3
	Workers	Dermal	Long-term systemic effects	0,5 mg/kg bw/day
	Workers	Dermal	Acute systemic effects	4 mg/kg bw/day
pentaerythritol tetrakis(3-(3,5-di-tert-butyl-4-hydroxy-phenyl)propionate)	Workers	Inhalation	Long-term systemic effects	9,5 mg/m3
	Workers	Skin contact	Long-term systemic effects	27 mg/kg

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name	Environmental Compartment	Value
bis(4-(1,1,3,3-tetramethylbutyl)phenyl)amine	Fresh water	0,00002 µg/l
	Marine water	0,000002 µg/l
	Fresh water sediment	0,00467 mg/kg
	Marine sediment	0,000467 mg/kg
	Soil	0,000934 mg/kg
Reaction mass of 3-methylphenyl diphenyl phosphate, 4-methylphenyl diphenyl phosphate, bis(3-methylphenyl) phenyl phosphate, 3-methylphenyl 4-methylphenyl phenyl phosphate and triphenyl phosphate	Fresh water	0,002 mg/l
	Marine water	0,0002 mg/l
	Fresh water sediment	3,43 mg/kg
	Marine sediment	0,343 mg/kg
pentaerythritol tetrakis(3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate)	Fresh water	0,086 mg/l
	Marine water	0,0086 mg/l

8.2 Exposure controls

Engineering measures

none

Personal protective equipment

Eye protection : Safety glasses with side-shields

Hand protection
- Material : Nitrile rubber
- Break through time : > 10 min
- Protective index : Class 1

Remarks	:	For prolonged or repeated contact use protective gloves. The break through time depends amongst other things on the material, the thickness and the type of glove and therefore has to be measured for each case. The selected protective gloves have to satisfy the specifications of Regulation (EU) 2016/425 and the standard EN 374 derived from it.
Respiratory protection	:	Not required; except in case of aerosol formation.
Filter type	:	Filter type A-P
Protective measures	:	The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	liquid
Colour	:	yellow
Odour	:	characteristic
Odour Threshold	:	No data available
Melting point/range	:	No data available
Boiling point/boiling range	:	No data available
Flammability (solid, gas)	:	Not applicable
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Flash point	:	>= 250 °C Method: ISO 2592, open cup
Auto-ignition temperature	:	No data available

Decomposition temperature Decomposition temperature	:	No data available
pH	:	8,0 (20 °C) Concentration: 100 %
Viscosity Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	220 mm2/s (40 °C)
Solubility(ies) Water solubility	:	partly soluble
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Vapour pressure	:	< 0,001 hPa (20 °C)
Relative density	:	1,050 (20 °C) Reference substance: Water The value is calculated
Density	:	1,05 g/cm3 (20 °C)
Bulk density	:	No data available
Relative vapour density	:	No data available

9.2 Other information

Explosives	:	Not explosive
Oxidizing properties	:	No data available
Self-ignition	:	No data available
Evaporation rate	:	No data available
Sublimation point	:	No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No hazards to be specially mentioned.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions : No dangerous reaction known under conditions of normal use.

10.4 Conditions to avoid

Conditions to avoid : No conditions to be specially mentioned.

10.5 Incompatible materials

Materials to avoid : No materials to be especially mentioned.

10.6 Hazardous decomposition products

No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity

Product:

Acute oral toxicity : Remarks: This information is not available.

Acute inhalation toxicity : Remarks: This information is not available.

Acute dermal toxicity : Remarks: This information is not available.

Components:

Reaction mass of 3-methylphenyl diphenyl phosphate, 4-methylphenyl diphenyl phosphate, bis(3-methylphenyl) phenyl phosphate, 3-methylphenyl 4-methylphenyl phenyl phosphate and triphenyl phosphate

:

Acute oral toxicity : LD50 (Rat): > 5.000 mg/kg

Acute dermal toxicity : LD50 (Rat): > 2.000 mg/kg
Method: OECD Test Guideline 402
GLP: yes
Assessment: The substance or mixture has no acute dermal

toxicity

Skin corrosion/irritation

Product:
Remarks : This information is not available.

