Service Manual

Wheel Loader

WL 48
WL 50

EN

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Repair Manual for Wheel Loader WL 48 / WL 50

Translation of the original repair manual

WDF-6009-00EN
2009
Edition 07/2009-1

Service address and spare parts

If you have any queries, contact your nearest Wacker Neuson SE dealership.

You can find the address at www.wackerneuson.com.

You can also order spare parts from there.

The operator's manual for the loader is also available from here.

Before you continue reading ...

Operator's manual

In addition to this repair manual, the operator's manual for the loader is also required for doing all work in full.

The repair manual is comprised of six parts:

1. Safety
2. Technical data, testing equipment and special tools
3. Inspections, maintenance work and troubleshooting
4. Replacement and repair procedures
5. Circuit diagrams and technical descriptions
6. Supplier service manuals (must be added to locally)

Structure

Each part is subdivided into the following, based on the loader's structure:

1. Complete vehicle
2. Engine
3. Hydraulic system
4. Drive and axles
5. Brake system (mechanical section)
6. Vehicle frame and load arm
7. Operator's platform/cab
8. Electrical system
9. Attachments

Navigation

In each part of the manual, there is a table of contents to assist you in searching for individual sections.

The overall table of contents follows on the next pages, after the list of abbreviations and units.

The overall list of key words can be found immediately before the "Safety" part.

The list of key words for the respective part of the manual can be found at the end of that part.

Applicability

The repair manual applies to loaders of the types WL 48 and WL 50, with the following article numbers:

- 0610146
- 0610147

Special features

The repair manual also describes work on special features that are not present on every loader.

Abbreviations and units

%	Percent
A	High-pressure connection on the variable displacement pump
as req.	As required
B	High-pressure connection on the variable displacement pump
bar	Unit of pressure
BK	Black
BL	Blue
BN	Brown
cm	Centimeter
cm^3	Cubic centimeter
F3	Fuse No. 3
G	Supply pressure at the variable displacement pump **or** Test pressure at the variable displacement motor
GN	Green
GR	Gray
h	Hour
KL30	Terminal designation
l	Liter
LB	Light blue
M_1	Test pressure at the variable displacement motor
M_A	Test pressure at the variable displacement pump
max.	Maximum, highest
M_B	Test pressure at the variable displacement pump
min	Minute
min.	Minimum, at least
Nm	Newton meter
Ø [mm^2]	Wire cross section [in square millimeters]
OR	Orange
P	Pin, pin contact
PK	Pink
RD	Red
rpm	Unit of speed (revolutions per minute)
s	Second
S	Socket, socket contact
SKA	Standard configuration, SKA machines
SP1	Welding point No. 1 in the machine's wiring harness
SP1M	Welding point No. 1 in the engine wiring harness
SV	Solenoid valve
TR	Transparent

VI	Violet
WH	White
X	Plug connector
X_1	Control pressure at the variable displacement pump
X_2	Control pressure at the variable displacement pump
YE	Yellow

A

B

C

D

E

F

G

P

R

S

T

V

W

Repair Manual for Wheel Loader WL 48 / WL 50

Part 1

Safety

Translation of the original repair manual

WDF-6009-00EN
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 repair work (complete vehicle)

▷ Besides the safety regulations outlined here, also pay attention to all safety instructions in the operator's manual.

Repair personnel

- The repair personnel must have specialized knowledge of and experience in repairing this or comparable loaders.
- Should such knowledge be lacking, thorough training must be provided by experienced repair personnel from e.g. the manufacturer's in-house Service Department.
- Personnel requiring training, familiarization or instruction, or personnel who are currently undergoing general training, may work on or with the machine only under the constant supervision of an experienced, authorized supervisor.

Equipment and work safety

- Workshop equipment appropriate for the work being done is absolutely essential for carrying out maintenance and repair measures.
- When working above head height, use suitable, safe climbing aids and work platforms. Never use parts of the machine as climbing aids. Keep all handles, steps, railings, pedestals, platforms and ladders free of dirt, snow and ice.
- If there are particular hazards involved, e.g. toxic gases, corrosive vapors, a toxic machine environment etc., wear personal safety equipment (filter for the inhaled air, protective overalls).

Environmental protection

- Ensure that fuels, consumables and replacement parts are disposed of safely and in an environmentally responsible way.

General safety

- No modifications, attachments or conversions that could impair safety may be applied to the loader unless expressly authorized by the manufacturer. The same also applies to the installation and settings of safety devices and safety valves, and also to welding on supporting parts.
- Replace the ROPS or FOPS protective structures if they are deformed or corroded (even only partially), or if they have been modified.
  Consult the manufacturer if the attachment points, the frame or the fasteners are damaged. Do not attempt to repair, align or reuse damaged ROPS or FOPS protective structures.
- Use only the manufacturer's original spare parts for maintenance of and repairs to the wheel loader.
- Repairs may only be carried out by authorized dealers approved by the manufacturer.
- Before dispatch, empty components completely in order to prevent damage, e.g. from frost.
- It is prohibited to change rated pressures of pressure control valves without the manufacturer's express approval.

Before repairs

- The entire loader, particularly the connections and screw attachments, must be cleaned with care agents at the start of the maintenance and repair work. Use fiber-free cleaning cloths and do not use any aggressive cleaning agents.
- Before cleaning the loader with water, a steam jet (high-pressure cleaner) or other cleaning agents, cover or seal all openings into which no water, steam or cleaning agents must not enter for safety or function-related reasons.
  The electrical components, the inlet and outlet openings for the engine's combustion air and refueling openings are at particular risk.
  Remove the covers and seals completely after cleaning.

Removing components

- Burn hazard from hot parts or liquids! Do not remove components when the loader is still at operating temperature!
- Clean components carefully before disassembly.
- So that no dirt can enter, carefully close off connections and any open holes uncovered when the component was removed.

Lifting loads

- When carrying out repairs on and replacing heavy individual parts and assemblies, use lifting gear to lift and secure them. Use only suitable lifting gear and load support equipment that is in perfect condition and that has a sufficient load-carrying capacity. Never stand or work under suspended loads!
- Only experienced personnel may be tasked with securing loads and instructing crane drivers. The instructor must be within sight of the operator, or must be in voice contact with him.

Installing components

- When it is necessary to dismantle safety devices for mounting, maintenance or repair work: Immediately after completing the work, refit all safety devices and check that they function correctly.
- Secure Bowden cables and safety cables at the ends so that the eyes remain rotatable in order to prevent the cables from bending and then breaking.
- Screw connections that have been undone during maintenance and repair work, particularly on lines carrying oil or fuel, must be tightened again prior to restarting. When carrying out maintenance and repair work, check all lines and screw connections for leaks and to make sure that they are secure.

After repairs

- If an area has been repainted and a safety sticker has been damaged or rendered illegible: Replace the safety sticker before restarting the machine. If there was a safety sticker on a replaced component or assembly: Also apply a safety sticker to the replacement part. Replacement stickers are available from the manufacturer.
- Apply protective varnish to all bare metal parts in order to prevent corrosion damage.
- Reattach the cable fastening screws after completing the repair work.
- After completing repair work, reinstall all safety fixtures, covers and insulation to protect against noise and vibrations.
- Check the function of the loader, particularly the function of the repaired components, in a test operation. When doing this, ensure that nobody is within the loader's danger area.
- Do not approve the loader for use again until it functions correctly in all areas.

Safety instructions for working on the engine

- Only perform repair work when the loader is secured (see operator's manual "Securing the loader").
- Caution: Risk of poisoning! Engine exhausts are toxic! Do not inhale any engine exhaust fumes!
- Perform the following measures for all work involving running the engine in an enclosed room: Ventilate the room well and extract the exhaust fumes with an extractor system.
- Risk of injury from rotating and hot parts! Allow the engine to cool down after switching it off.
- Inspect the V-belt only when the engine is stationary.
- Do not smoke when handling flammable liquids, and avoid naked flame or fire.
- Do not use water to extinguish fires on the loader and burning liquids. Use suitable extinguishing agents such as powder, carbon dioxide or foam.
- Always call the Fire Department in the event of a fire!
- Fix oil and fuel leaks immediately.
- Avoid damaging the environment. Do not allow oil and waste containing oil to enter the soil or bodies of water.
- Absorb escaped oil or fuel immediately using a binding agent. Dispose of the binding agent and the absorbed liquid separately from other waste and in an environmentally responsible manner.
- Biodegradable "environmentally friendly" oil must also be disposed of separately, just like any other oil.

Safety instructions for working on the hydraulic system

- Only trained experts with special knowledge and experience may work on hydraulic equipment.
- Residual pressure decreases only gradually! Even when the loader is parked on a horizontal surface with its lift frame lowered and its engine switched off, there can still be significant residual pressure in parts of the hydraulic system.
- Depressurize the system before carrying out repair work on the hydraulic system (see the section "Depressurizing the hydraulic system" in Part 4).
- Leaks from which oil escapes must be repaired in order to prevent the following hazards:
  Environmental hazard
  Fire hazard
  Slip hazard
  Explosion hazard
  Injury hazard
- Caution: Injury hazard! A fine, pressurized jet of hydraulic fluid can penetrate the skin! Seek immediate medical attention if oil gets in your eyes or penetrates your skin.
- Do not search for leaks using your hands! To trace a leak, use a piece of card or paper that shows up sprayed-out oil.
- Do not repair damaged pipelines and hydraulic hoses. Instead, replace them immediately with new ones even if only the penetration of dampness is visible.
- Hydraulic hoses must be replaced after a service life of six years at the latest. Country-specific regulations may specify shorter intervals, and these must be observed.
- Open hydraulic connections with care, so that you can react if large quantities of oil escape.
- Do not open damaged pre-tensioned units (e.g. hydraulic accumulators)! Always replace them completely instead.
- Use only suitable vessels to collect hydraulic fluid.
- Dispose of escaped oil and waste containing oil in an environmentally responsible manner.
- Handle O-rings, Q-rings and gaskets with particular care.
- Replace damaged or lost O-rings, Q-rings and gaskets immediately.
- Hydraulic lines must be laid and installed correctly! This work may only be done by authorized experts. Ensure that no connections are mixed up. The fittings, length and quality - particularly the pressure and temperature resistance of hydraulic lines - must meet requirements.

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.

Safety instructions for working on the brake system

- Repair work on brakes may only be carried out if the personnel is trained for working on brake systems. If in doubt, the manufacturer's Service Department must do the work.
- It is forbidden to use any brake fluid not approved by the manufacturer.
- When working with brake fluid, pay attention to the health hazard information and environmental protection.
- Only perform repair work on brakes when the loader is secured (see operator's manual "Securing the loader").

Safety instructions for working on the vehicle frame and load arm

- Fit the support provided for the lift frame before commencing work on the raised lift frame, so that the lift frame does not descend suddenly and unintentionally. This fixture must conform to ISO 10533.
- When carrying out repair work in the articulation crush zone, always block the articulated link with the articulation frame lock.
- Remove the block after completing the repair work.

Welding work

- Welding work may only be done by persons with the necessary training.
- Containers that contain or have contained materials that are combustible, promote combustion, are explosive or can produce harmful vapor, gas, mist or dust during welding work: Only authorized persons specifically assigned to this work and who are working under the supervision of a competent expert may carry out welding work on these containers. Always consult the manufacturer's Service Department if you have any problems or queries.
- Disconnect the battery before commencing welding work (see "Disconnecting and connecting the battery/changing the battery" in the operator's manual).
- Protect bare terminals and connections against short circuits!
- Attach the welding grounding terminal in the immediate vicinity of the welding location. The welding current must not pass through gears, bolts, articulated joints or hydraulic cylinders.
- Connect the battery after welding (see "Disconnecting and connecting the battery/changing the battery" in the operator's manual).

Safety instructions for working on the operator's platform and cab

Air conditioning

- Maintenance and repair work to the air-conditioning unit requires expert knowledge and must only be performed by suitably trained personnel.
- Caution: Risk of poisoning! Avoid all contact with liquid refrigerant. Remove contaminated clothing immediately. If you come into direct contact with refrigerant, rinse off the contaminated part of your body immediately with plenty of clean water. Seek immediate medical attention.
- Never open any pipes, tubes or other components that contain refrigerant.
- If any pipes, tubes or other components that contain refrigerant become damaged, replace them immediately.
- Do not carry out welding on components belonging to the refrigerant circuit or in their immediate vicinity.
- Observe national laws and regulations concerning the handling of air-conditioning units and refrigerants.

Safety instructions for working on the electrical system

- Repair personnel must possess the specialist knowledge required for working on the electrical system.
- Caution: Explosion hazard! Batteries give off explosive gases! No not smoke or bring naked flames near to a battery.
- Do not place any objects on the battery. If a metal object touches both the positive pole and the negative pole of a battery, a short occurs - and possibly an explosion. This can result in serious burns.
- Caution: Injury hazard! Battery acid is corrosive. Make sure that battery acid does not come into contact with your skin, eyes, mouth and clothes. Wear protective gloves, a protective apron and safety goggles. Remove contaminated clothing immediately! If you come into direct contact with battery acid, rinse off the contaminated part of your body immediately with a lot of clean water. Seek immediate medical attention.
- Always remove metal jewelry and watches before working on the battery or the electrical system.
- Dispose of old batteries in an environmentally responsible manner and separate from other waste.
- Replacement fuses must be of the same type and current rating as specified by the manufacturer.

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Part 2

Technical data, testing equipment and special tools

Translation of the original repair manual

WDF-6009-00EN
2009
Edition 07/2009-1

This part of the repair manual contains general technical data that gives an overview of the loader's properties.

Filling quantities

The list of filling quantities contains the fuels and consumables that are required for smooth operation of the loader.

Tightening torques

The list of tightening torques contains the values that must be maintained in order to reliably secure components and at the same time prevent damage to the connecting elements.

Pressure values

The list of pressure values refers to the variable displacement pump and variable displacement motor. The list simplifies troubleshooting on the hydraulic system.

Meaning and position of the safety stickers

On the loader there are safety stickers that warn about hazards or give instructions.

The meanings and location points for the safety stickers are summarized in a list.

Testing equipment

Special testing equipment is required for troubleshooting and adjustment work.

The standard tools for the work described are required in addition to the testing equipment summarized in this list.

Special tools

The described special tools are absolutely essential for the work described.

However, the special tools make work easier and in most cases you can make them yourself with little effort.

1.1 Technical data for diesel engine

Engine

- Deutz 4-cylinder Diesel engine
- Output 45 kW / 60 HP at 2300 rpm
- Type T 2011 L04 w water-cooled
- Capacity 3619 cm^3

Hydraulic system

- Driving hydraulics
  Flow rate 129 l/min (optional: 163 l/min)
  Working pressure 445 bar
- Working hydraulics
  Flow rate 64 l/min (optional: 75 l/min)
  Primary pressure, working pressure 230 bar
  Secondary pressure, lifting 250 bar
  Secondary pressure, curling to load 250 bar
  Secondary pressure, dumping 200 bar
- Steering hydraulics
  Flow rate 64 l/min (optional: 75 l/min)
  Working pressure 190 bar

Drive (driving speed)

- 1st gear 0 - 7 km/h
- 2nd gear 0 - 20 km/h
- Option: 2nd gear 0 - 27 km/h

Electrical system

- Operating voltage 12 V
- Battery 77 Ah
- Generator
  Charging voltage 14 V (at 2000 rpm)
  Maximum capacity 55 A

1.2 Technical data for turbo-diesel engine

Engine

- 4-cylinder turbo-diesel engine by Deutz
- Output 58.0 kW / 78 HP at 2300 rpm
- Type TD 2011 L04 w water-cooled
- Capacity 3619 cm^3

Hydraulic system

- Driving hydraulics
  Flow rate 129 l/min (optional: 163 l/min)
  Working pressure 445 bar
- Working hydraulics
  Flow rate 64 l/min (optional: 75 l/min)
  Primary pressure, working pressure 230 bar
  Secondary pressure, lifting 250 bar
  Secondary pressure, curling to load 250 bar
  Secondary pressure, dumping 200 bar
- Steering hydraulics
  Flow rate 64 l/min (optional: 75 l/min)
  Working pressure 190 bar

Drive (driving speed)

- 1st gear 0 - 7 km/h
- 2nd gear 0 - 20 km/h
- Option: 2nd gear 0 - 27 km/h

Electrical system

- Operating voltage 12 V
- Battery 77 Ah
- Generator
  Charging voltage 14 V (at 2000 rpm)
  Maximum capacity 55 A

▷ All values are approximate values.

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

	Location	Quantity in liters	Liquid	Specification
Engine	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 / anti-freeze	HP coolant / anti-freeze: 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

This section summarizes the tightening torques in two groups:

- Special tightening torques
- General tightening torques

▷ If no special tightening torque is stipulated, the general tightening torques apply (see "General tightening torques").

Special tightening torques

Assembly	Connection	Tightening torque (Nm)
Engine	Cylinder head cover	8.5
Drive and axles	Front axle securing	390
	Rear axle securing	360
Wheel	Wheel nut	285

General tightening torques

Screws with coarse-pitch thread

Tightening torques for screws with coarse-pitch thread as a function of the quality

Thread size in mm	Tightening torque [1] in Nm		
	Quality 8.8	Quality 10.9	Quality 12.9
M4	3	4	5
M5	5.5	8	10
M6	10	14	16
M8	23	34	40
M10	46	67	79
M12	79	115	135
M14	125	185	220
M16	195	290	340
M18	280	400	470
M20	395	560	660
M22	540	760	890
M24	680	970	1150
M27	1000	1450	1700
M30	1350	1950	2300

[1] These values apply to screws with an untreated, unlubricated surface.

Screws with fine-pitch thread

Tightening torques for screws with fine-pitch thread as a function of the quality

Thread size in mm	Tightening torque [1] in Nm		
	Quality 8.8	Quality 10.9	Quality 12.9
M8x1	28	39	46
M10x1.25	53	74	89
M12x1.5	91	126	151

Thread size in mm	Tightening torque [1] in Nm		
	Quality 8.8	Quality 10.9	Quality 12.9
M14x1.5	150	210	250
M16x1.5	225	315	380
M18x1.5	325	460	550
M20x1.5	460	640	770
M22x1.5	610	860	1050
M24x2	780	1100	1300
M27x2	1160	1640	1970
M30x2	1600	2330	2730

1) These values apply to screws with an untreated, unlubricated surface.

Hydraulic lines Tightening torques for conical sealing screw connections

Pipe outside diameter	Tightening torque [1] in Nm ± 5 %
L 6	20
L 8	30
L 10	40
L 12	50
L 15	70
L 18	90
L 22	120
L 28	160
L 35	250
L 42	380
S 6	25
S 8	40
S 10	50
S 12	60
S 14	75
S 16	85
S 20	140
S 25	190
S 30	270
S 38	400

1) Union nut waxed, thread oiled (source: www.voss.de, 07.09.08)

4.1 Pressure values 20 km/h version

- ▷ The stated values are guideline values and can vary between loaders.
- ▷ The values are intended as orientation aids for troubleshooting.

Variable displacement pump, driving forward

The following table contains the pressure values (in bar) at the variable displacement pump for driving forward and **with the drive blocked**.

Speed [rpm]	Pressure (in bar) at measuring point				
	G	X_1	M_B	X_2	M_A
1000	25	6	30	< 2	22
1100	25	7	80	< 2	22
1320	25	10	250	< 2	22
1600	26	13	360	< 2	25
2100	26	17.5	440	< 2	25
2470	27	19	440	< 2	25

Variable displacement pump, reversing

The following table contains the pressure values (in bar) at the variable displacement pump for reversing and **with the drive blocked**.

Speed [rpm]	Pressure (in bar) at measuring point				
	G	X_1	M_B	X_2	M_A
1000	25	< 2	30	6	30
1100	25	< 2	30	7	80
1320	25	< 2	30	10	250
1600	26	< 2	30	13	360
2100	26	< 2	30	17	440
2470	27	< 2	30	19	440

Variable displacement motor

The following table contains the pressure values (in bar) at the variable displacement motor with the **drive blocked**.

Speed [rpm]	Pressure (in bar) at measuring point	
	G	M_1
1000	30	0
1100	80	0
1320	250	125
1600	360	360
2100	440	440
2470	440	440

4.2 Pressure values 30 km/h version (optional)

- ▷ The stated values are guideline values and can vary between loaders.
- ▷ The values are intended as orientation aids for troubleshooting.

Variable displacement pump, driving forward

The following table contains the pressure values (in bar) at the variable displacement pump for driving forward and **with the drive blocked**.

Speed [rpm]	Pressure (in bar) at measuring point				
	G	X_2	M_B	X_1	M_A
975	28	4.5	22	< 2	22
1050	28	5	70	< 2	25
1450	30	10	270	< 2	25
1600	30	12	280	< 2	25
2100	30	18	420	< 2	25
2440	30	22	440	< 2	25

Variable displacement pump, reversing

The following table contains the pressure values (in bar) at the variable displacement pump for reversing and **with the drive blocked**.

Speed [rpm]	Pressure (in bar) at measuring point				
	G	X_2	M_B	X_1	M_A
975	29	< 2	30	4.5	22
1050	28	< 2	30	5	70
1450	29	< 2	30	11	270
1600	29	< 2	30	11	280
2100	30	< 2	30	18	420
2440	30	< 2	30	22	440

Variable displacement motor

The following table contains the pressure values (in bar) at the variable displacement motor with the **drive blocked**.

Speed [rpm]	Pressure (in bar) at measuring point	
	G	M_1
975	22	0
1050	70	0
1450	270	135
1600	280	280
2100	420	420
2440	440	440

5.1 Flow rates 20 km/h version

- ▷ The stated values are guideline values and can vary between loaders.
- ▷ The values are intended as orientation aids for troubleshooting.

The gear pumps deliver 2 x 14 cm^3 = 28 cm^3 per revolution.
This provides the following flow rates in liters per minute:

Gear pump

Speed [rpm]	Flow rate [l/min]
1000	28
1100	31
1320	37
1600	45
2100	59
2470	69

5.2 Flow rates 30 km/h version (optional)

- ▷ The stated values are guideline values and can vary between loaders.
- ▷ The values are intended as orientation aids for troubleshooting.

The gear pump delivers 32 cm^3 per revolution.
This provides the following flow rates in liters per minute:

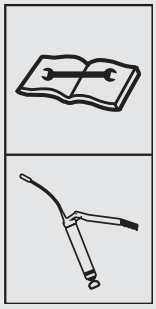
Gear pump

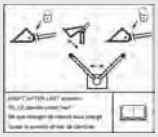
Speed [rpm]	Flow rate [l/min]
975	31
1050	34
1450	46
1600	51
2100	67
2440	78

Meaning and position of the safety stickers

Meaning The stickers have the following meanings:

Sticker	Meaning
	**Hazard** Stay out of the loader's danger area during operation. Do not walk under the raised lift frame.
	**Hazard** Risk of injury by moving parts. Never open the safety devices while the engine is running.
	**Hazard** Always stay outside the unsecured danger area. Use the safety supports.
	**Hazard** Always lock the roll bar in the protection position as soon as working conditions allow.
	**Hazard** Remove the ignition key before starting maintenance and repair work. Always follow the operator's manual when carrying out maintenance and repair work.

Sticker	Meaning
	**Risk of equipment damage** Lubricate the center joint daily before start-up. Refer to the lubrication plan in the operator's manual.
	**Hazard** Hot surfaces can cause burns. Never touch hot surfaces. Allow the surface to cool down and wear protective gloves.
	**Hazard** Risk of injury from falling. Do not climb into the raised earth bucket. Never lift persons with the earth bucket.
	**Hazard** Hot coolant can cause scalding injuries! Never open the cooling system when it is under pressure or when the engine is hot. Allow the engine to cool down and wear protective gloves.
	**Hazard** Falling out of the loader can cause injury. Always wear a seat belt when working.

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

Sticker	Meaning
	Identifies a tie-down point
	Identifies the maximum acoustic power level
	Indicates the use of hydraulic fluid
	Indicates the use of oil in the brake system
	Indicates that hardening time of the varnish
	**Hazard** Risk of injury from falling objects or the descending lift frame.

Location The locations of the safety stickers are shown in the following drawings:

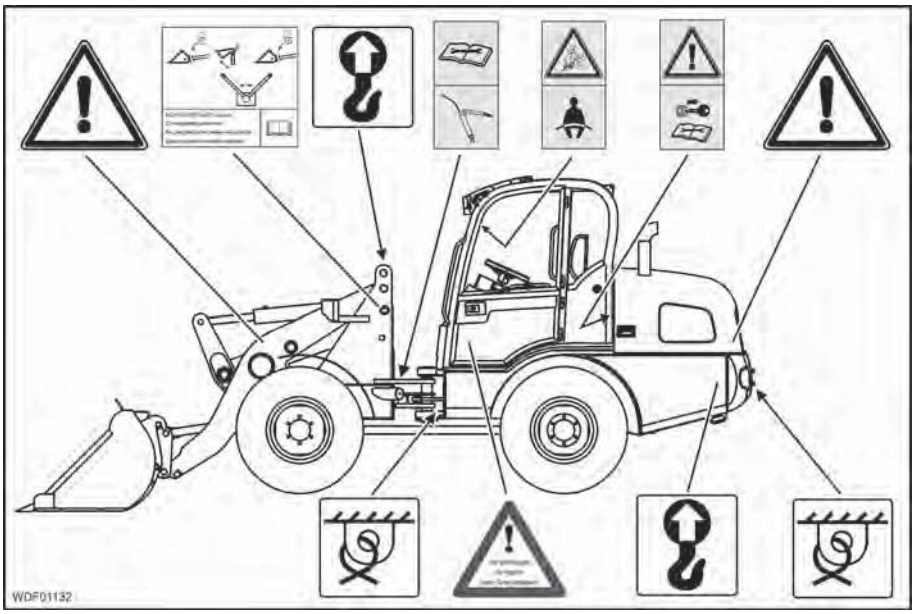


Fig. 1 Stickers located on the left in the driving direction

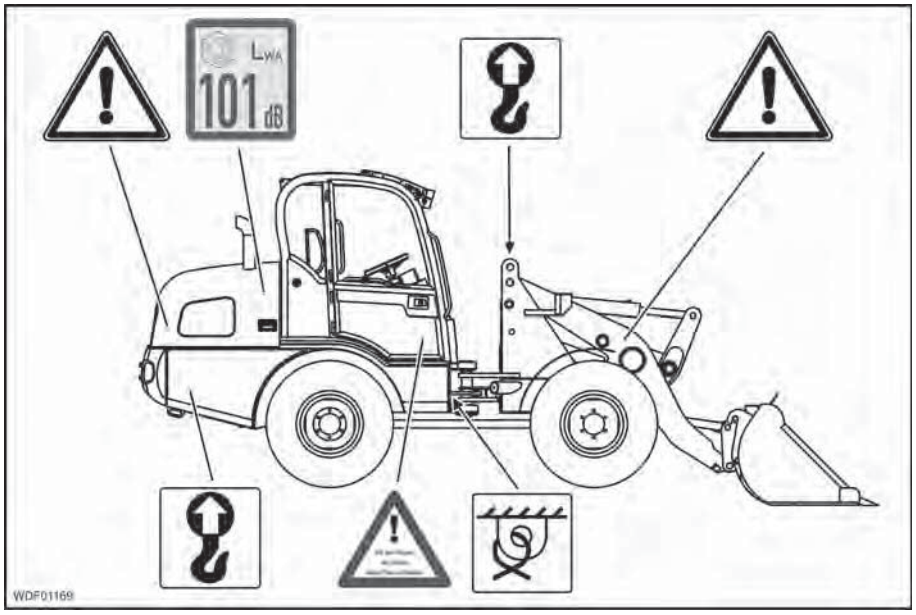


Fig. 2 Stickers located on the right in the driving direction

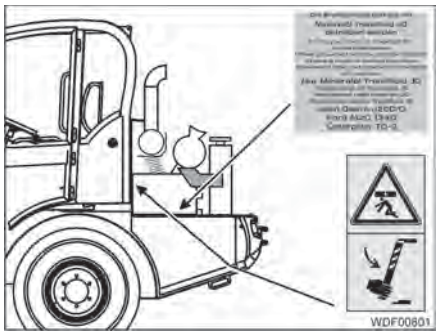


Fig. 3 Stickers located in the engine compartment (left)

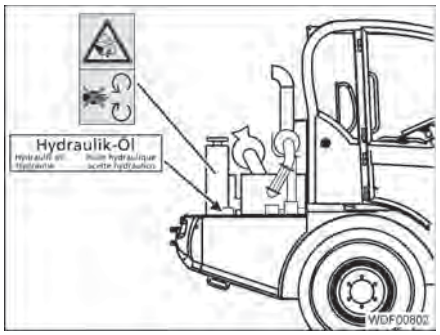


Fig. 4 Stickers located in the engine compartment (right)

7.1 Test pump

Purpose

The test pump checks the pressure resistance of the cooling system and that it is free of leaks.

Configuration

- Pressure range up to 1.6 bar
- Hand pump
- Connection for cooler opening

Fig. 5 Test pump

7.2 Flow meter

Purpose

The flow meter shows the flow and the pressure of the hydraulic circuit in which the flow meter is installed.

Configuration

- Pressure range up to 400 bar
- Flow up to 200 l/min
- Oil temperature up to 114 °C

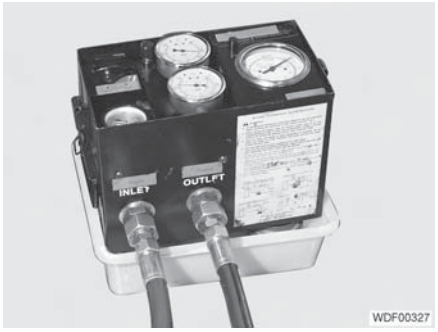


Fig. 6 Flow meter

7.3 Generator tester

Purpose

The generator tester allows the charging voltage and current intensity to be measured as a function of the engine speed.

Configuration

- 1 current indicator
- 1 voltage indicator
- 3 adjustable voltage ranges
- 3 adjustable current ranges
- 1 zero position
- 1 variable load
- 2 heavy current cable
- 1 clip-on ammeter

1 Heavy current cable
2 Variable load
3 Generator tester
4 Clip-on ammeter

Fig. 7 Generator tester

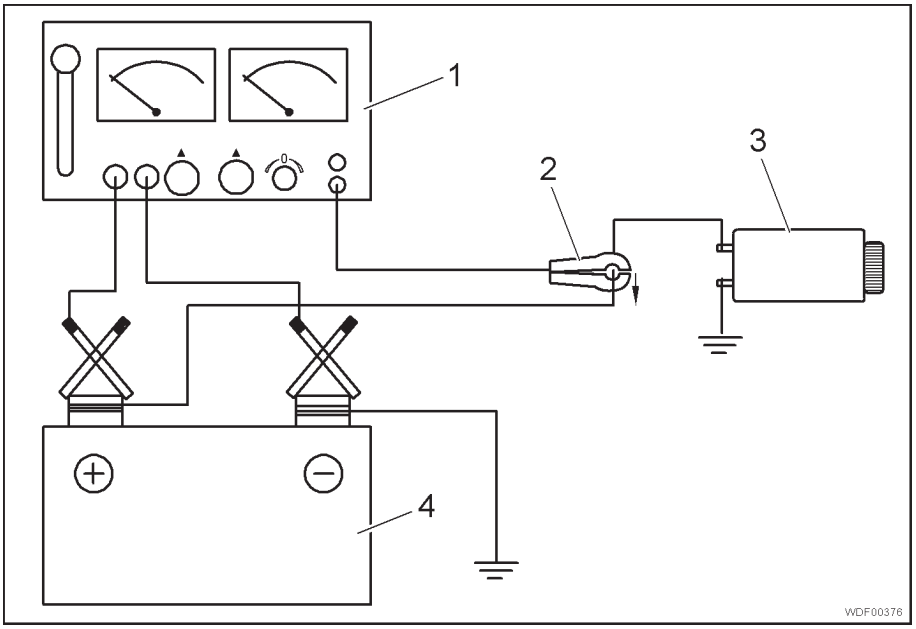


Fig. 8 Measurement set-up

1 Generator tester
2 Clip-on ammeter
3 Generator
4 Battery

Fig. 8 shows a possible measuring set-up with a generator tester (Fig. 8,1). The two heavy current cables connect the battery (Fig. 8,4) to the generator tester (Fig. 8,1). The clip-on ammeter (Fig. 8,2) covers the cable between the generator (Fig. 8,3) and the battery (Fig. 8,4).

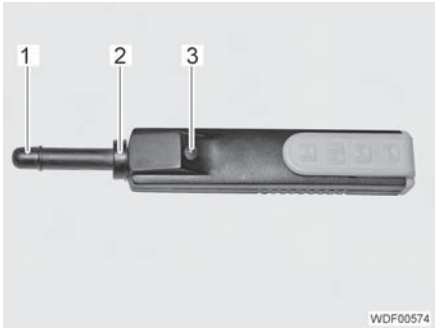
7.4 Magnetic field tester

Purpose

The magnetic field tester can be used for testing the function of electromagnetic components such as solenoid valves.

Configuration

- Battery-operated
- 1 display LED
- Permanent magnet for self-test



1 Test probe
2 Permanent magnet
3 LED

Fig. 9 Magnetic field tester

7.5 Test pressure gauge

Purpose

The test pressure gauge shows the pressure of the hydraulic circuit, the test connection of which it is connected to.

Configuration

- For the pressure ranges, see the table "Pressure range and number"
- Measuring line (Fig. 10,2)
- Adapter (Fig. 10,1)

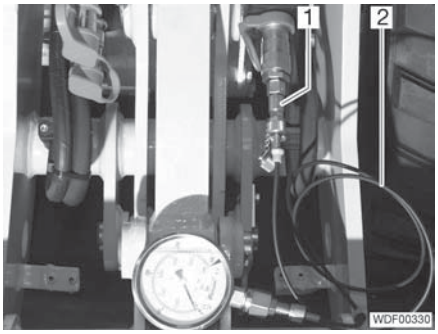


Fig. 10 Test pressure gauge (up to 400 bar)

Pressure range and number

Pressure range	Number required
0 ... 60 bar	3
0 ... 250 bar	1
0 ... 600 bar	2

▷ The test case (SAP No. 1000194790, Wacker Neuson No. 2810108) contains all the required test pressure gauges.

8.1 Expulsion and driving sleeves

Purpose

The expulsion and driving sleeves are used to expel and drive in pivot bearings (e.g. of the steering cylinder) straight and without damaging the pivot bearing.

For expulsion, the expulsion and driving sleeves of the next largest pivot bearing can be placed as a support under the component from which the pivot bearing is being expelled.

Configuration

- Metal, solid material
- For details, see the table "Dimensions and bearing types"

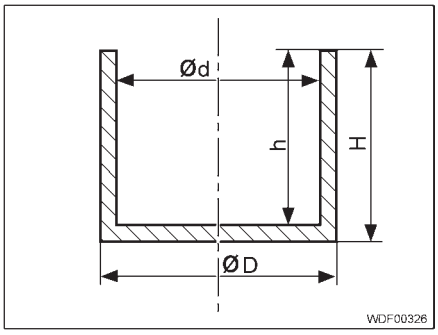


Fig. 11 Expulsion and driving sleeves (section)

Dimensions and bearing types

Bearing type	Dimensions in mm			
	D	d	H	h
GE25	37	31	30	20
GE30	42	37	30	20
GE40	60	50	50	25
GE45	70	60	50	25
GE50 (removal)	66	60	50	25
GE50 (installation)	75	51	50	25
GE50FO	81	72	50	25
GE63 (removal)	82	75	50	25
GE63 (installation)	94	64	50	25
GE70	110	100	50	25

8.2 Sealing plate (2 x)

Purpose

The sealing plates seal the hydraulic lines to the gear pump for as long as the gear pump is removed.

Configuration

- Metal plate
- Square
- 4 holes

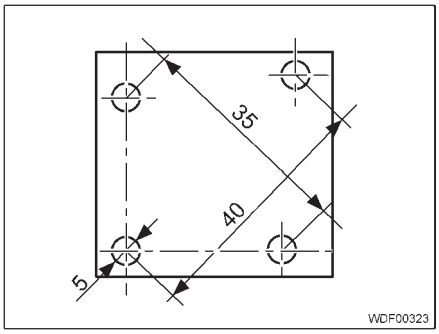


Fig. 12 Sealing plate

8.3 Insertion tool

Purpose

The insertion tool is used to insert the annular seals into the guide bushes of the hydraulic cylinders, without bending or otherwise damaging the annular seals.

Configuration

- Metal
- 2 hand levers

Fig. 13 Insertion tool

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

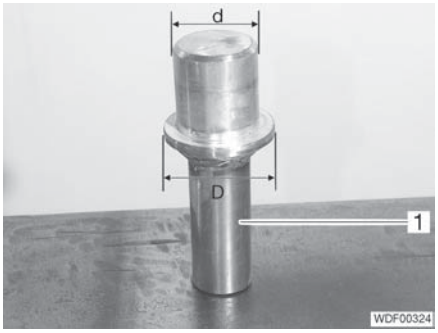


Fig. 14 Driving bolt

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

8.6 Half-shells and pull-off fixture

Purpose

The two half-shells and a three-arm pull-off fixture are used to pull the steering wheel off the steering column without damaging the steering wheel.

Configuration

- Metal, solid material
- For details, see the table "Dimensions"

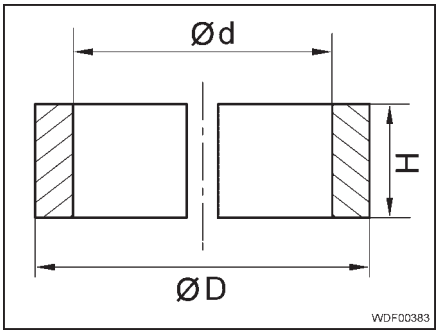


Fig. 16 Half-shells (section view)

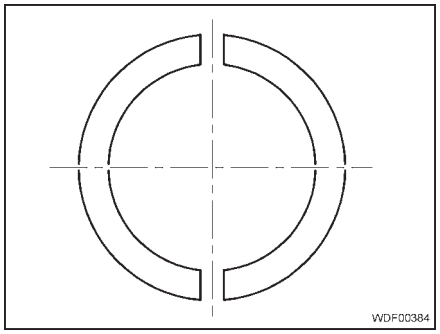


Fig. 17 Half-shells (top view)

Dimensions

Dimensions in mm		
D	**d**	**H**
52	46	7

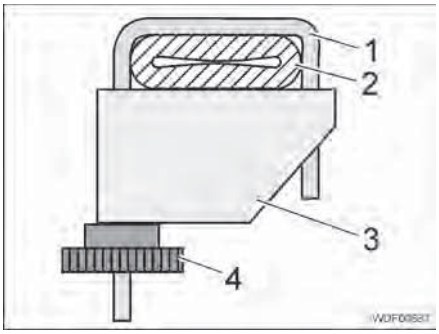
8.7 Hose clamp

Purpose

The hose clamp temporarily closes off hose lines, e.g. fuel hoses, **before** the hose lines are disconnected or removed.

Configuration

- Metal
- 4 sizes



1 Bar
2 Closed hose line
3 Metal plate
4 Knurled nut

Fig. 18 Hose clamp

Sizes

Item	Hose line diameter [mm]	Article number
1	up to 10	KL-0121-1
2	up to 15	KL-0121-2
3	up to 24	KL-0121-3
4	up to 45	KL-0121-4

Availability The hose clamps are available from:
KLANN Spezial-Werkzeugbau-GmbH
Breslauerstraße 41
78166 Donaueschingen, Germany

8.8 Tool for contact removal

Purpose The tool is used to detach the contacts of the Deutsch plug connections from the housing. In the housing, the plug and socket contacts are held in place by retaining pins. The contacts are installed and removed from the cable side.

Configuration
- Plastic
- 3 sizes

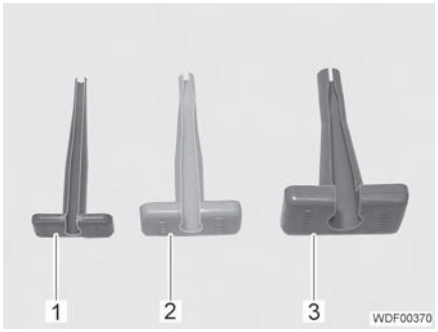


Fig. 19 Tool for contact removal

Sizes

Item	Color	Ø of the wire [mm²]	Article number
1	Blue	1.3	411-204-1605
2	Yellow	2.0 to 3.0	114010
3	Green	5.0 to 8.0	114008

Availability The tool for contact removal is available from:
Compagnie Deutsch GmbH
Fraunhoferstraße 11b
82152 Martinsried, Germany

▷ Enter every replaced hydraulic line in the hose book.

Model: WL 48 / WL 50	Publisher: Wacker Neuson SE	Date/Edition:	Inspections:			
Chassis number:		Place: D-80809 München				

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Ser. No.	Article number	Installation location	In acc. with DIN / EN / ISO	Max. period of use [Quarters]	Date of hose line manufacture [Month / year]	Hose line installation / company [Date]	Next hose replacement date [Quarter / year]	Date of hose line manufacture [Month / year]	Hose line installation / company [Date]	Next hose replacement date [Quarter / year]	Date of hose line manufacture [Month / year]	Hose line installation / company [Date]	Next hose replacement date [Quarter / year]
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2													
3													
4													
5													
6													
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Repair Manual for Wheel Loader WL 48 / WL 50
Part 3
Inspections, maintenance work and troubleshooting

Translation of the original repair manual

WDF-6009-00EN
2009
Edition 07/2009-1

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 Wacker Neuson Customer Service may remove the lead seals. Unauthorized removal of the lead seals renders the warranty void. If in doubt, consult Wacker Neuson 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.

1.1 Inspection log for Deutz engine

▷ Before the measurements, the vehicle must be brought to an operating temperature of between 50 and 60 °C (oil temperature).

▷ If you wish to use the inspection log more than once, copy it before entering the inspection results.

Vehicle data

Vehicle type	
Chassis number	
Factory number of the variable displacement pump	
Factory number of the variable displacement motor	

Engine

Inspection characteristic	Note	Setpoint	Actual	✓
Idling speed		1000 rpm		
Maximum speed	No load	2440 rpm		
Valve play, inlet	Oil temperature < 80 °C	0.3 ± 0.05 mm		
Valve play, outlet	Oil temperature < 80 °C	0.5 ± 0.05 mm		

Hydraulic system

Inspection characteristic	Note	Setpoint	Actual	✓
Starting speed	On a level surface	1180 rpm		
Driving speed, max.	Downhill and loaded	20 km/h (option: 27 km/h)		
Pressure cut-off	At maximum speed	445 bar		
Variable displacement pump supply pressure	At maximum speed	30 bar		
High pressure M_A	At maximum speed, forwards	440 bar		
High pressure M_B	At maximum speed, reverse	440 bar		
Positioning pressure X_2	At maximum speed, forwards	19 bar		
Positioning pressure X_1	At maximum speed, reverse	19 bar		
Steering pressure	Steering wheel fully turned	190 bar		
Primary pressure, gear pump	At maximum speed	230 bar		
Flow rate, gear pump	At maximum speed, no load	64 l/min (option: 75 l/min)		

Inspection characteristic	Note	Setpoint	Actual	✓
"Lifting" secondary pressure		250 bar		
"Dumping" secondary pressure		200 bar		
"Curling to load" secondary pressure		250 bar		

Electrical system

Inspection characteristic	Note	Setpoint	Actual	✓
Battery voltage	Engine switched off	12 V		
Charging voltage	At 2000 rpm, loaded	14 V		
Charging current	At 2000 rpm, loaded	55 A		

2.1 Checking and adjusting the valve play (Deutz)

▶ **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.

▷ The valve play may only be adjusted when the engine is cold.

▷ The engine must be allowed to cool down for at least 0.5 h.
The oil temperature must be < 80 °C.

▷ The adjustment sequence refers to the view of the engine from the flywheel side (see Fig. 1).

▷ Rotate the crankshaft clockwise.

▷ Valve play, inlet: 0.3 ± 0.05 mm
Valve play, outlet: 0.5 ± 0.05 mm

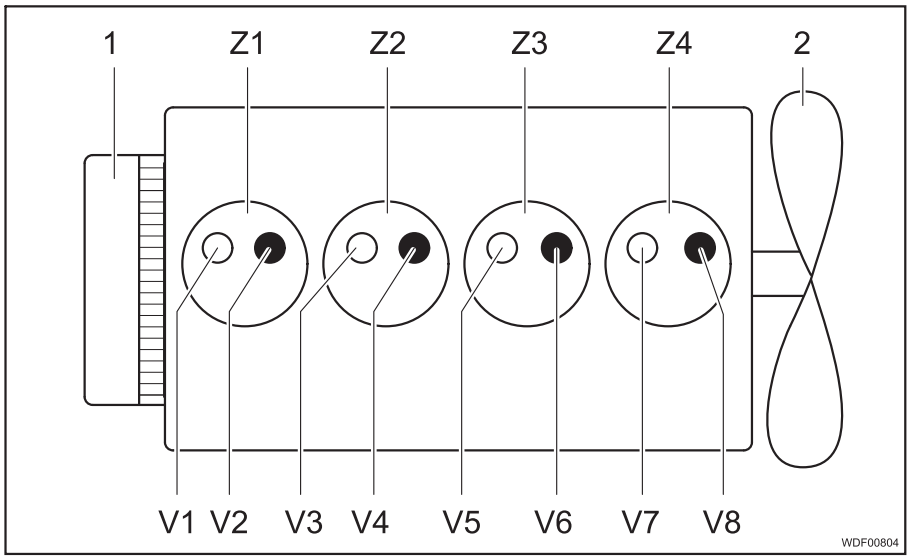


Fig. 1 Cylinder arrangement

1 Flywheel, ring gear
2 Fan wheel
V1 Inlet valve 1
V2 Outlet valve 2
V3 Inlet valve 3
V4 Outlet valve 4
V5 Inlet valve 5
V6 Outlet valve 6
V7 Inlet valve 7
V8 Outlet valve 8
Z1 Cylinder 1
Z2 Cylinder 2
Z3 Cylinder 3
Z4 Cylinder 4

Overlap	Adjust valve play
Cylinder 1	3, 6, 7 and 8
Cylinder 4	1, 2, 4 and 5

Requirements

Ensure the following:

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

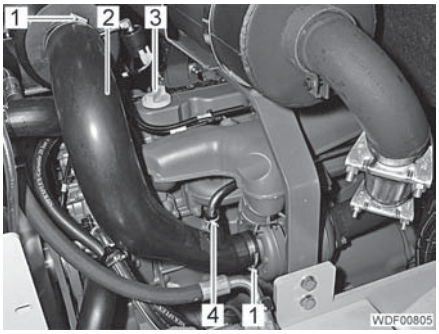


Fig. 2 Connection to the air filter

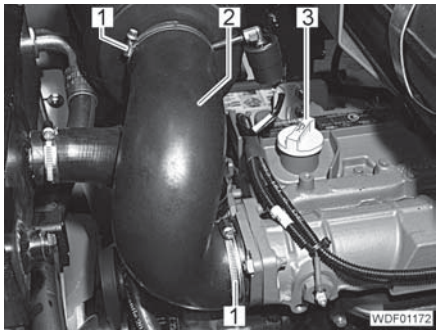


Fig. 3 Connection to the air filter (alternative)

Removing the hose

- Release the 2 clamps (Fig. 2,1 or Fig. 3,1).
- Release the clamp (Fig. 2,4) (if present).
- Remove the hose (Fig. 2,2 or Fig. 3,2).
- Unscrew the cap (Fig. 2,3 or Fig. 3,3).

