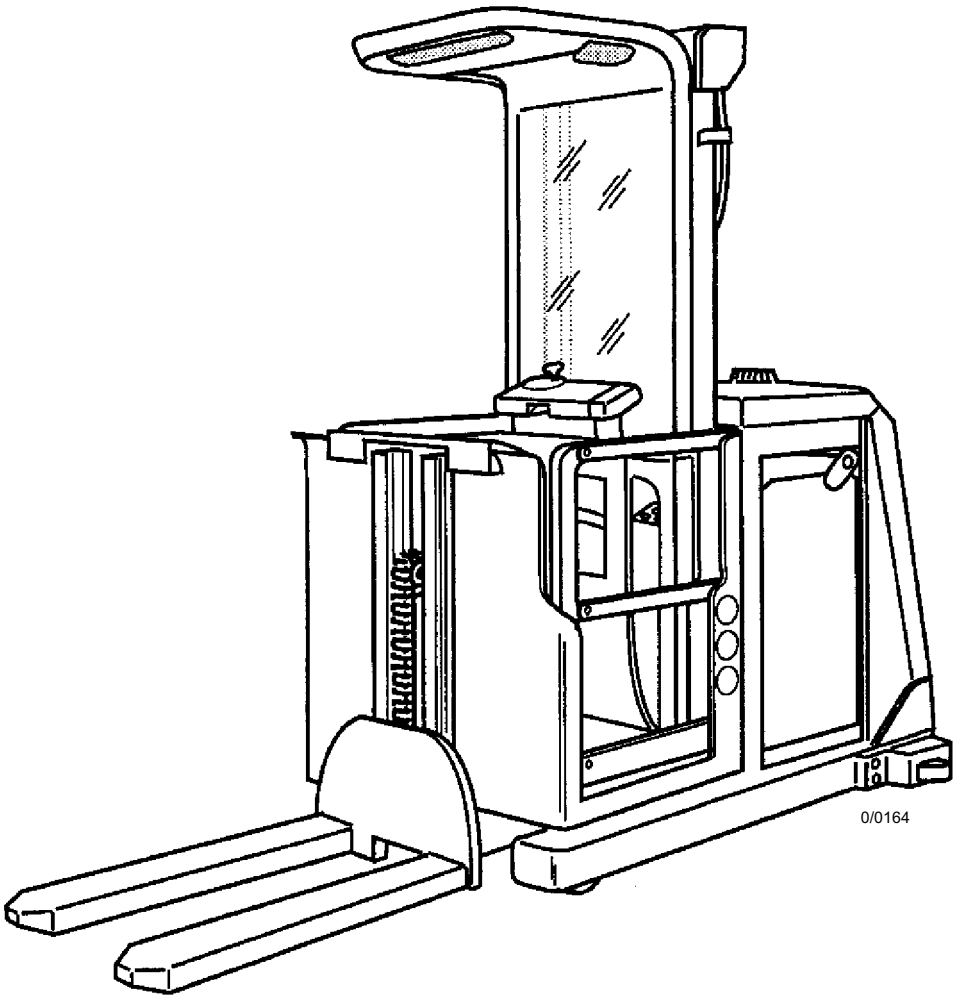
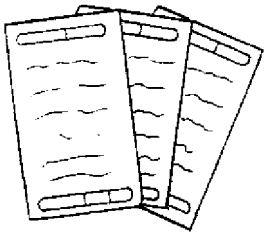
Workshop Manual EK12N

To get the table of sections click here



First Issue:	**07/00**	Workshop Manual	**EK12N**	Id.no. W8 054 169
Last Revision:	**05/03**			

Foreword



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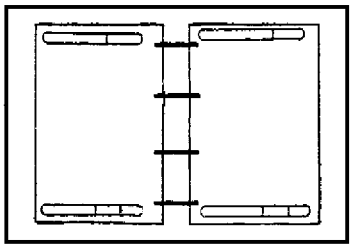

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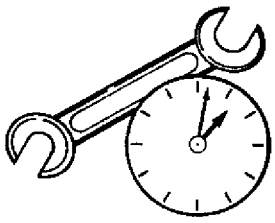
Updating of workshop manuals



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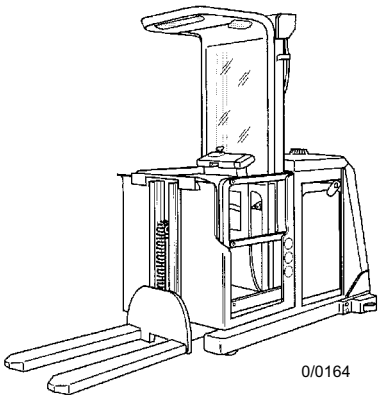


0/0164

This workshop manual provides specifications and describes functional characteristics of the standard truck.

