Repair Manual for Wheel Loader 3070 CX60 / 3070 CX80

Translation of the original repair manual

1000245278 - WDF-6008-00EN
2009
Edition 07/2009-1

This part of the repair manual contains special safety instructions relating to the loader's individual assemblies.

Warning notices

Warning notices are identified by a symbol, and differ in terms of the type and severity of the hazard described. The various types are shown below.

▶ **DANGER**

Identifies a hazard that will result in death or serious, irreversible injury if it is not prevented.

Follow the instructions in order to prevent the hazard.

▶ **WARNING**

Identifies a hazard that can result in death or serious, irreversible injury if it is not prevented.

Follow the instructions in order to prevent the hazard.

▶ **CAUTION**

Identifies a hazard that can result in minor reversible injury.

Follow the instructions in order to prevent the hazard.

▷ Identifies possible damage to the loader or to other property.

Notices

The following notices point out important items of information:

▷ Identifies a special item of information that is required for effective and efficient working.

▷ Identifies an environmental notice.

Do not start working until you have read and understood all safety instructions.

Sequence

The sequence of the described work is binding. Keep to the defined sequence in order to avoid hazards.

Safety instructions for working on the drive and axles

- When jacking up the loader, keep the load arm as low as possible in order to keep the center of gravity as close to the ground as possible.
- Use only suitable equipment, e.g. a garage jack, to jack up and support the loader.

▷ All values are approximate values.

The inspection holes, inspection glasses or dipsticks must be used to obtain a correct filling.

Engine

Location	Quantity in liters	Liquid	Specification
Fuel tank	90.0	Diesel fuel	DIN 51601 (see engine manual)
Engine oil with filter	10.5	Engine oil Ambient temperature -20 °C to +40 °C	SAE 10 W 40 API CG-4 / API CH-4 (see engine manual)
Content of cooling system	10.0	Water with standard HP coolant / antifreeze	HP coolant / antifreeze: ASTM D 4985

Hydraulic system

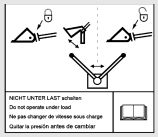
Complete hydraulic system	100.0	Hydraulic fluid	HLP ISO VG 46
Hydraulic fluid tank	80.0	Hydraulic fluid	HLP ISO VG 46
Brake hydraulics	1.0	Hydraulic fluid	ATF oil

Drive and axles

Front axle APR 715-PA940	4.2	Transmission oil	SAE 90 GL 5
Rear axle APR 715-PA940	4.9	Transmission oil	SAE 90 GL 5
Front axle PA1422 (optional)	5.2	Transmission oil	SAE 90 GL 5
Rear axle PA1422 (optional)	6.1	Transmission oil	SAE 90 GL 5

Air-conditioning unit

Air-conditioning unit (additional equipment)	approx. 0.8 (1000 + 50 g)	Refrigerant	R 134 a

Sticker	Meaning
	**Hazard** Risk of injury from being run over. Never carry passengers in the loader. Never sit on the fenders.
	**Risk of equipment damage** The ROPS bar and the driver's canopy are safety components that must never be modified. Do not drill holes in the material. Do not weld the material. Only do work that is described in this documentation.
	**Hazard** Risk of crush injury. All persons must remain outside the working loader's danger area. Always maintain a safety clearance from the working loader. Always use the climbing aids to climb in and out of the loader.
	**Hazard** Risk of crush injury. Always lock the center joint when carrying out maintenance work.
	**Hazard** When hydraulically operated attachments are used, the lever must always be set to "Hydraulic connection".
	**Risk of equipment damage** Close both doors before tilting the cab.
	Identifies an attachment point

8.4 Driving bolts

Purpose

The driving bolts are used to drive in bearing bushes (e.g. sliding bearings on the short drawbar) straight and without damaging the bearing.

Configuration

- Metal, solid material
- Cylindrical
- Handle (Fig. 14,1)
- d < inside diameter of the bearing bush
- D > outside diameter of the bearing bush

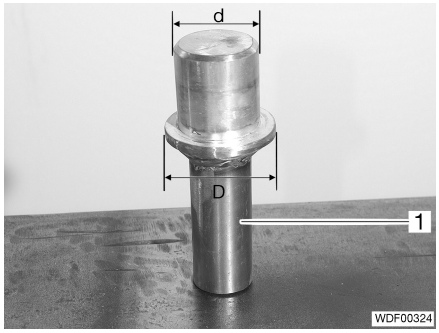


Fig. 14 Driving bolt

8.5 Electrical contact key

Purpose

The electrical contact key is used to remove and install the contacts on the tab connectors of the cables leading to the control unit.

Configuration

- Metal/plastic

Fig. 15 Electrical contact key

Availability

The electrical contact key, Article No. 124423, is available via:

Berner GmbH
Befestigungs- und Verbindungstechnik
Bernerstr. 4

74653 Künzelsau, Germany

This part of the repair manual contains inspection and adjustment procedures, details of special maintenance work (if applicable) and individual trouble-shooting lists, subdivided on the basis of the loader's assemblies.

Hydraulic system

▷ Only the WEIDEMANN Customer Service may remove the lead seals. Unauthorized removal of the lead seals renders the warranty void. If in doubt, consult the WEIDEMANN Customer Service.

▷ Some adjustment screws on the variable displacement pump and variable displacement motor have been lead-sealed by the manufacturer.

▷ For all inspections on the variable displacement motor, it must be operated across its entire control range, i.e. the variable displacement motor must be switched to "overdrive" (if present).

Maintenance

The operator's manual contains a complete overview of the maintenance work and intervals.

If a fault is found:

Remedying the problem

- Correct the position of the radiator (see Part 4, "Installing the radiator" section).
- Add to the foam insulation if necessary.

Final work

- Close the engine hood.

2.4 Inspecting the radiator for leaks

▶ **WARNING**

Hot coolant can cause scalding injuries!

Never open the cooling system when the engine is hot or the cooling system is pressurized.

Allow the engine to cool down or wear protective gloves.

Requirements

Ensure the following:

- The loader is secured (see operator's manual "Securing the loader").
- The engine hood is open (see operator's manual "Opening the engine hood").

Spare parts and auxiliary equipment

Designation	Quantity
Test pump	1

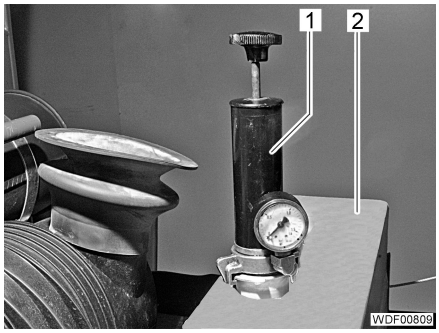


Fig. 8 Leakage inspection

- Remove the cap from the radiator (Fig. 8,2).
- Place the test pump (Fig. 8,1) onto the radiator and lock it.
- Generate a pressure of approx. 1 bar in the radiator with the hand pump.
- Wait overnight.
- Read off the pressure on the pressure gauge.
- When the pressure has dropped, check the radiator and the engine for leaks.
- Remedy any leaks and repeat the inspection.

Final work

- Remove the inspection tools.
- Close the engine hood.

3.1.7 Checking and adjusting the control commencement of the variable displacement motor

▷ Pay attention to the "Safety instructions for working on the hydraulic system" (see Part 1 "Safety").

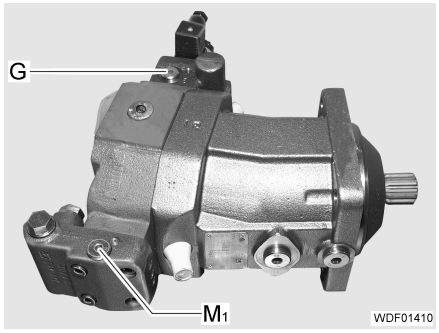


Fig. 20 Connections on the variable displacement motor

Setpoint values (diesel engine)

Pressure at measuring point	
G	**M_1**
< 230 bar	0 bar
= 230 bar	115 bar
> 230 bar	same as G

▷ Set the control commencement so that the variable displacement motor switches to the high displacement volume as from 230 bar high pressure. The control process begins when half the high pressure of Connection G is reached at M_1.

Setpoint values (turbo-diesel engine)

Pressure at measuring point	
G	**M_1**
< 250 bar	0 bar
= 250 bar	125 bar
> 250 bar	same as G

▷ Set the control commencement so that the variable displacement motor switches to the high displacement volume as from 250 bar high pressure. The control process begins when half the high pressure of Connection G is reached at M_1.

Requirements

Ensure the following:

- The operator's platform is tilted (see operator's manual "Tilting the operator's platform").

Spare parts and auxiliary equipment

Designation	Quantity
Test pressure gauge 0 ... 600 bar	2
Test adapter	2

3.5 Troubleshooting on the hydraulic system

Symptom	Possible cause	Remedy
No hydraulic function while the engine is running	Clutch hub of the variable displacement pump defective	Replace clutch hub
	Clutch PA flange of the engine defective	Replace clutch PA flange
High pressure of the driving hydraulics insufficient	Pressure cut-off maladjusted	Check that pressure cut-off is at correct value
	Incorrect starting speed set	Check and adjust starting speed
Hydraulic component of the driving direction recognition defective	Pressure "G" at the variable displacement motor too low	Check pressure "G" of the variable displacement motor, replace coil and drive of the solenoid valve if necessary
Driving speed changeover does not work	Driving direction recognition defective	Inspect electrical controller
Insufficient thrust or driving speed	Driving direction recognition defective	Inspect electrical controller

6.1 Checking the heater and the air-conditioning unit

▶ **DANGER**

Exhaust fumes are toxic and potentially lethal!

Do not inhale exhaust fumes.

Ensure that the area where you are carrying out the inspection is sufficiently well ventilated.

▷ Carry out this test only when at operating temperature.

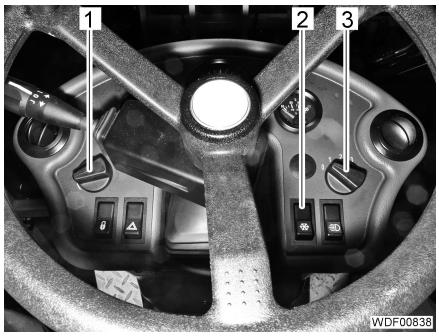


Fig. 44 Heater

Checking the heater

- Start the engine.
- Set the temperature controller (Fig. 44,1) to the lowest temperature.
- Set the fan switch (Fig. 44,3) to "I". The fan blows air into the cab.
- Set the air regulators in turn to "II" and "III". The fan blows more air into the cab.
- Set the temperature controller to the highest temperature. The air blown into the cab becomes warmer.

Checking the air-conditioning unit

- Switch on the air-conditioning unit using the switch (Fig. 44,2). The indicator lamp in the switch comes on.
- Set the temperature controller (Fig. 44,1) to the lowest temperature. The fan blows cool air into the cab.
- Switch off the engine.

If damage is found:

Remedying the problem

- Check the coolant (see operator's manual "Checking the coolant level/ refilling the coolant").
- If necessary, check the electrical connections (see the section 7.6 "Troubleshooting on the electrical system").
- Replace the heater blower if necessary (see Part 4, "Replacing the heater blower" section).
- If necessary have the air-conditioning unit repaired by suitably qualified personnel.

Repair Manual for Wheel Loader 3070 CX60 / 3070 CX80
Part 4
Replacement and repair procedures

Translation of the original repair manual

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2.1 Engine (as supplied)

2.1.1 Engine removal

▶ **WARNING**

Risk of injury by moving parts.