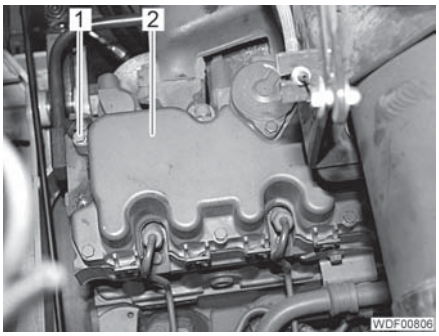


Fig. 4 Cylinder head cover attachment

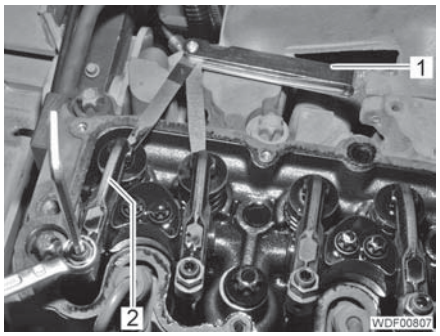


Fig. 5 Valves 1 and 2

Checking and adjusting the valve play

- Unscrew the 10 screws (Fig. 4,1).
- Remove the cylinder head cover (Fig. 4,2).
- Push the feeler gauge (Fig. 5,1) under the tipping lever (Fig. 5,2).
- If necessary, hold the nut with a suitable ring wrench and adjust the valve play with a hexagon socket wrench.

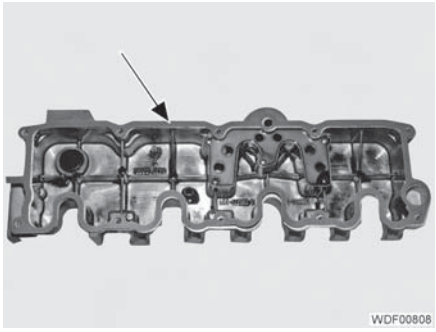


Fig. 6 Cylinder head cover seal

Installing the cylinder head cover

- Inspect the cylinder head cover seal (Fig. 6) and replace it if necessary.
- Put the cylinder head cover (Fig. 4,2) into position.
- Screw in the 10 screws (Fig. 4,1).
- Tighten screws from the inside outwards with a tightening torque of 8.5 Nm.
- Screw in the cover (Fig. 2,3 or Fig. 3,3).
- Attach the hose (Fig. 2,2 or Fig. 3,2) with clamps (Fig. 2,1 and 4 or Fig. 3,1) to the air filter, engine-breather hose and suction pipe.
- Tighten the 2 clamps (Fig. 2,1 or Fig. 3,1).
- Seal the hose with clamp (Fig. 2,4) (if present).

Final work

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

2.2 Inspecting the exhaust system for leaks

▶ **WARNING**

Hot parts can cause burns.

Never work on the engine when it is at operating temperature.

Allow the engine to cool down or wear protective gloves.

▶ **WARNING**

Hot parts can cause burns.

Never work on the exhaust when it is at operating temperature.

Allow the exhaust to cool down or wear protective gloves.

Inspecting the engine compartment interior

- Open the engine hood (see operator's manual "Opening the engine hood").
- Inspect the engine compartment interior for soot deposits.
- If there are no soot deposits, the exhaust system is free of leaks and this concludes the inspection.

Localizing the leak

- If there are soot deposits, inspect the exhaust system for visible damage.

▶ **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.

▶ **WARNING**

Risk of injury by moving parts.

Never reach into the engine compartment while the engine is running.

- If there is no visible damage, start the engine, close the exhaust and check the exhaust system for escaping smoke.
- Switch off the engine.

If damage is found:

Remedying the problem

- Replace the damaged component.
- Repeat the inspection.

Final work

- Close the engine hood.

2.3 Checking the radiator installation

▶ **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").

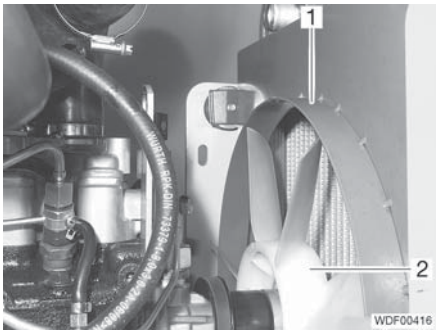


Fig. 7 Radiator

- Check that the fan wheel has sufficient clearance from other parts.
- Manually check that the fan wheel (Fig. 7,2) turns smoothly.
- Check whether the fan wheel terminates on the radiator side with the guide ring (Fig. 7,1).
- Inspect the foam insulation fan for damage. Short circuit risk!

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

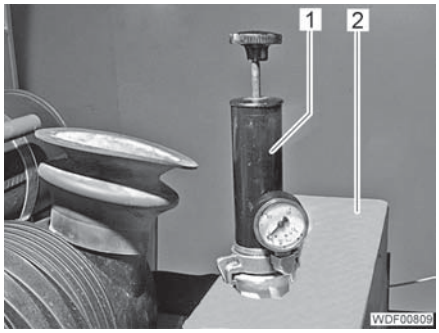


Fig. 8 Leakage inspection

- 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.

2.5 Troubleshooting on the engine

Symptom	Possible cause	Remedy
Engine will not start	Parking brake not applied	Apply parking brake
	Driving direction switch switched	Bring driving direction switch into Neutral position
	Fuel tank empty	Fill the fuel tank and, if necessary, vent the fuel system (see operator's manual "Venting the fuel system")
	Fuel filters dirty (paraffin precipitation in winter)	Change all fuel filters (see operator's manual "Servicing the fuel system"), refill with winter fuel
	Sieve filter (Deutz) blocked	Clean sieve filter
	Enabling solenoid on the engine does not pick up	Check fuse element for continuity and replace if necessary
	Fuel line leaking	Check condition of the fuel lines and replace if necessary
	Starter speed too low	Check battery and charge if necessary, clean battery pole terminals and check that all is secure
	Starter defective	Replace starter
Engine speed too low	Insufficient fuel supply	Inspect fuel filter and fuel pump and replace if necessary
	Accelerator actuator dirty	Clean accelerator actuator
	Bowden cable of the accelerator actuator stiff	Inspect accelerator actuator and replace Bowden cable if necessary
	Air filter system dirty	Check air filter system for cleanliness
	Engine faulty	Replace engine or repair it as described in the engine manufacturer's workshop manual

Symptom	Possible cause	Remedy
Engine pressed hard	High-pressure valves of the variable displacement pump incorrectly set	Adjust high-pressure valves or replace variable displacement pump
	Variable displacement pump defective (wear)	Replace variable displacement pump
	Transposition of the variable displacement pump incorrectly set	Have transposition set, check diameter of the diaphragm in the control cartridge or replace the variable displacement pump
	Control commencement of the variable displacement motor incorrectly set	Check and adjust control commencement of the variable displacement motor
	Variable displacement motor defective (wear)	Replace variable displacement motor
	Insufficient fuel supply	Inspect fuel filter and fuel pump and replace if necessary
	Injection pump defective	Replace engine and have injection pump inspected
Engine overheats	Radiator dirty	Clean radiator
	Liquid level too low	Top up liquid level (see operator's manual "Checking the coolant level/refilling the coolant")
	Radiator incorrectly installed	Check radiator installation
	Radiator defective	Inspect radiator and replace it if necessary
	Thermostat sticks	Replace thermostat (see the engine manufacturer's repair manual)
	V-belt on fan blade loose	Check and adjust V-belt tension (see the engine manufacturer's repair manual)
	Oil level too low or too high	Check oil level (see operator's manual "Checking the engine oil level")
Engine power too low	Air filter system dirty	Check air filter system for cleanliness
	Wrong fuel type	Change fuel
	Engine speed too low	See above

▷ Carry out all checks, inspections and adjustment work on the hydraulic system when it is at operating temperature.

3.1 Driving hydraulics

3.1.1 Checking and adjusting the starting speed

▷ In all cases, also refer to the variable displacement pump manufacturer's workshop manual.

Checking the starting speed

- Park the loader on level ground.
- Start the engine.
- Increase speed until the loader starts to move (setpoint value: idling speed + 100 rpm).
- Adjust the starting speed if it is too low or too high.

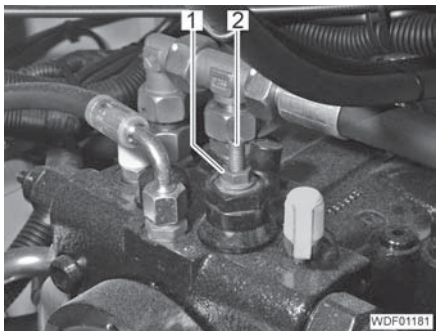


Fig. 9 Adjustment screw

Adjusting the starting speed

- Undo the nut (Fig. 9,1).
- Turn the screw (Fig. 9,2) 1/8 of a turn clockwise: The loader moves off later.
- Turn the screw (Fig. 9,2) 1/8 of a turn counter-clockwise: The loader moves off sooner.
- Tighten the nut (Fig. 9,1).
- Recheck the starting speed.

3.1.2 Checking and adjusting the pressure cut-off

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

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	1

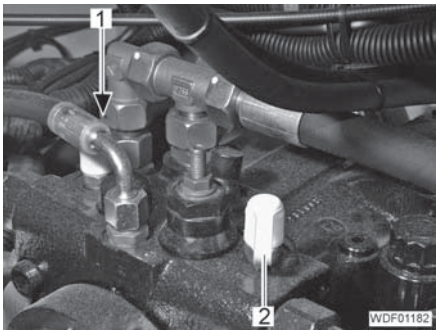


Fig. 10 Test connections

Fig. 11 Obstacle

Checking the pressure cut-off

- Connect the test pressure gauge, 0 ... 600 bar to the test connection M_A (Fig. 10,1) of the variable displacement pump.
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Carefully drive the loader with the tool attachment in front of an obstacle (Fig. 11).
- Driving forwards, press the loader against the obstacle and slowly increase the speed to the maximum.
- Read off the pressure on the test pressure gauge (setpoint value: 450 bar).
- Adjust the pressure cut-off if necessary.

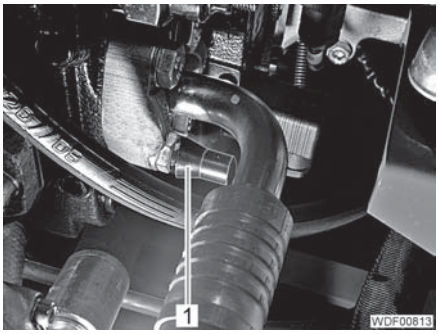


Fig. 12 Cover

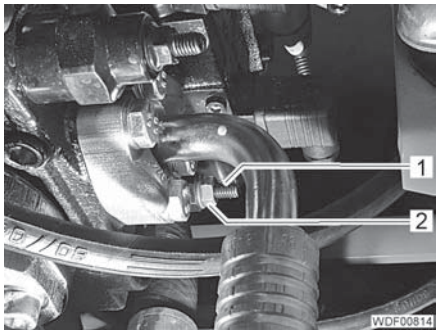


Fig. 13 Adjustment screw

Adjusting the pressure cut-off

- Remove the cap (Fig. 12,1).
- Undo the nut (Fig. 13,2).
- Adjust the pressure cut-off at the screw (Fig. 13,1):
  - Rotate the screw clockwise: Pressure increases.
  - Turn the screw counter-clockwise: Pressure decreases.
- Tighten the nut (Fig. 13,2).
- Check the pressure cut-off pedal again.

Final work

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

3.1.3 Checking the variable displacement pump high pressure

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

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

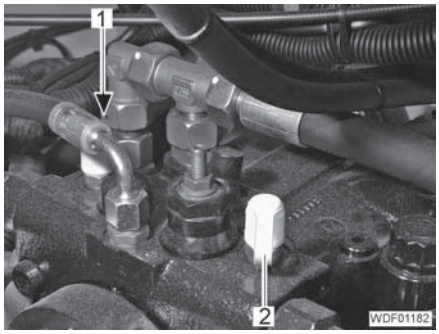


Fig. 14 Test connections

Checking the high pressure - driving forward

- Connect 1 test pressure gauge to each of the test connections "M_A" (Fig. 14,1) and "M_B" (Fig. 14,2).
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Carefully drive the loader with the tool attachment in front of an obstacle.
- Select the fast forward driving stage.
- Press the loader against the obstacle and slowly increase the speed to the maximum.
- Read off the high pressure "M_A" at the test pressure gauge (setpoint values: see Part 2, "Pressure values" section).
  If the high pressure "M_A" does not reach the setpoint values, you must check the pressure cut-off, supply pressure, and positioning pressure.

Checking the high pressure - reversing

- Secure the tool attachment very securely at a suitable point (e.g. tractor) in order to block the drive.
- Release the parking brake.
- Select the fast reversing stage.
- Slowly increase the speed to the maximum.
- Read off the high pressure "M_B" on the test pressure gauge (setpoint values: see Part 2, "Pressure values" section).
- Switch off the engine.
  If the high pressure "M_B" does not reach the setpoint values, you must check the pressure cut-off, supply pressure, and positioning pressure.

If a fault is found:

Remedying the problem

- Replace the variable displacement pump or have it repaired.

Final work

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

3.1.4 Checking the variable displacement pump supply pressure

▷ 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 Part 4, "Depressurizing the hydraulic system" section).
- 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 ... 60 bar	1

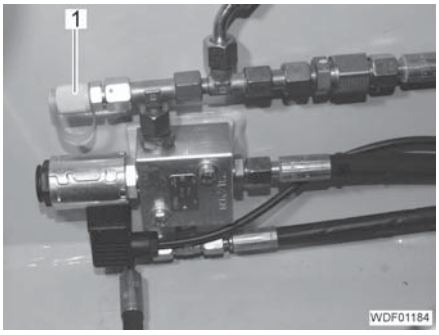


Fig. 15 Test connection

- Connect the test pressure gauge to the test connection (Fig. 15,1) of the solenoid valve.
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Start the engine.
- Read off the supply pressure "G" on the test pressure gauge (setpoint value: 25 bar).
- Switch off the engine.
- If the supply pressure does not reach the setpoint value, the supply pump is probably faulty.

If a fault is found:

Remedying the problem

- Inspect the supply pressure valve.
- Inspect the supply pump and replace it if necessary (see the variable displacement pump manufacturer's repair instructions).

▷ If the supply pump shows no visible signs of wear, the variable displacement pump may be seriously damaged.

Replace the variable displacement pump or have it repaired.

Final work

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

3.1.5 Checking the variable displacement pump positioning pressure

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

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 ... 60 bar	2
Test adapter	2

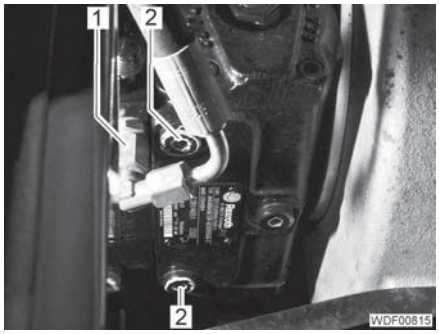


Fig. 16 Screw attachments

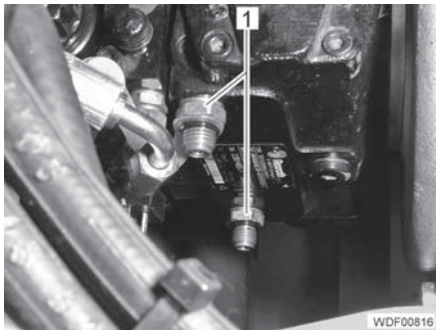


Fig. 17 Test adapter

- Loosen the hydraulic line (Fig. 16,1), rotate it upwards and tighten it.
- Unscrew the 2 screw attachments (Fig. 16,2).
- Screw in and tighten 2 test adapters (Fig. 17,1).
- Connect 1 test pressure gauge, 0 ... 60 bar to each test adapter.
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Carefully drive the loader with the tool attachment in front of an obstacle.
- Driving forwards, press the loader against the obstacle and slowly increase the speed to the maximum.
- Read off the positioning pressure "X_2" on the test pressure gauge (setpoint values: see Part 2, "Pressure values" section).

If a fault is found:

Remedying the problem

- Initiate a fault search (see the section 3.5 "Troubleshooting on the hydraulic system").

Final work

- Remove all test adapters.
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Perform a function test.

3.1.6 Adjusting the driving speed

▶ **DANGER**

Excessive speed can be fatal!

The set driving speed must not be significantly exceeded even if the operating temperature has been reached and the loader is driving downhill fully loaded.

Do not set the driving speed higher than the permissible maximum speed of **20 km/h** (optional: 27 km/h).

▷ The cap (Fig. 18,1) serves as a lead seal.

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

▷ Use suitable, calibrated measuring devices to determine the driving speed.

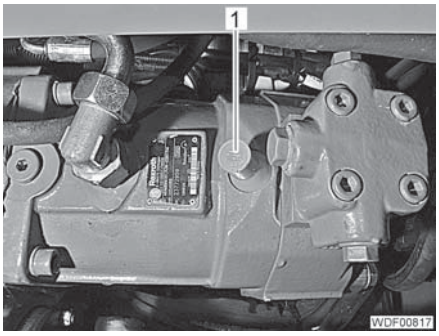


Fig. 18 Cover

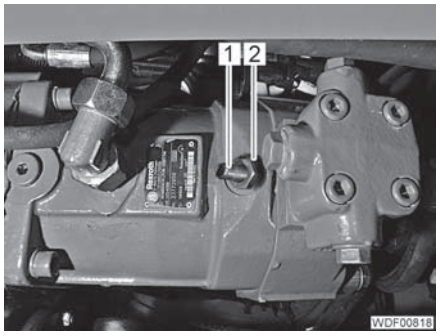


Fig. 19 Adjustment screw

- Remove the cap (Fig. 18,1).
- Undo the nut (Fig. 19,2).
- Adjust the driving speed at the screw (Fig. 19,1):
  - Rotate the screw clockwise: The driving speed decreases.
  - Turn the screw counter-clockwise: The driving speed increases.
- Tighten the nut (Fig. 19,2).
- Check the driving speed again.
- Put a new cap (Fig. 18,1) on the screw (Fig. 19,1).

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").

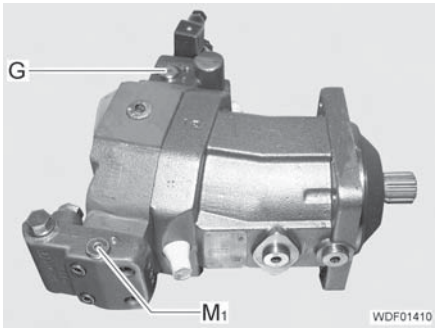


Fig. 20 Connections on the variable displacement motor

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

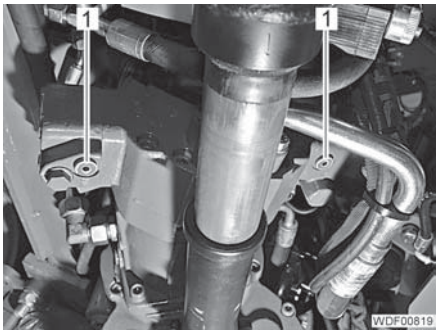


Fig. 21 Screw attachments

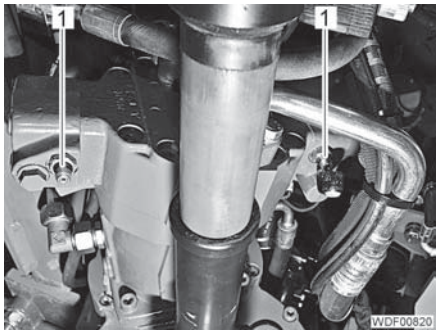


Fig. 22 Test adapter

Checking the control commencement

- Unscrew the 2 screw attachments (Fig. 21,1).
- Screw in and tighten 2 test adapters (Fig. 22,1).
- Connect 1 test pressure gauge, 0 ... 600 bar to each test adapter.
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Carefully drive the loader with the tool attachment in front of an obstacle.
- Driving forwards, press the loader against the obstacle and slowly increase the speed to the maximum.
- Read off the pressure "G" and pressure "M_1" of the variable displacement motor on the test pressure gauges (setpoint values: see Setpoint Values table).

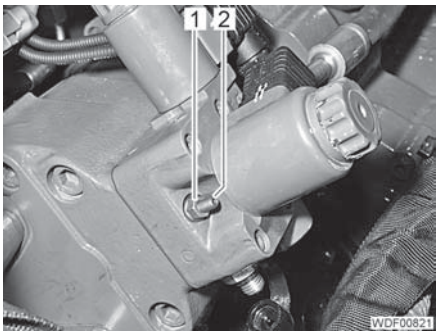


Fig. 23 Adjustment screw

Adjusting the control commencement

- Undo the nut (Fig. 23,1).
- Adjust the control commencement at the screw (Fig. 23,2):
  - Rotate the screw clockwise: Earlier control commencement (at lower pressure "G").
  - Turn the screw counter-clockwise: Later control commencement (at higher pressure "G").
- Tighten the nut (Fig. 23,1).
- Check the control commencement.

Final work

- Remove all test adapters.
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Perform a function test.

3.2 Testing the steering hydraulics

▷ 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 Part 4, "Depressurizing the hydraulic system" section).
- 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	1
T-screw connection	1

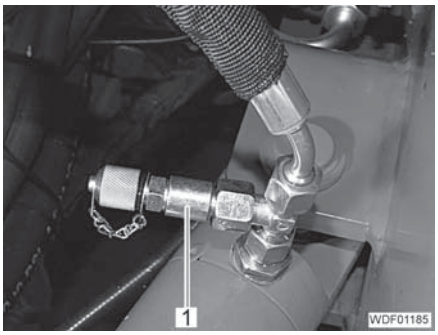


Fig. 24 Test connection

Testing the steering pressure

- Install the T-screw connection with the test adapter (Fig. 24,1) in the base hydraulic line of the steering cylinder.
- Connect a test pressure gauge, 0 ... 600 bar.
- Turn the steering wheel clockwise with the engine running until the articulated link is at the limit position.
- Read off the steering pressure on the test pressure gauge (setpoint value: 190 bar).
- If the steering pressure differs from the setpoint value, remove the orbital steering valve and set the steering pressure on a pressure test bench.

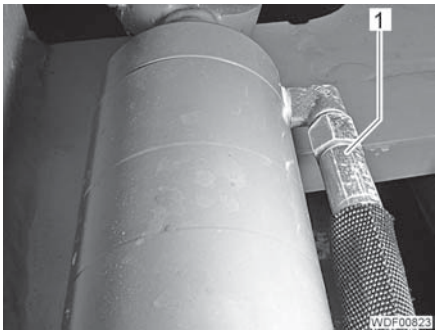


Fig. 25 Hydraulic connection, rod end

Checking the steering cylinder for internal leaks

- Extend the steering cylinder fully.
- Unscrew and close off the hydraulic line (Fig. 25,1).
- Leave the hydraulic connection on the steering cylinder open.

- Turn the steering wheel further clockwise with the engine running.
- When oil escapes at the hydraulic connection, the steering cylinder must be sealed on the inside (see Part 4, "Sealing the hydraulic cylinder" section).

Checking the emergency steering capability

- Turn the steering wheel counter-clockwise with the engine not running until the articulated link is at the limit position.
- If the steering wheel can still be turned despite reaching the limit position, replace the orbital steering valve (see Part 4, "Replacing the orbital steering valve" section).

Final work

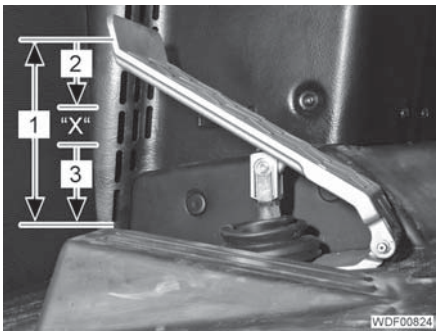
- Remove all test adapters.
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Perform a function test.

3.3 Checking and adjusting the inching

▷ In all cases, also refer to the variable displacement pump manufacturer's workshop manual.

▷ The easiest access to the adjustment screw is from the underside of the loader.

▷ There should be a pedal travel "X" at which the loader rolls, but it should be the minimum.



1 Max. travel
2 Inching: Pump is decreased
3 Braking: Service brake takes effect

Fig. 26 Travel of brake pedal

Checking the inching

- Stop the loader on an ascent with the service brake.
- Maintain the driving direction and apply full throttle.
- Release the service brake slowly until the loader starts to roll backwards.
- Release the service brake further until the loader starts to move forwards.
- Adjust the inching as necessary.

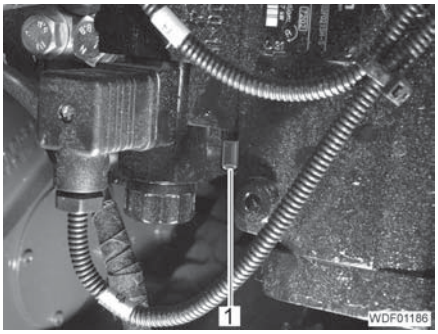


Fig. 27 Cover

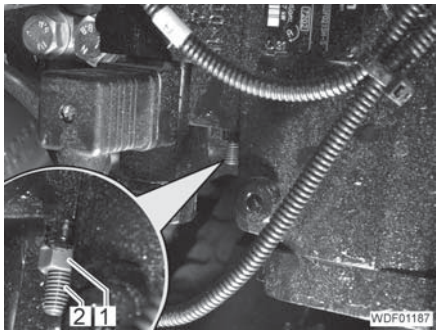


Fig. 28 Adjustment screw

Adjusting the inching

- Remove the cap (Fig. 27,1).
- Undo the nut (Fig. 28,1).
- Adjust the inching pedal at the screw (Fig. 28,2):
  - Rotate the screw clockwise: The pedal travel "X" is reduced.
  - Turn the screw counter-clockwise: The pedal travel "X" is increased.
- Tighten the nut (Fig. 28,1).
- Check the inching again.

3.4 Working hydraulics

3.4.1 Checking the gear pump

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

Setpoint values for flow rates

Engine	Flow rate	
	No load	With load
Deutz	60 l/min at 2300 rpm	52 l/min at 2395 rpm, 180 bar, 60 °C oil temperature

Requirements

Ensure the following:

- The hydraulic system is depressurized (see Part 4, "Depressurizing the hydraulic system" section).
- 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	1
T-screw connection	1
Non-return valve 1 bar	1
Flow meter	1

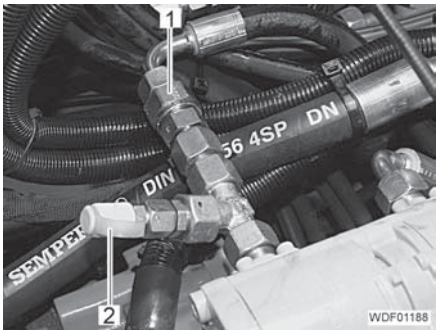


Fig. 29 Test connection P_H

Checking the primary pressure

- Install the T-screw connection with non-return valve (Fig. 29,1) and test adapter (Fig. 29,2) into one of the two hydraulic lines between the gear pump and the pressure filter.
- Connect a test pressure gauge, 0 ... 600 bar at the test adapter.
- Move the lift frame to its stop with the "Lift" function.
- Read off the supply pressure "P_H" on the test pressure gauge (setpoint value: 230 bar).
- If the setpoint value is not achieved, check the primary pressure in the second hydraulic line between the gear pump and the pressure filter, otherwise set the primary pressure and repeat the test.
- Check the secondary pressures when the setpoint value is reached. Otherwise, set the primary pressure and repeat the test.

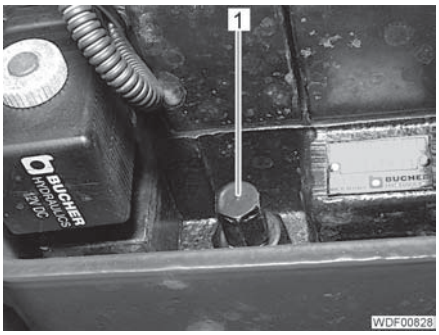


Fig. 30 Cover

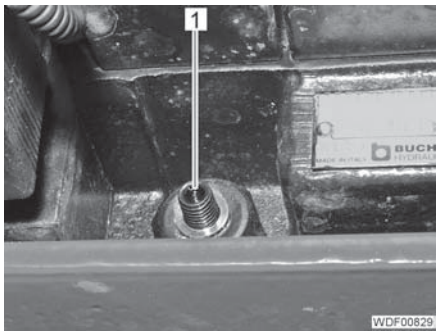


Fig. 31 Pressure control valve

▷ The easiest access to the adjustment screw is from the underside of the loader.

Setting the primary pressure

- Unscrew the cap (Fig. 30,1) from the primary pressure control valve on the control valve.
- Turn the primary pressure control valve (Fig. 31,1) clockwise with a hexagon socket wrench: Pressure increases.
- Check the primary pressure.
- If the primary pressure has changed, adjust the primary pressure control valve until the setpoint value is reached.
- If the primary pressure has not changed, turn the primary pressure control valve another turn clockwise.
- Check the primary pressure.

- If the primary pressure has changed, adjust the primary pressure control valve until the setpoint value is reached. Then check the secondary pressures.
- If the primary pressure has not changed, turn the primary pressure control valve another 2 turns counter-clockwise. Then check the gear pump flow.
- Screw the cap (Fig. 30,1) onto the primary pressure control valve and tighten it.

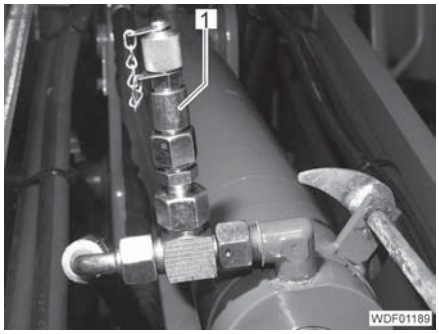


Fig. 32 Test connection

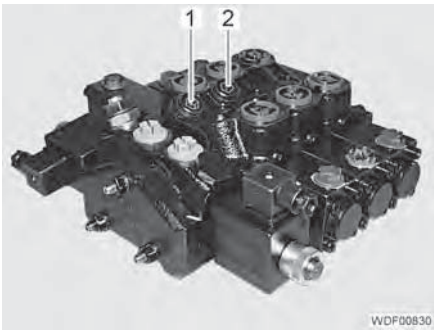


Fig. 33 Control valve

Checking the secondary pressures

- Install the T-screw connection with the test adapter (Fig. 32,1) in the rod-end hydraulic line of the tipping cylinder.
- Connect a test pressure gauge, 0 ... 600 bar at the test adapter.
- Raise the lift frame until it is approximately horizontal.
- Tip out the tool attachment completely.
- Raise the lift frame and read off the "Dumping" secondary pressure on the test pressure gauge (setpoint value: 250 bar).
- To check the secondary pressure control valve "Lift", swap over the secondary pressure control valves (Fig. 33,1 and 2) on the control valve and repeat the test (setpoint value: 250 bar).
- To check the "Curling to load" secondary pressure, swap round the hydraulic lines on the tipping cylinder and repeat the test (setpoint value: 200 bar).
- If the secondary pressures do not correspond to the setpoint values, replace the secondary pressure control valves on the control valve.

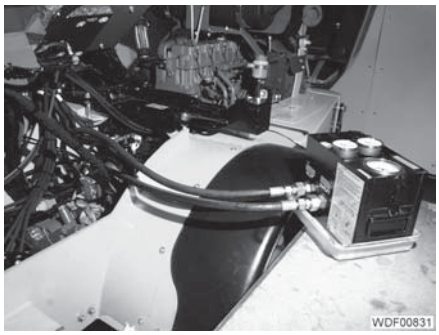


Fig. 34 Flow meter

Checking the flow rate

- Install a flow meter in the hydraulic line between the gear pump and the pressure filter (Fig. 34).
- Read off the flow rate of the gear pump on the flow meter (setpoint values: see table "Setpoint values for flow rates").
- If the flow rate is too low, seal or replace the gear pump.

Final work

- Remove all test adapters.
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Perform a function test.

3.4.2 Checking the function of the pilot control

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

Spare parts and auxiliary equipment

Designation	Quantity
Test pressure gauge 0 ... 60 bar	2
T-screw connection	2

- Check all functions of the working hydraulics (see operator's manual "Control lever for lift frame").
  - Lifting
  - Lowering
  - Curling to load
  - Dumping
  - Float control
- Check whether the multi-function lever springs into the zero position when it is released.
- Check all functions of the auxiliary hydraulics (see operator's manual "Auxiliary hydraulics control lever").
  - Unlock
  - Lock
- Check whether the control lever of the auxiliary hydraulics springs into the zero position when it is released.
- If malfunctions occur, check the pressure at the inlet and outlet of the pilot control.

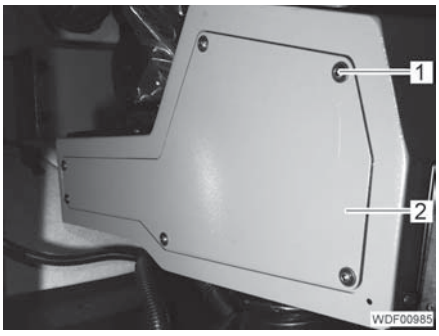


Fig. 35 Cover attachment

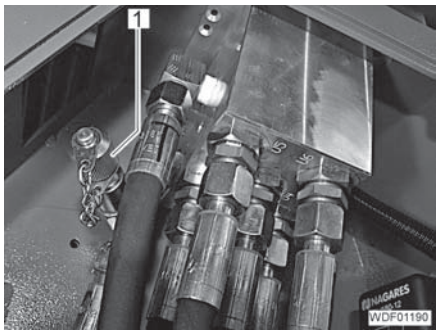


Fig. 36 Test connection

Testing the pressure at the inlet

- Depressurize the control hydraulic (see Part 4, "Depressurizing the control hydraulic" section).
- Unscrew the 6 screws (Fig. 35,1).
- Remove the cover (Fig. 35,2).
- Install the T-screw connection with the test adapter (Fig. 36,1) in the hydraulic line between the 2/2-way valve and pilot control.

- Connect a test pressure gauge, 0 ... 60 bar at the test adapter.
- Simultaneously check the functions of the working hydraulics and read off the pressure on the test pressure gauge (setpoint value: supply pressure "G" of variable displacement pump, see Part 2, section "Pressure values").
- If the setpoint value is not reached, check the following components for damage, e.g. leaks:
  - Hydraulic lines between variable displacement pump and pilot control
  - Pulsation damper
  - Diaphragm accumulator
  - 2/2-way valve
- Replace damaged components and repeat test.

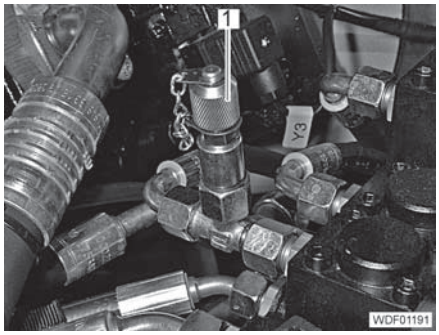


Fig. 37 Test connection

Testing the pressure at the outlet

- Depressurize the control hydraulic (see Part 4, "Depressurizing the control hydraulic" section).
- Tilt the operator's platform (see operator's manual "Tilting the operator's platform").
- Install the T-screw connection with the test adapter (Fig. 37,1) in **one** hydraulic line between the pilot control and the control valve.
- Connect a test pressure gauge, 0 ... 60 bar at the test adapter.
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Simultaneously check the functions of the working hydraulics and read off the pressure on the test pressure gauge (setpoint value: supply pressure "G" of variable displacement pump, see Part 2, section "Pressure values").
- If the setpoint value is not achieved, replace the pilot control.

Final work

- Remove all test adapters.
- Position the cover (Fig. 35,2).
- Screw in and tighten the 6 screws (Fig. 35,1).
- Check the control valve function if necessary.

3.4.3 Checking the control valve function

- Check all functions of the working hydraulics (see operator's manual "Control lever for lift frame").
  - Lifting
  - Lowering
  - Curling to load
  - Dumping
  - Float control
- Check all functions of the auxiliary hydraulics (see operator's manual "Auxiliary hydraulics control lever").
  - Unlock
  - Lock
- Check for internal leakage of the control valve (oil loss between control piston and valve housing).

	Tolerance given by manufacturer, at 100 bar, 50 °C	**Tipping cylinder**	**Lifting cylinder**
Hydraulically operated valve	Maximum value: 12 cm^3/min	approx. 2 mm/min	approx. 1.5 mm/min
Electrically operated valve	Maximum value: 25 cm^3/min	-	-

If a fault is found:

Remedying the problem

- Inspect the gear pump (see the section 3.4.1 "Checking the gear pump").
- Seal the control valve (see Part 4, "Sealing the control valve" section) or replace it (see Part 4, "Removing the control valve" section and "Installing the control valve" section).
- Inspect the hydraulic cylinder if necessary.

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

Symptom	Possible cause	Remedy
Supply pressure "G" of the variable displacement pump too low [1)]	Hydraulic fluid level too low	Check hydraulic fluid level (see operator's manual "Checking the hydraulic fluid level")
	Wrong oil used	Change hydraulic fluid (see operator's manual "Changing the hydraulic fluid")
	Hydraulic fluid filter dirty (warning lamp lights up)	Check hydraulic fluid filter for cleanliness and replace it if necessary (see operator's manual "Changing the return filter element"). If the hydraulic fluid is dirty, also change the hydraulic fluid (see operator's manual "Changing the hydraulic fluid")
	Hydraulic fluid filter dirty (warning lamp does not light up)	Check overpressure switch of the return filter for cleanliness and replace it if necessary (see operator's manual "Changing the return filter element"). If the hydraulic fluid is dirty, also change the hydraulic fluid (see operator's manual "Changing the hydraulic fluid")
	Suction hose between hydraulic fluid filter and variable displacement pump bent or defective	Check that hose has been laid correctly and is in good condition, and if necessary relay or replace hose
	Supply pressure valve sticks open	Inspect supply pressure valve and clean or replace it if necessary (see the variable displacement pump manufacturer's repair instructions)
	Supply pump of the variable displacement pump defective	Check supply pressure of the variable displacement pump, replace supply pump
	Variable displacement motor defective	Replace variable displacement motor and have it repaired if necessary
	Engine speed too low	See the section 2.5 "Troubleshooting on the engine"

Symptom	Possible cause	Remedy
Positioning pressure ("X_1" or "X_2") of the variable displacement pump too low	Oil temperature too high (warning lamp lights up)	Clean cooling system and check for leaks, replace parts if necessary
	Supply pressure too low	Check supply pressure
	Incorrect starting speed set	Check and adjust starting speed
	Inching pedal incorrectly set	Check and adjust inching pedal
	Brake linkage incorrectly set	Check brake linkage and pedal play, adjust pedal play if necessary (set-point value: 2 mm)
	Main brake cylinder defective (pressure on the brake line without pedal actuation)	Replace main brake cylinder
	Inching actuator sticks	Inspect inching actuator and replace it if necessary
	Inching valve defective	Replace solenoid valve
	Pressure cut-off incorrectly set	Check and adjust pressure cut-off
	Positioning cylinder in the variable displacement pump leaks	Replace variable displacement pump or have it repaired
High pressure "M_A" or "M_B" insufficient	High-pressure valve is still in the towing position	Check high-pressure valve and set to Driving operation if necessary (see operator's manual "Disconnecting the drive")
	High-pressure valve dirty	Remove high-pressure valve, perform a visual inspection and clean if necessary (see the variable displacement pump manufacturer's repair instructions)
	Variable displacement pump defective	Replace variable displacement pump or have it repaired
	Variable displacement motor defective	Replace variable displacement motor or have it repaired
No or defective function of working hydraulics	Pilot control defective	Check pilot control and replace if necessary
	Control valve defective	Inspect control valve and replace it if necessary

Symptom	Possible cause	Remedy
Supply line to pilot control not passable	Hydraulic line defective	Replace hydraulic line
	Pulsation damper defective	Replace pulsation damper
	2/2-way valve defective	Replace 2/2-way valve
Working hydraulics move even though pilot control is in zero position	Return spring in control valve defective	Replace return spring (see Part 4, "Sealing the control valve" section)

1) When measuring the supply pressure "G", it is necessary to eliminate the possibility of leaks at the connected secondary loads.

4.1 Inspecting the differential lock

▷ 2 persons are required to carry out this work.

▷ When the differential lock is engaged and is active, the wheels cannot be rotated against the resistance of the transmission pump.

Requirements

Ensure the following:

- The loader is secured against rolling away at the axle that is **not** being raised (e.g. with chocks).
- The articulated link is blocked (see operator's manual "Blocking the articulated link").
- The parking brake is applied.

Fig. 38 Rotation of the wheels

Performing the inspection

- Lift the loader on the axle to be inspected (e.g. with a jack) until the wheels can rotate freely.

▷ If the differential lock is not engaged, the wheels rotate in opposite directions.

- At the same time, rotate one wheel and observe the other wheel.
- Start the engine.
- Switch on the differential lock (see operator's manual "Differential lock").

▷ If the differential lock is engaged, the wheel can no longer be rotated.

- Rotate the wheel until the differential lock tangibly engages.
- Switch off the differential lock (see operator's manual "Differential lock").

▷ If the differential lock is not engaged, the wheels rotate in opposite directions.

- At the same time, rotate one wheel and observe the other wheel.

If a fault is found:

Remedying the problem

- Check electrical actuation of the differential lock.
- Check the differential lock in the axle (see the axle manufacturer's workshop manual).

4.2 Checking the water filling of the wheels

▶ **WARNING**

Risk of injury from aggressive tire-filler fluid.

Avoid contact with the hands.

Wear protective gloves.

Rinse any fluid splashes off the skin immediately using plenty of clean water and seek medical advice as a precaution.

Fig. 39 Position of the wheel

Fig. 40 Water filling valve

▷ The valve on tires with a water filling (Fig. 40) differs in terms of the air valve design.

- Park the loader so that the tire valve is at the top (Fig. 39).
- Release some air in order to eliminate the residual water from the valve.
- Check the air pressure (see operator's manual "Pumping up the tires").
- Check the wheel for leaks, i.e. escaping water or air.
- If the wheel is leaking, have it emptied and repaired or replaced by experts.

▷ Observe the specified composition of the tire-filler fluid.

4.3 Troubleshooting on the drive

Symptom	Possible cause	Remedy
Loader does not move when the engine is running	Parking brake applied	Release the parking brake
	Parking brake switch defective	Check the switching behavior of the parking brake switch (see circuit diagram) and replace if necessary
Loader does not stop when the engine is running	Control commencement of the variable displacement pump incorrectly set	Check and adjust the control commencement of the variable displacement pump (see the variable displacement pump manufacturer's repair instructions)
	Mechanical zero position of the variable displacement pump incorrectly set	Check the Mechanical zero position of the variable displacement pump (see the variable displacement pump manufacturer's repair instructions)
Loader starts moving too late	Incorrect starting speed set	Check and adjust the starting speed
	Inching pedal incorrectly set	Check and adjust the inching pedal
	Control commencement of the variable displacement pump incorrectly set	Check and adjust the control commencement of the variable displacement pump
	Supply pressure "G" of the variable displacement pump too low	See the section 3.5 "Troubleshooting on the hydraulic system"
	Positioning pressure ("X_1" or "X_2") of the variable displacement pump too low	See the section 3.5 "Troubleshooting on the hydraulic system"

Symptom	Possible cause	Remedy
Insufficient thrust	Incorrect tire size	Check that tires are the correct size
	Parking brake applied	Release the parking brake
	Bowden cable of the parking brake stiff	Inspect the parking brake and replace the Bowden cable if necessary
	Engine speed too low	See the section 2.5 "Troubleshooting on the engine"
	High pressure of the driving hydraulics insufficient	See the section 3.5 "Troubleshooting on the hydraulic system"
	Electrical component of the driving direction recognition defective	See the section 7.5 "Troubleshooting on the electrical system"
	Hydraulic component of the driving direction recognition defective	See the section 3.5 "Troubleshooting on the hydraulic system"
	Control commencement of the variable displacement pump incorrectly set	Check and adjust the control commencement of the variable displacement pump
Driving speed not reached	Engine speed too low	Check and adjust the engine speed (see the repair manual of the engine manufacturer)
	Inching pedal incorrectly set	Check and adjust the inching pedal
	Positioning pressure ("X_1" or "X_2") of the variable displacement pump too low	See the section 3.5 "Troubleshooting on the hydraulic system"
	Incorrect tire size	Check that tires are the correct size
	Control commencement of the variable displacement motor incorrectly set	Check and adjust the control commencement of the variable displacement motor
	Overdrive deactivated	Activate overdrive (see operator's manual "Changing speeds").
	Electrical component of the overdrive circuit defective	See the section 7.5 "Troubleshooting on the electrical system"

5.1 Checking and adjusting the curling to load and dumping stops

▷ The stops protect the kinematics and the hydraulic cylinder.

▷ Correctly set stops help to prevent damage.

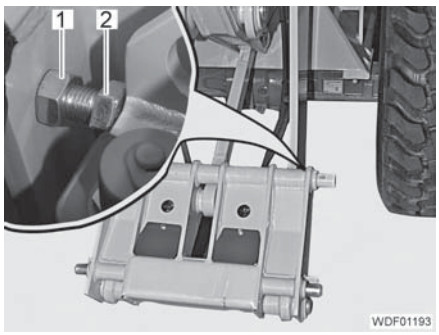


Fig. 41 Curling to load stop

Checking and adjusting the curling to load stop

- Raise the load arm approximately 1 m.
- Curl the tool attachment until the tipping cylinder is at the stop on the rod end.
- Lower the load arm as far as possible.
- In each case, undo the 1 nut (Fig. 41,1).
- In each case, unscrew 1 stop screw (Fig. 41,2) until the screw head just touches the attachment.
- Tighten 1 nut each.