This provides you with a comprehensive documentation to ensure better understanding of the vehicle technology and so permit correct maintenance and repair work to be carried out.

The workshop manual is always updated by supplementary sheets.

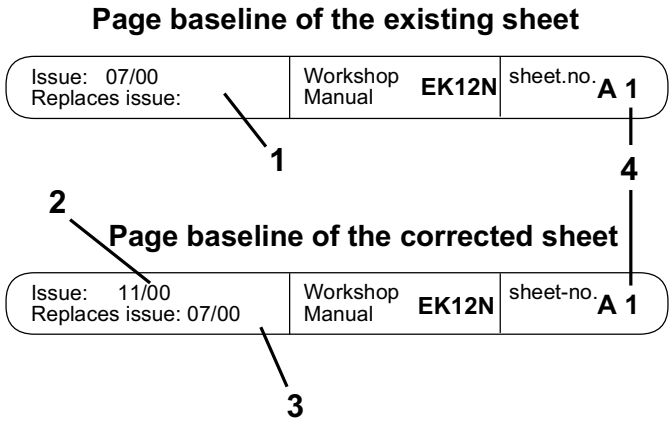
The industrial truck range is subject to continuous further development. This means that certain components or assemblies are exchanged or modified.

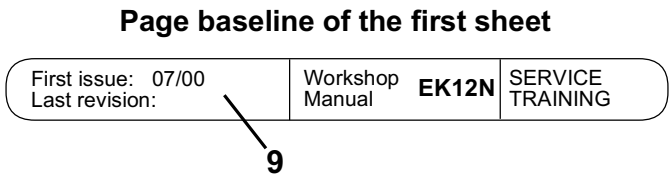
To ensure that the holder of this manual always has the most up to date version of the documentation, it is important to abide by the following updating system.

Updating workshop manuals
(Contd.)

1. Exchanging faulty sheets

If a particular page contains mistakes, for example due to altered setting values, the respective sheet must be exchanged.
A newly inserted sheet can be recognized by the altered left-hand baseline (1). Here, the date of compilation is updated in the line entitled **Issue** (2). In the line **Replaces issue** (3) is the compilation date of the sheet to be replaced. The sheet no. remains the same (4).
With every revision the **first sheet** will be replaced. In (9) you see the **first issue** and the date of the **last revision**. This tells you the revision state of the whole book.

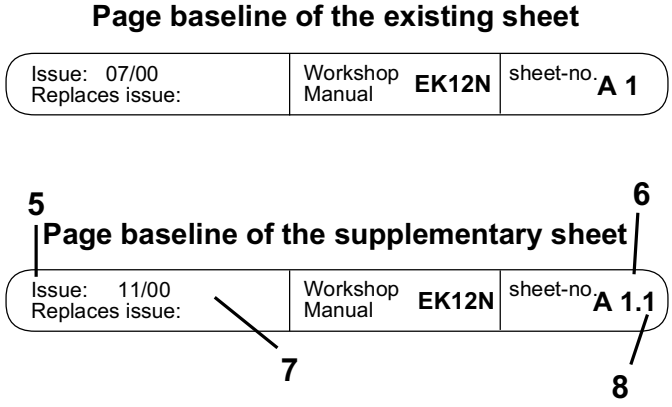




2. Insertion of supplementary sheets

If new, modified or additional components are included in the series truck, it may be necessary to add one or more supplementary sheets.
The additional sheet is recognized by the left-hand and right-hand page baseline (5+6).
In the Issue line on the left-hand side is the compilation date (7). On the right, the supplementary sheet is marked by the sheet no. with continuous index (8).
In addition, the table of contents of the respective assembly must also be exchanged.

Newly compiled sheets, whether replacements or supplementary sheets, and the new tables of contents are sent by post to all known holders of workshop manuals.



Remarks, imprint

No guarantee claims arise as a result of working in accordance with the instructions contained in this manual.

This does not affect the guarantee stipulations.

We are continuously involved in the further development of our industrial trucks. Please appreciate that this documentation is subject to alteration and error, and that no claims may be derived from information, illustrations and descriptions contained in the workshop manual .

Publisher

STILL WAGNER
GMBH & CO KG
Trainingszentrum
Ernst-Wagner-Weg 1-5
72766 Reutlingen-Mittelstadt

Sections:

Contents

Sheet no.

Drive motor

Id. no. W8 407 275

General

9/0067

The drive motor used in this vehicle is a 48V shunt motor.

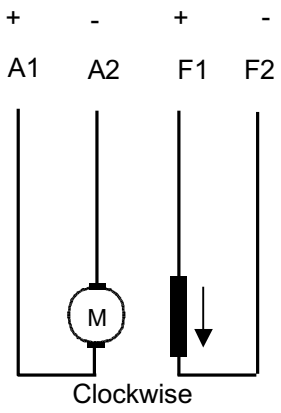
The armature and field coils are controlled separately from the travel and pump controller.