Do not open the engine hood when the engine is running, unless this manual expressly instructs you to do so.

▶ **WARNING**

Explosion and fire hazard!

Do not smoke when handling fuel, and avoid naked flame or fire.

Do not mix gasoline with the Diesel fuel.

▷ Avoid damaging the environment. Collect any escaping fuel and dispose of it in an environmentally responsible way.

▷ Use suitable lifting gear to lift the engine (e.g. workshop crane).

▷ The engine must be replaced by two persons.

▷ Mark the electric cables in order to avoid mix-ups.

Requirements

Ensure the following:

- The operator's platform is tilted (see operator's manual "Tilting the operator's platform").
- The radiator has been removed (see the section 2.2.1 "Removing the radiator").
- The complete air filter has been removed (see the section 2.3.2 "Replacing the complete air filter").
- The battery has been removed (see operator's manual "Disconnecting and connecting the battery/changing the battery").
- The air-conditioning compressor (where applicable) has been removed (see section 7.5.3 "Removing and installing the air-conditioning compressor").

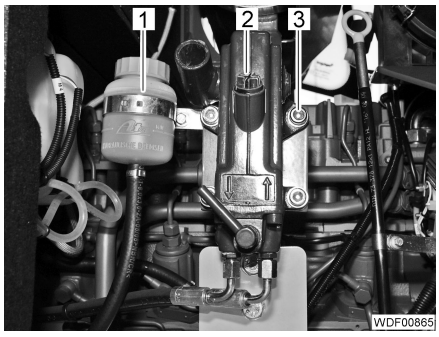

Fig. 2 Hand pump attachment

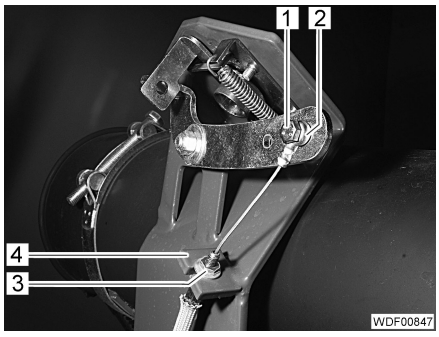

Fig. 3 Locking mechanism of engine hood

Removing the hand pump

- Unscrew the 4 screws (Fig. 2,3).
- Carefully pull the hand pump (Fig. 2,2) and tank (Fig. 2,1) forwards and below the driver's seat.
- Unscrew the screw (Fig. 3,1).

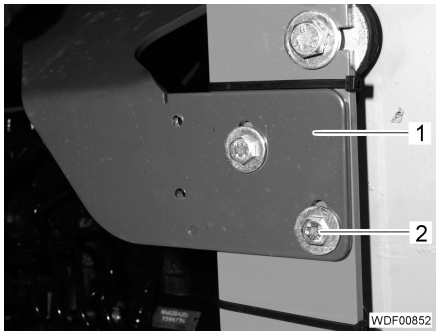

Fig. 49 Holder attachment

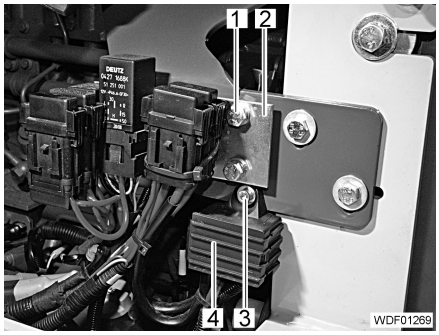

Fig. 50 Relay, fuses and junction box

- Position and adjust the holder (Fig. 49,1) and screw in and tighten the 2 screws (Fig. 49,2).
- Position the junction box (Fig. 50,4) and screw in and tighten the screw (Fig. 50,3).
- Carefully position and adjust the plate with fuses and relay (Fig. 50,2).
- Screw in and tighten the 2 screws (Fig. 50,1).

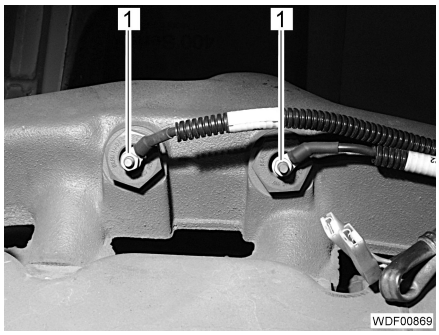

Fig. 51 Glow plugs

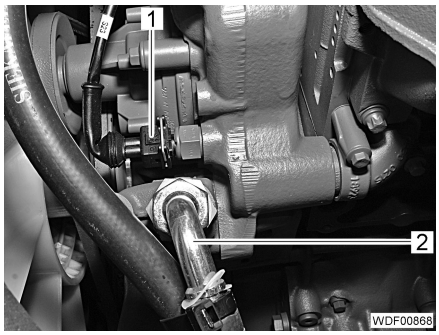

Fig. 52 Connections on right-hand side

Installing the cables (right)

- Connect the 2 lines (Fig. 51,1) to the glow plugs.
- Screw the hydraulic line (Fig. 52,2) onto the connection on the engine and tighten.
- Attach and lock the connector (Fig. 52,1) to the temperature sensor.

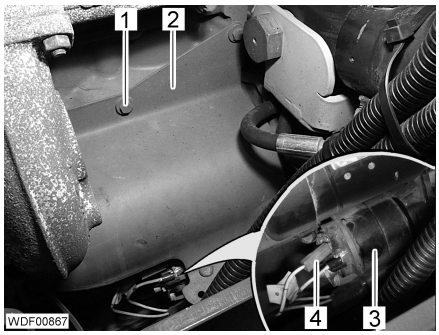

Fig. 53 Starter

Fig. 54 Temperature sensor plug

- Connect the connector (Fig. 53,4) to the starter (Fig. 53,3).
- Position the cover plate (Fig. 53,2).
- Screw in 3 screws (Fig. 53,1) with washers and tighten.
- Attach the connector (Fig. 54,1) onto the pressure switch.

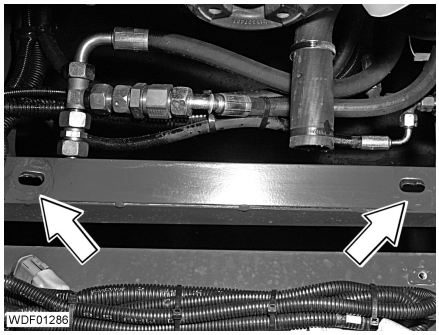

Fig. 77 Attachment points

Putting in the radiator

- If necessary, insert the sealing plate and shim washers.
- Put in the radiator carefully so that the screws on the underside of the radiator engage in the attachment point slots (Fig. 77).
- If necessary, attach the fan wheel (see the engine manufacturer's workshop manual).

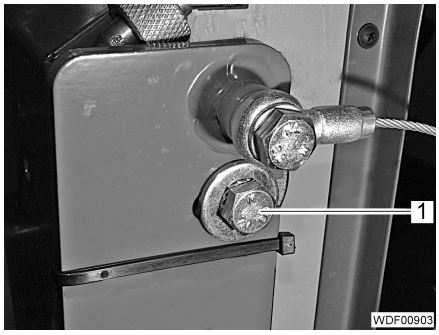

Fig. 78 Side attachment of the radiator

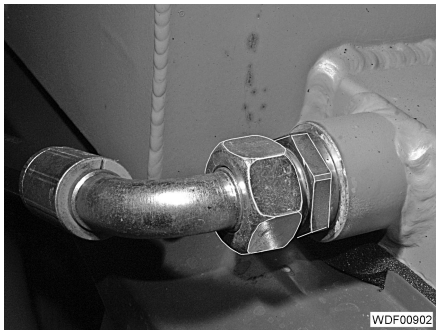

Fig. 79 Hydraulic line

Attaching the radiator

- Carefully tilt the radiator forwards until the screws (Fig. 78,1) slide into the guides on both sides of the radiator with 1 washer each.
- Tighten 1 screw on both sides.
- Screw the hydraulic line (Fig. 79) onto the connection on the radiator and tighten it.

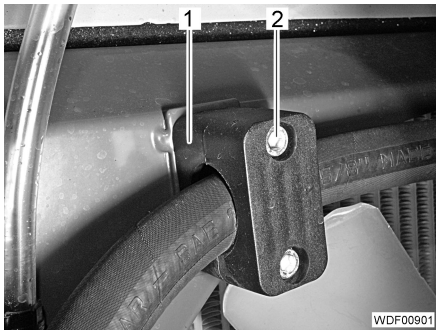

Fig. 80 Hydraulic line attachment

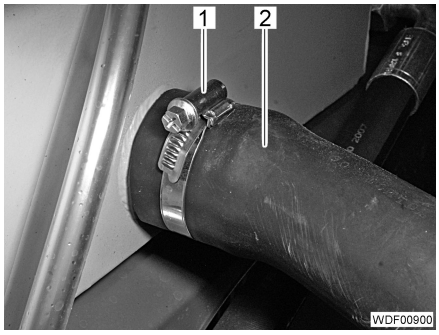

Fig. 81 Cooling hose (top)

- Place the attachment (Fig. 80,1) into position.
- Screw in and tighten the 2 screws (Fig. 80,2).
- Push the cooling hose (Fig. 81,2) onto the connection on the radiator and tighten the hose clamp (Fig. 81,1).

▷ Avoid damaging the environment. Collect any escaping fuel and dispose of it in an environmentally responsible way.

Requirements

Ensure the following:

- The loader is secured (see operator's manual "Securing the loader").
- The engine hood is open (see operator's manual "Opening the engine hood").
- The base plate has been removed (see the section 6.2.2 "Replacing the base plate").
- The fuel level sensor has been removed (see the section 8.3.1 "Replacing the fuel level sensor").

Spare parts and auxiliary equipment

Designation	Quantity
Fuel tank	1
Filter insert	1

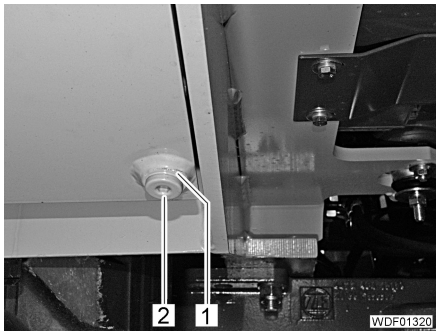

Fig. 95 Drainage screw

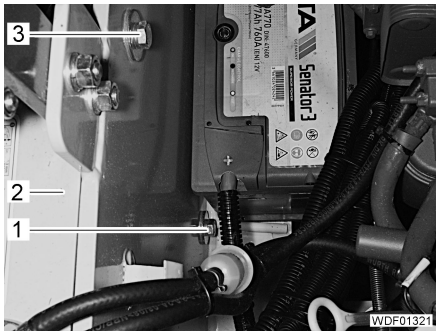

Fig. 96 Fuel tank attachment

Draining the fuel tank

- Place a suitably large collecting vessel under the drain hole (Fig. 95,1) of the fuel tank.
- Remove the bottom-end plug (Fig. 95,2) and carefully drain the fuel.
- Mark the position of the fuel tank (Fig. 96,2) on the rear carriage.

Replacing the fuel tank

- Unscrew the 4 screws (Fig. 96,1).
- Place the fuel tank to one side.
- If necessary, replace the sieve filter and change and tighten the bottom-end plug.
- Position the new fuel tank from the side.
- Screw in and tighten the screws (Fig. 96,1) with spring lock washers and disks.
- Align the fuel tank and tighten the screws.