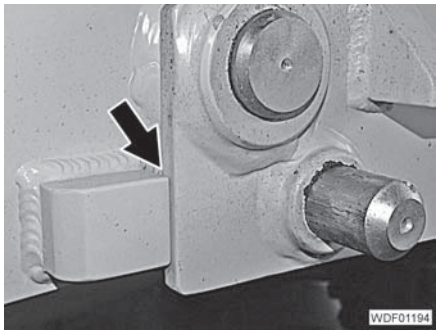


Fig. 42 Front stop

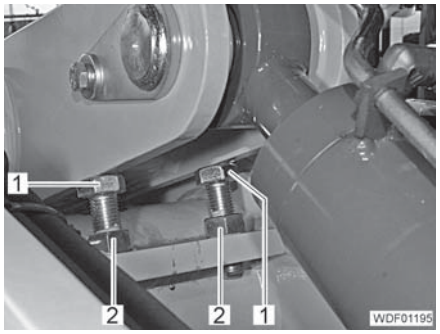


Fig. 43 Dumping stop

Checking and adjusting the dumping stop

- Tilt out the tool attachment until the tipping cylinder is at the bottom-end stop.
- Raise the load arm until the front stops (Fig. 42) just touch the tool attachment.
- Undo the 2 nuts (Fig. 43,2).
- Unscrew the 2 stop bolts (Fig. 43,1) until the head of the bolt just touches the reversing lever.
- Tighten the 2 nuts.

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.

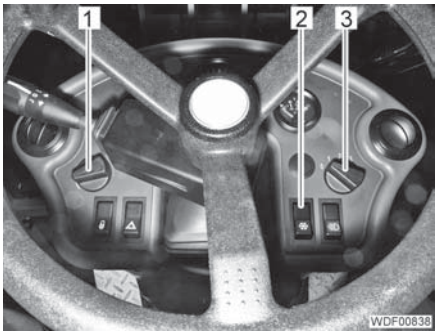


Fig. 44 Heater

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 7.5 "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.

6.2 Troubleshooting in the cab

Symptom	Possible cause	Remedy
Ventilation system not working	Fuse element faulty	Check fuse element for continuity and replace if necessary
	Fan switch defective	Check the switch and replace it if necessary
	Fan motor defective	Replace the fan motor
Heater not working	Coolant cold	Keep the engine running until the coolant is warm
	Heater regulator faulty	Replace the heater regulator

7.1 Checking the generator

▶ **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.

▶ **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.

▷ If possible, test the generator with a generator tester (see Part 2, "Generator tester" section) (setpoint values: see "Technical data").

▷ If no generator tester is available, the a basic test of the generator can be performed using the method described here.

Requirements

Ensure the following:

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

Measuring the battery voltage

- Start the engine.
- Measure the battery voltage at idling speed (setpoint value: 14 V).
- Switch on all headlamps.
- Measure the battery voltage at idling speed (setpoint value: 13.8 V).
- Measure the battery voltage at maximum speed (setpoint value: 14.4 V).
- Switch off the engine.

If damage is found:

Remedying the problem

- Replace the generator (see Part 4, "Replacing the generator" section).

Final work

- Close the engine hood.

7.2 Checking the starter

▶ **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.

▷ If possible, test the starter with the magnetic field tester (see Part 2, "Magnetic field tester" section).

Requirements Ensure the following:

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

Checking the starter function

- Insert the ignition key into the ignition lock.
- At the same time, hold the test probe near to the starter and turn the ignition key into the "3" position.
  When the LED lights up, voltage is present at the starter and the coil generates a magnetic field.
- Switch off the engine immediately when it starts up.

If damage is found:

Remedying the problem

- Replace the starter (see Part 4, "Replacing the starter" section).

Final work

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

7.3 Checking the temperature sensors

▶ **WARNING**

Hot parts can cause burns.

Never work on the engine when it is at operating temperature.

Allow the engine to cool down or wear protective gloves.

▷ Perform the test if the engine temperature/hydraulic fluid temperature warning lamp also lights up in the cooled-down state.

▷ The temperature sensors in the hydraulic fluid tank (Fig. 45) and in the engine (Fig. 46) switch on the indicator lamp at 110 °C.

▷ The temperature sensor on the Deutz engine is mounted next to the V-belt pulley (Fig. 46,1).

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 Part 4, "Replacing the base plate" section).

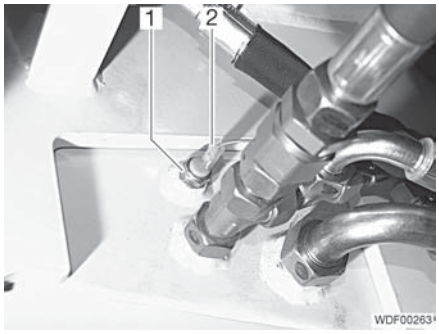


Fig. 45 Temperature sensor on the hydraulic fluid tank

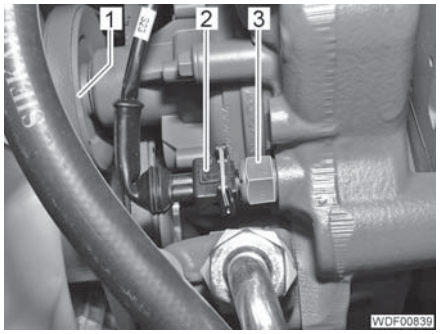


Fig. 46 Temperature sensor on the engine (Deutz)

Checking the temperature sensors

- Switch on the ignition.
- Remove the plug (Fig. 45,2).
- When the warning lamp goes out, replace the temperature sensor (Fig. 45,1) (see Part 4, "Replacing the temperature sensor of the hydraulic fluid tank" section).
- Plug the plug onto the temperature sensor.
- Remove the plug (Fig. 46,2).
- When the warning lamp goes out, replace the temperature sensor (Fig. 46,3) (see Part 4, "Replacing the engine temperature sensor" section).
- If the warning lamp does not go out, check the cable for shearing and short circuit, and replace it if necessary.
- Plug the plug onto the temperature sensor.
- Switch off the ignition.

Final work

- Close the engine hood.
- Install the base plate (see Part 4, "Replacing the base plate" section).

7.4 Testing the fuel level sensor

▶ **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.

▷ If the fuel tank is too full, fuel can escape from the fuel level sensor opening.

Empty the fuel tank until the fuel level is below the tank sensor opening.

▷ The stated resistance values are guideline values and can vary between loaders.

Requirements Ensure the following:

- The fuel level sensor has been removed (see Part 4, "Replacing the fuel level sensor" section).

Testing the fuel level sensor

- Connect the ohmmeter to the black and orange wires.
- Hold the fuel level sensor so that the tubes point upwards.
- Read off the resistance on the ohmmeter.
  The displayed measured value must be approx. 5 Ω (tolerance ± 5 Ω).
- Hold the fuel level sensor in the normal position.
- Read off the resistance on the ohmmeter.
  The displayed measured value must be approx. 320 Ω (tolerance ± 20 Ω).

If a fault is found:

Remedying the problem

- Replace the fuel level sensor (see Part 4, "Replacing the fuel level sensor" section).

7.5 Troubleshooting on the electrical system

Symptom	Possible cause	Remedy
Electrical part of the gear changer is not working	Fuse element faulty	Check fuse element for continuity and replace if necessary
	Multi-function lever defective	Check the switching behavior of the multi-function lever (see circuit diagram) and replace if necessary
	Driving direction recognition solenoid valve defective	Check the function of the solenoid valve, replace the coil and drive if necessary
	Cable defective	Check cable for continuity and replace if necessary
Low gear selection cannot be engaged	Fuse element faulty	Check fuse element for continuity and replace if necessary
	Button for overdrive circuit defective	Check the switching behavior of the button (see circuit diagram) and replace if necessary
	Solenoid valve of the overdrive circuit defective	Check the function of the solenoid valve, replace the coil and drive if necessary
	Cable defective	Check cable for continuity and replace if necessary

Repair Manual for Wheel Loader WL 48 / WL 50

Part 4

Replacement and repair procedures

Translation of the original repair manual

WDF-6009-00EN
2009
Edition 07/2009-1

This part of the repair manual contains the necessary replacement and repair procedures.

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

Safety Pay attention to ensuring your own safety and that of others. Obey the safety and warning notices in order to avoid the risk of injury and property damage.

Connection Work not described in this repair manual may not be carried out.

Spare parts Use only original spare parts or spare parts that the manufacturer has expressly approved.

1.1 Helpful tips

Locking agent

Locking agent hardens quickly.

Work quickly when using locking agent, so as to prevent it from hardening **during** assembly.

Small parts

Small parts are especially sensitive to dirt.

Use suitable vessels (e.g. plastic bowls) for the temporary storage of small parts while working.

Cleanliness

Foreign bodies can damage the loader's systems (e.g. the hydraulic system).

Clean the loader before starting repair work.

Close off the openings and connections in order to prevent the ingress of foreign bodies.

Drive shaft

Parts of the drive shaft are not easy to access.

The drive shaft can be rotated into a better position for working.

Secure the loader to prevent it from rolling away (e.g. with chocks).

Release the parking brake.

Rotate the drive shaft into the desired position.

Apply the parking brake

Changing a wheel

Wheels can be very heavy and unwieldy.

If necessary, lift a wheel with a wheel spider on the hub.

Hydraulic connections

Some hydraulic lines are secured very tightly to the connections.

When loosening the hydraulic connection, hold the screw attachment securely in place in order to prevent damage to the screw attachment or the hydraulic cylinder.

Coolant

Coolant is expensive.

Collect the coolant during disassembly, filter it and reuse during for reassembly.

1.2 Replacing protective stickers

Stickers

Stickers are applied to the loader in order to warn the operator about hazards or to give him operating instructions.

The stickers used and their locations are shown in a drawing (see Part 2, "Safety stickers" section).

Requirements

Ensure the following:

- The remainder of the damaged or missing sticker has been completely removed.
- The surface is completely clean and free of grease.

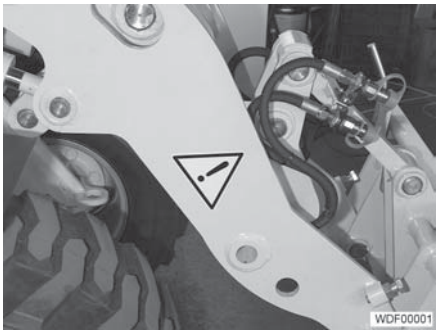


Fig. 1 Example

Replacement

- Peel off approximately 1/3 of the protective film on the back of the sticker.
- Apply the sticker in the desired location.
- At the same time, remove the remainder of the protective film and smooth out the sticker with your hand.

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").

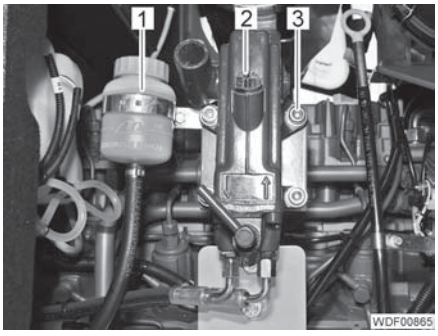


Fig. 2 Hand pump attachment

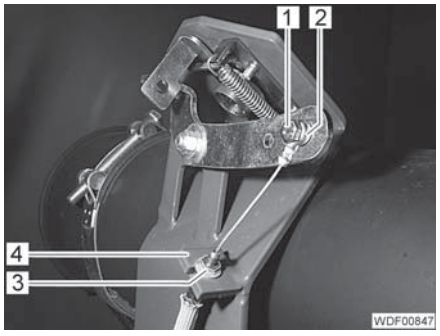


Fig. 3 Locking mechanism of engine hood

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).

- Undo the nut (Fig. 3,3).
- Remove the Bowden cable (Fig. 3,2) upwards out of the holder (Fig. 3,4).

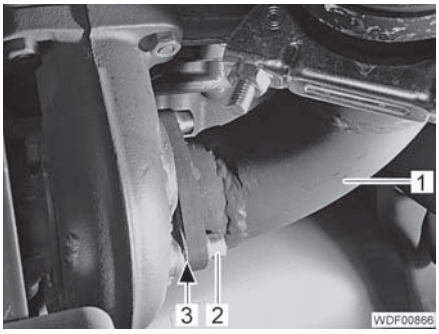


Fig. 4 Flue attachment

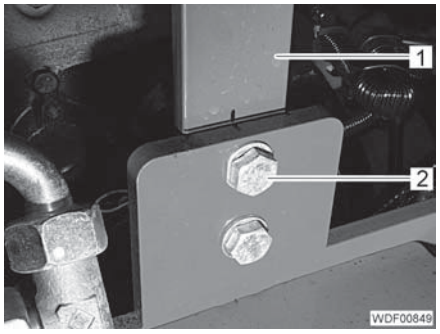


Fig. 5 Exhaust bracket attachment

Removing the exhaust

- Unscrew the 3 screws (Fig. 4,2).
- Carefully pull off the flue (Fig. 4,1).
- Loosely fix the seal (Fig. 4,3) or intermediate washer with seals to the engine using 3 screws if necessary, so that the parts are not lost.
- Mark the location of the exhaust bracket (Fig. 5,1) on both sides on the rear carriage.
- Attach suitable lifting gear (e.g. workshop crane) to the exhaust bracket with exhaust.
- Unscrew 2 screws (Fig. 5,2) on both sides.
- Carefully lift the exhaust bracket and exhaust away from you.

Fig. 6 Temperature sensor plug

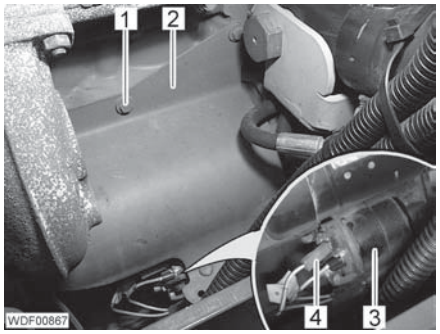


Fig. 7 Starter

Removing the cables (right)

- Remove the plug (Fig. 6,1) from the temperature sensor.
- Unscrew the 3 screws (Fig. 7,1) and remove the cover plate (Fig. 7,2).
- Disconnect the connector (Fig. 7,4) from the starter (Fig. 7,3).

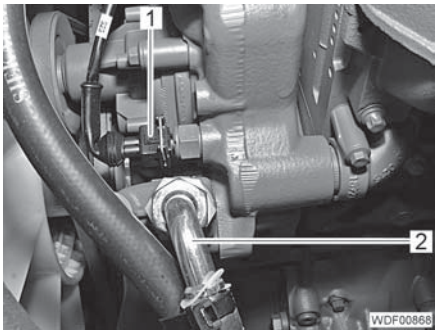


Fig. 8 Connections on right-hand side

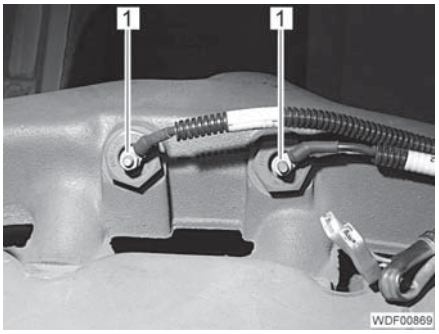


Fig. 9 Glow plugs

- Release the connector (Fig. 8,1) and disconnect it from the temperature sensor.
- Unscrew and close off the heating line (Fig. 8,2).
- Disconnect the 2 lines (Fig. 9,1) from the glow plugs.

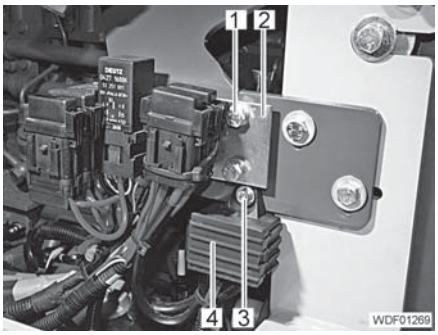


Fig. 10 Relay, fuses and junction box

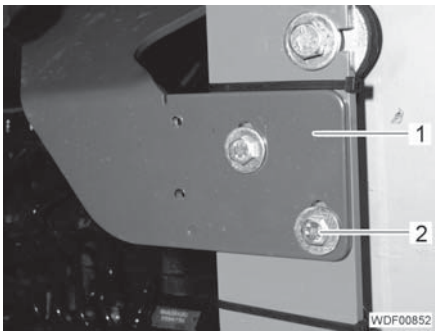


Fig. 11 Air filter holder attachment

Removing the holders (left)

- Unscrew the 2 screws (Fig. 10,1).
- Carefully remove the plate to the right with fuses and relay (Fig. 10,2).
- Unscrew the screw (Fig. 10,3).
- Carefully remove the junction box (Fig. 10,4) to the right.
- Mark the position of the air filter holder (Fig. 11,1) on the rear carriage.
- Unscrew the 2 screws (Fig. 11,2) and remove the holder.

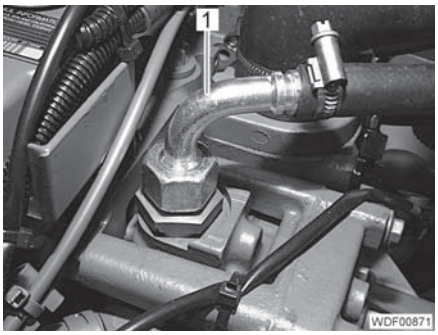


Fig. 12 Heater connection

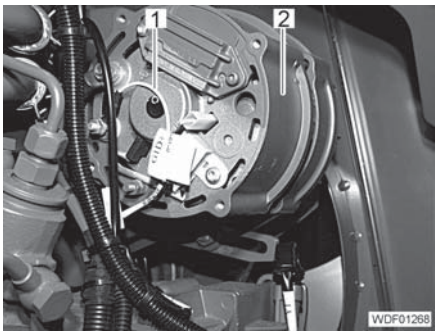


Fig. 13 Generator

- Unscrew and close off the heating line (Fig. 12,1).
- Remove the 3 cables (Fig. 13,1) from the generator (Fig. 13,2).

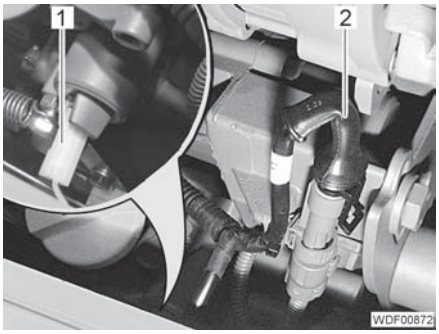


Fig. 14 Electrical connectors (rear)

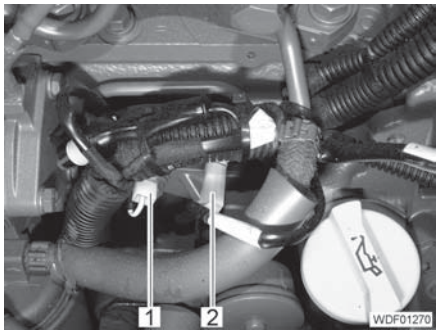


Fig. 15 Electrical connectors (center)

Disconnecting electrical cables (left)

- Remove the connector (Fig. 14,2) for the cutoff solenoid.
- Remove the connector (Fig. 14,1) from the negative contact pin.
- Remove the connector (Fig. 15,1) from the temperature sensor.
- Pull off the connector (Fig. 15,2) from the pressure switch.

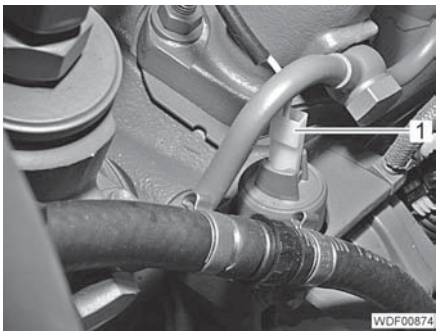


Fig. 16 LDA

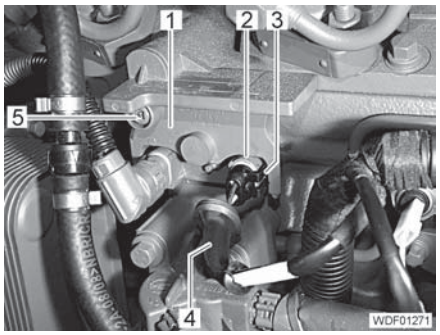


Fig. 17 LDA (alternative)

- Remove the connector (Fig. 16,1) from the LDA.

or

- Pull back the plug protection (Fig. 17,4).
- Unscrew the screw (Fig. 17,5).
- Remove the locking plate (Fig. 17,1).
- Release (Fig. 17,2) and remove the connector (Fig. 17,3).

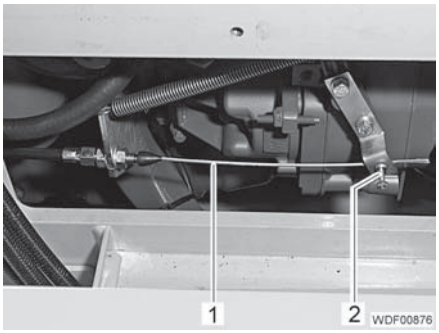


Fig. 18 Accelerator cable

Removing the accelerator cable and fuel lines

- Remove the accelerator cable (Fig. 18,1).

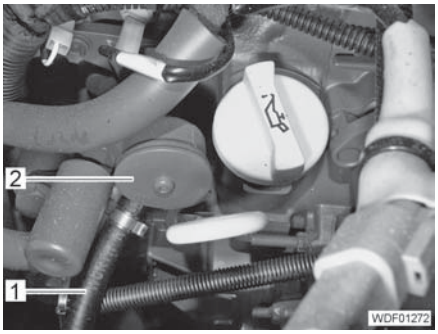


Fig. 19 Fuel line

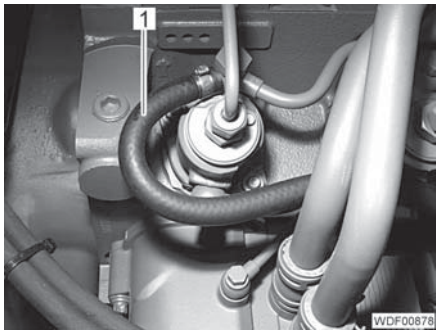


Fig. 20 Fuel return line

- Close off and separate the fuel line (Fig. 19,1) ahead of the sieve filter (Fig. 19,2) (e.g. using a hose clamp).
- Close off and separate fuel return line (Fig. 20,1) (e.g. with a hose clamp).
- Carefully remove all lines from the engine compartment.

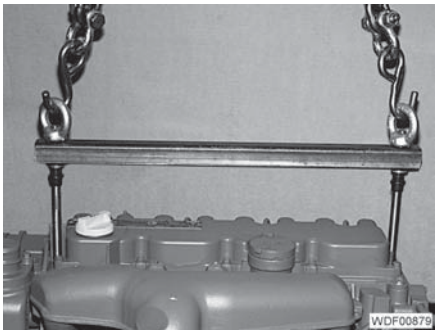


Fig. 21 Engine attachment

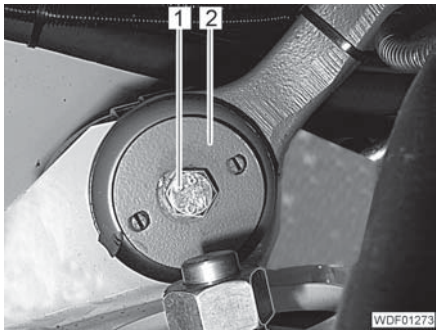


Fig. 22 Engine mount

Releasing the engine mounts

- Attach suitable lifting gear to the engine (e.g. workshop crane and traverse) (Fig. 21).
- Undo 1 screw (Fig. 22,1) on each engine mount (Fig. 22,2).

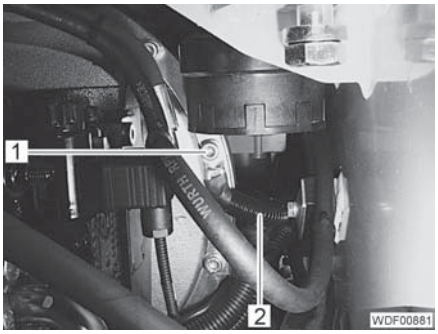


Fig. 23 Clutch bell attachment

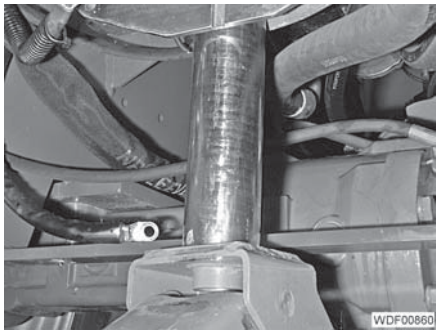


Fig. 24 Clutch bell support

Lifting out the engine

- Unscrew the 11 screws (Fig. 23,1) for securing the clutch bell.
- Remove the grounding strips (Fig. 23,2).
- Using a suitable tool (e.g. a jack) support the clutch bell or carefully raise it up slightly (Fig. 24).
- Carefully lift out the engine upwards and towards the rear.
- If necessary, remove the clutch PA flange (see the section 2.1.7 "Replacing the clutch PA flange").

2.1.2 Preparations for engine installation

▷ Before installing a **new** engine, some components must be replaced or added to.

▷ If these components on the removed engine are still in working order, they can be used again on the new engine.

Spare parts and auxiliary equipment

Designation	Quantity
Temperature sensor	1
Screw attachment	2
Dummy plug	1
Dummy plug	1
Fan wheel flange	1
Fan wheel	1
Copper seal	1
Oil drainage valve	1

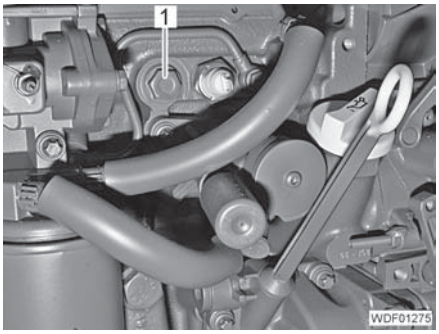


Fig. 25 Plug

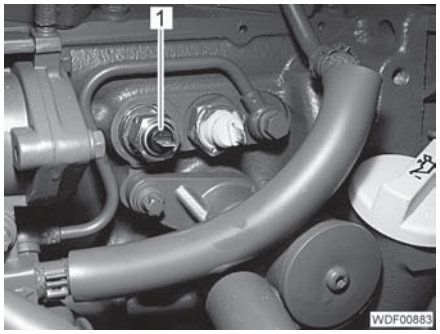


Fig. 26 Temperature sensor

Installing the temperature sensor

- Set down the engine so that it cannot tip over (e.g. on the work bench).
- Unscrew the plug (Fig. 25,1).
- Screw in and tighten the temperature sensor (Fig. 26,1) with the copper seal.

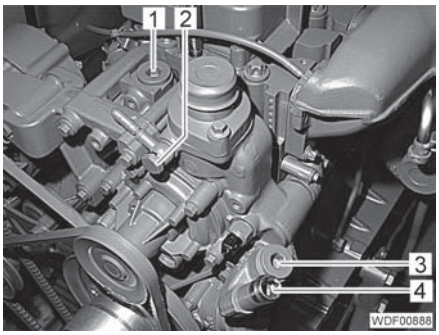


Fig. 27 Connections of the cooling system

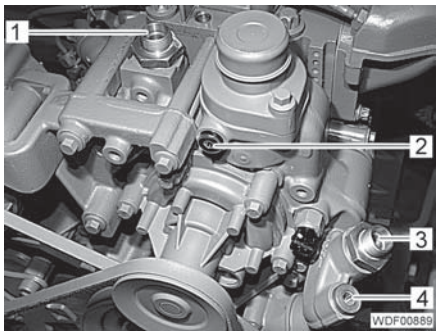


Fig. 28 Heating connections

Installing the heating connections

- Unscrew the 2 plugs (Fig. 27,1 and 3).
- Unscrew the screw (Fig. 27,2).
- Unscrew the connection (Fig. 27,4).

- Screw in and tighten the 2 screw attachments (Fig. 28,1 and 3).
- Screw in and tighten the 2 plugs (Fig. 28,2 and 4).

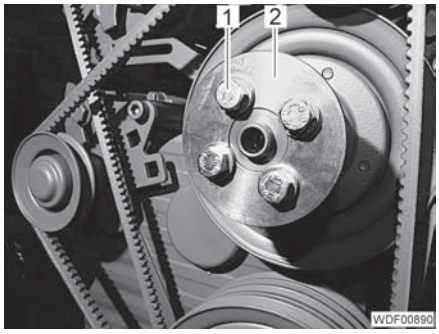


Fig. 29 Disc of the fan wheel flange

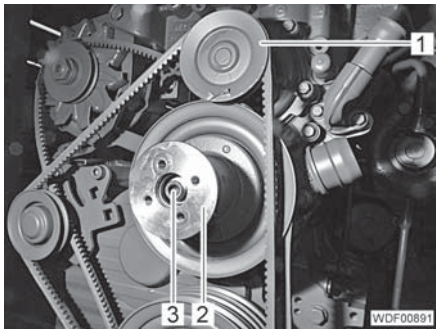


Fig. 30 Fan wheel flange attachment (Deutz)

Installing the fan wheel

- Unscrew the 4 screws (Fig. 29,1).
- Remove the washer (Fig. 29,2).
- Unscrew the screw (Fig. 30,3).
- Remove the fan wheel flange (Fig. 30,2).

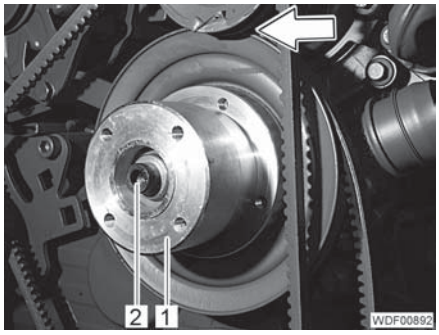


Fig. 31 Fan wheel flange attachment

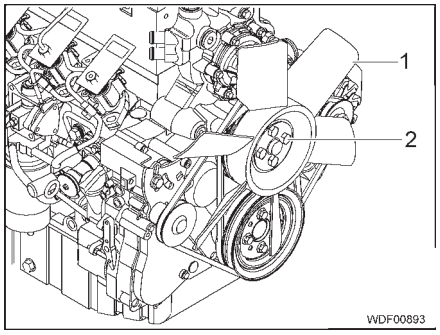


Fig. 32 Fan wheel attachment

- Place the new fan wheel flange (Fig. 31,1) into position in such a way that it lies between the belt pulley (Fig. 30,1) and the engine.
- Screw in and tighten the screw (Fig. 31,2) with the washer.
- Put the fan wheel (Fig. 32,1) into position.
- Screw in 4 screws (Fig. 32,2) with washers and tighten.

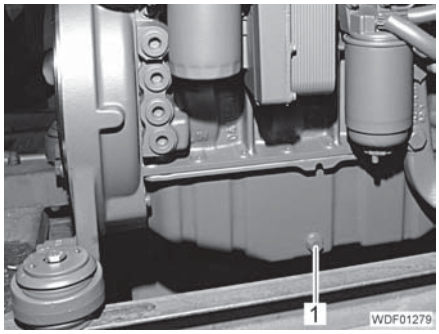


Fig. 33 Oil drainage screw

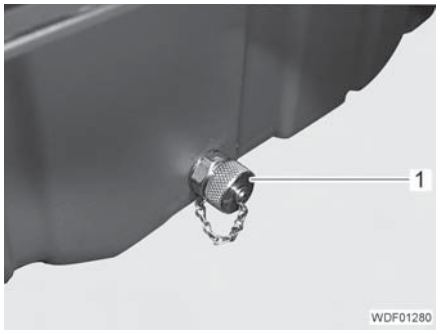


Fig. 34 Oil drainage valve

Replacing the oil drainage screw

- Unscrew the oil drainage screw (Fig. 33,1).
- Screw in and tighten the oil drainage valve (Fig. 34,1) with the copper seal.

2.1.3 Engine installation

▶ **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.

Requirements

Ensure the following:

- The engine is ready for installation (see section 2.1.2 "Preparations for engine installation").

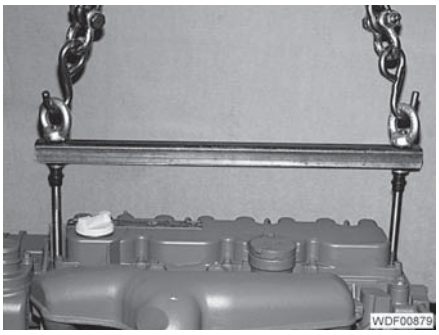


Fig. 35 Engine attachment

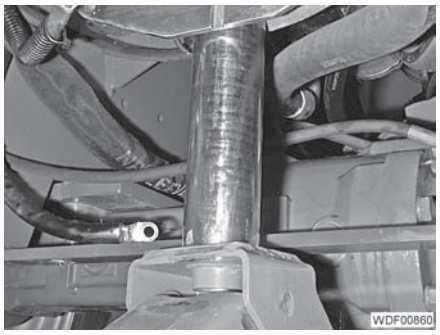


Fig. 36 Clutch bell support

Installing the engine

- Using suitable lifting gear, carefully install the engine from above and the rear (Fig. 35).
- Raise the clutch bell slightly (e.g. with a jack) (Fig. 36).

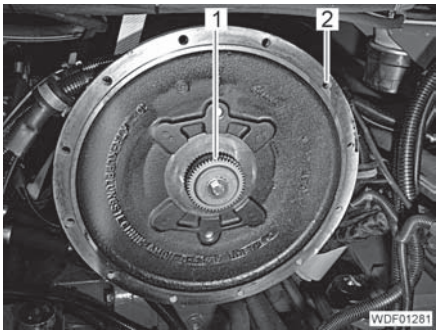


Fig. 37 Clutch bell

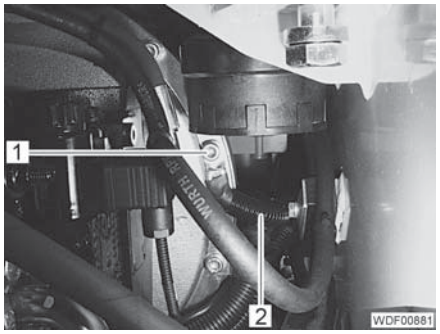


Fig. 38 Clutch bell attachment

Connecting the engine

- Swivel the engine into the clutch bell so that the holes (Fig. 37,2) match up exactly with the threads on the engine.
- Screw in some of the 11 screws (Fig. 38,1) loosely in order to fix the position of the clutch bell and the engine.
- Rotate the engine on the fan wheel until the clutch hub (Fig. 37,1) engages in the clutch PA flange.

- Push the engine forwards until the clutch bell abuts.
- Place the grounding strips (Fig. 38,2) in position.
- Screw in and tighten the 11 screws (Fig. 38,1) for securing the clutch bell.
- Remove the clutch bell support.

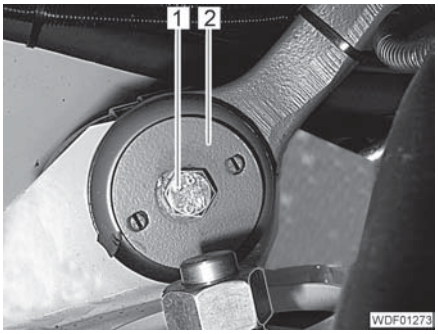


Fig. 39 Engine mount

Securing the engine

- Screw in 1 screw (Fig. 39,1) on each of the engine mounts (Fig. 39,2) but do not tighten.

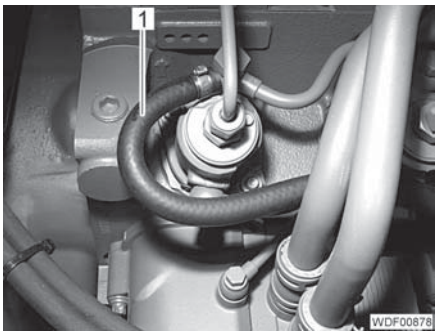


Fig. 40 Fuel return line

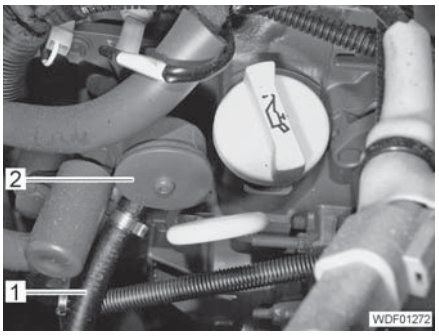


Fig. 41 Fuel line

Installing the fuel lines and the accelerator cable

- Carefully pass all lines in turn into the engine bay.
- Connect the fuel return line (Fig. 40,1) secure with a clamp and open them (e.g. remove hose clamp).
- Connect the fuel line (Fig. 41,1) to the sieve filter (Fig. 41,2) with a clamp and open them (e.g. remove hose clamp).

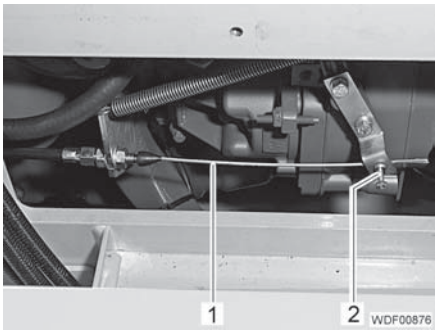


Fig. 42 Accelerator cable

- Fit the accelerator cable (Fig. 42,1), pull it taut and secure it with the screw (Fig. 42,2).

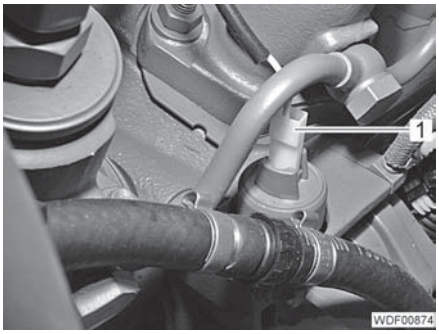


Fig. 43 LDA

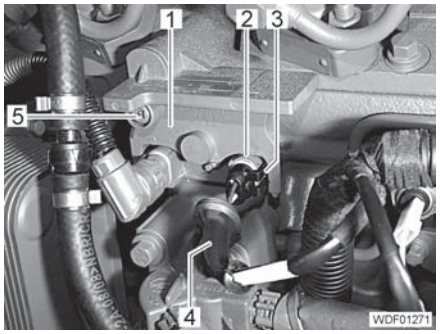


Fig. 44 LDA (alternative)

Connecting the electrical cables (left)

- Attach the connector (Fig. 43,1) to the LDA.

or

- Insert the connector (Fig. 44,3) and fix it with a clip (Fig. 44,2).
- Fix the locking plate (Fig. 44,1) with screw (Fig. 44,5).
- Slide on the plug protection (Fig. 44,4).

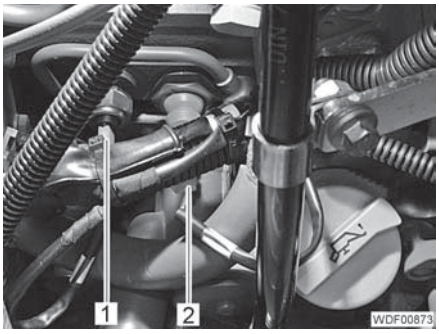


Fig. 45 Electrical connectors (center)

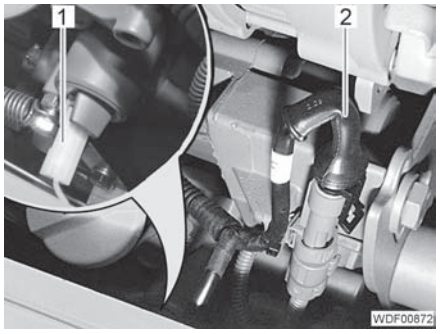


Fig. 46 Electrical connectors (rear)

- Attach the connector (Fig. 45,2) onto the pressure switch.
- Attach the connector (Fig. 45,1) onto the pressure switch.
- Attach the connector (Fig. 46,1) to the negative contact pin.
- Remove the connector (Fig. 46,2) of the cutoff solenoid.

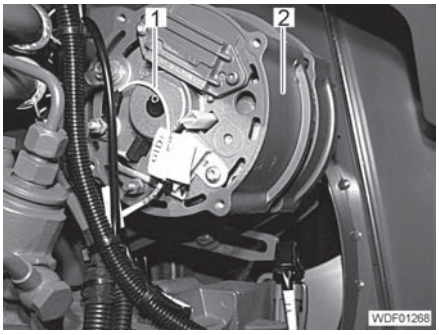


Fig. 47 Generator

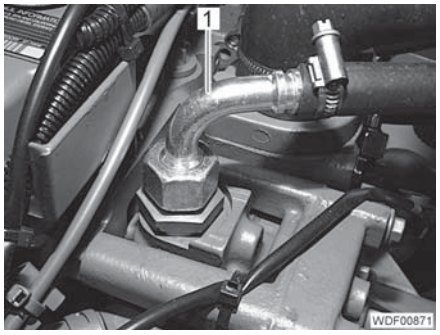


Fig. 48 Heater connection

Fitting the holders (left)

- Connect the 3 cables (Fig. 47,1) to the generator (Fig. 47,2).
- Screw the heating line (Fig. 48,1) onto the connection on the engine and tighten.

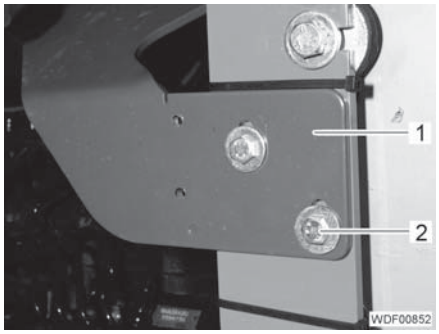


Fig. 49 Holder attachment

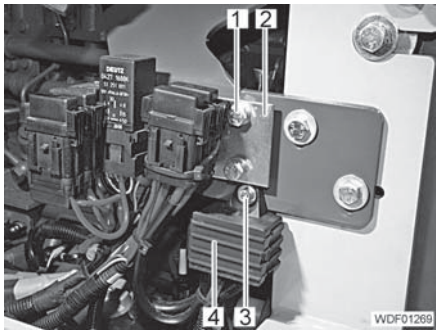


Fig. 50 Relay, fuses and junction box

- 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).

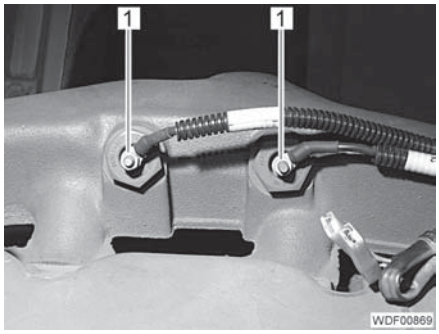


Fig. 51 Glow plugs

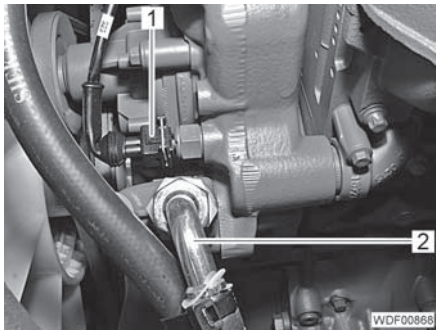


Fig. 52 Connections on right-hand side

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.

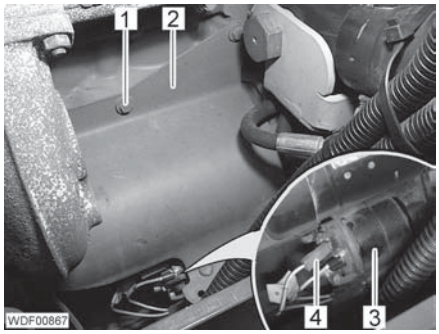


Fig. 53 Starter

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.

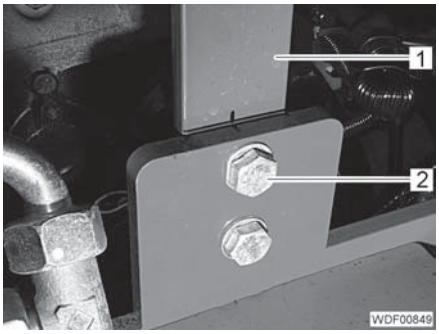


Fig. 55 Exhaust bracket attachment

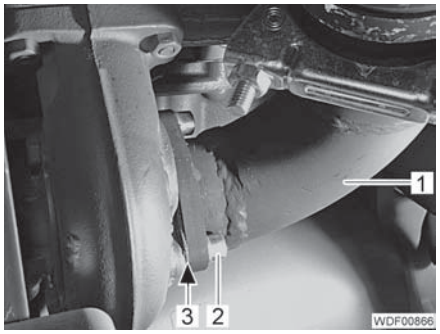


Fig. 56 Flue attachment

Fitting the exhaust

- Attach suitable lifting gear (e.g. workshop crane) to the exhaust bracket with exhaust.
- Carefully position the exhaust bracket with exhaust at the back from above.
- Screw in 2 screws (Fig. 55,2) on both sides.
- Adjust the exhaust bracket (Fig. 55,1) and screw in the 2 screws.
- Position the flue (Fig. 56,1) with seal (Fig. 56,3) or with seals and intermediate washer.
- Screw in and tighten the 3 screws (Fig. 56,2).

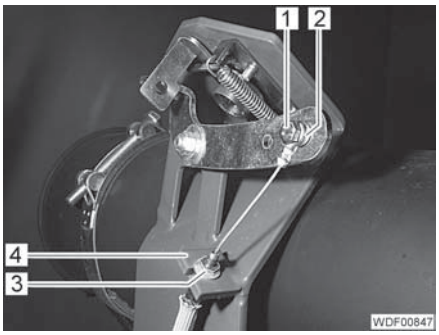


Fig. 57 Locking mechanism of engine hood

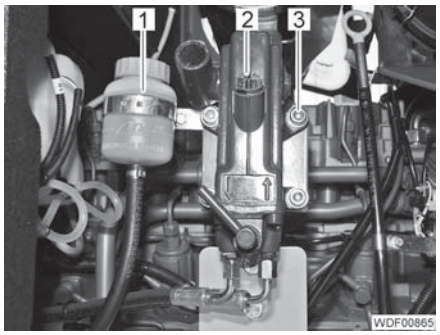


Fig. 58 Retaining plate of hand pump

Installing the hand pump

- Insert the Bowden cable (Fig. 57,2) into the holder (Fig. 57,4) from the front.
- Tighten the nut (Fig. 57,3).
- Push the screw (Fig. 57,1) through the Bowden cable (Fig. 57,2) and the metal plate and screw tight.
- Position the hand pump (Fig. 58,2) and tank (Fig. 58,1).
- Screw in and tighten the 4 screws (Fig. 58,3).