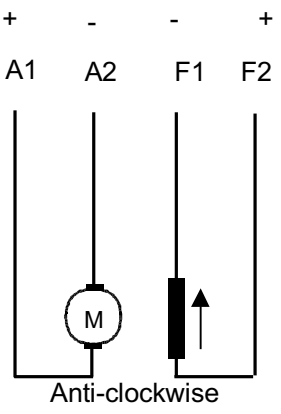
The travel movement is initiated as follows: voltage is applied to the armature (A1/A2) and the field (F1/F2) is excited.

As soon as the armature voltage is equal to the battery voltage, the field current is reduced in order to achieve an increase in speed.

The current speed of the drive motor is determined by a current measurement (measuring shunt) in the travel and pump controller.

Note: The field current must not be interrupted during operation, otherwise the speed of the motor increases.



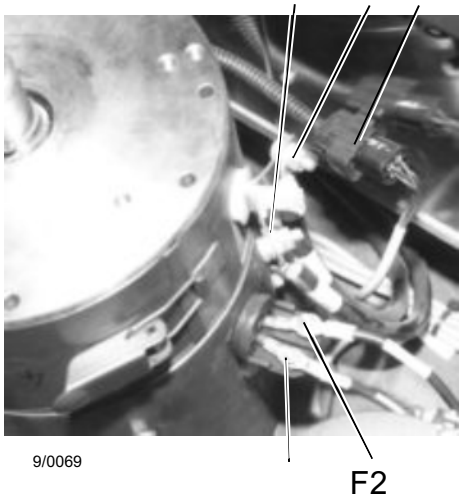


Drive motor

Id. no. W8 407 275

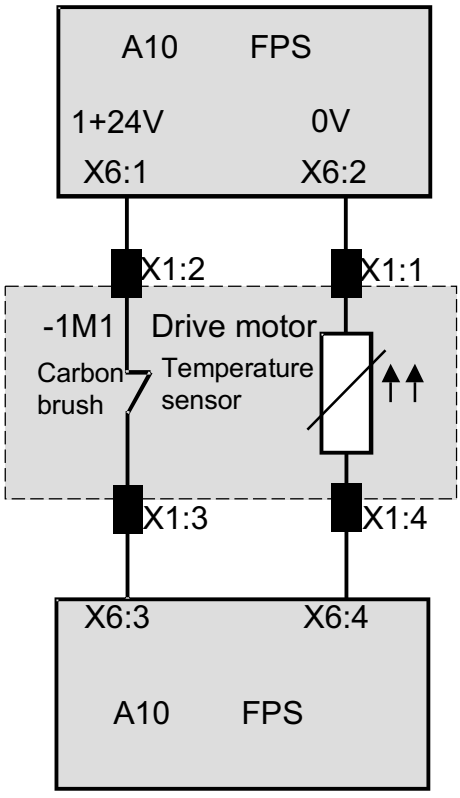
Terminals

Marking on the motor	Main current terminals
A 1	Armature coil, start
A 2	Armature coil, end
F1	Field coil, start
F2	Field coil, end
	Sensor terminals
X1:4	Temperature sensor signal
X1:1	0V temperature sensor supply
X1:2	1+24V carbon brush monitor
X1:3	Carbon brush monitor signal



Remark:

The markings for the main current terminals are stamped on the housing.



Drive motor specifications

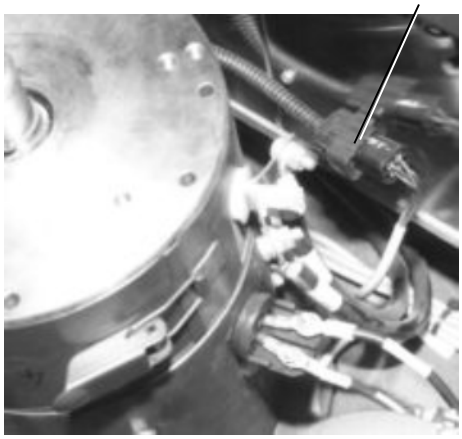
Type	JULI GF 116-QS
Id. no.	W8 407 275
Type of excitation	Shunt
Nominal voltage	48 V
Nominal current	90 A
Nominal output	3400 W
Nominal speed	2400 min - 1
Direction of rotation	clockwise / anti-clockwise
Protection class / insulation class	JP 23

Drive motor

Id. no. W8 407 275

Monitors

The drive motor has a temperature monitor and a carbon brush monitor.