Components:

Reaction mass of 3-methylphenyl diphenyl phosphate, 4-methylphenyl diphenyl phosphate, bis(3-methylphenyl) phenyl phosphate, 3-methylphenyl 4-methylphenyl phenyl phosphate and triphenyl phosphate

:
Species : Rabbit
Assessment : No skin irritation
Method : OECD Test Guideline 404
Result : No skin irritation

Serious eye damage/eye irritation

Product:
Remarks : This information is not available.

Components:

Reaction mass of 3-methylphenyl diphenyl phosphate, 4-methylphenyl diphenyl phosphate, bis(3-methylphenyl) phenyl phosphate, 3-methylphenyl 4-methylphenyl phenyl phosphate and triphenyl phosphate

:
Species : Rabbit
Assessment : No eye irritation
Method : OECD Test Guideline 405
Result : No eye irritation

Respiratory or skin sensitisation

Product:
Remarks : This information is not available.

Components:

Reaction mass of 3-methylphenyl diphenyl phosphate, 4-methylphenyl diphenyl phosphate, bis(3-methylphenyl) phenyl phosphate, 3-methylphenyl 4-methylphenyl phenyl phosphate and triphenyl phosphate

:

Assessment	:	Did not cause sensitisation on laboratory animals.
Result	:	Did not cause sensitisation on laboratory animals.

Germ cell mutagenicity

Product:

Genotoxicity in vitro	:	Remarks: No data available
Genotoxicity in vivo	:	Remarks: No data available

Components:

Reaction mass of 3-methylphenyl diphenyl phosphate, 4-methylphenyl diphenyl phosphate, bis(3-methylphenyl) phenyl phosphate, 3-methylphenyl 4-methylphenyl phenyl phosphate and triphenyl phosphate

:

Genotoxicity in vitro	:	Test Type: Ames test Test system: Salmonella typhimurium Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative GLP: yes

Carcinogenicity

Product:

Remarks	:	No data available

Reproductive toxicity

Product:

Effects on fertility	:	Remarks: No data available
Effects on foetal development	:	Remarks: No data available

Components:

Reaction mass of 3-methylphenyl diphenyl phosphate, 4-methylphenyl diphenyl phosphate, bis(3-methylphenyl) phenyl phosphate, 3-methylphenyl 4-methylphenyl phenyl phosphate and triphenyl phosphate

:

Reproductive toxicity - Assessment : - Fertility -
No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.

Repeated dose toxicity

Product:
Remarks : This information is not available.

Aspiration toxicity

Product:
This information is not available.

11.2 Information on other hazards

Endocrine disrupting properties

Product:
Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Further information

Product:
Remarks : Information given is based on data on the components and the toxicology of similar products.

SECTION 12: Ecological information

12.1 Toxicity

Product:
Toxicity to fish : Remarks: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Toxicity to daphnia and other aquatic invertebrates	:	Remarks: No data available
Toxicity to algae/aquatic plants	:	Remarks: No data available
Toxicity to microorganisms	:	Remarks: No data available

Components:

Reaction mass of 3-methylphenyl diphenyl phosphate, 4-methylphenyl diphenyl phosphate, bis(3-methylphenyl) phenyl phosphate, 3-methylphenyl 4-methylphenyl phenyl phosphate and triphenyl phosphate

:

Toxicity to fish	:	LC50 (Oryzias latipes (Japanese medaka)): 1,3 mg/l Exposure time: 96 h
Toxicity to algae/aquatic plants	:	EC50 (Desmodesmus subspicatus (green algae)): 0,55 mg/l Exposure time: 72 h
M-Factor (Acute aquatic toxicity)	:	1
Toxicity to microorganisms	:	EC50 (activated sludge): Exposure time: 3 h Method: OECD Test Guideline 209
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 0,12 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea)

12.2 Persistence and degradability

Product:

