SERVICE MANUAL

HR120C-9 (canopy)

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Chapter 1

Machine Designation, Manufacturer, Vehicle Identification Number Technical Dimension Units

- **Contents**
  - This chapter will inform you about:
  - the machine type, the manufacturer
  - the vehicle identification number
  - dimension units and conversion tables

1.1 Machine Designation, Application and Manufacturer

Designation	Type
HYUNDAI Rollers	HR120C-9
Application	
The HYUNDAI compaction rollers serve to compact soil.	
Designated use:	
The compaction roller may only be used for the purposes and work specified in the operating manual. Any use of the machine for further purposes is considered as misuse and is not permitted.	

1.1.1 Manufacturer

Manufacturer's name
ATLAS WEYHAUSEN F. Weyhausen GmbH & Co. KG Maschinenfabrik
Address:
27793 Wildeshausen, Visbeker Straße 35 (Germany)
Communication:
Phone: +49 (0) 4431 981-0 Fax: +49 (0) 4431 981-139 e-mail: info@f-weyhausen.de Web: www.atlaswalzen.com

1.1.2 Distributor

Distributor, Adderss
Hyundai Heavy Industries co., Ltd. 1000, Bangeojin sunhwan-doro, Dong-Gu, Ulsan, 682-792, Korea

1.1.3 Type plate and vehicle identification number on HYUNDAI rollers HR120C-9

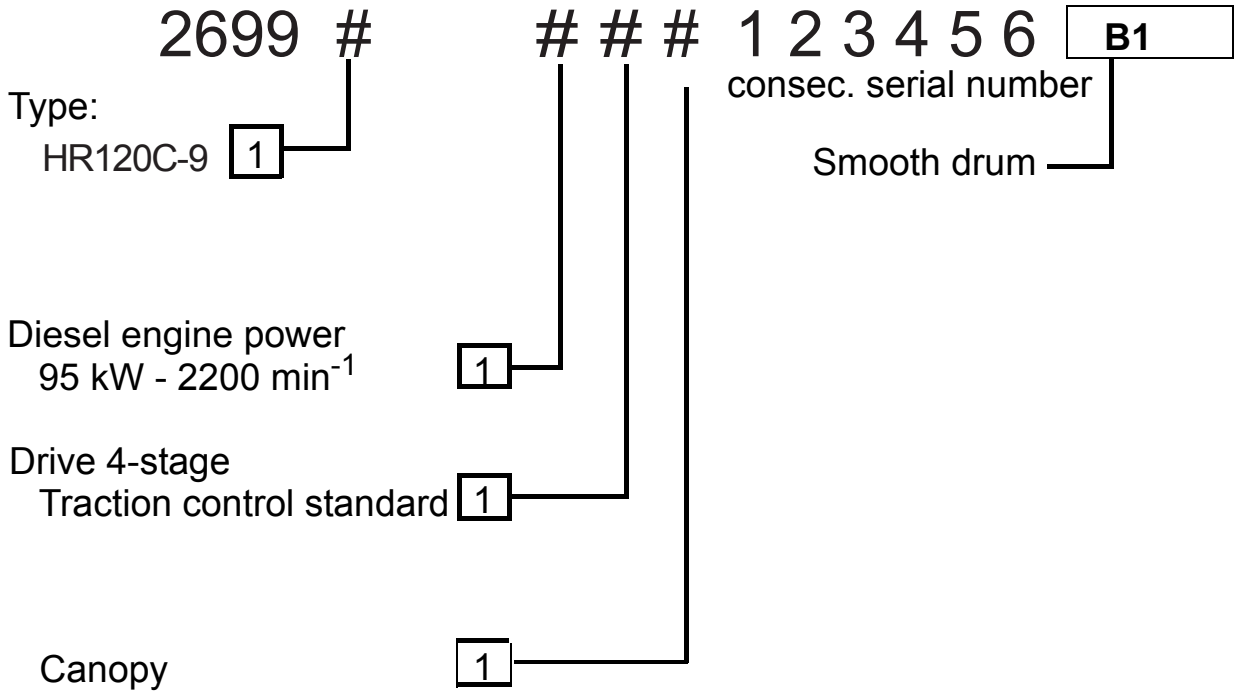
Type plate designations

2 6 9 9 X X X X 1 2 3 4 5 6

The vehicle identification number (1) contains codes **X** to identify special vehicle equipment, a serial number and the drum type.

The vehicle identification number (1) i s shown on the type plate (2); in addition, it has been engraved on the basic frame.

Vehicle identification number key



1.1.4 Designation of the legal dimension units

Metric	Inch
25.40 mm	1 in (inch)
1 kg (kilogram)	2.205 lbs (pounds)
1.356 Nm (1 kpm)	7.233 lbf x ft (pound force foot)
1.356 Nm (0.138 kpm)	1 lbf x ft (pound force foot)
1 kg / cm	5.560 lbs / in (pound per inch)
1 bar (1.02 kp/cm^2)	14.233 psi (pounds force per square inch lb/in^2)
0.070 bar (0.071 kp/cm^2)	1 psi (lb/in2)
1 Liter	0.264 Gallon (Imp.)
4.456 Liter	1 Gallon (Imp.)
1 Liter	0.220 Gallon (US)
3.785 Liter	1 Gallon (US)
1609.344 m	1 Mile (land mile)
0° C (Celsius)	+ 32° F (Fahrenheit)
0° C (Celsius)	273.15 Kelvin

1.1.5 Tightening torques (in Nm) for screws

ISO metric standard thread DIN 13, sheet 13			
Dimension	**8.8**	**10.9**	**12.9**
M4	2.8	4.1	4.8
M5	5.5	8.1	9.5
M6	9.5	14	16.5
M7	15	23	28
M8	23	34	40
M10	46	68	79
M12	79	115	135
M14	125	185	215
M16	195	280	330
M18	280	390	460
M20	390	560	650
M22	530	750	880
M24	670	960	1100
M27	1000	1400	1650
M30	1350	1900	2250
M33	1850	2600	3000
M36	2350	3300	3900
M39	3000	4300	5100

ISO metric fine thread DIN 13, sheet 13			
Dimension	**8.8**	**10.9**	**12.9**
M8 x 1	24	36	43
M9 x 1	36	53	62
M10 x 1	52	76	89
M10 x 1.25	49	72	84
M12 x 1 .25	87	125	150
M12 x 1.5	83	120	145
M14 x 1.5	135	200	235
M16 x 1.5	205	300	360
M18 x 1.5	310	440	520
M18 x 2	290	420	490
M20 x 1.5	430	620	720
M22 x 1.5	580	820	960
M24 x 1.5	760	1100	1250
M24 x 2	730	1050	1200
M27 x 1.5	1100	1600	1850
M27 x 2	1050	1500	1800
M30 x 1.5	1550	2200	2550
M30 x 2	1500	2100	2500
M33 x 1.5	2050	2900	3400

ISO metric fine thread DIN 13, sheet 13			
Dimension	**8.8**	**10.9**	**12.9**
M33 x 2	2000	2800	3300
M36 x 1.5	2700	3800	4450
M36 x 3	2500	3500	4100
M39 x 1.5	3450	4900	5700
M39 x 3	3200	4600	5300

NOTE!

Friction coefficient: μ tot. = 0.12 for screws and nuts without posttreatment and phosphated nuts. **Tighten by hand!**

Chapter 2

Technical Specifications

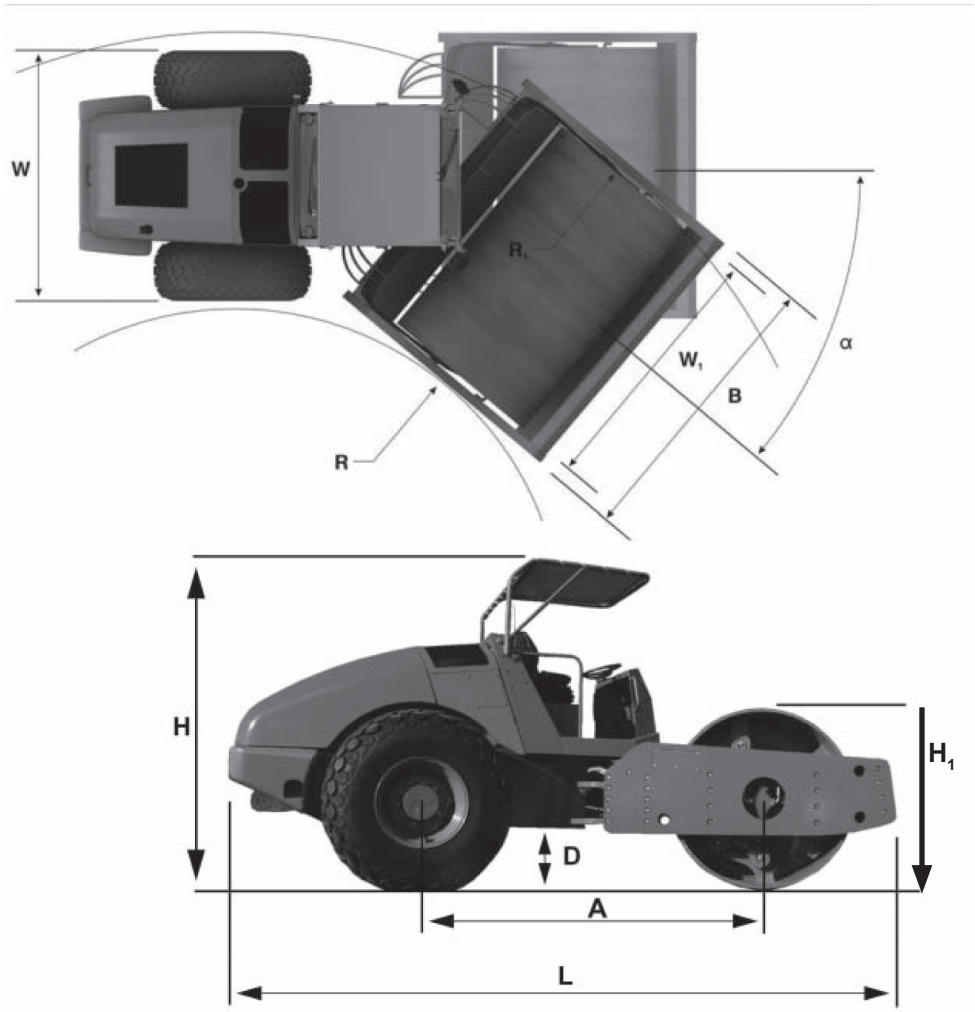
- **Contents**
  - This chapter will inform you about:
  - technical specifications
  - dimensions
  - filling quantities of fluids and lubricants

2.1 Technical Specifications Compaction Roller PF 2699

2.1.1 Operating data

Compaction roller with smooth drum	**HR120C-9**
General data:	
Service weight	12000 kg
Axle load, front	6900 kg
Axle load, rear	5100 kg
Compaction capacity:	
Static linear load	32.80 kg/cm
Amplitude high / low	1.8/0.6 mm
Frequency with high / low amplitude	30/40 Hz
Centrifugal force with high / low amplitude	240/140 kN
Drum:	
Drum width	2100 mm
Drum diameter	1500 mm
Drum thickness	30 mm
Transmission / Drive:	
Speed	0-12 km/h
Pendulum angle	+/- 12 degrees
Gradeability with / without vibration	48% / 52%

2.1.2 Dimensions



Dimensions

Dimensions with smooth drum	in mm
A	3195
B	2270
D	490
H	3200
H_1	1500
L	5757
R	4860
R_1	7015
W	2090
W_1	2100
α	+ / - 30 degrees

2.1.3 Tires (with smooth drum)

HR120C-9	
Standard	23.1-26

2.1.4 Fill levels

HR120C-9	in liters
Fuel tank	300
Hydraulic tank	106

2.1.5 Diesel engine

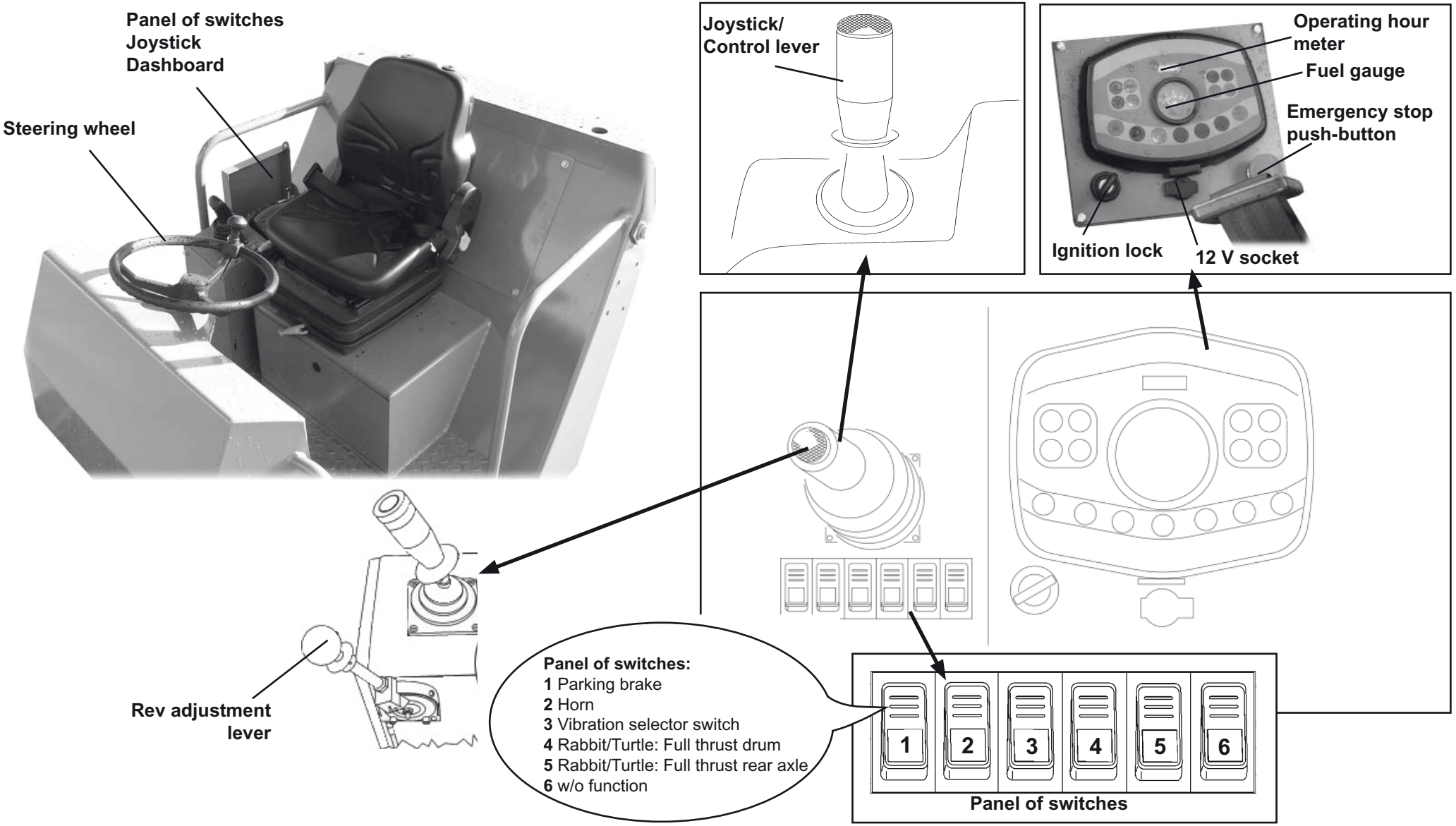
HR120C-9	
Make	Deutz BF4M 2012 C
Nominal output	95 kW (129 HP)

Chapter 3

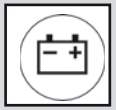
Control Elements & Displays

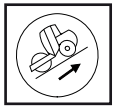
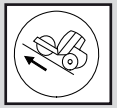
- **Contents**
  - This chapter will inform you about:
  - the arrangement of the control elements & displays
  - the control lever functions
  - and functions for roller operation

3.1 Control elements and Displays

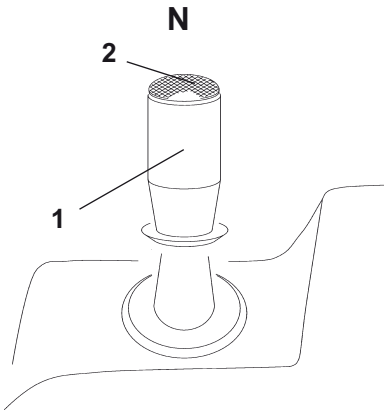


3.1.1 Displays Dashboard

Symbol	Function	Description
	**Display forward motion (green)**	Activation (light) indicates that the compaction roller is moving forward.
	**Display reverse motion (green)**	Activation (light) indicates that the compaction roller is moving backward.
	**Warning light parking brake (red)**	Light indicates the activation of the parking brake. The Diesel engine can only be started with the parking brake applied. Driving is not possible with the parking brake applied.
	**Warning light charge control (red)**	Light indicates that the ignition is activated. Fades as soon as the Diesel engine and the generator have started.
	**Warning light brake pressure (red)**	Indicates that the hydraulic oil pressure of the brake system is insufficient.
	**Diesel engine oil temperature (red)**	If this lamp lights up, immediately stop the compaction roller and let the Diesel engine idle until the oil cools down! See Deutz operating manual.
	**Diesel engine oil pressure (red)**	If this lamp lights up during operation, immediately stop the Diesel engine!

Symbol	Function	Description
	**Coolant fill level Diesel engine (red)**	Indicates an insufficient level of coolant (see maintenance instructions).
	**Dual display: dirty fuel filter/air filter**	If this lamp lights up, clean or replace the filter in question.
	**Display high amplitude (yellow)**	Indicates that "**high** amplitude" has been selected by means of the switch "soil compaction" on the panel next to the control lever.
	**Display low amplitude (yellow)**	Indicates that "**low** amplitude" has been selected by means of the switch "soil compaction" on the panel next to the control lever.
	**Display full thrust drum (green)**	Lights up whenever the left "rabbit/turtle" button on the panel of switches is set to "full thrust drum".
	**Display full thrust axle (green)**	Lights up whenever the right "rabbit/turtle" button on the panel of switches is set to "full thrust axle".

3.1.2 Control lever/Joystick



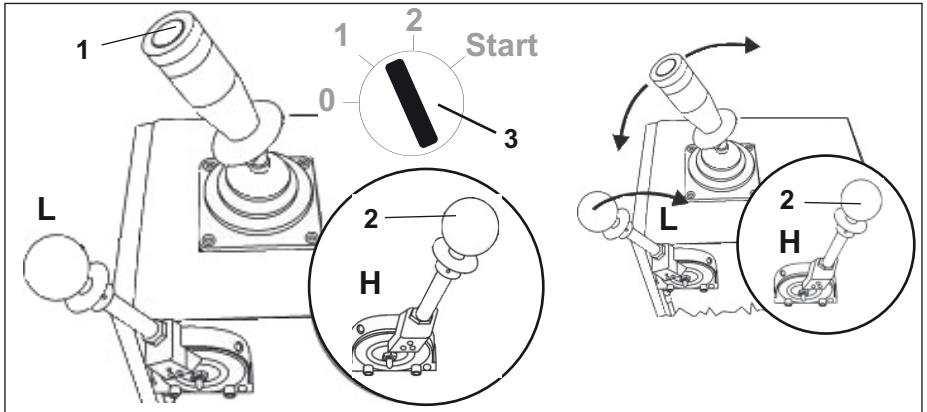
- Use the joystick (**1**) to set the direction of motion and the speed of the compaction roller.
- The button (**2**) on the joystick serves to activate and deactivate the vibration.

NOTE!

Speed of the compaction roller!

- The further you move the joystick into the desired direction of motion, the higher the speed of the vehicle.
- As soon as the end position of the joystick is reached, the maximum speed of the compaction roller has been reached as well.
- The compaction roller stops if it is set to the neutral position **N**.

Starting the Diesel engine and setting the engine speed



- The engine speed is adjusted by means of the rev adjustment lever (**2**). The required number of revolutions depends on the purpose of your operation, i.e. whether you intend to put the vehicle to use as a compactor (work) or you just want to drive it (without compaction).The rev adjustment lever (**2**) disposes of two notch positions:
  - **Pos. 1**: Start/stop: idle speed (**L**)
  - **Pos. 2**: Driving/working: max. speed (**H**)
- For maximum driving speed, drive at full throttle, with the two “turtle/rabbit“ switches set to position b (see 3.1.4). In order to drive slowly, set to idle speed. The lowest driving speed is reached if you additionally press down the “turtle/rabbit“ switches at the top (position a).
- If the lever is not actuated for a while, it will eventually move back to idle speed.

- In order to start the Diesel engine, make sure the joystick (**1**) is in the central (neutral) position. It may not be operated during the starting procedure. Make sure the parking brake is applied.
- Insert the ignition key in the ignition lock (**3**) and turn the key to the first stage in order to activate the ignition. The parking brake symbol lights up on the dashboard.

Starting a cold engine:

When starting, do not fully accelerate!

- To start the Diesel engine, turn the ignition key further, to the limit stop, and wait until the engine starts. As soon as the engine has started, release your grip on the ignition key. Shift the rev adjustment lever to the L position.

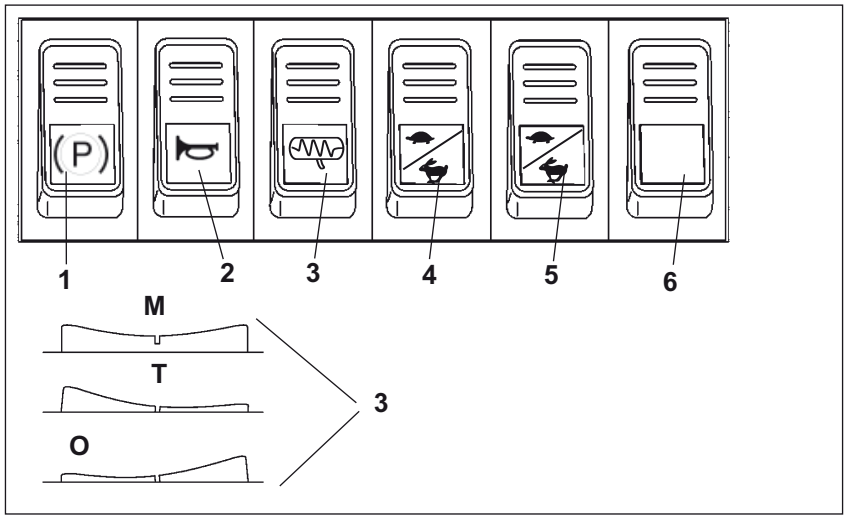
CAUTION!

A warming-up phase of ***10 minutes*** with the Diesel engine running at idle speed is required prior to driving the compaction roller or to carrying out any movements of the attachments! The functions of the hydraulic system are not available before the hydraulic oil has sufficiently warmed up!

Starting a warm engine:

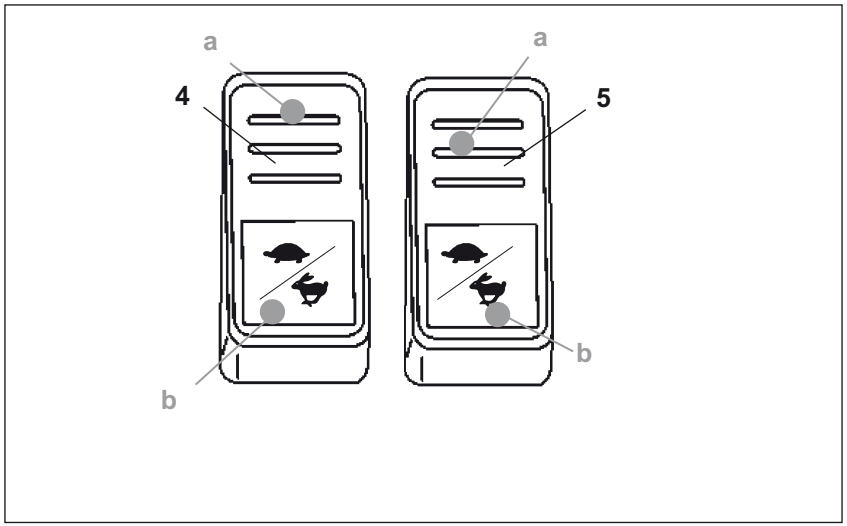
- In order to start the Diesel engine, turn the ignition key to the limit stop, and wait until the engine starts. As soon as the Diesel engine has started, immediately release your grip on the ignition key. **The compaction roller is now ready for operation.**

3.1.3 Panel of switches



1 Parking brake
2 Horn
3 Vibration selector switch
4 “Rabbit/Turtle“: Full thrust drum
5 “Rabbit/Turtle“: Full thrust rear axle
6 w/o function

3.1.4 Selecting the mode of operation



There are two modes of operation, which are selected by means of the two “rabbit/turtle“ switches.

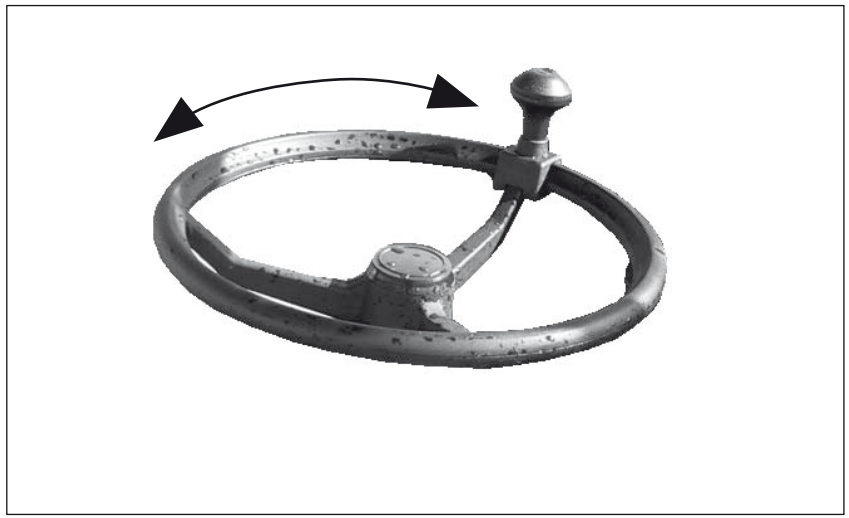
Left “rabbit/turtle“ key (**4**):

- If the top of the switch is pressed down (position **a**), maximum thrust is made available to the drum while the machine is set to a slow speed.
- If the bottom of the switch is pressed down (position **b**), the machine is set to a fast speed but the thrust of the drum is reduced accordingly.

Right “rabbit/turtle“ key (**5**):

- If the top of the switch is pressed down (position **a**), maximum thrust is made available to the axle while the machine is set to a slow speed.
- If the bottom of the switch is pressed down (position **b**), the machine is set to a fast speed but the thrust of the axle is reduced accordingly.
- Changing the mode of operation with the vehicle in motion is possible.

3.1.5 Setting & changing the direction of motion

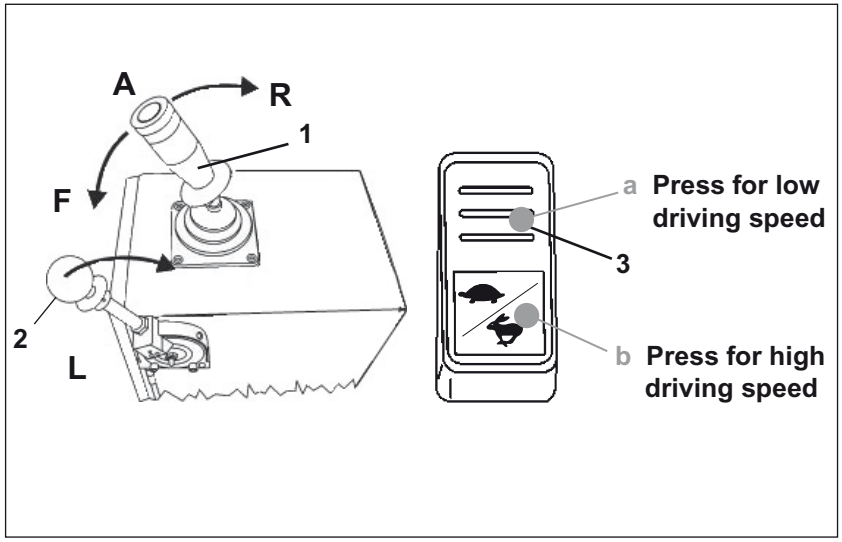


Turn the steering wheel (**7**) in the desired direction of motion.

- Turning the steering wheel to the right causes the compaction roller to turn right.
- Turning the steering wheel to the left causes the compaction roller to turn left.

3.2 Roller functions: Driving & working

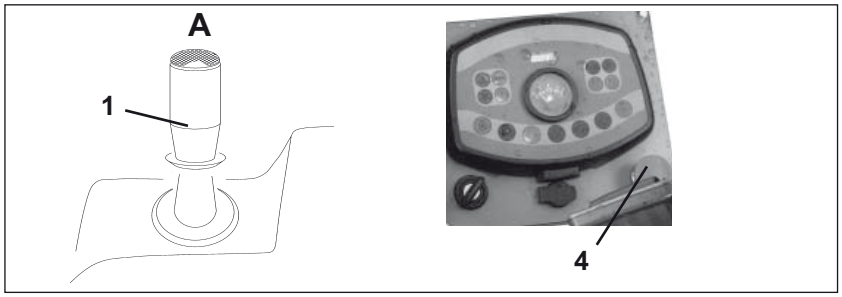
3.2.1 Operation without vibration: Driving the compaction roller



NOTE!
In order to drive the compaction roller without vibration, the Diesel engine speed needs to be set to maximum speed.

- Set the highest Diesel engine speed by means of the rev adjustment lever (2).
- In order to drive slowly, set both “rabbit/turtle“ switches (3) on the panel of switches to position a, i.e. press them down at the top. In order to drive fast, set both “rabbit/turtle“ switches (3) to position b, i.e. press them down at the bottom. Release the parking brake.
- Make sure the vibration selector switch is set to the central position and the vibration mode is deactivated.
- Slowly move the joystick (1) from the central position (**A**) in the desired direction of motion:
  - **Forward motion** of the compaction roller: Move the joystick forward (**F**).
  - **Reverse motion** of the compaction roller: Move the joystick backward (**R**).
- The more you move the joystick (1), the faster the motion of the compaction roller.
- In order to change the direction of motion while driving, turn the steering wheel. The compaction roller will bend at the articulated joint and move in the desired direction.

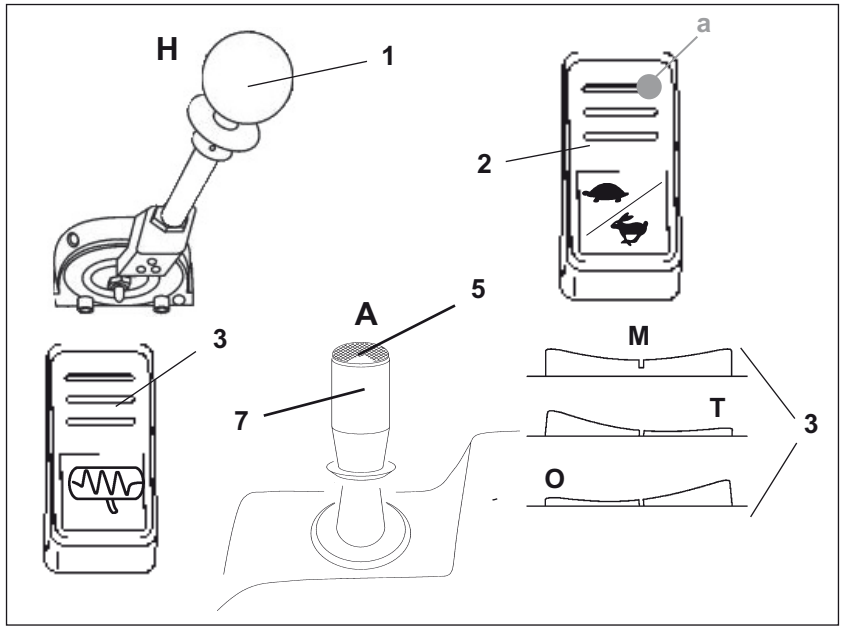
3.2.2 Operation without vibration: Stopping the compaction roller



- Moving the joystick (**1**) to the central position **A** causes the compaction roller to stop.
- As soon as the joystick (**1**) is in the central position, the stopping procedure must be initiated.

CAUTION!
If the compaction roller does not stop although the joystick is in the central position or if an emergency situation calls for an immediate standstill of the compaction roller, push the emergency stop push-button (**4**)!

3.2.3 Operation with vibration: Driving the compaction roller

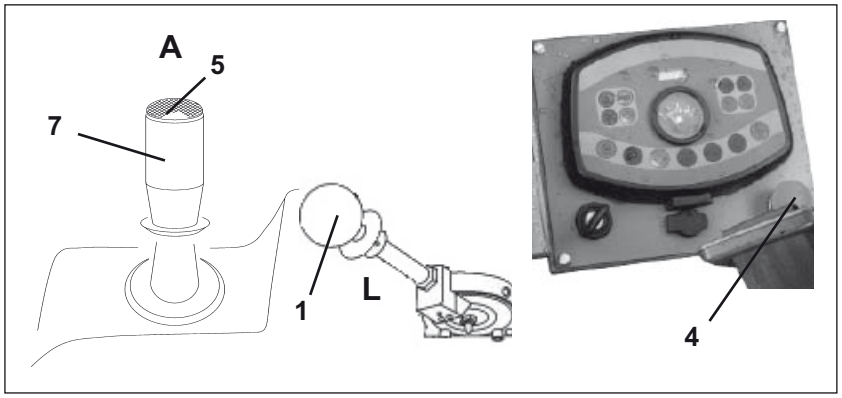


- Move the rev adjustment lever (1) to the **H** position.
- Make sure both “rabbit/turtle“ switches (2) on the panel of switches are set to (i.e. pressed down at) position a.
- Release the parking brake by means of the corresponding switch.
- Use the selector switch (3) to select the desired type of compaction:
  M Middle position: Vibration off
  T Right side pressed down: Deep compaction
  O Left side pressed down: Surface compaction

NOTE!
Selecting the type of vibration does not activate the vibration itself. In order to do so, press the button on the top of the joystick (5).

Slowly move the joystick (7) from the central position (**A**) in the desired direction of motion:
  - **Forward motion** of the compaction roller: Move the joystick forward (**F**).
  - **Reverse motion** of the compaction roller: Move the joystick backward (**R**).
- The more you move the joystick, the faster the motion of the compaction roller.
- In order to change the direction of motion while driving, turn the steering wheel. The compaction roller will bend at the articulated joint and move in the desired direction. The vibration does not have to be deactivated for any changes of direction.

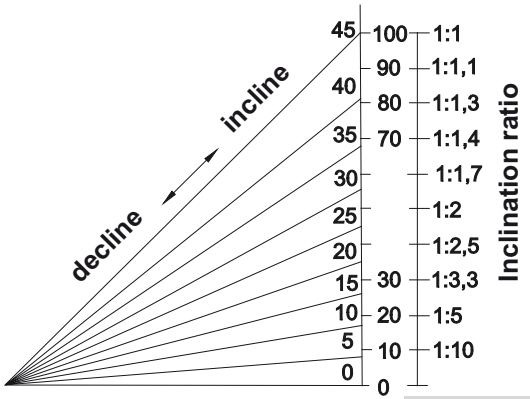
3.2.4 Operation with vibration: Stopping the compaction roller



- Deactivate the vibration by pushing the button (5) on the top of the joystick (7). The previously set mode of
  vibration remains selected.
- Moving the joystick (7) to the central position **A** initiates the brake application, which causes the vehicle to stop.
- Move the rev adjustment lever (1) to position **L**.

CAUTION!
If the compaction roller does not decelerate and stop although the joystick is set to the central position or if an emergency situation calls for an immediate standstill of the compaction roller, push the emergency stop push-button (**4**)!

3.2.4 Driving on slopes



Maximum gradeability*

a) with compaction: 45%
b) w/o compaction: 48%

*depending on the surface

DANGER!