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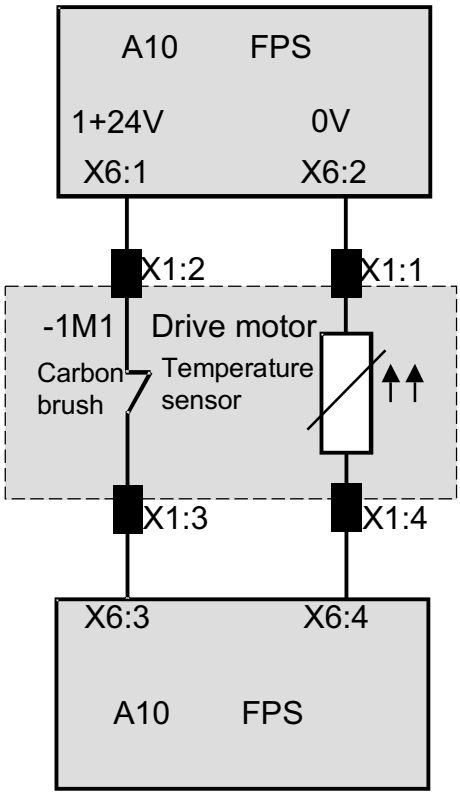
Temperature >130°C, deceleration within 5 min. to 50% of the selected speed.
The temperature sensor has approx. 600 ohms at 27°.
As the temperature increases, the resistance increases. The switching threshold of 130°C is equivalent to approx. 1200 ohms. The temperature monitor must be programmed using the software (V18).

Error message FE 19 (drive motor temperature too high).

Carbon brush monitor after hours deceleration to 2.5 km/h. The carbon brush monitor must be programmed using the software (V18).

Error message FE 29 (drive motor carbon brush worn down).



Drive motor

Removal

Note:
Because the brake (2) is mounted on the drive motor, the vehicle is unbraked once the brake and drive motor have been removed. For this reason, you must secure the vehicle to prevent it rolling away.

1. Pull out the battery plug (1).

2. Disconnect the motor connection cable (3), check the marking and mark if necessary (A3).

3. Disconnect terminal X1 for the carbon brush monitor and temperature sensor (A3).

4. Remove the spring force brake (2) (C3).

5. Remove the 6 screws (5).

6. Screw the special equipment M6 eye bolt (6), into the armature shaft (by at least 20 mm).

7. Pull a rope (7) (special equipment "rope pulley") through the eye bolt (6).
   Id. no. W8 420 446

Remark:
Ensure that the rope is rigged correctly (8)

8. Fix the length of the rope (it is adequate to hold it by hand).

9. Use a lever to raise the drive motor, see fig. 2.

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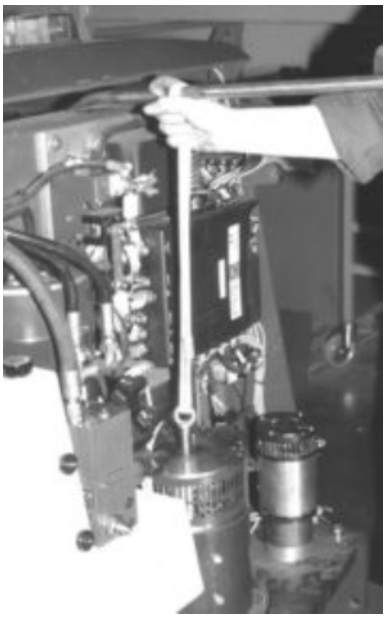

Fig. 2

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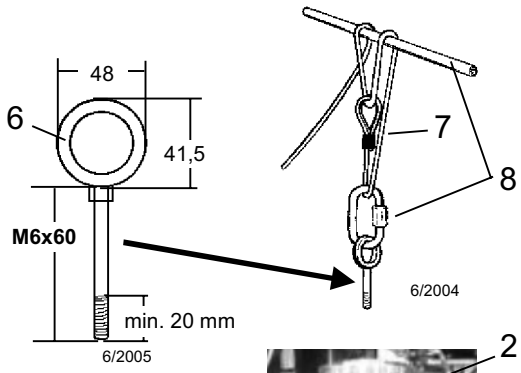

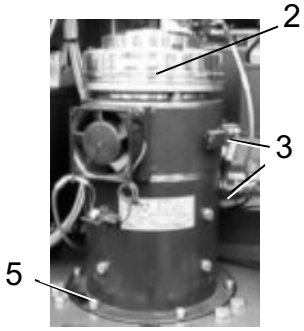

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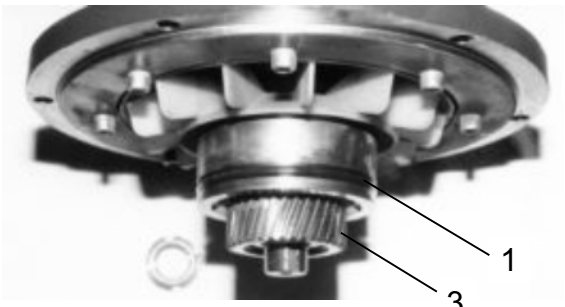
Continued on sheet no. A 5

Drive motor

Removal

Continued from sheet A4

Note:
Do not work without auxiliary tools. It required a great deal of force to release the seal (1) between the drive motor and the gear.