Final work

- Fill the vehicle with fuel (see operator's manual "Filling with fuel").
- Install the fuel level sensor (see the section 8.3.1 "Replacing the fuel level sensor").
- Close the engine hood.
- Install the base plate (see the section 6.2.2 "Replacing the base plate").

Removing the variable displacement pump

- Unscrew the 2 screws (Fig. 114,1).
- Two persons must then carefully lift out the variable displacement pump.
- If the clutch hub is to be reused, remove it (see the section 3.2.2 "Replacing the clutch hub").

Installing the variable displacement pump

- If necessary, fit the clutch hub (see the section 3.2.2 "Replacing the clutch hub").
- Two persons must then carefully insert the variable displacement pump.
- Tighten the 2 screws (Fig. 114,1) with spring lock washers and disks.

Connecting the lines

- Put each flange half for securing the high pressure lines (Fig. 114,4 and Fig. 115,4) into position and loosely screw in 2 screws with spring lock washers.
- Press 1 high pressure line under each flange half and align so that the second flange half can be put into position.
- Put each second flange half into position and loosely screw in 2 screws with spring lock washers.
- Tighten the 4 screws on each of the high pressure lines.
- Screw the hydraulic line from the combination filter (Fig. 115,3) onto the connection on the variable displacement pump and tighten.
- Screw the hydraulic line to the differential lock (Fig. 115,1) onto the connection on the variable displacement pump and tighten.
- Screw the hydraulic line to the cross flushing connection (Fig. 115,2) onto the connection on the variable displacement pump and tighten.
- Plug the connectors (Fig. 114,3) onto the solenoid valves and secure with 1 screw for each.
- Screw the hydraulic line of the inching pedal (Fig. 114,2) onto the connection on the variable displacement pump and tighten.

Final work

- Install the gear pump (see the section 3.5 "Working hydraulics (gear pump, valves)").
- Vent the service brake (see the section 3.4.4 "Replacing the brake fluid").

3.2.2 Replacing the clutch hub

Requirements

Ensure the following:

- The variable displacement pump has been removed (see the section 3.2.1 "Replacing the variable displacement pump").

Spare parts and auxiliary equipment

Designation	Quantity
Clutch hub	1
Locking agent (e.g. Loctite®)	as req.

- Carefully align the pin holder, bearing and shim washers over each other so that there are no noticeable steps on the inside between the components.
- Drive in the pin (Fig. 136,2) with the washer from above.
- Place the washer into position at the bottom and secure it with the locking ring (Fig. 136,1).

▷ Check that all locking rings are fitted correctly.

3.4 Brake hydraulics

3.4.1 Replacing the main brake cylinder

▷ Pay attention to the "Safety instructions for working on the hydraulic system" (see Part 1 "Safety").

▷ For the brake hydraulics, use only mineral oil of the specified quality (see Part 2 "Filling quantities").

Requirements

Ensure the following:

- The hydraulic system is depressurized (see the section 3.1.1 "Depressurizing the hydraulic system").
- The operator's platform is tilted (see operator's manual "Tilting the operator's platform").

Spare parts and auxiliary equipment

Designation	Quantity
Main brake cylinder	1

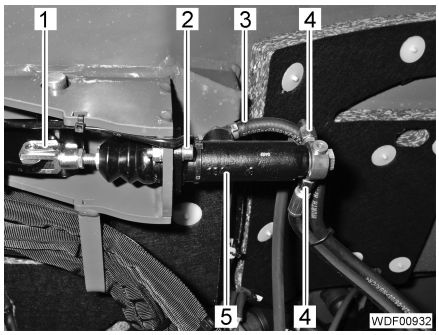

Fig. 137 Main brake cylinder

Removing the main brake cylinder

- Unlock the pin (Fig. 137,1) and pull it out of the fork end.
- Unscrew and close off the 2 hydraulic lines (Fig. 137,4).
- Close off the hydraulic line (Fig. 137,3) with a clip, open the clamp and pull off the hydraulic line.
- Unscrew the 2 screws (Fig. 137,2).
- Remove the main brake cylinder (Fig. 137,5).

Installing the main brake cylinder

- Insert the main brake cylinder (Fig. 137,5).
- Screw in 2 screws (Fig. 137,2) with washers and tighten.
- Attach the hydraulic line (Fig. 137,3) to the connection on the main brake cylinder, secure it with a clamp and open the clip.

3.5.4 Sealing the gear pump (dual pump)

▷ Pay attention to the "Safety instructions for working on the hydraulic system" (see Part 1 "Safety").

Requirements

Ensure the following:

- The gear pump (dual pump) has been removed (see the section 3.5.2 "Replacing the gear pump (dual pump)").

Spare parts and auxiliary equipment

Designation	Quantity
Set of seals	1

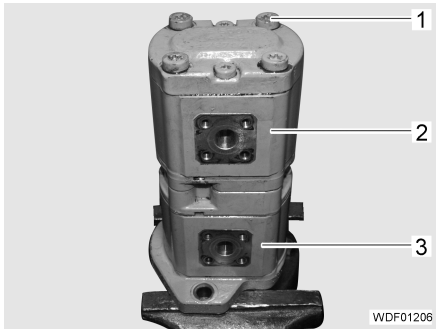

Fig. 153 Gear pump housing

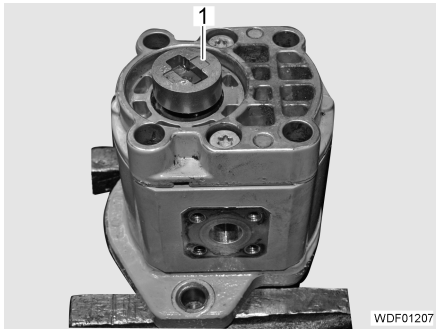

Fig. 154 Clutch

Disconnecting the dual pump

- Mark the pump housing and cover.
- Unscrew the 4 screws (Fig. 153,1).
- Remove pump A (Fig. 153,2) and place it aside.
- Remove the clutch (Fig. 154,1) and place it to one side.
- Carefully place pump B (Fig. 153,3) to one side.

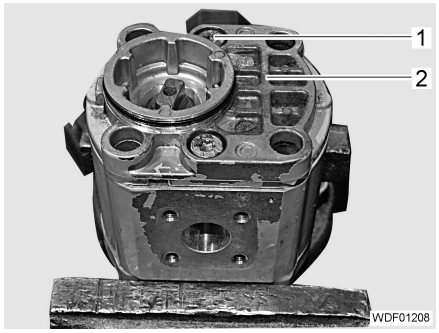

Fig. 155 Flange attachment

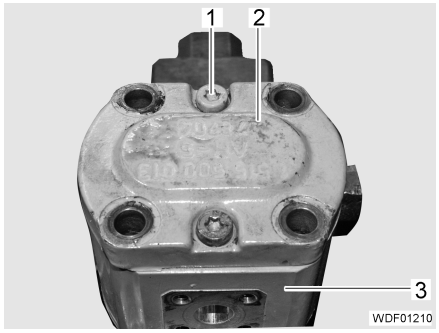

Fig. 156 Cover attachment

Disassembling pump A

- Unscrew the 2 screws (Fig. 155,1).
- Carefully rotate the pump 180° and carefully tighten the flange (Fig. 155,2).
- Unscrew the 2 screws (Fig. 156,1).
- Remove the cover (Fig. 156,2) and place it aside.

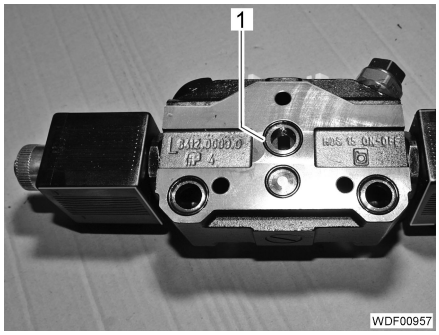

Fig. 186 Additional segment

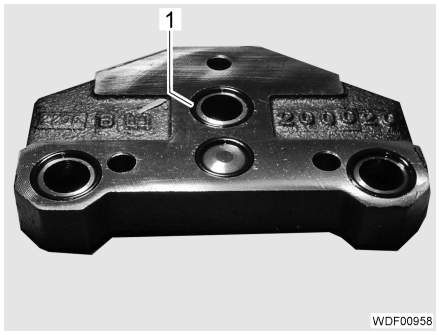

Fig. 187 Cover

Installing the additional segment

- Clean the surfaces of the additional segment (Fig. 186) and cover (Fig. 187).
- Replace the 4 O-rings (Fig. 186,1) on the additional segment.
- Position the additional segment (Fig. 168,1).
- Replace the 4 O-rings (Fig. 187,1) on the cover.
- Position the cover (Fig. 168,2).
- Screw the 3 nuts (Fig. 168,3) with spring lock washers onto the threaded rods and tighten them with a tightening torque of 20 Nm.

Final work

- Install the control valve (see the section 3.5.6 "Installing the control valve").

3.5.8 Replacing the 2/2-way valve (curl stop)

▷ Pay attention to the "Safety instructions for working on the hydraulic system" (see Part 1 "Safety").

▷ To prevent the load from falling onto the loader when the telescopic arm is raised, curling is hydraulically limited by the curl stop.

Requirements

Ensure the following:

- The hydraulic system is depressurized (see the section 3.1.1 "Depressurizing the hydraulic system").

Spare parts and auxiliary equipment

Designation	Quantity
2/2-way valve	1

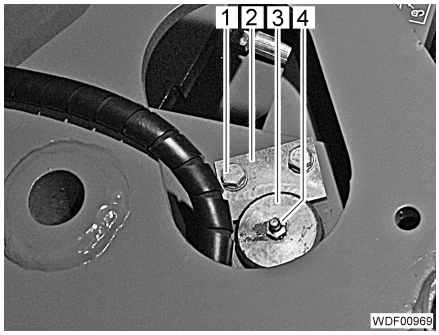

Fig. 208 Pin attachment

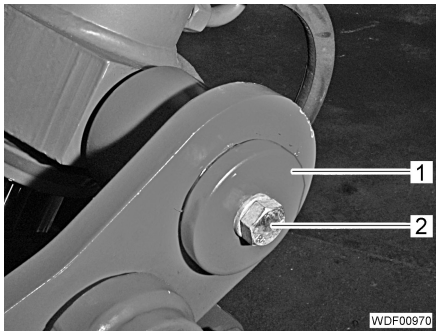

Fig. 209 Securing the tipping cylinder

Removing the securing devices

- Unscrew the grease nipple (Fig. 208,4).
- Unscrew the 2 screws (Fig. 208,1).
- Remove the locking plate (Fig. 208,2).
- Unscrew the screw (Fig. 209,2).
- Remove the washer (Fig. 209,1).