Final work

- Fit the air-conditioning compressor (where applicable) (see section 7.5.3 "Removing and installing the air-conditioning compressor").
- Install the battery (see operator's manual "Disconnecting and connecting the battery/changing the battery").
- Install the complete air filter (see the section 2.3.2 "Replacing the complete air filter").
- Install the radiator (see the section 2.2.2 "Installing the radiator").
- Make sure that the engine is in the correct position with respect to the radiator and lower it (see Part 3, "Checking the radiator installation" section).
- Tighten 1 screw (Fig. 39,1) in each case.

- Vent the fuel lines (see operator's manual "Venting the fuel system").
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").

2.1.4 Replacing the front rubber buffers

▶ **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.

Requirements

Ensure the following:

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

Spare parts and auxiliary equipment

Designation	Quantity
Rubber buffer	2

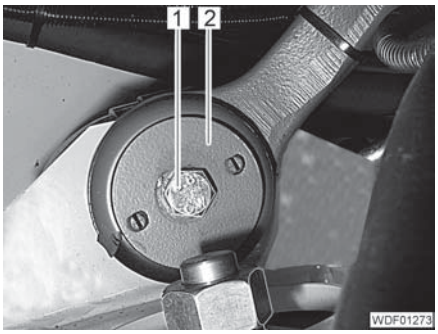


Fig. 59 Engine mount

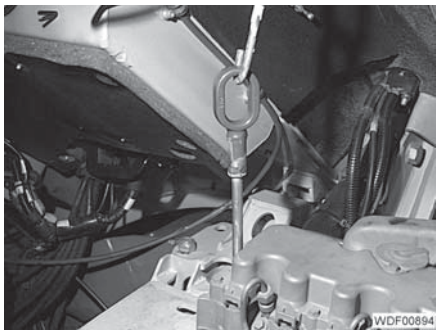


Fig. 60 Engine attachment

Releasing the engine

- Unscrew the screw (Fig. 59,1) on the bearing to be replaced.
- Unscrew 1 screw (Fig. 59,1) on each of the other bearings.
- Attach suitable lifting gear (e.g. workshop crane) to one side of the engine (Fig. 60) and raise it up by approximately 10 cm.

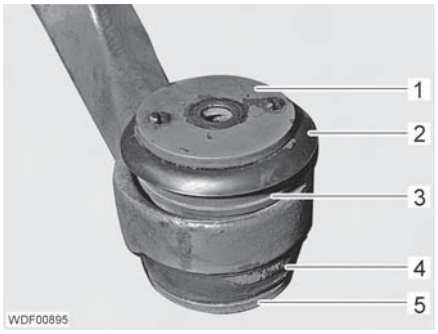


Fig. 61 Rubber buffer

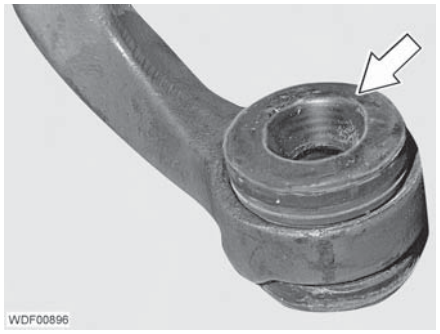


Fig. 62 Installation position

Replacing the rubber buffer

- Remove the washer (Fig. 61,1).
- Remove cap (Fig. 61,2) and lower section (Fig. 61,5).
- Detach the rubber buffers (Fig. 61,3 and 4).

- Position the new rubber buffers in such a way that the sinkhole points away from the engine mount (Fig. 62).
- Push in the lower section (Fig. 61,5) and cap (Fig. 61,2).
- Fit the washer (Fig. 61,1) onto the cap.

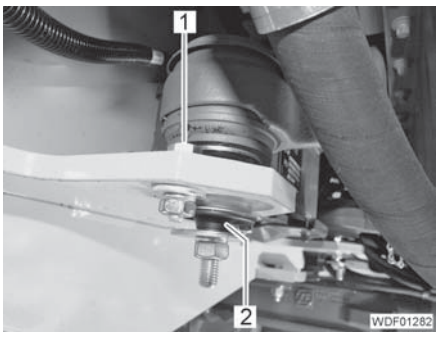


Fig. 63 Spacer

Replacing the spacer

- Unscrew the 2 screws (Fig. 63,1).
- Remove the spacer (Fig. 63,2).
- Insert the new spacer.
- Screw in and tighten the 2 screws (Fig. 63,1).

Securing the engine

- Lower the engine.
- Screw in the screw (Fig. 59,1) but do not tighten it yet.
- Make sure that the engine is in the correct position with respect to the radiator (see Part 3, "Checking the radiator installation" section).
- Tighten 1 screw (Fig. 59,1) on each engine mount.

2.1.5 Replacing the rear rubber buffers

Requirements

Ensure the following:

- The engine has been removed (see the section 2.1.1 "Engine removal").

Spare parts and auxiliary equipment

Designation	Quantity
Rubber buffer	2

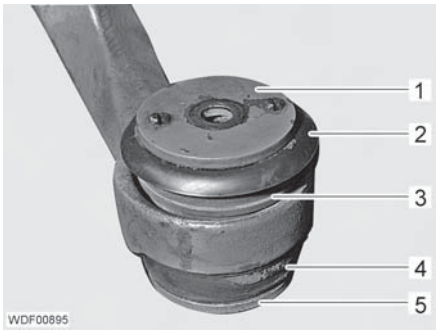


Fig. 64 Rubber buffer

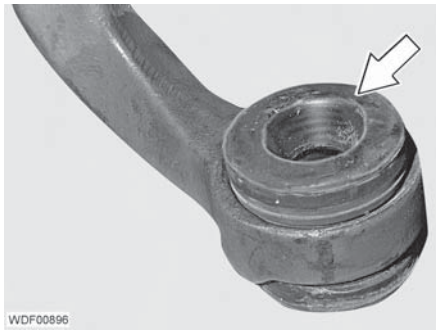


Fig. 65 Installation position

Replacing the rubber buffer

- Remove the washer (Fig. 64,1).
- Remove cap (Fig. 64,2) and lower section (Fig. 64,5).
- Detach the rubber buffer (Fig. 64,3 and 4).

- Position the new rubber buffer in such a way that the sinkhole points away from the engine mount (Fig. 65).
- Push in the lower section (Fig. 64,5) and cap (Fig. 64,2).
- Fit the washer (Fig. 64,1) onto the cap.

Final work

- Install the engine (see the section 2.1.3 "Engine installation").

2.1.6 Replacing the spacer at the rear

Requirements

Ensure the following:

- The engine has been removed (see the section 2.1.1 "Engine removal").

Spare parts and auxiliary equipment

Designation	Quantity
Rubber buffer	2

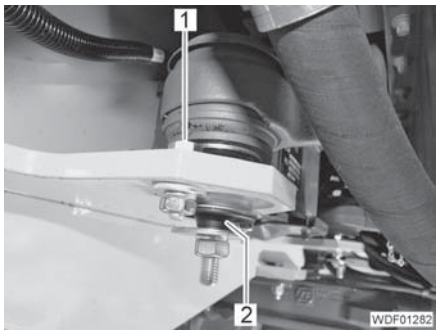


Fig. 66 Spacer

Replacing the spacer

- Unscrew the 2 screws (Fig. 66,1).
- Remove the spacer (Fig. 66,2).
- Insert the new spacer.
- Screw in and tighten the 2 screws (Fig. 66,1).

Final work

- Install the engine (see the section 2.1.3 "Engine installation").

2.1.7 Replacing the clutch PA flange

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 PA flange	1

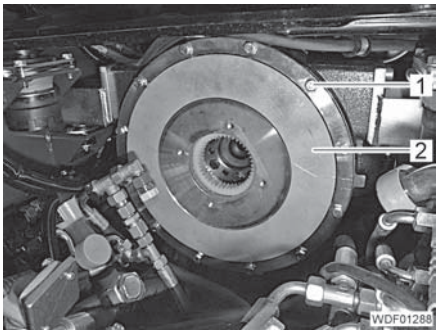


Fig. 67 Clutch bell

Removing the clutch bell

- Unscrew all screws (Fig. 67,1).
- Remove the clutch bell (Fig. 67,2).

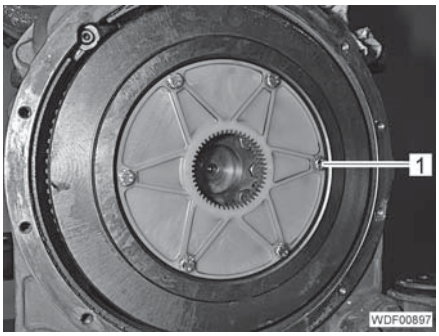


Fig. 68 Clutch PA flange attachment

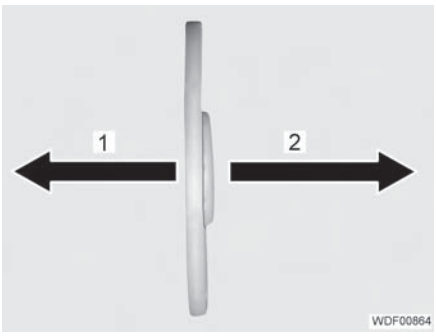


Fig. 69 Installation direction

Removing the flange

- Unscrew the 6 screws (Fig. 68,1).
- Remove the clutch PA flange.

▷ Pay attention to the installation direction (Fig. 69) of the clutch PA flange:
1 = in the direction of the variable displacement pump
2 = in the direction of the engine

Installing the flange

- Place the clutch PA flange into position.
- Tighten the 6 screws.

Fitting the clutch bell

- Position the clutch bell.
- Screw in and tighten all screws diagonally.

Final work

- Install the variable displacement pump (see the section 3.2.1 "Replacing the variable displacement pump").

2.1.8 Cleaning the engine (after toppling the loader)

▶ **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**

Hot parts can cause burns.

Never work on the engine when it is at operating temperature.

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").

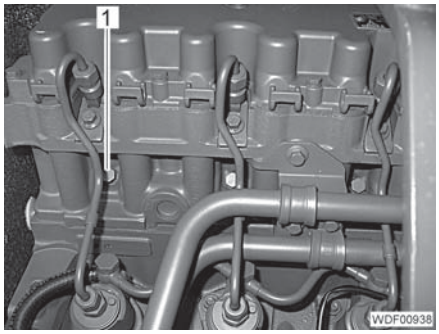


Fig. 70 Engine (left)

Turning the engine manually

- Unscrew the 4 plugs (Fig. 70,1).
- Cover the plugs with an absorbent cloth.
- Slowly turn the engine manually (e.g. at the fan wheel) through 5 full revolutions.
- Remove any escaped oil.

Turning the engine with the starter (3 seconds)

- Cover the plugs with absorbent cloths such that the cloths cannot be caught by any moving parts.
- Close the engine hood.
- Actuate the starter for 3 seconds.
- Open the engine hood.
- Remove any escaped oil.

Turning the engine with the starter (5 seconds)

- Cover the plugs with absorbent cloths such that the cloths cannot be caught by any moving parts.
- Close the engine hood.
- Actuate the starter for 5 seconds.
- Open the engine hood.
- Remove any escaped oil.

▷ A slight deviation from the compression setpoint value occurs due to residual oil in the cylinders.

If the deviation is greater than 3 bar, repair the engine in accordance with the manufacturer's workshop manual.

- Perform a compression measurement (see the engine manufacturer's workshop manual).
- Screw in and tighten the 4 plugs (Fig. 70,1).

Checking the air supply and oil level

- Check the air filter system for cleanliness.
- Remove the cylinder head cover (see Part 3, "Checking and adjusting the valve play" section).
- Check the intake manifold for cleanliness.
- Check the valve drive for completeness and that the parts are in the correct position (see the engine manufacturer's workshop manual).
- Install the cylinder head cover (see Part 3, "Checking and adjusting the valve play" section).
- Check the engine oil level (see operator's manual "Checking the engine oil level").
- Give the engine a cursory external clean.
- Close the engine hood.

▷ Heavy smoke when the engine is started is caused by residual oil in the cylinders.

If the exhaust does not become noticeably clearer after a maximum of 30 minutes, repair the engine in accordance with the manufacturer's workshop manual.

Starting the engine

- Start the engine.
- If unusual noises occur for any length of time, repair the engine as described in the manufacturer's workshop manual.

2.2 Radiator

2.2.1 Removing the radiator

▶ **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**

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.

▷ 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 3.1.1 "Depressurizing the hydraulic system").
- The engine hood has been removed (see the section 6.2.4 "Replacing the engine hood").
- The base plate has been removed (see the section 6.2.2 "Replacing the base plate").
- The air-conditioning condenser (where applicable) has been removed (see section 7.5.5 "Removing and installing the air-conditioning condenser").

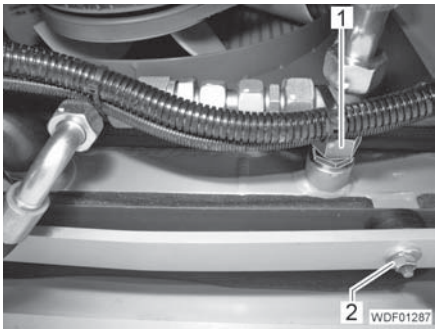


Fig. 71 Underside of the radiator

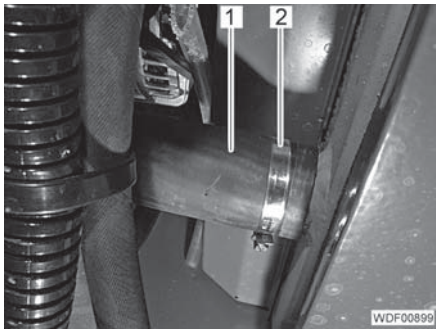


Fig. 72 Cooling hose (bottom)

Detaching the lines on the underside

- Unscrew and close off the hydraulic line (Fig. 71,1).
- Unscrew the 2 nuts (Fig. 71,2).
- Place a collecting vessel under the radiator.
- Open the radiator cap.
- Release the hose clamp (Fig. 72,2) on the cooling hose (Fig. 72,1).
- Pull off the cooling hose slowly to allow coolant to run off in a controlled manner.

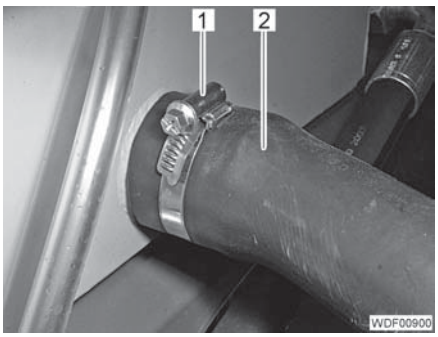


Fig. 73 Cooling hose (top)

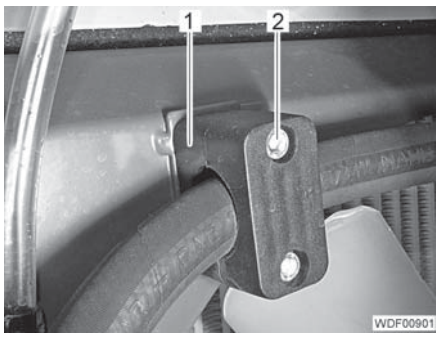


Fig. 74 Hydraulic line attachment

Removing the radiator

- Release the hose clamp (Fig. 73,1) on the cooling hose (Fig. 73,2).
- Pull off the cooling hose.
- Unscrew the 2 screws (Fig. 74,2).
- Remove the attachment (Fig. 74,1).

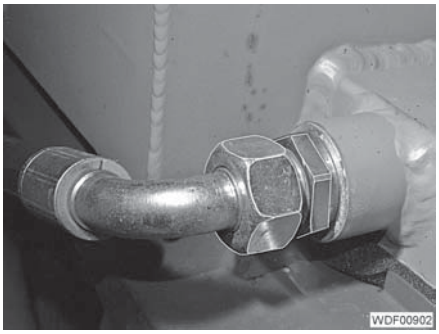


Fig. 75 Hydraulic line

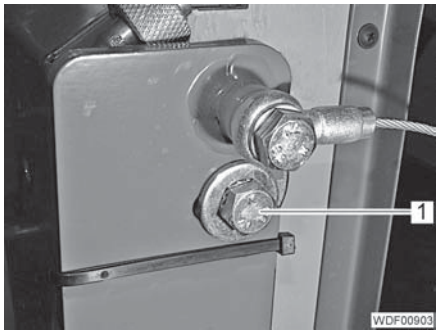


Fig. 76 Side attachment of the radiator

- Unscrew and close off the hydraulic line (Fig. 75).
- Undo 1 screw (Fig. 76,1) on both sides of the radiator, but do not unscrew them completely.
- If necessary, remove the fan wheel (see the engine manufacturer's workshop manual).
- Attach suitable lifting gear (e.g. workshop crane) to the radiator.
- Carefully tilt the radiator back and lift it out.
- If necessary, remove the inserted sealing plate.
- If necessary, remove the shim washers.

2.2.2 Installing the radiator

▷ The coolant must consist of equal amounts of water and antifreeze. This mixture guarantees an optimum ratio between cooling performance and corrosion protection.

▷ Do not fill with coolant too quickly. Fill at a maximum of **5 l/min**. If the cooling system is filled too quickly, air can be trapped in the cooling system and cause the engine to overheat.

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

Spare parts and auxiliary equipment

Designation	Quantity
Water/oil cooler	1
Coolant	approx. 10 l

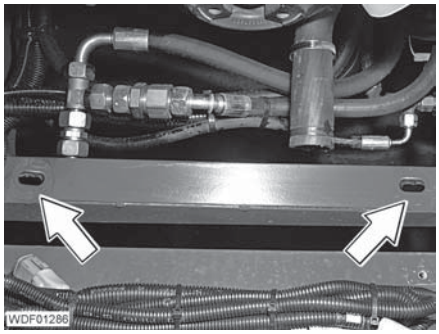


Fig. 77 Attachment points

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).

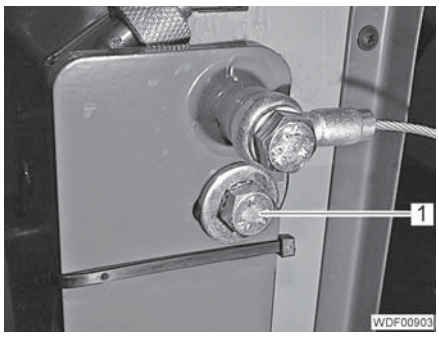


Fig. 78 Side attachment of the radiator

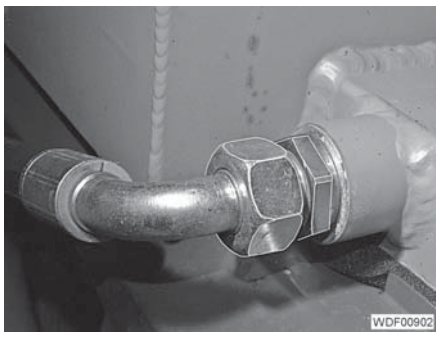


Fig. 79 Hydraulic line

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.

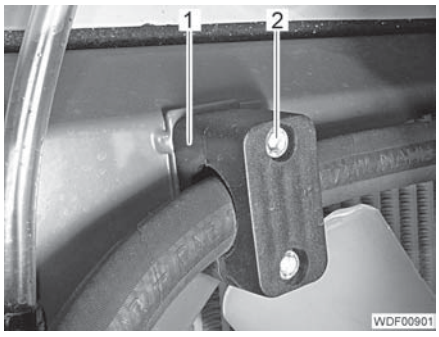


Fig. 80 Hydraulic line attachment

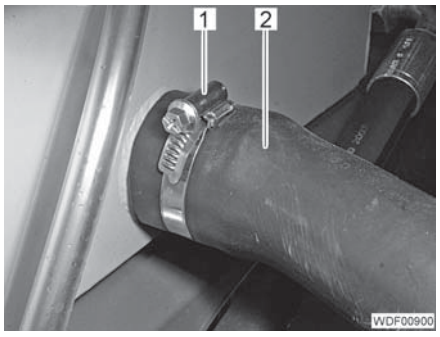


Fig. 81 Cooling hose (top)

- 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).

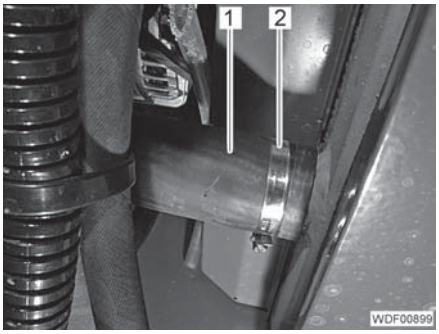


Fig. 82 Cooling hose (bottom)

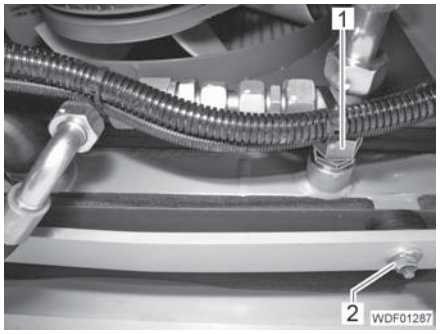


Fig. 83 Underside of the radiator

Connecting the lines on the underside

- Attach the cooling hose (Fig. 82,1) to the radiator and tighten the hose clamp (Fig. 82,2).
- Align the radiator so that the fan wheel of the engine projects approx. 2/3 of the way into the air deflector (see Part 3, "Checking the radiator installation").
- Push the sealing plate right back until the sealing lip abuts the frame.
- Tighten the 2 nuts (Fig. 83,2) with disks and spring lock washers.
- Screw the hydraulic line (Fig. 83,1) onto the connection on the radiator and tighten it.
- **Slowly** fill with coolant until the radiator slats are covered with coolant.
- Close the radiator cap.

▶ **WARNING**

Risk of injury by moving parts.

Never reach into the engine compartment while the engine is running.

- Start the engine.
- Set the heater temperature regulator to the maximum setting.
- Slowly increase the speed and maintain it for 2 minutes.
- Switch off the engine.
- Check the coolant level (see operator's manual "Checking the coolant level/refilling the coolant").

Final work

- Fit the air-conditioning condenser (where applicable) (see section 7.5.5 "Removing and installing the air-conditioning condenser").
- Install the base plate (see the section 6.2.2 "Replacing the base plate").
- Install the engine hood (see the section 6.2.4 "Replacing the engine hood").
- Check the coolant level after half an hour's operation (see operator's manual "Checking the coolant level/refilling the coolant" section).

2.3 Air filter system

2.3.1 Replacing the suction hose

▶ **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**

Hot parts can cause burns.

Never work on the engine when it is at operating temperature.

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
Suction hose	1

Engine

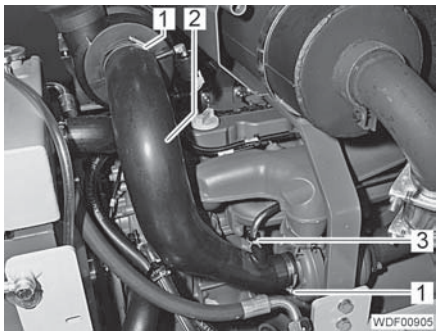


Fig. 84 Suction hose attachment (with turbo charger)

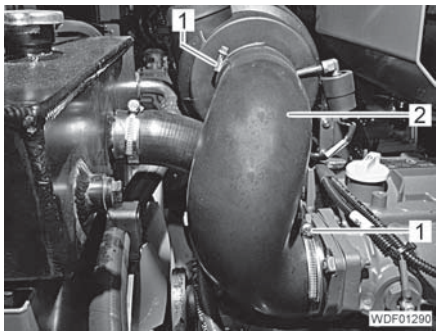


Fig. 85 Suction hose attachment (without turbo charger)

Removing the suction hose

- Release the 2 hose clamps (Fig. 84,1 or Fig. 85,1).
- If present, disconnect the hose clamp (Fig. 84,3) for the engine-breather.
- Remove the suction hose (Fig. 84,2 or Fig. 85,2).
- Close off the air inlet on the engine (e.g. with a cloth).

Installing the suction hose

- If necessary, open the connection for the engine ventilation on the new suction hose (e.g. drill through).
- Attach the new suction hose (Fig. 84,2 or Fig. 85,2) with the hose clamps to the connectors on the engine and the air filter housing.
- If present, fix the hose clamp (Fig. 84,3) for the engine-breather.
- Tighten the 2 hose clamps (Fig. 84,1 or Fig. 85,1).

Final work

- Close the engine hood.

2.3.2 Replacing the complete air filter

▶ **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.

Requirements

Ensure the following:

- The suction hose has been removed (see the section 2.3.1 "Replacing the suction hose").

Spare parts and auxiliary equipment

Designation	Quantity
Bellows	1
Air filter	1
Retaining clamp	1
Vacuum indicator	1
Rubber dust valve	1

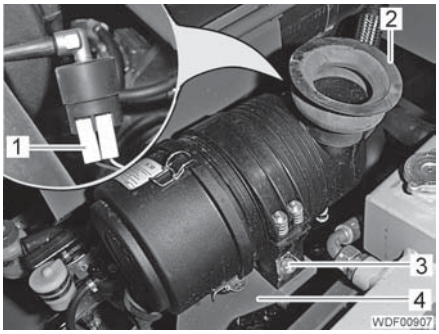


Fig. 86 Air filter

Removing the complete air filter

- Mark the position of the air filter (Fig. 86,2) on the mount (Fig. 86,4).
- Remove the 2 connectors (Fig. 86,1) from the vacuum gauge.
- Unscrew 1 screw (Fig. 86,3) on both sides.
- Remove the complete air filter.

Installing the complete air filter

- Put in the complete air filter (Fig. 86,2) and align it on the marking on the mount (Fig. 86,4).
- Screw in 1 screw (Fig. 86,3) on both sides and tighten.
- Attach the 2 connectors (Fig. 86,1) to the vacuum gauge.
- Check the position of the air filter if necessary (see the section 2.3.3 "Replacing the air filter housing").

Final work

- Attach the suction hose (see section 2.3.1 "Replacing the suction hose").

2.3.3 Replacing the air filter housing

▶ **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.

Requirements

Ensure the following:

- The suction hose has been removed (see the section 2.3.1 "Replacing the suction hose").

Spare parts and auxiliary equipment

Designation	Quantity
Air filter	1

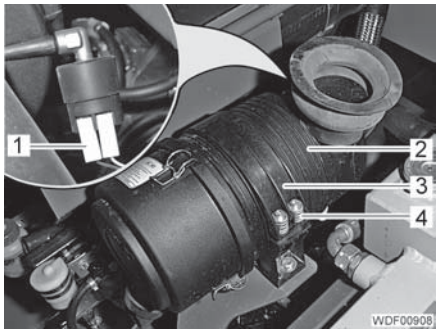


Fig. 87 Air filter

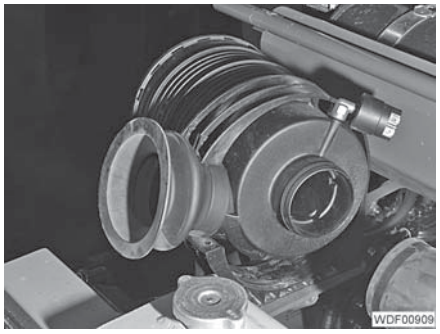


Fig. 88 Air filter holder

Removing the air filter housing

- Mark the position of the air filter housing (Fig. 87,2) on the retaining clamp (Fig. 87,3).
- Remove the cover and the filter insert (see operator's manual "Servicing the air filter system").
- Remove the 2 connectors (Fig. 87,1) from the vacuum gauge.
- Unscrew the 2 screws (Fig. 87,4).
- Carefully bend open the retaining clamp (Fig. 88) and remove the air filter housing.
- If necessary, apply the marking to the air filter housing.

Installing the air filter housing

- Carefully bend open the retaining clamp and insert the air filter housing so that the markings correspond.
- Tighten the 2 screws (Fig. 87,4).
- Attach the 2 connectors (Fig. 87,1) to the vacuum gauge.
- Install the filter inserts and cover (see operator's manual "Servicing the air filter system").

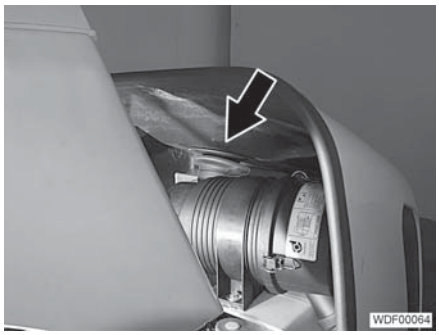


Fig. 89 Position of the air filter

Checking the position of the air filter

- Tilt the operator's platform (see operator's manual "Tilting the operator's platform").
- Carefully close the engine hood and check the position of the air filter (Fig. 89).

▷ The intake opening of the air filter must cover the intake opening of the engine hood.

- If the intake opening of the air filter does not cover the intake opening of the engine hood, rotate the air filter housing in the air filter holder.
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").

Final work

- Attach the suction hose (see section 2.3.1 "Replacing the suction hose").

2.4 Fuel system

2.4.1 Replacing the fuel pre-filter (Deutz)

▶ **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**

Hot parts can cause burns.

Never work on the engine when it is at operating temperature.

Allow the engine to cool down or wear protective gloves.

▶ **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.

Spare parts and auxiliary equipment

Designation	Quantity
Fuel pre-filter	1
Clamp	2

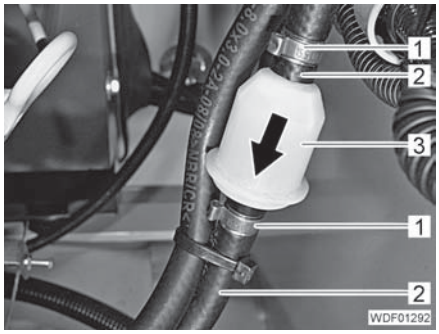


Fig. 90 Fuel pre-filter

Removing the fuel pre-filter

- Close off the fuel lines (Fig. 90,2).
- Remove the 2 clamps (Fig. 90,1).
- Pull off the fuel lines and remove the fuel pre-filter (Fig. 90,3).

Installing the fuel pre-filter

- Attach the fuel lines (Fig. 90,2) with clamps (Fig. 90,1) to the fuel pre-filter (Fig. 90,3) so that the direction of flow (arrow) points towards the engine.
- Secure the 2 clamps (Fig. 90,1).
- Open the fuel lines.

Final work

- Vent the fuel system (see operator's manual "Venting the fuel system").

2.4.2 Replacing the sieve filter of the fuel feed pump (Deutz)

▶ **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**

Hot parts can cause burns.

Never work on the engine when it is at operating temperature.

Allow the engine to cool down or wear protective gloves.

▶ **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.

Requirements

Ensure the following:

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

Spare parts and auxiliary equipment

Designation	Quantity
Cover (with sieve filter)	1

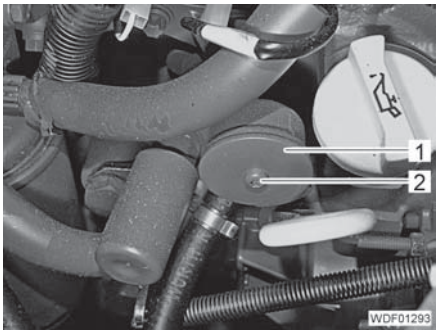


Fig. 91 Cover attachment

Removing the sieve filter

- Unscrew the screw (Fig. 91,2).
- Remove the cover (Fig. 91,1) with sieve filter.

Installing the sieve filter

- Insert new cover (Fig. 91,1) with sieve filter.
- Screw in and tighten the screw (Fig. 91,2).

Final work

- Vent the fuel system (see operator's manual "Venting the fuel system").
- Close the engine hood.

2.4.3 Replacing the fuel line

▶ **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**

Hot parts can cause burns.

Never work on the engine when it is at operating temperature.

Allow the engine to cool down or wear protective gloves.

▶ **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.

Requirements Ensure the following:

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

▷ This section describes the replacement of a fuel line.

▷ The other fuel lines are replaced in the same way.

▷ Reuse fuel in the fuel line or dispose of it in an environmentally responsible manner.

Spare parts and auxiliary equipment

Designation	Quantity
Hose (meter goods)	as req.
Clamp	2

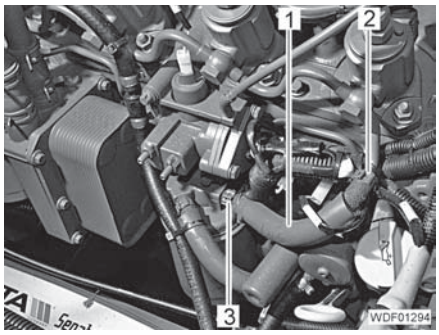


Fig. 92 Fuel line

Removing the fuel line

- Close off the fuel line (Fig. 92,1) at both ends.
- Remove the clamp (Fig. 92,2) and clamp (Fig. 92,3).
- Pull off the fuel line.
- Remove the fuel line.

Installing the fuel line

- Cut the new fuel line to the required length.
- Attach fuel line with 1 clamp (Fig. 92,2 and 3) in each case.
- Secure the clamp (Fig. 92,2) and clamp (Fig. 92,3).

Final work

- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Vent the fuel system (see operator's manual "Venting the fuel system").

2.4.4 Replacing the Bowden cable of the accelerator

▶ **WARNING**

Risk of injury by moving parts.

Do not tilt the operator's platform when the engine is running, unless this manual expressly instructs you to do so.

▷ The eyes of the Bowden cable are secured with **stop nuts**.

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
Bowden cable	1

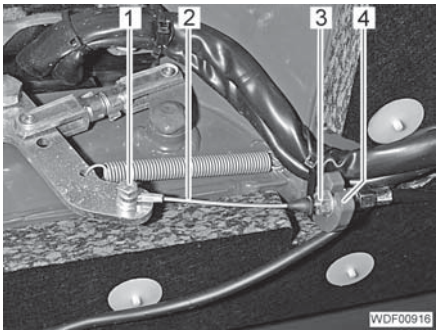


Fig. 93 Front attachment of the Bowden cable

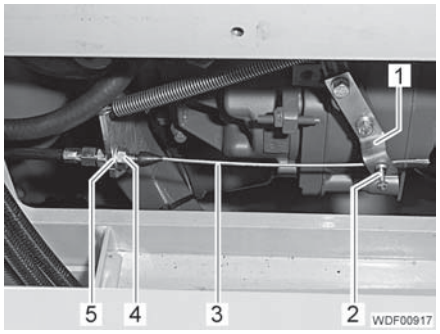


Fig. 94 Rear attachment of the Bowden cable

Removing the Bowden cable

- Unscrew the screw (Fig. 93,1).
- Undo the nut (Fig. 93,3) and remove the Bowden cable (Fig. 93,2) from the mount (Fig. 93,4).
- Undo the screw (Fig. 94,2).
- Undo the nut (Fig. 94,4) and remove the Bowden cable (Fig. 94,3) from the mount (Fig. 94,5).
- Undo or remove all fastenings (e.g. cable ties) along the Bowden cable.
- At the same time, pull out the Bowden cable at one end and pull in a new Bowden cable.

Installing the Bowden cable

- Insert the Bowden cable (Fig. 93,2) into the mount (Fig. 93,4) and tighten the nut (Fig. 93,3).
- Put the eye on the end of the Bowden cable with washers into position on the pedal.
- Insert the screw (Fig. 93,1) with the washer and tighten so that the eye is rotatable.
- Insert the Bowden cable (Fig. 94,3) into the mount (Fig. 94,5) and tighten the nut (Fig. 94,4).
- Thread the Bowden cable through the screw (Fig. 94,2) on the mount (Fig. 94,1).
- Pull the Bowden cable tight and tighten the screw (Fig. 94,2).

Final work

- Tighten or replace undone or removed fastenings (e.g. cable ties) along the Bowden cable.
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").

2.4.5 Replacing the fuel tank

▶ **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.

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

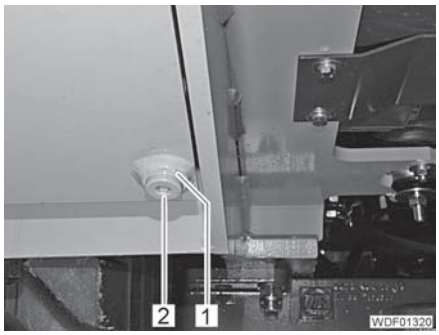


Fig. 95 Drainage screw

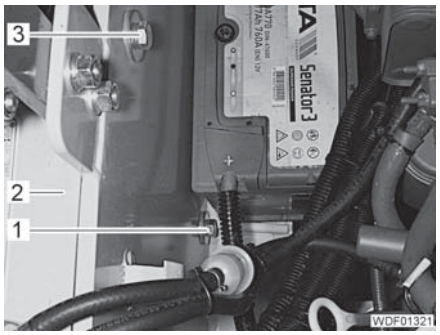


Fig. 96 Fuel tank attachment

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").

2.5 Exhaust system

2.5.1 Replacing the muffler and tail pipe

▶ **WARNING**

Hot parts can cause burns.

Never work on the exhaust when it is at operating temperature.

Allow the exhaust to cool down or wear protective gloves.

Requirements

Ensure the following:

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

Spare parts and auxiliary equipment

Designation	Quantity
Muffler	1
Tail pipe	1

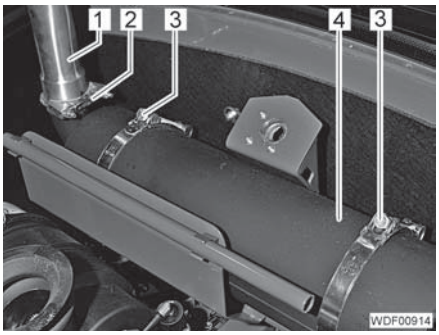


Fig. 97 Muffler

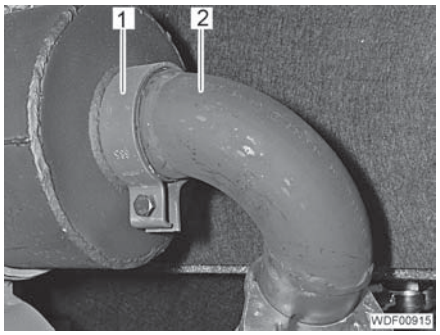


Fig. 98 Connection to flexi-pipe

Detaching the tail pipe

- Release the clamp (Fig. 97,2).
- Detach the tail pipe (Fig. 97,1) by pulling it upwards.

Removing the muffler

- Mark the position of the muffler on the holder.
- Release the clamp (Fig. 98,1).
- Pull of the connecting piece (Fig. 98,2).
- Unscrew the 2 screws (Fig. 97,3).
- Pull out the muffler (Fig. 97,4) to the left.

Installing the muffler

- Insert the mufflers (Fig. 97,4) into the clamps from the left-hand side and adjust.
- Tighten the 2 screws (Fig. 97,3).
- Attach the connection piece (Fig. 98,2) with clamp (Fig. 98,1) from the outside to the muffler.
- Tighten the clamp (Fig. 98,1).

Installing the tail pipe

- Attach the tail pipe (Fig. 97,1) with clamp (Fig. 97,2) to the muffler from above.
- Tighten the clamp (Fig. 97,2).

Final work

- Check the exhaust system for leaks (see Part 3, "Inspecting the exhaust system for leaks" section).
- Close the engine hood.

2.5.2 Replacing the flue and flexi-pipe

▶ **WARNING**

Hot parts can cause burns.

Never work on the exhaust when it is at operating temperature.

Allow the exhaust to cool down or wear protective gloves.

Requirements

Ensure the following:

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

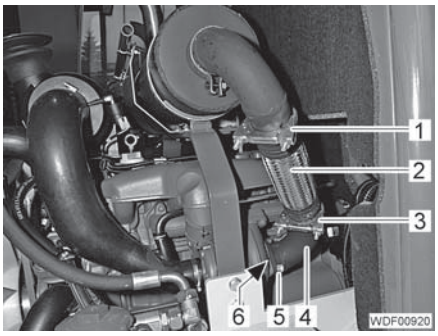


Fig. 99 Exhaust (with turbocharger)

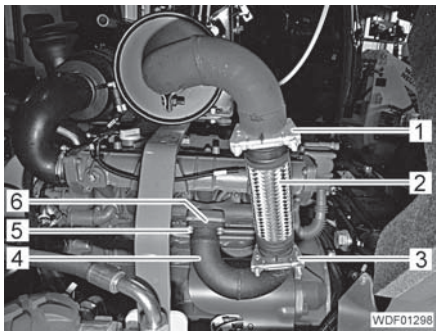


Fig. 100 Exhaust (without turbocharger)

Removing the flue

- Unscrew the 3 screws (Fig. 99,5 or Fig. 100,5).
- Release the clamp (Fig. 99,3 or Fig. 100,3).
- Remove the flue (Fig. 99,4 or Fig. 100,4) with seal (Fig. 99,6) or with seals and intermediate washer (Fig. 100,6).

Replacing the flexi-pipe

- Release the clamp (Fig. 99,1 or Fig. 100,1).
- Remove the flex-pipe (Fig. 99,2 or Fig. 100,2) by pulling it downwards.
- Position the new flexi-pipe from below.
- Tighten the clamp (Fig. 99,1 or Fig. 100,1).

Installing the flue

- Position the flue (Fig. 99,4 or Fig. 100,4) with seal (Fig. 99,6) or with seals and intermediate washer (Fig. 100,6).
- Insert and tighten 3 screws (Fig. 99,5 or Fig. 100,5) with spring lock washers and disks.
- Tighten the clamp (Fig. 99,3 or Fig. 100,3).

Final work

- Check the exhaust system for leaks (see Part 3, "Inspecting the exhaust system for leaks" section).
- Close the engine hood.

3.1 Complete vehicle

3.1.1 Depressurizing the hydraulic system

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

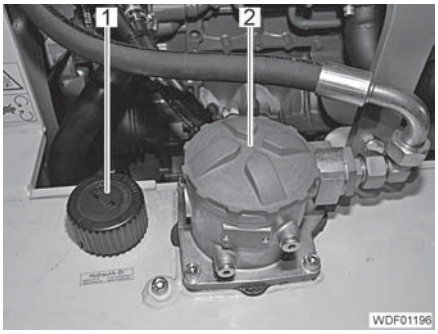


Fig. 101 Depressurizing the hydraulic system

Depressurizing the hydraulic system

- Fully lower the lift frame.
- Switch off the engine.
- Switch on the ignition.
- Immediately after switching off the engine, move all control levers and pedals of the hydraulic system several times in all directions.
- Switch off the ignition.
- Open the cap (Fig. 101,1) in order to depressurize the hydraulic fluid tank.
- Briefly open the cap (Fig. 101,2) so that the hydraulic fluid can flow out of the return filter and into the hydraulic fluid tank.
- Close the 2 caps (Fig. 101,1 and 2).

3.1.2 Sealing the hydraulic cylinder

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

Requirements

Ensure the following:

- The hydraulic cylinder has been removed (see the section 3.3.4 "Installing the steering cylinder" or 3.6 "Working hydraulics (hydraulic cylinder)").
- The hydraulic cylinder is lying horizontally on a workbench and is secured against accidental movement.

Spare parts and auxiliary equipment

Designation	Quantity
Set of seals	1
Lubricating grease	as req.
Crepe tape	as req.
Locking agent (e.g. Loctite®)	as req.

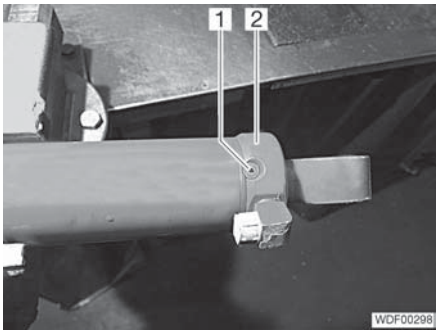


Fig. 102 Securing the guide bush

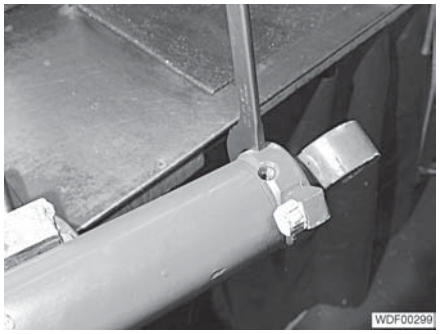


Fig. 103 Sickle spanner

Removing the piston

- Unscrew the screw (Fig. 102,1).
- Unscrew the guide bush (Fig. 102,2) with a sickle spanner (Fig. 103).
- Remove the bottom-end plug if necessary.

▷ Collect any escaping hydraulic fluid.

- Carefully pull the piston out of the cylinder.

▷ If there are any scratches, furrows or similar on the inside of the cylinder, the complete hydraulic cylinder must be replaced.

- Inspect the inside of the cylinder for damage.

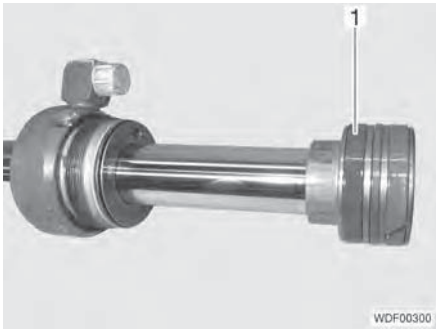


Fig. 104 Guide rings

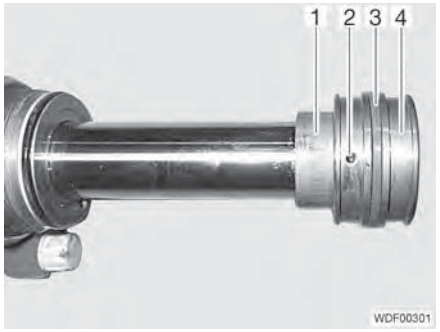


Fig. 105 Securing the piston

Removing the piston

- Remove the 2 guide rings (Fig. 104,1).
- Remove the annular seal (Fig. 105,3) and the O-ring underneath.
- Unscrew the stud screw (Fig. 105,2).
- Unscrew the piston (Fig. 105,4) with a face spanner.
- Remove the spacer (Fig. 105,1) with the O-ring.
- Carefully pull the guide bush off the piston rod.

▷ If there are any scratches, furrows or similar on the piston rod or piston, the complete hydraulic cylinder must be replaced.

- Inspect the piston rod and the piston for damage.

Fig. 106 Compression of the annular seal

Sealing the piston

- Clean the piston thoroughly.
- Place the O-ring in the middle groove.

▷ The annular seal is **always** widened slightly when it is removed.

- Place the annular seal (Fig. 105,3) over the O-ring.
- Wrap the annular seal securely in several layers of crepe tape (Fig. 106).
- Press the annular seal into its original shape with a clip.