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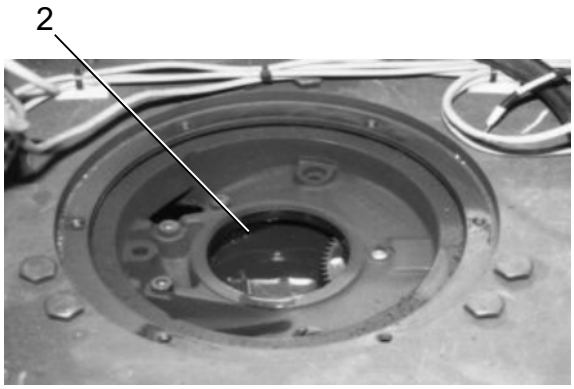
9. Remove the auxiliary tools.

10. Lift the drive motor out by hand.

Remark:
Once the drive motor has been removed, the gear opening that is left free (2) must be covered over to prevent dirt penetrating to the inside of the gear.



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Installation

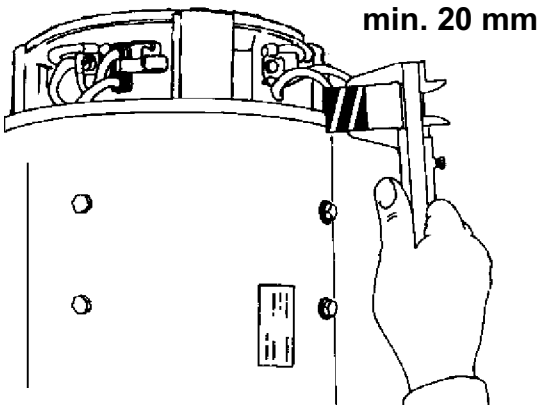
Clean the gear opening.
To replace the drive motor, follow the instructions for removal in reverse order.
Use auxiliary tools to assist with installation, so that the motor does not tilt during installation (risk of damage to the drive pinion (3) and to the gear).

Note:
Only use screws of the prescribed length (M8x25), otherwise the four-point bearing may be damaged!

Remark:
Screw in and tighten the 6 screws diagonally in several passes.

Replacing the carbon brushes

Id. no. W8 408 586 (1 set)



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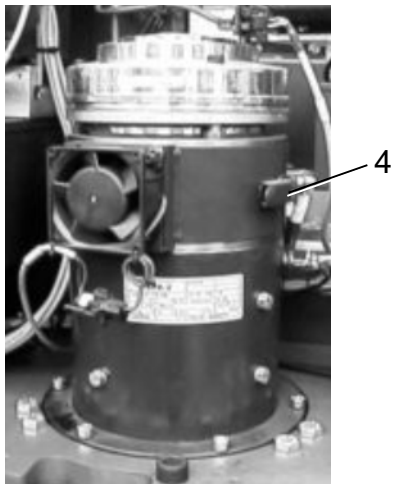
The carbon brushes must be replaced when they are worn down to a length of 50%, which is equivalent to 20 mm.

Length of a new carbon brush: 40 mm

The entire set of carbon brushes (4 brushes) must always be replaced.

Dismantling:

1. Pull out the battery plug (see sheet A4).
2. Remove the cover (4).
3. Raise the brush spring (1) and hook into the brush spring holder.
4. Pull the carbon out at the connecting cable (2).
5. Disconnect the connecting cable (3).
6. Clean out the commutator compartment with compressed air.



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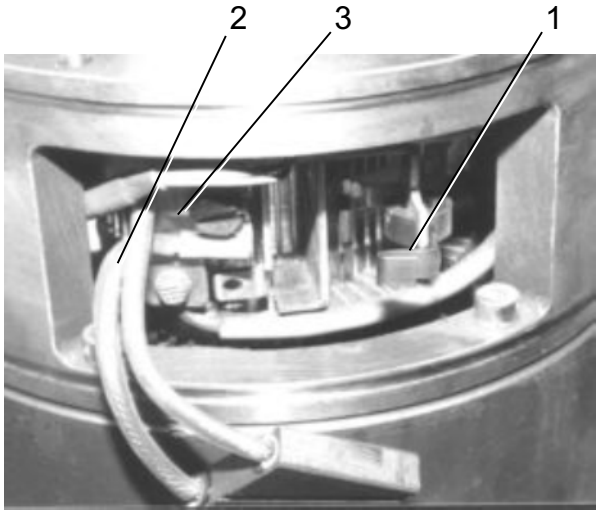
Note:
Never inhale carbon dust!
Wear a mouth and nose mask.