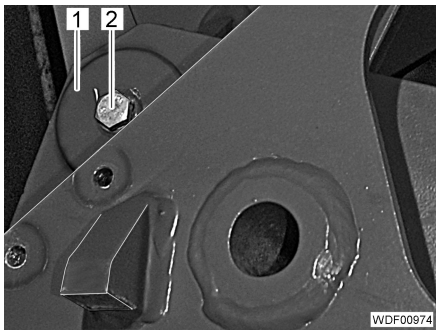

Fig. 210 Pin cover

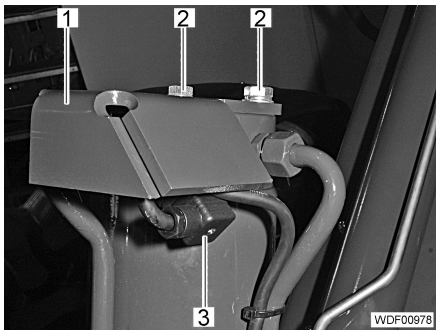

Fig. 211 Electrical plug

Disconnecting the plug

- Unscrew the screw (Fig. 210,2).
- Remove the washer (Fig. 210,1).
- Unscrew the 2 screws (Fig. 211,2) and remove the metal plate (Fig. 211,1).
- Unscrew screw on plug (Fig. 211,3), remove plug and protect the contacts (e.g. with protective cap).

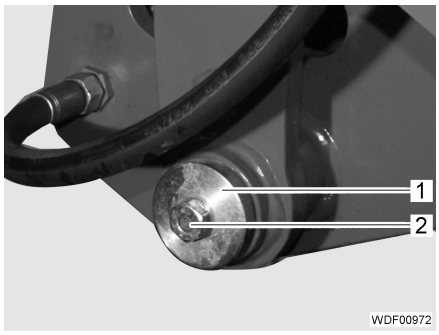

Fig. 212 Pin cover

Fig. 213 Securing the tipping cylinder

Securing the tipping cylinder

- Unscrew the screw (Fig. 212,2).
- Remove the washer (Fig. 212,1).
- Secure the tipping cylinder with suitable lifting gear (e.g. a crane) (Fig. 213).

3.7 Control hydraulic

3.7.1 Depressurizing the control hydraulic

▶ **CAUTION**

Risk of injury from escaping hydraulic oil!

The diaphragm accumulator stores the pressure in the control hydraulic even if the remaining hydraulic system is pressureless.

Release the stored pressure before carrying out repairs to the control hydraulic.

Depressurizing

- Bring the lift frame into a roughly horizontal position.
- Switch off the engine.
- Move the control lever in all directions until no further switching noise is to be heard from the control valve.

Checking the condition

- Switch on the ignition.

▷ If the lift frame drops, the diaphragm accumulator is still under pressure.

- Select the "Lower" function (see operating instructions "Control lever for lift frame") and observe the lift frame.
- If the lift frame lowers, switch off the ignition and continue to release the pressure (see above).
- If the lift frame does not lower, switch off the ignition. The control hydraulic is pressureless.

3.7.2 Replacing the pilot control

▷ Pay attention to the "Safety instructions for working on the hydraulic system" (see Part 1 "Safety").

Requirements

Ensure the following:

- The hydraulic system is depressurized (see the section 3.7.1 "Depressurizing the control hydraulic").
- The console of the radio has been removed (see section 7.2.7 "Replacing the radio console").

Spare parts and auxiliary equipment

Designation	Quantity
Pilot control	1
Securing material (e.g. cable ties)	as req.

Spare parts and auxiliary equipment

Designation	Quantity
Return filter	1
Sealant	as req.

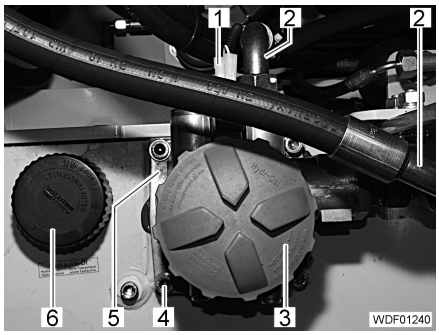

Fig. 259 Return filter

Removing the return filter

- Open the cap (Fig. 259,6).
- Briefly open the cap (Fig. 259,3) so that the fluid can flow out of the return filter and into the hydraulic fluid tank.
- Close the 2 caps (Fig. 259,3 and 6).
- Remove the 2 connectors (Fig. 259,1) from the pressure switch.
- Unscrew and close off the hydraulic lines (Fig. 259,2).
- Unscrew the 4 screws (Fig. 259,4).
- Pull the return filter (Fig. 259,5) upwards and to the rear out of the hydraulic fluid tank.
- Cover the openings immediately (e.g. with cloths).

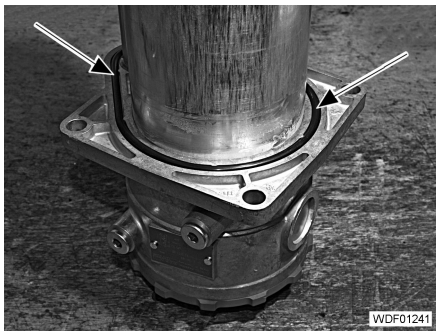

Fig. 260 Sealing

Installing the return filter

- Clean the contact surfaces on the return filter and the hydraulic fluid tank.
- Apply sealant along the O-ring (Fig. 260).
- Carefully place the return filter into the hydraulic fluid tank from above.
- Screw in the 4 screws (Fig. 259,4) with spring lock washers and tighten.
- Screw the hydraulic lines (Fig. 259,2) onto the return filter and tighten.
- Connect the 2 connectors (Fig. 259,1) to the pressure switch.

Final work

- Close the engine hood.

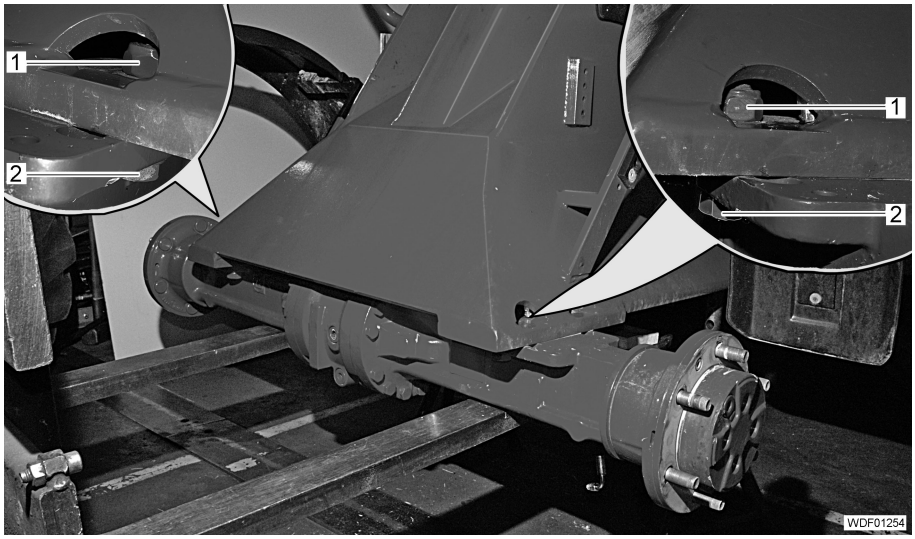

Fig. 279 Front axle support

Securing the front axle

- Clean the contact surfaces on the front axle and front carriage.
- Carefully press the front axle against the front carriage from below.
- Insert the 4 screws (Fig. 279,2) with washers through the holes from below.
- Screw on 4 nuts (Fig. 279,1) with washers onto the screws and tighten with a tightening torque of 390 Nm.

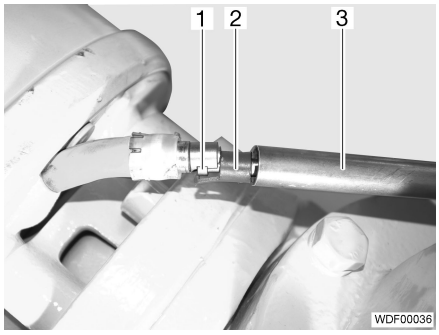

Fig. 280 Bowden cable on the front axle

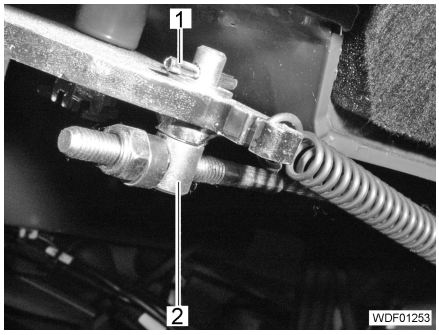

Fig. 281 Bowden cable on the hand-brake lever

Fitting the Bowden cable

- Push in the Bowden cable (Fig. 280,1) at the side.
- Push the fastener (Fig. 280,2) towards the brake drum and secure it with the hook.
- Push the sleeve (Fig. 280,3) over the fastener.
- Tilt the operator's platform (see operator's manual "Tilting the operator's platform").
- Insert the holder of the Bowden cable (Fig. 281,2) into the metal plate on the handbrake lever.
- Tilt the operator's platform back.
- Slowly apply the parking brake 6 x in order to adjust the automatic brake setting.
- Drive in the hollow dowel pin (Fig. 281,1) with washer into the holder of the Bowden cable.

Requirements

Ensure the following:

- The rear axle of the loader is secured to prevent it from rolling away (e.g. with chocks).
- The articulated link is blocked (see operator's manual "Blocking the articulated link").
- The hydraulic system is depressurized (see the section 3.1.1 "Depressurizing the hydraulic system").
- The drive shaft has been removed on the front axle (see the section 4.1 "Replacing the drive shaft").
- The parking brake is released.

Spare parts and auxiliary equipment

Designation	Quantity
Brake drum	1

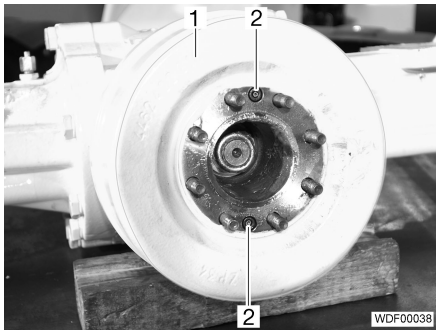

Fig. 302 Brake drum

Removing the brake drum

- Unscrew the 2 screws (Fig. 302,2).
- Remove the brake drum (Fig. 302,1).

Fitting the brake drum

- Put the brake drum into position.
- Screw in and tighten the 2 screws hand-tight.

Final work

- Install the drive shaft (see the section 4.1 "Replacing the drive shaft").
- Loosen the blocking of the articulated link (see operator's manual for the articulated link).
- Adjust the parking brake (see the section 5.2.1 "Replacing the Bowden cable of the parking brake").
- Vent the service brake (see the section 3.4.3 "Venting the brake hydraulics").

5.2 Parking brake

5.2.1 Replacing the Bowden cable of the parking brake

Requirements

Ensure the following:

- The rear axle of the loader is secured to prevent it from rolling away (e.g. with chocks).
- The parking brake is released.
- The operator's platform is tilted (see operator's manual "Tilting the operator's platform").

- Screw the nut (Fig. 320,4) onto the Bowden cable and tighten it.
- Push the Bowden cable (Fig. 318,5) into the mounting bracket from the front.
- Screw the nut (Fig. 318,6) onto the Bowden cable and tighten it.
- Tension the Bowden cable and shorten it sufficiently so that the end of the Bowden cable reaches as far as lever (Fig. 318,3).