Biodegradability	:	Remarks: No data available
Physico-chemical removability	:	Remarks: No data available

Components:

Reaction mass of 3-methylphenyl diphenyl phosphate, 4-methylphenyl diphenyl phosphate, bis(3-methylphenyl) phenyl phosphate, 3-methylphenyl 4-methylphenyl phenyl phosphate and triphenyl phosphate

:

Biodegradability	:	Result: rapidly biodegradable Biodegradation: 75 % Exposure time: 28 d Method: OECD Test Guideline 301C

12.3 Bioaccumulative potential

Product:

Bioaccumulation	:	Remarks: This mixture contains no substance considered to be persistent, bioaccumulating and toxic (PBT). This mixture contains no substance considered to be very persistent and very bioaccumulating (vPvB).

Components:

Reaction mass of 3-methylphenyl diphenyl phosphate, 4-methylphenyl diphenyl phosphate, bis(3-methylphenyl) phenyl phosphate, 3-methylphenyl 4-methylphenyl phenyl phosphate and triphenyl phosphate

:

Bioaccumulation	:	Bioconcentration factor (BCF): 220
Partition coefficient: n-octanol/water	:	log Pow: 4,5

12.4 Mobility in soil

Product:

Mobility	:	Remarks: No data available
Distribution among environmental compartments	:	Remarks: No data available

12.5 Results of PBT and vPvB assessment

Product:

Assessment	:	This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher..

12.6 Endocrine disrupting properties

Product:

Assessment	:	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects

Product:

Additional ecological information : Harmful to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : The product should not be allowed to enter drains, water courses or the soil.
Do not dispose of with domestic refuse.
Dispose of as hazardous waste in compliance with local and national regulations.

Waste codes should be assigned by the user based on the application for which the product was used.

Contaminated packaging : Packaging that is not properly emptied must be disposed of as the unused product.
Dispose of waste product or used containers according to local regulations.

The following Waste Codes are only suggestions:

Waste Code : unused product
13 02 06*, synthetic engine, gear and lubricating oils

uncleaned packagings
15 01 10, packaging containing residues of or contaminated by hazardous substances

SECTION 14: Transport information

14.1 UN number or ID number

Not regulated as a dangerous good

14.2 UN proper shipping name

Not regulated as a dangerous good

14.3 Transport hazard class(es)

Not regulated as a dangerous good

14.4 Packing group

Not regulated as a dangerous good

14.5 Environmental hazards

Not regulated as a dangerous good

14.6 Special precautions for user

Not applicable

14.7 Maritime transport in bulk according to IMO instruments

Remarks : Not applicable for product as supplied.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII)	:	Not applicable
REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	:	This product does not contain substances of very high concern (Regulation (EC) No 1907/2006 (REACH), Article 57).
REACH - List of substances subject to authorisation (Annex XIV)	:	Not applicable
Regulation (EC) No 1005/2009 on substances that deplete the ozone layer	:	Not applicable
Regulation (EU) 2019/1021 on persistent organic pollutants (recast)	:	Not applicable
Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals	:	Not applicable
Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.	:	Not applicable
Water contaminating class (Germany)	:	WGK 2 obviously hazardous to water Classification according to AwSV, Annex 1 (5.2)
TA Luft List (Germany)	:	Total dust: others: 3,18 % Inorganic substances in powdered form: Not applicable Inorganic substances in vapour or gaseous form: Not applicable Organic Substances:

portion Class 1: < 0,01 %
others: 96,82 %

Carcinogenic substances:
Not applicable
Mutagenic:
Not applicable
Toxic to reproduction:
Not applicable

Volatile organic compounds : Directive 2010/75/EU of 24 November 2010 on industrial emissions (integrated pollution prevention and control)
Volatile organic compounds (VOC) content: 0,06 %

15.2 Chemical safety assessment
This information is not available.

SECTION 16: Other information

Full text of H-Statements

H400 : Very toxic to aquatic life.
H412 : Harmful to aquatic life with long lasting effects.

Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office

of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

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