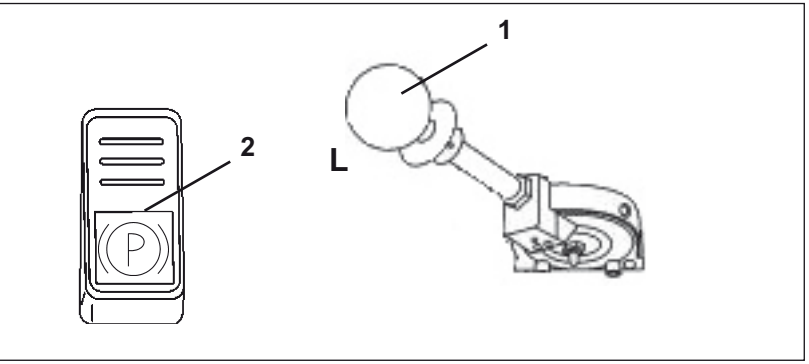
Danger of tipping!

Never drive or park the compaction roller across slopes, as operation involving lateral inclinations increases the danger of tipping. Never turn the vehicle around on a slope! Take the maximum climbing ability (gradeability) of the compaction roller into account.

- To drive downhill or uphill, set the highest Diesel engine speed and make sure the “rabbit/ turtle“ switches are set to position **b**.

- **Driving uphill:**
  a) with the roller drum ahead:
  Forward motion required; the roller drum needs to point uphill, in the direction of motion.
  b) with the rear end ahead:
  Reverse motion required, with the rear of the compaction roller pointing uphill, in the direction of motion.
- **Driving downhill:**
  Reverse motion is required, with the rear end of the compaction roller pointing downhill, in the direction of motion.

3.2.5 Stopping and parking the compaction roller



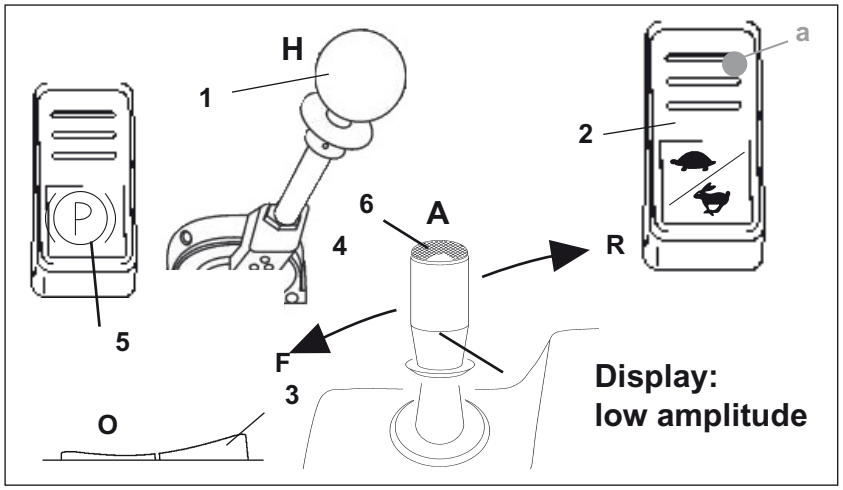
- Make sure you always park the vehicle on level, solid grounds, which need to be able to carry the weight of the compaction roller without sagging.
- Stop the compaction roller (with or without vibration, see instructions above).
- Move the rev adjustment lever (**1**) to the **L** position.
- Activate the parking brake (**2**).
- Turn the ignition key to the 0-Position and pull it out of the ignition lock.
- Secure the vehicle against rolling by means of wheel chocks.

WARNING!

If you intend to park the compaction roller in areas that are part of public road service, be sure to observe the applicable regulations, safety guidelines and laws!

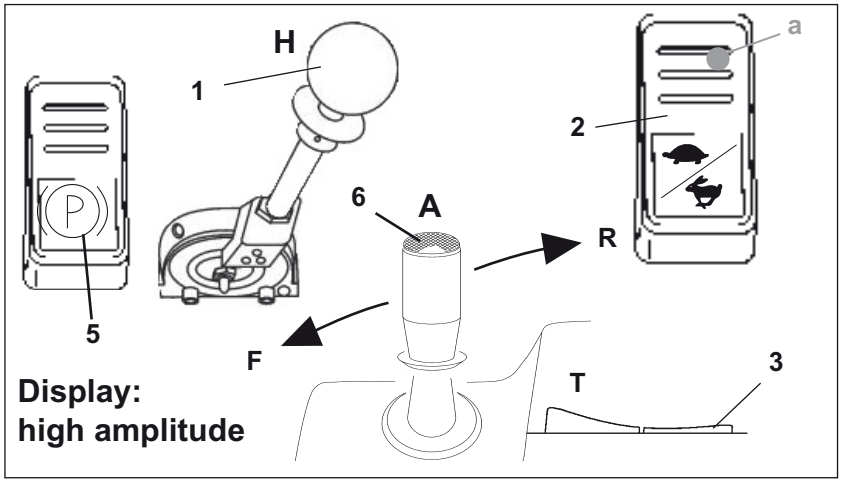
3.2.6 Working with the compaction roller: Soil compaction

Surface soil compaction



- Move the rev adjustment lever (1) to position **H**.
- Make sure both “rabbit/turtle“ switches (2) on the panel of switches are set to position **a**.
- Release the parking brake (5).
- The vibration selector switch (3) needs to be pressed down on the left (position **O**) to
- activate surface soil compaction.
- Slowly move the joystick (4) from the central position **A** to the desired direction of motion
- (**F** or **R**). The farther you move the joystick, the faster the speed of the vehicle.
- In order to activate the vibration, push the button (6) on the top of the joystick.

Deep soil compaction



- Move the rev adjustment lever (1) to position **H**.
- Make sure both “rabbit/turtle“ switches (2) on the panel of switches are set to position **a**.
- Release the parking brake (5).
- The vibration selector switch (3) needs to be pressed down on the right (position **T**) to activate deep soil compaction.
- Slowly move the joystick (4) from the central position **A** to the desired direction of motion (**F** or **R**). The farther you move the joystick, the faster the speed of the vehicle.
- In order to activate the vibration, push the button (6) on the top of the joystick.

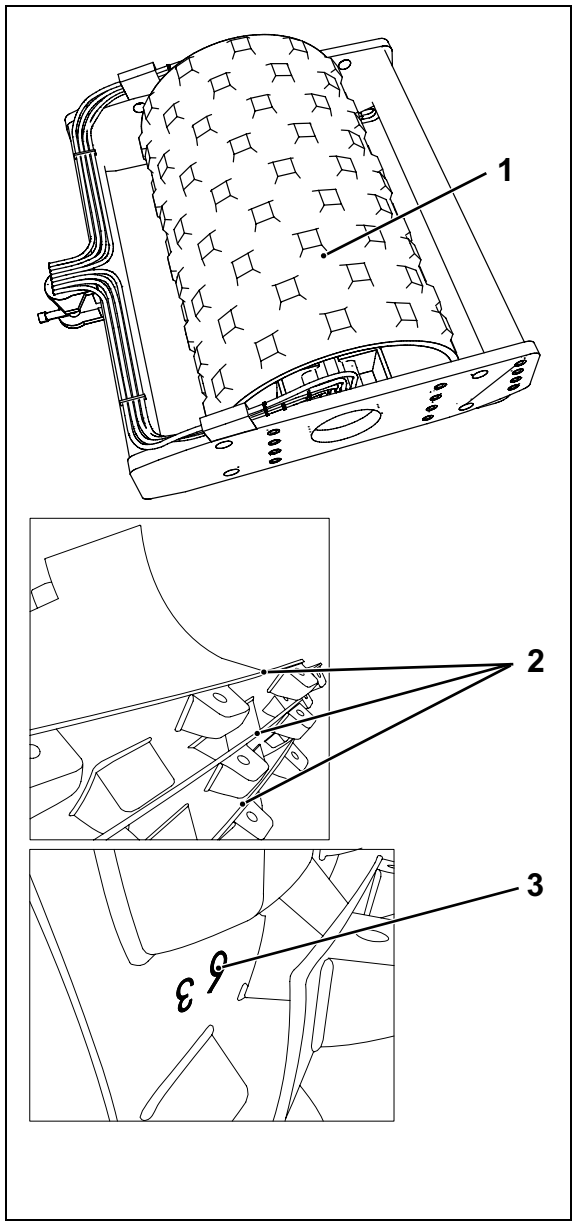
Chapter 4

Optional equipment & accessories*

- Contents
- This chapter will inform you about:
  - conversion from a smooth drum to a pad foot drum
  - adjustment and conversion of the scrapers
  - the use and installation of a compaction measurement system

*** available from the manufacturer on request**

4.1 Conversion from a smooth roller drum to a pad foot drum



Safety instructions referring to work with the compaction roller

NOTE!

Obligatory information!

- Inform yourself of all issues related to operating the compaction roller.
- A crane with a lifting capacity of at least 8 tons is required to retrofit the compaction roller and convert to a pad foot drum.

Converting from a smooth drum to a pad foot drum

- A retrofit kit containing three pad foot segments is available for using the compaction roller with a pad foot drum (1).

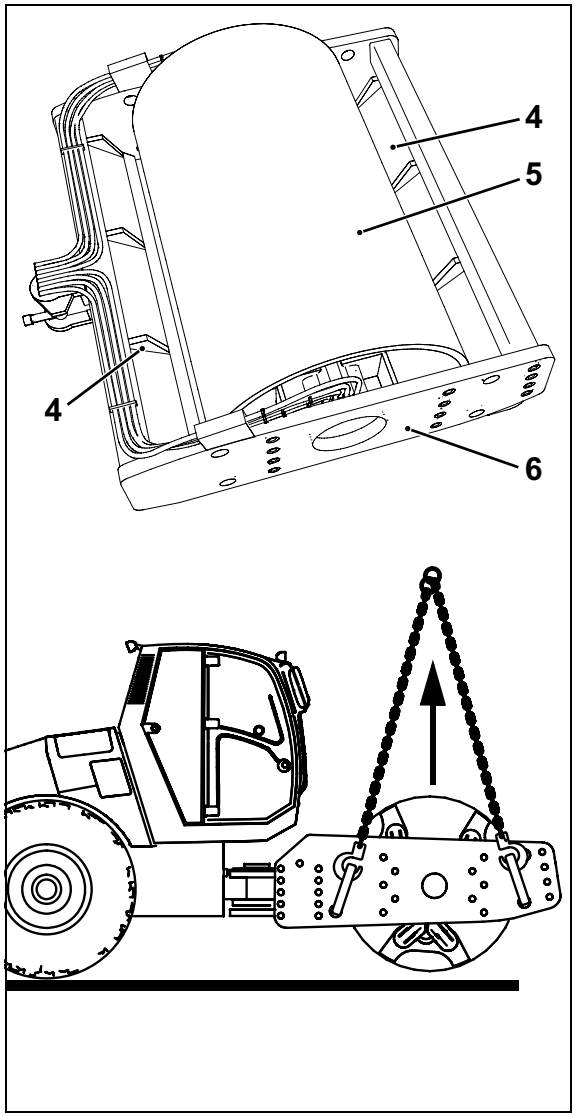
Labeling of the pad foot segments

- Each of the three pad foot segments (2) is individually labeled next to the split pad feet (3).

NOTE!

- Observing the following instructions and maintaining the correct sequence of actions is of vital importance in order to mount the three pad foot segments (PD shells).
- Pay close attention to the labeling (3) of the segments (2) and the correlation of the serial numbers.
- Only appropriately labeled pad foot segments (2) with identical serial numbers match up for this particular compaction roller.

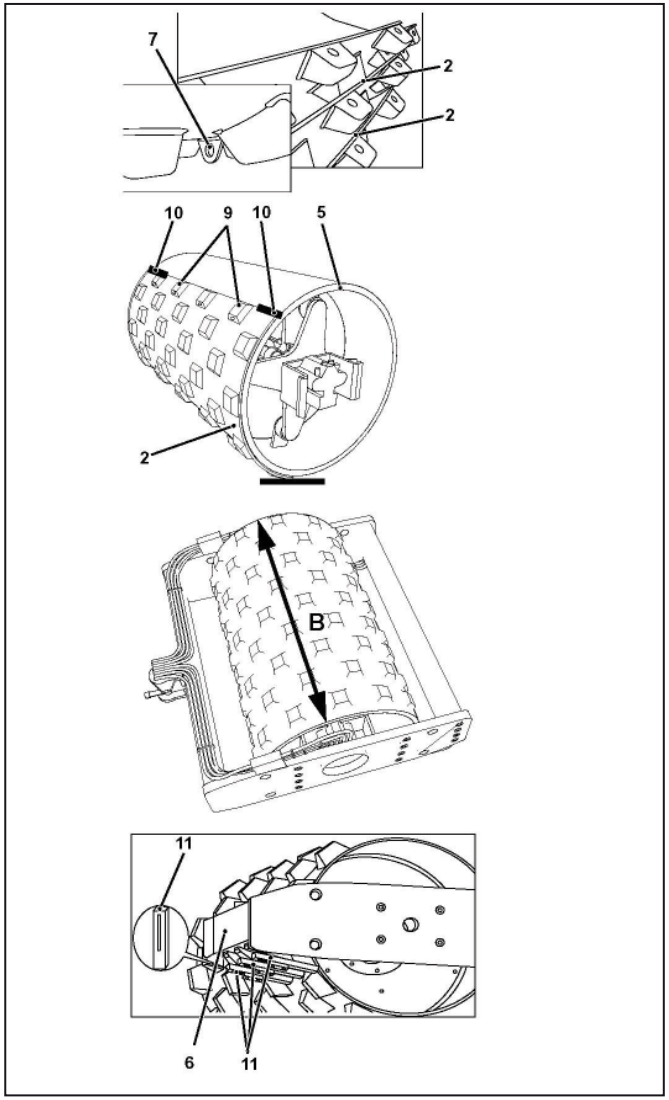
4.1.1 Preparing the smooth roller drum



Removing the attached parts from the smooth roller drum

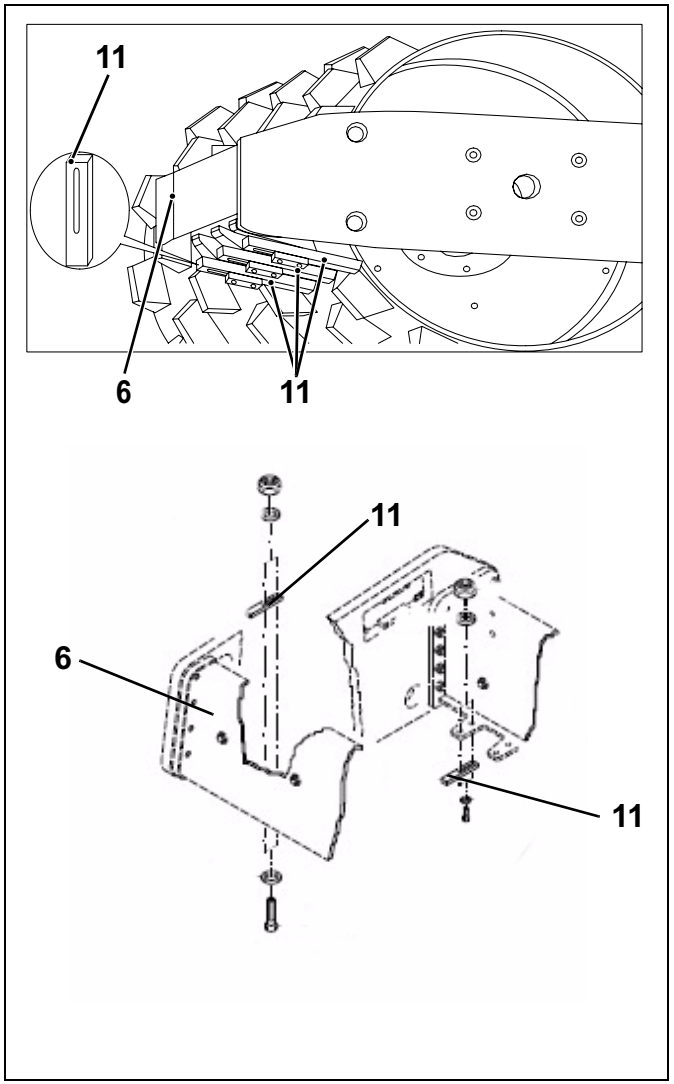
- Remove the front and rear scrapes (4) from the smooth drum (5)
- Make sure the roller frame (6) is securely fastened by appropriate tie-down equipment before lifting it by means of a crane. The lifting height is sufficient if a pad foot segment can be placed under the smooth roller drum (5).
- Prior to starting work, place supporting struts under the drum frame.
- Use a high-pressure cleaner to clean the smooth roller drum (5).

4.1.2 Mounting the pad foot segments



- Use a crane to lift the first segment (2) at the lifting lug (7) and to place it onto a transport vehicle at the lifting lugs. Drive the transport vehicle under the smooth roller drum (5), put down the segment (2) and adjust its position.
- Lower the roller frame (6) by means of the crane and place the smooth roller drum (5) on the segment (2). Remove the tie-down equipment.
- Advance the compaction roller until the smooth roller drum (5) rests only on the rear edge (8) of the first segment (2).
- Lift the second segment at the lifting lug (7). Place it on the top of the smooth roller drum (5), adjust it and connect it to the first segment (2) by bolting them together at the junctions (9).
- Use clamps (19) to attach the loose edge of the second segment to the smooth roller drum (5).
- Make sure there is enough space between the mounted segments and the roller frame.
- Back up the compaction roller until the bare part of the surface of the smooth roller drum (1) points upward, rendering it possible to mount the third segment (2).
- Attach the third segment (2). Connect it to the first and the second segment (2) by bolting them together at the junctions (9).
- Tighten all screws at the junctions evenly (9) along the entire width of the roller (B).
- Repeatedly drive the compaction roller forward and backward so the segment junctions point upward.
- Check all screw connections at the junctions (9) and tighten them (tightening torque: 660 Nm).
- Install the corresponding pad foot scrapers (11) in order to use the drum as a pad foot roller (6).
- After approx. 10 hours of operation, check all screws again. If necessary, tighten them.

4.1.3 Mounting scrapers for the pad foot drum



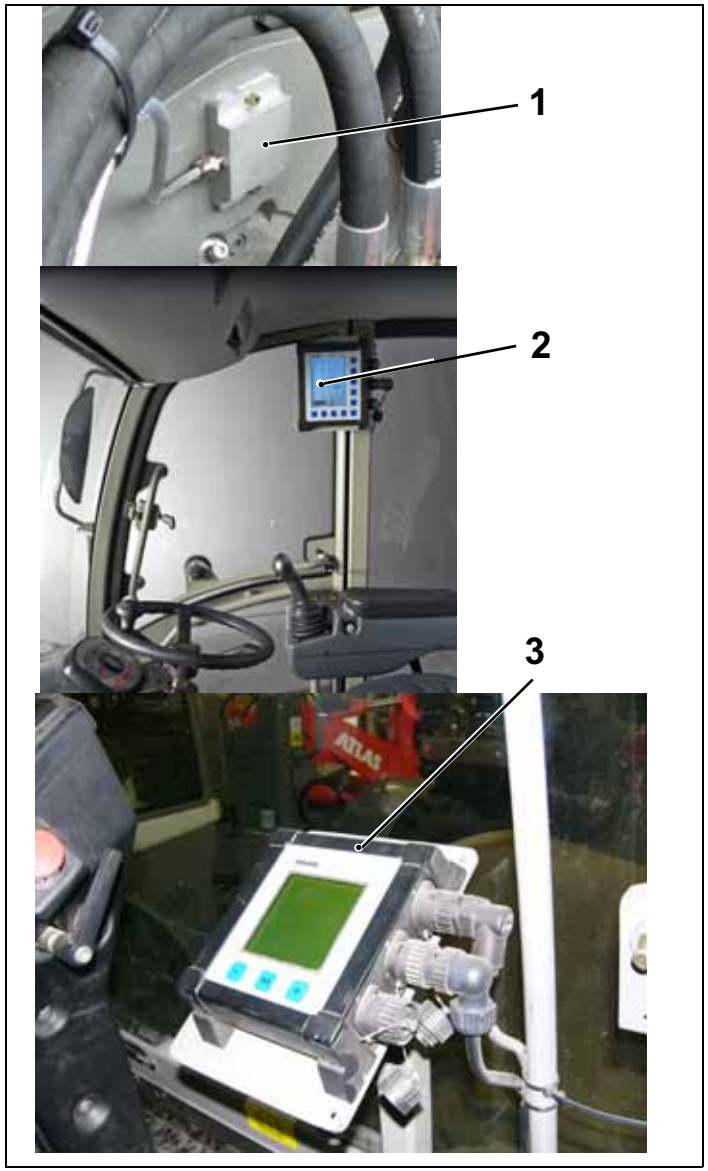
- Attach the PD scrapers (11) to the drum frame (6).

Checking the screw connections

NOTE!

After about 10 hours of operati on with the pad foot segments, check all screw connections again.
If required, retighten them to a torque of **660 Nm**.

4.2 Compaction measurement system



- If the compaction roller is equipped with a compaction measurement system (option), the vibration or the acceleration of the drum is measured. These values are established by a sensor (1) on the drum and passed on to a computer unit (2, 3).
- The computer unit transmits the vibration values to a display in the driver's compartment. The values for compaction and vibration are available to the driver (display 2, 3) at all times.

NOTE!

- The compaction measurement system determines the measured values and informs the driver about the compaction.
- There is no interference with the operating procedure of the compaction roller.

1. Sensor on the drum
2. Compaction measurement system with documentation (data storage)
3. Compaction measurement system with digital display only

4.2.1 Variants of the compaction measurement system

Compaction measurement system with documentation (data storage)

- In addition to displaying the current information regarding vibration and compaction, this type of measurement system is able to gather, record and save all the respective information available, once operation has started.
- The memory capacity allows you to record approx. one week of work on the site.
- The data is recorded per track, which ensures reliable recordings even for complex construction measures and intricate maneuvering.
- The data thus retrieved can be transferred to a personal computer and evaluated by means of special software.

NOTE!

- From an economic point of view, the most relevant advantages of compaction measurement with storage function are: quality enhancement of the operation as a result of controlled compaction and the documentation of the results both for the contractor and the customer.

Analysis and evaluation of the data

- The data of the entire construction project can be graphically displayed and printed as an overview.
- Areas of the image that show values smaller than a preset limit value are marked in red.
- The overview screen can be gradually enlarged in order to display certain parts in greater detail.
- Not only can each roller track be marked separately, but it is possible to display and print the individual tracks as line diagrams.
- A movable cursor serves to compare the results of various tracks and transitions. The values can easily be calibrated with the results of selective standard test runs.

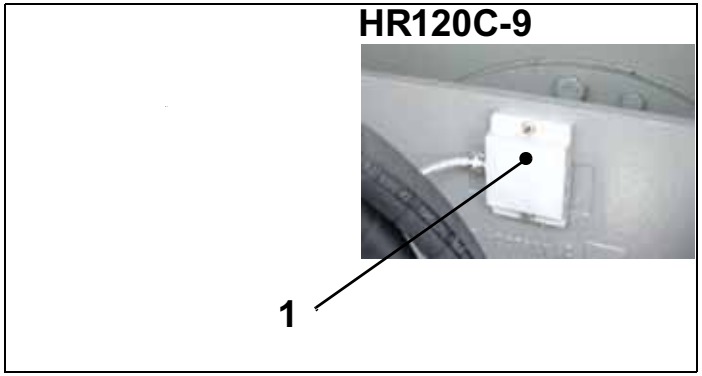
Compaction measurement system with digital display

- The compaction measurement system with track and pressure function and digital display enables you to control the compacting process.

  However, recording the data for subsequent analysis is not possible with this type of system.
- **Display:**
  - Informs you of the current compaction results (LARGE mode) and the compaction progress with the current position of the roller in the track and its reference to the nominal compaction value (TRACK mode).
  - The display of smaller values can be gradually enlarged.
- **Compaction information:**
  - the higher the compaction of the soil, the higher the value.
  - a fixed value signals to the machine operator that sufficient compaction has been reached (bar graph and digital values).
- **Jump:**
  - Vehicle starts to jump because of operation on soil that is over-compacted.
- **Amplitude:**
  - vertical vibration of the drum (in mm).
- **Frequency:**
  - the current frequency of the vibration system (in Hz).
- **Traveling speed:**
  - Display in km/h
- **Track:**
  - display of the compaction progress in the track, of the current position in meters and of the nominal value (displayed as a broken line).

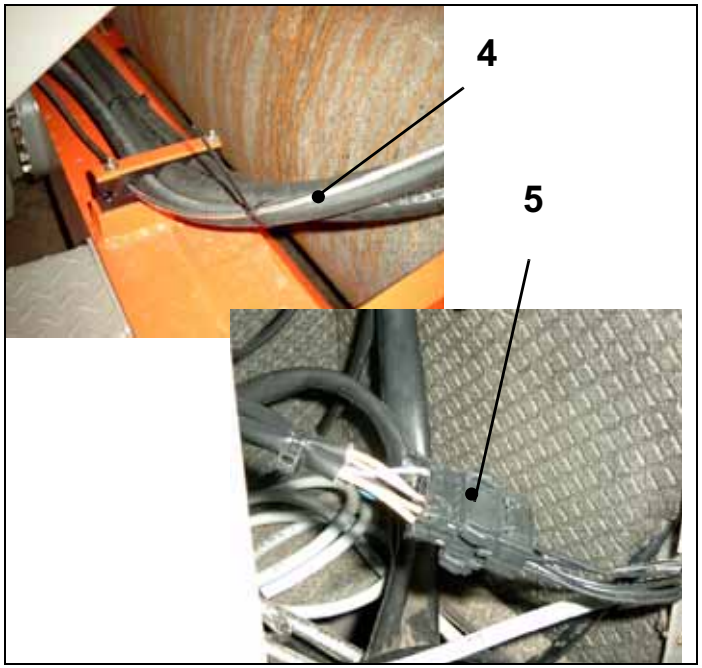
4.2.2 Installation and connection of the sensors to the compaction measurement system

Attachment of the sensor to the drum



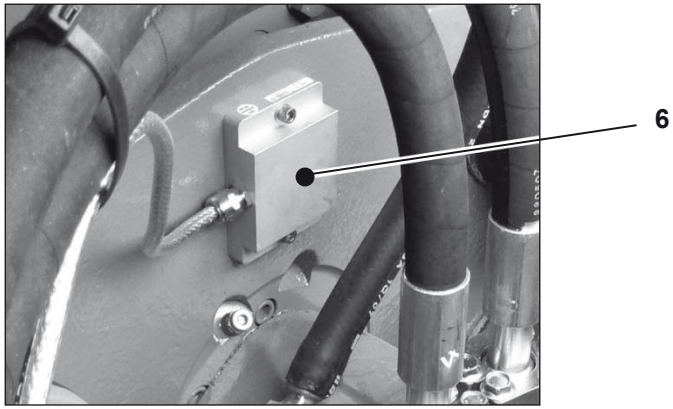
- **Roller type HR120C-9:**
  - Install holder vertically and centrally above the axle, drill holes M6 (distance from top edge 18 mm, drill hole distance 84 mm).
  - Screw on sensor (1) (secure with Loctite 243). The arrow on the sensor must point upwards.

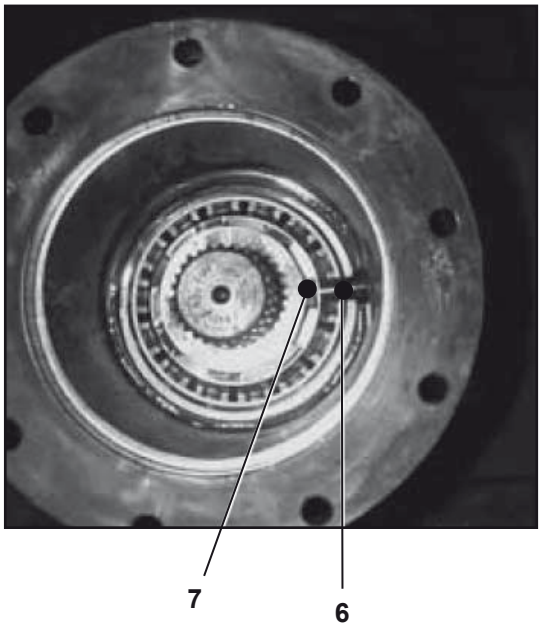
Installation of the sensor wiring



- Lay sensor cable (4) along the hydraulic hoses and from the bottom to the driver`s compartment.
- Connect sensor cable to the top connection of the compaction measurement system.
- Run the power supply cable from the central connection of the compaction measurement system into the lateral console.
- Fit the power supply connecting plug (5).

Installing the speed sensor (axle)

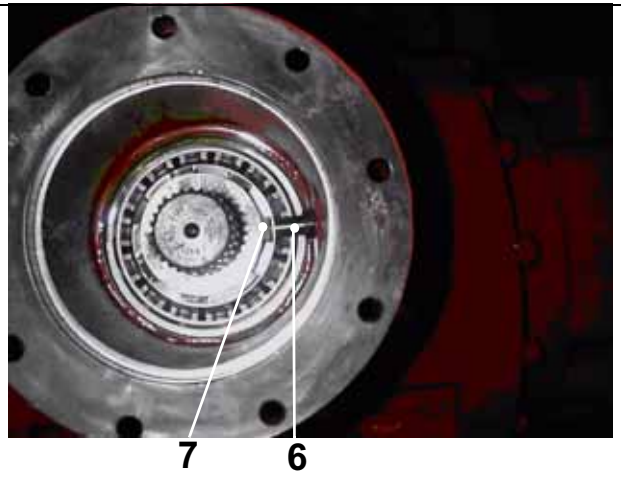


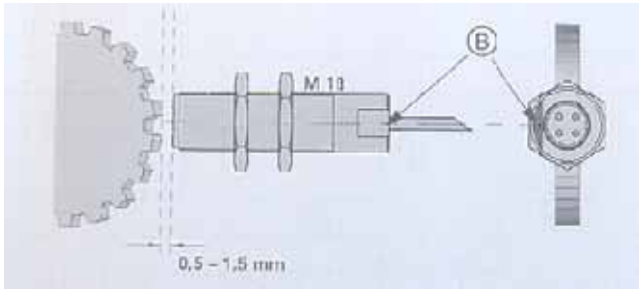


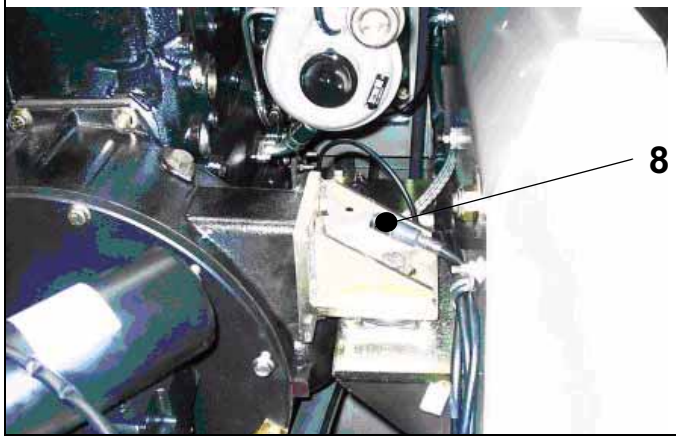
The speed sensor (6) is attached to the axle, in the speedometer port.

NOTE!
Before screwing in the speed sensor, check whether there is a cam (**7**) of the cam plate in the axle directly in front of the drill hole of the speed sensor (**6**).
If the speed sensor is pushed in too far, it might collide with the cam (**7**).

Adjustment of the speed sensor

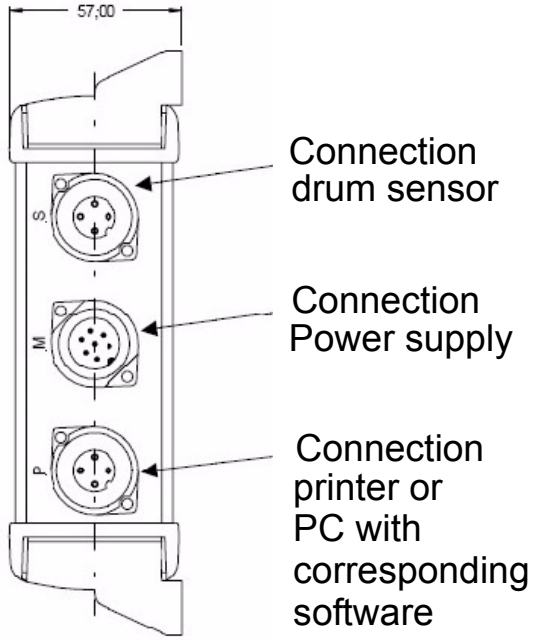






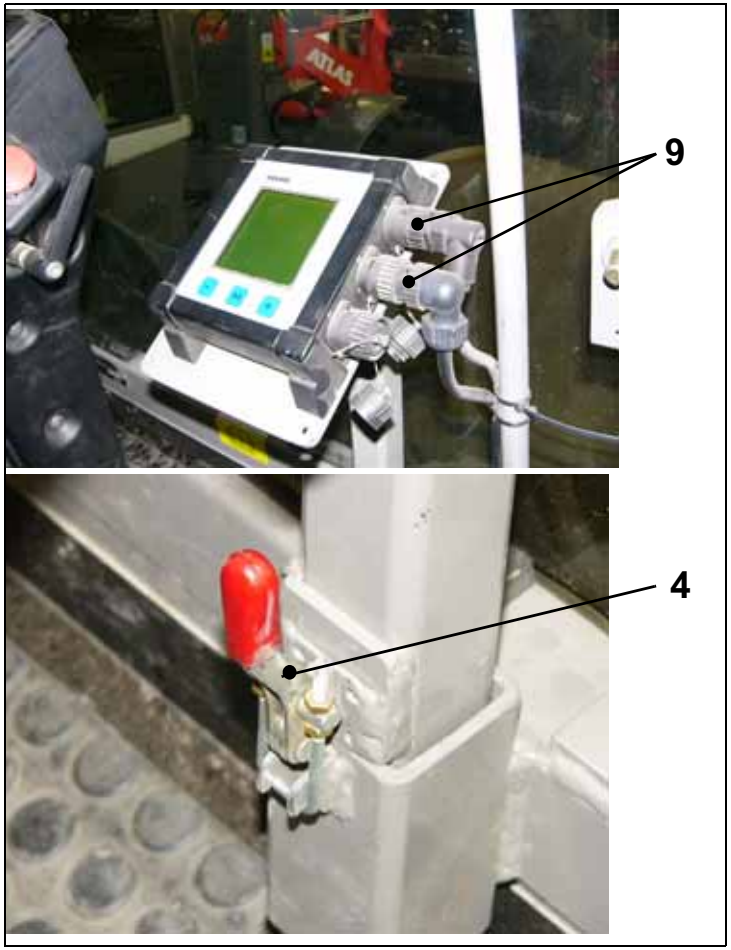
- Screw the speed sensor without plug (6) into the drill hole of the axle until the surface of the sensor touches the cam (7).
- Slightly loosen the speed sensor (6) again by half a turn.
- Loosen the speed sensor (6) further, until the milled recess **B** is parallel to the running direction.
- Lock the speed sensor (6) in this position by means of the lock nut.
- Lay the sensor cable and connect it with the plug (8) in the engine compartment.

4.2.3 Connecting the compaction measurement system



- The connections for the compaction measurement system (2,3) are established by means of plug adapters (9).
- Be sure to observe the correct allocation of the plugs.

4.2.4 Installation and removal of the compaction measurement system (with connections and sensors in place)



- The compaction measurement system is easy to install/dismantle. Removing the device after each operation of the vehicle serves to prevent theft or damage.
- Fit/remove the protective caps of the plug adapters.
- Screw in/out the plug connections (9) from the compaction measurement system.
- Lock/unlock the holding bracket (4).
- Remove the compaction measurement system from the driver´s compartment.

Chapter 5

Maintenance Instructions & Tire Filling

- **Contents**
  - This chapter will provide information on:
  - required service and maintenance work
  - filling the rear tires with water
  - checking the tire air pressure
  - changing the tires

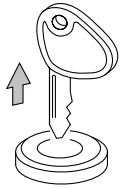
5.1 Maintenance instructions

5.1.1 Safety instructions referring to maintenance work

WARNING!
Be sure to take all safety precautions and to observe all instructions regarding the operation of the compaction roller when carrying out maintenance work!