7. Insert the new carbon brushes.

Remark:
Ensure that the carbon brushes run easily in the shaft.



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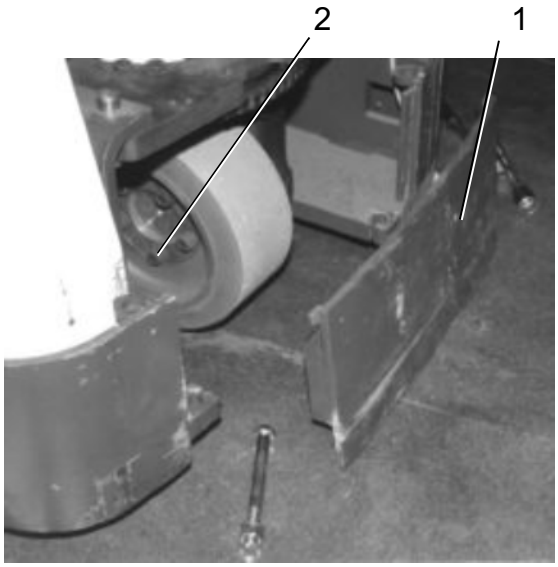
Note:
After replacing the carbon brushes, do not run the motor at full power straight away. The carbon brushes run in relatively quickly under minimal loads

Checking the brush springs

Brush springs with insufficient pre-tension cause the commutator to burn.

Replacing the drive wheel
Id. no. W8 423 414

Dimensions when new: 310 x 125 mm



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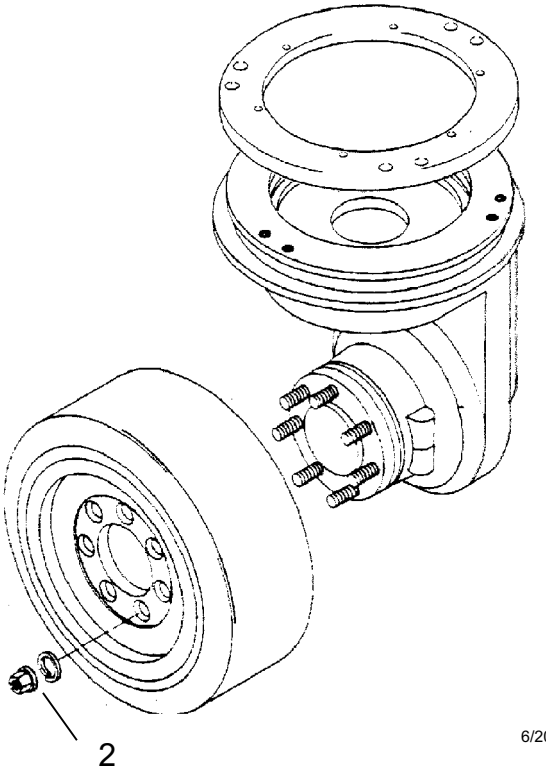
The drive wheel must be replaced when:

- The running surface is pitted or out of round or there are cracks in the surface,
- The diameter of the tyre has decreased by 10 % (smallest permissible tyre diameter: 280 mm).

Removal

1. Park the vehicle with the forks against a wall to prevent it from rolling away.
2. Remove the collision protector, Id no. W8 387 658 (1)
3. Turn the steering until the wheel nuts (2) are easily accessible.
4. Pull out the battery plug (see A4).
5. Release the wheel nuts (2) before the vehicle is jacked up.
6. Raise the vehicle to a height of about 100 mm with the hydraulic jack (5 tonnes), Id. no. W8 050 724.
7. Support the vehicle from below on both sides with hardwood chocks.
8. Lower the hydraulic jack and remove it.
9. Unscrew the 5 wheel nuts (2).
10. Remove the drive wheel.



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Installation

Before fitting the drive wheel, clean the wheel seat (3) and inspect it to ensure that it is in good condition.