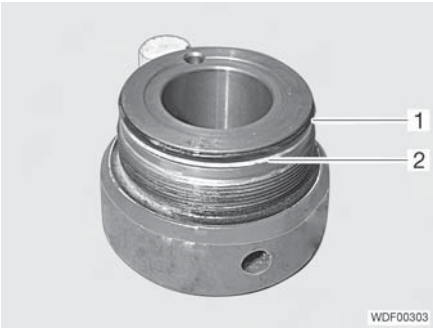


Fig. 107 Inside of the guide bush

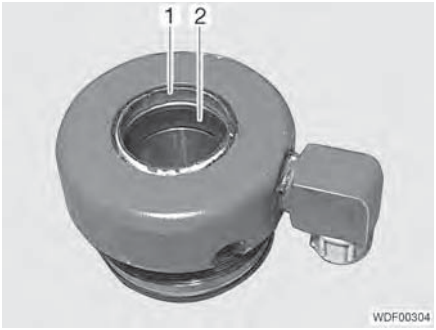


Fig. 108 Outside of the guide bush

Cleaning the guide bush

- Remove the O-ring (Fig. 107,1).
- Remove the support ring (Fig. 107,2).
- Remove the annular seal (Fig. 108,2).
- Remove the dust arrester (Fig. 108,1).
- Clean the guide bush thoroughly.

▷ If there are any scratches, furrows or similar on the guide bush, the complete hydraulic cylinder must be replaced.

- Inspect the guide bush for damage.

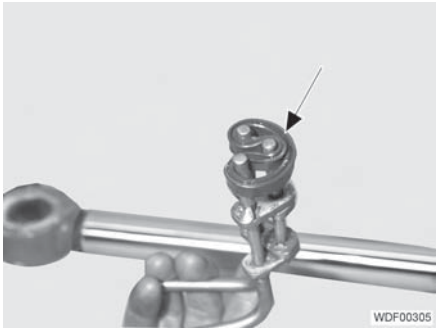


Fig. 109 Annular seal with insertion tool

Sealing the guide bush

- Insert the dust arrester (Fig. 108,1) into the guide bush so that the seal lip faces outwards.
- Slightly grease the annular seal (Fig. 108,2) and, with the insertion tool (Fig. 109), insert it into the guide bush so that the groove faces inwards.
- Insert the support ring (Fig. 107,2).
- Insert the O-ring (Fig. 107,1).

Installing the piston

- Clean the piston rod thoroughly.
- Carefully push the guide bush onto the piston rod.
- Carefully push the spacer (Fig. 105,1) with the O-ring onto the piston rod.
- Screw and tighten the piston (Fig. 105,4) onto the piston rod.
- Coat the stud screw (Fig. 105,2) with locking agent and screw it in.
- Insert the 2 guide rings (Fig. 104,1).

Installing the piston

- Remove the clamp and the crepe tape (Fig. 106).
- Slightly grease the cylinder on the thread and the piston.
- Carefully push the piston into the cylinder.
- Screw in the guide bush until the recesses for the screw (Fig. 102,1) correspond.
- Screw in and tighten the screw (Fig. 102,1).

Final work

- Install the hydraulic cylinder (see the section 3.3.5 "Installing the steering cylinder" or 3.6 "Working hydraulics (hydraulic cylinder)").
- Lubricate the new bearing.

3.1.3 Replacing the pivot bearing on the hydraulic cylinder

▶ **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 hydraulic cylinder has been removed (see the section 3.3.4 "Installing the steering cylinder" or 3.6 "Working hydraulics (hydraulic cylinder)").
- The hydraulic cylinder is lying horizontally on a workbench and is secured against accidental movement.

Spare parts and auxiliary equipment

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

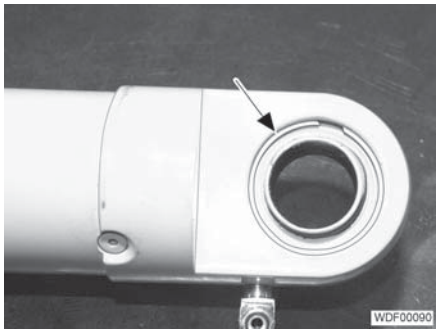


Fig. 110 Securing the bearing

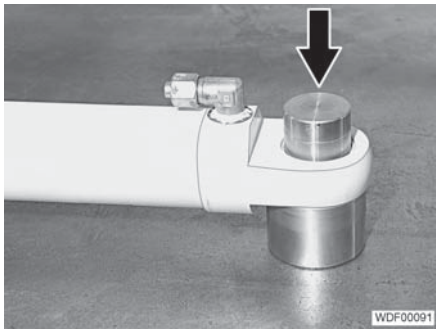


Fig. 111 Expulsion tool

Removing the pivot bearing

- Remove the locking ring (Fig. 110).
- Rotate the hydraulic cylinder.
- Drive out the pivot bearing downwards using a suitable expulsion tool (Fig. 111).

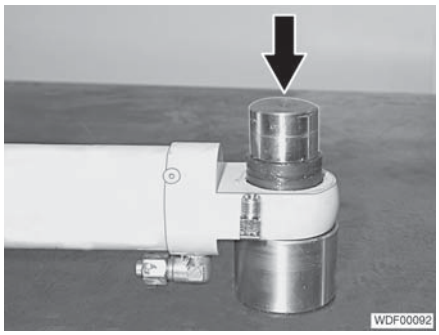


Fig. 112 Driving tool

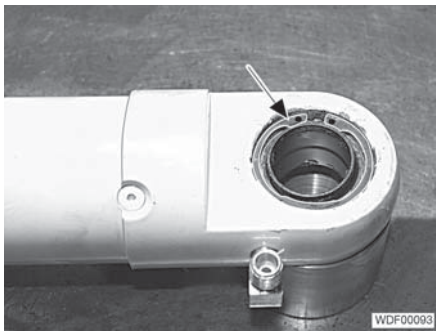


Fig. 113 Securing the bearing

Installing the pivot bearing

- Rotate the hydraulic cylinder if necessary.
- Position the pivot bearing from above and use a suitable driving tool (Fig. 112) to drive it in.
- Insert the locking ring (Fig. 113).

▷ Check that all locking rings are fitted correctly.

Final work

- Install the hydraulic cylinder (see the section 3.3.5 "Installing the steering cylinder" or 3.6 "Working hydraulics (hydraulic cylinder)").
- Lubricate the new bearing.

3.2 Driving hydraulics

3.2.1 Replacing the variable displacement pump

▶ **CAUTION**

Risk of injury by a heavy component.

The variable displacement pump weighs approx. 30 kg.

When removing and installing the variable displacement pump, use suitable lifting gear or work with another person.

▷ 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 3.1.1 "Depressurizing the hydraulic system").
- The operator's platform is tilted (see operator's manual "Tilting the operator's platform").
- The gear pump has been removed (see the section 3.5 "Working hydraulics (gear pump, valves)").

Spare parts and auxiliary equipment

Designation	Quantity
Variable displacement pump	1

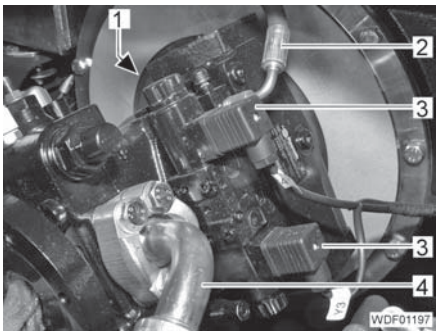


Fig. 114 Connections of variable displacement pump (left)

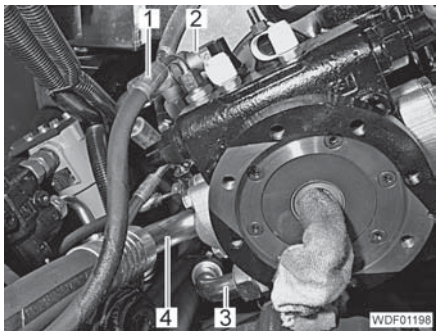


Fig. 115 Output end of the variable displacement pump

Detaching the lines

- Unscrew and close off the hydraulic line from the inching pedal (Fig. 114,2).
- Mark the connectors of the solenoid valves in order to prevent mix-ups.
- Undo 1 screw on each of the connectors (Fig. 114,3), pull the connectors off the solenoid valves and protect the contacts (e.g. with a protective cap).
- Unscrew and close off the hydraulic line to the cross flushing connection (Fig. 115,2).
- Unscrew and close off the hydraulic line to the differential lock (Fig. 115,1).
- Unscrew and close off the hydraulic line from the combination filter (Fig. 115,3).
- Undo 4 screws on each of the flange halves of the two high pressure lines (Fig. 114,4 and Fig. 115,4) and remove the flange halves.
- Remove and close off the high pressure lines.

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.

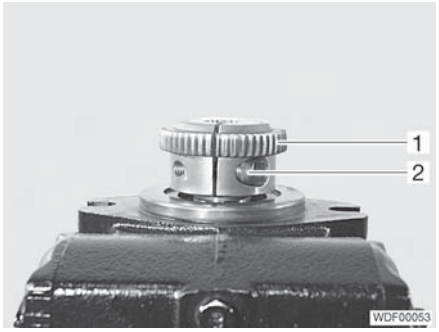


Fig. 116 Clutch hub attachment

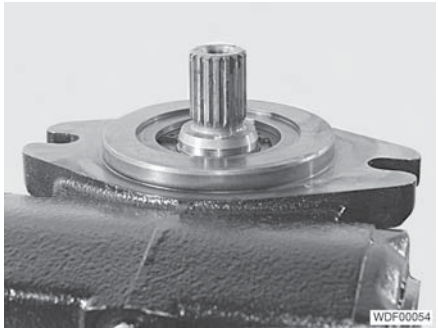


Fig. 117 Variable displacement pump drive

Removing the clutch hub

- Undo the screw (Fig. 116,2).
- Widen the gap in the clutch hub (Fig. 116,1) slightly using a suitable tool (e.g. wedge).
- Pull off the clutch hub.
- Clean the internal teeth of the clutch hub and variable displacement pump drive (Fig. 117) to remove locking agent residues.

Fitting the clutch hub

- Coat the internal teeth of the clutch hub with locking agent.
- Place the clutch hub onto the variable displacement pump drive.
- Coat the screw thread with locking agent.
- Tighten the screw.

Final work

- Install the variable displacement pump (see the section 3.2.1 "Replacing the variable displacement pump").

3.2.3 Replacing the annular shaft seal of the variable displacement pump

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

Requirements

Ensure the following:

- The clutch hub has been removed (see the section 3.2.2 "Replacing the clutch hub").

Spare parts and auxiliary equipment

Designation	Quantity
Annular shaft seal	1
Locking ring	1

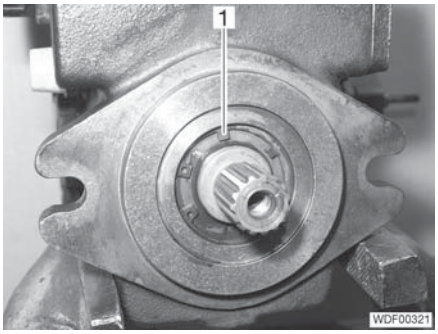


Fig. 118 Securing the annular shaft seal

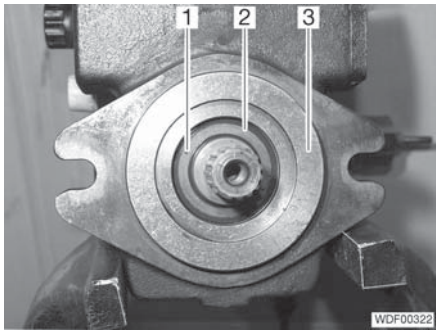


Fig. 119 Annular shaft seal

Removing the annular shaft seal

- Remove the locking ring (Fig. 118,1).
- Screw 2 sheet metal screws into the holes (Fig. 119,1).
- Pull out the annular shaft seal (Fig. 119,2) on the sheet metal screws.

Fitting the annular shaft seal

- Slightly oil the new annular shaft seal (Fig. 119,2).
- Place the annular shaft seal into position so that the metal ring faces away from the variable displacement pump (Fig. 119,3).
- Using a suitable driving tool, carefully drive in the annular shaft seal sufficiently far for the locking ring (Fig. 118,1) to be inserted.
- Insert the locking ring (Fig. 118,1).

Final work

- Install the clutch hub (see the section 3.2.2 "Replacing the clutch hub").

3.2.4 Replacing the variable displacement motor

► **WARNING**

Risk of injury by a heavy component.

The variable displacement motor weighs approx. 47 kg.

When removing and installing the variable displacement motor, use suitable lifting gear or work with another person.

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

Requirements

Ensure the following:

- The rear axle has been removed (see the section 4.3.1 "Removing the rear axle").

Spare parts and auxiliary equipment

Designation	Quantity
Variable displacement motor	1
Sealant	as req.
Locking agent (e.g. Loctite®)	as req.

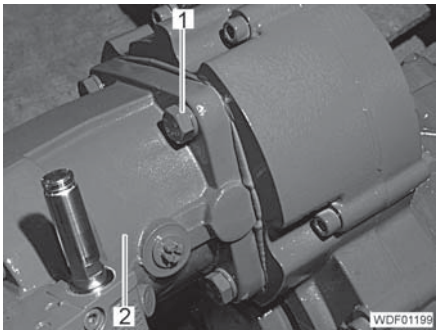


Fig. 120 Variable displacement motor attachment

Removing the variable displacement motor

- Loosen the 4 screws (Fig. 120,1) but do not unscrew them.
- Get a second person to help you hold the variable displacement motor (Fig. 120,2) securely in place.
- Unscrew the 4 screws and carefully lift off the variable displacement motor (two persons).
- Close off the openings in the rear axle (e.g. with a cloth).

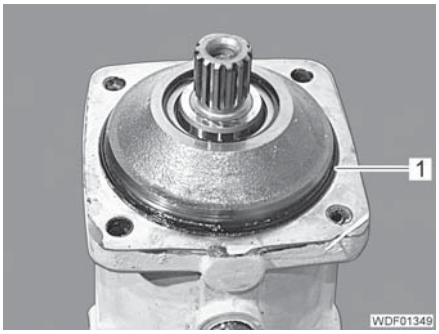


Fig. 121 Sealing the variable displacement motor

Installing the variable displacement motor

- Clean the contact surfaces on the variable displacement motor and the rear axle.
- Uncover the opening on the rear axle if necessary (e.g. remove the cloths).
- Apply sealant along the O-ring (Fig. 121,1).
- Coat the thread of the 4 screws (Fig. 120,1) with locking agent.
- Carefully (two people!) insert the variable displacement motor (Fig. 120,2) into the rear axle and screw in the 4 screws.
- Tighten the 4 screws. Sealant escapes at the side.

Final work

- Install the rear axle (see the section 4.3.2 "Installing the rear axle").

3.3 Steering hydraulics

3.3.1 Cleaning the priority valve

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

▷ Under the screw attachment there is a spring that is under slight pressure.

Requirements

Ensure the following:

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

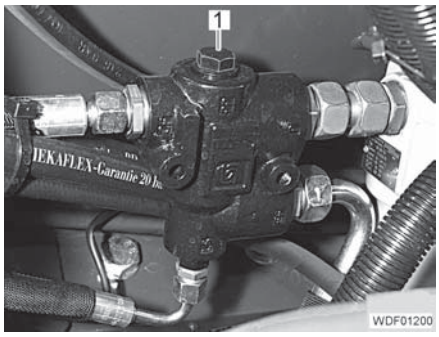


Fig. 122 Priority valve

Opening the priority valve

- Unscrew the screw attachment (Fig. 122,1).
- Carefully screw the M6 screw into the control piston from above.

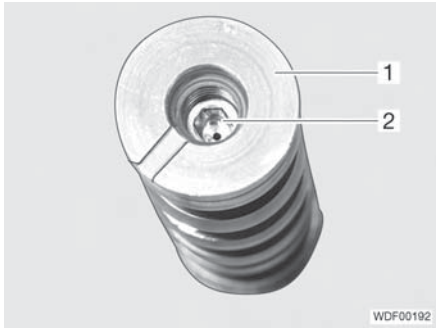


Fig. 123 Control piston

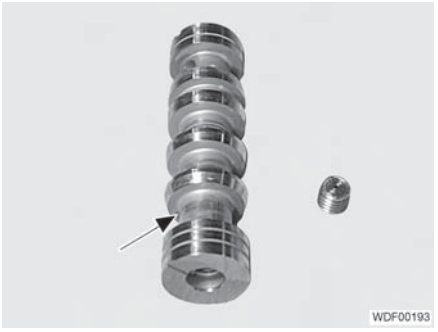


Fig. 124 Individual parts

Cleaning the control piston

- Carefully pull out the control piston and unscrew the M6 screw.

▷ Do not damage the outer surfaces of the control piston (Fig. 123,1).

▷ If necessary, hold the control piston firmly in the recesses (Fig. 124).

- Unscrew the nozzle (Fig. 123,2).
- Clean the control piston and nozzle thoroughly and blow them off with compressed air.
- Screw the nozzle into the control piston and tighten hand-tight.

Closing off the priority valve

- Carefully place the control piston into the priority valve.
- Screw the screw attachment (Fig. 122,1) into the priority valve and tighten hand-tight.

Final work

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

3.3.2 Replacing the priority valve

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

Requirements

Ensure the following:

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

Spare parts and auxiliary equipment

Designation	Quantity
Priority valve	1

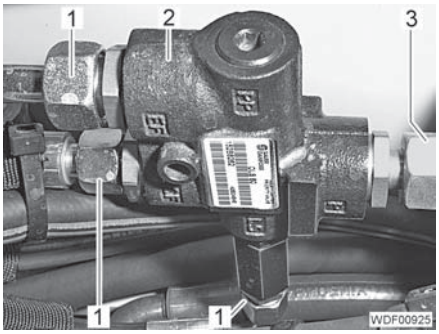


Fig. 125 Priority valve

Replacing the priority valve

- Unscrew and close off the hydraulic lines (Fig. 125,1).
- Unscrew the union nut (Fig. 125,3) and remove the priority valve (Fig. 125,2).
- Position new priority valve, screw the union nut (Fig. 125,3) onto the connection on the pressure filter and tighten.
- Screw the hydraulic lines (Fig. 125,1) onto the connection on the priority valve and tighten.

Final work

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

3.3.3 Replacing the orbital steering valve

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

Requirements

Ensure the following:

- The steering column has been removed (see the section 7.4.1 "Replacing the steering column").
- The cladding of the steering column is removed (see section 7.4.2 "Replacing the cladding of the steering column").
- The hydraulic system is depressurized (see the section 3.1.1 "Depressurizing the hydraulic system").

Spare parts and auxiliary equipment

Designation	Quantity
Orbital steering valve	1

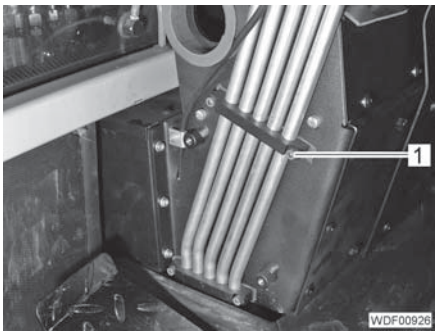


Fig. 126 Hydraulic lines

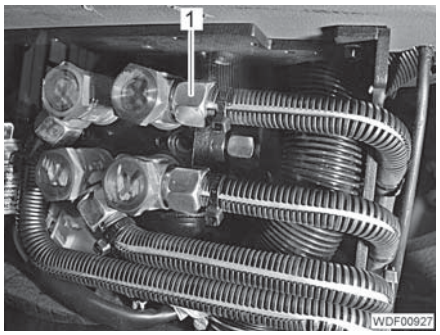


Fig. 127 Connections on the orbital steering valve

Removing the orbital steering valve

- Unscrew the 2 screws (Fig. 126,1) on the two holders.
- Mark the hydraulic lines in order to prevent mix-ups.
- Unscrew and close off the 5 hydraulic lines (Fig. 127,1).

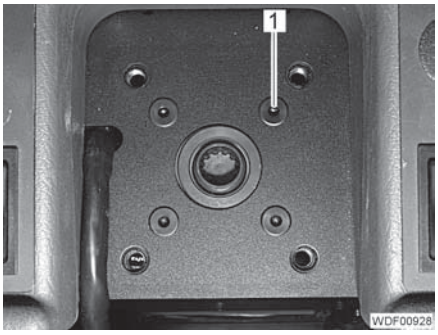


Fig. 128 Orbital steering valve attachment

- Unscrew the 4 screws (Fig. 128,1) and remove the orbital steering valve rearwards.

Installing the orbital steering valve

- Insert the orbital steering valve from behind.
- Screw in and tighten the 4 screws (Fig. 128,1).

- Screw and tighten the 5 hydraulic lines (Fig. 127,1) to the connections on the orbital steering valve.
- Tighten the 2 screws (Fig. 126,1) on each of the two holders.

Final work

- Attach the cladding of the steering column (see section 7.4.2 "Replacing the cladding of the steering column").
- Install the steering column (see the section 7.4.1 "Replacing the steering column").

3.3.4 Removing the steering cylinder

▷ 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.

▷ Take out the shim washers during the removal procedure and reuse them during installation if necessary.

▷ Avoid damaging the piston rod.

Requirements

Ensure the following:

- The parking brake has been applied and the loader secured against rolling away (e.g. with chocks).
- The articulated link is blocked (see operator's manual "Blocking the articulated link").

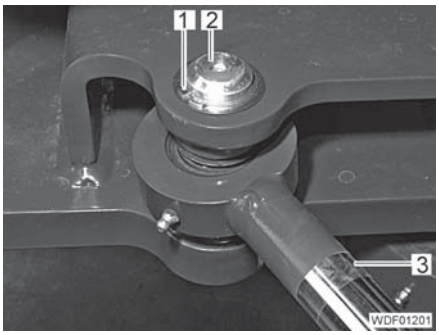


Fig. 129 Steering cylinder, rod end

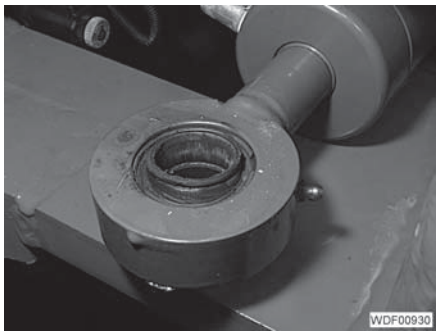


Fig. 130 Steering cylinder support surface

Removing the steering cylinder at the rod end

- Remove the locking ring (Fig. 129,1) and take off the washer.
- Drive out the pin (Fig. 129,2) downwards.
- Hold and guide the piston rod (Fig. 129,3) in the painted area.
- Slowly rotate the steering wheel counter-clockwise until the steering cylinder is fully in.
- Place the steering cylinder on the rear carriage (Fig. 130).

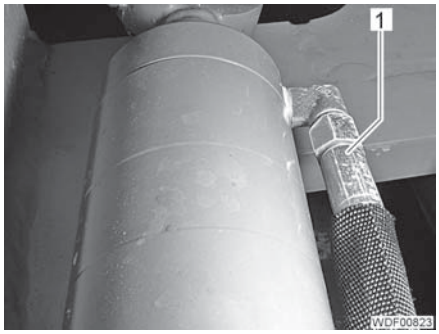


Fig. 131 Hydraulic line, rod end

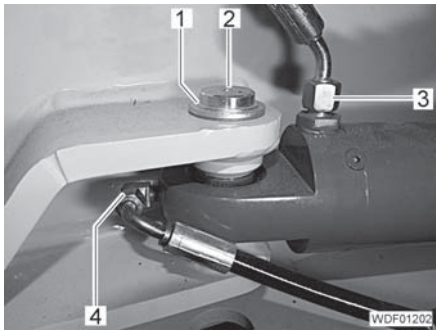


Fig. 132 Steering cylinder, bottom end

Removing the steering cylinder at the bottom end

- Depressurize the hydraulic system (see the section 3.1.1 "Depressurizing the hydraulic system").
- Tilt the operator's platform (see operator's manual "Tilting the operator's platform").
- Unscrew and close off the hydraulic line (Fig. 131,1).
- Unscrew and close off the hydraulic line (Fig. 132,3).
- Unscrew the remote lubrication line (Fig. 132,4).
- Remove the locking ring (Fig. 132,1) and take off the washer.
- Drive out the pin (Fig. 132,2) downwards.

Removing the steering cylinder

- Pull the steering cylinder forwards out of the pin holder.
- Lift out the steering cylinder up and to the rear.
- If necessary, unscrew the bottom-end screw attachments.

3.3.5 Installing the steering cylinder

▷ 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.

▷ If the pin holder on the front carriage is worn out, replace it with a new one.

▷ If the pin holder on the rear carriage is worn out, use an expander pin in the installation procedure (see "Expander pin documentation").

▷ Avoid damaging the piston rod.

Spare parts and auxiliary equipment

Designation	Quantity
Expander pin	as req.
Lubricating grease	as req.

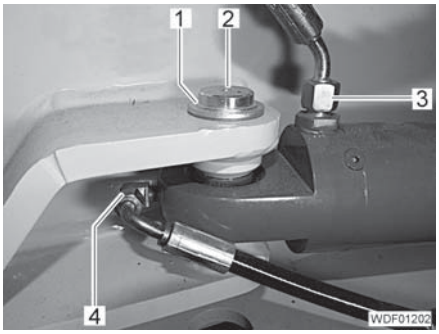


Fig. 133 Hydraulic line, bottom end

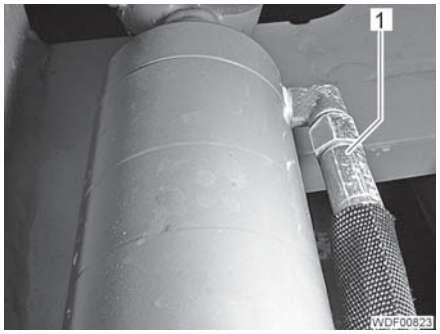


Fig. 134 Steering cylinder, rod end

Inserting the steering cylinder

- If necessary, screw in the bottom-end screw attachments.
- Guide the steering cylinder from the rear and above through the opening next to the center joint.
- Push the bottom end of the steering cylinder into the pin holder from the front, if necessary with shim washers.

Installing the steering cylinder at the bottom end

- Grease the pin and bearing slightly.
- 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. 133,2) with the washer from above.
- Place the washer into position at the bottom and secure it with the locking ring (Fig. 133,1).
- Screw the remote lubrication line (Fig. 133,4) onto the connection on the steering cylinder and tighten.
- Screw the hydraulic line (Fig. 133,3) onto the connection on the steering cylinder and tighten.
- Screw the hydraulic line (Fig. 134,1) onto the connection on the steering cylinder and tighten.
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").

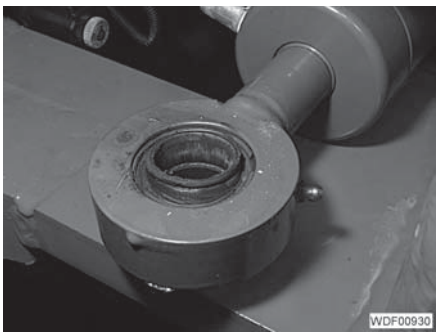


Fig. 135 Steering cylinder support surface

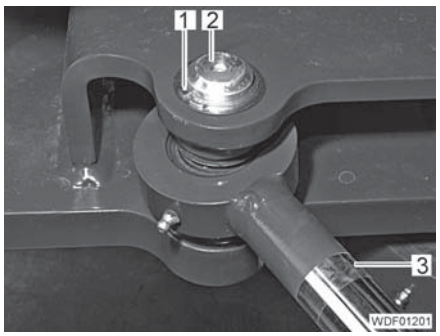


Fig. 136 Steering cylinder, rod end

Installing the steering cylinder at the rod end

- Lift and guide the piston rod in the painted area (Fig. 135).
- Rotate the steering wheel clockwise slowly until the bearing of the steering cylinder projects into the pin holder of the front carriage.
- Grease the pin and bearing slightly.
- Insert shim washers if necessary.

- 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

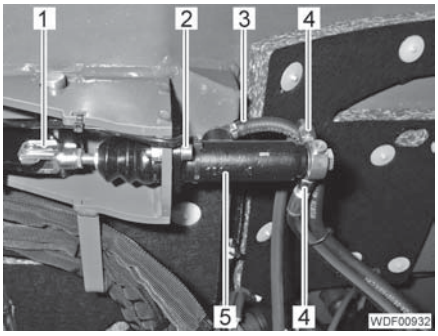


Fig. 137 Main brake cylinder

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.

- Screw the 2 hydraulic lines (Fig. 137,4) onto the connections on the main brake cylinder and tighten.
- Push the pin (Fig. 137,1) through the fork end and brake linkage and secure.

Final work

- Vent the brake hydraulics (see the section 3.4.3 "Venting the brake hydraulics").
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").

3.4.2 Replacing the brake hydraulics tank

▶ **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.

▷ 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 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
Brake fluid container	1
Tab clamp	1
Mineral oil Transfluid JD	as req.

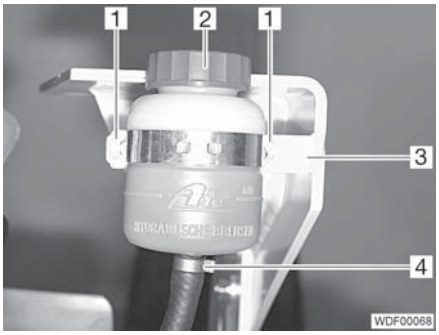


Fig. 138 Brake hydraulics tank

Removing the tank

- Unscrew the 2 screws (Fig. 138,1).
- Remove the tank.

Replacing the tank

- Unscrew the cap (Fig. 138,2).
- Pour the mineral oil into a suitable vessel.
- Remove the tab clamp (Fig. 138,4).
- Pull the tank off the hose.

- Push a new tab clamp over the hose.
- Insert the new tank into the hose.
- Secure the tab clamp.

Installing the tank

- Place the tank into position on the holder (Fig. 138,3).
- Tighten the 2 bolts (Fig. 138,1) with washers.

Final work

- Top up the mineral oil (see operator's manual "Checking the brake fluid level/refilling the brake fluid")
- Vent the brake hydraulics (see the section 3.4.3 "Venting the brake hydraulics").
- Close the engine hood.

3.4.3 Venting the brake hydraulics

▷ 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").

▷ Never mix mineral oil and ordinary brake fluid.

▷ If possible, vent the brake hydraulics with a brake venting unit for mineral oil.

▷ If no brake venting unit is available, the brake hydraulics can be vented using the method described here.

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
Hose, transparent	as req.

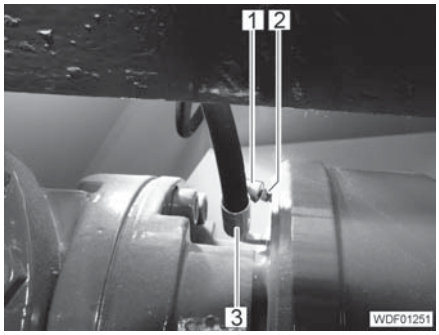


Fig. 139 Front axle venting nipple

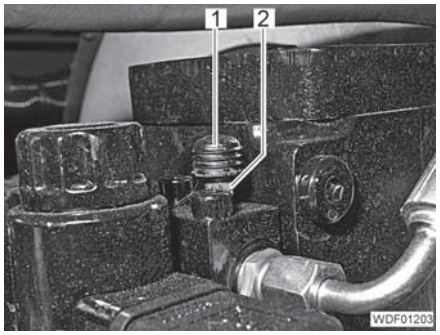


Fig. 140 Variable displacement pump venting nipple

Venting the brake line to the front axle

- Press down the brake pedal as many times as necessary until a tangible pressure has built up.
- Hold down the brake pedal in the uppermost position against the pressure.
- Unscrew the venting nipple (Fig. 139,2) by 1/2 a turn. Air and brake fluid escape.

- Tighten the venting nipple when the brake pedal is in the lowest position.
- Build up the pressure and release it via the front axle venting nipple as often as necessary until the brake fluid emerges without any bubbles at the venting nipple.
- Pull the transparent hose off the venting nipple.
- Place the protective cap (Fig. 139,1) onto the venting nipple.

Venting the brake line to the variable displacement pump

- Build up the pressure and release it via the variable displacement pump venting nipple (Fig. 140,2) as often as necessary until the brake fluid emerges without any bubbles at the venting nipple.
- Pull the transparent hose off the venting nipple.
- Place the protective cap (Fig. 140,1) onto the venting nipple.
- Fill up the brake hydraulics tank.

Final work

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

3.4.4 Replacing the brake fluid

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

Spare parts and auxiliary equipment

Designation	Quantity
Hose, transparent	as req.
Balloon pump	1

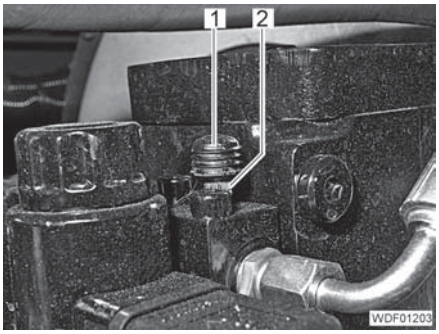


Fig. 141 Variable displacement pump venting nipple

Evacuating the brake fluid (rear)

- Remove the tank cap.
- Siphon off the brake fluid from the tank using a suitable balloon pump.
- Fill the tank with fresh brake fluid.
- Pull off the protective cap (Fig. 141,1).
- Attach the transparent hose to the venting nipple (Fig. 141,2).

▷ Collect the brake fluid in suitable vessels.

- Unscrew the venting nipple (Fig. 141,2) by 1/2 a turn.
- Press down the brake pedal repeatedly until the tank is almost completely empty.
- Tighten the venting nipple (Fig. 141,2).

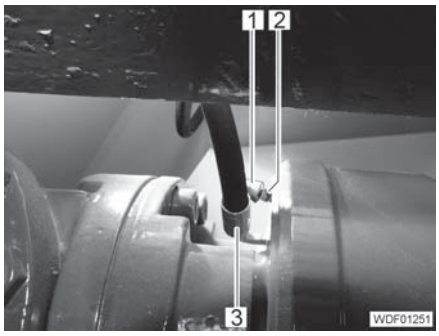


Fig. 142 Front axle venting nipple

Evacuating the brake fluid (front)

- Fill the tank with fresh brake fluid.
- Pull off the protective cap (Fig. 142,1).
- Attach the transparent hose to the venting nipple (Fig. 142,2).

▷ Collect the brake fluid in suitable vessels.

- Unscrew the venting nipple (Fig. 142,2) by 1/2 a turn.
- Press down the brake pedal repeatedly until the tank is almost completely empty.
- Tighten the venting nipple (Fig. 142,2).

Repetition

- Empty the tank once more via the venting nipple of the variable displacement pump (see "Evacuating the brake fluid (rear)").
- Empty the tank once more via the venting nipple of the front axle (see "Evacuating the brake fluid (front)").

Final work

- Top up the brake fluid (see operator's manual "Checking the brake fluid level/topping up the brake fluid").
- Check the brake hydraulics for leaks and that it functions correctly.
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").

3.4.5 Replacing the 3/2-way valve

▷ 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 3.1.1 "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
3/2-way valve	1

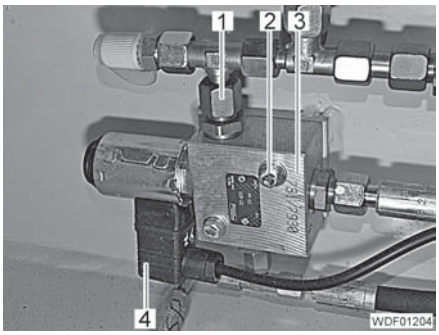


Fig. 143 3/2-way valve

Replacing the 3/2-way valve

- Mark the hydraulic lines in order to prevent mix-ups.
- Unscrew and close off the 3 hydraulic lines (Fig. 143,1).
- Unscrew screw on plug (Fig. 143,4), remove plug and protect the contacts (e.g. with protective cap).
- Unscrew the 2 screws (Fig. 143,2) and remove the 3/2-way valve (Fig. 143,3).

Fitting the 3/2-way valve

- Position the 3/2-way valve (Fig. 143,3).
- Insert and tighten 2 screws (Fig. 143,2) with spring lock washers and disks.
- Attach the plug (Fig. 143,4) to the contacts and secure it with a screw.
- Screw the 3 hydraulic lines (Fig. 143,1) onto the connections on the 3/2-way valve and tighten.

Final work

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

3.5 Working hydraulics (gear pump, valves)

3.5.1 Replacing the gear pump

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

▷ Use home-made sealing plates to temporarily seal the hydraulic lines at the screw connections (see Part 2, "Sealing plate" section).

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
Gear pump	1
Seal	1
O-ring	1
O-ring	2

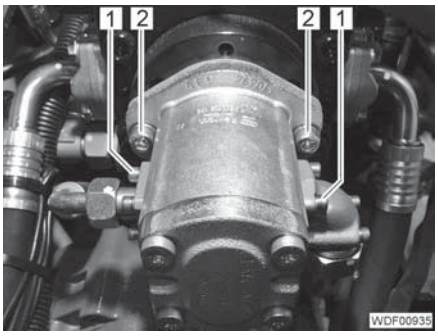


Fig. 144 Gear pump

Fig. 145 Gear pump seals

Removing the gear pump

- Unscrew 4 screws on each of the screw connections of the hydraulic lines (Fig. 144,1).
- Remove and close off the hydraulic lines.
- Unscrew the 2 screws (Fig. 144,2).
- Carefully remove the gear pump.

▷ Before installing the gear pump, replace the used seals with new ones.

Installing the gear pump

- Place a seal (Fig. 145,3) onto the flange (Fig. 145,1) of the gear pump.
- Place an O-ring (Fig. 145,2) onto the seal.
- Carefully position gear pump on the variable displacement pump.
- Tighten the 2 screws (Fig. 144,2) with spring lock washers.

- Put on the hydraulic lines (Fig. 144,1) with new O-rings.
- Tighten 4 screws with spring lock washers on each of the screw connections of the hydraulic lines.

Final work

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

3.5.2 Replacing the gear pump (dual pump)

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

▷ Use home-made sealing plates to temporarily seal the hydraulic lines at the screw connections (see Part 2, "Sealing plate" section).

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
Gear pump (dual pump)	1
Seal	1
O-ring	1
O-ring	4

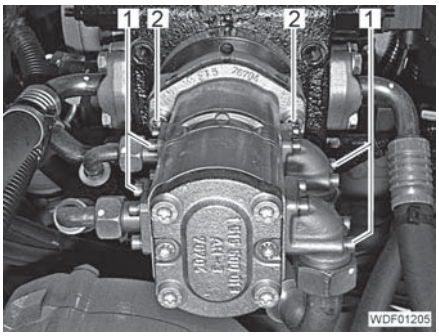


Fig. 146 Gear pump

Fig. 147 Gear pump seals

Removing the gear pump

- Unscrew 4 screws on each of the screw connections of the hydraulic lines (Fig. 146,1).
- Remove and close off the hydraulic lines.
- Unscrew the 2 screws (Fig. 146,2).
- Carefully remove the gear pump.

▷ Before installing the gear pump, replace the used seals with new ones.

Installing the gear pump

- Place a seal (Fig. 147,3) onto the flange (Fig. 147,1) of the gear pump.
- Place an O-ring (Fig. 147,2) onto the seal.
- Carefully position gear pump on the variable displacement pump.
- Tighten the 2 screws (Fig. 146,2) with spring lock washers.
- Put on the hydraulic lines (Fig. 146,1) with new O-rings.
- Tighten 4 screws with spring lock washers on each of the screw connections of the hydraulic lines.

Final work

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

3.5.3 Sealing the gear pump

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

Requirements

Ensure the following:

- The gear pump has been removed (see the section 3.5.1 "Replacing the gear pump").

Spare parts and auxiliary equipment

Designation	Quantity
Set of seals	1

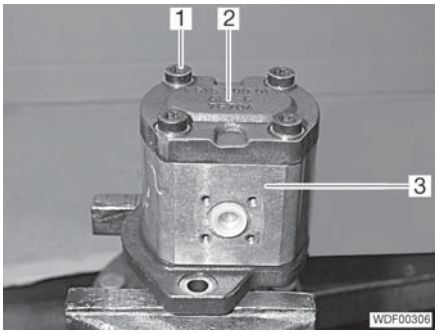


Fig. 148 Gear pump housing

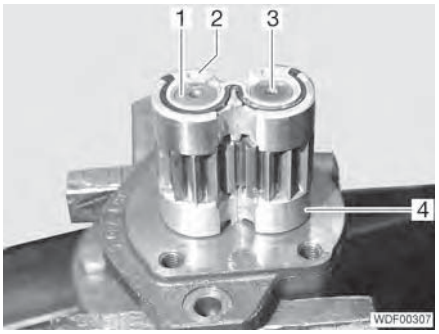


Fig. 149 Internal configuration

Disassembling the gear pump

- Mark the pump housing and cover.
- Unscrew the 4 screws (Fig. 148,1).
- Remove the cover (Fig. 148,2) and place it aside.

▷ The position and sequence of the internal components is important.
Do not mix up any components and do not alter the installation position.

- Carefully remove the housing (Fig. 148,3) and place it aside.
- Remove the outer bearing (Fig. 149,2) and place it aside.
- Remove the gears (Fig. 149,1 and 3) and place them aside.
- Remove the inner bearing (Fig. 149,4) and place it aside.

Fig. 150 Bearing seal

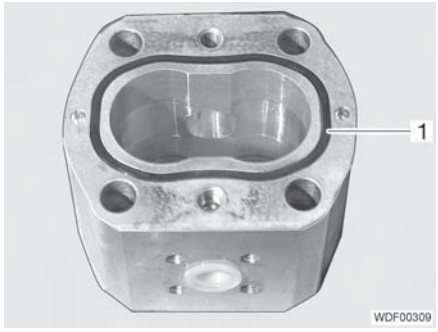


Fig. 151 Housing seal

Replacing the seals

- Remove 1 support ring (Fig. 150,2) on each of the two bearings.
- Remove 1 spectacle seal (Fig. 150,1) on each of the two bearings.
- Clean the bearing.
- Insert 1 new support ring into each of the two bearings.
- Insert 1 new spectacle seal into each of the two bearings.
- Remove 1 seal (Fig. 151,1) on each side of the housing.
- Clean the housing.
- Insert 1 new seal on each side of the housing.

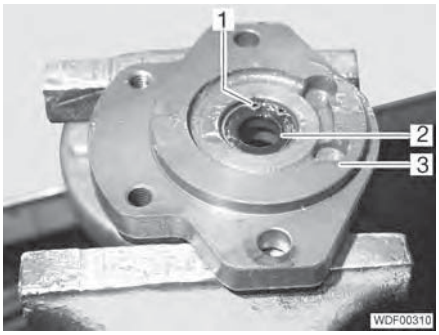


Fig. 152 Annular shaft seal

Replacing the annular shaft seal

- Remove the locking ring (Fig. 152,1).
- Drive out the shaft seal (Fig. 152,2) outwards.
- Clean the flange (Fig. 152,3) thoroughly.
- Drive in the new annular shaft seal from the outside sufficiently far so that the locking ring can engage.
- Insert the locking ring.

Assembling the gear pump

- Place the inner bearing (Fig. 149,4) onto the flange.
- Insert the gear wheel (Fig. 149,1) through the bearing and the flange.
- Insert the gear wheel (Fig. 149,3) into the inner bearing.
- Connect the outer bearing (Fig. 149,2) onto the gear wheels.
- Pull the housing (Fig. 148,3) over the internal components.
- Place the cover (Fig. 148,2) onto the housing.
- Screw in the 4 screws (Fig. 148,1) with washers and tighten.

Final work

- Install the gear pump (see the section 3.5.1 "Replacing the gear pump").

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

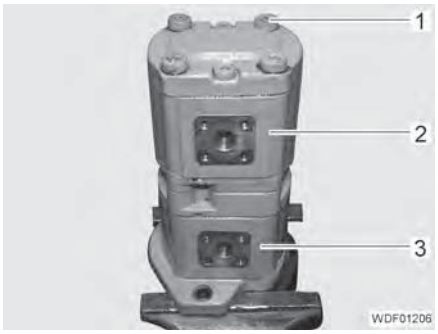


Fig. 153 Gear pump housing

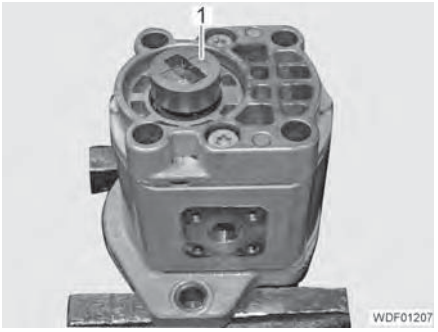


Fig. 154 Clutch

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.

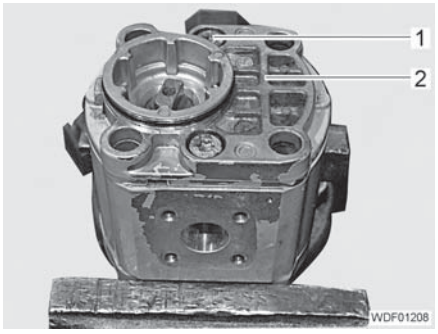


Fig. 155 Flange attachment

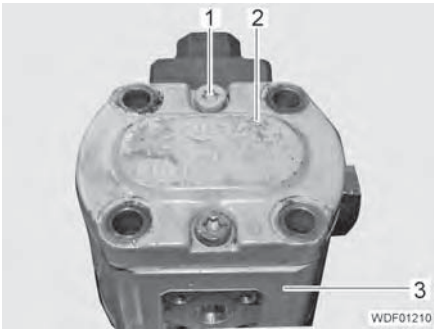


Fig. 156 Cover attachment

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.

▷ The position and sequence of the internal components is important.
Do not mix up any components and do not alter the installation position.

- Carefully remove the housing (Fig. 156,3) and place it aside.

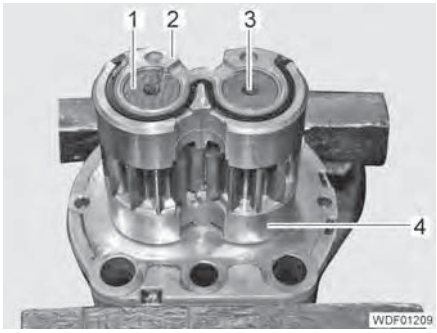


Fig. 157 Internal configuration

- Remove the outer bearing (Fig. 157,2) and place it aside.
- Remove the gears (Fig. 157,1 and 3) and place them aside.
- Remove the inner bearing (Fig. 157,4) and place it aside.