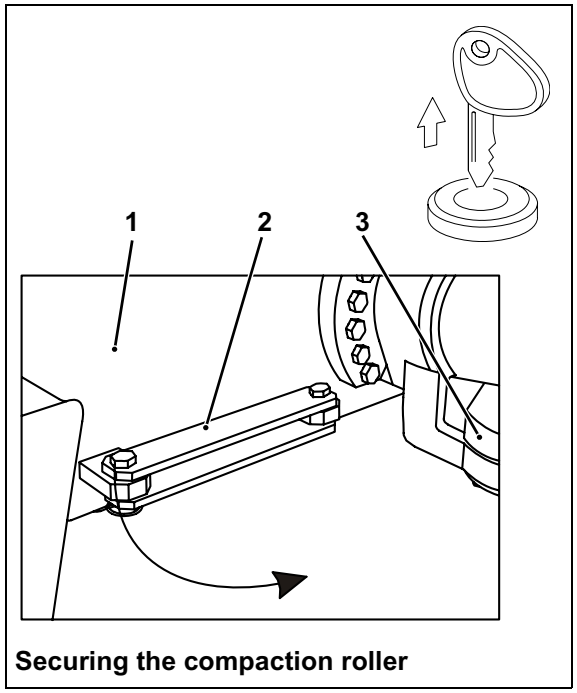
WARNING!
Read and observe the safety instructions and warnings in this manual and the operating manual before starting any maintenance work!

NOTE!
Use signs and warning notices to point out that maintenance work is being carried out!

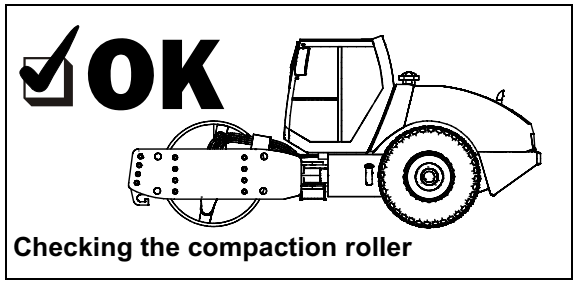


WARNING!
Prevent the compaction roller from unintentionally starting by removing the ignition key from the ignition lock.

5.1.2 Safety precautions to be taken prior to maintenance work



Securing the compaction roller



Checking the compaction roller

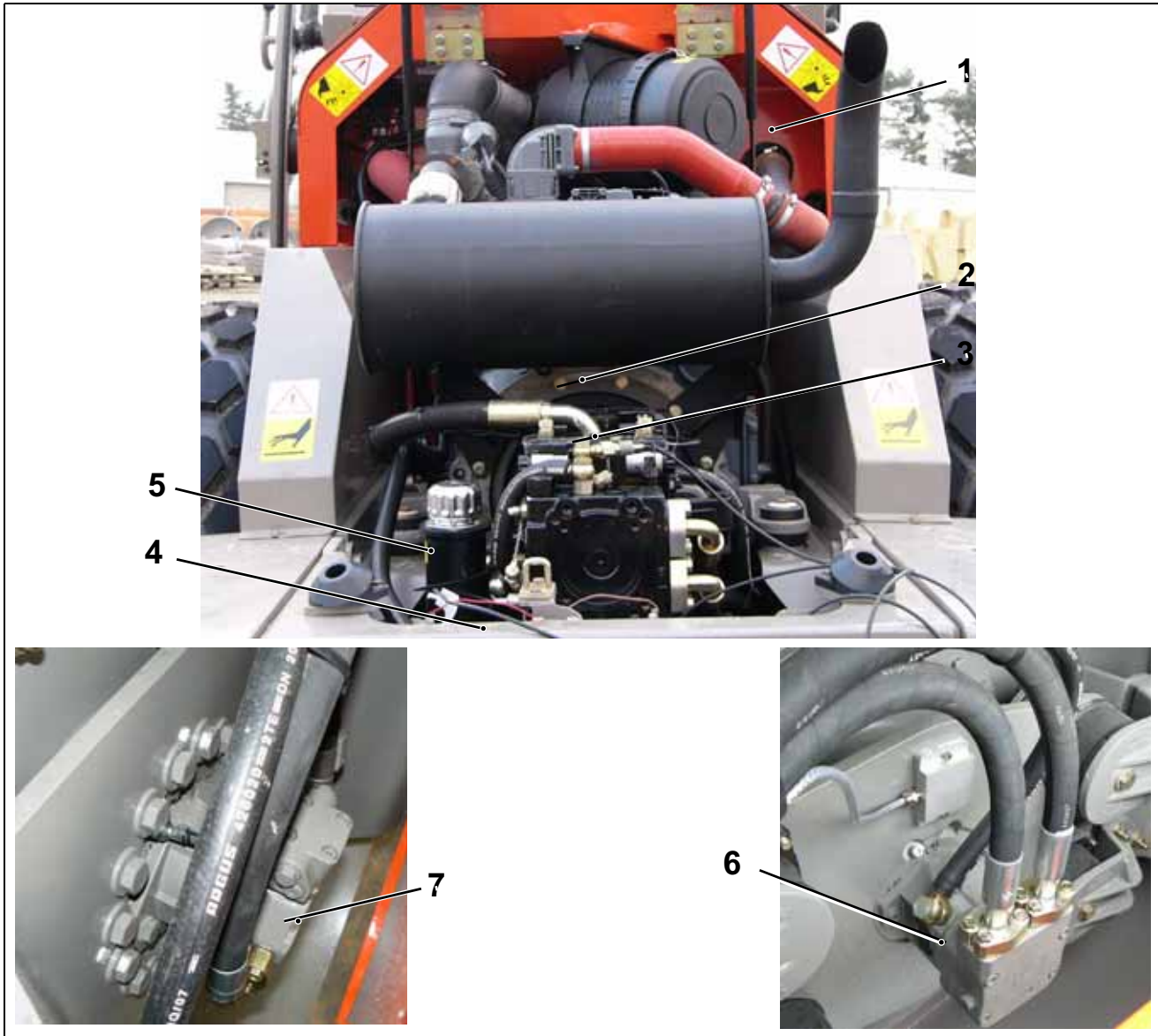
Secure the compaction roller before starting work

- Stop the Diesel engine and secure it against unintentional activation by removing the ignition key.
- Activate the parking brake.
- Secure the wheels by means of wheel chocks.
- Provide for a safe working environment if maintenance work needs to be carried out in the work zone:
  - Ensure the compaction roller`s stability.
  - Protect the working area against moisture and dirt.
  - Check whether the hydraulic system has been depressurized.
  - For work related to the roller drum, the roller frame or the steering system, always insert the anti-buckling device (2) between the roller frame (3) and the rear end (1).
- Use only tools and auxiliary equipment described in the maintenance instructions.

After completing the maintenance work

- Ensure that the compaction roller is in a safe operating condition.
- Check the hydraulic system of the compaction roller for leaks after starting it.
- Test the roller functions.
- Do not resume your work before thoroughly checking the compaction roller.

5.1.3 Maintenance overview HR120C-9



1 Engine compartment
2 Diesel engine
3 Hydraulic pump assembly
4 Battery
5 Hydraulic tank
6 Vibration drive
7 Drum drive

Engine compartment overview, drum and vibration drive

5.1.4 Table of lubricants

Lubrication point	Lubricants	Viscosity	Equivalent standard
Diesel engine	API classification	SAE 10 W	
Arctic climate	CG 4/CH 4	SAE 20 W - 20	
Temperate climate		SAE 30	
Tropical climate		SAE 40	
All climes		SAE 15 W - 40	New machine
Axles, gear units, antifriction bearings Friction bearings	HLS		Approved: Fuchs Renogear HLS 90, Shell rear axle oil LS-BMW, ELF Tranself BM-LS 90
Hydraulic oil	ATLAS Spezial 46	ISO VG 32 ISO VG 46 ISO VG 68	New machine Pay particular attention to the specifications referring to operation with temperatures below 0°C; be sure to preheat the hydraulic oil sufficiently.

5.2 Maintenance Work

5.2.1 Maintenance work related to the Diesel engine

Fuel system

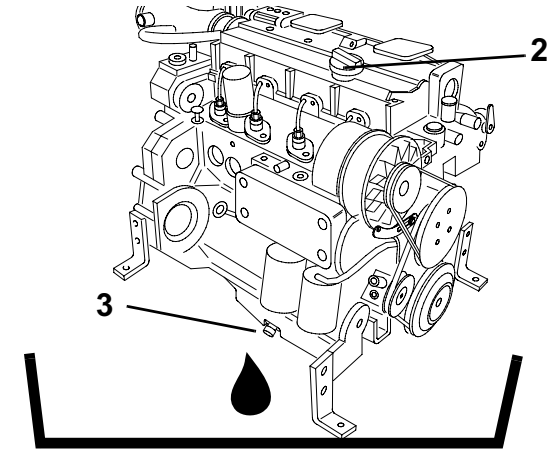
Check the water-fuel separator weekly or after 100 hours of operation:

- The water-fuel separator (1) is attached to the stiffener wall on the right, in the direction of motion.
- Open the cover with the ventilation grills.
- Drain the water-fuel separator (1) by means of the drain plug below the separator.

50 operating hours after the initial operation*: Check and replace the fuel filter (*subsequently, at intervals of 500 operating hours)

- Replace the filter cartridges of the fuel filters (2) at intervals of 500 operating hours or 12 months.
- Open the cover with the ventilation grills (on the right, in the direction of motion).
- Place a receptacle under the fuel filter in order to collect leaking fuel.
- Unscrew both filter cartridges and dispose of them in an environmentally friendly way.
- The EU waste disposal key is 150299 (EU).
- Apply oil to the surfaces of the new oil filter sealings.
- Fit and tighten the filter cartridges by hand.
- Let the Diesel engine turn by actuating the starter.
- Open the fuel vent plug and vent the fuel system. See Deutz operating manual for further information.

Engine oil system



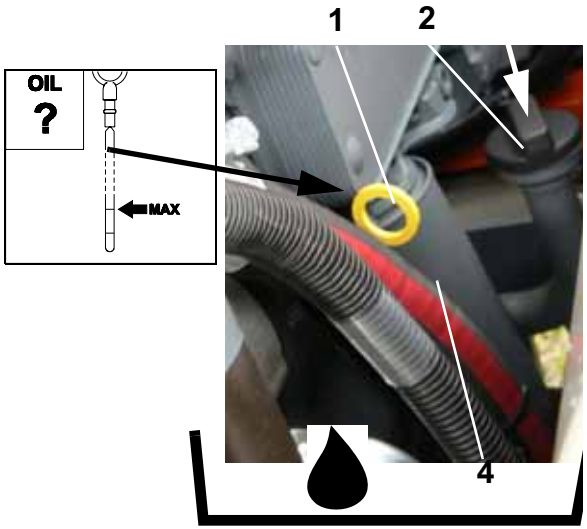
Carry out an oil change at the Diesel engine after the initial 50 operating hours (subsequently, at intervals of 500 operating hours)

ATTENTION!

Environmental protection!

- The engine oil must not penetrate the ground, pollute water or leak into the sewer system. Be sure to collect it in sufficiently dimensioned receptacles and dispose of it in an environmentally friendly way.

- Start the engine and wait until operating temperature is reached.
- Stop the Diesel engine and remove the ignition key.
- Place a sufficiently dimensioned receptacle under the exterior drain plug of the Diesel engine.
- Unscrew the oil drain plug (3), pull out the dipstick (1) & drain the oil.
  - Dispose of the waste oil in an environmentally friendly way. EU waste disposal key: 130202 (EU).
- Screw in the oil drain plug (3) with a new O-ring.



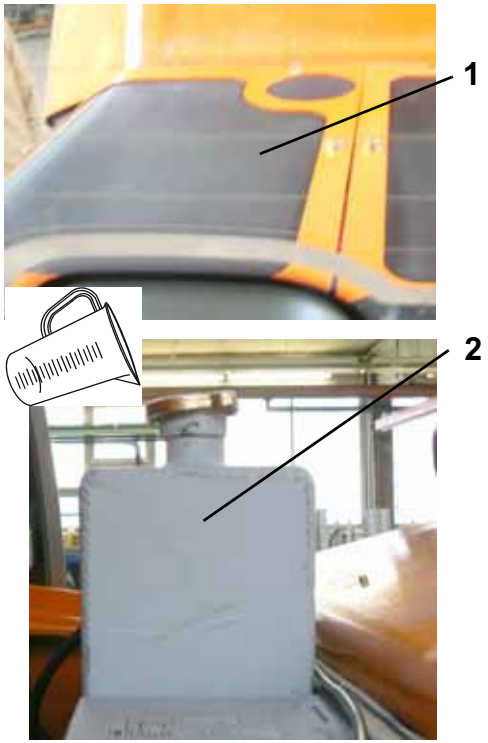
Replacing the oil filter:

- Unscrew the filter cartridge (4) and dispose of it in an environmentally friendly way. Waste disposal key in the EU: 150299 (EU).
- Apply oil to the sealing face of the new oil filter cartridge.
- Fit and tighten the oil filter cartridge by hand.

Adding oil:

- Fill a sufficient amount of new engine oil (about 10 ltrs) into the Diesel engine via the filler neck (2).
- After filling in the engine oil, screw off the lid and let the Diesel engine turn via the starter.
- Check the oil level at the dipstick. Add further oil, if necessary.
- Start the Diesel engine and let it idle to reach operating temperature.

Cooling system



To be carried out if the warning lamp lights up or after repair work.

ATTENTION!

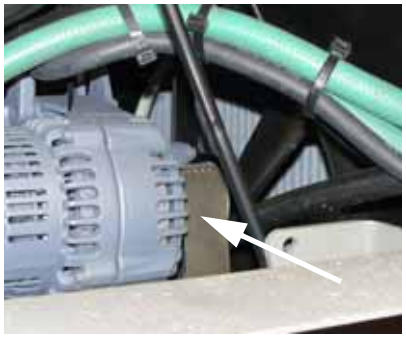
Risk of burns caused by hot coolant!

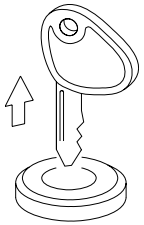
- Let the Diesel engine and the cooling system cool down before opening the lid of the cooler!

- Open the cover (1) with the ventilation grills (right, in the direction of motion).

- Carefully screw off the lid of the combination cooler (2).
- Check the coolant level.
- If coolant needs to be added or after repair work, the following mixing ratio is required:
  - Capacity of the cooling system: approx. 15 liters.
    40% of coolant per liter of water.
  - Mixing ratio: 0.6 liter of water and 0.4 liter of coolant.

Checking the V-belt





- Check the V-belt tension and watch out for damage.

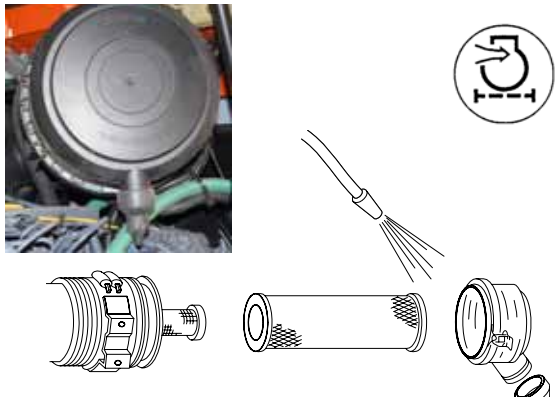
WARNING!

- Never check the V-belt tension with the Diesel engine running!
- Turn off the Diesel engine and remove the ignition key.

NOTE!

- Refer to the Deutz Diesel engine operating manual for instructions on tensioning and replacing the V-belt.

Replacing the combustion air filter



NOTE!

- The air filter must be cleaned or replaced when the clogging indicator of the air filter for the combustion air lights up on the dashboard.
- Replace the filter insert after five cleaning cycles max. with compressed air.
- Wash and dry the inside of the air filter housing, if necessary clean with vacuum cleaner.

ATTENTION!

Motor damage!

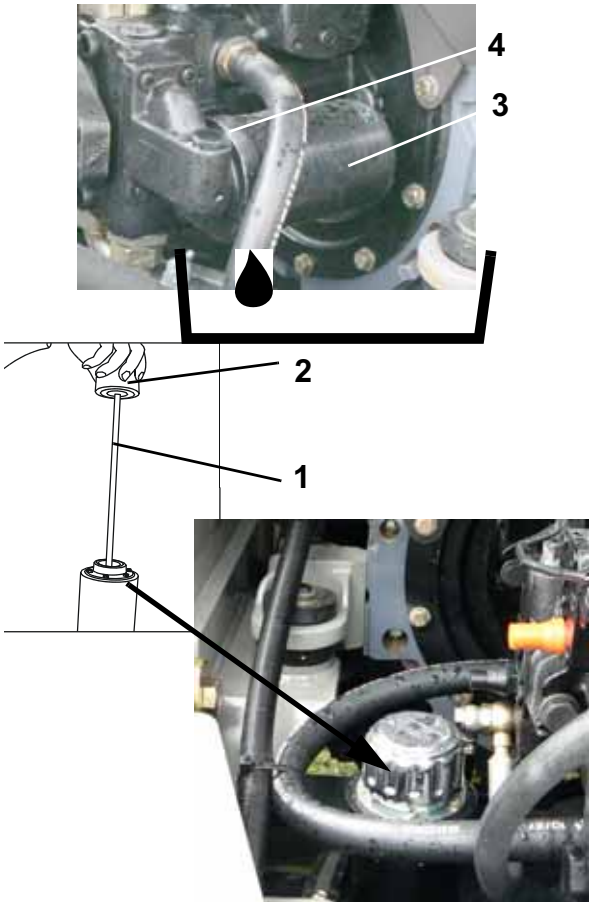
Never clean the air filter housing with compressed air!

5.2.2 Maintenance work referring to the hydraulic system

NOTE!

Observe the approved hydraulic oils when carrying out any work referring to the hydraulic installation (see table of lubricants).

Hydraulic oil change and replacing the oil filter cartridge



The oil filter cartridge of the hydraulic oil is to be replaced after the initial 50 hours of operation, and subsequently, at intervals of 500 operating hours.

- Slightly loosen the oil filter cartridge (3) by means of a tension band or a similar tool. Do not yet unscrew it.

NOTE!

To prevent the content of the suction line from flowing out when changing the oil filter cartridge, stop loosening the oil filter cartridge when a suction noise is heard. The oil in the suction line may flow back into the tank due to the entry of air.

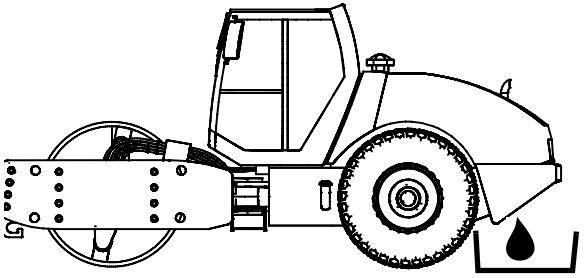
- As soon the suction noise has disappeared, unsrcew and remove the oil filter cartridge and dispose of it in an environmentally friendly way.
- The EU disposal key is 150299 (EU).
- Clean the sealing face of the filter head (4).
- Apply clean hydraulic oil to the new oil filter cartridge (3).
- Screw it on and tighten the new oil filter cartridge by hand.

NOTE!

- Do not use a tension band for tightening.

Checking the hydraulic system fill level:

- Screw out the oil filling socket with the dip stick (1) and check the oil level.
- Top up hydraulic oil, if necessary.
- Clean the vent head (2).
- Please observe the required specifications in case oil needs to be added, according to the table of lubricants.



Replace the hydraulic oil at intervals of 2000 operating hours or if a different type of oil is to be used.

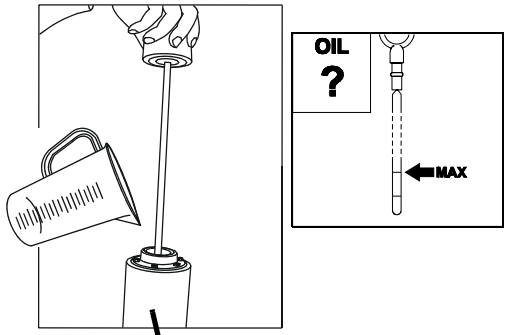
NOTE!

Transport the compaction roller to a workshop to carry out the oil change.

ATTENTION!

Environmental protection!

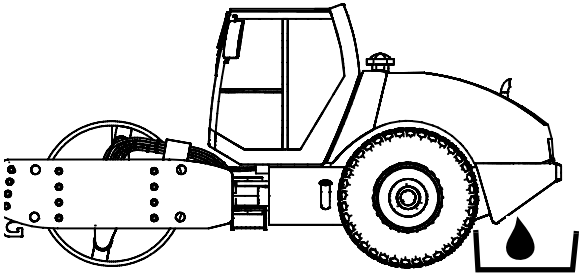
- Make sure no hydraulic oil or fuel penetrates the ground or leaks into the sewer system. Collect the oil in suitable waste containers and dispose of in accordance with the regulations. EU disposal key no. 130202.



- Let the Diesel engine run until the hydraulic oil has heated up.
- Stop the Diesel engine and remove the ignition key.
- Place an oil receptacle under the hydraulic oil tank.
- Remove the oil filling socket with the dip stick.

NOTE!

- Take the amount of hydraulic oil to be drained into account. Choose a sufficiently dimensioned container to collect it.

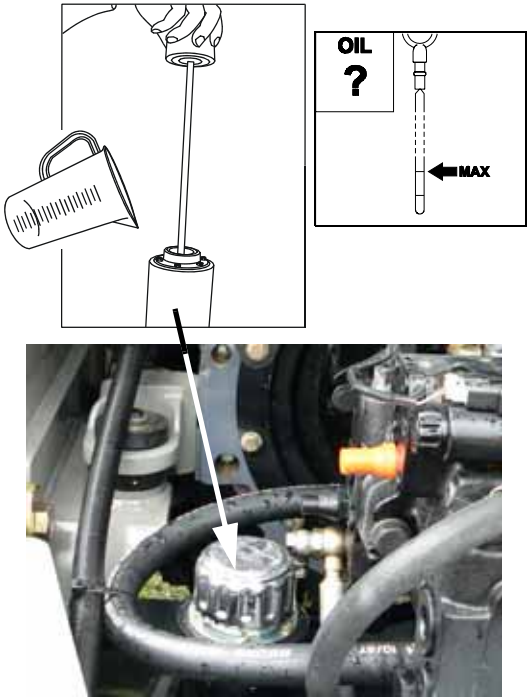


- Unscrew the oil drain plug (3) and the dipstick and drain the hydraulic oil.
  - Dispose of the waste oil according to the disposal key.
  - The EU disposal key is 130202 (EU).
- Replace the oil filter cartridge, see instructions above.
- Screw in the oil drain plug with a new O ring.
- Add hydraulic oil.

ATTENTION!

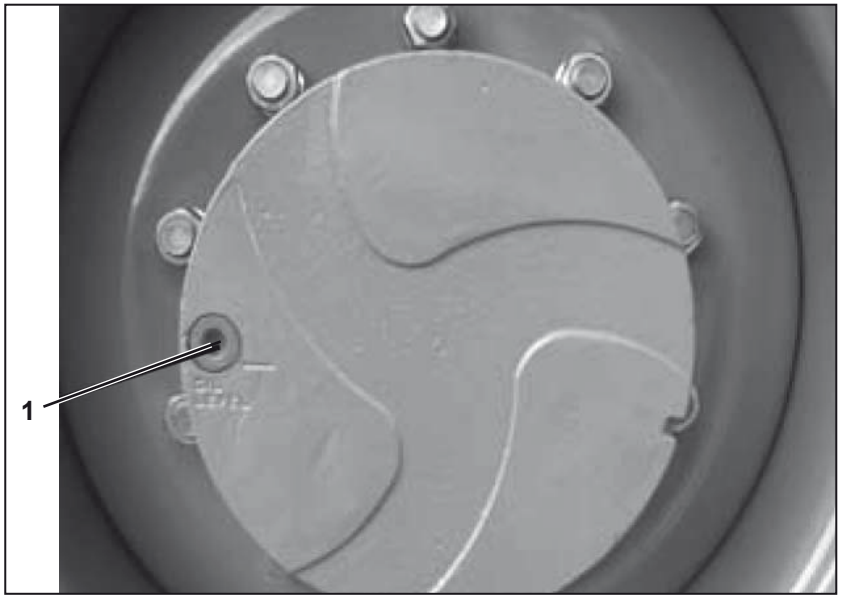
Prevent dirt from entering when filling in hydraulic oil!

Refer to the table of lubriants for information on the specifications of the hydraulic oil to be used.



- Hydraulic oil is to be added via the oil filling socket.
- Start the Diesel engine and let it run until the hydraulic oil has heated up.
- Stop the Diesel engine and remove the ignition key.
- Check the hydraulic oil level again.

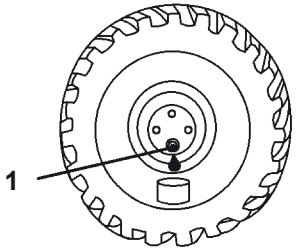
5.2.3 Maintenance work referring to the rear axle



NOTE!
Use signs and warning notices to point out that maintenance work is being carried out!

ATTENTION!
Environmental protection!
Prevent the axle oil from penetrating the ground, polluting water or leaking into the sewer system!

Checking the oil level in the wheel drives:
Advance the compaction roller until the oil drain plug (**1**) is in the correct position (see photo on the left).
Unscrew the oil drain plug (**1**).
The oil level should be barely visible underneath the opening or tangible with a finger.
In case oil needs to be added, be sure to consult the table of lubricants for information on the required specifications.
Screw the oil drain plug (**1**) back in.



Oil change in the wheel drives:
In order to replace the oil in the wheel drives, advance the compaction roller until the oil drain plug (**1**) is in the lowest position (6 o`clock).
Place a sufficiently dimensioned receptacle under the respective wheel drive.
Unscrew the oil drain plug (**1**) and drain the oil.
Screw the oil drain plug (**1**) back in and add axle oil by following the instructions above.

Checking the axle oil level

The oil level in the rear axle and the wheel drives is checked after the initial 50 operating hours and subsequently, at intervals of 500 operating hours.

NOTE!

- Secure the compaction roller against rolling before starting work referring to the rear axle.
- Switch on the parking brake and wedge the tires.

ATTENTION!

Observe pollution control criteria!

- Do not allow the axle oil to reach underground or surface water or the sewage system.

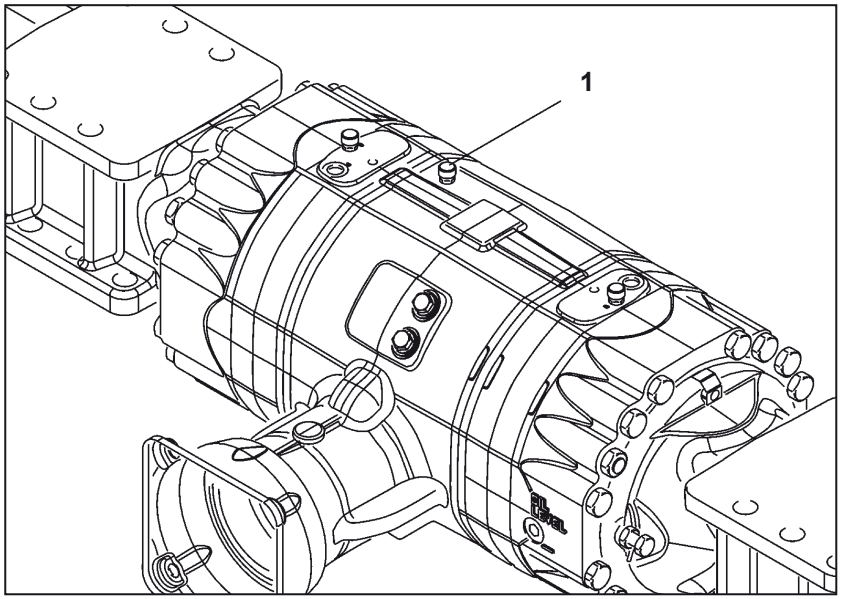
Checking the oil level in the axle casing:

- Remove the oil filling screws (2) from the axle casing.
- The oil level is correct if you can feel or see it just below the filling hole.
- Turn the oil filling screws (2) in again.

Change the oil after 500 and 1500 and subsequently, at intervals of 1500 operating hours:

- Place a sufficiently dimensioned receptacle under the 3 drain screws (3).
- Unscrew the drain screws (3) and drain the axle oil.
  - Dispose of the waste oil according to the disposal key.
  - The EU disposal key is 130202 (EU).
- Tighten the drain screws (3) again.
- Please observe the specifications in the table of lubricants if oil needs to be added.
- Fill in new axle oil via the filling screws (2).
- Attach and tighten the filling screws (2).

Checking and replacing the breather



The breather of the axle needs to be replaced after the initial 50 operating hours and subsequently, at intervals of 500 operating hours:

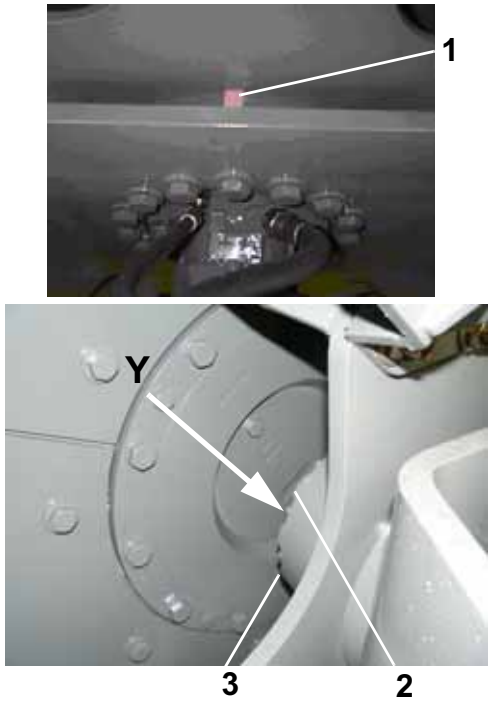
- Carry out a visual inspection to detect any oil leaks related to the axle.
- Replace the breather (**1**) on the axle.
- The breather is part of the maintenance kit, see spare parts list.

5.2.4 Maintenance work referring to the drum and vibration drive

NOTE!

Observe the approved gear oils when carrying out any service and maintenance work on the drum components (see table of lubricants).

Checking the oil level in the drum drive



The oil level in the drum drive is checked after the initial 50 hours of operation and subsequently, at intervals of 500 operating hours.

NOTE!

- Secure the compaction roller against rolling before starting any work referring to the drum drive.
  Switch on the parking brake and wedge the tires.

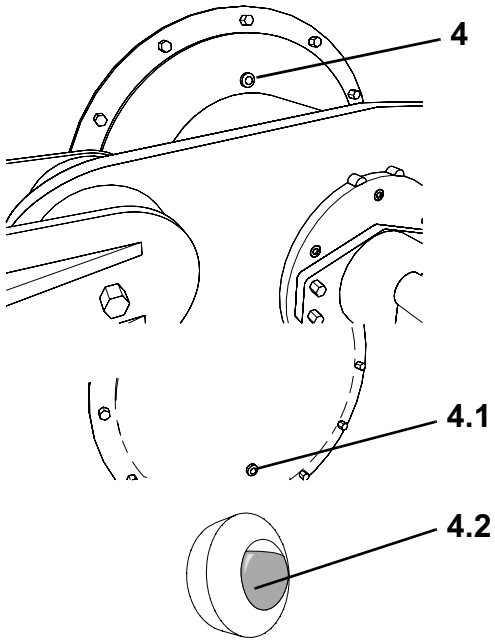
ATTENTION!

Observe pollution control criteria!

- Do not allow the axle oil to reach underground or surface water or the sewer system.

- Move the compaction roller until the mark (1) on the gear flange is visible and pointing upwards.
- The oil filling and oil drain screws (2) can be found on the interior gear side Y.
- With the mark (1) properly aligned, the check screw (2) is on the left side and the drain screw (3) points downwards.
- Unscrew the filling screw (2) from the gear unit.
- The oil level is correct if you can feel it just below the filling hole.
- Add oil, if necessary.
- Please observe the oil specifications in the table of lubricants in case oil needs to be added.

Checking the oil level in the vibration drive



The oil level in the vibration drive is checked after the initial 50 hours of operation and subsequently, at intervals of 500 operating hours.

NOTE!

- Secure the compaction roller against rolling before starting work related to the vibration drive.
  Activate the parking brake and wedge the tires.

ATTENTION!

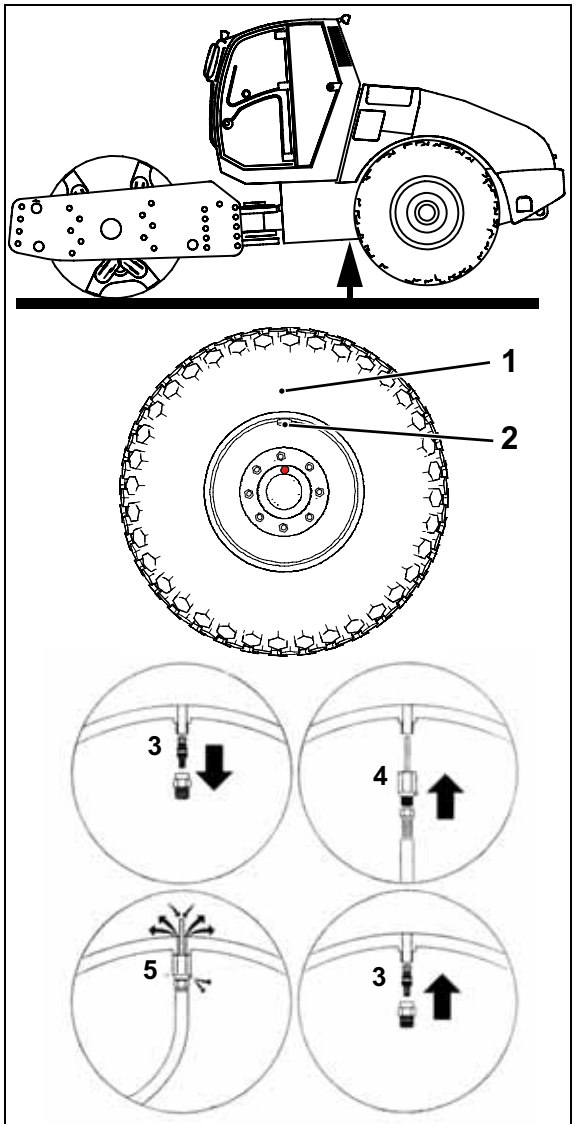
Observe pollution control criteria!

- Do not allow the axle oil to reach underground or surface water or to leak into the sewer system.

- Move the compaction roller until the inspection glass (4) is in its bottom position (6 o'clock) (4.1).
- As a result, the oil filling screw (4) is in its top position (12 o'clock).
- Oil needs to be added if the gear oil level in this position of the inspection glass does not correspond to the level shown in the illustration on the left (4.2).
- When adding oil, please observe the specifications in the table of lubricants.
- Unscrew the oil filling screw (4) from the housing.
- Fill in oil until the oil level is correct, see illustration on the left (4.2).
- Attach the oil filling screw again.

5.3 Tires at the rear axle

5.3.1 Water filling



Filling the tires

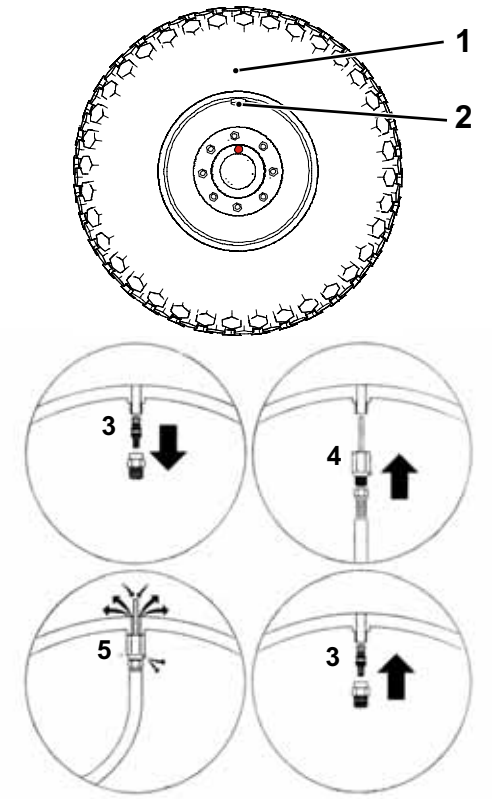
- In order to improve their propulsional properties, on delivery, the tires are filled with water and an antifreeze additive composed of magnesium chloride.