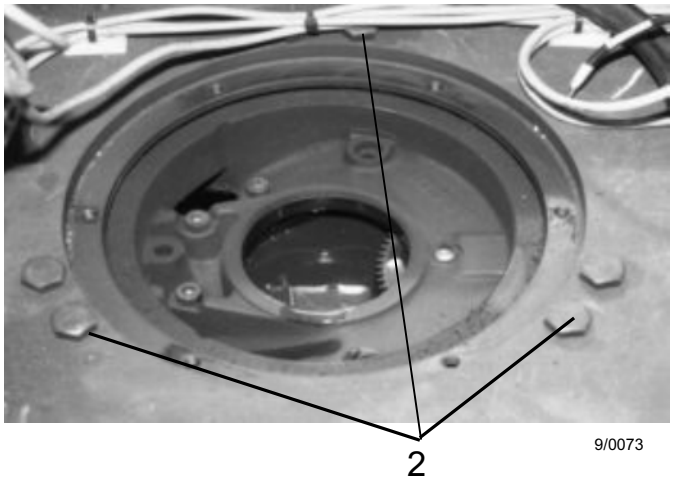
1. Push on the drive wheel and tighten the 5 nuts by hand.
2. Lower the vehicle.
3. Tighten the nuts diagonally and in several passes with a torque controlled wrench. **Tightening torque: 140 Nm.**

Removing the gear

Id. no. W8 423 424

Removing the gear:

1. Pull out the battery plug (A5).
2. Jack up the vehicle so that there is a space of 10 cm between the floor and the lower edge of the wheel.
3. Remove the collision protector.
4. Turn the gear sideways.
5. The drive motor must be removed before the gear can be taken out (see sheet A5).
6. Release the tension on the steering chain and open the chain joint at the chain holder. The chain can now be removed (see sheet B24).
7. Move a hand elevating truck into position underneath the drive wheel (clear fork distance approx. 220 mm).
8. Raise the hand elevating truck until there is a slight pressure on the drive wheel.
9. Release the 6 screws M12 x 60 (Item 2) and slowly lower the hand elevating truck.
10. The gear is now supported by the hand elevating truck and can be pulled out to the front.



Remark:
Prevent the gear from falling over by supporting it from below.

Changing the gear oil

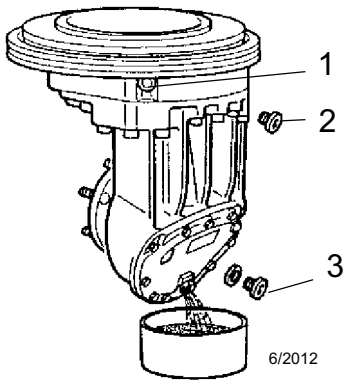
The first oil change should be carried out after 6 months or 1000 operating hours.
All subsequent oil changes must be carried out after about 2000 operating hours or once a year.

Caution:
The gear oil must be drained off when it is at operating temperature, and can reach a temperature of 80°C.
Risk of scalding!

The following viscosity classes are used:

Standard oil:	SAE 80/90
Ambient temperature:	0°C to 40°C
Low-temperature oils:	SAE 80W
Ambient temperature:	to - 26°C
Low temperature oil:	SAE 75W
Ambient temperature:	to - 40°C
Amount of oil for this gear:	2.5l

Remark:
The amount of oil specified here is intended for guidance only. The volume of oil is correct when the gear is filled to the lower edge of the filler hole (1). Avoid overfilling, since this damages the seals and the operating temperature may not be maintained under some circumstances. The maximum permissible operating temperature is 80°C.

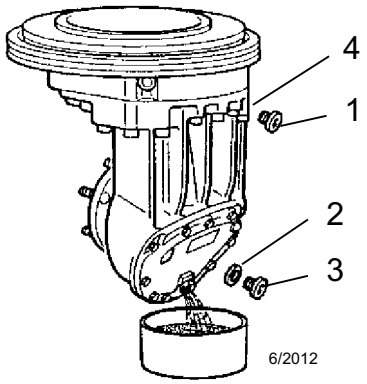


Changing the oil:

1. Turn the steering clockwise until the oil filler cap (2) is easily accessible.
2. Set an oil catchment vessel with a minimum volume of 2.5 litres underneath the oil drainage screw (3) of the gear.
3. Use a hexagon socket screw key (spanner size 6) to unscrew the oil filler screw (2).