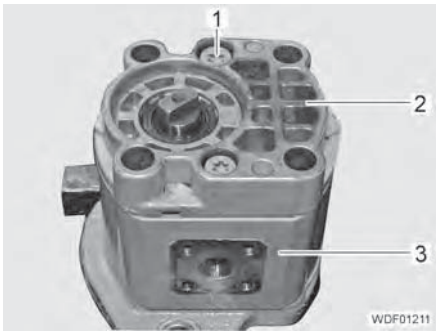


Fig. 158 Gear pump housing

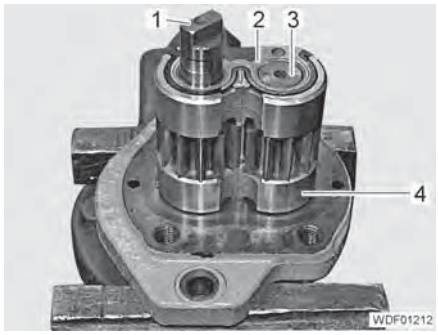


Fig. 159 Internal configuration

Disassembling the pump B

- Unscrew the 2 screws (Fig. 158,1).
- Remove the cover (Fig. 158,2) and place it aside.

▷ The position and sequence of the internal components is important.
Do not mix up any components and do not alter the installation position.

- Carefully remove the housing (Fig. 158,3) and place it aside.
- Remove the outer bearing (Fig. 159,2) and place it aside.
- Remove the gears (Fig. 159,1 and 3) and place them aside.
- Remove the inner bearing (Fig. 159,4) and place it aside.

Fig. 160 Bearing seal

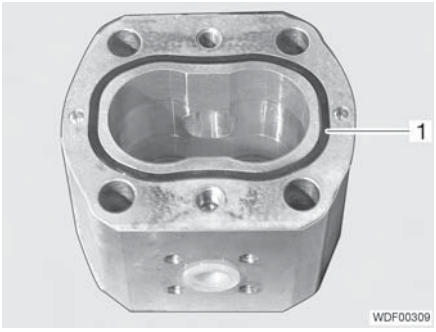


Fig. 161 Housing seal

Replacing the seals

- Remove 1 support ring (Fig. 160,2) on each of the 4 bearings.
- Remove 1 spectacle seal (Fig. 160,1) on each of the 4 bearings.
- Clean all bearings.
- Insert 1 new support ring into each of the 4 bearings.
- Insert 1 new spectacle seal into each of the 4 bearings.
- Remove 1 seal (Fig. 161,1) on both sides of the housings.
- Clean both housings.
- Insert 1 new seal on both sides of the two housings.

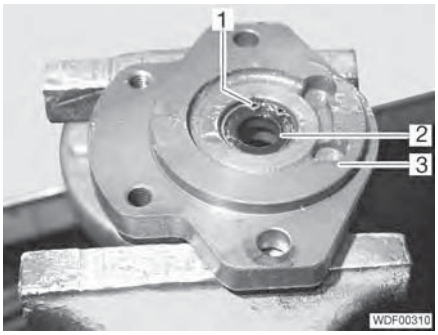


Fig. 162 Annular shaft seal

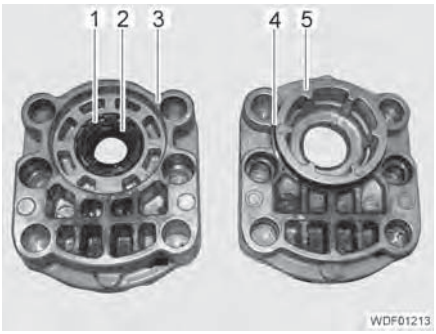


Fig. 163 Annular shaft seal and O-ring

Replacing the annular shaft seals and O-ring

- Remove the locking rings (Fig. 162,1 and Fig. 163,1).
- Drive out the annular shaft seals (Fig. 162,2 and Fig. 163,2) outwards.
- Remove the O-ring (Fig. 163,4).
- Thoroughly clean the flange (Fig. 162,3 and Fig. 163,5) and cover (Fig. 163,3).
- Drive in the new annular shaft seals from the outside sufficiently far so that the locking rings can engage.
- Insert the locking rings.
- Insert new O-ring.

Assembling the pump A

- Place the inner bearing (Fig. 157,4) onto the flange.
- Insert the gear wheel (Fig. 157,1) through the bearing and the flange.
- Insert the gear wheel (Fig. 157,3) into the inner bearing.
- Connect the outer bearing (Fig. 157,2) onto the gear wheels.
- Pull the housing (Fig. 156,3) over the internal components.
- Place the cover (Fig. 156,2) onto the housing.
- Screw in and tighten the 2 screws (Fig. 156,1).

- Carefully rotate the pump 180° and carefully tighten the cover (Fig. 156,2).
- Screw in and tighten the 2 screws (Fig. 155,1).

Assembling the pump B

- Place the inner bearing (Fig. 159,4) onto the flange.
- Insert the gear wheel (Fig. 159,1) through the bearing and the flange.
- Insert the gear wheel (Fig. 159,3) into the inner bearing.
- Connect the outer bearing (Fig. 159,2) onto the gear wheels.
- Pull the housing (Fig. 158,3) over the internal components.
- Place the cover (Fig. 158,2) onto the housing.
- Screw in and tighten the 2 screws (Fig. 158,1).

Connecting the dual pump

- Clean the clutch (Fig. 154,1) and insert it.
- Connect pump A (Fig. 153,2) to pump B (Fig. 153,3).
- Screw in 4 screws (Fig. 153,1) with washers and tighten.

Final work

- Install the gear pump (see the section 3.5.1 "Replacing the gear pump").

3.5.5 Removing the control valve

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

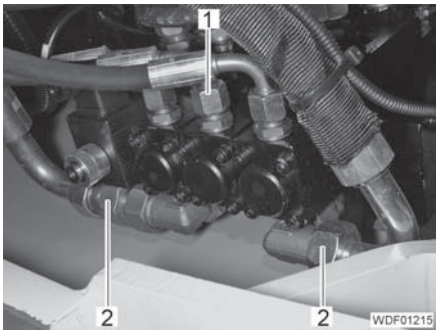


Fig. 164 Underside of the control valve

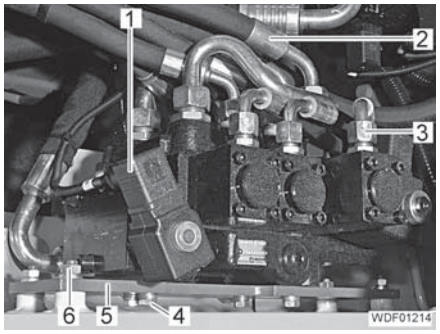


Fig. 165 Topside of the control valve

Removing the control valve

- Mark the hydraulic lines in order to prevent mix-ups.
- Mark the connectors in order to prevent mix-ups.
- Unscrew and close off the hydraulic lines (Fig. 164,2).
- Unscrew and close off the hydraulic lines (Fig. 164,1).
- Unscrew 1 screw on each of the connectors (Fig. 165,1), pull the connectors off and protect the contacts (e.g. with a protective cap).
- Unscrew and close off the hydraulic lines (Fig. 165,3).
- Unscrew and close off the hydraulic lines (Fig. 165,2).
- Unscrew the 4 nuts (Fig. 165,6).

- Lift out the control valve with metal plate.
- Unscrew the 4 screws (Fig. 165,4) and remove the metal plate (Fig. 165,5).

3.5.6 Installing the control valve

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

Spare parts and auxiliary equipment

Designation	Quantity
Control valve	1
Securing material (e.g. cable ties)	as req.

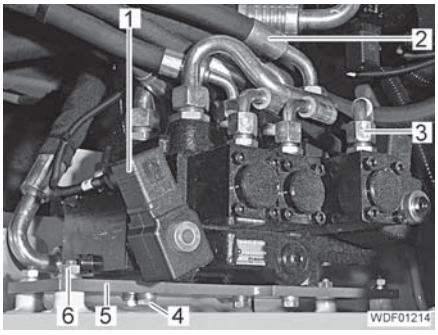


Fig. 166 Control valve attachment

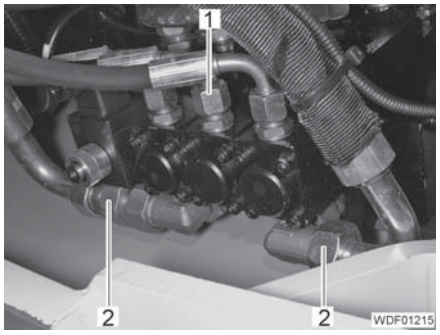


Fig. 167 Topside of the control valve

Installing the control valve

- Position plate (Fig. 166,5) and screw and tighten 4 screws (Fig. 166,4) with spring lock washers and disks.
- Position the control valve with plate from above.
- Screw the 4 nuts (Fig. 166,6) with spring lock washers and disks onto the thread and tighten.
- Screw the hydraulic lines (Fig. 166,2) onto the connection on the control valve and tighten.
- Screw the hydraulic lines (Fig. 166,3) onto the connection on the control valve and tighten.
- Plug the connectors (Fig. 166,1) onto the contacts and secure with 1 screw for each.
- Screw the hydraulic lines (Fig. 167,1) onto the connection on the control valve and tighten.
- Screw the hydraulic lines (Fig. 167,2) onto the connection on the control valve and tighten.

Final work

- Check the function of the control valve (see Part 3, "Checking the function of the control valve").
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").

3.5.7 Sealing the control valve

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

Requirements

Ensure the following:

- The control valve has been removed (see the section 3.5.5 "Removing the control valve").

Spare parts and auxiliary equipment

Designation	Quantity
Set of seals	1
Locking agent (e.g. Loctite®)	as req.
Lubricating grease	as req.

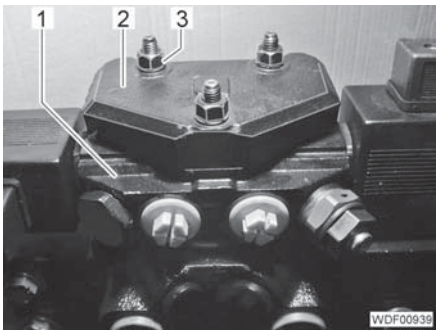


Fig. 168 Cover attachment

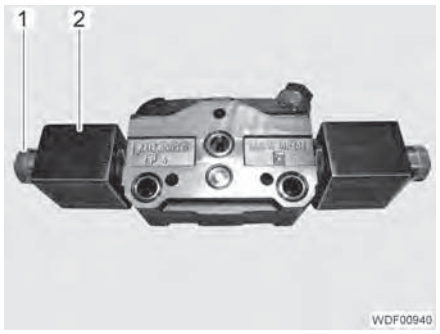


Fig. 169 Additional segment

Removing the additional segment

- Unscrew the 3 nuts (Fig. 168,3).
- Remove the cover (Fig. 168,2).
- Remove the additional segment (Fig. 168,1).
- Unscrew 1 nut (Fig. 169,1) on both sides.
- Remove 1 coil (Fig. 169,2) on both sides.

▷ To prevent damage do not tension components on the sealing surfaces.

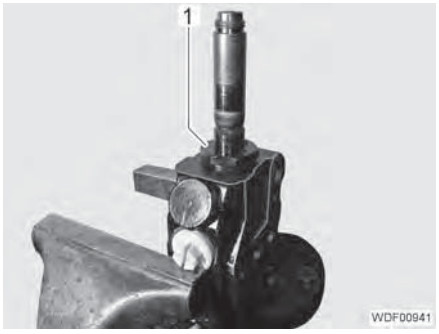


Fig. 170 Core attachment

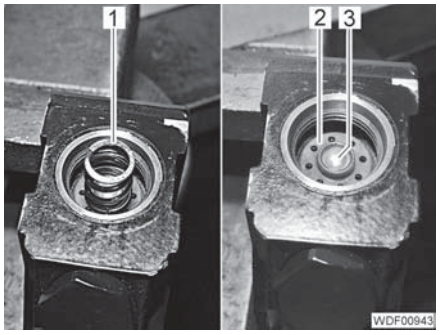


Fig. 171 Spring and disk

Sealing the cores

- Unscrew 1 core (Fig. 170,1) on both sides.
- Remove 1 spring (Fig. 171,1) and 1 disk (Fig. 171,2) on both sides.
- Check that control pistons (Fig. 171,3) move easily.

▷ To simplify installation, rotate the component so that the core can be installed in the horizontal position.

▷ Lightly grease the slide valves, springs and disks.

- Insert 1 spring (Fig. 171,2) and 1 disk (Fig. 171,1) on both sides.

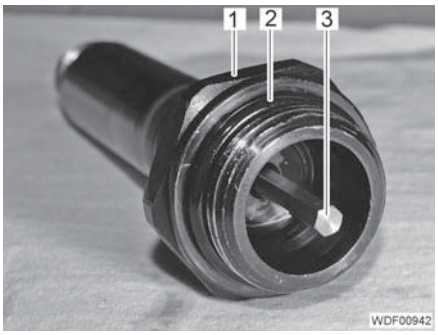


Fig. 172 Core with slide valve

- Replace 1 O-ring (Fig. 172,2).
- Screw in the core (Fig. 172,1) with the slide valve (Fig. 172,3) into the segment and tighten it hand-tight.

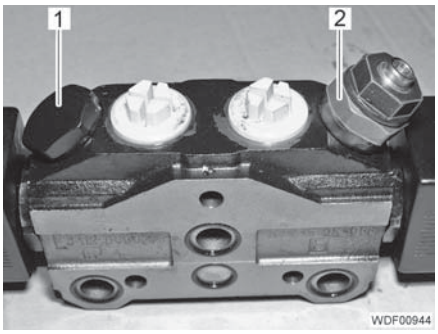


Fig. 173 Plug and pressure control valve

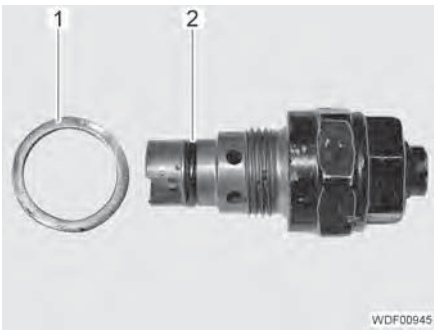


Fig. 174 Pressure control valve

Sealing the plug and pressure control valve

- Unscrew the plug (Fig. 173,1) and pressure control valve (Fig. 173,2).
- Clean the plug and pressure control valve.
- Replace 1 O-ring (Fig. 174,2) and 1 copper seal (Fig. 174,1).
- Screw in plug (Fig. 173,1) and pressure control valve (Fig. 173,2) and tighten.

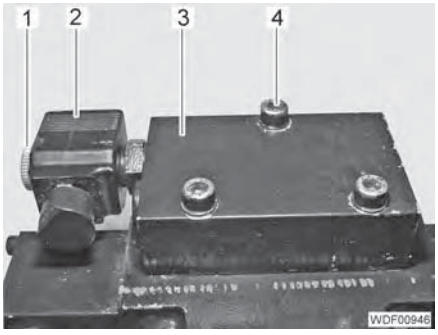


Fig. 175 Valve block attachment

Removing the valve block

- Unscrew the nut (Fig. 175,1).
- Remove the coil (Fig. 175,2).

- Unscrew the 3 screws (Fig. 175,4).
- Remove the valve block (Fig. 175,3).

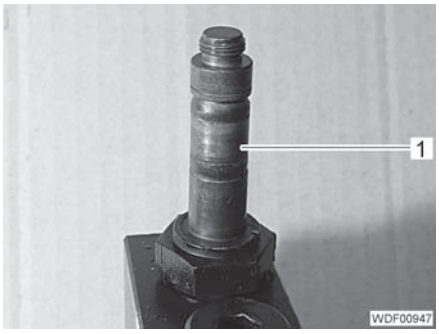


Fig. 176 Pressure relief valve

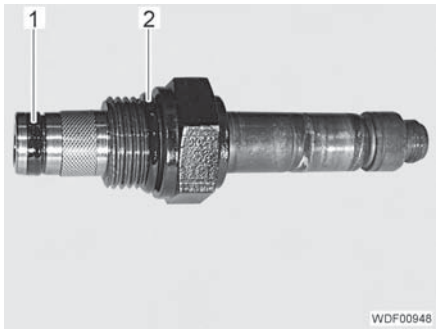


Fig. 177 Seals

Sealing the pressure relief valve

- Unscrew the pressure relief valve (Fig. 176,1).
- Clean the pressure relief valve.
- Replace the O-ring (Fig. 177,1) with support ring and O-ring (Fig. 177,2).
- Screw in the pressure relief valve (Fig. 176,1) and tighten hand-tight.

▷ Under the longest cover is located a spring that is under slight pressure.

▷ Centering pieces are pushed onto the retaining screws between the cover and valve body.

▷ Do not damage or lose the centering pieces.

▷ The following instruction describes how to seal a cover. The other covers are sealed in the same way.

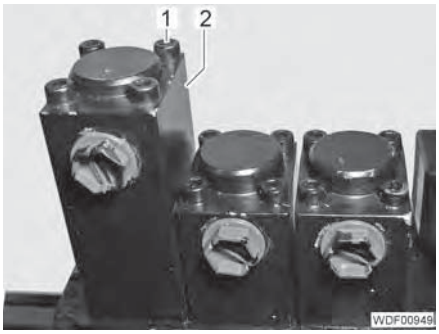


Fig. 178 Cover attachment

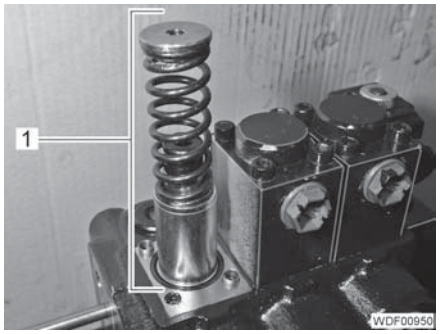


Fig. 179 Spring assembly

Sealing the cover

- Unscrew the 4 screws (Fig. 178,1).
- Remove the cover (Fig. 178,2).
- Remove the spring assembly (Fig. 179,1) (if present).

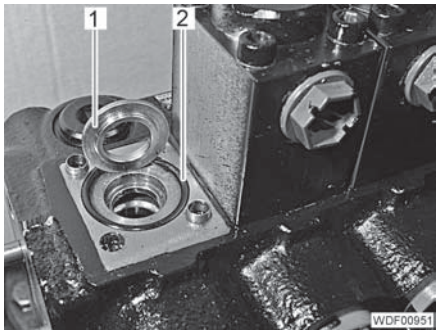


Fig. 180 Washer and O-ring

- Remove the washer (Fig. 180,1).
- Replace the O-ring (Fig. 180,2).
- Insert the ring (Fig. 180,1).
- Position the spring assembly (Fig. 179,1) (if present).
- Coat the thread of the screws (Fig. 178,1) with locking agent.
- Simultaneously press the cover (Fig. 178,2) against the valve body and screw in and tighten 4 screws (Fig. 178,1).

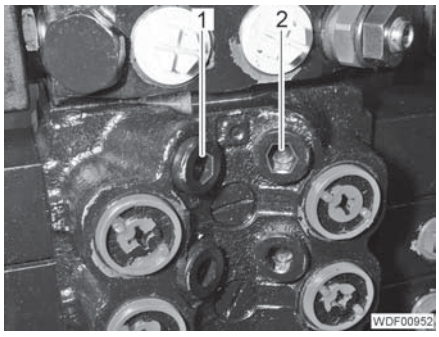


Fig. 181 Topside of the control valve

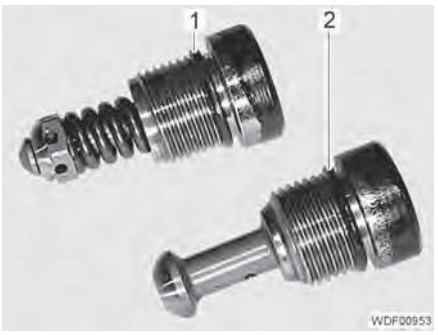


Fig. 182 O-rings

Sealing the secondary pressure control valves

- Mark the secondary pressure control valves (Fig. 181,2) and plugs (Fig. 181,1) in order to prevent mix-ups.
- Unscrew the plug (Fig. 181,1).
- Unscrew the 3 secondary pressure control valves (Fig. 181,2).
- Replace the O-rings (Fig. 182,1 and 2).
- Screw in and tighten the 3 secondary pressure control valves (Fig. 181,2) hand-tight.
- Screw in the plug (Fig. 181,1) and tighten hand-tight.

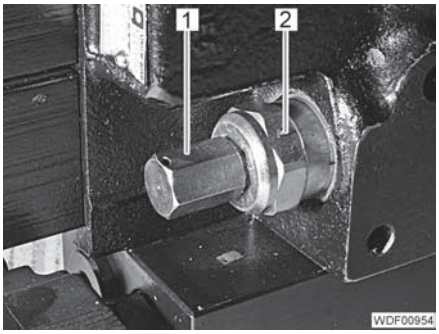


Fig. 183 Primary pressure control valve

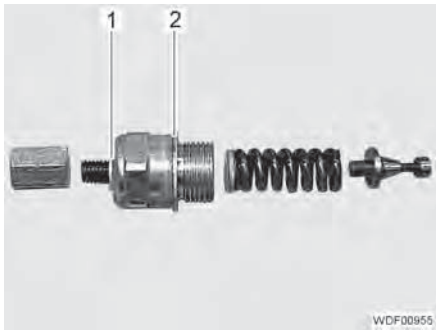


Fig. 184 Seals

Sealing the primary pressure control valve

- Unscrew the cap (Fig. 183,1).
- Unscrew the primary pressure control valve (Fig. 183,2).
- Replace the copper seals (Fig. 184,1 and 2).
- Screw in the primary pressure control valve (Fig. 183,2) and tighten hand-tight.
- Fit the cap (Fig. 183,1) onto the primary pressure control valve and tighten it hand-tight.

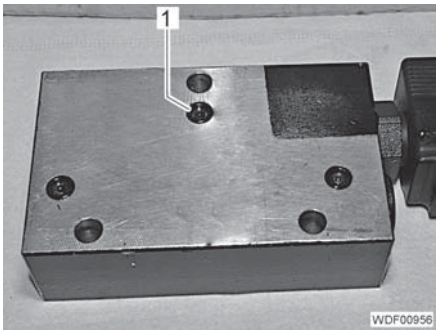


Fig. 185 Sealing surface of the valve block

Removing the valve block

- Clean the surface of the valve block (Fig. 185).
- Replace the 3 O-rings (Fig. 185,1).
- Clean the surfaces of the control valve.
- Position the valve block (Fig. 175,3).
- Screw in the 3 screws (Fig. 175,4) with spring lock washers and tighten with a tightening torque of 20 Nm.

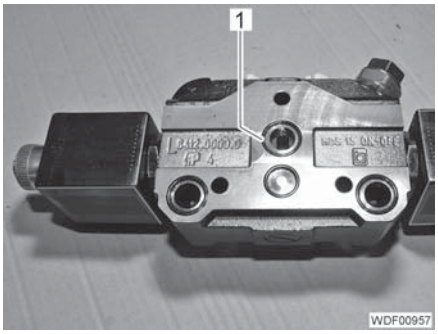


Fig. 186 Additional segment

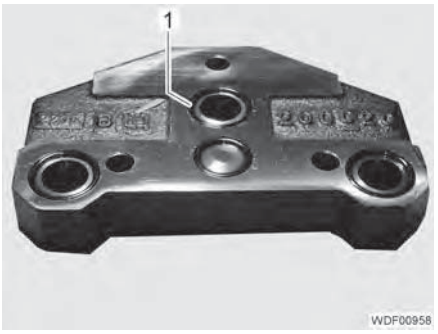


Fig. 187 Cover

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 valve of the vibration damping unit

▶ **WARNING**

Risk of injury from escaping hydraulic oil!

The diaphragm accumulator stores the pressure in the vibration damping unit even if the rest of the hydraulic system is pressureless.

Release the stored pressure before carrying out repairs to the vibration damping unit.

▷ 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").

Spare parts and auxiliary equipment

Designation	Quantity
Valve	1

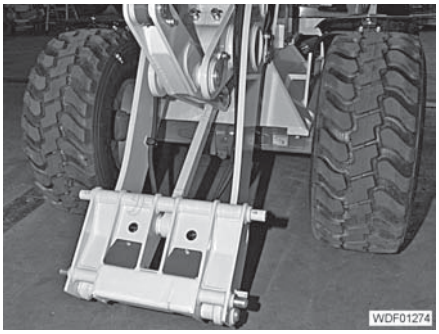


Fig. 188 Load arm in lowered position

Releasing the stored pressure

- Fully lower and curl in the load arm (Fig. 188).
- Switch on the ignition.
- Switch on the vibration damping unit (see operator's manual "Lift frame - vibration damping unit").
- Move the multi-function lever **slowly** between the positions "Raise" and "Lower" a multiple number of times (see operator's manual "Control lever for lift frame").

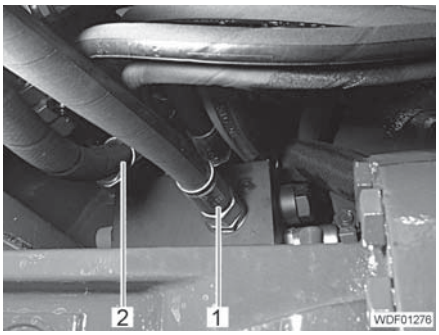


Fig. 189 Hydraulic lines

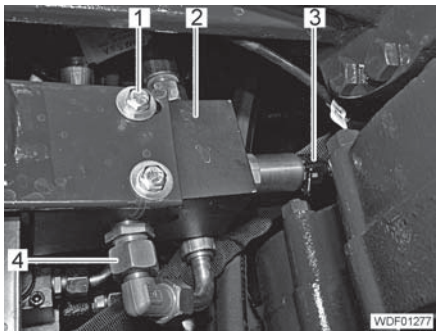


Fig. 190 Valve attachment

Removing the valve

- Unscrew and close off the 2 hydraulic lines (Fig. 189,1 and 2).
- Remove the plug (Fig. 190,3).
- Unscrew and close off the hydraulic line (Fig. 190,4).
- Unscrew the 2 screws (Fig. 190,1) and remove the valve (Fig. 190,2).

Installing the valve

- Place on the valve (Fig. 190,2).
- Insert and tighten 2 screws (Fig. 190,1) with spring lock washers and disks.
- Screw the hydraulic line (Fig. 190,4) onto the connection on the valve and tighten.
- Insert the connector (Fig. 190,3) on the valve.
- Screw the 2 hydraulic lines (Fig. 189,1 and 2) onto the connections on the valve and tighten.

Final work

- Install the base plate (see the section 6.2.2 "Replacing the base plate").

3.5.9 Replacing the diaphragm accumulator of the vibration damping unit

▶ **WARNING**

Risk of injury from escaping hydraulic oil!

The diaphragm accumulator stores the pressure in the vibration damping unit even if the rest of the hydraulic system is pressureless.

Release the stored pressure before carrying out repairs to the vibration damping unit.

▷ 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").

Spare parts and auxiliary equipment

Designation	Quantity
Diaphragm accumulator	1

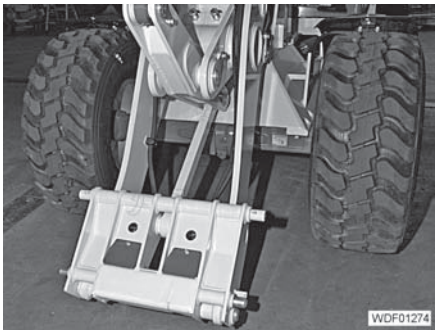


Fig. 191 Load arm in lowered position

Releasing the stored pressure

- Fully lower and curl in the load arm (Fig. 191).
- Switch on the ignition.
- Switch on the vibration damping unit (see operator's manual "Lift frame - vibration damping unit").
- Move the multi-function lever **slowly** between the positions "Raise" and "Lower" a multiple number of times (see operator's manual "Control lever for lift frame").

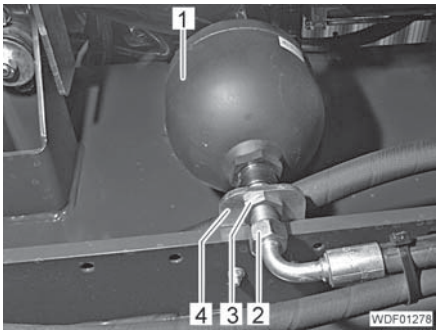


Fig. 192 Diaphragm accumulator

Replacing the diaphragm accumulator

- Unscrew and close off the hydraulic line (Fig. 192,2).
- Unscrew the nut (Fig. 192,3).
- Remove the diaphragm accumulator (Fig. 192,1).
- Insert new diaphragm accumulator into the holder (Fig. 192,4).
- Screw the nut (Fig. 192,3) onto the connection of the diaphragm accumulator and tighten.
- Screw the hydraulic line (Fig. 192,2) onto the connection of the diaphragm accumulator and tighten.

Final work

- Install the base plate (see the section 6.2.2 "Replacing the base plate").

3.6 Working hydraulics (hydraulic cylinder)

3.6.1 Replacing the lifting cylinder

▶ **CAUTION**

Risk of injury by a heavy component.

The lifting cylinder weighs approx. 23 kg.

When removing and installing the lifting cylinder, use suitable lifting gear or work with another person.

▷ 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.

▷ This section describes replacement of a lifting cylinder.

The second lifting cylinder is replaced in the same way.

Spare parts and auxiliary equipment

Designation	Quantity
Hydraulic cylinder	1
Lubricating grease	as req.

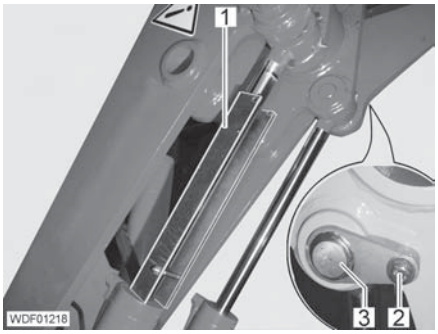


Fig. 193 Securing the lift frame

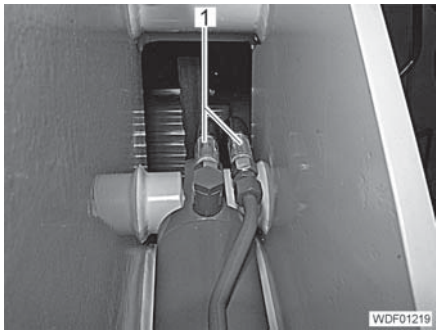


Fig. 194 Hydraulic lines

Removing the lifting cylinder, rod end

- Raise the lifting cylinder, and to prevent accidental lowering, secure it at the side (Fig. 193,1) on which the lifting cylinder **is not** being replaced.
- Depressurize the hydraulic system (see the section 3.1.1 "Depressurizing the hydraulic system").
- Unscrew the screw (Fig. 193,2).
- Hold onto the lifting cylinder and knock out the pins (Fig. 193,3).
- Carefully place the lifting cylinder on the front carriage.
- Insert the lifting cylinder fully.
- Detach and close off the hydraulic lines (Fig. 194,1).

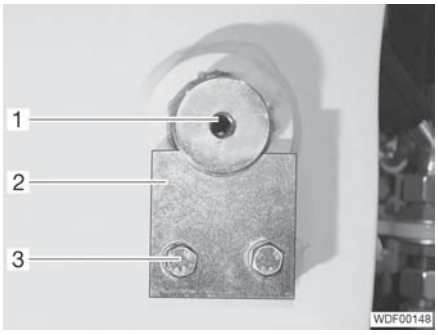


Fig. 195 Pin attachment

Removing the lifting cylinder, bottom end

- Unscrew the 2 screws (Fig. 195,3) and remove the locking plate (Fig. 195,2).
- At the same time, hold the lifting cylinder in place and drive out the pin (Fig. 195,1), removing the shim washers if necessary.
- Remove the lifting cylinder (two persons).
- Unscrew the screw attachments if necessary.

Installing the lifting cylinder, bottom end

- Screw in and tighten the screw attachments if necessary.
- Insert the lifting cylinder so that the pin holders at the bottom end line up exactly.
- Insert shim washers if necessary.
- Grease pin and bearing slightly.
- Drive in the pin (Fig. 195,1) so that the groove for the locking plate points towards the screws (Fig. 195,3).
- Insert the locking plate (Fig. 195,2).
- Insert and tighten 2 screws (Fig. 195,3) with spring lock washers and disks.

Installing the lifting cylinder, rod end

- Screw the hydraulic lines (Fig. 194,1) onto the connections on the lifting cylinder and tighten.
- At the same time, raise the lifting cylinder and extend it sufficiently far that the pin holders at the rod end line up exactly.
- Grease pin and bearing slightly.
- Drive in the pin (Fig. 193,3).
- Screw in and tighten the screw (Fig. 193,2) with the washer.

Final work

- Lubricate the lifting cylinder bearings.

3.6.2 Removing the tipping cylinder

▶ **CAUTION**

Risk of injury by a heavy component.

The tipping cylinder weighs approx. 22.5 kg.

When removing and installing the tipping cylinder, use suitable lifting gear or work with another person.

▷ 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.

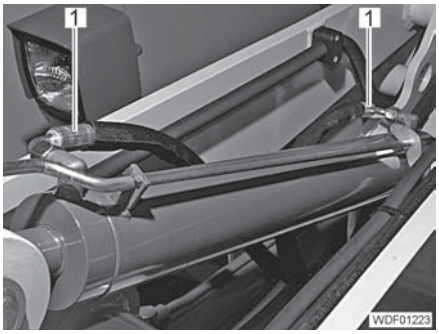


Fig. 196 Hydraulic lines

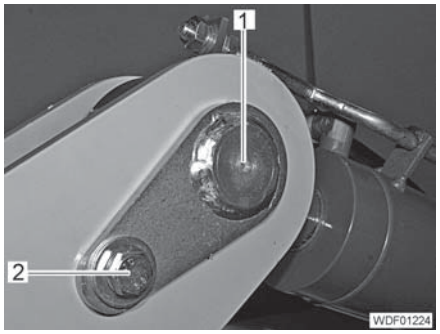


Fig. 197 Rod end attachment

Removing the tipping cylinder, rod end

- Fully tilt out the tool attachment and place it on a suitable surface (e.g. workbench) so that it cannot tip over.
- Depressurize the hydraulic system (see the section 3.1.1 "Depressurizing the hydraulic system").
- Detach and close off the hydraulic lines (Fig. 196,1) at the rod end and bottom end.
- Unscrew the screw (Fig. 197,2).
- Drive out the pin (Fig. 197,1).

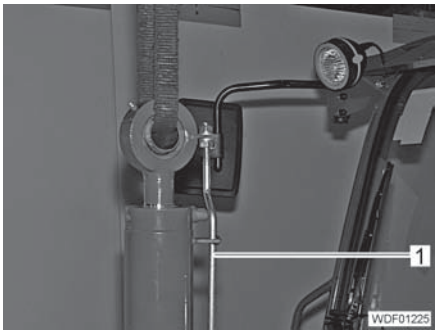


Fig. 198 Raising the tipping cylinder

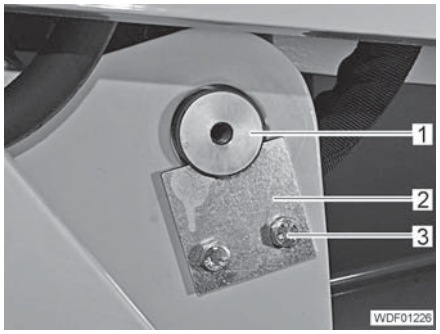


Fig. 199 Bottom end attachment

▷ Do not bend or damage the tilting indicator (Fig. 198,1).

Removing the tipping cylinder, bottom end

- Raise the tipping cylinder at the rod end as far as possible using suitable lifting gear (e.g. a crane) (Fig. 198).
- Unscrew the 2 screws (Fig. 199,3) and remove the locking plate (Fig. 199,2).
- Drive out the pin (Fig. 199,1) and remove the shim washers if necessary.
- Remove the tipping cylinder.
- Unscrew the screw attachments if necessary.

3.6.3 Installing the tipping cylinder

► **CAUTION**

Risk of injury by a heavy component.

The tipping cylinder weighs approx. 22.5 kg.

When removing and installing the tipping cylinder, use suitable lifting gear or work with another person.

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

▷ Do not bend or damage the tilting indicator (Fig. 200,1).

▷ 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
Hydraulic cylinder	1
Lubricating grease	as req.

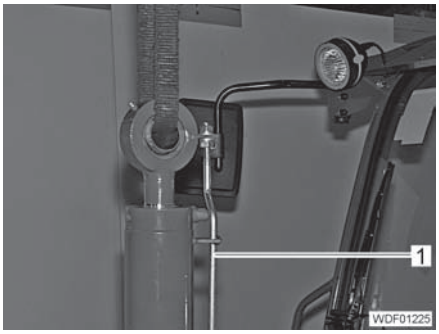


Fig. 200 Raising the tipping cylinder

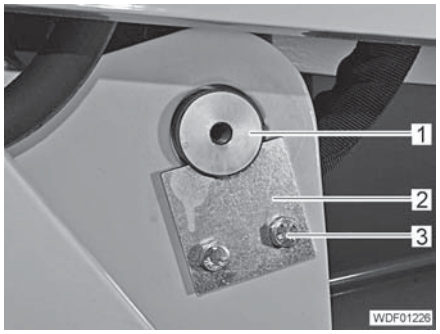


Fig. 201 Bottom end attachment

Installing the tipping cylinder, bottom end

- Screw in and tighten the screw attachments if necessary.
- Using suitable lifting gear (e.g. a crane), guide the tipping cylinder into the front carriage from above so that the pin holders line up precisely.
- If present, insert the shim washers.
- Grease pin and bearing slightly.
- Drive in the pin (Fig. 201,1) so that the groove for the locking plate points towards the screws (Fig. 201,3).
- Insert the locking plate (Fig. 201,2).
- Insert and tighten 2 screws (Fig. 201,3) with spring lock washers and disks.

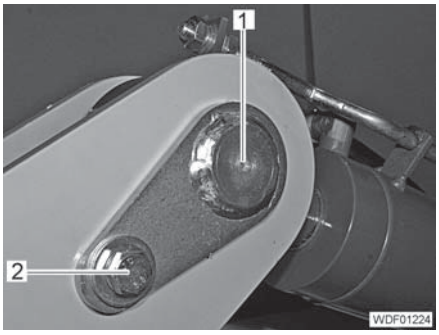


Fig. 202 Rod end attachment

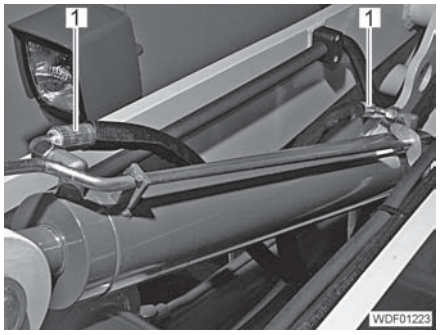


Fig. 203 Hydraulic lines

Installing the tipping cylinder, rod end

- Lower the tipping cylinder until the rod-end pin holders line up precisely.
- Grease pin and bearing slightly.
- Drive in the pin (Fig. 202,1).
- Screw in and tighten the screw (Fig. 202,2) with the washer.
- Screw the hydraulic lines (Fig. 203,1) onto the rod-end and bottom end connections and tighten.

Final work

- Lubricate the tipping cylinder bearings.

3.6.4 Replacing components of the load holding control valve

▶ **DANGER**

Risk of death from uncontrolled lowering of the lift frame!

The load holding control valve is a safety component.

Do not adjust the pressure control valve (Fig. 204,6).

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

Requirements

Ensure the following:

- The hydraulic cylinder on which a component of the load holding control valve is to be replaced is not under load.
- The hydraulic system is depressurized (see the section 3.1.1 "Depressurizing the hydraulic system").

Spare parts and auxiliary equipment

Designation	Quantity
Coil	as req.
Valve insert	as req.

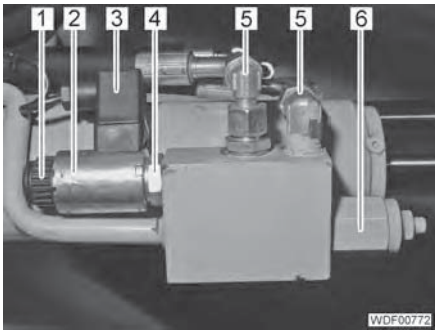


Fig. 204 Load holding control valve

Removing the coil

- Detach the hydraulic lines (Fig. 204,5) to allow the residual pressure to escape.
- Unscrew the screw (Fig. 204,3) on the connector.
- Pull off the plug and protect the contacts.
- Unscrew the nut (Fig. 204,1).
- Pull off the coil (Fig. 204,2).

Replacing the valve insert

- Unscrew the valve insert (Fig. 204,4).
- Screw in and tighten a new valve insert.

Installing the coil

- Plug the coil (Fig. 204,2) onto the valve insert (Fig. 204,4).
- Screw the nut (Fig. 204,1) onto the valve insert and tighten it hand-tight.
- Attach the plug (Fig. 204,3) onto the coil and secure it with a screw.
- Tighten the hydraulic lines (Fig. 204,5).

Replacing the pressure control valve

- Unscrew the pressure control valve (Fig. 204,6).
- Screw in and tighten the new pressure control valve.

Final work

- Check the function of the load holding control valve.

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.

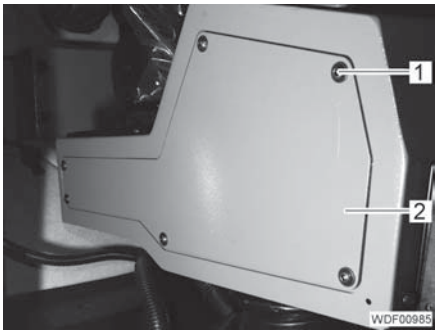


Fig. 205 Cover attachment

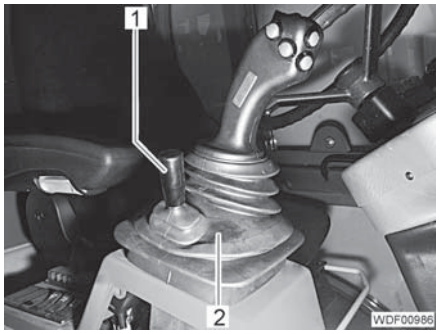


Fig. 206 Control lever

Opening the console

- Unscrew the 6 screws (Fig. 205,1).
- Remove the cover (Fig. 205,2).
- Unscrew the handle (Fig. 206,1) from the control lever of the auxiliary hydraulics.
- Carefully remove the bellows (Fig. 206,2) upwards.

Fig. 207 Control unit

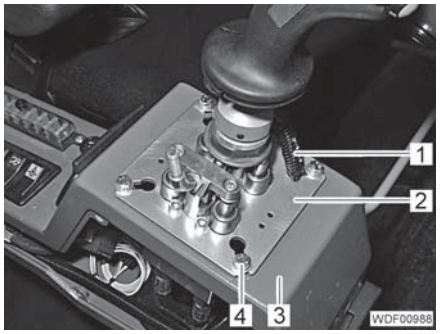


Fig. 208 Pilot control attachment

Removing the cable

- Unplug the plug (Fig. 207) on the control unit.
- Carefully trim the hose (Fig. 208,1) so that a small amount lies above the plate (Fig. 208,2) without damaging the cable.
- Pull the hose down just sufficiently to stop it protruding out of the plate.
- Unscrew the 4 screws (Fig. 208,4).
- Set the lowest weight on the driver's seat (see operator's manual "Setting the driver's seat").
- Simultaneously place a weight on the driver's seat and pull out the cable at the side from the metal plate (Fig. 208,2).
- Carefully pull out the cable with plug from between the plate (Fig. 208,2) and console (Fig. 208,3).

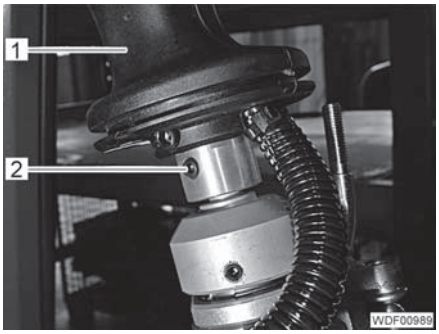


Fig. 209 Multi-function lever attachment

Removing the multi-function lever

- Loosen the stud screw (Fig. 209,2) but do not unscrew it.
- Unscrew the multi-function lever (Fig. 209,1).
- If necessary pull the cable from the pieces of tubing.

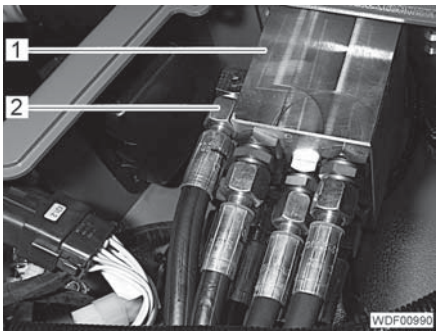


Fig. 210 Hydraulic lines

Replacing the pilot control

- Mark the hydraulic lines in order to prevent mix-ups.
- Unscrew the 8 hydraulic lines (Fig. 210,2).
- Remove the pilot control (Fig. 210,1) upwards.
- Unscrew the screw attachments and reuse them if necessary.
- Insert new pilot control (Fig. 210,1) from above.
- Screw the 8 hydraulic lines (Fig. 210,2) onto the connections on the pilot control and tighten.

Installing the multi-function lever

- If necessary, push the pieces of tubing over the cable.
- Screw the multi-function lever (Fig. 209,1) onto the thread and align it.
- Tighten the stud screw (Fig. 209,2) hand-tight.

Installing the cable

- Place a weight on the driver's seat and simultaneously push the cable with plug between the plate (Fig. 208,2) and console (Fig. 208,3).
- Thread the cable into the plate (Fig. 208,2) from the side.
- Push the hose (Fig. 208,1) from below through the sheet (Fig. 208,2) and secure (e.g. with cable ties).
- Insert and tighten 4 screws (Fig. 208,4) with spring lock washers and disks.
- Plug in the plug (Fig. 207) on the control unit.

Closing the console

- Pull the bellows (Fig. 206,2) carefully upwards over the control levers.
- Screw the nut (Fig. 206,1) onto the control lever of the auxiliary hydraulic and tighten it hand-tight.

- Position the cover (Fig. 205,2).
- Screw in and tighten the 6 screws (Fig. 205,1).

Final work

- Check the function of the pilot control (see Part 3, "Checking the function of the pilot control").
- Fit the radio console (see section 7.2.7 "Replacing the radio console").
- If necessary, adjust the resting strength and play (see section 3.7.3 "Adjusting the resting strength and play of the pilot control").

3.7.3 Adjusting the resting strength and play of the pilot control

▷ Adjust the resting strength so that the multi-function handle always remains in the zero position regardless of the driving position.

▷ Adjust the pilot control free of play with slight initial tension.