NOTE!

- Magnesium chloride is commercially available granulated salt with a 47% share of dry substance. In countries where the exterior temperatures never fall below 0° C, the tires can be filled with industrial water, without any additives.

Filling procedure: Water and antifreeze additive

- Use a hydraulic jack to lift the compaction roller at the rear axle.
- Turn the respective tire (1) until the charge valve (2) is in its **top** position.
- Slowly unscrew the valve core (3).
- Screw a hose line (4) onto the charge valve (2).
- The saline solution can be poured into the tire (1) by means of a container placed at a higher level or via a special pump.
- The filling process (5) must be interrupted repeatedly because the tire needs to be bled (ventilated).
- If the tire is not sufficiently filled after pouring in the saline solution, add industrial water to establish the required fill level.



Filling the tires

NOTE!

- Repeatedly interrupt the filling process (5) to vent the tires. As soon as the level of the water/saline solution has reached 75% of the tire volume, stop filling in water.
- The remaining air in the upper part of the tire is essential to ensuring its springing properties.
- As soon as the required fill level of 75% has been reached, the saline solution must not leak from the tire with the charge valve opened (2).

- After completing the process, attach the valve core (3) and fill the tire (1) with compressed air. Prescribed pressure: **1.6 bar**.

NOTE!

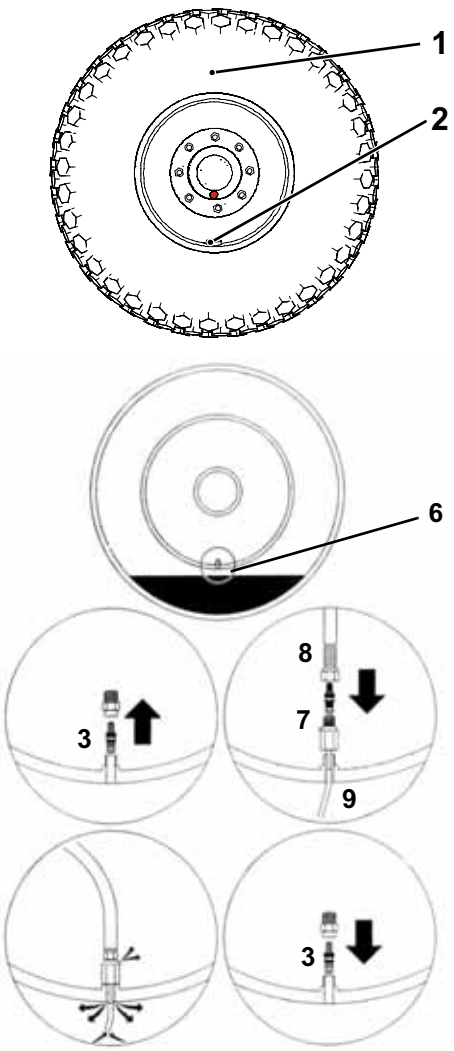
Preparation of the saline solution:

- Mix magnesium chloride and water at a weight ratio of 1:1 in a clean container. Stir until the salt has completely dissolved.
- Always add the salt to the water, never vice versa.

Filling procedure: Pure water

- In order to fill the tire with pure water, use industrial water.
- The filling process is identical to the one with antifreeze additive.

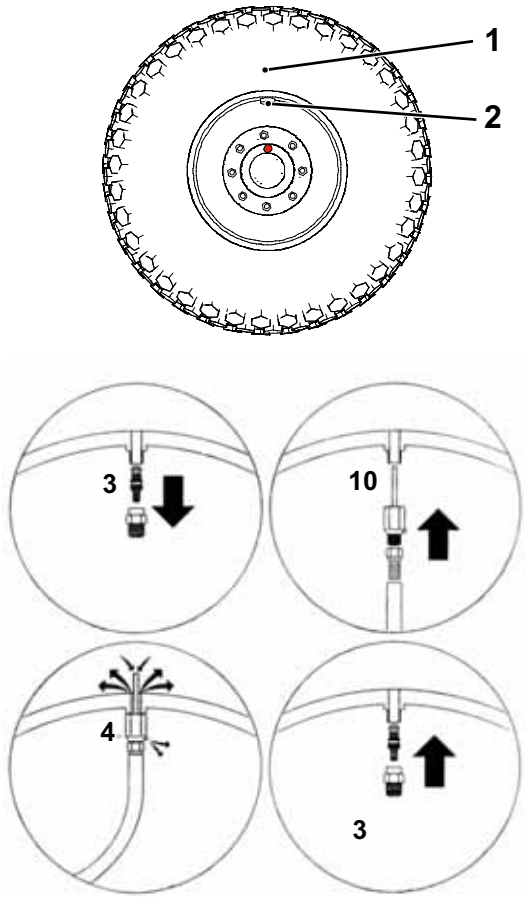
5.3.2 Emptying the tires



Emptying the tires

- Lift the compaction roller at the rear axle by means of a hydraulic jack.
- Turn the respective tire (1) until the charge valve (2) is in the lowest position.
- Slowly unscrew the valve core (3). Due to the overpressure in the tire, water will pour out of the tire, down to the level of the charge valve.
- Extend the vent pipe of the composite valve (7) by means of a thin rubber hose (9).
- To remove the residual water from the tire, screw the composite valve (7) onto the charge valve (2) and fill it with compressed air (8).
- The compressed air forces the residual water out of the rubber hose (9); the water escapes through a lateral hole in the composite valve.
- As soon as the tire is empty, attach the valve core (3) and fill the tire (1) with compressed air. Prescribed pressure: 1.6 bar.

5.3.3 Filling process with the "Hanauer Maus" (waterboy)



Filling the tires

- In order to fill or empty a tire by means of the so-called "Hanauer Maus", carry out the following instructions:

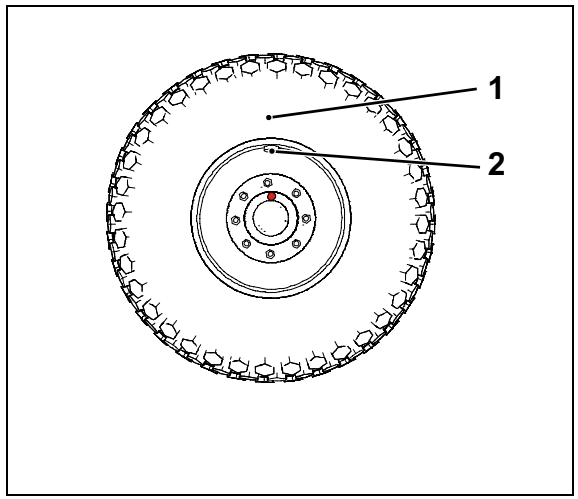
- Use a sufficiently dimensioned hydraulic jack to lift the roller at the rear axle.
- Turn the respective tire (1) until the charge valve (2) is in its **top** position.
- Slowly screw off the valve core (3).
- Screw the fill valve (10) into the charge valve (2).
- Screw a hose line (4) onto the fill valve (10).
- The air escapes from the tube and the lateral hole in the fill valve (10).

NOTE!

The filling process is complete as soon as a constant jet of water exits the opening.

- Twist off the fill valve (10) and tighten the valve core (3).
- At the end of the filling procedure, unscrew the fill valve (10) and screw in the valve core (3).
- Fill the tire (1) with compressed air until the required pressure of 1.6 bar (for standard tires) has been established.

5.3.4 Checking the tire inflation pressure



DANGER!
Risk of injuries!
- Antifreeze solution may leak while the tire pressure is being checked.
- This can lead to chemical burns. Be sure to wear protective clothing!

- Check the tire pressure once a week:

	Pressure	
Standard tires	1.6 bar	water filling

Checking the tire pressure

- To check the tire pressure, the charge valve (2) needs to be in the top (12 o'clock) position.
- Move the compaction roller forward and backward to establish this position of the tires (1).
- Unscrew the protection cap from the charge valve.
- Press the charge valve until the saline solution stops leaking from the charge valve (2).

ATTENTION!
Material damage!
- Before checking the tire pressure, always discharge the entire salt solution or moisture from the charge valve (2).
- Moisture destroys the tire gauge.

- Attach the tire gauge and check the tire inflation pressure.
- If necessary, adjust the tire pressure.

5.3.5 Mounting the tires

ATTENTION!
Material damage!

- Have tires replaced or mounted by an authorized HYUNDAI dealer or a trained expert only.
- In order to prevent the tire from sliding on the wheel rim, the tire must not be mounted with the aid of lubricants.

- Tightening torque of the wheel nuts (2): **500 Nm.**

Chapter 6

Diesel Engine & Hydraulic System

- Contents
- This chapter will inform you about:
  - the Diesel engine specifications
  - the entire hydraulic system

6.1 Diesel engine

NOTE!
Please refer to the enclosed Deutz operating manual (Deutz BF4M 2012 C) for further information!

6.1.1 Technical specifications

Compaction roller HR120C-9	
Make	Deutz BF4M 2012 C
Type	4-stroke with charging & direct fuel injection
Nominal output	95 kW (129 HP)
Max. speed	2300 min^{-1}
Cooling	Fluid-cooled / cooling protection
Fuel tank capacity (Diesel/ltrs)	300

6.1.2 Maintenance overview Diesel engine Deutz BF4M 2012 C

Prior to the initial operation	at intervals of _____ operating hours						once a year	every 2 yrs	check	clean	replace	Actions to be taken	to be carried out by trained staff only
	10 or daily	250	500	1000	6000	12000							
X	X								X			lubricant level: add, if necessary	
			X								X	lubricant (depending on field of application)	
			X								X	oil filter cartridge (at every oil change)	
				X							X	fuel filter cartridge	
				X					X			Flexible fuel leakage pipes	
								X			X	replacing the flexible fuel leakage pipes	
							X				X	injection valve	X
X									X			preliminary fuel filter	
				X						X		preliminary fuel filter	
X			X						X			coolant (concentration of additives)	
								X			X	coolant (concentration of additives)	
						X					X	coolant pump	X
X	X								X			coolant pump	
X	X								X			suction filter	
				X							X	suction filter	
X				X					X			charge air cooler	
							X			X		charge air cooler	
				X					X			battery and cable connections	
X				X					X			engine monitoring, warning system	X
				X						X		valve play (adjust if necessary)	X
				X					X			V-belt (tension or replace)	
								X			X	V-belt (tension or replace)	
						X					X	pressure relief valve at the injection pump	X
				X					X			crankcase pressure vent valve	X
						X					X	crankcase pressure vent valve	X

6.2 Hydraulic system

NOTE!
Please refer to the enclosed Deutz operating manual (Deutz BF4M 2012 C) for further information!

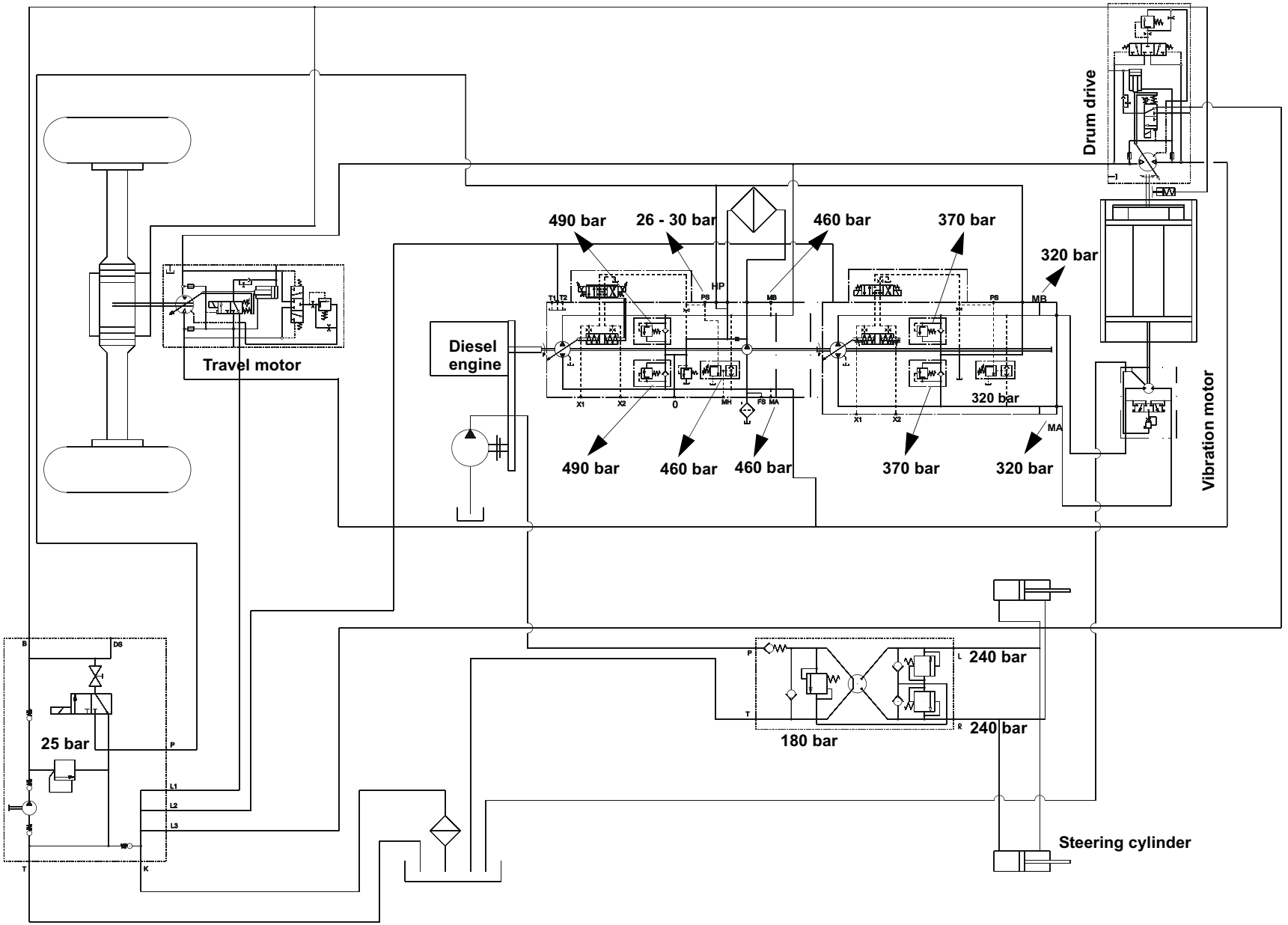
6.2.1 Technical specifications

Compaction roller HR120C-9	
Hydraulic tank capacity (ltrs)	106
Hydraulic oil filter	Filter cartridge, installed in the pump assembly
Specifications hydraulic oil	ATLAS Spezial 46 or ISO VG 32/ ISO VG 46/ ISO VG 68. see table of lubricants.

6.2.2 Maintenance work referring to the hydraulic system

NOTE!
Be sure to gather all the information required to carry out the maintenance work by consulting this chapter and the corresponding sections in the operating manual before carrying out any maintenance work related to the hydraulic system!

6.2.3 Hydraulic circuit diagram - entire hydraulic system HR120C-9



Chapter 7

Drum & Rear Axle Drive

- **Contents**
- This chapter will inform you about:
  - the drum and its drive unit
  - the rear axle and its drive unit
  - the sequence of functions and troubleshooting
  - the measured and default values
  - the measuring points
  - the adjustment options
  - drum installation and dismantling

7.1 Drum and Rear axle

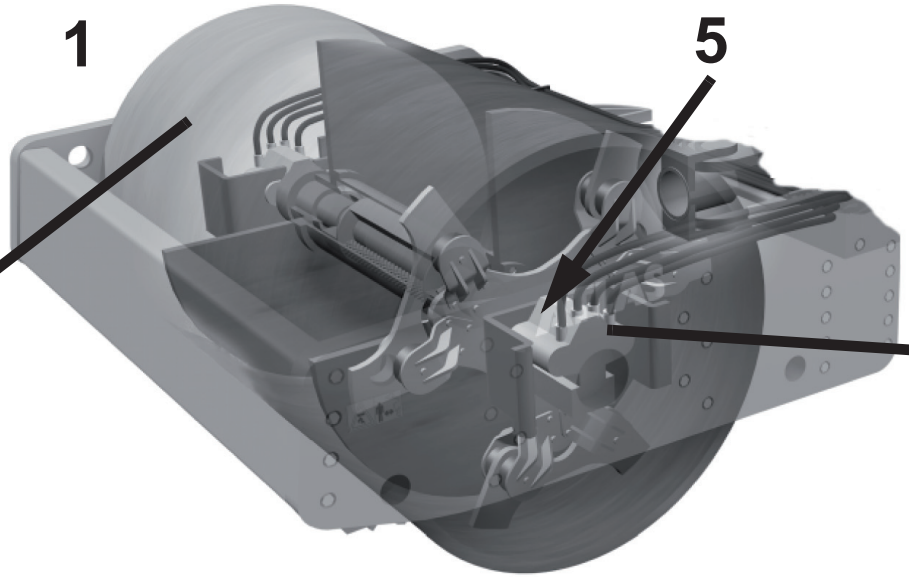
7.1.1 Technical specifications: Drum

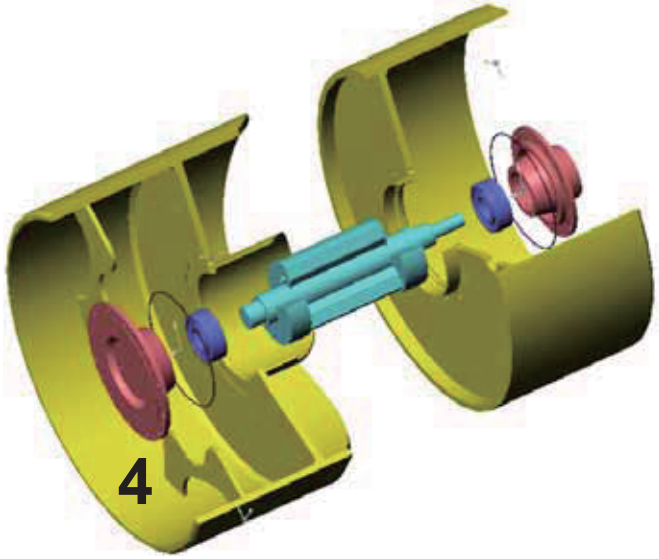
Compaction roller HR120C-9	with smooth drum
Drum:	
Drum width	2100 mm
Drum diameter	1500 mm
Drum thickness	30 mm

7.1.2 Technical specifications: Rear axle

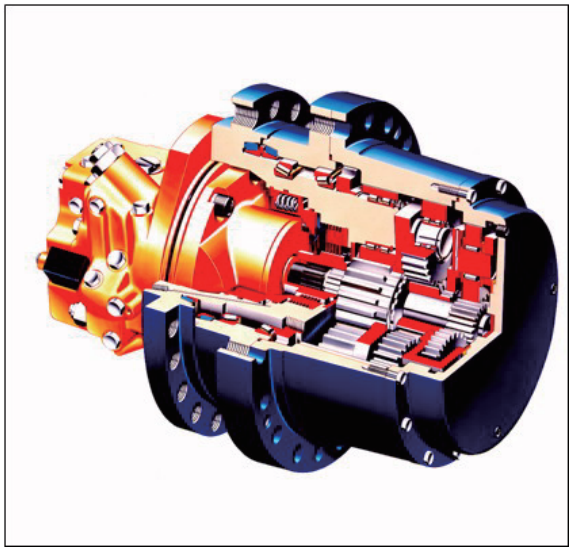
Compaction roller HR120C-9	with smooth drum
Rear axle:	DANA Spicer 192 HD
Standard Tires	23.1-26

7.1.3 Overview Compaction Roller Drum



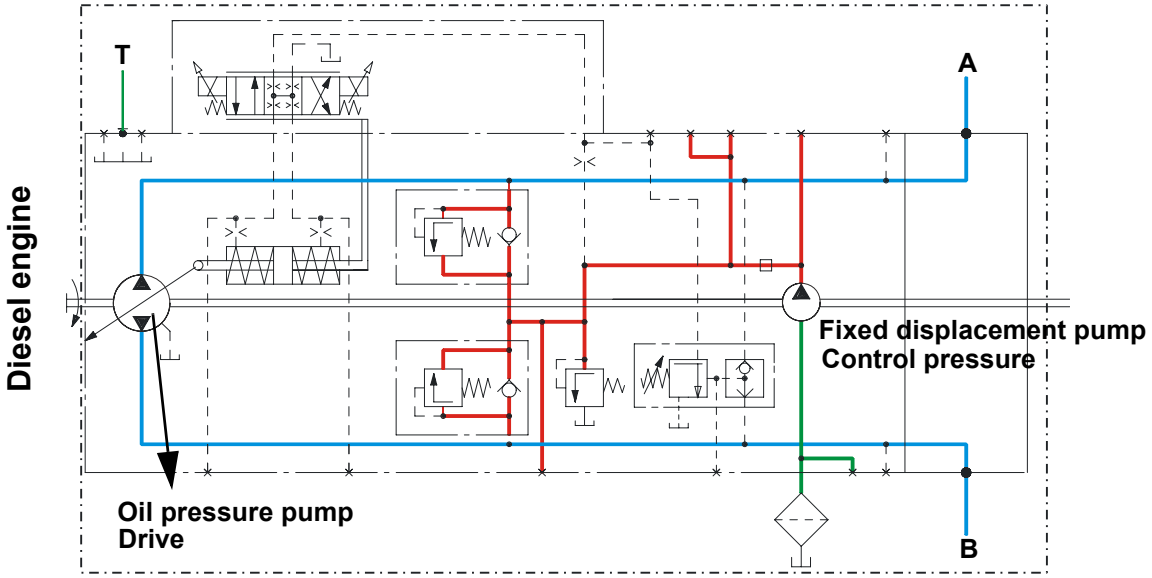


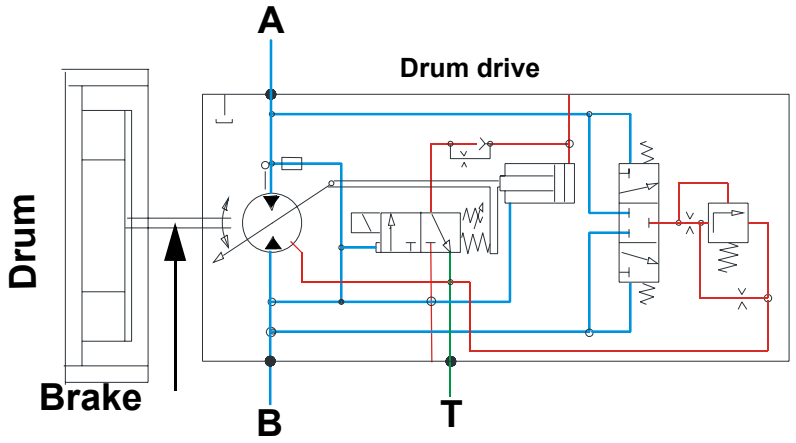
1 Drum
2 Drum drive
3 Vibration drive
4 Vibration system
5 Drum gear unit



7.1.4 Overview Travel Hydraulics Drum

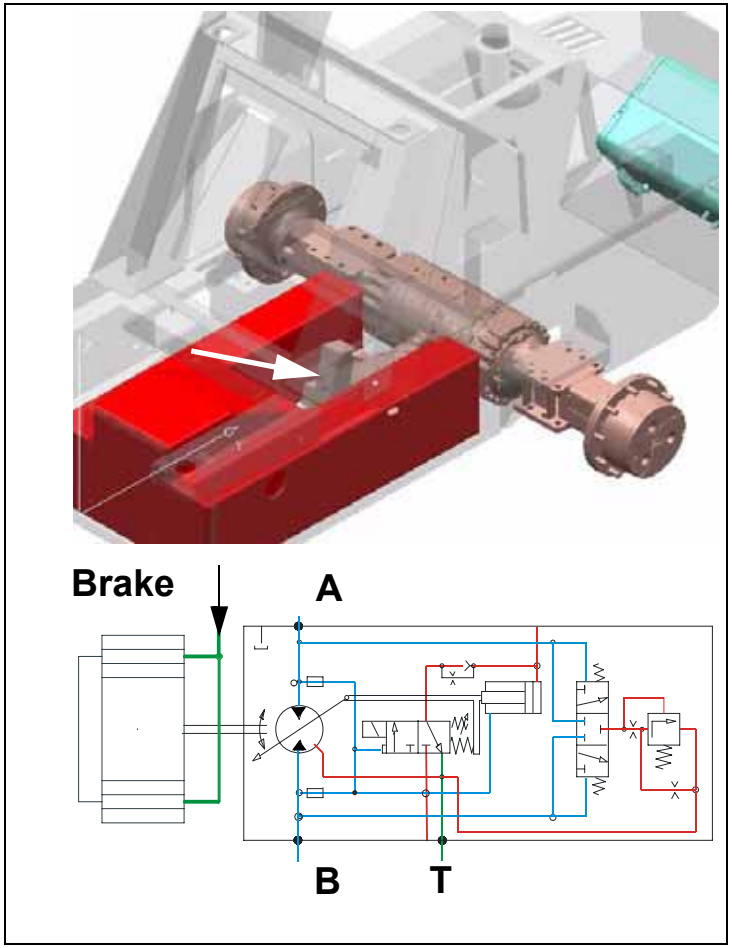
= HD oil system A & B
= Control oil system PS
= Tank line



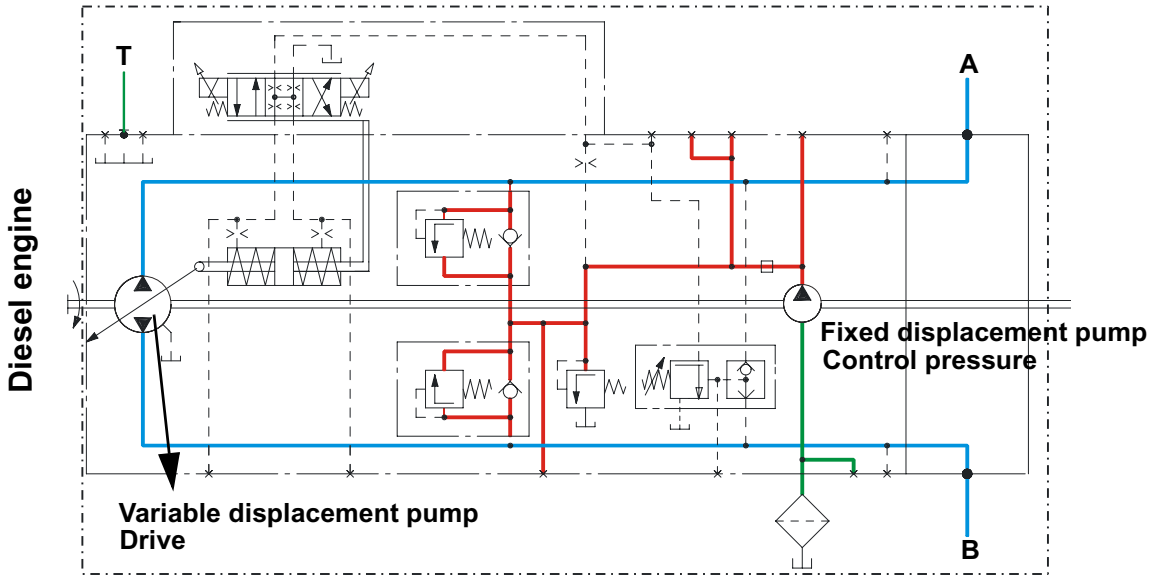


1 Oil pressure pump drive
2 Control lever
3 Drum drive motor

7.1.5 Overview Drive Hydraulics Rear Axle

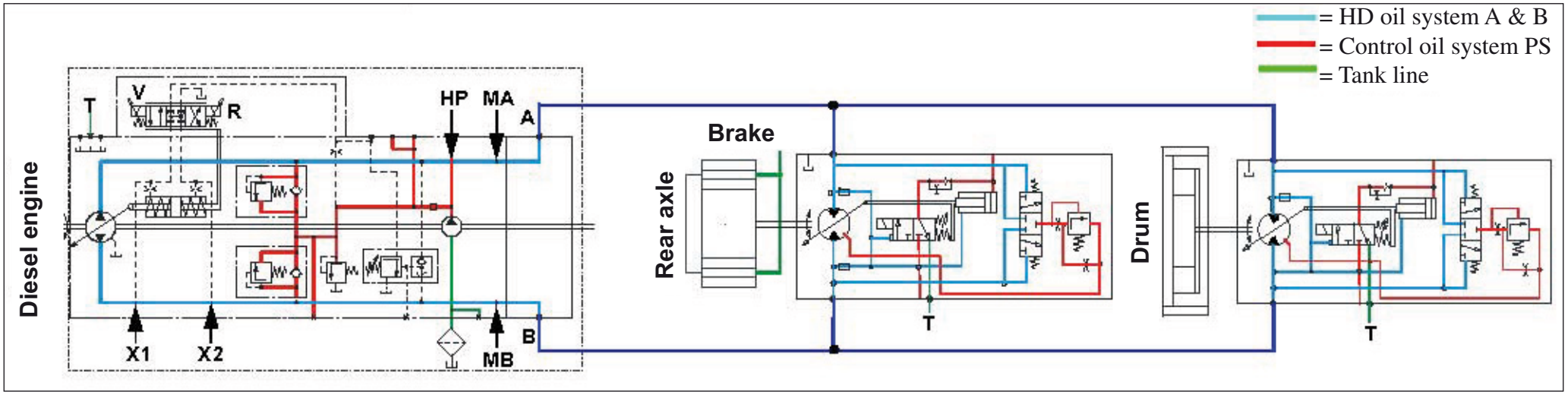


= HD oil system A a. B
= Control oil system PS
= Tank line



7.1.6 Sequence of functions: Drive

- See chapter **3.2** for information on starting and driving the compaction roller with/without vibration.
- When the control lever (**1**) is moved in the desired direction of motion, the solenoid valve for forward or reverse travel is switched.
- The control pressure for the oil control pump is transferred to the displacement disk of the oil pressure pump (drum/rear axle drive).
- The oil pressure pump swivels into the selected direction. The oil flow reaches the drum drive and the rear axle drive.



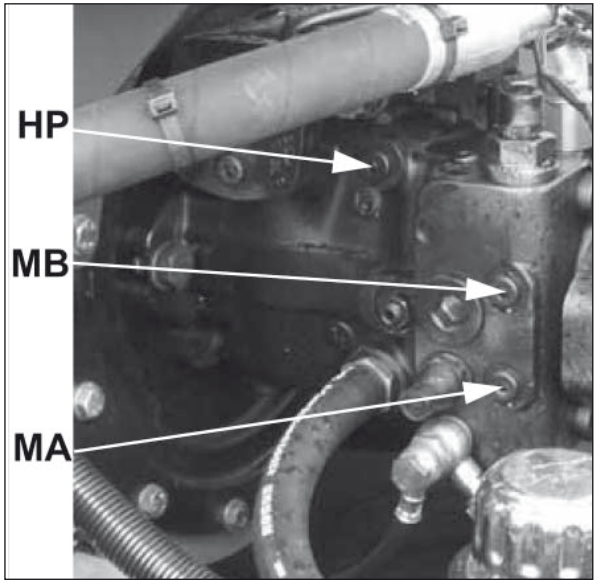
7.1.7 Troubleshooting

Malfunction / Fault	Causes and Effects	Measures to be taken
The compaction roller does not move in the desired direction.	• Contact fault in the electrical system • Cable or plug connections are loose and/or defective	• Check the cable and plug connections. • Measure the power supply to the solenoid valve.
The compaction roller does not move.	• The parking brake has not been switched off, which is indicated by an acoustic warning signal . • An electrical fault has occured while switching off the parking brake. • The high-pressure valve has not been tightened properly after towing: Charge pressure is too low.	• Deactivate the parking brake and actuate the joystick (control lever). • Refer to the sections on the electrical installation in this manual. • Check the charge pressure at measuring point PS. Check the high pressure **A** & **B** at the measuring points **MA/MB**.
The drum loses ground contact (i.e. it jumps).	• The ground is too hard. • The compaction limit of the compaction roller has been reached.	Do not continue the compaction process.
The drum or the rear wheels slip on slopes or wet soils: Either the drum slips and the rear wheels stop or the rear wheels slip and the drum stops.	The traction control prevents the drive from slipping, which causes the compaction roller to stop - in case the drum or/and the wheels sink in while driving on heavy terrain or - the driving resistance increases on slopes	In some situations, it may become necessary to override the traction control, e.g. - if the compaction roller is started after the rear wheels or the drum have sunk in or - if the compaction roller is operated at a finely dosed speed. In this case, deactivate the traction control by actuating the override switch for the hydraulic motor of the drum or the rear axle (see ch. **3**). As a result, the compaction roller will operate at the maximum driving torque of the drum or the rear wheels.

7.1.8 Engine speed & hydraulic measured and default values

Value to be established	Default/required values	Measuring point / Component affected
Diesel engine: minimum idle speed	900 min^{-1}	Diesel engine
Charge pressure	26 bar	PS
Diesel engine: maximum idle speed	2300 min^{-1}	Diesel engine
Charge pressure	30 bar	PS
Maximum Diesel engine speed	2200 min^{-1}	Diesel engine
Traction drive: forward motion	460 bar	MA
Maximum Diesel engine speed	2200 min^{-1}	Diesel engine
Traction drive: reverse motion	460 bar	MB
Maximum roller speed	12 km/h 50 meters in 14 to 16 seconds	Test distance/stop watch

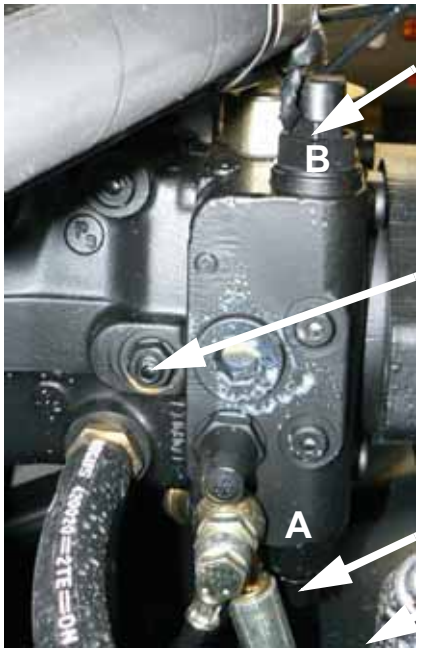
7.1.9 Overview of the measuring points and measuring conditions



ATTENTION!
In order to measure the engine speed and the hydraulic oil pressure, the Diesel engine needs to have reached operating temperature and the hydraulic oil must have reached a minimum temperature of 50 degrees C!

NOTE!
Establishing the maximum speed of the compaction roller:
Travel a distance of 50 meters at a previously established maximum speed. By means of a stop watch, measure and note down the time required.