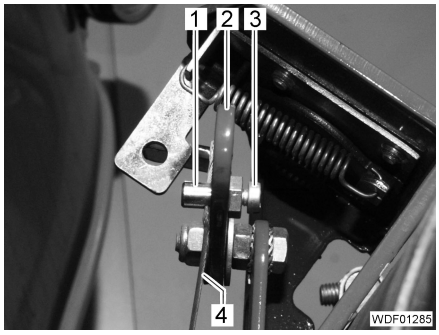

Fig. 321 Fixing a new Bowden cable

Installing the lock

- Locate the locking mechanism (Fig. 319,2) in position.
- Screw in the 3 screws (Fig. 319,1).
- Align the locking mechanism and tighten 3 screws.
- Place the lever (Fig. 318,3) into position.
- Screw the nut (Fig. 318,7) onto the screw and tighten it so that the lever can still be pivoted.
- Push the sleeve (Fig. 321,1) through the lever (Fig. 321,2).
- Push the Bowden cable (Fig. 321,4) through the sleeve.
- Screw in the screw (Fig. 321,3) and tighten hand-tight.

Final work

- Align the lock until the engine hood closes reliably.
- Close the engine hood.

6.3 Center joint

6.3.1 Detaching the center joint

▷ **For the front and rear carriages, the center of gravity is behind the axle in each case.**

Support the front carriage between the axle and the center joint.

Support the rear carriage at the rear weight.

▷ On both sides of the bearing, there can be shim washers in order to reduce the play and prevent damage.

▷ Mark the line assemblies in order to avoid mix-ups during installation.

Requirements

Ensure the following:

- **Both** axles of the loader are secured to prevent it from rolling away (e.g. with chocks).
- The front and rear carriages are supported (e.g. with jacks).
- The drive shaft has been removed (see the section 4.1 "Replacing the drive shaft").
- The steering cylinder has been removed at the rod end (see the section 3.3.4 "Removing the steering cylinder").

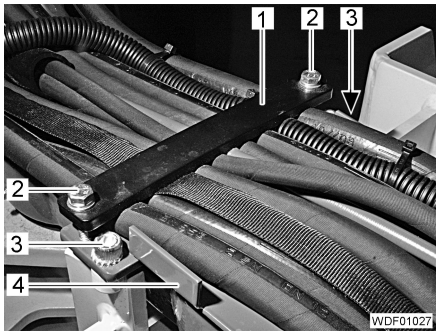

Fig. 350 Line attachment

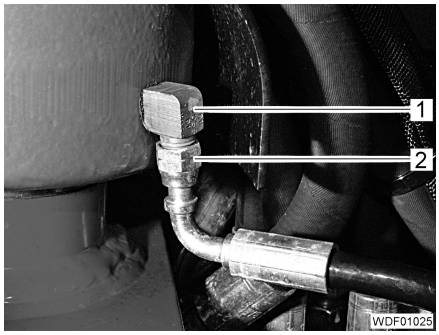

Fig. 351 Connection of the remote lubrication line

Attaching the lines

- Put the holder (Fig. 350,4) into position and tighten the 2 screws (Fig. 350,3).
- Place the lines in the holder.
- Put the holder (Fig. 350,1) into position and tighten the 2 screws (Fig. 350,2).
- Screw in the angle screw connection (Fig. 351,1).
- Screw the remote lubrication line (Fig. 351,2) onto the angle screw connection and tighten.

Final work

- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Install the steering cylinder at the rod end (see the section 3.3.5 "Installing the steering cylinder").
- Install the drive shaft (see the section 4.1 "Replacing the drive shaft").
- Lubricate all bearings of the center joint.

6.3.5 Replacing the bearing in the self-aligning bearing

▶ **WARNING**

Risk of injury from flying metal chips!

Wear safety goggles and protective gloves.

▷ Use home-made sleeves to expel and drive in the bearings (see Part 2, "Expulsion and driving sleeves" section).

Requirements

Ensure the following:

- The self-aligning bearing has been removed (see Part 4, section "Detaching the center joint").

Spare parts and auxiliary equipment

Designation	Quantity
Pivot bearing	as req.
Locking ring	1 per bearing
Lubricating grease	as req.

- In each case, drive in 1 pin (Fig. 376,1) from the outside so that the groove for the locking plate points towards the screws (Fig. 376,3).
- Insert 1 locking plate (Fig. 376,2).
- Screw in and tighten 2 screws (Fig. 376,3) on each side with spring lock washers and disks.

Final work

- Lubricate the load arm bearings.

6.6 Telescopic arm 986

6.6.1 Replacing the complete telescopic arm

▶ **DANGER**

Risk of injury by a heavy component.

The complete telescopic arm weighs approx. 650 kg.

Use suitable lifting gear (e.g. a crane) to remove and install the telescopic arm.

▷ Pay attention to the "Safety instructions for working on the hydraulic system" (see Part 1 "Safety").

▷ On both sides of the bearing, there can be shim washers in order to reduce the play and prevent damage.

Spare parts and auxiliary equipment

Designation	Quantity
Telescopic arm, complete	1
Lubricating grease	as req.

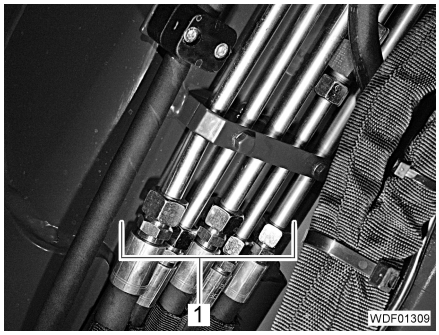

Fig. 378 Underside of telescopic arm

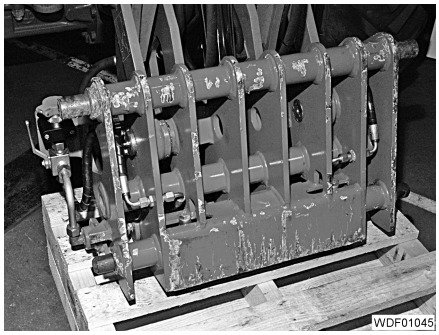

Fig. 379 Resting the tool attachment

Disconnecting the lines at the base

- Raise the telescopic arm and fully curl in the tool attachment.
- Depressurize the hydraulic system (see the section 3.1.1 "Depressurizing the hydraulic system").
- Remove the counterbalance cylinder (see the section 3.6.8 "Replacing the counterbalance cylinder (telescopic cylinder)").
- Unscrew and close off the 5 hydraulic lines (Fig. 378,1).
- Set down the tool attachment in a slightly raised position onto a suitable surface (e.g. pallets) (Fig. 379).

6.6.4 Replacing the energy chain

Requirements

Ensure the following:

- The inner cylinder has been removed (see the section 6.6.2 "Removing the inner cylinder").
- Socket, plug and tilt switch have been disconnected from the cable.

Spare parts and auxiliary equipment

Designation	Quantity
Energy chain	1
Crimp connectors	as req.
Shrink tubing	as req.

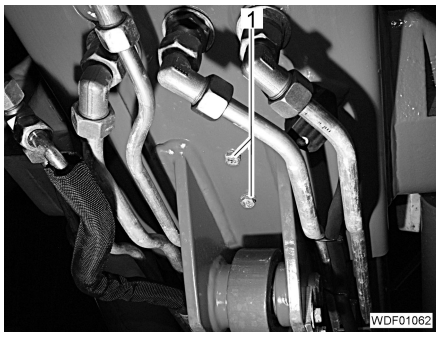

Fig. 410 Energy chain attachment

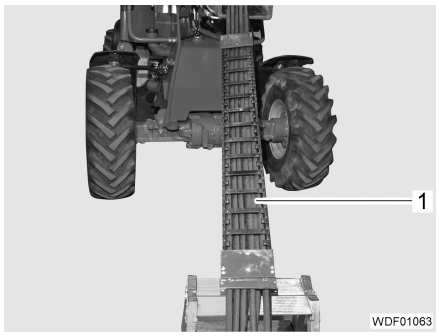

Fig. 411 Energy chain

Replacing the energy chain

- Unscrew the 2 screws (Fig. 410,1).
- Carefully remove the hydraulic lines and cable from the energy chain (Fig. 411,1).

▷ Insert the hydraulic lines into the energy chain so that they lie flat, without crossing any of them over.

- Carefully push the hydraulic lines and cable through the energy chain (Fig. 411,1).
- Carefully push the energy chain as far as it will go over the hydraulic lines and the cable into the outer cylinder.
- Insert and tighten 2 screws (Fig. 410,1) with spring lock washers and disks.

Final work

- Connect the socket, plug and tilt switch to the cable and seal the connection point.
- Install the inner cylinder (see the section 6.6.3 "Installing the inner cylinder").

- Screw in the grease nipple (Fig. 435,3).
- Push the hydraulic line through the holder (Fig. 434,3) from behind.
- Attach the ring of the cap (Fig. 434,5) to the hydraulic line.
- Screw the nut (Fig. 434,4) onto the hydraulic line and tighten it.
- Push the socket (Fig. 434,2) into the holder (Fig. 434,3) from the side.
- Screw in and tighten the 2 screws (Fig. 434,1).

Final work

- Install the tipping cylinder (see Part 4, "Installing the tipping cylinder" section).

6.7 Tool attachment

6.7.1 Replacing the tool attachment

▷ If the tool attachment has a hydraulic lock, the locking cylinder must first be removed (see the section 3.8.1 "Replacing the locking cylinder").

Spare parts and auxiliary equipment

Designation	Quantity
Tool attachment	1
Lubricating grease	as req.

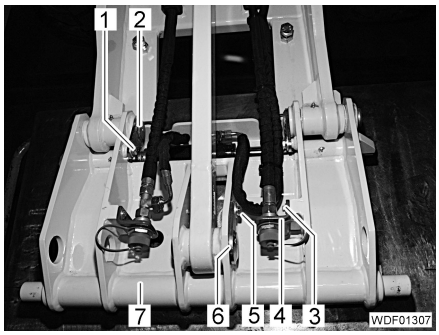

Fig. 438 Securing the tool attachment

Removing the tool attachment

- Set down the tool attachment so that it cannot tip over (e.g. on the work bench).
- Unscrew the 2 screws (Fig. 438,3).
- Carefully place the 2 hydraulic lines with holders (Fig. 438,4) to one side.
- Unscrew the 3 screws (Fig. 438,1 and 5).
- Drive out the pin (Fig. 438,6) on the drawbar.
- Tilt in the drawbar.
- Drive out the 2 pins (Fig. 438,2).
- Carefully raise the load arm until the tool attachment (Fig. 438,7) is free.

Installing the tool attachment

- Lower the load arm into the tool attachment (Fig. 438,7) so that the holes of the pin holders line up precisely.
- Grease pin and bearing slightly.
- Drive in the 2 pins (Fig. 438,2).
- Tilt out the drawbar until the pin holders line up precisely.
- Drive in the pin (Fig. 438,6).

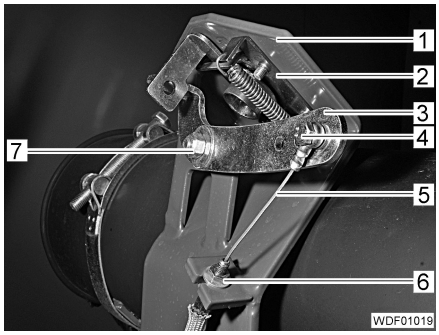

Fig. 459 Locking mechanism of engine hood

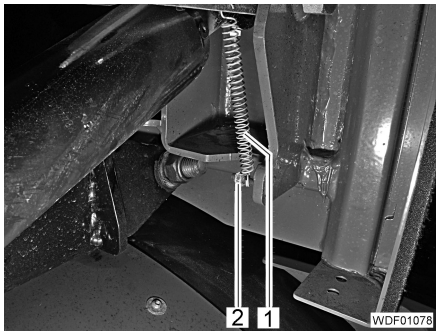

Fig. 460 Spring attachment

Unhooking the spring

- Unscrew the screw (Fig. 459,4).
- Loosen the nut (Fig. 459,6) and pull the Bowden cable forwards out of the mount (Fig. 459,1).
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Unscrew the nut (Fig. 460,2).
- Unhook the spring (Fig. 460,1).