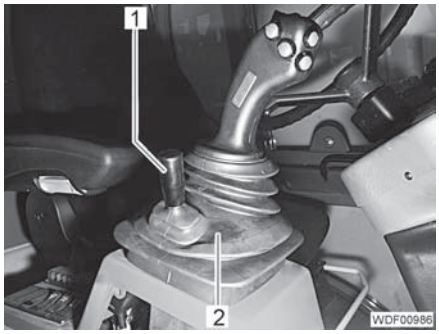


Fig. 211 Control lever

Removing the bellows

- Unscrew the handle (Fig. 211,1) from the control lever of the auxiliary hydraulics.
- Carefully remove the bellows (Fig. 211,2) upwards.

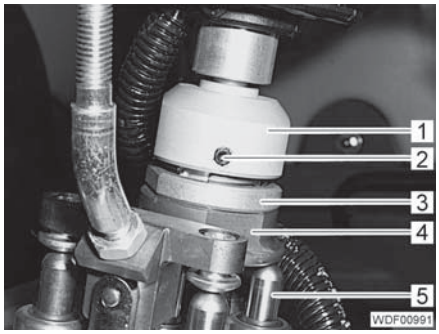


Fig. 212 Pilot control

Adjusting the resting strength

- Loosen the stud screw (Fig. 212,2) but do not unscrew it.
- Adjust the desired resting strength on the adapter (Fig. 212,1):
  - Rotate the adapter clockwise: the resting strength increases.
  - Rotate the adapter counter-clockwise: the resting strength decreases.
- Tighten the stud screw (Fig. 212,2) hand-tight.

Adjusting the play

- Release the locking ring (Fig. 212,3).
- Twist the adjusting ring (Fig. 212,4) until it touches all pressure regulators (Fig. 212,5).

- Rotate the adjusting ring by 1/8 in a clockwise direction to generate an initial tension.
- Tighten the locking ring (Fig. 212,3).

Fitting the bellows

- Pull the bellows (Fig. 211,2) carefully upwards over the control levers.
- Screw the nut (Fig. 211,1) onto the control lever of the auxiliary hydraulic and tighten it hand-tight.

3.7.4 Replacing the pulsation damper

▷ 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 base plate has been removed (see the section 6.2.2 "Replacing the base plate").

Spare parts and auxiliary equipment

Designation	Quantity
Pulsation damper	1

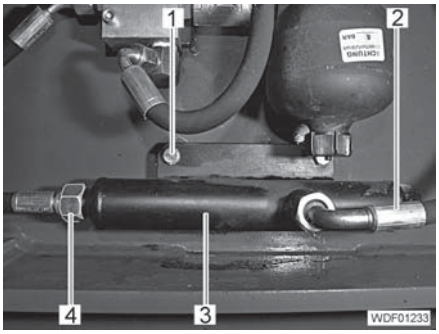


Fig. 213 Pulsation damper attachment

Replacing the pulsation damper

- Unscrew and close off the 2 hydraulic lines (Fig. 213,2 and 4).
- Unscrew the 2 screws (Fig. 213,1).
- Remove the pulsation damper (Fig. 213,3).
- Put a new pulsation damper in position.
- Screw in 2 screws (Fig. 213,1) with washers and tighten.
- Screw the 2 hydraulic lines (Fig. 213,2 and 4) onto the connections on the pulsation damper and tighten.

Final work

- Install the base plate (see the section 6.2.2 "Replacing the base plate").

3.7.5 Replacing the diaphragm accumulator

▷ 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 engine hood is open (see operator's manual "Opening the engine hood").

Spare parts and auxiliary equipment

Designation	Quantity
Diaphragm accumulator	1

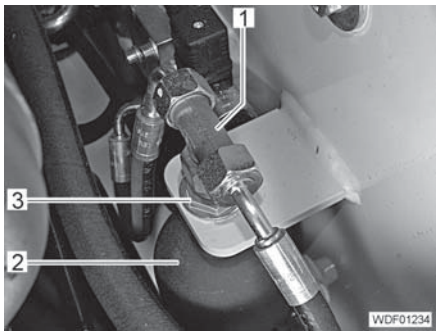


Fig. 214 Hydraulic line

Replacing the diaphragm accumulator

- Unscrew and close off the hydraulic line (Fig. 214,1).
- Unscrew the nut (Fig. 214,3).
- Remove the diaphragm accumulator (Fig. 214,2) downwards.
- Position a new diaphragm accumulator from below.
- Screw in and tighten the nut (Fig. 214,3) with washer onto the connection on the diaphragm accumulator.
- Screw the hydraulic line (Fig. 214,1) onto the connection on the diaphragm accumulator and tighten it.

Final work

- Close the engine hood.

3.7.6 Replacing the 2/2-way valve of the control hydraulic

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

Spare parts and auxiliary equipment

Designation	Quantity
2/2-way valve	1

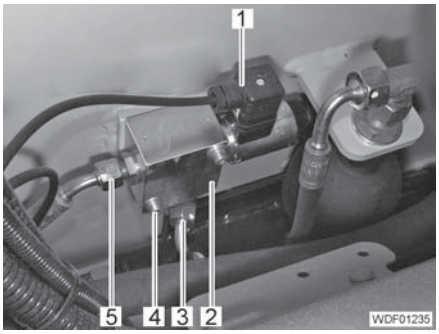


Fig. 215 2/2-way valve

Replacing the 2/2-way valve

- Unscrew screw on plug (Fig. 215,1), remove plug and protect the contacts (e.g. with protective cap).
- Unscrew and close off the 2 hydraulic lines (Fig. 215,3 and 5).
- Unscrew the 2 screws (Fig. 215,4).
- Remove the 2/2-way valve (Fig. 215,2).
- Position a new 2/2-way valve.
- Insert and tighten 2 screws (Fig. 215,4) with spring lock washers and disks.
- Screw the 2 hydraulic lines (Fig. 215,3 and 5) onto the connections on the 2/2-way valve and tighten.
- Attach the plug (Fig. 215,1) to the contacts and secure it with a screw.

Final work

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

3.8 Auxiliary hydraulics and hydraulic lock

3.8.1 Replacing the locking cylinder

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

Spare parts and auxiliary equipment

Designation	Quantity
Locking cylinder	1
Stop nut	2

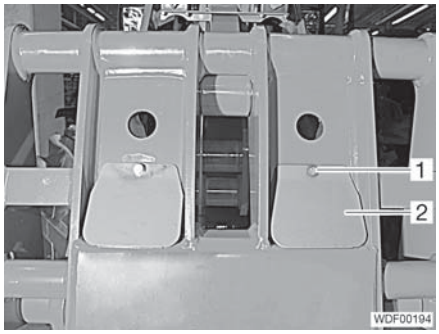


Fig. 216 Covers

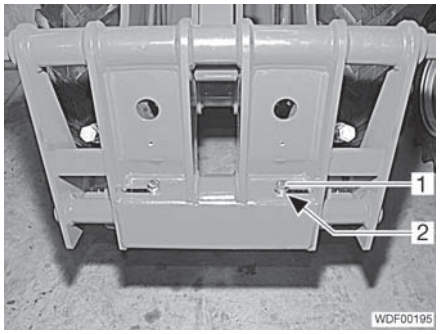


Fig. 217 Pin attachment

Removing the pins

- Unscrew 1 screw (Fig. 216,1) for each.
- Remove the covers (Fig. 216,2).
- Unscrew 1 screw (Fig. 217,1) for each.
- Remove 1 sleeve (Fig. 217,2) in each case.
- Push the pin fully out.

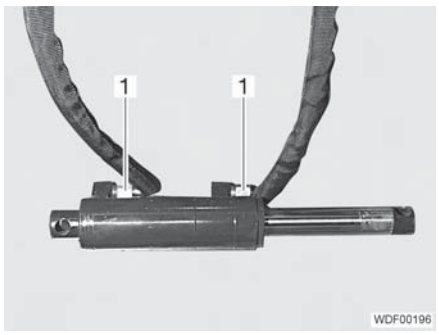


Fig. 218 Locking cylinder

Removing the locking cylinder

- Retract the locking cylinder fully.
- Lift the locking cylinder upwards and to the rear out of the tool attachment.
- Extend the locking cylinder fully.
- With the engine switched off, move the auxiliary hydraulics lever back and forth several times in order to depressurize the auxiliary hydraulics.
- Unscrew and close off the hydraulic lines (Fig. 218,1).

Installing the locking cylinder

- Screw the hydraulic lines (Fig. 218,1) onto the connections on the locking cylinder and tighten.
- Retract the locking cylinder fully.
- Insert the locking cylinder into the tool attachment from the rear and above.

Fitting the pins

- Attach the rod-end pin onto the locking cylinder.
- Screw in and tighten the screw (Fig. 217,1) with a sleeve (Fig. 217,2).
- Attach the rod-end pin onto the locking cylinder.
- Screw in and tighten the screw with the washer.
- Place on the covers (Fig. 216,2).
- Screw in and tighten 1 screw (Fig. 216,1) in each case.

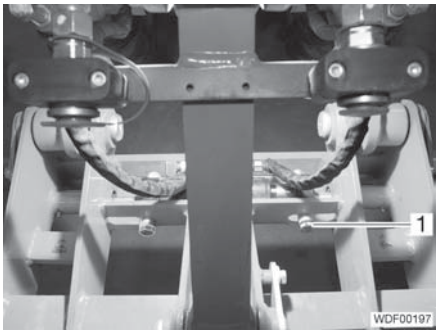


Fig. 219 Euro holder

▷ In the case of the Euro holder, the retaining screws (Fig. 219,1) of the locking pins are not behind a cover.

3.9 Tank, filter and hydraulic lines

3.9.1 Replacing 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 hydraulic fluid tank is empty (see operator's manual "Replacing the hydraulic fluid").
- The base plate has been removed (see the section 6.2.2 "Replacing the base plate").
- The engine hood is open (see operator's manual "Opening the engine hood").

Spare parts and auxiliary equipment

Designation	Quantity
Hydraulic fluid tank	1

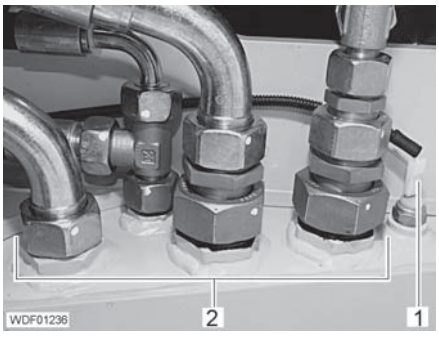


Fig. 220 Connections on the underside

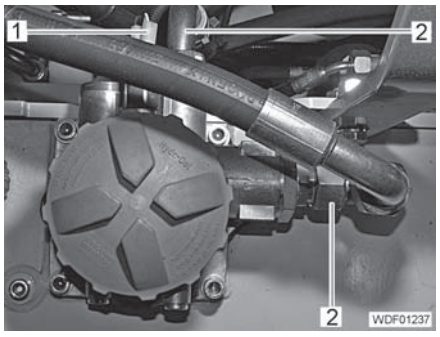


Fig. 221 Connections on the topside

Detaching the lines

- Remove the plug (Fig. 220,1) from the temperature sensor.
- Unscrew and close off the hydraulic lines (Fig. 220,2).
- Remove the 2 connectors (Fig. 221,1) from the pressure switch.
- Unscrew and close off the hydraulic lines (Fig. 221,2).

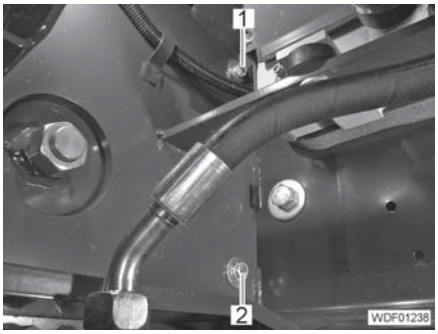


Fig. 222 Rear attachment

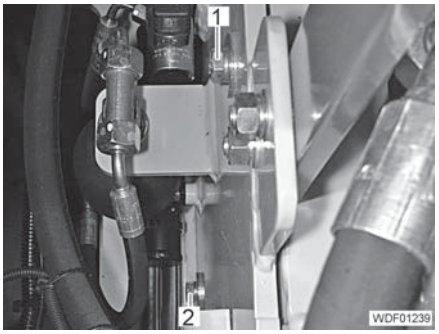


Fig. 223 Front attachment (top)

Replacing the hydraulic fluid tank

- Mark the position of the hydraulic fluid tank on the rear carriage.
- Unscrew the screw (Fig. 222,2) and the screw (Fig. 223,2).
- Hold the hydraulic oil tank and simultaneously unscrew the screw (Fig. 222,1) and screw (Fig. 223,1).
- Remove the hydraulic fluid tank to the side.
- Replace the return filter if necessary.
- Position hydraulic oil tank at the side and simultaneously screw in the screw (Fig. 222,1) and screw (Fig. 223,1) with spring lock washers and disks.
- Screw in screw (Fig. 223,2) and screw (Fig. 222,2) with spring lock washers and disks.
- Align the hydraulic fluid tank and tighten the screws.

Connecting the lines

- Screw the hydraulic lines (Fig. 221,2) onto the return filter and tighten.
- Connect the 2 connectors (Fig. 221,1) to the pressure switch.
- Screw the hydraulic lines (Fig. 220,2) onto the connections on the hydraulic fluid tank and tighten.
- Attach the connector (Fig. 220,1) onto the pressure switch.
- Close the engine hood.

Final work

- Install the base plate (see the section 6.2.2 "Replacing the base plate").
- Fill the hydraulic fluid tank (see operator's manual "Replacing the hydraulic fluid").
- Close the engine hood.

3.9.2 Replacing the complete return filter

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

▷ **Foreign bodies and sealant can damage the hydraulic system.**

Do not allow any foreign bodies to enter the hydraulic fluid tank.

Do not allow any sealant to enter the hydraulic fluid tank.

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
Return filter	1
Sealant	as req.

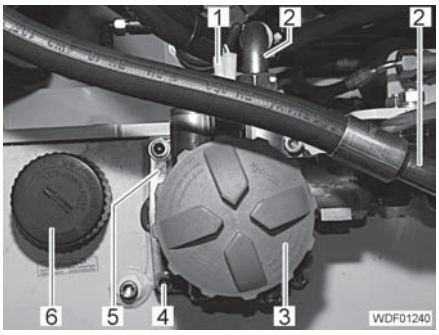


Fig. 224 Return filter

Removing the return filter

- Open the cap (Fig. 224,6).
- Briefly open the cap (Fig. 224,3) so that the fluid can flow out of the return filter and into the hydraulic fluid tank.
- Close the 2 caps (Fig. 224,3 and 6).
- Remove the 2 connectors (Fig. 224,1) from the pressure switch.
- Unscrew and close off the hydraulic lines (Fig. 224,2).
- Unscrew the 4 screws (Fig. 224,4).
- Pull the return filter (Fig. 224,5) upwards and to the rear out of the hydraulic fluid tank.
- Cover the openings immediately (e.g. with cloths).

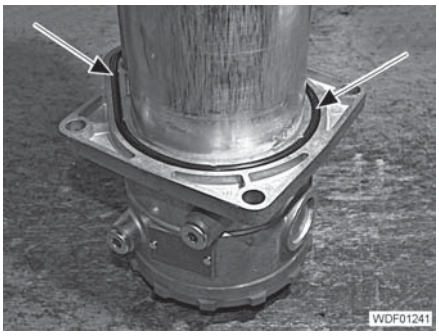


Fig. 225 Sealing

Installing the return filter

- Clean the contact surfaces on the return filter and the hydraulic fluid tank.
- Apply sealant along the O-ring (Fig. 225).
- Carefully place the return filter into the hydraulic fluid tank from above.
- Screw in the 4 screws (Fig. 224,4) with spring lock washers and tighten.
- Screw the hydraulic lines (Fig. 224,2) onto the return filter and tighten.
- Connect the 2 connectors (Fig. 224,1) to the pressure switch.

Final work

- Close the engine hood.

3.9.3 Replacing the pressure filter

▷ 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 3.1.1 "Depressurizing the hydraulic system").
- The base plate has been removed (see the section 6.2.2 "Replacing the base plate").
- The operator's platform is tilted (see operator's manual "Tilting the operator's platform").

Spare parts and auxiliary equipment

Designation	Quantity
Pressure filter	1

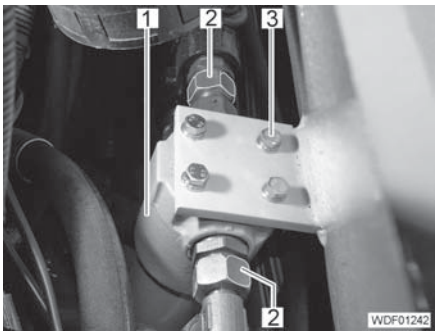


Fig. 226 Pressure filter attachment

- Unscrew and close off the 2 hydraulic lines (Fig. 226,2).
- Unscrew the 4 screws (Fig. 226,3).
- Remove the pressure filter (Fig. 226,1) by pulling it downwards.
- Position a new pressure filter from below.
- Screw in and tighten the 4 screws (Fig. 226,3).
- Screw the 2 hydraulic lines (Fig. 226,2) onto the connections on the pressure filter and tighten.

Final work

- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Install the base plate (see the section 6.2.2 "Replacing the base plate").

3.9.4 Cleaning the pressure filter

▷ 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 3.1.1 "Depressurizing the hydraulic system").
- The base plate has been removed (see the section 6.2.2 "Replacing the base plate").
- The operator's platform is tilted (see operator's manual "Tilting the operator's platform").

Spare parts and auxiliary equipment

Designation	Quantity
Pressure filter insert	1

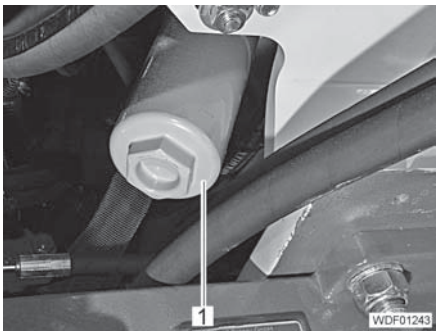


Fig. 227 Filter housing of the pressure filter

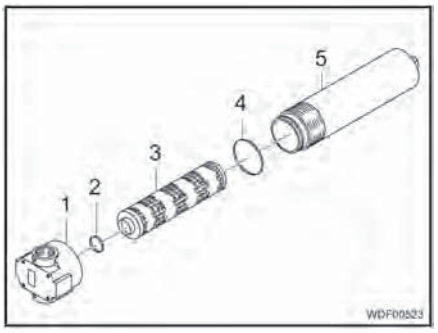


Fig. 228 Individual parts of the pressure filter

Replacing the pressure filter insert

- Unscrew the filter housing (Fig. 227,1) of the pressure filter.
- Pull out the pressure filter insert (Fig. 228,3).
- Clean the filter housing (Fig. 228,5) and seals (Fig. 228,2 and 4) thoroughly.
- Replace the pressure filter insert (Fig. 228,3).
- Replace the seals if they are damaged.

Closing the pressure filter

- Insert the pressure filter insert (Fig. 228,3) with seal (Fig. 228,2) into the cap (Fig. 228,1).
- Screw the filter housing (Fig. 228,5) with seal (Fig. 228,4) into the cap.
- Tighten the filter housing (Fig. 227,1) of the pressure filter as far as possible and then unscrew it by 1/6 of a rotation.

Final work

- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Install the base plate (see the section 6.2.2 "Replacing the base plate").

3.9.5 Replacing the hydraulic line

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

▷ This section describes replacement of a hydraulic line.
The other hydraulic lines are replaced in the same way.

▷ Reuse hydraulic fluid in the hydraulic line or dispose of it in an environmentally responsible manner.

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
Hydraulic hose (prefabricated)	as req.

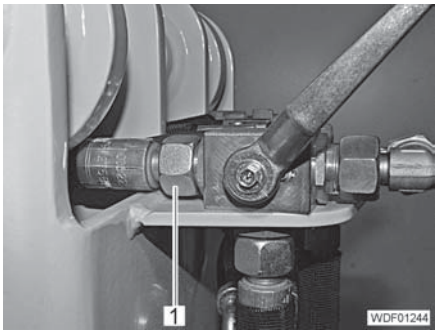


Fig. 229 Hydraulic connections

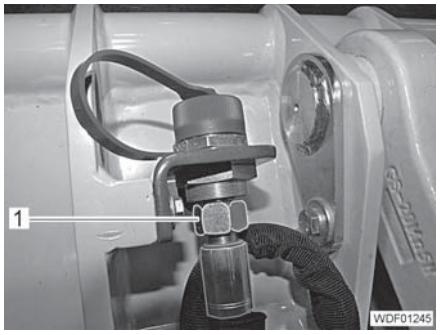


Fig. 230 Hydraulic connection

Removing the hydraulic line

- Unscrew and close off the hydraulic line (Fig. 229,1).
- Unscrew and close off the hydraulic line (Fig. 230,1).
- Loosen or remove all fixings along the hydraulic line.
- Remove the hydraulic line.

Installing the hydraulic line

- Select the required hydraulic line.
- Screw the hydraulic line (Fig. 230,1) onto the coupling and tighten.
- Screw the hydraulic line (Fig. 229,1) onto the connection of the valve and tighten.
- Tighten or replace loose or removed fixings along the hydraulic line.

4.1 Replacing the drive shaft

▷ Do not disassemble the drive shaft for removal or installation.

If the drive shaft has been disassembled, pay attention to the markings during assembly (Fig. 231). If necessary, apply markings yourself.

▷ Do not damage the grease nipple on the drive shaft.

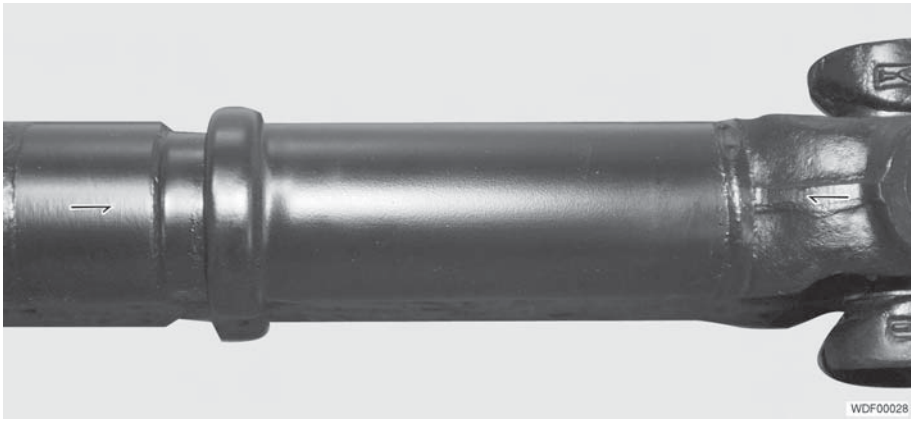


Fig. 231 Markings on the drive shaft

Requirements

Ensure the following:

- The parking brake has been applied and the loader secured against rolling away (e.g. with chocks).
- The articulated link is blocked (see operator's manual "Blocking the articulated link").

Spare parts and auxiliary equipment

Designation	Quantity
Drive shaft	1
Stop nut - hexagon M10	16
Locking agent (e.g. Loctite®)	as req.

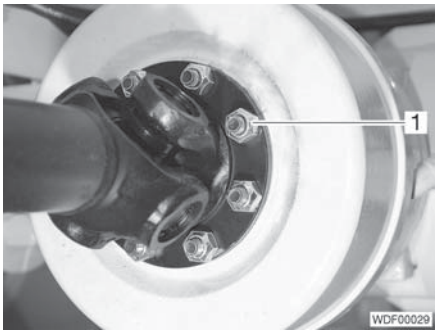


Fig. 232 Connection to the front axle

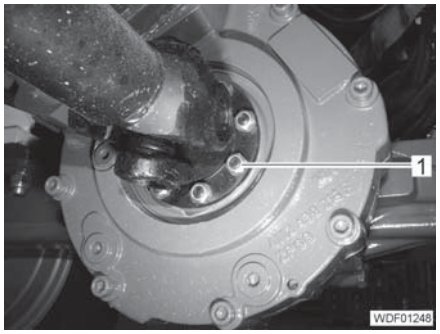


Fig. 233 Connection to the rear axle

Removing the drive shaft

- Unscrew the 8 nuts (Fig. 232,1).
- Unscrew the 8 nuts (Fig. 233,1).
- Detach the drive shaft from the front axle.
- Detach the drive shaft from the rear axle.
- Clean both contact surfaces if the same drive shaft is to be re-installed.

Installing the drive shaft

- Clean the contact surface and the threaded bolts on the front axle.
- Coat the 8 threaded bolts with locking agent.

- Place the drive shaft onto the threaded bolts on the front axle.
- Screw the 8 nuts (Fig. 232,1) onto the threaded bolts and tighten.
- Clean the contact surface and the threaded bolts on the rear axle.
- Coat the 8 threaded bolts and the contact surface with locking agent.
- Place the drive shaft onto the threaded bolts on the rear axle.
- Screw the 8 nuts (Fig. 233,1) onto the threaded bolts and tighten.

▷ If you must only remove the drive shaft on one side, you can swing the drive shaft to the side and secure it temporarily to allow you to work more easily (Fig. 234).

Fig. 234 Temporary securing

4.2 Front axle

4.2.1 Removing the front axle

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

▷ Rest the axle on a suitable support (e.g. a forklift truck) to stop it from tipping over and to prevent damage.

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.

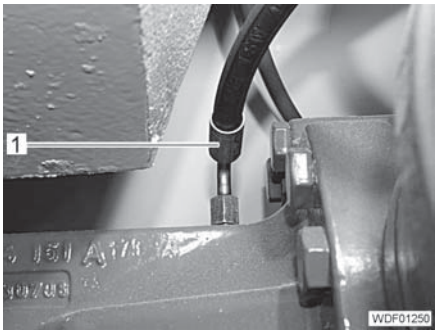


Fig. 235 Hydraulic line of the differential lock

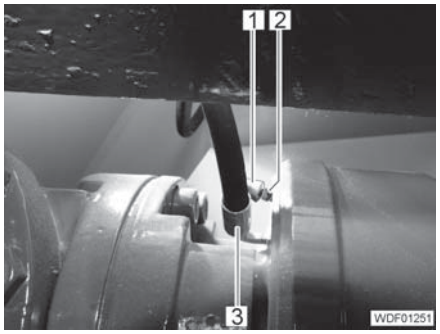


Fig. 236 Hydraulic line of the service brake

Removing the hydraulic lines

- Unscrew and close off the hydraulic line of the differential lock (Fig. 235,1).
- Unscrew and close off the hydraulic line of the service brake (Fig. 236,3).

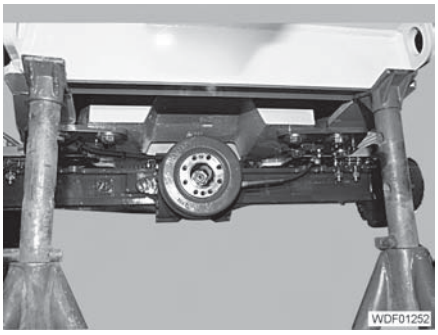


Fig. 237 Front carriage support

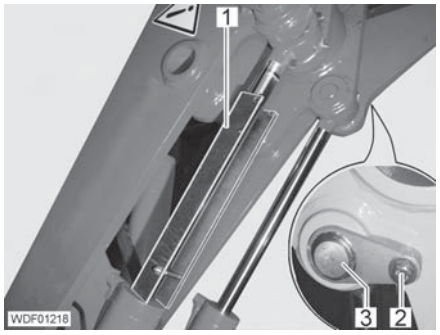


Fig. 238 Securing the lift frame

Relieving the load on the front axle

- Raise the front carriage (e.g. with a jack).
- Support the front carriage with suitable jack stands to prevent it from tipping over (Fig. 237), and so that the wheels can be turned freely.
- Remove the wheels (see operator's manual "Changing wheels").
- Raise the lift frame and secure it to prevent accidental lowering (Fig. 238,1).

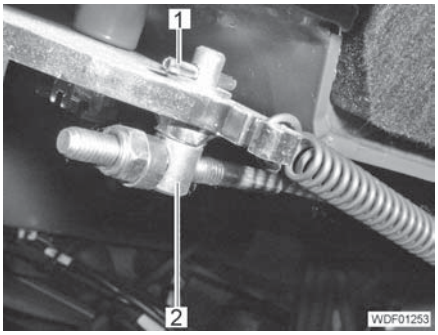


Fig. 239 Bowden cable on the hand-brake lever

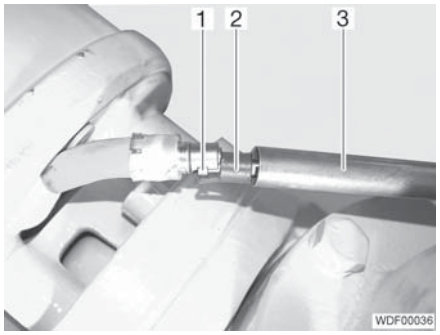


Fig. 240 Bowden cable on the front axle

Removing the Bowden cable

- Tilt the operator's platform (see operator's manual "Tilting the operator's platform").
- Drive out the hollow dowel pin (Fig. 239,1) on the handbrake lever.
- Remove the holder of the Bowden cable (Fig. 239,2).
- Tilt the operator's platform back.
- Push back the sleeve (Fig. 240,3).

- Carefully bend the hook of the fastener (Fig. 240,2) out to the side.
- Pull out the Bowden cable (Fig. 240,1) to the side.

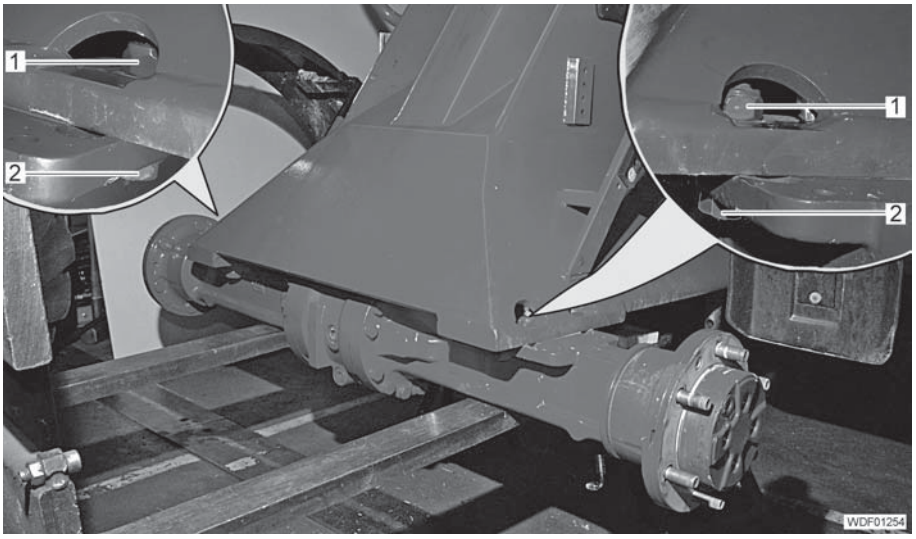


Fig. 241 Front axle support

Removing the front axle

- Support the front axle by suitable means (e.g. a forklift truck) (Fig. 241).
- Unscrew the 4 nuts (Fig. 241,1).
- Carefully lower and extend the front axle.

4.2.2 Installing the front axle

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

▷ Rest the axle on a suitable support (e.g. a forklift truck) to stop it from tipping over and to prevent damage.

Spare parts and auxiliary equipment

Designation	Quantity
Stop nut - hexagon M30	4

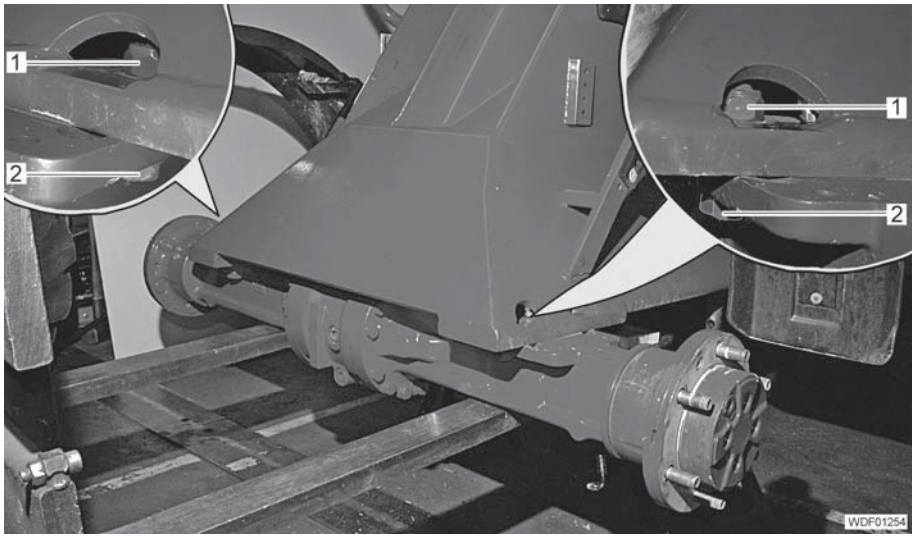


Fig. 242 Front axle support

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. 242,2) with washers through the holes from below.
- Screw on 4 nuts (Fig. 242,1) with washers onto the screws and tighten with a tightening torque of 390 Nm.

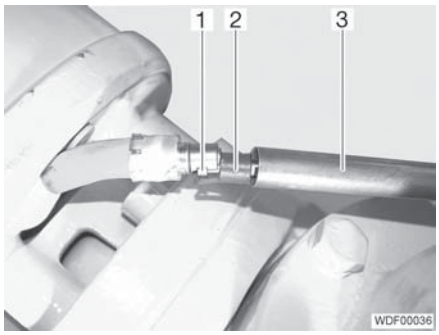


Fig. 243 Bowden cable on the front axle

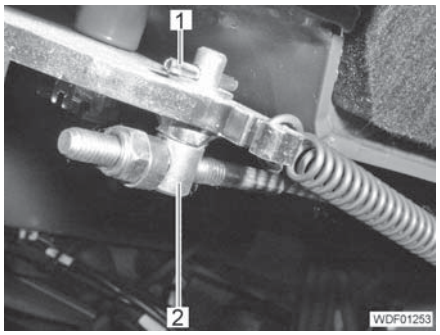


Fig. 244 Bowden cable on the hand-brake lever

Fitting the Bowden cable

- Push in the Bowden cable (Fig. 243,1) at the side.
- Push the fastener (Fig. 243,2) towards the brake drum and secure it with the hook.
- Push the sleeve (Fig. 243,3) 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. 244,2) 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. 244,1) with washer into the holder of the Bowden cable.

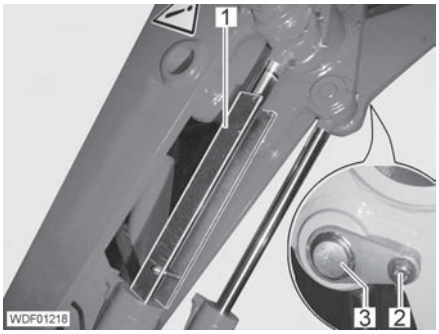


Fig. 245 Securing the lift frame

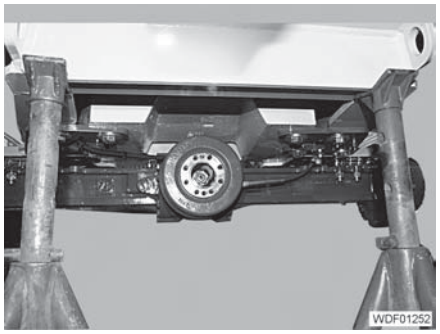


Fig. 246 Front axle support

Loading the front axle

- Remove the fastener (Fig. 245,1) and lower the lift frame.
- Fit the wheels (see operator's manual "Changing wheels").
- Raise the front carriage and remove the jack stands (Fig. 246).
- Lower the front carriage.

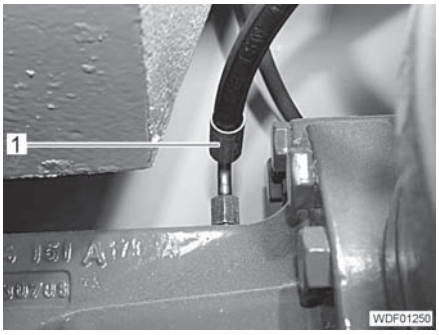


Fig. 247 Hydraulic line of the differential lock

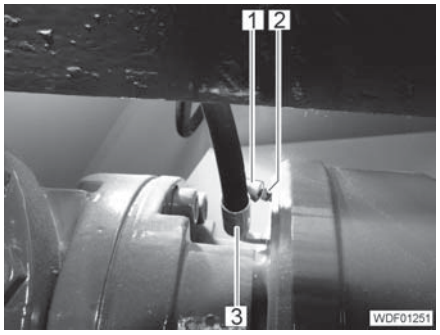


Fig. 248 Hydraulic line of the service brake

Connecting the hydraulic lines

- Depressurize the hydraulic system (see the section 3.1.1 "Depressurizing the hydraulic system").
- Screw the hydraulic line of the differential lock (Fig. 247,1) onto the connection on the axle bracket and tighten.

▷ Do not allow any oil to enter the brake drum.

Clean the brake drum if oil enters it.

- Screw the hydraulic line of the service brake (Fig. 248,3) onto the connection on the brake drum and tighten.

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").

4.3 Rear axle

4.3.1 Removing the rear axle

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

▷ Rest the axle on a suitable support (e. g. a jack with a pallet) to prevent it from tipping over and to prevent damage.

Requirements

Ensure the following:

- The parking brake has been applied and the loader secured against 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 rear axle (see the section 4.1 "Replacing the drive shaft").
- The lift frame has not been fully lowered.
- The base plate has been removed (see the section 6.2.2 "Replacing the base plate").
- The valve for the vibration damping unit (if present) has been removed (see the section 3.5.8 "Replacing the valve of the vibration damping unit").

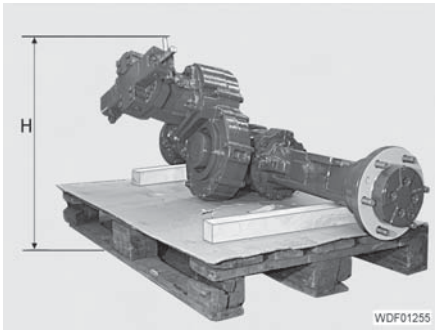


Fig. 249 Rear axle with support

Fig. 250 Rear carriage support

Relieving the load on the rear axle

- Raise the rear carriage to the height of the rear axle with the support (Fig. 249, H).
- Support the rear carriage with suitable jack stands to prevent it from tipping over (Fig. 250).
- If necessary, secure the loader with suitable lifting gear.
- Remove the wheels (see operator's manual "Changing wheels").

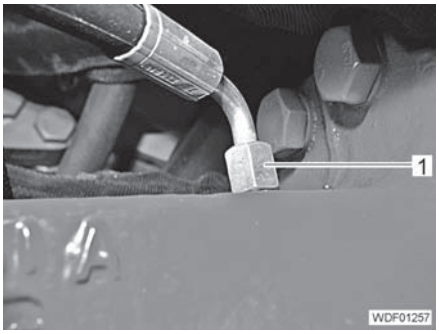


Fig. 251 Hydraulic line of the differential lock

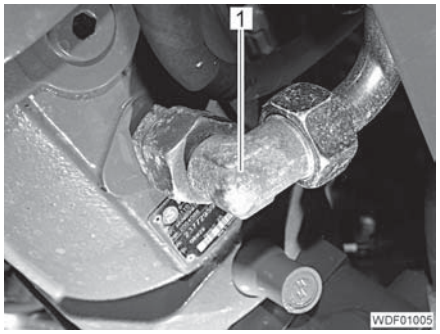


Fig. 252 Hydraulic line of the cross flushing connection

Detaching the hydraulic lines on the underside

- Unscrew and close off the hydraulic line of the differential lock (Fig. 251,1).
- Unscrew and close off the hydraulic line of the cross flushing connection (Fig. 252,1).

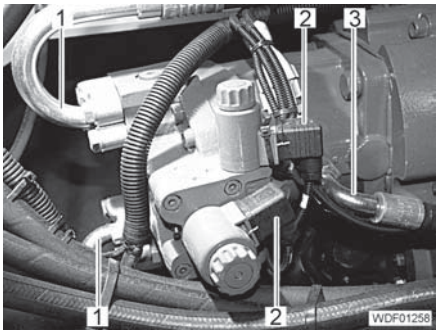


Fig. 253 Topside of the variable displacement motor

Detaching the lines on the topside

- Tilt the operator's platform (see operator's manual "Tilting the operator's platform").
- Mark the connectors of the solenoid valves in order to prevent mix-ups.
- Undo 1 screw on each of the connectors (Fig. 253,2), pull the connectors off the solenoid valves and protect the contacts (e.g. with a protective cap).
- Unscrew and close off the hydraulic line of the cross flushing connection (Fig. 253,3).
- Undo 4 screws on each of the flange halves of the two high pressure lines (Fig. 253,1) and remove the flange halves.
- Remove and close off the high pressure lines.
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").

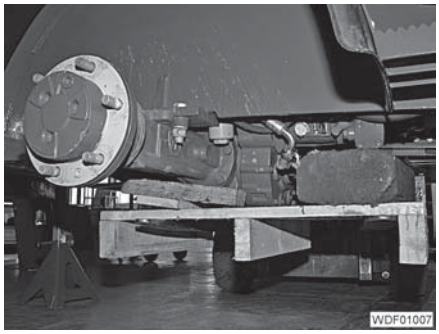


Fig. 254 Rear axle support

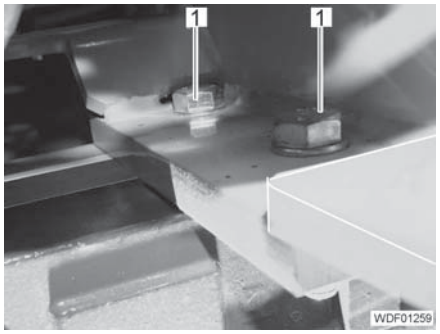


Fig. 255 Rear axle attachment

Removing the rear axle

- Provide a suitable support for the rear axle (e.g. pallet and lifting carriage) (Fig. 254).
- Unscrew 2 screws (Fig. 255,1) on each side of the rear axle.
- Carefully lower the rear axle.

▷ Make sure that the solenoid valves are not damaged.

- Carefully pull out the rear axle to the side.

4.3.2 Installing the rear axle

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

▷ Rest the axle on a suitable support (e. g. a jack with a pallet) to prevent it from tipping over and to prevent damage.

▷ Make sure that the solenoid valves are not damaged.

Spare parts and auxiliary equipment

Designation	Quantity
Stop nut - hexagon M20	4

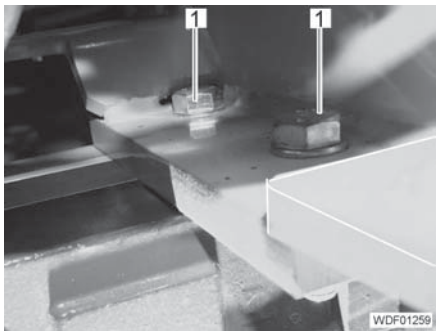


Fig. 256 Rear axle attachment

Securing the rear axle

- Clean the contact surfaces on the rear axle and rear carriage.
- Carefully push the rear axle under the rear carriage from the side.
- Carefully press the rear axle against the rear carriage from below.

- Insert 2 screws (Fig. 256,1) with washers on both sides of the rear axle through the holes from above.
- Screw the 2 nuts with washers onto the screws (Fig. 256,1).
- In each case, tighten the 2 screws (Fig. 256,1) with a tightening torque of 360 Nm.

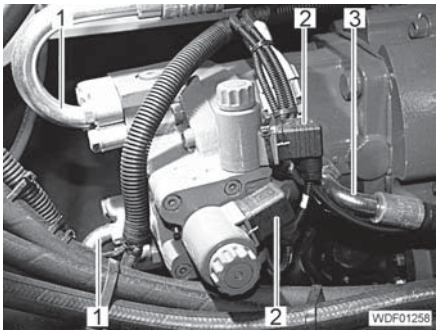


Fig. 257 Topside of the variable displacement motor

Connecting the lines on the topside

- Tilt the operator's platform (see operator's manual "Tilting the operator's platform").
- Depressurize the hydraulic system (see the section 3.1.1 "Depressurizing the hydraulic system").
- Put each flange half for securing the high pressure lines (Fig. 257,1) 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 of the cross flushing connection (Fig. 257,3) onto the connection on the variable displacement motor and tighten.
- Plug the connectors (Fig. 257,2) onto the solenoid valves and secure with 1 screw for each.
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").

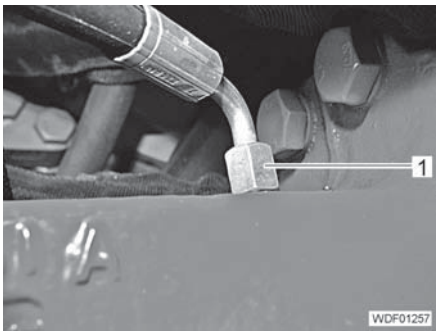


Fig. 258 Hydraulic line of the differential lock

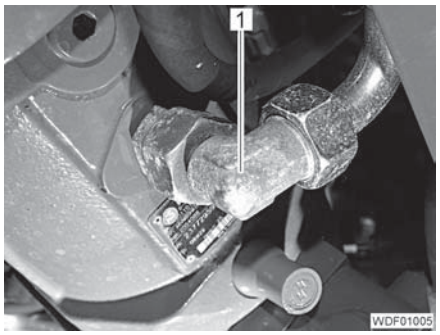


Fig. 259 Hydraulic line of the cross flushing connection

Connecting the hydraulic lines on the underside

- Screw the hydraulic line of the differential lock (Fig. 258,1) onto the connection on the axle bracket and tighten.
- Screw the hydraulic line of the cross flushing connection (Fig. 259,1) onto the connection on the variable displacement motor and tighten.

Fig. 260 Rear carriage support

Loading the rear axle

- Fit the wheels (see operator's manual "Changing wheels").
- Raise the rear carriage and remove the jack stands (Fig. 260).
- Lower the rear carriage.

Final work

- Install the base plate (see the section 6.2.2 "Replacing the base plate").
- Install the drive shaft (see the section 4.1 "Replacing the drive shaft").
- Loosen the blocking of the articulated link (see operator's manual "Blocking the articulated link").

5.1 Service brake

5.1.1 Replacing the brake shoes

▷ Keep the contact surface of the brake drum and the brake shoes free of grease and oil.

Requirements

Ensure the following:

- The brake drum has been removed (see the section 5.1.2 "Replacing the brake drum").