7.1.10 Overview of the adjustments on the variable oil pressure pump: drum drive



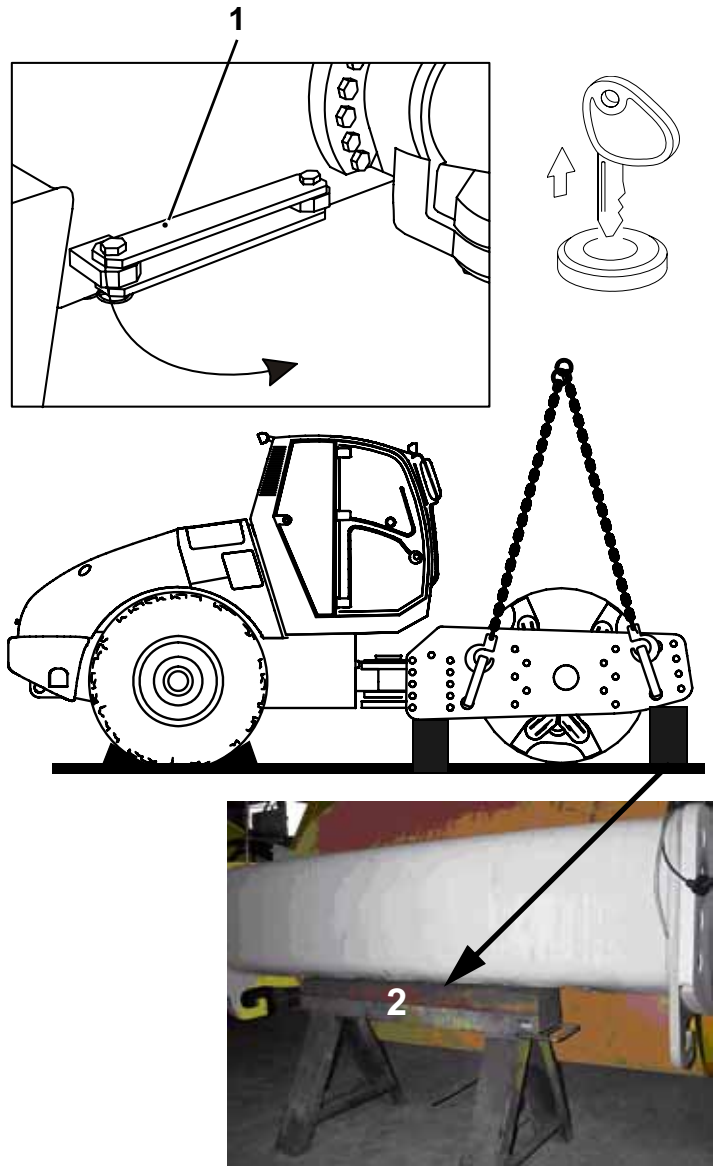
HP valve
490 bar

HP
Control pressure
adjustment

HP valve
490 bar

Pressure
limiting device
460 bar

7.2 Installing and dismantling the drum



Supporting the drum frame

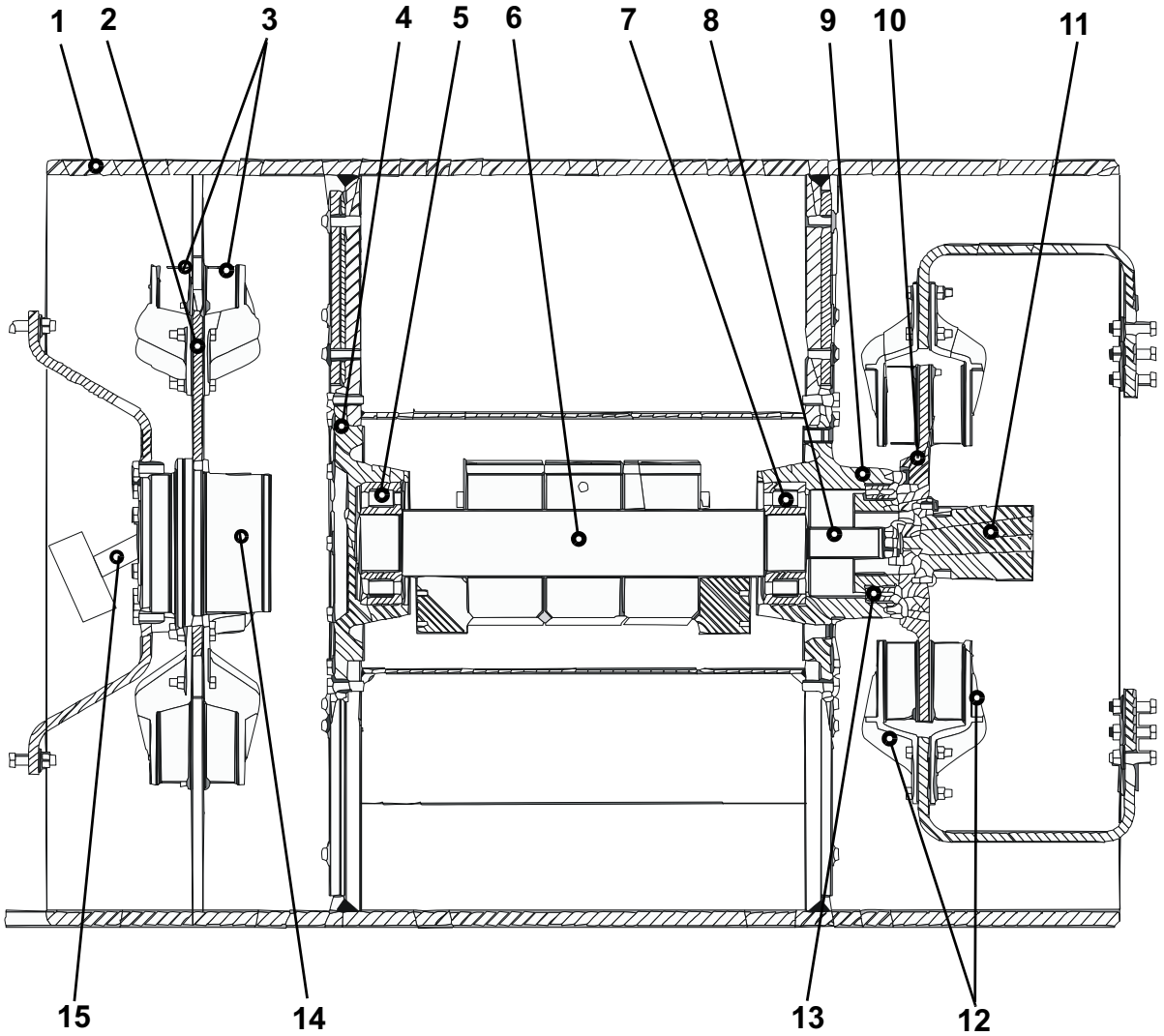
7.2.1 Preparing the roller for drum removal and installation

ATTENTION!

The drum may only be removed in a workshop.
Sufficient crane capacity must be available to lift the drum frame and the drum.

- Secure the roller against rolling before starting work.
- Pull out the ignition key.
- Insert the anti-buckling device (1) between the drum frame and the basic frame.
- Be sure to secure the rear wheels by means of wheel chocks.
- Use suitable lifting gear to fasten the drum frame to a crane.
- Lift the drum frame so that the drum and the rubber buffer are released from any charge .
- Place supports (2) under the front and at the rear of the drum frame.
- Put oil receptacles under the drum drive and under the vibration drive.

Drum HR120C-9

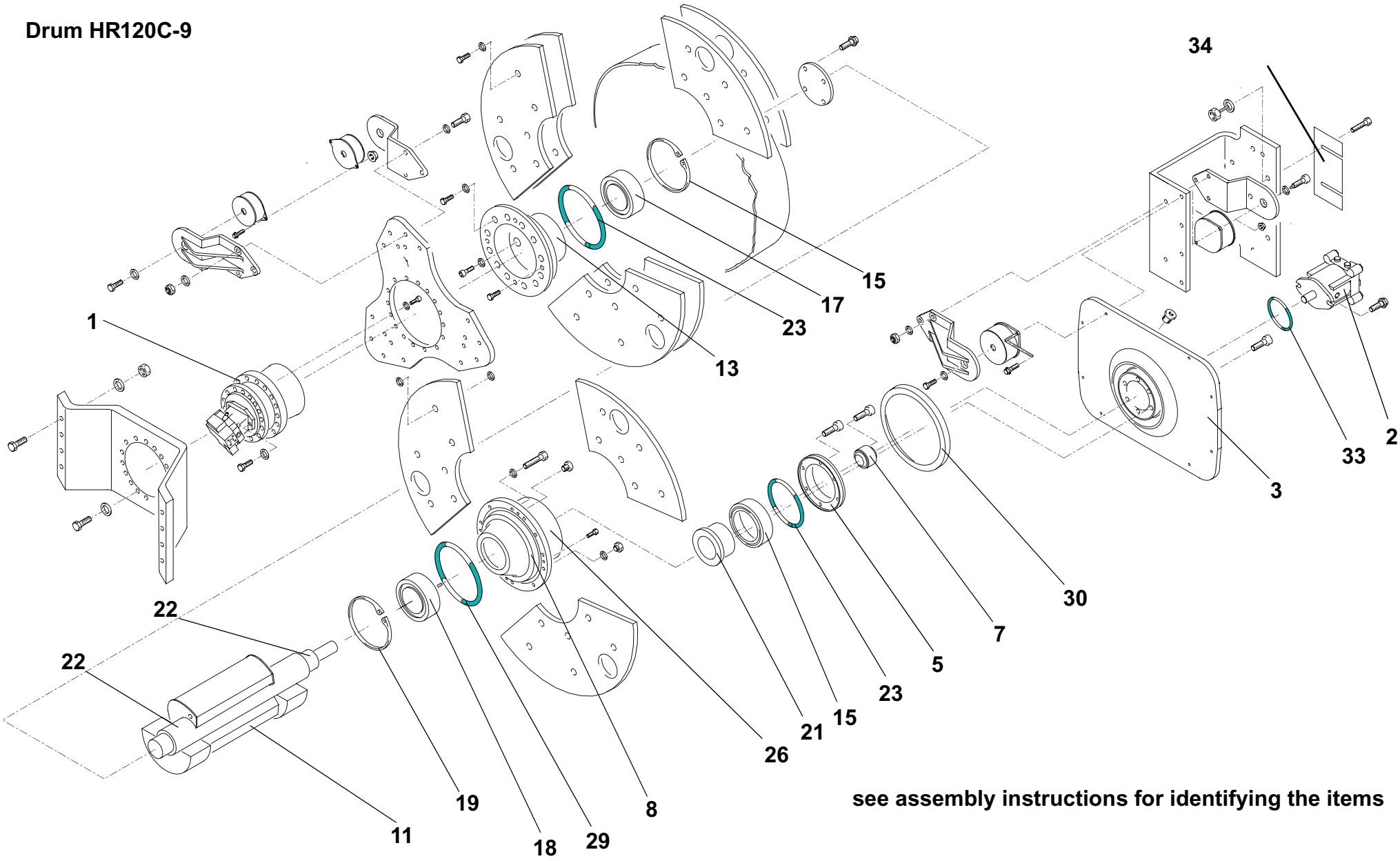


1 Drum
2 Drive system
3 Rubber buffer
4 Bearing housing
5 Cylinder roller bearing
6 Vibration shaft
7 Cylinder roller bearing (drive bearing)
8 Coupling
9 Bearing housing
10 Side plate
11 Vibration motor
12 Buffer bracket
13 Cylinder roller bearing
14 Drum drive/gear unit
15 Drum drive hydraulic motor

NOTE!

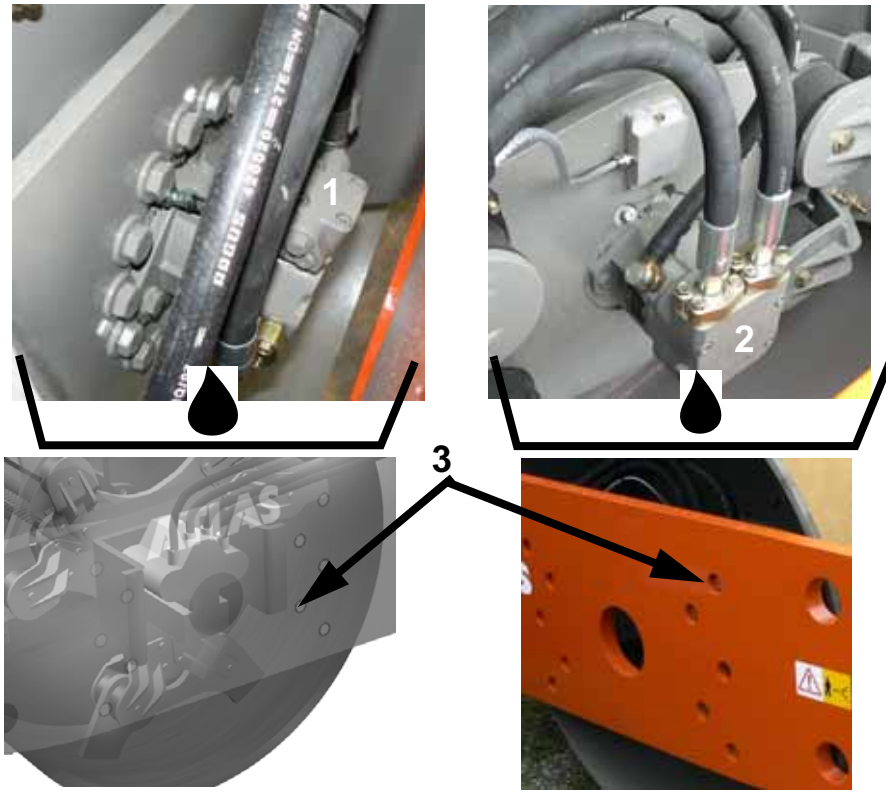
Please refer to the table 'Tightening torques' in chapter 1 for tightening torques and screw joints not specified here.

Drum HR120C-9



see assembly instructions for identifying the items

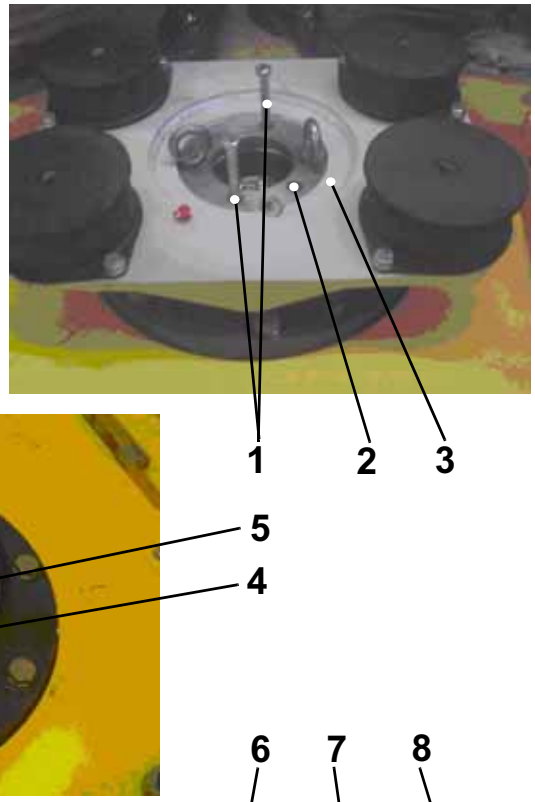
7.2.2 Removing the drum



In order to label the hydraulic connections:

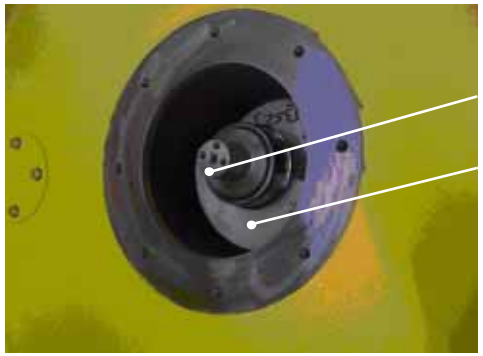
- Detach the hydraulic connections from the drum drive (1) and from the vibration drive (2).
- Disconnect the brake connection of the gear box engine.
- Be sure to collect the leaking hydraulic oil.
- Immediately seal the hydraulic hoses and connections in the drives by means of plugs.
- Use a crane and lifting hooks to lift the drum (4) so that the rubber buffers are released from any charge.
- Remove the bolts between the frame and the buffer bracket on the vibration drive side.
- Remove the bolts (3) between the frame and the adapter on the drum drive side.
- By means of a crane and lifting hooks, lift the drum (4) from the frame.

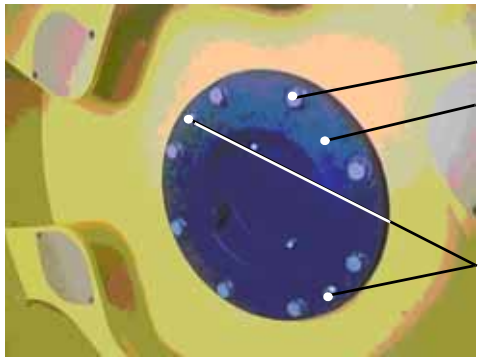
7.2.3 Dismantling the drum



In order to remove the vibrator shaft, by means of a crane, lift the drum on the vibration drive side and place it vertically up.

- Erect a work platform next to the drum.
- Unscrew the bolts (2) of the side plate (3).
- Screw forcing screws (1) into two opposite threads until the side plate (3) can be removed.
- Unscrew the 6 cylinder head screws (4) of the bearing cover (5).
- Remove the bearing cover (5) with the rotary shaft seal.
- Remove the bolts (6) of the bearing housing (8).
- Loosen the bearing housing by means of the forcing screws (9).
- Remove the bearing housing (8).
- Unscrew the coupling (7) from the shaft.





- Screw an eyebolt into the marked tap hole (10).
- Use a crane to lift the shaft (4) out of the drum.
- To remove the components on the drum drive side, by means of a crane, lift the drum on the vibration drive side, turn it by 90° and place it vertically up.

WARNING!

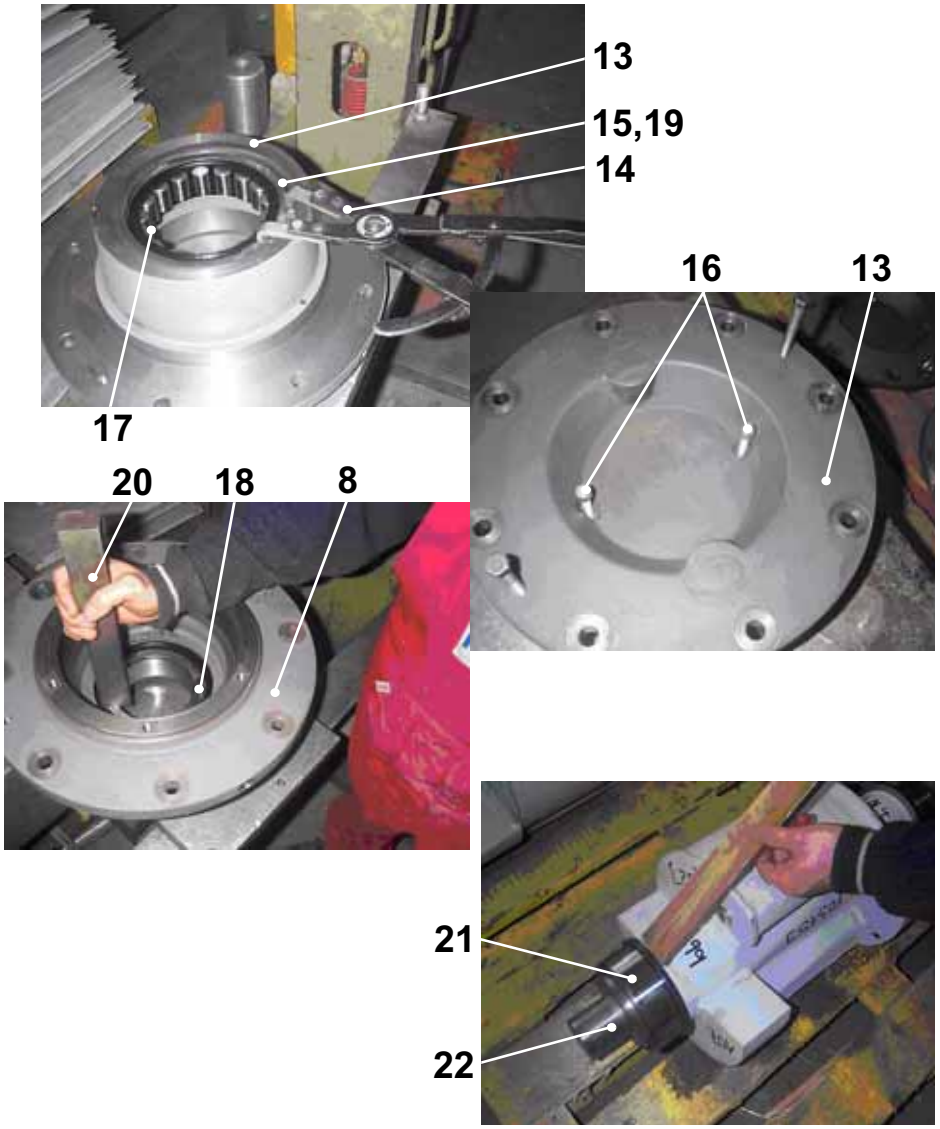
Environmental protection!

The vibration unit contains oil. Be sure to remove the oil before turning the drum again.

- Fasten the drum on the drive side, lift and put it in an upright position.
- Erect a work platform next to the drum.

- Unscrew all bolts (14) from the bearing housing (13).
- Attach and tighten the forcing screws (12) and pull the bearing housing (13) out of the drum.

7.2.4 Removing a bearing



In order to remove the bearing housing (drum drive side):

- Place the bearing housing (13) on a workbench.
- Use circlip pliers (14) to compress and remove the retaining ring (15).
- Rotate the bearing housing by 180°.
- Screw two forcing screws (16) into the tap holes of the bearing housing (13) and pull the bearing (17) out of the housing.

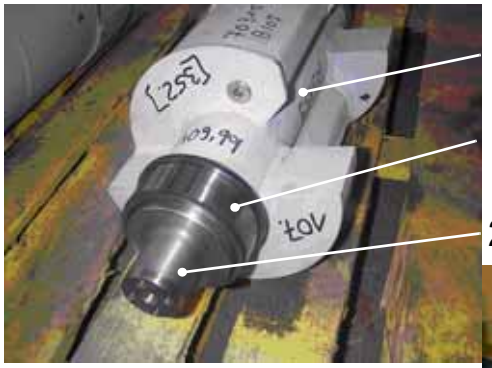
Removing the bearing housing on the vibration drive side:

- Place the bearing housing (8) on a workbench.
- Use circlip pliers to compress and remove the retaining ring (15).
- Rotate the bearing housing (8) by 180°.
- By means of a mandrel (20), remove the bearing (18) from the housing (8).

Pulling the bearing rings off the shaft journal:

- Force the inner bearing rings (21) off the journal (22) by means of a mandrel.

7.2.5 Installing the bearing



DANGER!

Danger of burns caused by hot components!

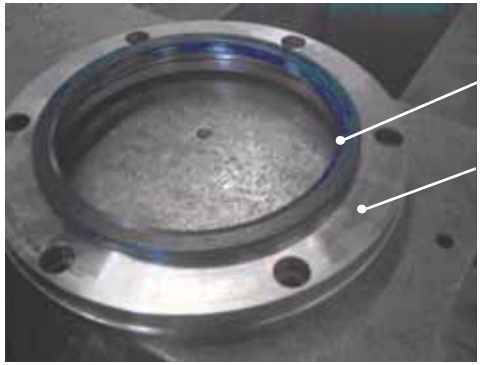
- Some bearings need to be heated in order to install them. Be sure to wear gloves!

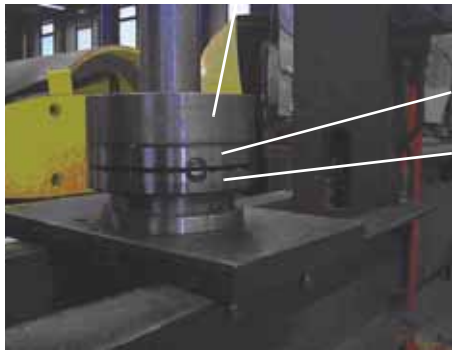
Fitting new bearing rings on the shaft journals:

- Heat the inner bearing rings (21) to about 100°C in an oil bath and press them onto the bearing journals (22) of the shaft (11).

Inserting new cylinder roller bearings and retaining rings:

- Press new cylinder roller bearings (17,18) into the bearing housings (8, 13) by means of a hydraulic press and an intermediate plate.
- Insert the retaining rings (15, 19) into the respective bearing housings and make sure they click into place.





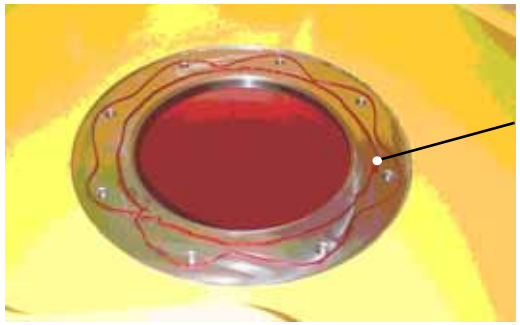
Inserting a new rotary shaft seal:

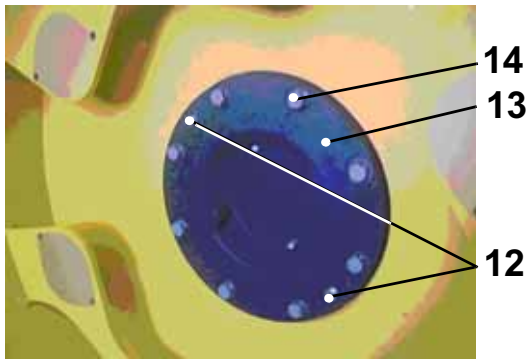
- Press the rotary shaft seal (23) out of the bearing cover (5).
- Slightly grease the sealing lip of the new rotary shaft seal.
- Insert new rotary shaft seal (23) with the sealing lip up into the bearing cover (5). Press it in until the limit stop is reached.

Inserting a new drive bearing into the bearing fixture:

- Use a plate (24) to remove the bearing fixture (26) from the drive bearing (25).
- Put a new drive bearing (25) onto the bearing fixture (26).
- Press the drive bearing (25) onto the bearing fixture (26) up to the stop using a push-in device (27).
- Insert the bearing fixture (26) with the drive bearing (25) into the bearing housing (8) in such a way that the tap holes of the bearing fixture point upwards.
- By means of the push-in device (27), press the bearing (8) into the housing (26) until it fits closely to it.

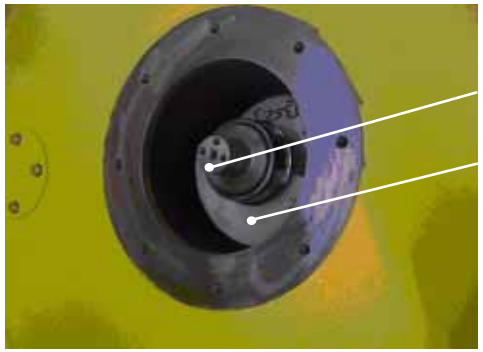
7.2.6 Assembling the drum

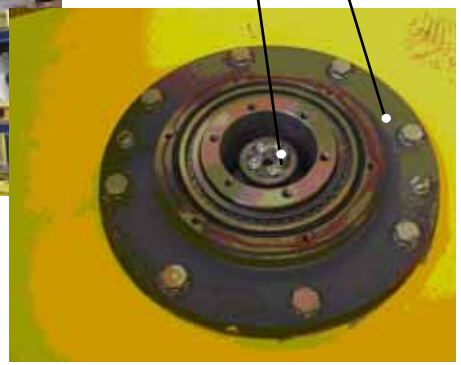




Installing the bearing housing (drum drive side):

- Apply a sealing compound, e.g. Loctite 518, to the sealing surface (28) of the drum.
- Slightly grease the O-ring (29) and attach it to the bearing housing (13).
- Insert the bearing housing (13) by placing it on the sealing face (28) of the drum drive side.
- Use the screws (14) to fasten the bearing housing (13) up to the limit stop.
- Tighten the screws (14) by means of a torque wrench.
- Close the forcing holes (12) by means of screws.
- In order to install the components on the vibration drive side, use a crane to lift the drum on the drum drive side, rotate it by 90° and put it down on the edge of the drum.
- Fasten the drum again on the vibration drive side, lift it and put it into an upright position.
- Erect a work platform next to the drum.

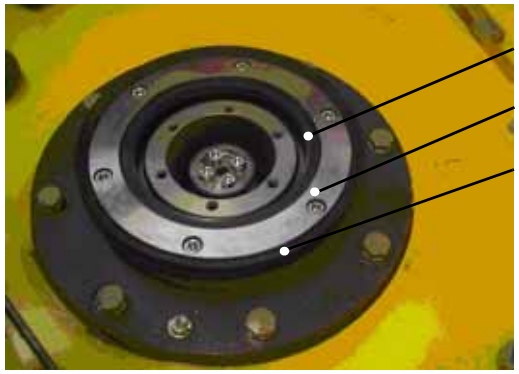


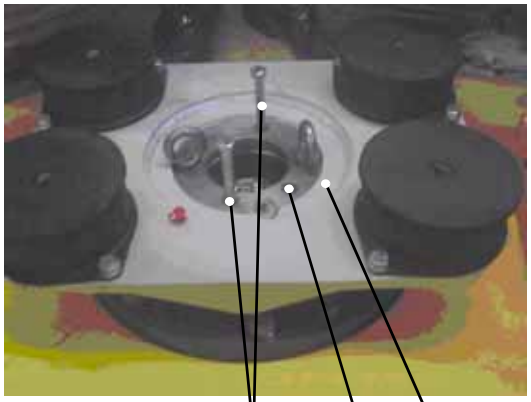


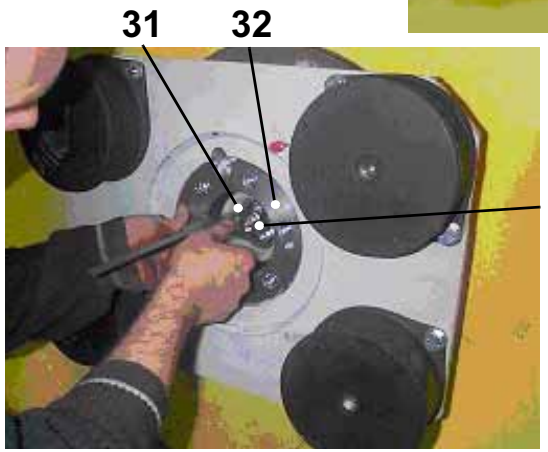
Installing the bearing housing and the vibration shaft on the vibration drive side:

- Screw an eyebolt into the marked tap hole (10).
- Use a crane to insert the vibration shaft (11) into the drum.
- After inserting the shaft (11) by turning it, check whether it is seated correctly in the bearing of the drum drive side.

- Remove the eyebolt (10).
- Use four screws to install the coupling (7) in the housing (8) and bolt it onto the shaft.
- Apply sealing compound (e.g. Loctite 518) to the sealing face of the drum.
- Insert the bearing housing (8) into the vibration drive side. Refer to the description 'Installing the bearing housing of the drum drive side'.
- Fill in lubricating oil (in accordance with the SAE 40 specifications) via the opening between the bearing fixture and the shaft bearing.
  - Required quantity of lubricating oil: 17 liters







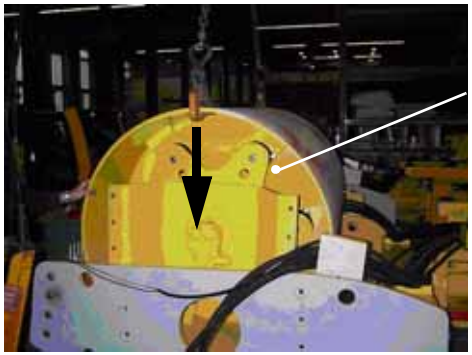
Completing work on the vibration drive side:

- Slide a new v-ring (30) over the bearing cover, its sealing lip pointing upward, to the limit stop.
- Slightly grease the sealing lip, the sealing face of the bearing cover (5) and the rotary shaft seal (23).
- Use a crane to lift the side plate (3) from the eyebolts over the guide screws (1) onto the bearing cover (5).
- Turn the bolts (2) into the side plate (3) and tighten them to the appropriate torque.
- To install the hydraulic components, use a crane to lift the drum on the vibration drive side, rotate it by 90° and put it down on the edge of the drum.
- Press the drive shaft (31) into the bearing housing up to the coupling.
- Use a depth gauge to measure the distance from the sealing face (32) to the coupling (7).
- Pull out the shaft (31) up to the limit stop, and measure again, as described before.
- The difference of the two measurements corresponds to the bearing clearance.
- Clearances ranging from 1.9 to 2.4 mm.
- Calibrate the coupling by means of the depth gauge!
- Bolt vibration motor 1 to the side plate with the connections pointing towards the grease nipple.

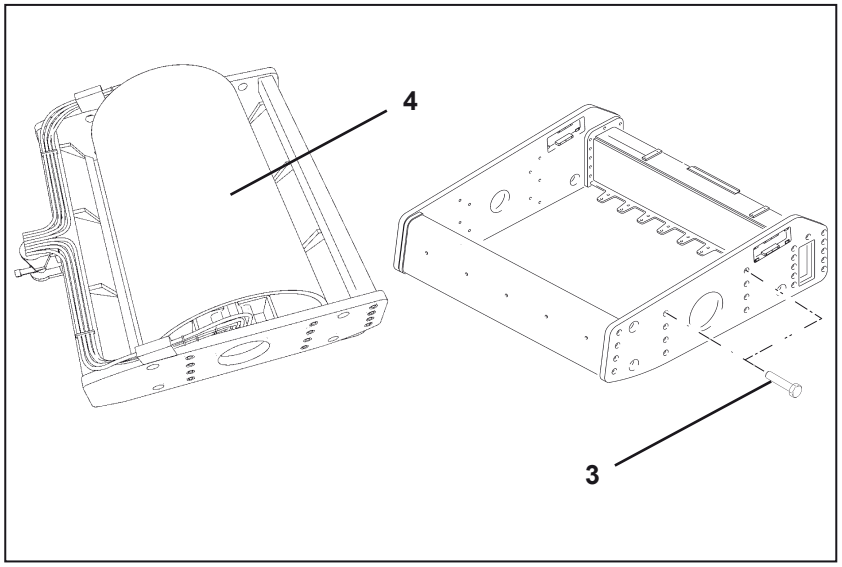
(to be continued on page 7-22)

- Slightly grease the O-ring (33) to seal the bearing housing/ vibration drive and push it onto the drive.
- Calibrate the coupling (34) on the vibration drive (2) by means of the depth gauge!
- Bolt the vibration drive to the side plate, connections pointing towards the grease nipple.

The drum (4) is now completely assembled and ready to be installed in the drum frame.

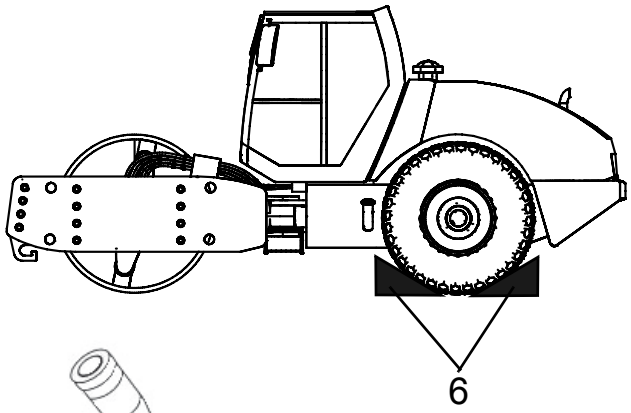


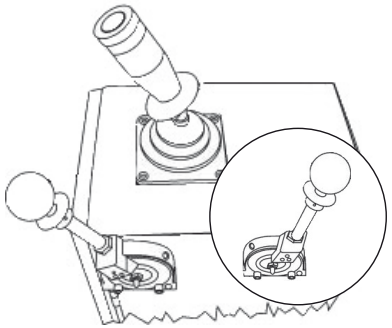
7.2.7 Installing the drum



After repairs or replacing components, carry out the following work in order to insert the drum into the drum frame:

- Ensure the correct assignment of the drum drive side.
- Use a crane to lower the drum (**4**) and move it so that the screw holes match.
- Tighten the bolts (**3**) on the drum drive side.
- Evenly tighten all fastening bolts (**3**).





Completing work related to the hydraulic connections:

- Attach the hydraulic connections according to the labeling of the drives.
- Remove the sealing plugs from the hydraulic connections.
- Attach the hydraulic connections to the drum drive (1) and the vibration drive (2).
- Detach the brake connection at the gear box engine.

- Secure the rear wheels by means of wheel chocks (6).
- Start the Diesel engine, release the parking brake and slightly
- move the joystick forwards and backwards to check whether the drum rotates correctly.
- Fasten the drum frame to a crane (2) by means of lifting gear.
- Lift the drum frame so the supports under the drum frame can be removed.
- Check all roller functions by performing a test run.