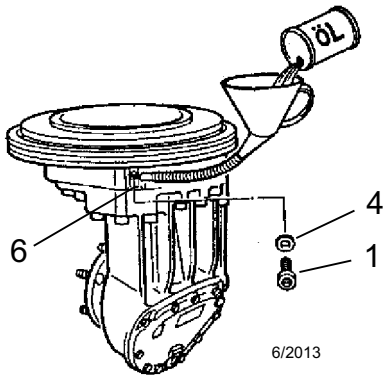
Changing the gear oil

Continued



4. Unscrew the oil drainage screw (3) with a hexagon socket screw key (spanner size 6) and drain off the oil.

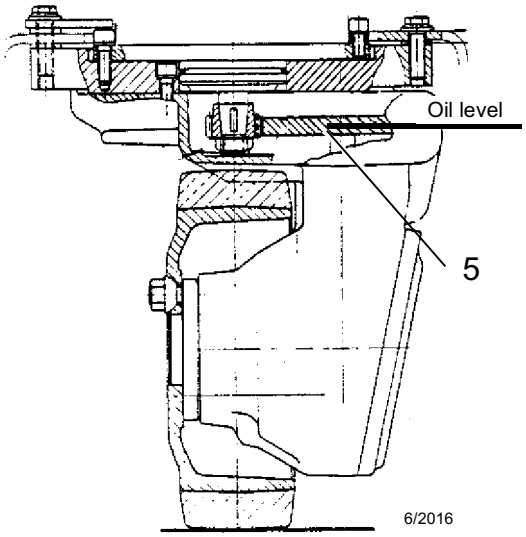
Caution:
Risk of scalding!
The oil can reach a temperature of up to 80°C.



5. Clean the magnet at the oil drainage screw (3) an screw it in with a new sealing ring, Id. no. W8 006 172 (2).

Note:
Tightening torque for oil filler cap (1) and drainage screw (3) M_A= 22Nm.

6. Fill with new gear oil up to the lower edge of the filler hole (6).



Remark:
The gear oil can also be poured in or checked through the upper gear opening (drive motor removed, see sheet A4/5).
When the oil level is correct, the spur gear (5) should be submerged in the oil by about 1/3 of its height.

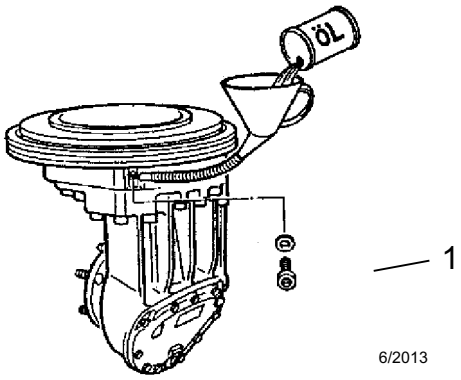
7. Screw in the oil filler cap (1) with a new sealing ring, Id. no. W8 006 172 (4).

Checking the oil level

Option 1

1. Remove the oil filler cap (1).

2. Touch test through the threaded hole of the filler cap. The gear oil level must be at the lower edge of the filler hole. Top up if necessary.



Option 2

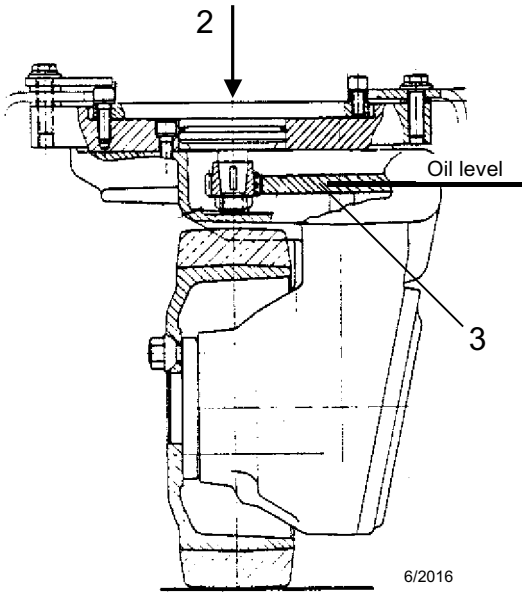
1. Pull out the battery plug (A5).

2. Remove the drive motor (A5). The brake and connector cable do <u>not</u> have to be disconnected and removed!

3. Check the level of the gear oil through the gear opening (2).

   When the oil level is correct, the spur gear (3) should be submerged in the oil by about 1/3 of its height.

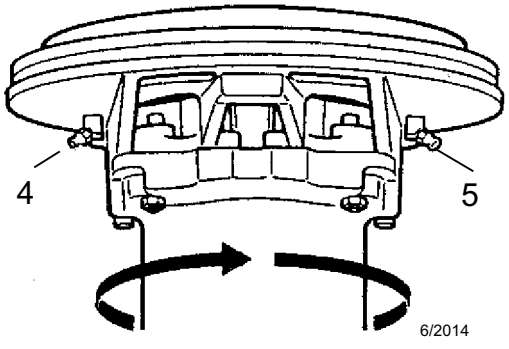
4. Install the drive motor (see sheet A5).



<u>Remark:</u>
If the vehicle has an EASS option (automatic braking at the end of aisle), the incremental encoder must be removed.

Lubricating the bogie bearing

The bogie bearing should be lubricated twice a year through the two lubricating nipples 4 and 5, which are located at opposite sides. It is particularly important to do this after the gear has been cleaned (e.g. with a steam jet).



Grease type: all-purpose grease

Amount of grease for dry bearing: ca. 50 g

Contents **Sheet no.**

Block diagram

Standard electrical steering system