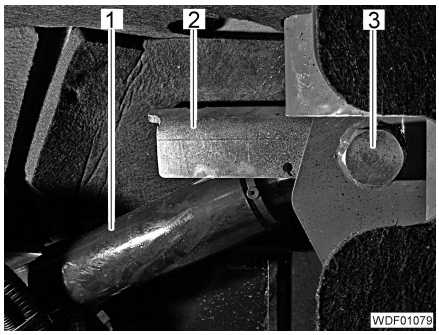

Fig. 461 Hydraulic cylinder attachment

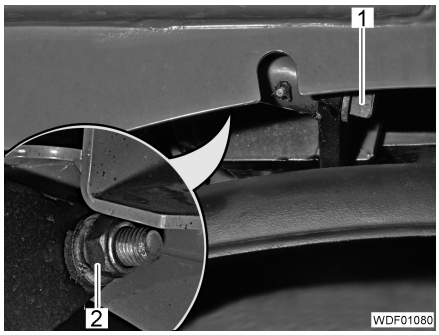

Fig. 462 Cab attachment (rear)

Lifting the cab

- Hook up the cab with suitable lifting gear (e.g. a crane).
- Unscrew the screw (Fig. 461,3).
- Unscrew the nut (Fig. 462,2).
- Drive out the hinge pins (Fig. 462,1) forwards.

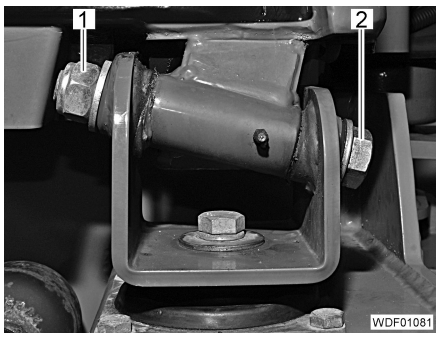

Fig. 463 Cab attachment (front)

- Unscrew the nut (Fig. 463,1).
- Drive out the hinge pins (Fig. 463,2) forwards.
- Carefully lift off the cab upwards with lifting gear.

7.2.8 Replacing the sun visor

Spare parts and auxiliary equipment

Designation	Quantity
Sun visor	1

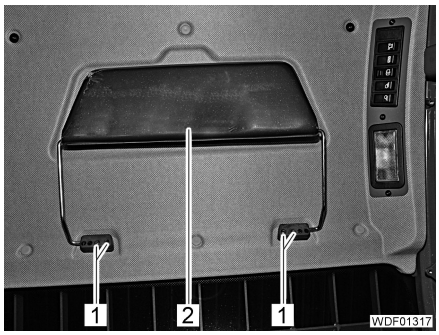

Fig. 489 Sun visor

Removing the sun visor

- Unscrew the 4 screws (Fig. 489,1).
- Remove the sun visor (Fig. 489,2).

Fitting the sun visor

- Position the sun visor (Fig. 489,2).
- Screw in and tighten the 4 screws (Fig. 489,1).

7.3 Windows/windshield and doors

7.3.1 Replacing the windshield wiper arms

Spare parts and auxiliary equipment

Designation	Quantity
Windshield wiper arm	1
or windshield wiper arm, parallel	1

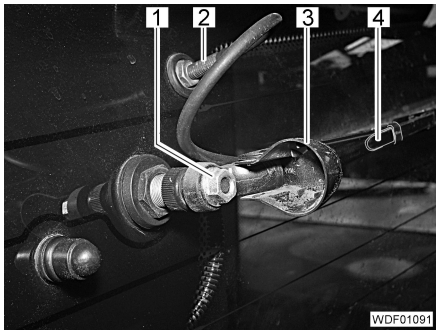

Fig. 490 Rear windshield wiper arm

Removing the rear windshield wiper arm

- Mark the position of the windshield wiper arm.
- Pull off the hose (Fig. 490,2) of the windshield washer system.
- Fold the cap (Fig. 490,3) away from the fastening.
- Undo the nut (Fig. 490,1).
- Press the windshield wiper arm (Fig. 490,4) against the nut with a lever.
- Remove the nut and windshield wiper arm.

Fitting the right-hand cladding

- Carefully position the cladding (Fig. 513,1) from the right-hand side for the contacts of the ignition lock (Fig. 514,2) to be accessible.
- Attach the connector (Fig. 514,1) to the contact of the ignition lock.
- Position and adjust the cladding (Fig. 513,1).
- Screw in and tighten the 6 screws (Fig. 513,2).

Fix the windshield wiper motor

- Position the windshield wiper motor (Fig. 512,2).
- Screw the 2 nuts (Fig. 512,3) onto the screws and tighten.
- Place on the cover (Fig. 511,2).
- Screw in and tighten the 3 screws (Fig. 511,1).

Fit the left-hand cladding

- Carefully position the cladding (Fig. 510,2) from the left.
- Screw in and tighten the 6 screws (Fig. 510,1).
- Fold the pedal (Fig. 509,1) forwards.
- Push the pin (Fig. 509,2) through the fork end and secure.

7.4.3 Replacing the steering wheel

▷ So as not to damage the underside of the steering wheel, to pull it off use two suitable half-shells (see Part 2, "Half-shells and pull-off fixture" section) and and a three-armed puller.

Requirements

Ensure the following:

- The steering column switch has been removed (see section 8.2.8 "Replacing the steering column switch").

Spare parts and auxiliary equipment

Designation	Quantity
Steering wheel	1

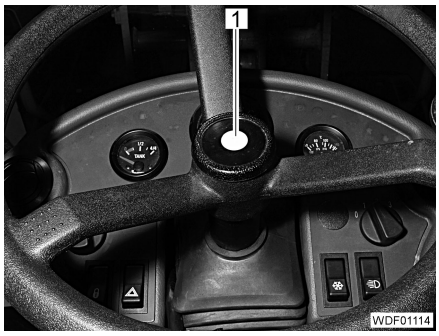

Fig. 515 Cover

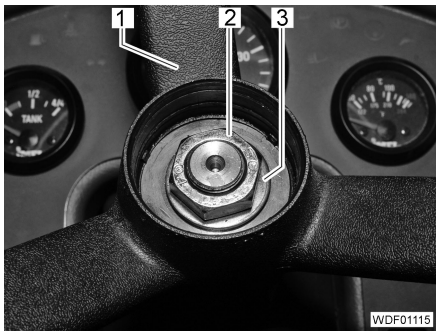

Fig. 516 Steering wheel attachment

Removing the steering wheel

- Remove the cap (Fig. 515,1).
- Unscrew the nut (Fig. 516,2).
- Remove the washer (Fig. 516,3).

- Screw in and tighten the screw (Fig. 535,3) with the spring lock washer and washer.
- Fit the eye (Fig. 534,5) onto the bolt (Fig. 534,2).
- Screw the nut (Fig. 534,4) onto the bolt and tighten so that the eye can still be turned.
- Replace the fixing (Fig. 534,3).

Final work

- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").

Requirements

Ensure the following:

- The loader is secured (see operator's manual "Securing the loader").
- The engine hood is open (see operator's manual "Opening the engine hood").

Spare parts and auxiliary equipment

Designation	Quantity
Temperature sensor	1
Sealant	as req.

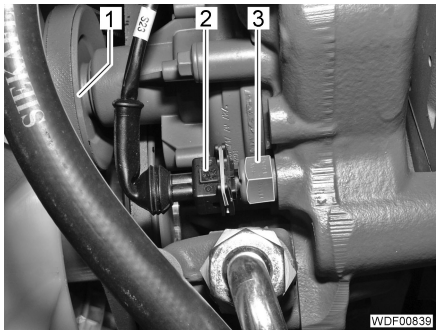

Fig. 552 Temperature sensor

Replacing the temperature sensor

- Open the radiator cap briefly in order to depressurize the cooling system.
- Remove the plug (Fig. 552,1).
- Unscrew the temperature sensor (Fig. 552,2) and close off the opening in the engine.
- Screw the new temperature sensor into the engine and tighten it.
- Plug the plug onto the temperature sensor.

Final work

- Close the engine hood.

8.2.4 Replacing the temperature sensor of the hydraulic fluid tank

▷ Pay attention to the "Safety instructions for working on the hydraulic system" (see Part 1 "Safety").

Requirements

Ensure the following:

- The base plate has been removed (see the section 6.2.2 "Replacing the base plate").
- The hydraulic system is depressurized (see the section 3.1.1 "Depressurizing the hydraulic system").

Spare parts and auxiliary equipment

Designation	Quantity
Temperature sensor	1
Sealant	as req.

8.4.3 Replacing the coil and core on the variable displacement pump

Requirements

Ensure the following:

- The operator's platform is tilted (see operator's manual "Tilting the operator's platform").

Spare parts and auxiliary equipment

Designation	Quantity
Solenoid (coil and core)	1

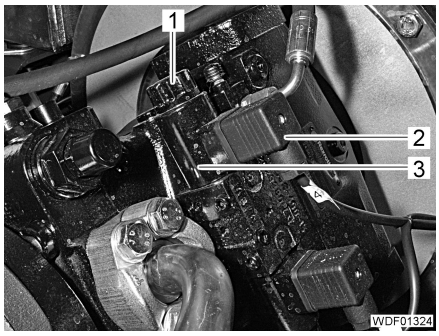

Fig. 569 Variable displacement pump solenoid valve

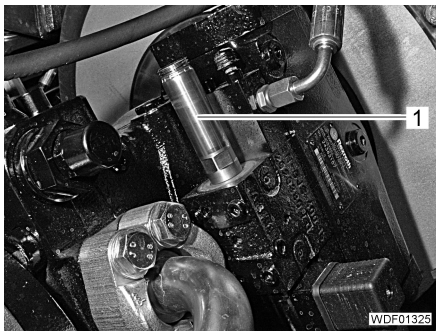

Fig. 570 Core

Removing the coil

- Unscrew the screw (Fig. 569,2) on the connector.
- Disconnect the plug.
- Unscrew the nut (Fig. 569,1).
- Pull off the coil (Fig. 569,3).

Replacing the core

- Unscrew the core (Fig. 570,1).
- Screw a new core into the solenoid valve and tighten it.

Installing the coil

- Attach the new coil (Fig. 569,3) onto the core of the solenoid valve.
- Screw the nut (Fig. 569,1) with the O-ring onto the core of the solenoid valve and tighten it hand-tight.
- Plug the plug (Fig. 569,2) into the connections on the coil.
- Tighten the screw on the plug.

Final work

- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").

8.4.4 Replacing the solenoid valve core on the variable displacement motor

▷ Pay attention to the "Safety instructions for working on the hydraulic system" (see Part 1 "Safety").

Requirements

Ensure the following:

- The variable displacement motor has been removed (see the section 3.2.4 "Replacing the variable displacement motor").

9.1 Replacing the earth bucket digging tooth

▷ After installation, check the tightening torque of the bolts and nuts after every hour of operation until it no longer changes.