Chapter 8

Drive unit of the vibration system

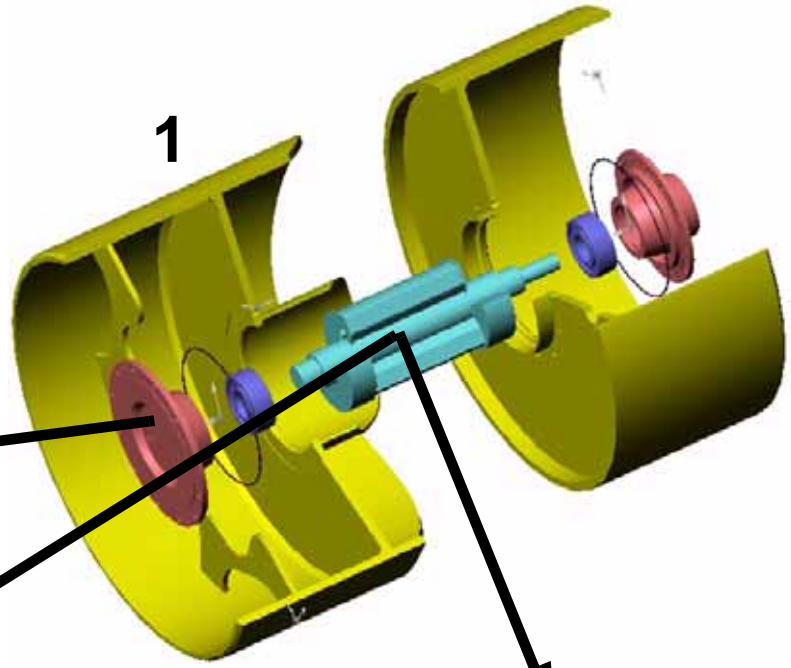
- **Contents**
- This chapter will inform you about:
  - the vibration system and its drive unit
  - the sequence of functions and troubleshooting
  - the measured and default values
  - the arrangement of the measuring points
  - the location of the adjustment facilities

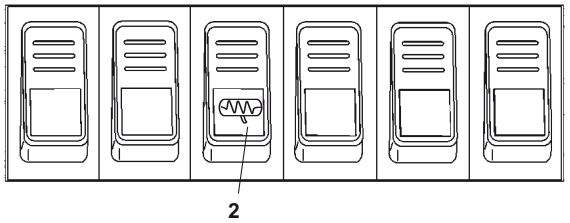
8.1 Compaction and Vibration

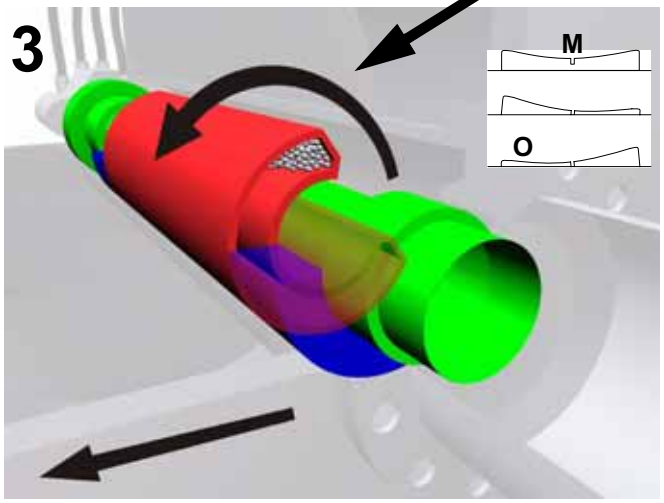
8.1.1 Technical data

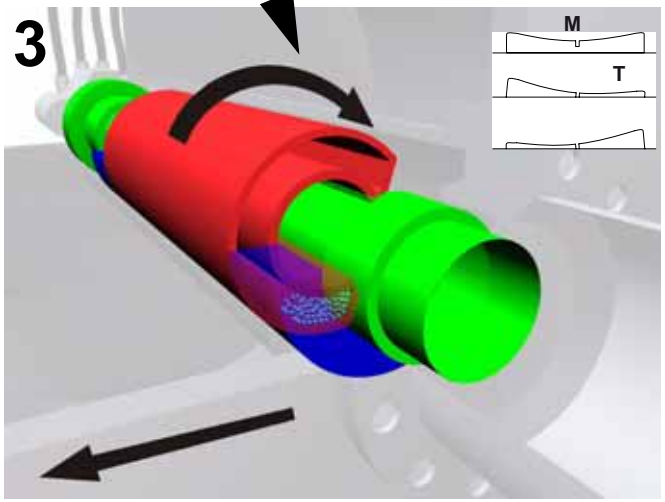
Compaction roller HR120C-9	with smooth drum
Compacting power	
Static linear load	32.80 kg/cm (72.31 lb/cm)
Amplitude high/low	1.8/0.6 mm
Frequency high/low amplitude	30/40 Hz
Centrifugal force at high/low amplitude (kN)	240/140

8.1.2 Overview: Vibration System









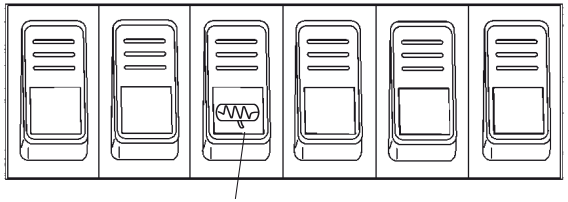
1 Drum

2 Vibration type selector switch

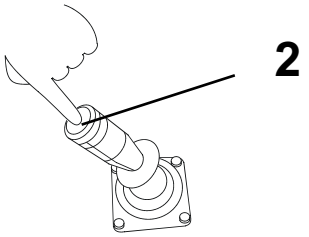
- O low amplitude
- T high amplitude

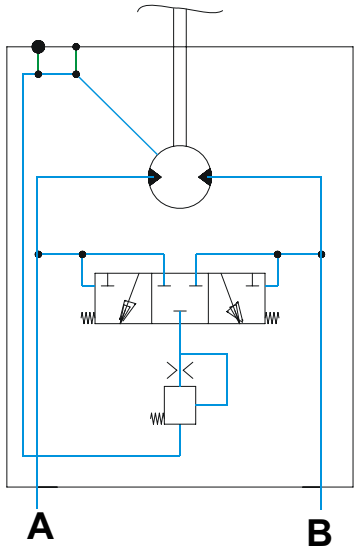
3 Vibration system

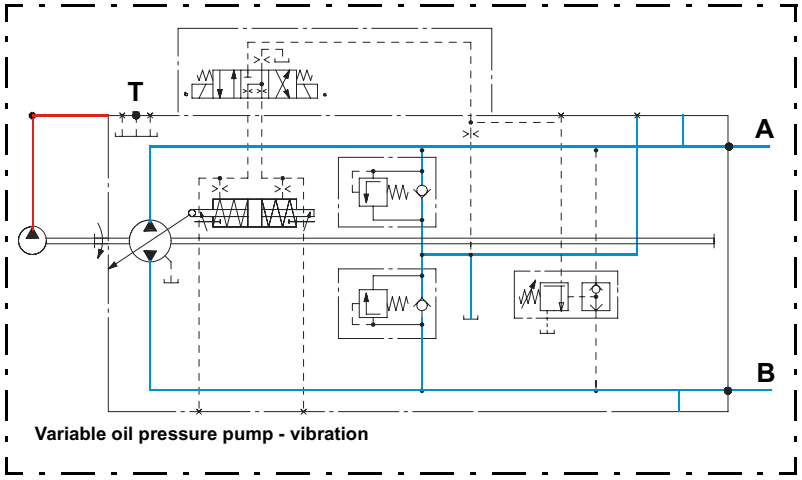
8.1.3 Overview: Hydraulic Vibration System



Vibration



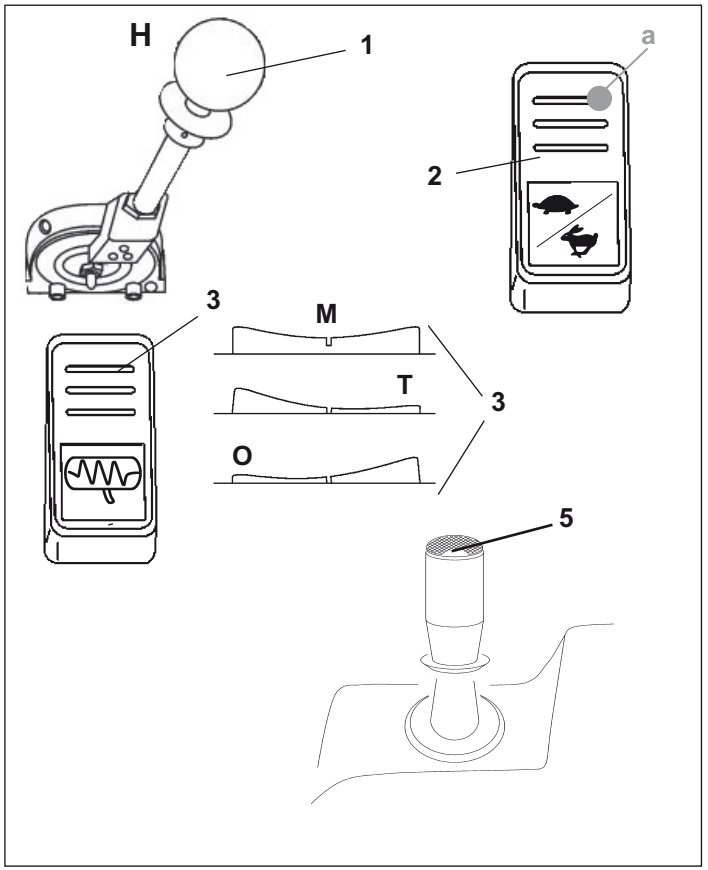




= HD oil system A & B
= Control oil system PS
= Tank line

1 Variable oil pressure pump - vibration
2 Control lever, button vibration ON
3 Vibration type selector switch
4 Vibration drive

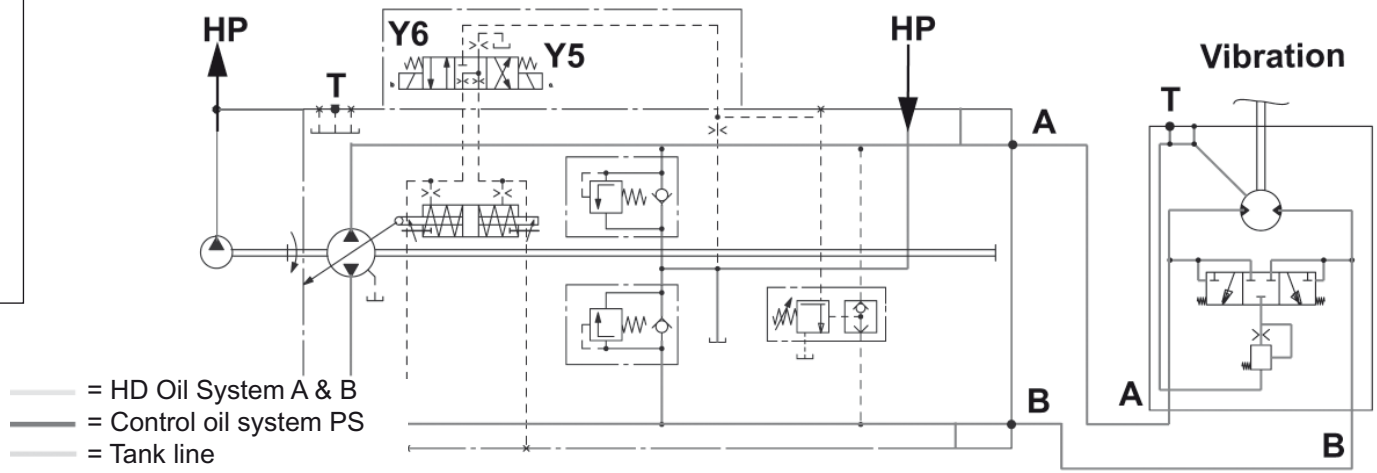
8.1.4 Sequence of functions: Vibration mode



- Move the rev adjustment lever (1) to the **H** position.
- Make sure both “rabbit/turtle“ switches (2) on the panel of switches are set to (i.e. pressed down at) position **a**.
- Release the parking brake by means of the corresponding switch.
- Use the selector switch (3) to select the desired type of compaction:
  M Middle position: Vibration off
  T Right side pressed down: Deep compaction
  O Left side pressed down: Surface compaction

NOTE!
Selecting the type of vibration does not activate the vibration itself. In order to do so, press the button on the top of the joystick (5).

Depending on whether **T** or **O** is activated, the corresponding solenoid valve on the variable oil pressure pump is opened and releases the control oil pressure to the displacement disk of the oil pressure pump. The oil pressure pump swivels to establish the selected type of vibration. The oil flow reaches the vibration drive.



8.1.5 Troubleshooting

Malfunction / Fault	Causes and Effects	Measures to be taken
Vibration fails to start	**Electrical fault**: • The button on the top of the joystick, which serves to (de)activate the vibration, is defective. • Fuse 02 is defective. • Solenoid valve Y05/06 is defective. **Hydraulic fault:** • The supply pressure is too low.	• Check the vibration selector switch on the console. Check relay K04. • Replace the fuse, if necessary. • Replace the solenoid valve, if necessary. • Check the supply pressure. • Check high pressure **A** & **B** at measuring points. • Check the coupling between the vibration motor and the shaft.
Vibration cannot be stopped	• The button on the top of the joystick, which serves to (de)activate the vibration, is defective.	
The vibration system works sluggishly	• Speeds	• Check high pressure **A** & **B** at measuring points **MA** and **MB**. • Check the oil level in the vibration bearing, see **Maintenance Instructions**.
The vibration system produces loud noise	• Frequencies	• Check the frequencies. • Check the vibration system.

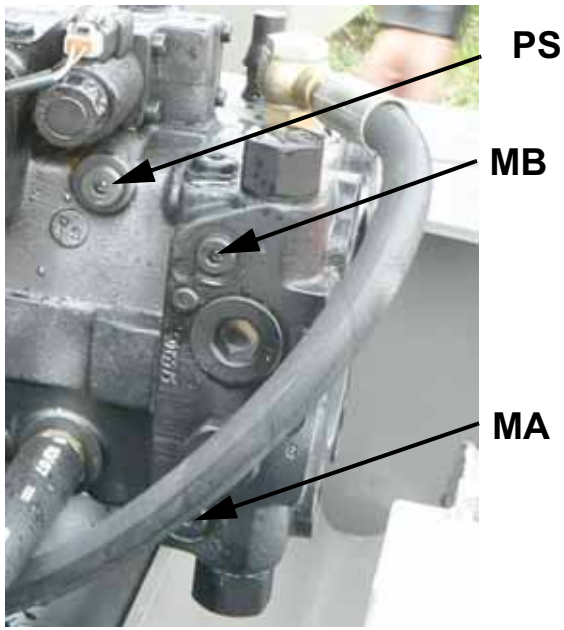
8.2 Engine speeds, hydraulic measured and default values

Measurement/Adjustment	Required values	Measuring point/Tools
Maximum Diesel engine speed	2200 min^{-1}	Diesel engine
Maximum Diesel engine idle speed	2300 min^{-1}	Diesel engine
Starting pressure, high amplitude	330-350 bar	MB
Operating pressure, high amplitude	230-280 bar	MB
Frequency at high amplitude	30 Hz (corresponds to 1800 min^{-1} of the vibration shaft)	Sirometer/Adjustment via adjusting screw V2
Starting pressure, low amplitude	330-350 bar	MA
Operating pressure, low amplitude	130-180 bar	MA
Frequency at low amplitude	40 Hz (corresponds to 2400 min^{-1} of the vibration shaft)	Sirometer/Adjustment via adjusting screw V2
Amplitude at high frequency	0.6 mm	
Amplitude at low frequency	1.8 mm	
Run-up time, vibration	2 - 4 seconds	Stop watch

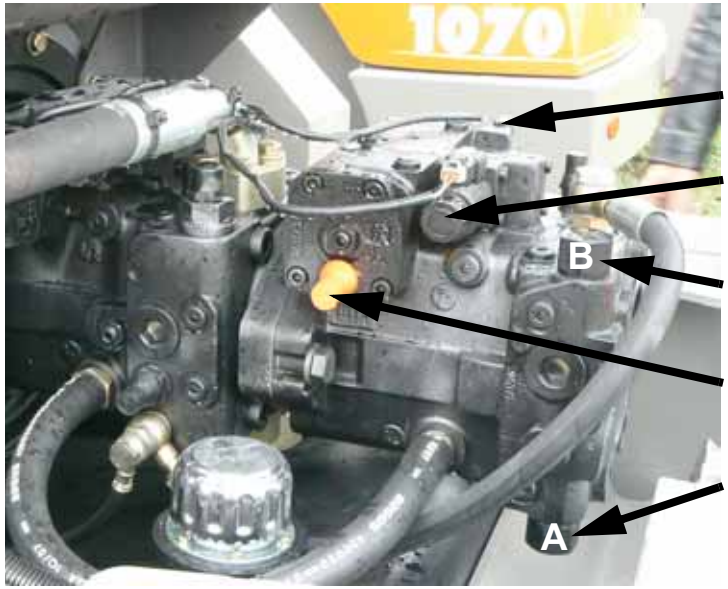
8.2.1 Overview: Measuring points of the vibration hydraulics and measuring conditions

ATTENTION!
Prior to measuring the speeds and the hydraulic oil pressures, make sure the Diesel engine has reached its operating pressure and the hydraulic oil in the supply circuit has warmed up to a minimum temperature of 50°C.

NOTE!
Measuring the required vibration values:
The vibration values are to be measured by means of a sirometer (see chapter 'Using a sirometer').



8.2.2 Overview: Adjustments related to the variable oil pressure pump



Y5 high frequency

Y6 low frequency

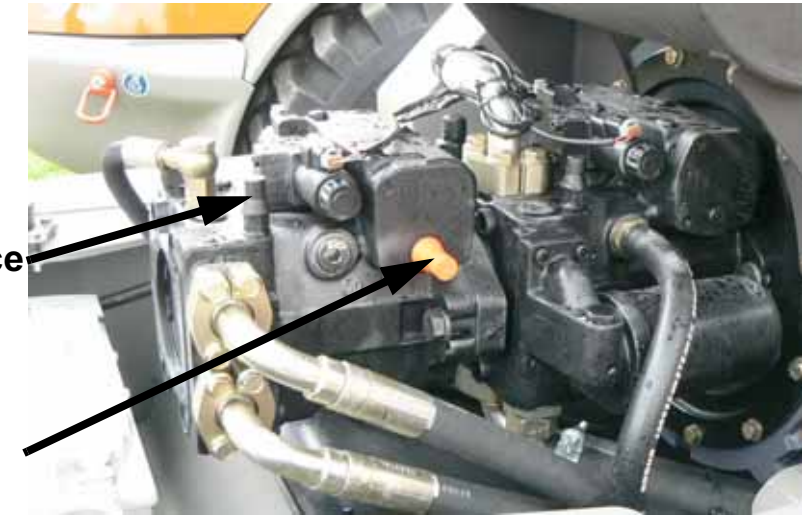
HP valve
370 bar

Adjustment V1
low amplitude

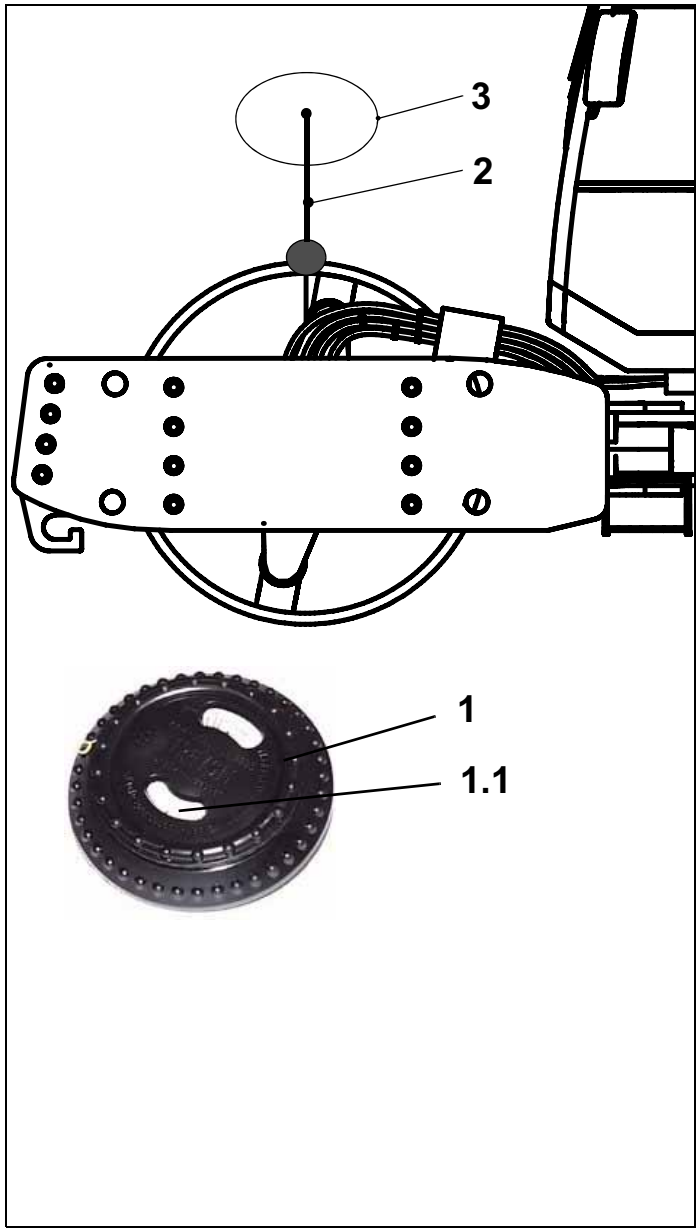
HP valve
370 bar

Pressure
limiting device
320 bar

Adjustment V2
high amplitude



8.3 Using a sirometer



- A sirometer allows for a high-accuracy measurement of the engine speed and frequency on any running motor or machine in operation.
- For the TREYSIT sirometer (1), the resonance on the drum serves as the basis of the evaluation.
- The engine speed or frequency to be measured (bottom scale 1.1) is shown on the two scales.
- Tested and approved by the Federal Standards Laboratory in Braunschweig, Germany, the TREYSIT sirometer, with a tolerance of 1-2%, ensures an adequate degree of accuracy for the regular measurements.

DANGER!
Danger of injury!

- Vibration measurement with the sirometer may only be carried out with the roller **stopped**.

- In order to carry out the measurement, position the sirometer (1) at the edge of the drum.
- Turn the top part of the sirometer to the left so the measuring wire (2) extends.
- As soon as the vibration is activated, the end of the measuring wire (2) starts to vibrate (3).
- When the largest oscillations (3) of the measuring wire (2) have been reached, the mark on the bottom scale (1.1) indicates the number of vibrations per second in Hz.

Chapter 9

Electrical Installation

- Contents
- This chapter will inform you about:
  - the electrical equipment of the HYUNDAI compaction rollers
  - maintenance work related to the electrical equipment
  - the fuses, relays and location of the components
  - the electric circuit diagrams

9.1 Electrical Installation

ATTENTION!

Operating voltage of the HYUNDAI compaction rollers:**12 Volt.** Be sure to take this into account in the event of a jump start or when replacing components.

WARNING!

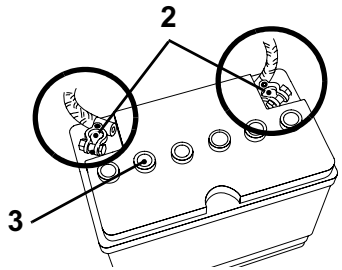
Any repair work related to the electrical installation may only be carried out by staff that has undergone specific training. Disconnect the positive terminal (2) of the battery (1) before carrying out any work referring to the electrical components and the wiring.

9.1.1 Maintenance work related to the electrical installation

Explosion hazard!

Keep away sparks and open fire when working on the battery!

Do not smoke!

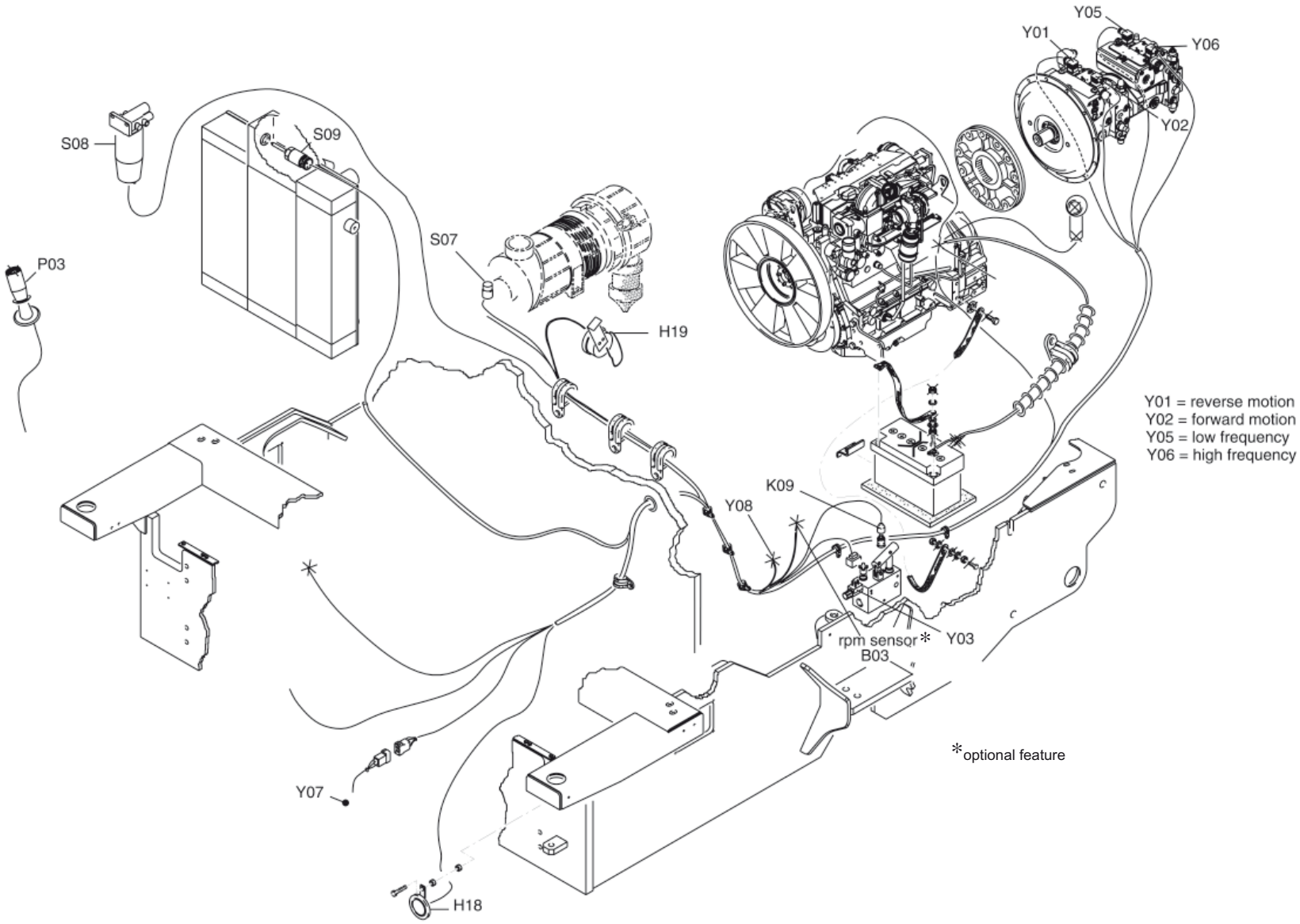


- Check the battery terminals (2) for any signs of dirt and corrosion.
- Grease the poles and terminals,
  Required type of lubricant: Order no. 0830684.
- Open the locking caps (3) of the battery and check the level above the cells.
- The fill level needs to be well above the cells.

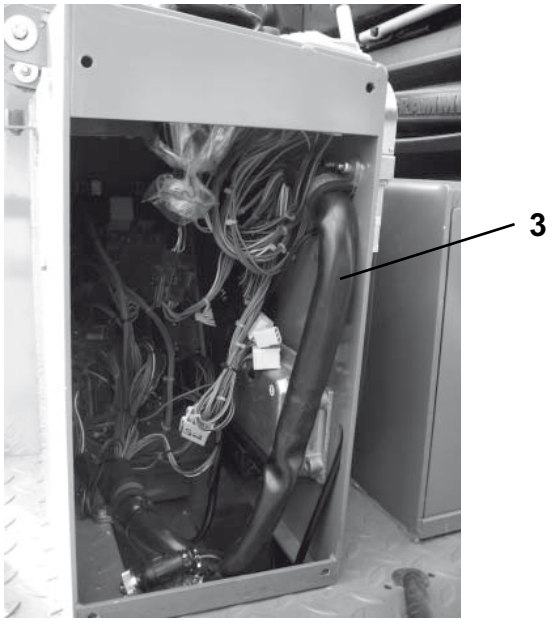
ATTENTION!

Be sure to add distilled water only!

9.1.2 Overview: Electrical installation



9.1.3 Printed circuit board, fuses and relays



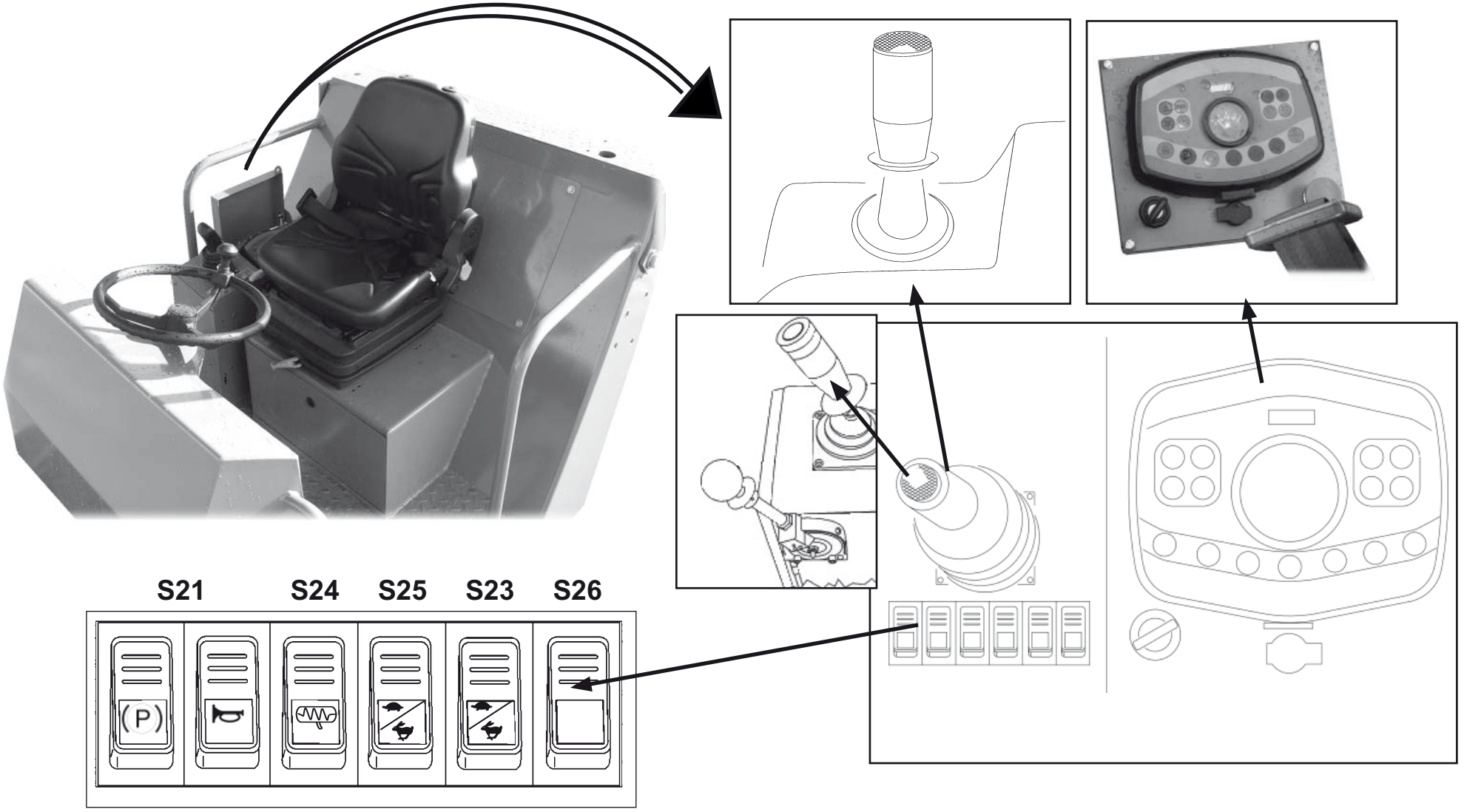
Printed circuit board

- The printed circuit board acts as the distribution center of the electrical system. It is equipped with the fuses and relays.
- The printed circuit board (3) is to be found in the console next to the driver`s seat.
- Open the cover of the console and carry out a visual inspection to check the condition of the printed circuit board (3).
- Check the fuses and relays for any signs of dirt and damage.
- Always replace defective fuses, refer to section 'Layout of the fuses on the printed circuit board'.
- The control block for the joystick and/or forward and reverse switching is also located in the console.

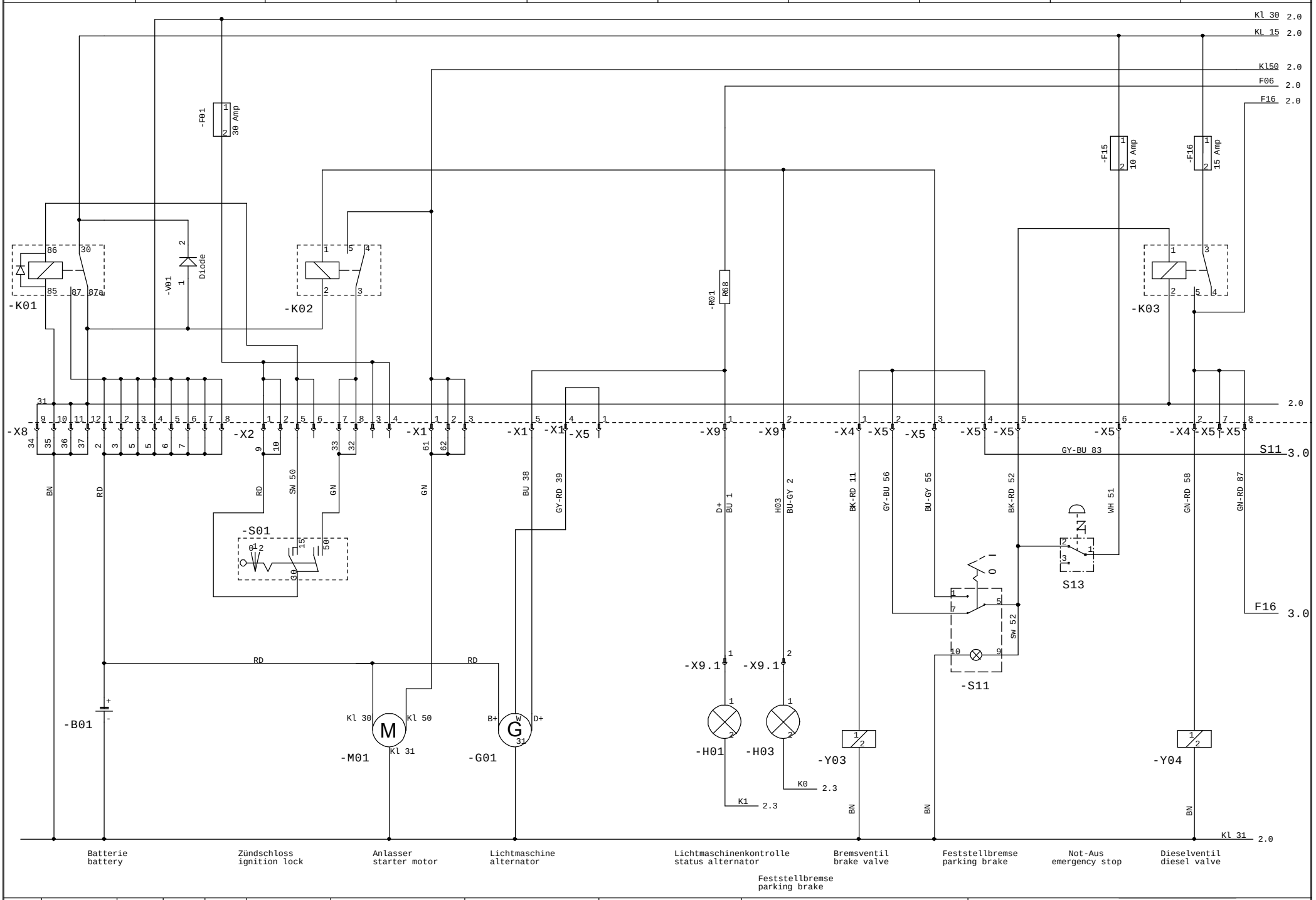
Layout of the fuses on the printed circuit board

No.	Ampère	Function
F1	30 A	Ignition lock, overflow valve
F2	7.5 A	
F3	7.5 A	Vibration
F4	25 A	
F5	25 A	
F6	7.5 A	Sensors, control lights H01, 02, 05, 09, 10, 11, 12, 13, 16, fuel gauge, D+
F7	7.5 A	Gear switch axle/drum
F8	15 A	Horn, (optional feature: electrical equipment driver`s seat)
F9	15 A	
F10	15 A	Rotating light, (optional feature: front work lights)
F11	15 A	Optional feature: rear work lights
F12	25 A	
F13	7.5 A	
F14	15 A	Connector for socket, rpm sensor, (optional feature: compaction measurement)
F15	10 A	Emergency stop, parking brake, drive control
F16	15 A	Drive control, vibration, accumulation of dirt at the oil filter, Diesel valve, joystick, backup warner

Overview: Switches (refer to electrical circuit diagrams for further information on the functions)



9.2 Electrical circuit diagrams



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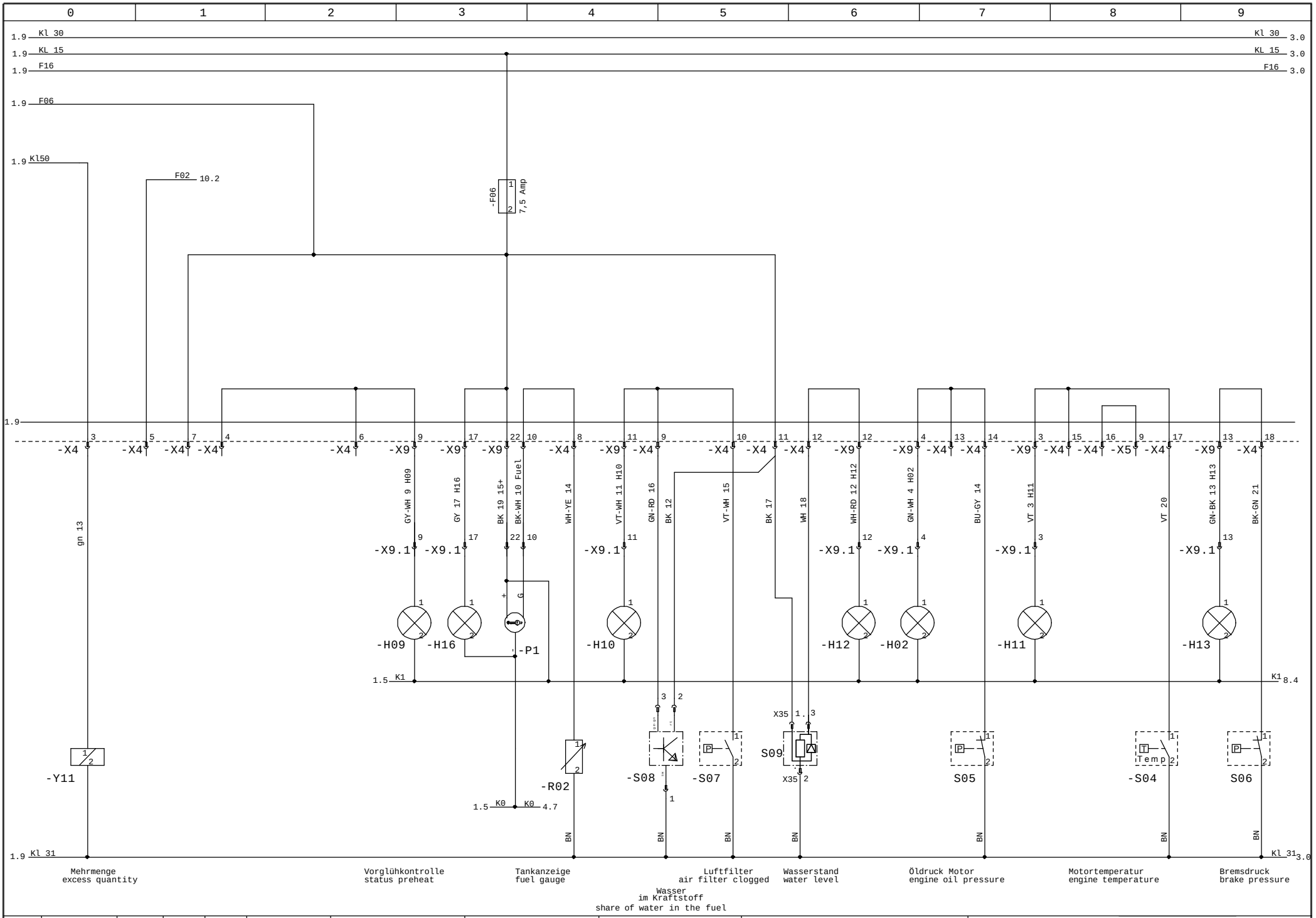

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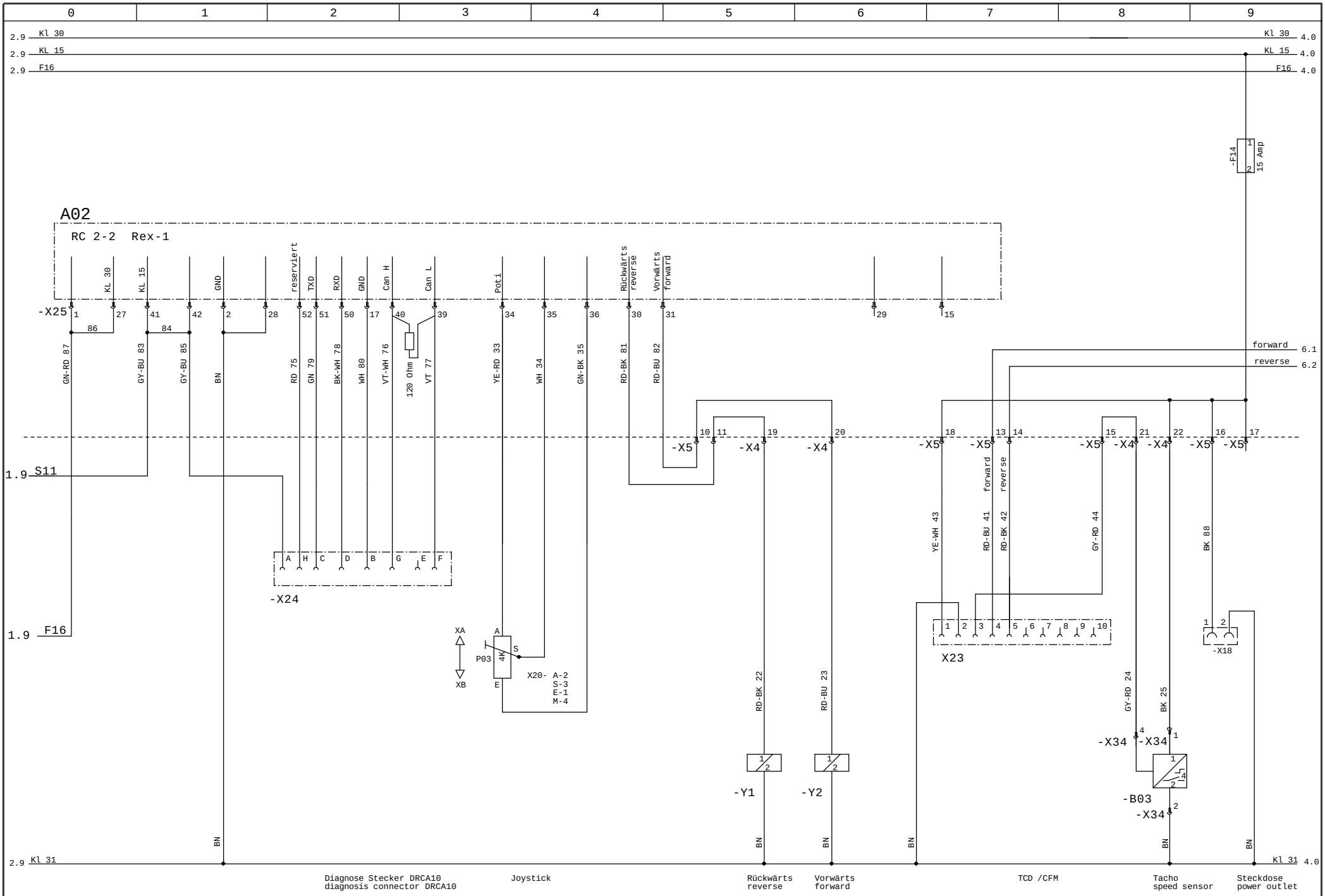

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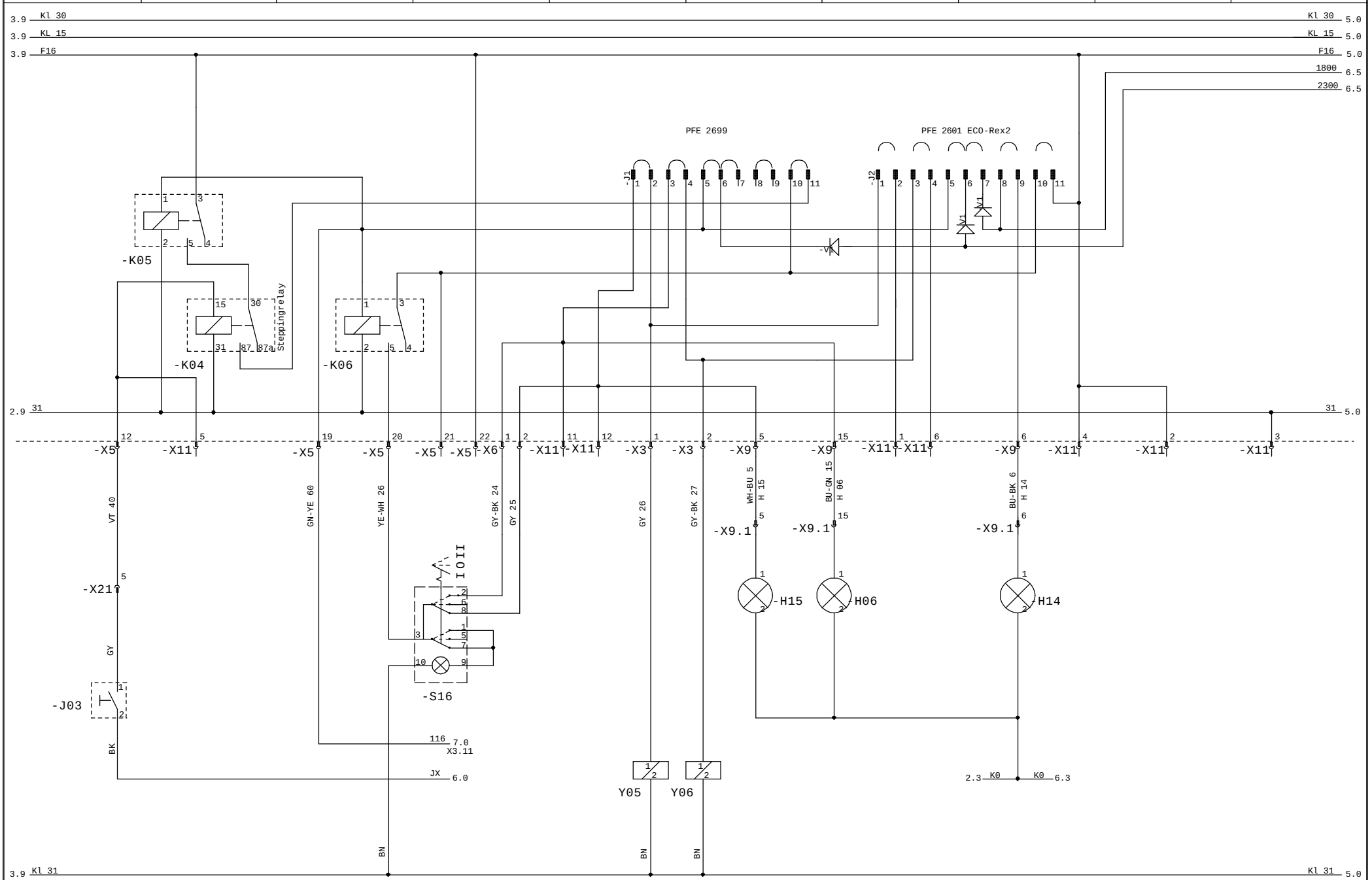

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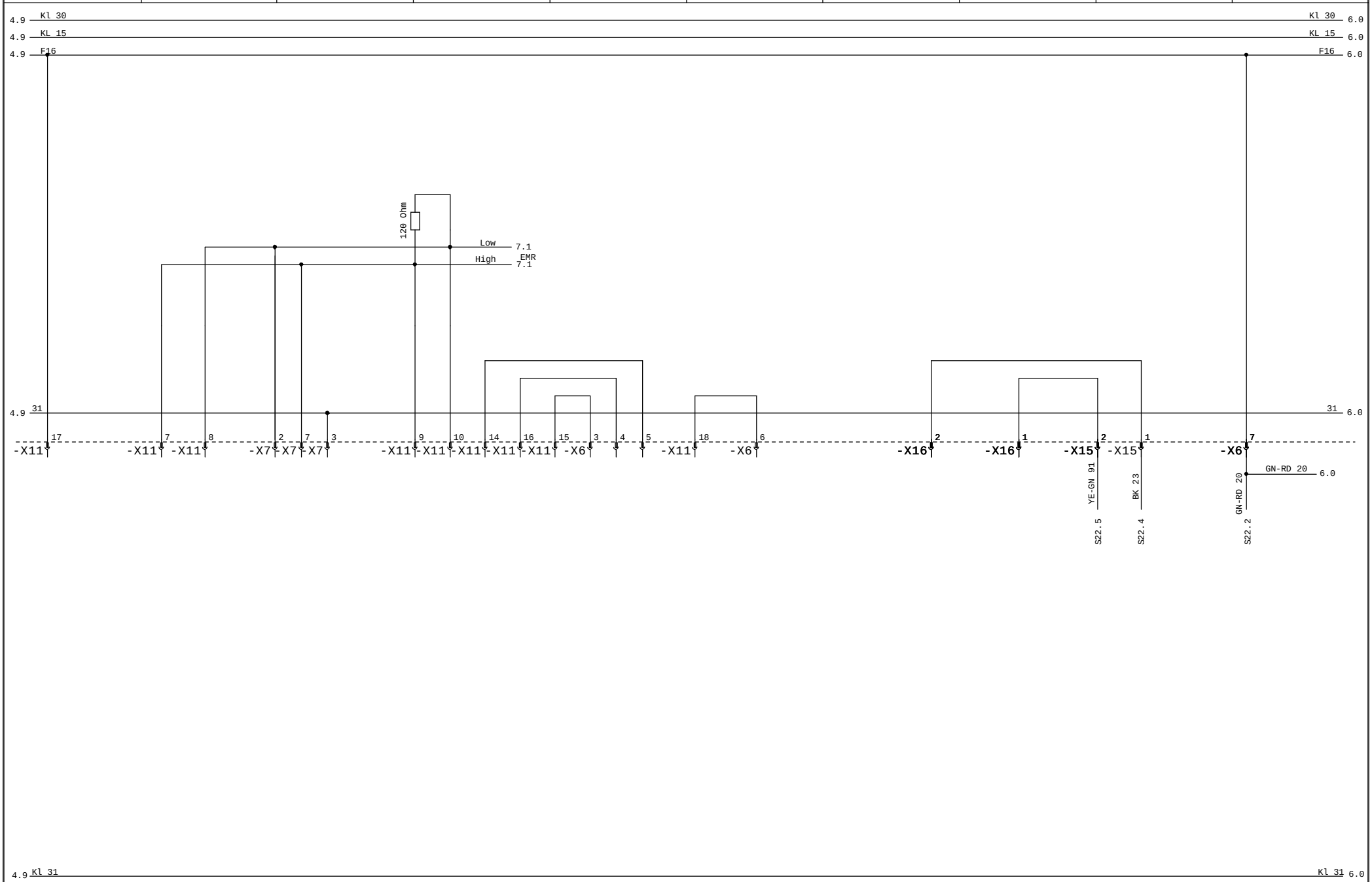

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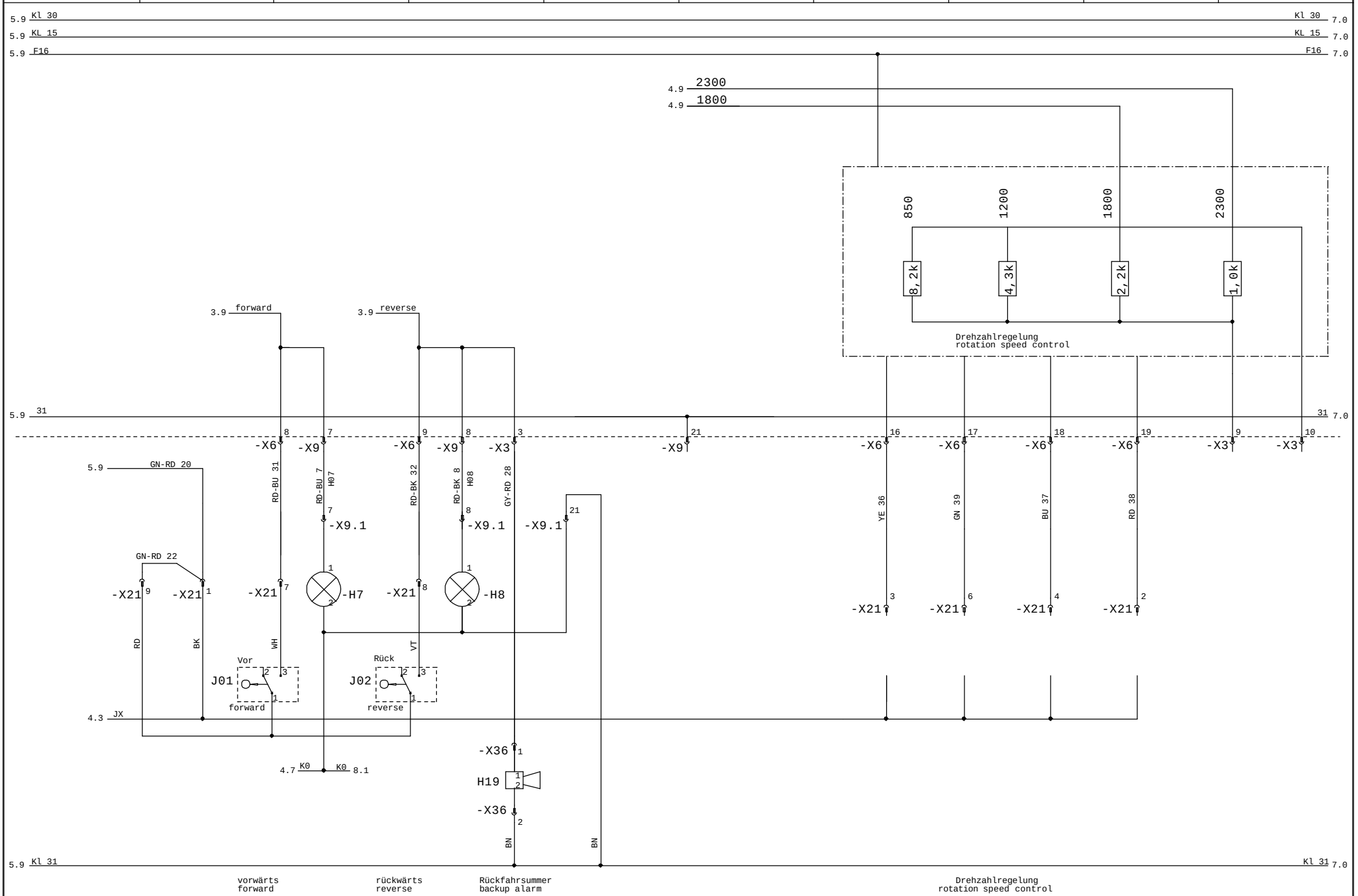

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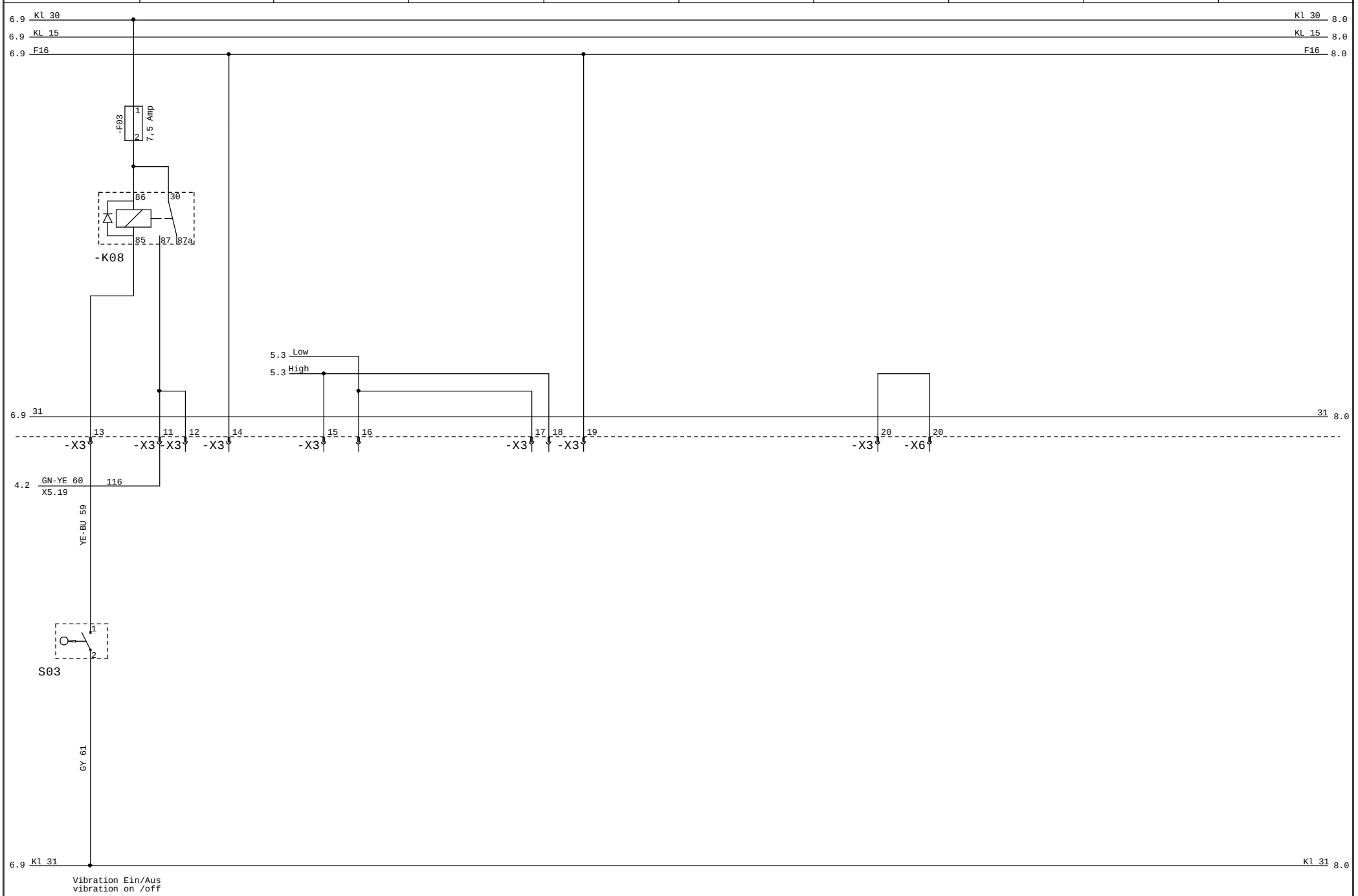

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Vers 01

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Stromlaufplan / circuit diagram

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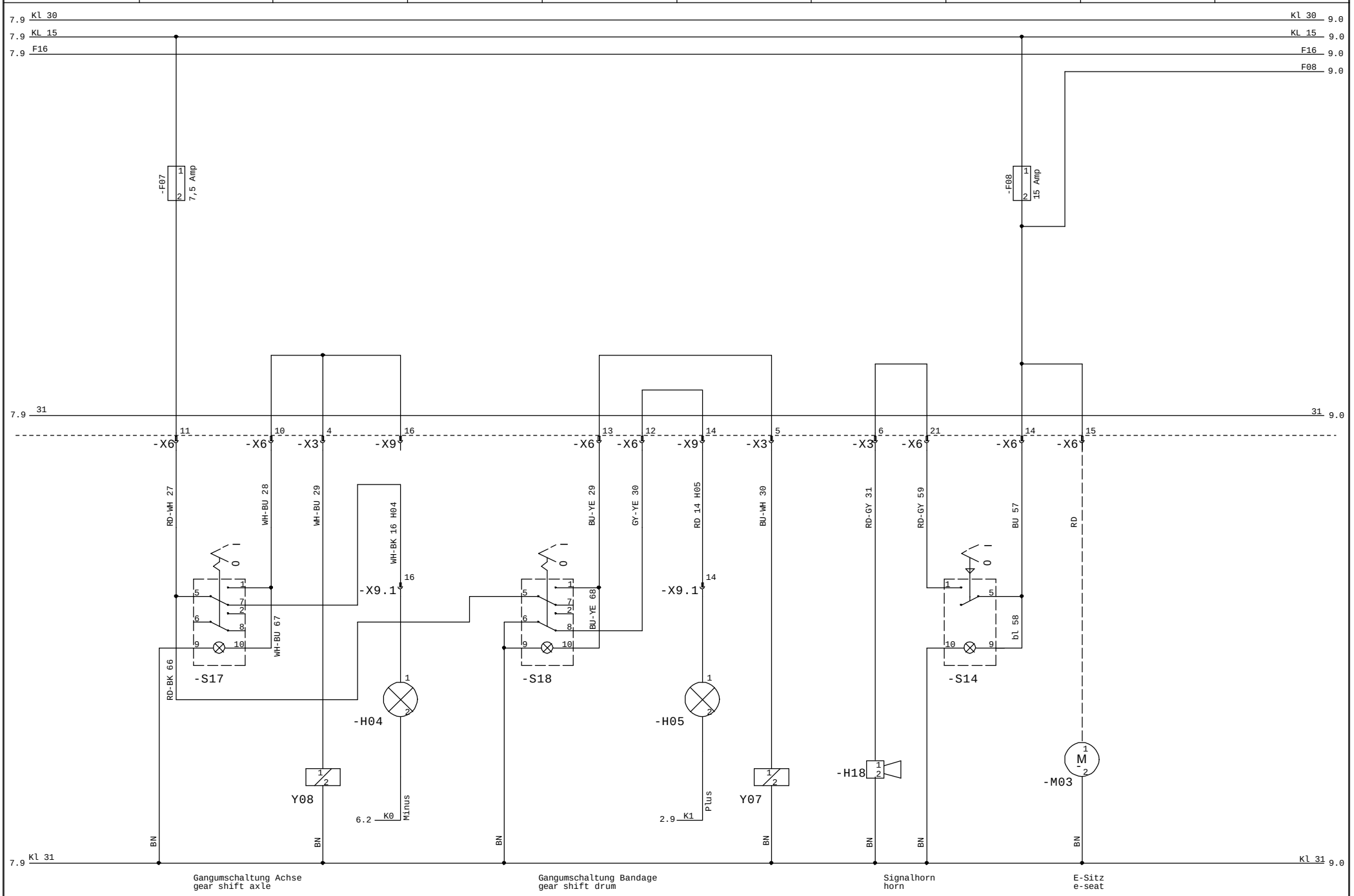

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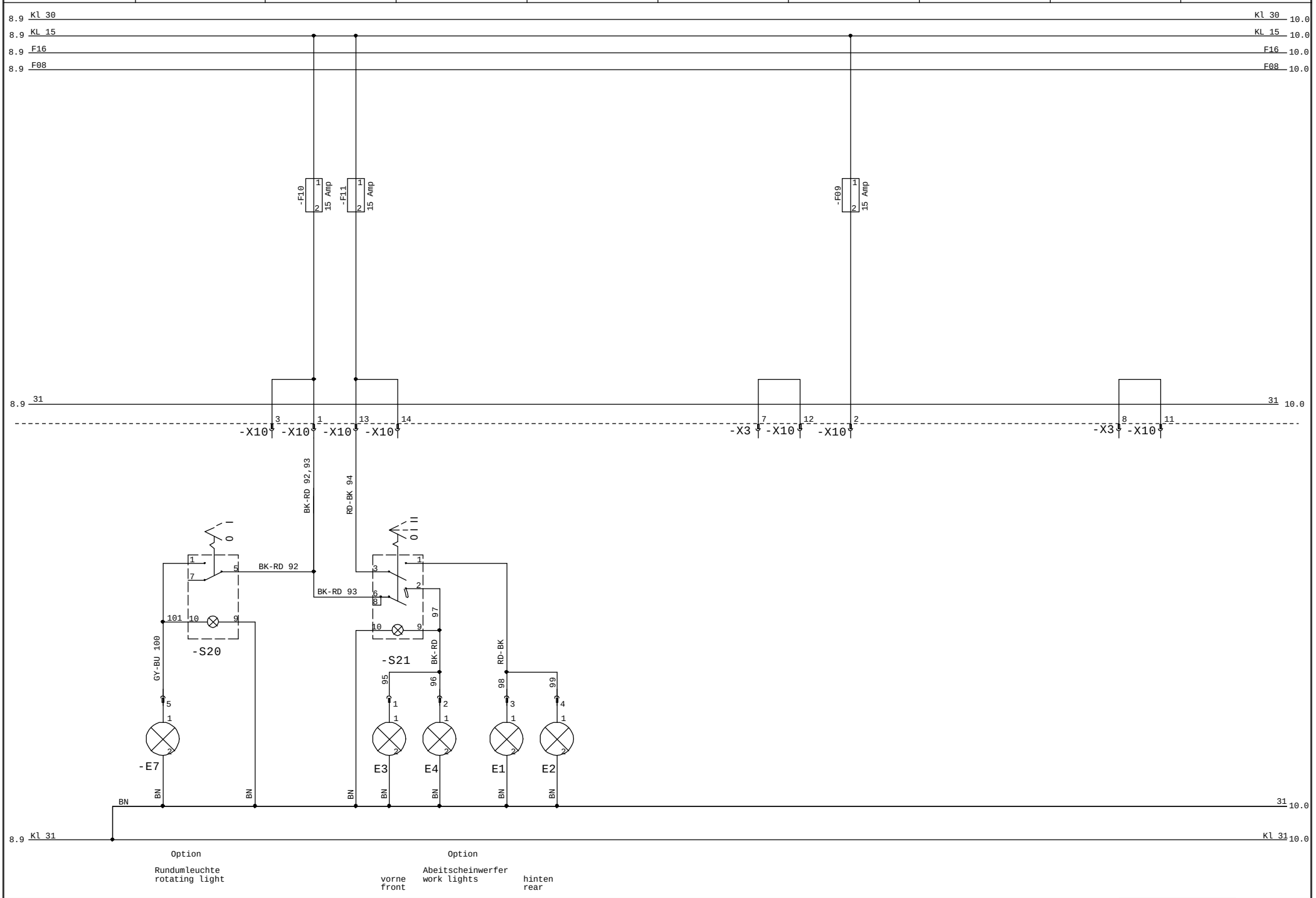

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Stromlaufplan / circuit diagram

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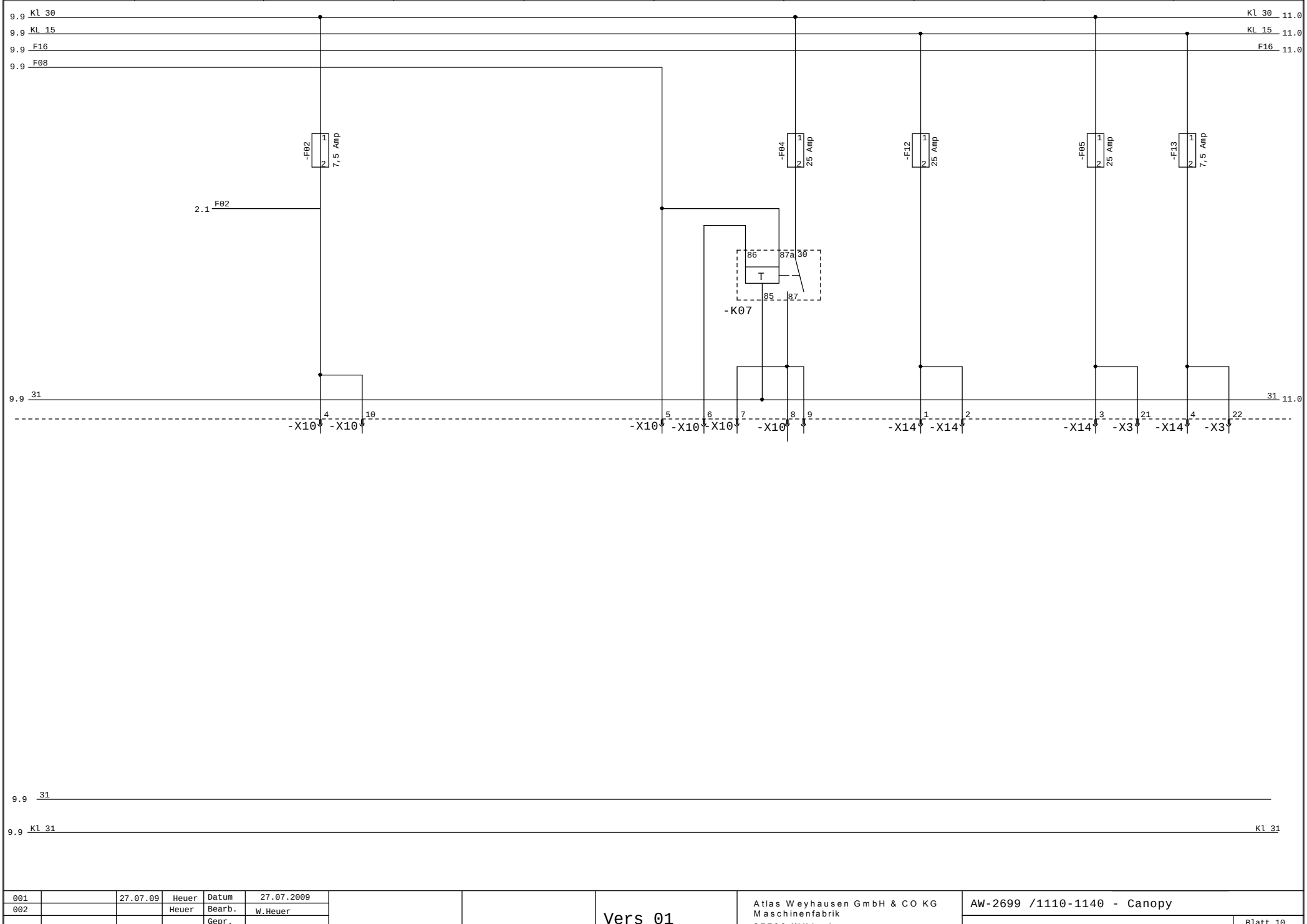

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				Gepr.							
Zust.	Änderung	Datum	Name	Norm		Urspr.	Ers.f	Ers.d			

0	1	2	3	4	5	6	7	8	9

weiss	WS	white	WH
grau	GR	grey	GY
gelb	GE	yellow	YE
rosa	RS	pink	PK
rot	RT	red	RD
grün	GN	green	GN
blau	BL	blue	BL
braun	BR	brown	BN
orange	OR	orange	OG
violett	VI	violet	VT
schwarz	SW	black	BK
türkis	TK	turquoise	TQ

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Zust.	Änderung	Datum	Name	Norm		Urspr.	Ers.f	Ers.d			

Chapter 10

Steering System & Articulated Joint

- **Contents**
- This chapter will inform you about:
  - the steering system
  - the design of the articulated joint
  - removal and installation of the articulated joint

10.1 Steering System and Articulated Joint

ATTENTION!