Spare parts and auxiliary equipment

Designation	Quantity
Digging tooth	1

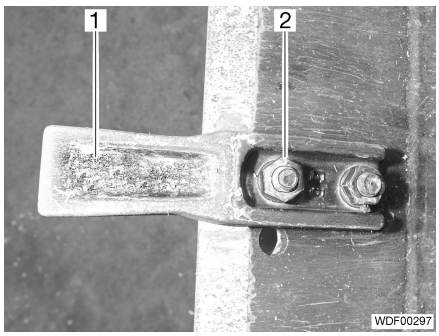

Fig. 592 Digging tooth attachment

- Unscrew the 2 nuts (Fig. 592,2).
- Remove the digging tooth (Fig. 592,1).
- Put a new digging tooth into place.
- Screw the 2 nuts (Fig. 592,2) with spring lock washers onto the bolts and tighten.

9.2 Replacing the prongs of the fork & grab

▷ After installation, check the tightening torque of the bolts and nuts after every hour of operation until it no longer changes.

Spare parts and auxiliary equipment

Designation	Quantity
Prong	1

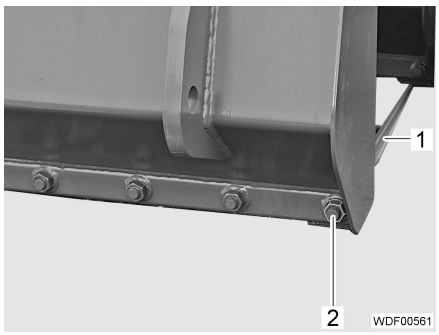

Fig. 593 Securing the prong

Replacing prong

- Unscrew the nut (Fig. 593,2).
- Pull out the prong (Fig. 593,1).

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Repair Manual for Wheel Loader 3070 CX60 / 3070 CX80
Part 5
Circuit diagrams and technical descriptions

Translation of the original repair manual

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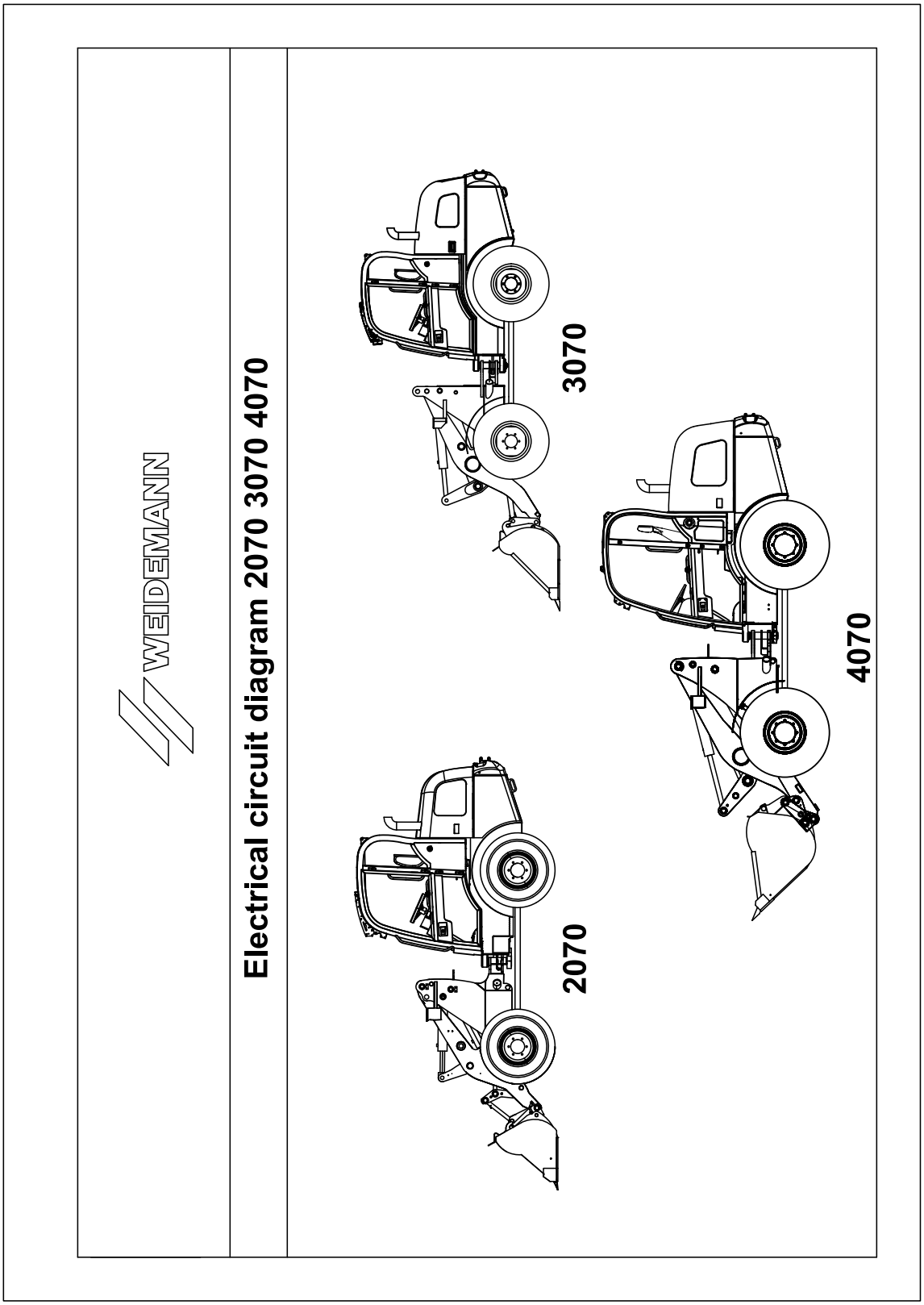
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Electrical circuit diagram 2070 3070 4070
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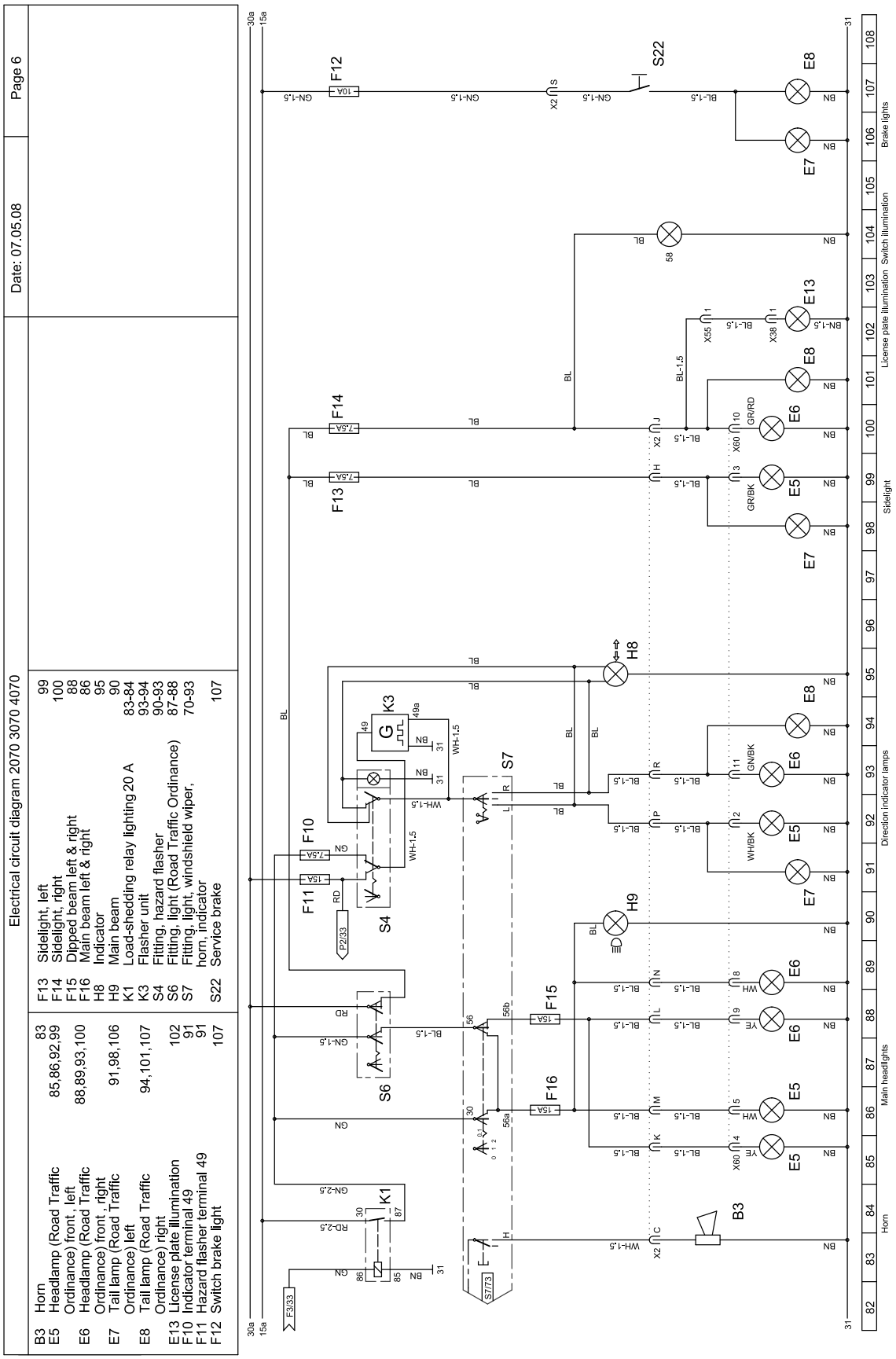
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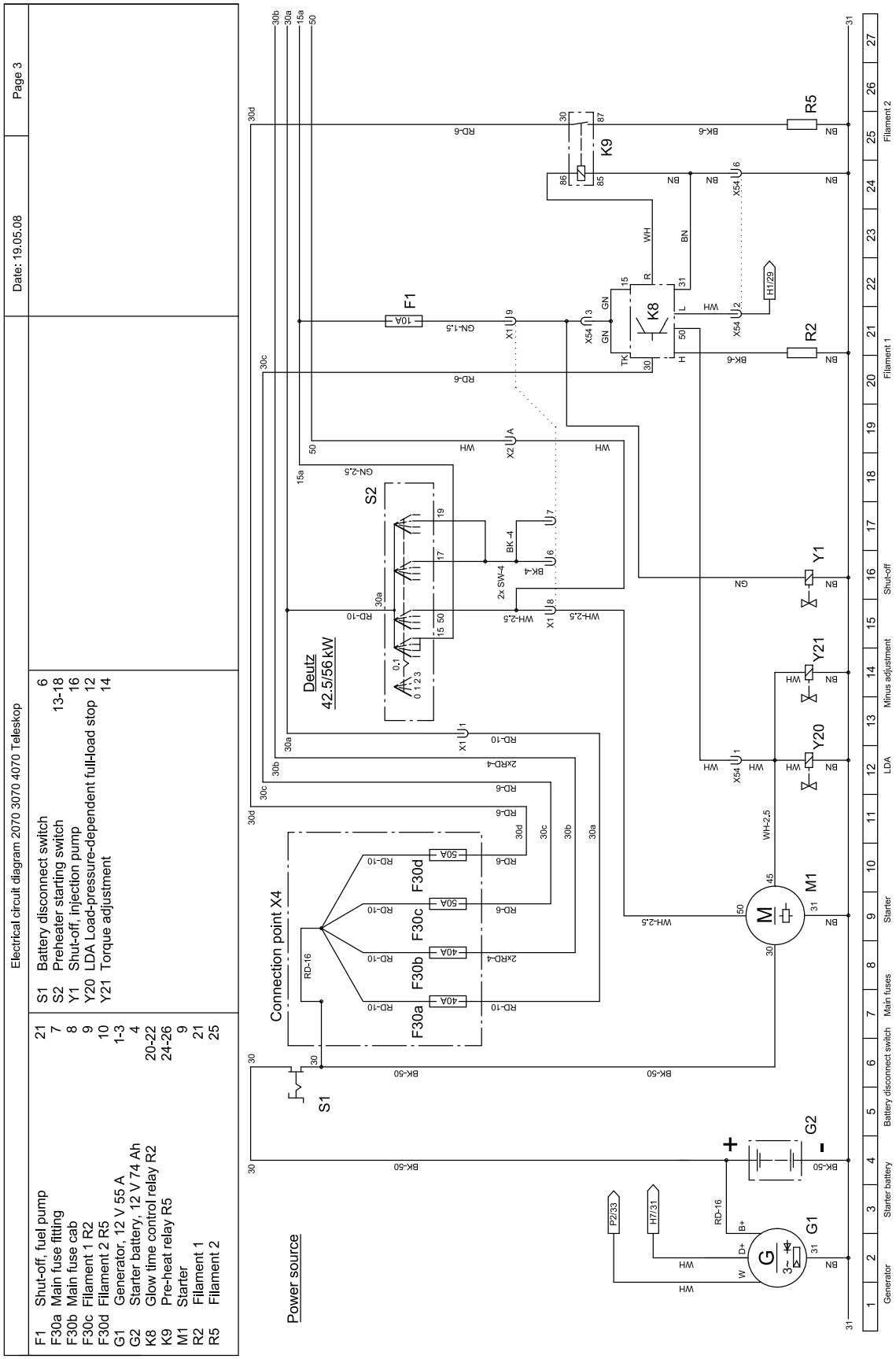
Electrical circuit diagram 2070 3070 4070 Teleskop
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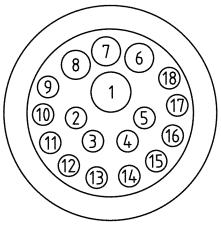
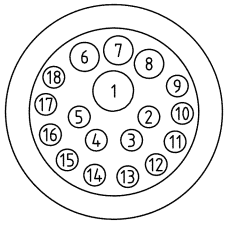
Starter battery
Battery disconnect switch
Main fuses
Starter
LDA
Minus adjustment
Shut-off
Filament 1
Filament 2