The articulated joint and the steering system constitute one unit.
The articulation of the drum ensures the maneuverability of the vehicle.

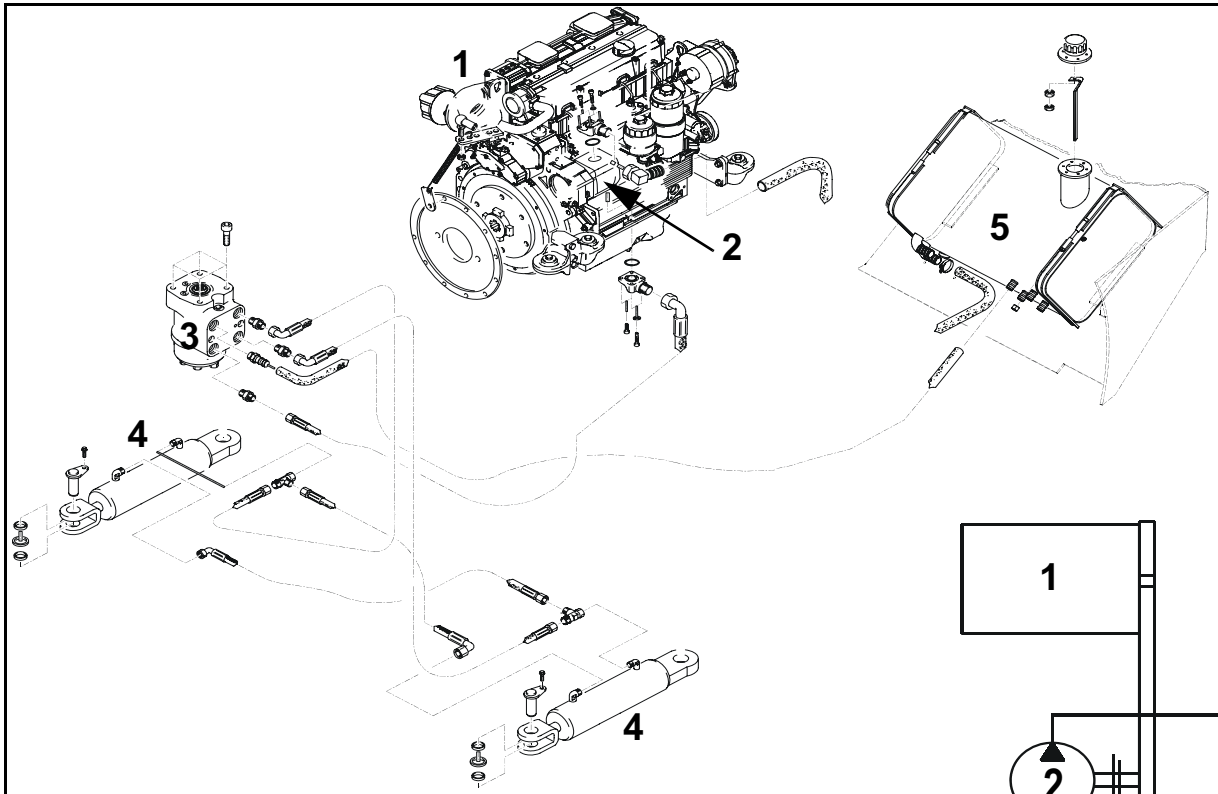
10.2 Steering system

- The steering motions are caused by the extension/retraction of the cylinders.
- The hydraulic steering system is powered by a pump at the Diesel engine.
- The steering orbitrol (control block) is located below the steering column.
- The movement of the steering wheel controls the oil flow in the corresponding control block to the effect that the hydraulic cylinder in the articulated joint is extended while the opposite one is retracted.
- The steering movement determines the steering angle (maximum angle: ±30°).

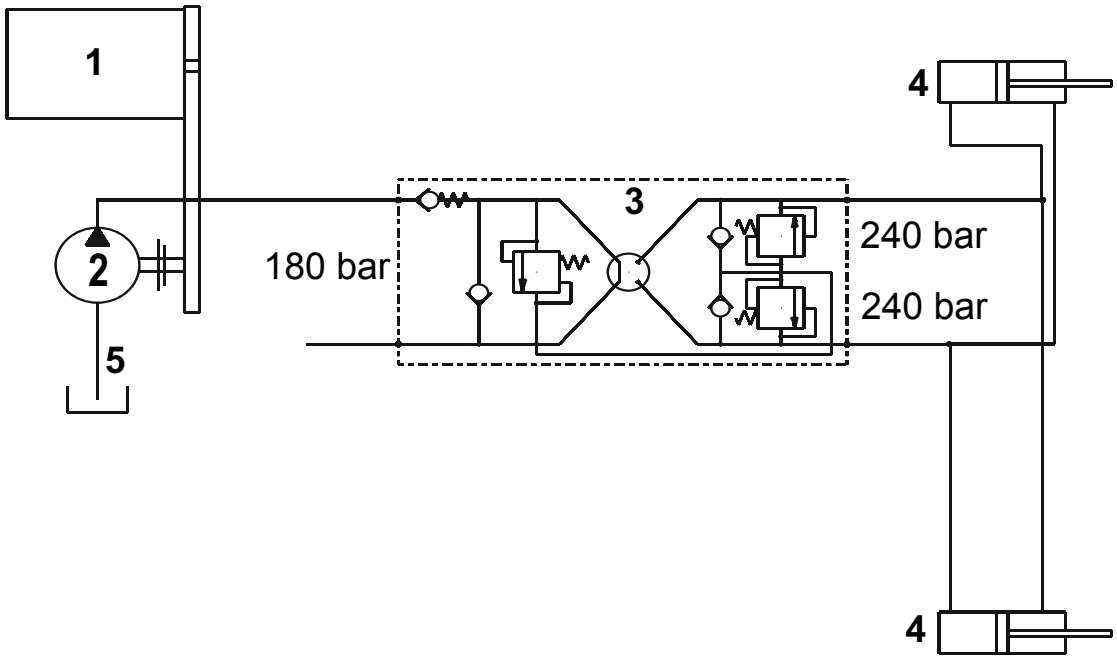
10.2.1 Technical Specifications: Steering System

Measurement/Adjustment	Adjustment values	Measuring point
Operating pressure: Steering system	180 bar	
Pressure control valve	180 bar	

10.2.2 Overview Steering Hydraulics and Components



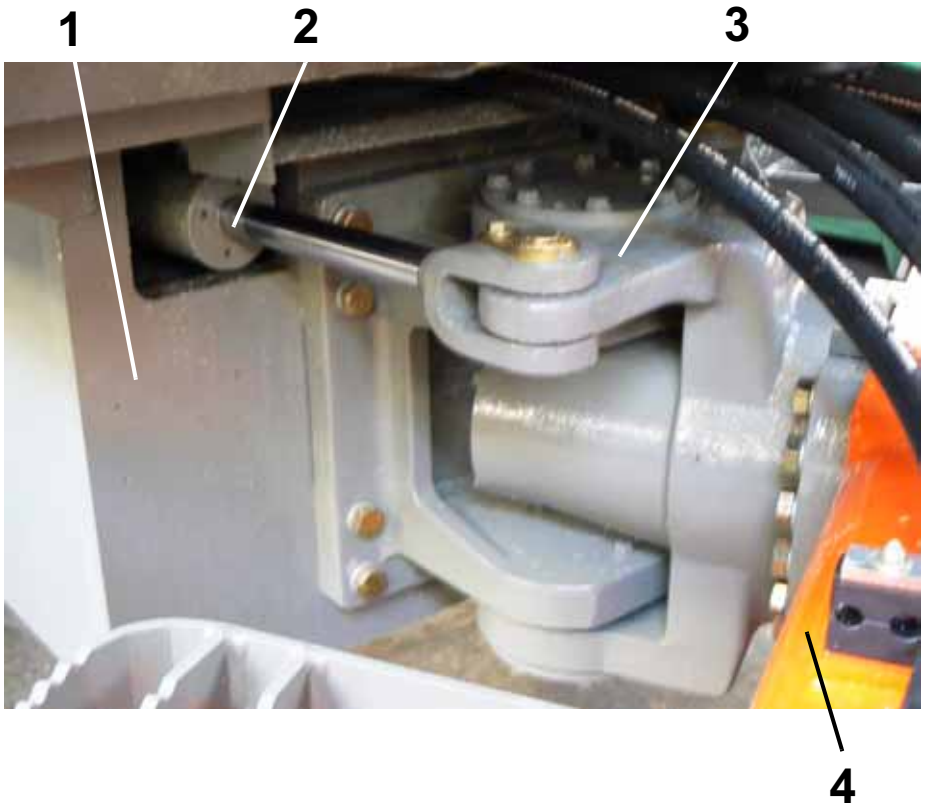
1 Diesel engine
2 Steering gear hydraulic pump
3 Steering orbitrol
4 Steering cylinder
5 Hydraulic oil tank

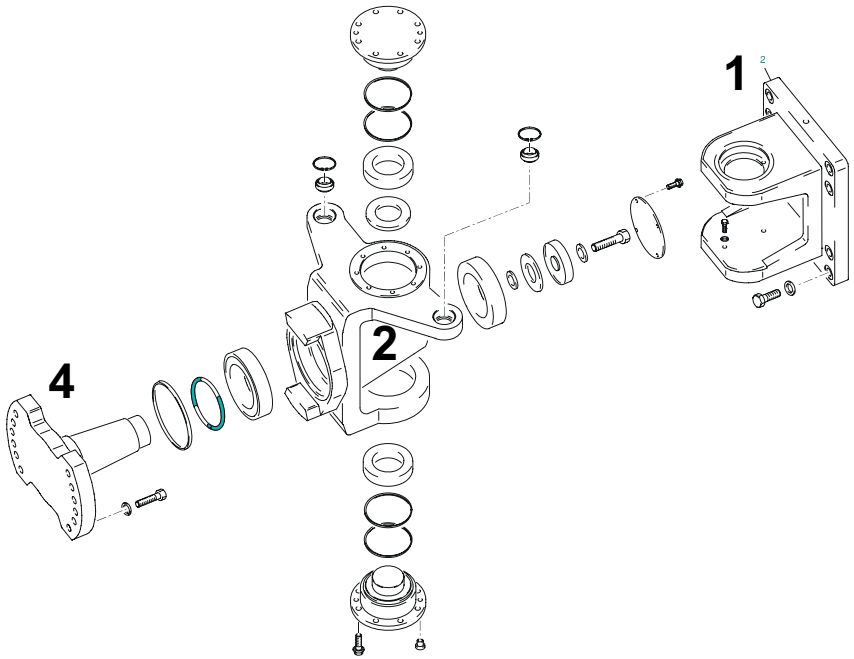


Overview Steering Hydraulics

10.3 Articulated Joint

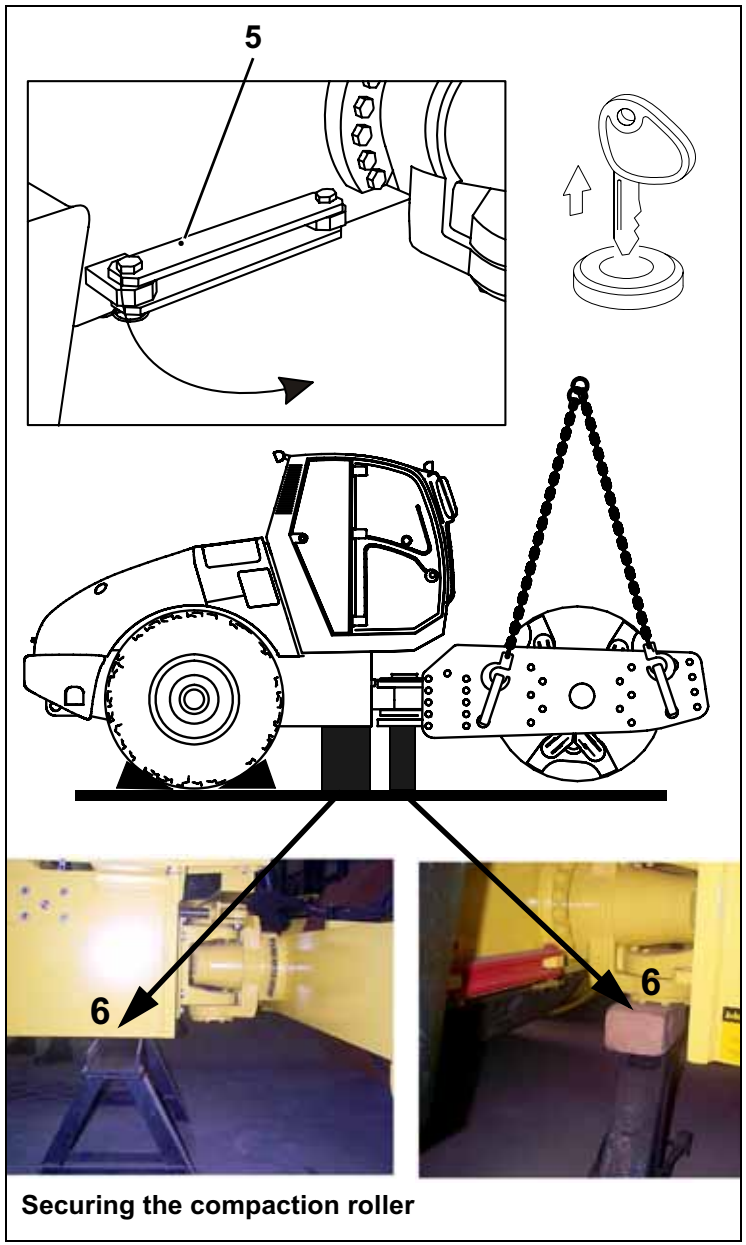
- The articulated joint constitutes the interface between the drum frame and the basic frame of the compaction roller.
- The articulation is effected in the articulated joint.





1 **Basic (rear) frame**
2 **Steering cylinder**
3 **Articulated Joint**
4 **Drum frame**

10.3.1 Removing and installing the articulated joint



Securing the compaction roller

Preparing the compaction roller for removal and installation

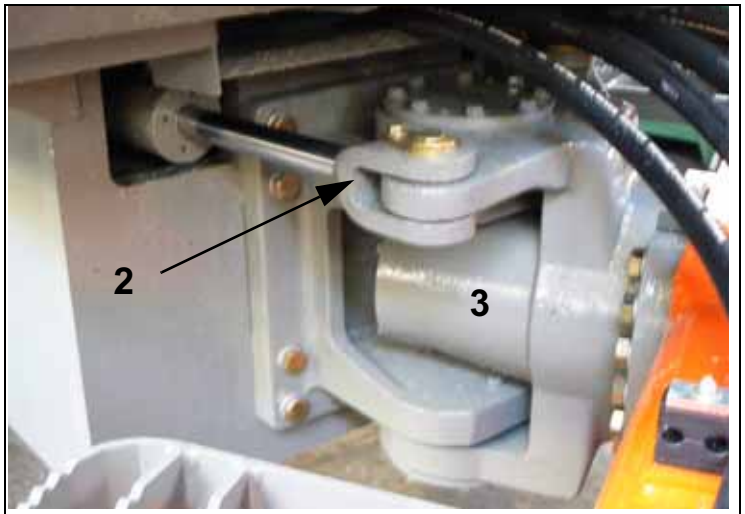
ATTENTION!

The articulated joint may only be removed in a workshop. Sufficient crane capacity must be available to lift the components.

- Secure the roller against rolling before starting work.
- Pull out the ignition key.
- Insert the anti-buckling device (5) between the drum frame & the basic (rear) frame.
- By means of wheel chocks, secure the rear wheels.
- Fill new axle oil into the axle casing through the filling screws (2).
- Lift the drum frame slightly.
- Place supports (6) under the basic (rear) frame and the articulated joint.

Dismounting the two steering cylinders from the articulated joint

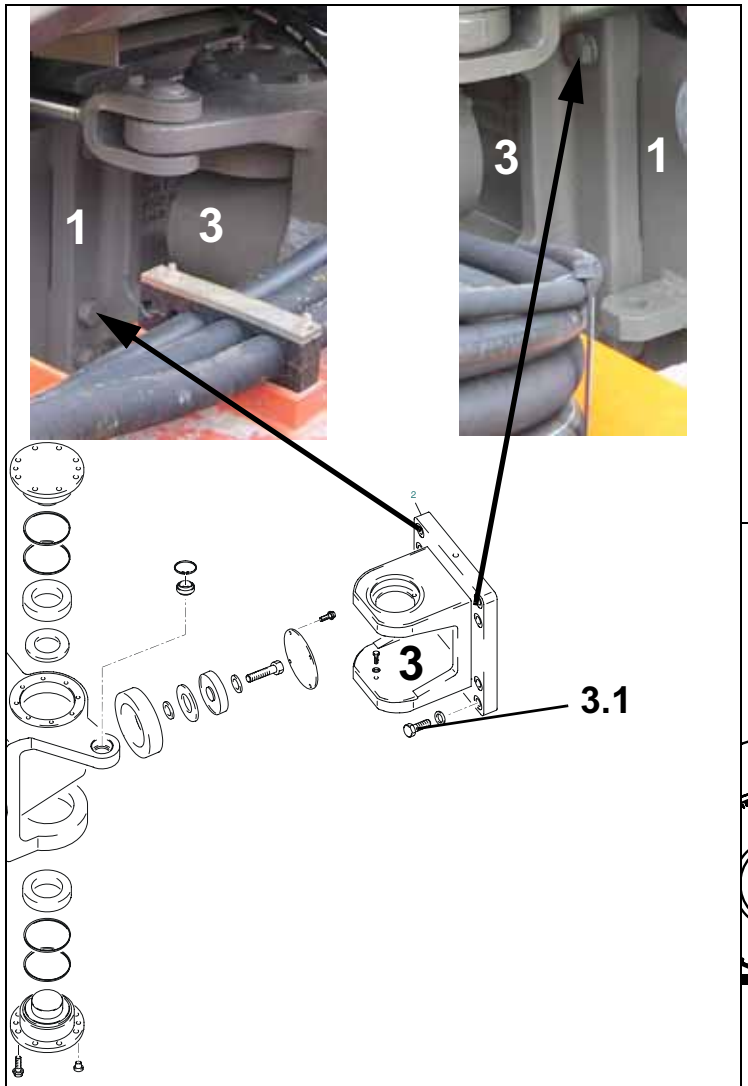
- Dismount the two steering cylinders (2) before removing the articulated joint (3).
- Turn the screws (2.1) out of the steering bolts (2.2) and push the bolt upwards, out of the cylinder fork and the articulated joint (3).



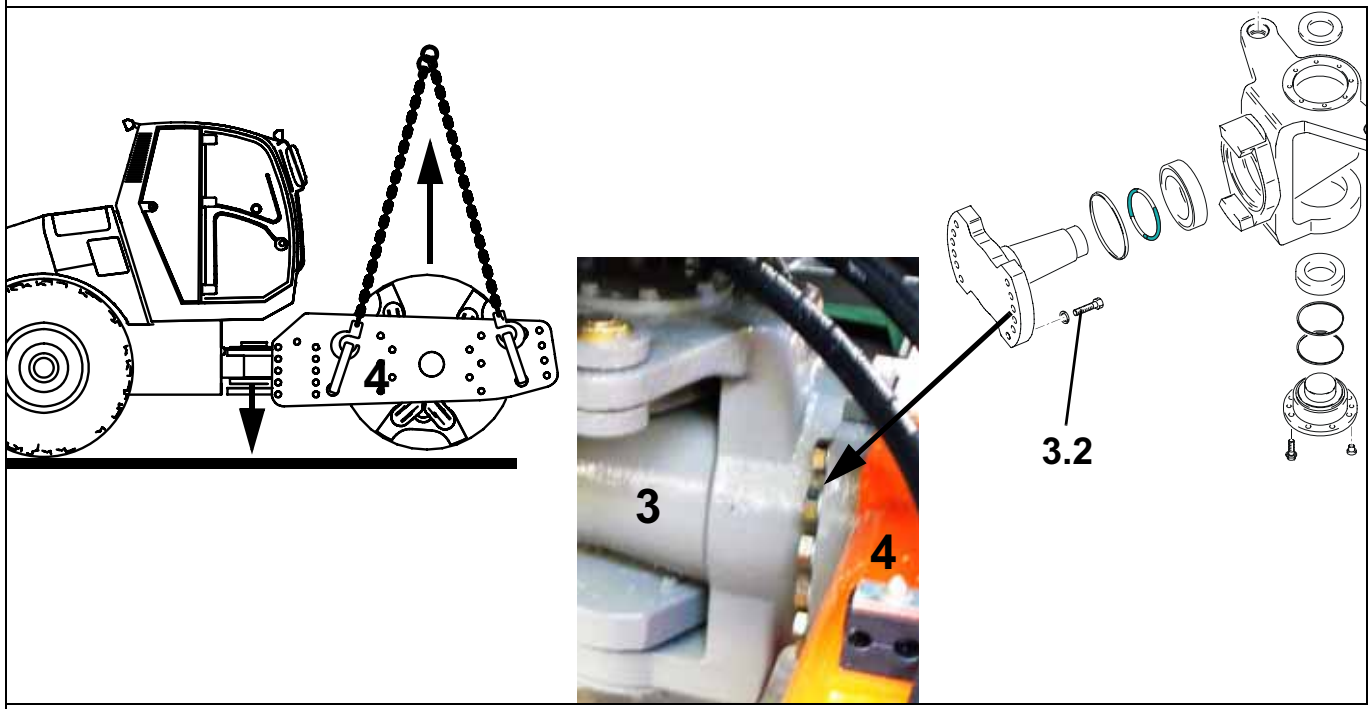
Dismounting the steering cylinder

Removing the articulated joint

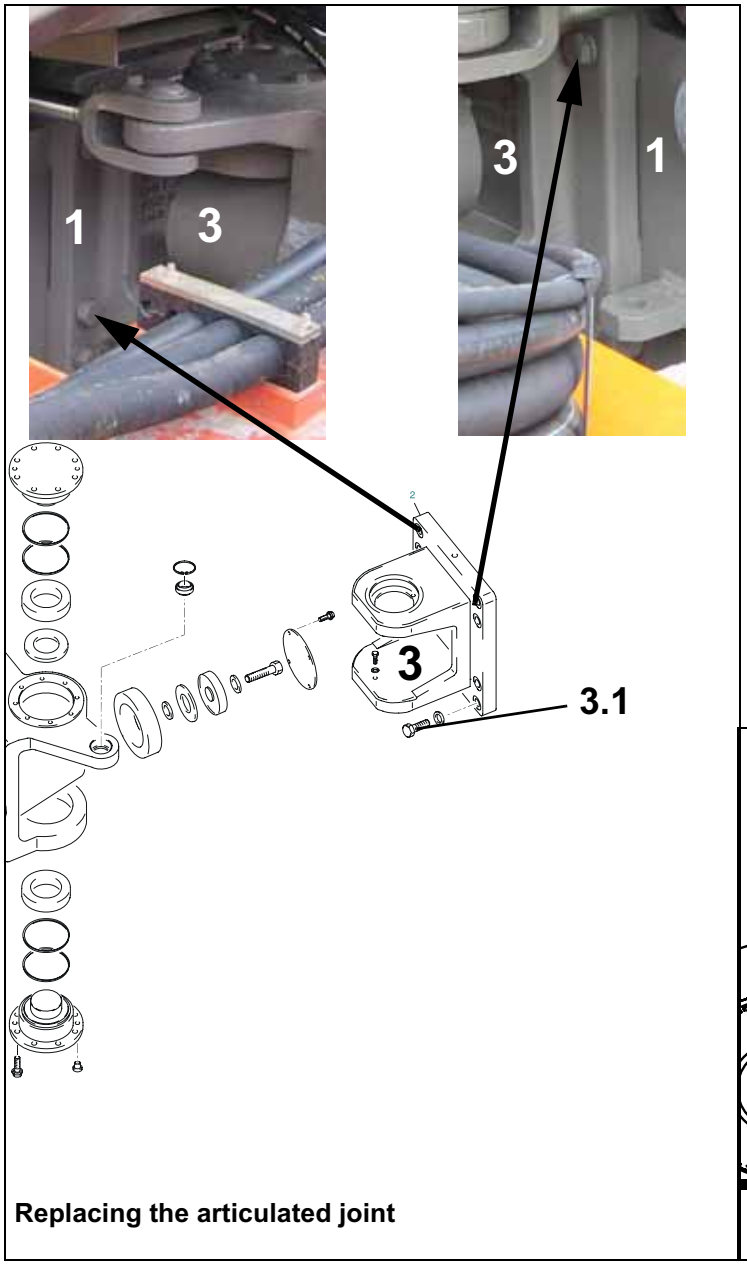
- Remove the support under the articulated joint and place an elevating platform truck under the articulated joint.
- Lift the platform so that it is below the articulated joint.
- Detach the screws (3.1) from the screw connection basic (rear) frame/ articulated joint (1/3).
- Remove the screws (3.2) from the screw connection drum frame/articulated joint (3/4).
- Slightly lift the drum frame (4) by means of a crane.
- Use a lift truck to lower the released articulated joint (3) to the ground.



Removing the articulated joint



Replacing and installing the articulated joint

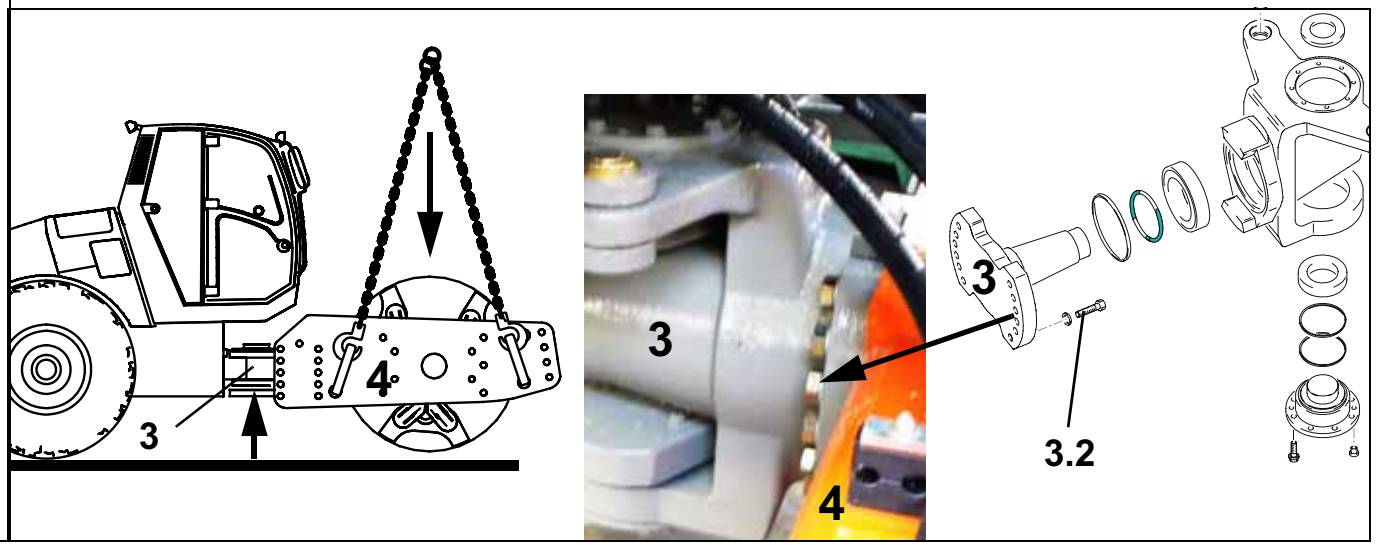


Replacing the articulated joint

ATTENTION!

The articulated joint can only be repaired in the manufacturer's factory by means of the appropriate tools.
Always replace the entire articulated joint.

- Place the new articulated joint (3) on the lift truck and move it into the compaction roller area for installation.
- Use the lift truck to lift the articulated joint so that you can bolt the articulated joint (3) with the drum frame (4) (screw coupling 3.2).
- Slightly lower the drum frame with the crane and align the articulated joint (3) to the basic frame (1).
- Bolt the articulated joint (3) with the basic frame (1) (screw coupling 3.1.).
- Tighten all screws crosswise and retighten them to the required torque (see table of tightening torques).



Chapter 11

Towing the compaction roller

- Contents
- This chapter will inform you about:
  - the towing process

11.1 Towing the compaction roller

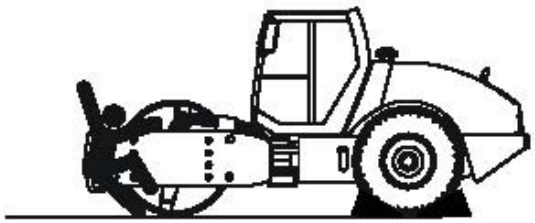
11.1.1 Safety instructions referring to the towing process

CAUTION!
Precautionary measures for towing!
The towing preparations and the towing process itself may only be carried out by experienced and skilled persons who have undergone the specific training required for these measures.
Make sure the towing vehicle disposes of the required tractive force. The total weight of the compaction roller needs to be taken into account, see section on **Technical Specifications**.

WARNING!
The compaction roller may only be towed if its emergency steering is in working order!

WARNING!
Material damage!
Before starting the towing process, make sure that the required preparations at the driving hydraulics and the parking brake have been completed. Set the towing vehicle in motion very slowly.

11.1.2 Measures to be taken prior to towing



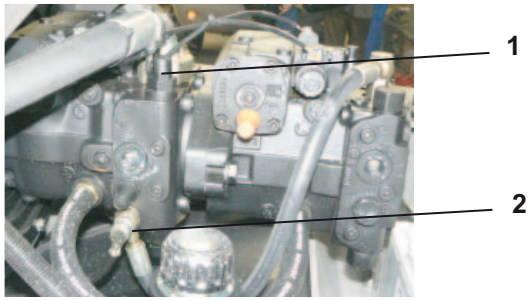
Securing the compaction roller against rolling

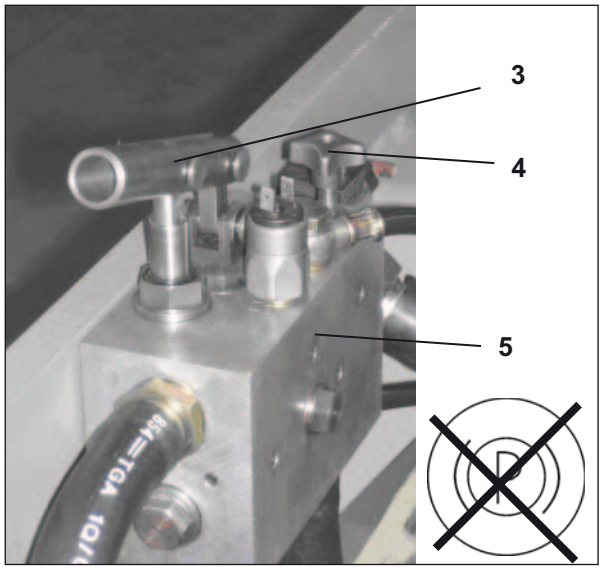
DANGER!
Risk of death!
Use the wheel chocks to prevent the compaction roller from rolling, since there is no braking effect after releasing the parking brake and the HP valves!

- Put wheel chocks under the rear wheels.

WARNING!
Operation on slopes!
If the compaction roller is parked on a slope and needs to be towed, make sure that the rear wheels and the drum are adequately secured!

11.1.3 Releasing the parking brake and the HP valves





DANGER!
Risk of death!
If the compaction roller is not properly secured against rolling, you must **not** carry out any of the work described below!

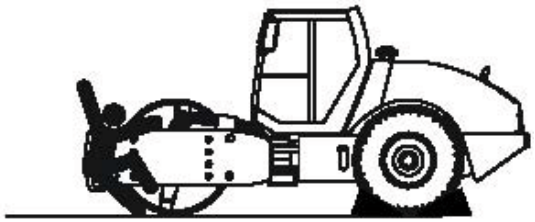
Opening the HP valves

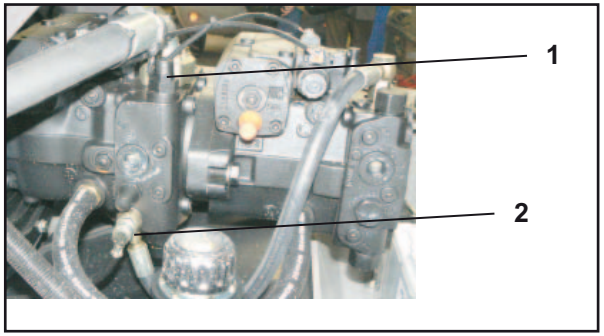
- In order to tow the compaction roller, short-circuit the hydraulic circuit between the traction pump and the hydraulic traction motors.
- Access the HP valves from the left side of the engine compartment (in the direction of motion).
- You need a socket head wrench (size WW4) to loosen the HP valves (**1**) and (**2**).
- Unscrew the protecting caps.
- Use the socket head wrench to screw in the adjusting spindles until they are level with the valve housing.

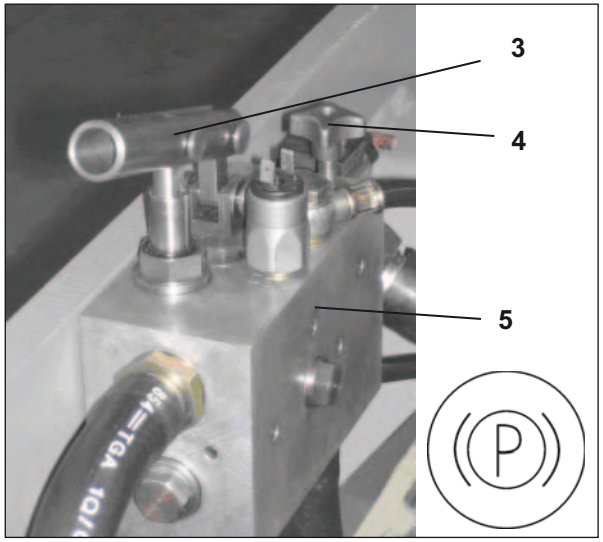
Deactivating (releasing) the parking brake

- In order to tow the compaction roller, you need to release the parking brake in the rear axle and in the drum via the hand pump (**5**).
- The hand pump (**5**) is installed in the engine compartment (on the left side, in the direction of motion).
- Put a pipe extension into the pump actuation (**3**).
- Close the relief valve (**4**).
- Build up pressure by manually pumping, which releases the parking brake and causes the corresponding light on the dashboard to go out.
- Remove the pipe extension.

11.1.4 Carrying out the towing process







WARNING!

Material damage!

- The compaction roller may only be towed if its emergency steering is in working order.
- Before starting the towing process, make sure the preparations concerning the driving hydraulics and the parking brake have been completed.
- Set the towing vehicle in motion very slowly.
- The compaction roller may only be towed within a work zone.

- First of all, secure the compaction roller against rolling by establishing the connection with the towing vehicle.
- Remove the wheel chocks and the additional safety equipment used for preventing the compaction roller from rolling.
- The towing distance is to be kept as short as possible.

DANGER!

Immediately after completing the towing process, secure the compaction roller against rolling by means of the wheel chocks and further equipment, if required.

Opening the HP valves

- After the towing process, the hydraulic circuit between the traction pump and the traction motor must be closed and the parking brake needs to be put in working order again.
- Access the HP valves from the left side of the engine compartment (direction of motion).
- In order to activate the HP valves (1 & 2), you need a socket head wrench (WW4). Use the wrench to loosen the adjusting spindles until they have reached their initial position.
- Attach the protecting caps.

Activating the parking brake

- After towing the vehicle, you need to activate the parking brake in the rear axle again.
- The hand pump (5) is situated in the engine compartment, on the left side (direction of motion).
- Slowly open the relief valve (4).
- The oil pressure escapes in the tank and the parking brake is activated, which is con rmed by the display on the dashboard, where the corresponding symbol needs to light up.