Deutsch 18-pole
Art. No. HDP 24-24-18-PE

X1

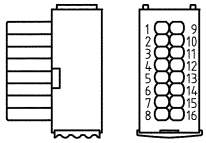
P	Color	Ø [mm²]	Designation
1	RD	10	S2 Preheater starting switch, terminal 30
2	WH	1	P3 Instrument engine temperature
3	WH	1	Relay K4-86 H7 Indicator lamp, generator
4	WH	1	H10 Indicator lamp, engine oil pressure
5	WH	1	P2 Rev counter
6	BK	4	S2 Preheater starting switch, terminal 17
7	BK	4	S2 Preheater starting switch, terminal 17
8	WH	2.5	S2 Preheater starting switch, terminal 50
9	GN	1.5	F1 Fuse
10	WH	1	H6 Indicator lamp, cooling water temperature/hydraulic oil temperature
11	WH	1	H5 Indicator lamp, fuel reserve
12	WH	1	P1 Instrument, fuel tank gauge
13	WH	1	S28 Temperature switch, air-conditioning unit
14	WH	1	H12 Indicator lamp, air filter clogging
15	WH	1	H4 Indicator lamp plus (**1**) option
16	WH	1.5	H1 Indicator lamp, pre-heating system
17	WH	1.5	H4 Indicator lamp minus (**1**) option
18	WH	1	H3 Indicator lamp, hydraulic fluid clogging



Deutsch 18-pole
Art. No. HDP 26-24-18-SE

X1

S	Color	Ø [mm²]	Designation
1	RD	10	F30a Main fuse fitting
2	WH	1	B2 Temperature sensor, coolant/engine oil
3	WH	1	G1 Generator terminal D+
4	WH	1	S24 Switch engine oil pressure
5	WH	1	G1 Generator terminal W

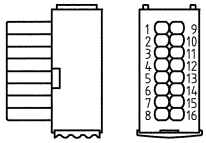


Rack, 16-pin
Art. No. 5931632171

S	Color	Ø [mm²]	Designation
5	WH	1	Differential lock
6	-	-	Not assigned
7	-	-	Not assigned
8	WH	1	Preheater starting switch terminal 50
9	GN	1.5	Fuse F18
10	BN	1	Ground
11	YE	1	Y4 Solenoid valve backup gear H16 Fitting Indicator lamp, backup gear
12	YE	1	Y3 Solenoid valve forward gear H13 Fitting indicator lamp, forward gear
13	YE	1	Y5 Solenoid valve overdrive H14, H15 Fitting indicator lamp, overdrive
14	WH	1	Y10 Solenoid valve (where applicable) (differential lock) [1)]
15	WH	1	Y11 Solenoid valve (where applicable) (electrical connection) [1)]
16	WH	1	S21 Switch, parking brake

[1)] Variances if equipped with hydro connection comfort (optional).

X33



Rack, 16-pin
Art. No. 5931632171

S	Color	Ø [mm²]	Designation
1	-	-	Not assigned
2	-	-	Not assigned
3	-	-	Not assigned
4	-	-	Not assigned
5	BK	1	Electrical connection or changeover valve
6	BK	1	Y11 Solenoid valve (where applicable) (electrical connection or changeover valve) [1)]
7	BK	1	Y10 Solenoid valve (where applicable) (differential lock) [1)]
8	BK	1	Control unit, overdrive
9	-	-	Not assigned
10	-	-	Not assigned

	P	Color	Ø [mm²]	Designation
X33	1	-	-	Not assigned
	2	-	-	Not assigned
	3	-	-	Not assigned
	4	-	-	Not assigned
	5	BK	1	S7 (option)
	6	BK	1	S5
	7	BK	1	S4
	8	BK	1	S3
	9	-	-	Not assigned
	10	-	-	Not assigned
	11	-	-	Not assigned
	12	-	-	Not assigned
	13	BK	1	S6 (option)
	14	BK	1	S1
	15	BK	1	S2
	16	BK	1	Switch, input
X34	1	YE	1	M3 terminal 53a
	2	RD	1	M3 terminal 53
	3	GN	1	M3 terminal 31b
	4	BK	1	M3 terminal 31
X35	1	RD	1	Terminal 30
	2	GN	1	Terminal 15
	3	BN	1	Terminal 31 ground
X36	1	BK	1	Plus loudspeaker left
	2	RD/BK	1	Minus loudspeaker left
	3	BK	1	Plus loudspeaker right
	4	RD/BK	1	Minus loudspeaker right
X37	1	GN	1	Terminal 15 Additional control lever
	2	GN	1	Terminal 31 Additional control lever

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Repair Manual for Wheel Loader 3070 CX60 / 3070 CX80
Part 6
Supplier service manuals

Translation of the original repair manual

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Electric Drives and Controls | Hydraulics | Linear Motion and Assembly Technologies | Pneumatics | Service

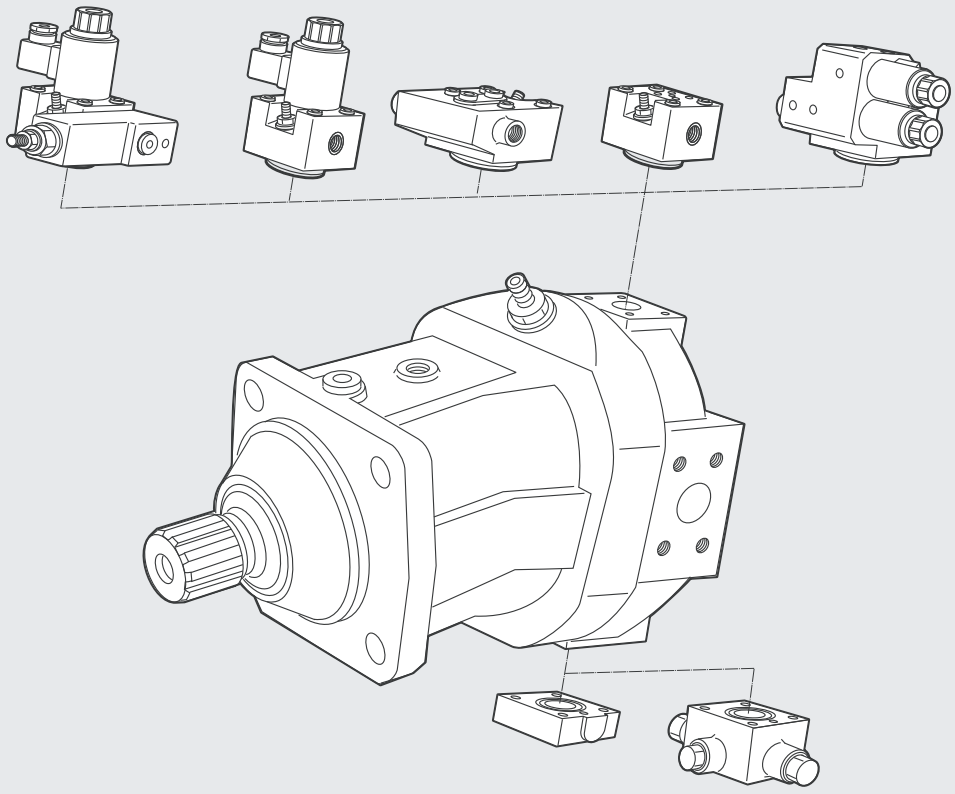
Rexroth Bosch Group

Verstellmotor A6VM NG 28–200
Variable Displ. Motor A6VM NG 28–200
Baureihe/Series 63

RDE 91 604-11-R/03.06

R1

Reparaturanleitung / Repair Manual
Baugruppen / Assembly Groups



Overload Measuring Device, OMD

Manual and Calibration Instructions

3. Calibration with vehicle

A standard calibration is pre-programmed. Every OMD must however be calibrated in the vehicle, to compensate for tolerance during sensor mounting and to adjust the display range exactly to the vehicle's behaviour. For the calibration, the vehicle must be brought into two load situations. The system is calibrated with 0% (without load) and 100% (maximal load), the vehicle must be placed on a flat surface.

Preparation for calibration procedure:

a) Bring vehicle in 0% load situation

b) Turn ignition off

c) Press the system check button on the OMD (keep pressed) – turn ignition on

d) Keep the system check button pressed – orange LED illuminates - after approx. 10 sec. the LED display changes into two inward convergent LED bands

e) Disengage the system check button

→ *Preparation of calibration procedure can be repeated max. 10x. Afterwards the calibration procedure cannot be started and the OMD changes into standard operation.*

Start calibration procedure:

f) The two inward convergent LED bands meet each other in the middle (middle green LED illuminates, warning tone sounds)

g) Press the button (the button is active as long as the middle LED is illuminated) - OMD is now in calibration mode.

h) The first green LED illuminates

→ *This state will not be left. Should calibration be interrupted here, the ignition has to be turned off. The old calibration data remain stored.*