Spare parts and auxiliary equipment

Designation	Quantity
Brake shoe	1
Brake shoe with brake lever	1
Lubricating grease	as req.

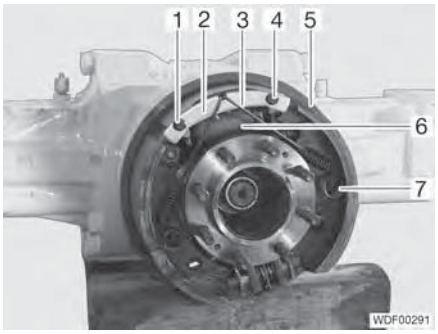


Fig. 261 Brake shoe attachment

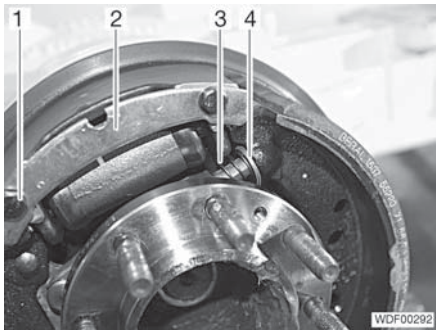


Fig. 262 Upper bearing

Releasing the brake shoes

- Undo the 2 screws (Fig. 261,1 and 4).
- Apply a suitable lever between the metal plate (Fig. 261,2) and the brake cylinder (Fig. 261,6).
- With the lever, move the metal plate (Fig. 261,2) slightly upwards and unscrew the screw (Fig. 261,1).
- Unhook and remove the 2 springs (Fig. 261,3) on the metal plate (Fig. 261,2).
- Press the 2 springs (Fig. 261,7) through the brake shoes (Fig. 261,5), rotate them clockwise through 90° and pull them out.
- Temporarily secure the metal plate (Fig. 262,2) with the screw (Fig. 262,1).

▷ Do not lose the washer (Fig. 262,4).

- Press the brake shoes together on the upper bearing against the spring (Fig. 262,3) and remove.

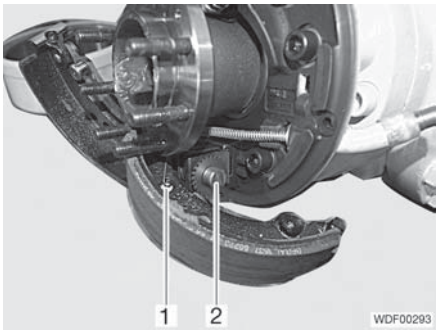


Fig. 263 Lower bearing

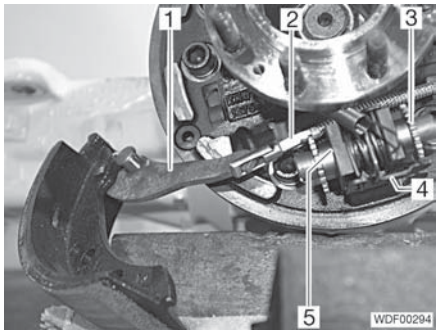


Fig. 264 Bowden cable attachment

Removing the brake shoes

- Unhook the spring (Fig. 263,1) on both sides.
- Unhook the hook (Fig. 264,1) from the Bowden cable (Fig. 264,2).
- Remove the brake shoes.

Checking and setting the adjustment device

- Check that adjustment device is in perfect condition.
  If the adjustment device has visible damage, contact the manufacturer.
- Slightly grease the thread (Fig. 264,5).
- Raise the lock (Fig. 264,4) and rotate the adjustment wheel (Fig. 264,3) as far as possible clockwise.

Installing the brake shoes

- Place the brake shoes into position.
- Hook the hook (Fig. 264,1) into the Bowden cable (Fig. 264,2).
- Hook the spring (Fig. 263,1) into the brake shoes on both sides.
- Plug the brake shoes onto pin (Fig. 263,2).

Securing the brake shoes

- Push the brake shoes (Fig. 261,5) together on the upper bearing against the spring (Fig. 262,3) with the washer (Fig. 262,4) and insert.
- Press the 2 springs (Fig. 261,7) through the brake shoes, rotate them counter-clockwise through 90° and hook them in on the rear side of the brake housing.
- Hook the 2 springs (Fig. 261,3) into the brake shoes.
- Unscrew the screw (Fig. 261,1).
- Hook in the 2 springs (Fig. 261,3) in the center of the metal plate (Fig. 261,2).
- Apply a suitable lever between the metal plate (Fig. 261,2) and the brake cylinder (Fig. 261,6).
- Move the metal plate (Fig. 261,2) sufficiently far up and tension the springs (Fig. 261,3) sufficiently so that the screw (Fig. 261,1) can be screwed in.
- Screw in the screw (Fig. 261,1).
- Screw in and tighten the 2 screws (Fig. 261,1 and 4).

Final work

- Install the brake drum (see the section 5.1.2 "Replacing the brake drum"), including the final work.

5.1.2 Replacing the brake drum

▷ Keep the contact surface of the brake drum and the brake shoes free of grease and oil.

▷ Clean the contact surfaces thoroughly if they are contaminated with oil or grease.

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

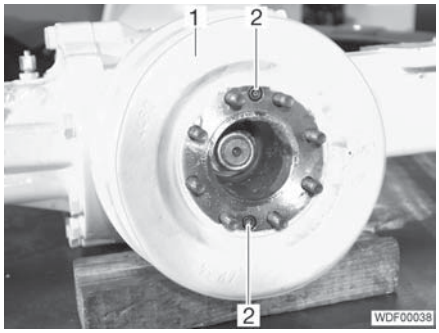


Fig. 265 Brake drum

Removing the brake drum

- Unscrew the 2 screws (Fig. 265,2).
- Remove the brake drum (Fig. 265,1).

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").

Spare parts and auxiliary equipment

Designation	Quantity
Bowden cable	1

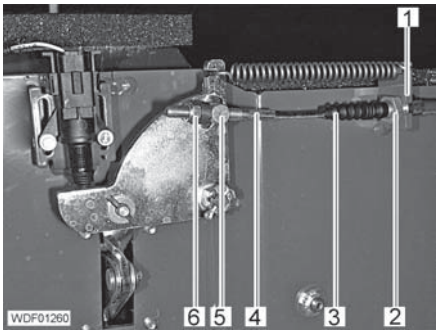


Fig. 266 Bowden cable on the hand-brake lever

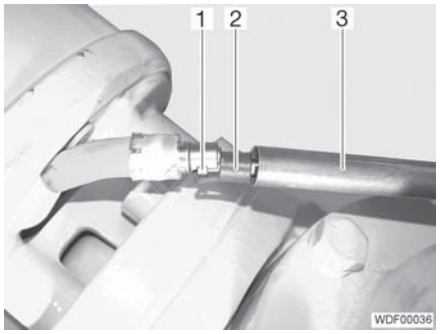


Fig. 267 Bowden cable on the front axle

Removing the Bowden cable

- Unscrew the nut (Fig. 266,6).
- Pull the Bowden cable (Fig. 266,4) downwards and out of the holder (Fig. 266,5).
- Push back the sleeve (Fig. 267,3).
- Carefully bend the hook of the fastener (Fig. 267,2) out to the side.
- Pull out the Bowden cable (Fig. 267,1) to the side.

Pulling in the Bowden cable

- Pull off the rubber bushing (Fig. 266,3).
- Unscrew the nut (Fig. 266,2) from remove it from the Bowden cable.
- Remove the Bowden cable downwards out of the holder (Fig. 266,1).
- Undo or remove all fastenings (e.g. cable ties) along the Bowden cable.
- Pull out the Bowden cable towards the front axle and at the same time pull in the new Bowden cable.
- Push the Bowden cable (Fig. 266,4) into the holder (Fig. 266,1) from below.
- Screw the nut (Fig. 266,2) onto the Bowden cable and tighten it.
- Attach the rubber bushing (Fig. 266,3) onto the Bowden cable.

Fitting the Bowden cable

- Push in the Bowden cable (Fig. 267,1) at the side.
- Push the fastener (Fig. 267,2) towards the brake drum and secure it with the hook.
- Push the sleeve (Fig. 267,3) over the fastener.
- Insert the Bowden cable (Fig. 266,4) into the holder (Fig. 266,5) from below.
- Screw the nut (Fig. 266,6) with the spacer ring onto the Bowden cable.

Adjusting the parking brake

- Screw the nut (Fig. 266,6) onto the Bowden cable sufficiently far so that the parking brake can be pulled in up to the fifth or sixth catch.

Final work

- Tighten or replace undone or removed fastenings (e.g. cable ties) along the Bowden cable.
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").

6.1 Front carriage

6.1.1 Replacing the front fender

Spare parts and auxiliary equipment

Designation	Quantity
Fender 270 mm	1

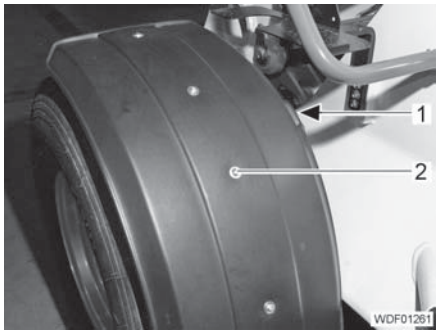


Fig. 268 Fender

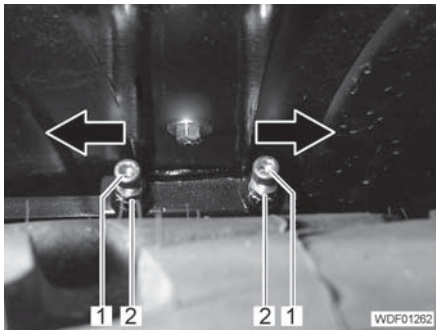


Fig. 269 Attachment

Replacing the fender

- Unscrew the 4 screws (Fig. 268,2) and remove the fender.
- Position a new fender in place so that the recess (Fig. 268,1) is exactly above the holder.
- Mark the position of the holes from below and drill them.
- Tighten the 4 screws (Fig. 268,2).

Final work

- If necessary, undo the nuts (Fig. 269,2) and screws (Fig. 269,1) and move the fender to the side so that it is exactly in the center above the wheel.
- Tighten the screws (Fig. 269,1) and nuts (Fig. 269,2).

6.1.2 Replacing the front weight

▶ **DANGER**

Risk of injury by a heavy component.

The front weight weighs approximately 247 kg.

Use suitable lifting gear to remove and install the front weight.

Requirements

Ensure the following:

- The front axle has been removed (see the section 4.2.1 "Removing the front axle").

Spare parts and auxiliary equipment

Designation	Quantity
Front weight	1

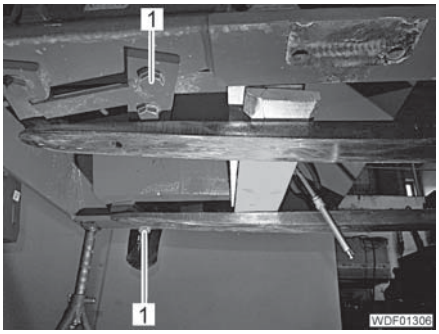


Fig. 270 Front weight attachment

Replacing the front weight

- Support the front weight using suitable lifting gear (e.g. a forklift truck).
- Unscrew the 4 screws (Fig. 270,1).
- Carefully remove the front weight downwards.
- From below, carefully place the new front weight in position using suitable lifting gear (e.g. forklift).
- Screw in 4 screws (Fig. 270,1) with washers and tighten.

Final work

- Install the front axle (see the section 4.2.2 "Installing the front axle").

6.2 Rear carriage and engine hood

6.2.1 Replacing the rear fender

▷ The holes must be 0.5 mm smaller than the outside diameter of the threaded sleeves.

▷ This section describes replacement of a fender.

The second fender is replaced in the same way.

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
Fender	1
Threaded sleeve	11

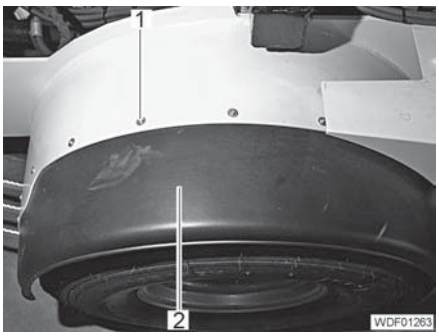


Fig. 271 Fender attachment

Removing the fender

- Unscrew the 11 screws (Fig. 271,1).
- Remove the fender (Fig. 271,2).

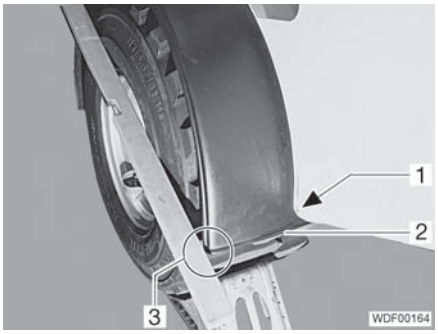


Fig. 272 Fender attachment

Attaching the fender

- Place the fender into position so that the bead (Fig. 272,2) is exactly below the rear carriage and the wheel projects approximately 10 mm over the fender (Fig. 272,3).
- Mark the position of the first hole (Fig. 272,1) and drill it.
- Press the threaded sleeve into the hole from the inside.
- Screw in the 1 screw (Fig. 272,1).
- Align the fender parallel to the wheel.
- Mark the position of the other holes and drill them.
- Press the threaded sleeves into the hole from the inside.
- Screw in the 10 screws (Fig. 271,1) and tighten all screws.

Final work

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

6.2.2 Replacing the base plate

▶ **CAUTION**

Risk of injury by a heavy component.

The base plate weighs approx. 29 kg.

When removing and installing the base plate, use suitable tools or work with a second person.

Spare parts and auxiliary equipment

Designation	Quantity
Base plate	1

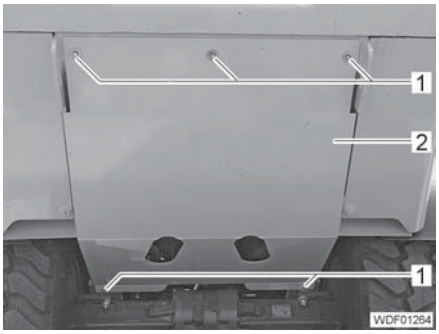


Fig. 273 Base plate attachment

Removing the base plate

- With a second person, hold the base plate and simultaneously unscrew 5 screws (Fig. 273,1).
- Remove the base plate (Fig. 273,2).

Installing the base plate

- With a second person, carefully press the base plate (Fig. 273,2) from below against the rear carriage.
- Insert and tighten 5 screws (Fig. 273,1) with spring lock washers and disks.

6.2.3 Replacing the rear weight

▶ **CAUTION**

Risk of injury by a heavy component.

The rear weight weighs approx. 356 kg.

Use suitable lifting gear to remove and install the rear weight.

Attach the rear weight to the side crane eyes.

▷ Do not damage the electrical cables when removing and installing the rear weight.

Requirements

Ensure the following:

- The engine hood has been removed (see the section 6.2.4 "Replacing the engine hood").

Spare parts and auxiliary equipment

Designation	Quantity
Rear weight	1

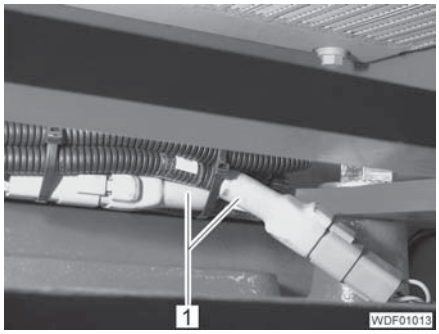


Fig. 274 Cable for the rear lighting

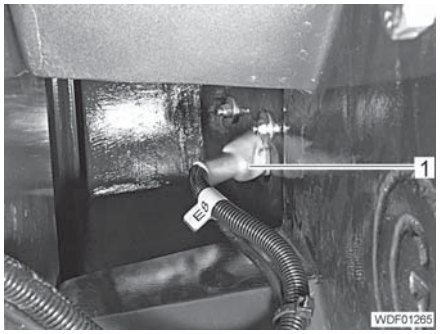


Fig. 275 Cable for the rear lighting (alternative)

Disconnecting the cable

- Remove 2 connectors (Fig. 274,1) or 1 connector each (Fig. 275,1) on both sides.

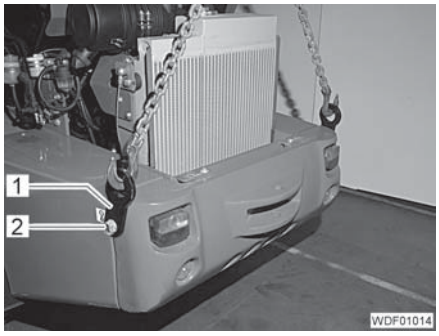


Fig. 276 Securing the rear weight

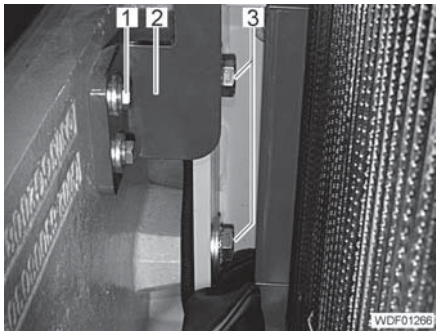


Fig. 277 Rear weight attachment

Removing the rear weight

- Unscrew 1 screw (Fig. 276,2) in each case.
- Rotate the crane eyes (Fig. 276,1) upwards on both sides and tighten 1 screw in each case.
- Secure the rear weight with suitable lifting gear (e.g. a crane).
- Mark the position of the holder (Fig. 277,2) on the rear carriage.
- Unscrew 2 screws (Fig. 277,1) on both sides and remove the holder.
- Unscrew 2 screws (Fig. 277,3) on both sides.
- Carefully separate the rear weight from the rear carriage.

Installing the rear weight

- Carefully swivel the rear weight against the rear carriage using suitable lifting gear (e.g. a crane).
- Screw in 2 screws (Fig. 277,3) on both sides.
- Align the rear weight so that it abuts flush at the top and sides.
- Tighten 2 screws in each case.
- Locate 1 holder (Fig. 277,2) on both sides.
- Screw in 2 screws (Fig. 277,1) with spring lock washers and disks on both sides and tighten.
- Unscrew 1 screw (Fig. 276,2) in each case.
- Rotate the crane eyes (Fig. 276,1) downwards on both sides and tighten 1 screw in each case.

Final work

- Connect 2 connectors (Fig. 274,1) or 1 connector each (Fig. 275,1) on both sides.
- Install the engine hood (see the section 6.2.4 "Replacing the engine hood").

6.2.4 Replacing the engine hood

▶ **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.

▶ **CAUTION**

Risk of crush injury from component flying back.

The mounting brackets for the engine hood are spring-tensioned.

Work carefully, and guide spring-pretensioned parts slowly into their end position.

▷ Replace the engine hood with another person.

▷ If you are working alone, use a bench that is as high as the upper edge of the rear weight.

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
Engine hood	1

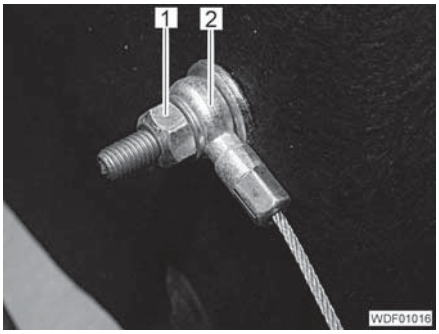


Fig. 278 Cable

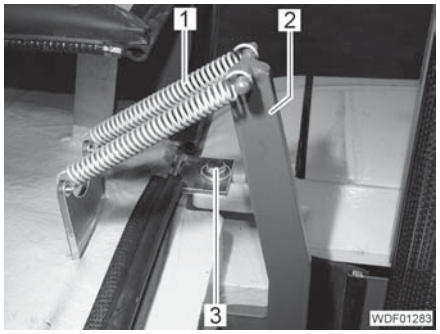


Fig. 279 Engine hood attachment

Removing the engine hood

- Loosen 1 nut (Fig. 278,1) on both sides, but do not unscrew them.
- Mark the position of the fastenings.
- Using suitable tools, unhook 2 springs each (Fig. 279,1) on the holder (Fig. 279,2).
- In each case, loosen 1 screw (Fig. 279,3) but do not unscrew it.
- Get a second person to help you firmly hold the engine hood.
- Unscrew 1 screw (Fig. 279,3) in each case.

- In each case, unscrew 1 nut (Fig. 278,1) and remove 1 eye (Fig. 278,2).
- Remove the engine hood.

Installing the engine hood

- Get a second person to help you position the engine hood.
- Push 1 eye each (Fig. 278,2) with washer onto the thread.
- In each case, screw 1 nut (Fig. 278,1) with washer loosely onto the thread.
- Loosely screw in and tighten 1 screw each (Fig. 279,3) with spring lock washer and disk.
- Align the engine hood and tighten 1 screw (Fig. 279,3) in each case.
- Tighten the nut (Fig. 278,1) so that the eye remains rotatable.

Final work

- Close the engine hood.

6.2.5 Emergency release of the engine hood

▶ **WARNING**

Hot parts can cause burns.

Never work on the exhaust when it is at operating temperature.

Allow the exhaust to cool down or wear protective gloves.

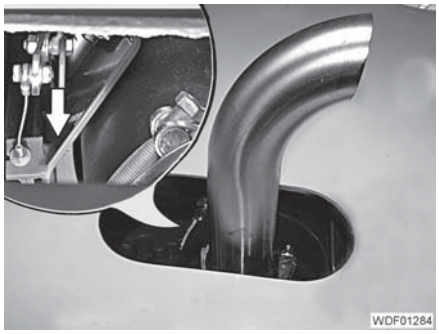


Fig. 280 Locking mechanism of engine hood

Emergency release of the engine hood

- Carefully reach into the engine bay through the opening for the tail pipe.
- Push down the lever of the locking mechanism (Fig. 280) and open the engine hood.

6.2.6 Replacing the lock of the engine hood

▶ **WARNING**

Hot parts can cause burns.

Never work on the exhaust when it is at operating temperature.

Allow the exhaust 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
Bowden cable	1
Protective hose	1
Lock	1
Lever	1

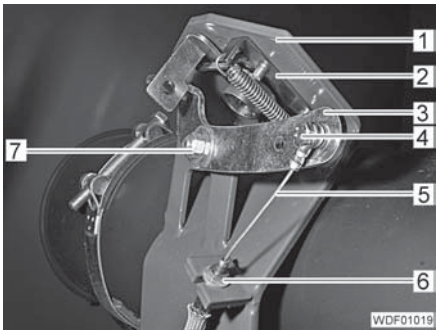


Fig. 281 Locking mechanism of engine hood

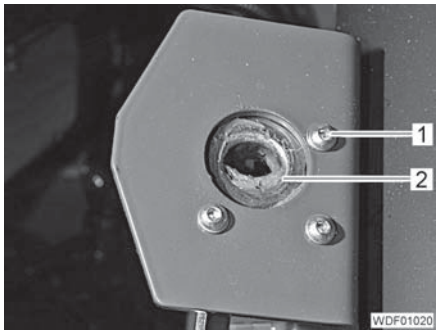


Fig. 282 Lock attachment

Removing the lock

- Unscrew the screw (Fig. 281,4).
- Unscrew the nut (Fig. 281,7).
- Remove the lever (Fig. 281,3).
- Mark the position of the lock (Fig. 281,2) on the mount (Fig. 281,1).
- Unscrew the 3 screws (Fig. 282,1).
- Remove the locking mechanism (Fig. 282,2).

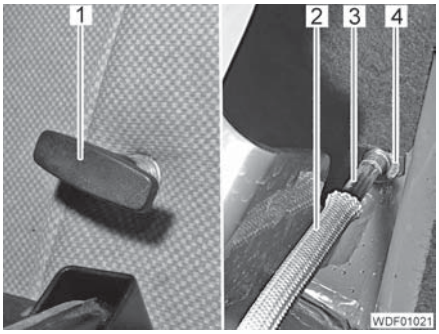


Fig. 283 Threading through the Bowden cable

Removing the Bowden cable

- Unscrew the nut (Fig. 281,6).
- Remove the Bowden cable (Fig. 281,5) from the mounting bracket by pulling it forwards.
- Unscrew the nut (Fig. 283,4).
- Unscrew the handle (Fig. 283,1).
- Remove the protective hose (Fig. 283,2).
- Pull out the Bowden cable (Fig. 283,3) in an inwards direction.

Installing the Bowden cable

- Insert new Bowden cable (Fig. 283,3) from the inside through the wall of the cab.
- Slide the protective hose (Fig. 283,2) over the Bowden cable.
- Screw the handle (Fig. 283,1) onto the Bowden cable.

- Screw the nut (Fig. 283,4) onto the Bowden cable and tighten it.
- Push the Bowden cable (Fig. 281,5) into the mounting bracket from the front.
- Screw the nut (Fig. 281,6) 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. 281,3).

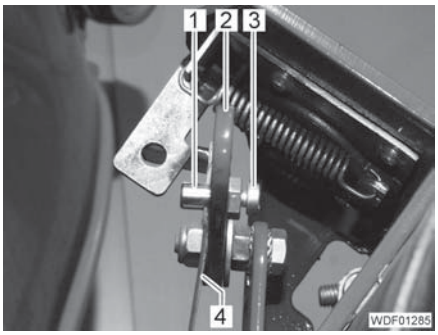


Fig. 284 Fixing a new Bowden cable

Installing the lock

- Locate the locking mechanism (Fig. 282,2) in position.
- Screw in the 3 screws (Fig. 282,1).
- Align the locking mechanism and tighten 3 screws.
- Place the lever (Fig. 281,3) into position.
- Screw the nut (Fig. 281,7) onto the screw and tighten it so that the lever can still be pivoted.
- Push the sleeve (Fig. 284,1) through the lever (Fig. 284,2).
- Push the Bowden cable (Fig. 284,4) through the sleeve.
- Screw in the screw (Fig. 284,3) 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").

- The operator's platform is tilted (see operator's manual "Tilting the operator's platform").
- The articulated link is **not** blocked.

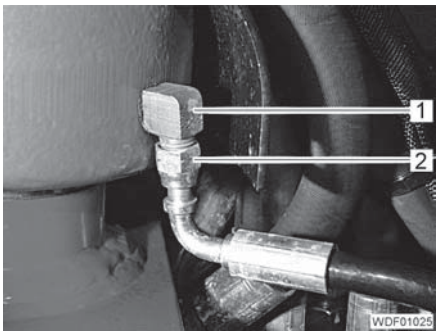


Fig. 285 Connection of the remote lubrication line

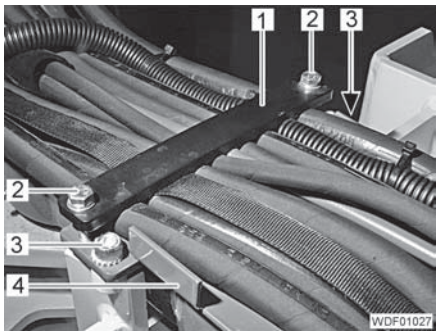


Fig. 286 Line attachment

Exposing the center joint

- Unscrew the remote lubrication line (Fig. 285,2).
- Unscrew the angle screw connection (Fig. 285,1).
- Unscrew the 2 screws (Fig. 286,2) and remove the holder (Fig. 286,1).
- Pull all the lines outwards and temporarily secure them (e.g. with belts).
- Unscrew the 2 screws (Fig. 286,3) and remove the holder (Fig. 286,4).

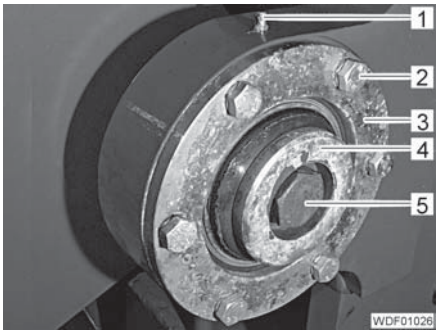


Fig. 287 Lower bearing attachment

Preparing the lower bearing

- Unscrew the grease nipple (Fig. 287,1).
- Unscrew the 6 screws (Fig. 287,2) and remove the perforated disk (Fig. 287,3).
- Unscrew the screw (Fig. 287,5) and remove the liner (Fig. 287,4) with the disk.
- Screw the screw (Fig. 287,5) loosely into the thread.

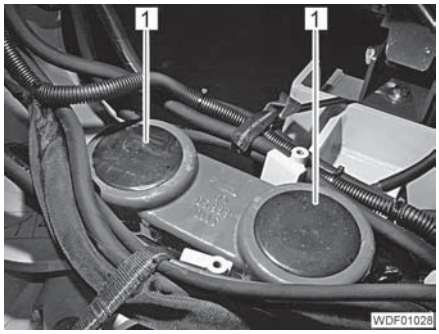


Fig. 288 Protective caps

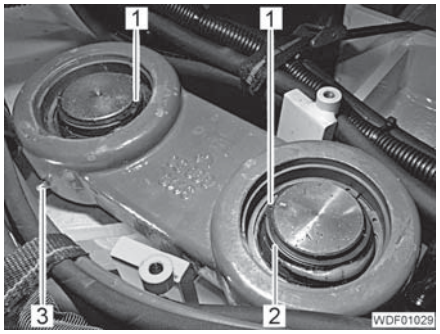


Fig. 289 Retaining mounts of the self-aligning bearing

Preparing the self-aligning bearing

- Remove the protective caps (Fig. 288,1).
- Remove the 2 locking rings (Fig. 289,1).
- Unscrew the grease nipple (Fig. 289,3).

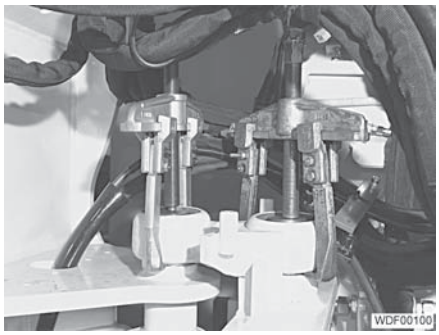


Fig. 290 Removing the self-aligning bearing

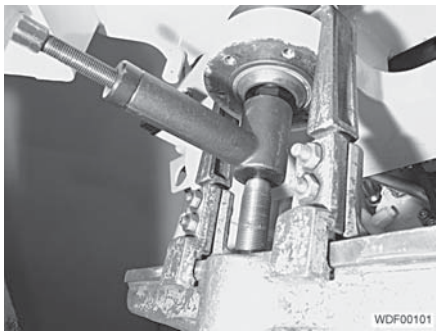


Fig. 291 Removing the shaft

▷ The pivot bearings can sit very securely on the shaft or the bolt.

▷ If necessary, use a hydraulic tool (Fig. 291) to pull off, drive out or drive in the pivot bearings (e.g. hydraulic hand pump).

Removing the self-aligning bearing

- Pull up the self-aligning bearing using a suitable tool (Fig. 290).

Separating the front and rear carriage

- Using a suitable removal tool, press the shaft of the front carriage up and out of the lower bearing (Fig. 291).
- Swivel the front carriage to the side.

6.3.2 Connecting the center joint

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

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

▷ The pivot bearings can sit very securely on the shaft or the bolt.

▷ If necessary, use a hydraulic tool to pull off, drive out or drive in the pivot bearings (e.g. hydraulic hand pump).

Spare parts and auxiliary equipment

Designation	Quantity
Locking ring	2
Rubber washer	1
Locking agent (e.g. Loctite®)	as req.
Lubricating grease	as req.

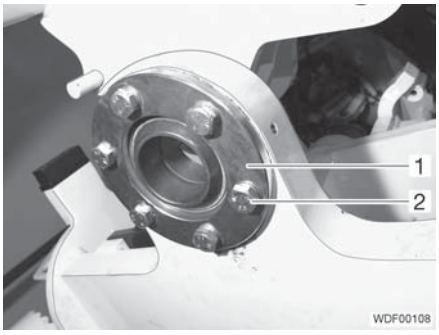


Fig. 292 Securing the lower bearing

Securing the lower bearing

- Coat the thread of the screws (Fig. 292,2) with locking agent.
- Put the perforated disk (Fig. 292,1) in position.
- Screw in and tighten the 6 screws (Fig. 292,2).

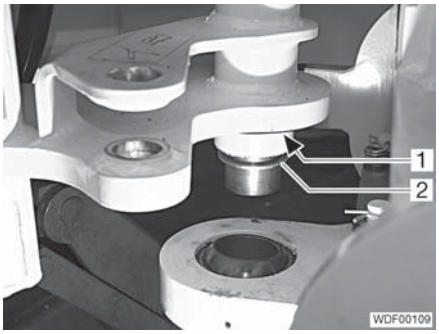


Fig. 293 Shaft and bearing

Fig. 294 Pressing tool

Connecting the front and rear carriages

- Position the shaft of the front carriage exactly over the lower bearing (Fig. 293).
- Grease the pin and the bearing slightly.
- If the rubber washer (Fig. 293,1) is faulty, replace it with a new one.
- If necessary, fit shim washers (Fig. 293,2) onto the shaft.
- Press the shaft into the bearing from above using a suitable pressing tool (Fig. 294).

Installing the self-aligning bearing

- Grease the pin and bearing slightly.
- If necessary, fit shim washers onto the pins.
- Place the self-aligning bearing onto the pins from above.
- If necessary, readjust the front and rear carriages.
- Using a suitable tool, press the self-aligning bearing from above onto the pins.

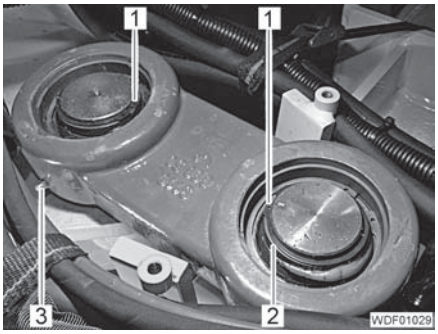


Fig. 295 Retaining mount of the self-aligning bearing

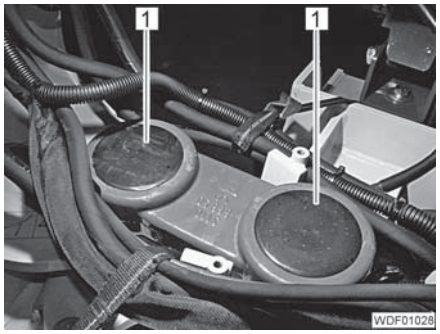


Fig. 296 Protective caps

Securing the self-aligning bearing

- If necessary, fit shim washers (Fig. 295,2) onto the pins.
- Insert 1 locking ring (Fig. 295,1) for each.
- Screw the grease nipple (Fig. 295,3) into the self-aligning bearing.

▷ Check that all locking rings are fitted correctly.

- Press 1 protective cap (Fig. 296,1) into each hole.

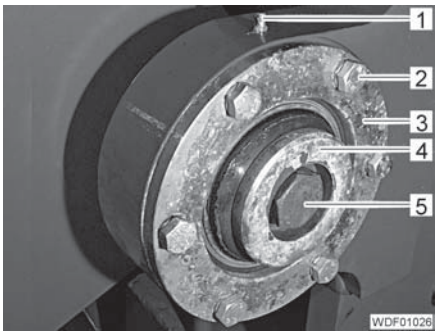


Fig. 297 Lower bearing attachment

Securing the front carriage at the bottom

- Coat the thread of the screw (Fig. 297,5) with locking agent.
- Screw in the liner (Fig. 297,4) with the disk.
- Screw in and tighten the screw (Fig. 297,5).
- Screw in the grease nipple (Fig. 297,1).

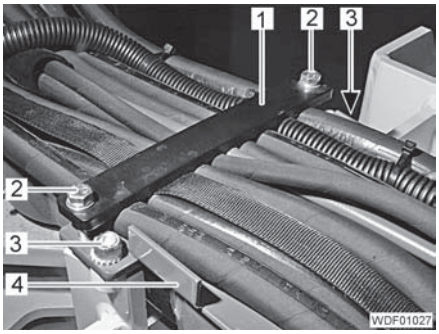


Fig. 298 Line attachment

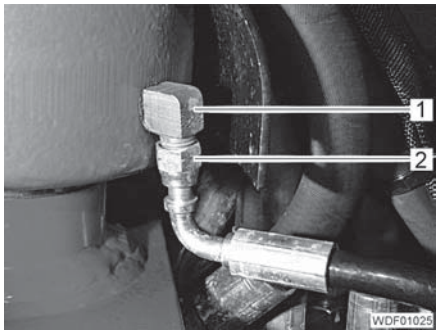


Fig. 299 Connection of the remote lubrication line

Attaching the lines

- Put the holder (Fig. 298,4) into position and tighten the 2 screws (Fig. 298,3).
- Place the lines in the holder.
- Put the holder (Fig. 298,1) into position and tighten the 2 screws (Fig. 298,2).
- Screw in the angle screw connection (Fig. 299,1).
- Screw the remote lubrication line (Fig. 299,2) 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.

6.3.3 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.

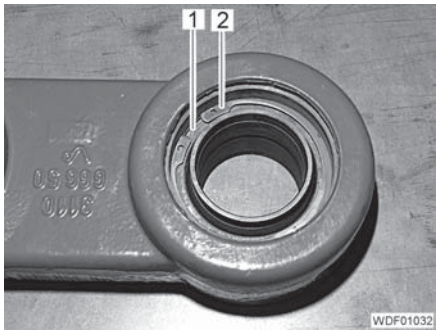


Fig. 300 Securing the bearing

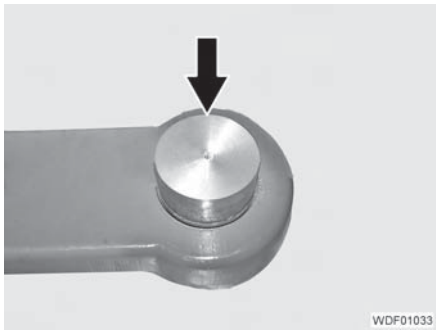


Fig. 301 Expulsion tool

Driving out the pivot bearing

- Remove the locking ring (Fig. 300,2) and washer (Fig. 300,1) on the underside of the self-aligning bearing.
- Turn the self-aligning bearing over.
- Drive out the pivot bearing downwards using a suitable expulsion tool (Fig. 301).

Fig. 302 Underside of the self-aligning bearing

Driving in the pivot bearing

- Slightly grease the pivot bearing and the bearing eye.
- Put the pivot bearing into position on the underside (Fig. 302) of the self-aligning bearing and drive it in using a suitable driving tool.
- Insert the washer (Fig. 300,1) and locking ring (Fig. 300,2).

▷ Check that all locking rings are fitted correctly.

Final work

- Install the self-aligning bearing (see Part 4, section "Connecting the center joint").

6.3.4 Replacing the lower 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 front and rear carriages are separated (see Part 4, "Detaching the center joint" section).

Spare parts and auxiliary equipment

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

Fig. 303 Rear carriage support

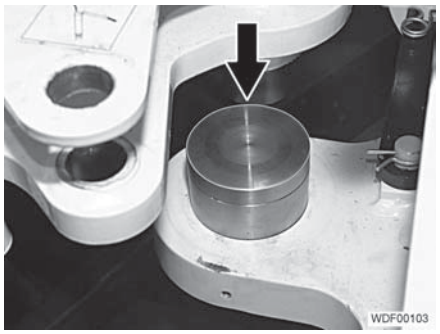


Fig. 304 Expulsion tool

Driving out the pivot bearing

- Support the rear carriage with a jack stand (Fig. 303).
- Drive out the pivot bearing **downwards** using a suitable expulsion tool (Fig. 304).

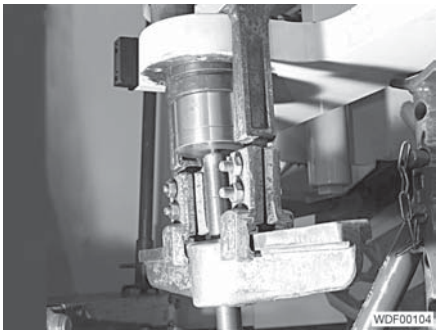


Fig. 305 Driving tool

Driving in the pivot bearing

- Slightly grease the bearing and the bearing eye.
- Put the bearing into position and press it in using a suitable pressing tool (Fig. 305).

Final work

- Connect the front and rear carriages (see Part 4, "Connecting the center joint" section).

6.4 Insulation mats

6.4.1 Replacing an insulation mat

▶ **CAUTION**

Risk of injury by pointed objects.

The attachment pins can be sharp.

Do **not** knock or press onto the attachment pins with your bare hand.

Wear protective gloves.

▷ This section describes an example replacement of an insulation mat.
The replacement procedure for the other insulation mats may differ slightly.

Spare parts and auxiliary equipment

Designation	Quantity
Set of insulation mats	1

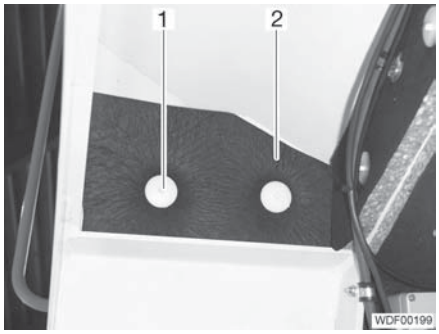


Fig. 306 Insulation mat

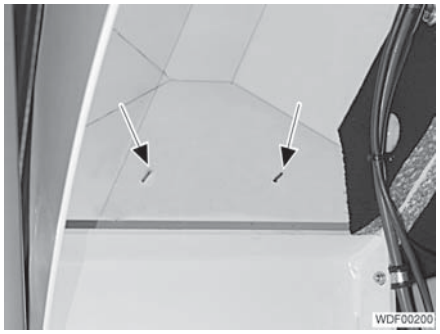


Fig. 307 Attachment pins

Removing the insulation mat

- Remove the attachment clips (Fig. 306,1).
- Remove the entire insulation mat (Fig. 306,2).

Installing the insulation mat

- Clean the bonding surface and attachment pins (Fig. 307).
- Place the insulation mat into position and press it carefully onto the attachment pins.
- Remove the insulation mat and cut the protective film on the rear with a knife.
- Carefully press the insulation mat onto the attachment pins.
- Slightly raise the insulation mat on the upper edge, pull off the protective film and press on the insulation mat.
- Raise the lower edge of the insulation mat slightly, pull off the second half of the protective film and press on the insulation mat.
- Connect the attachment clips (Fig. 306,1) to the attachment pins and knock them carefully into place with the hammer.

Final work

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

6.5 Load arm

6.5.1 Replacing the complete load arm

▶ **DANGER**

Risk of injury by a heavy component.

The complete load arm weighs approx. 426 kg.

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

Requirements

Ensure the following:

- The hydraulic lock (if present) is completely extended.
- The hydraulic system is depressurized (see the section 3.1.1 "Depressurizing the hydraulic system").

Spare parts and auxiliary equipment

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

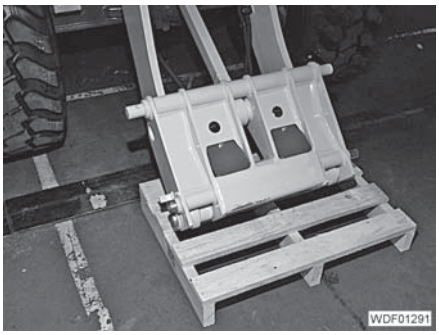


Fig. 308 Setting down the load arm

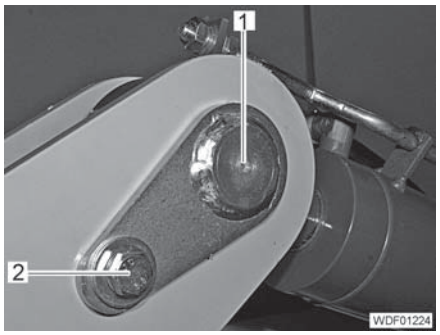


Fig. 309 Rod end attachment

Removing the tipping cylinder at the rod end

- Fully lower the load arm and set it down onto a suitable surface (e.g. pallet) so that it cannot tip over (Fig. 308).
- Unscrew the screw (Fig. 309,2).
- Drive out the pin (Fig. 309,1).
- Fully extend the tilt cylinder, raise it and carefully fold it back as far as it will go.

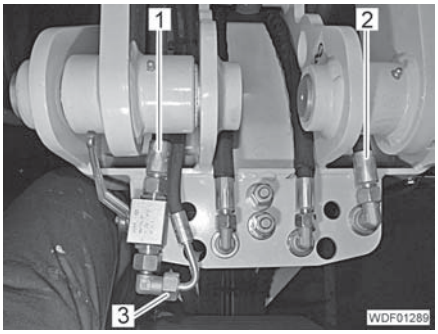


Fig. 310 Hydraulic lines

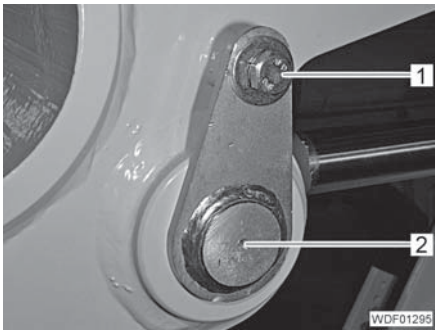


Fig. 311 Attachment of the lifting cylinder at the rod end

Removing the lifting cylinder at the rod end

- Depressurize the hydraulic system (see the section 3.1.1 "Depressurizing the hydraulic system").
- Unscrew and close off the hydraulic lines (Fig. 310,1 to 3).
- Unscrew 1 screw (Fig. 311,1) in each case.
- Drive out 1 pin (Fig. 311,2) in each case.
- Place both lifting cylinders on the front carriage.

Fig. 312 Securing the load arm

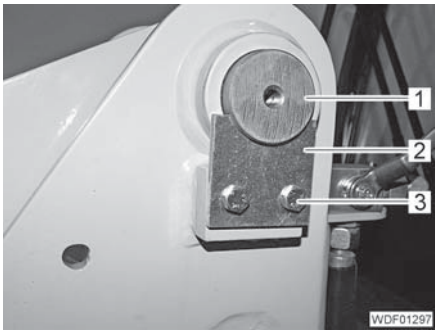


Fig. 313 Pin attachment

Removing the load arm

- Secure the load arm with suitable lifting gear (Fig. 312).
- Unscrew the 2 screws (Fig. 313,3) and remove the locking plate (Fig. 313,2).
- In each case, drive out 1 pin (Fig. 313,1) in an outwards direction.
- Raise the load arm with suitable lifting gear.
- Reverse the loader away carefully.

Installing the load arm

- Carefully drive the loader under the load arm.
- Carefully lower the load arm so that the pin holders line up exactly.
- In each case, drive in 1 pin (Fig. 313,1) from the outside so that the groove for the locking plate points towards the screws (Fig. 313,3).
- Insert 1 locking plate (Fig. 313,2).
- Screw in and tighten 2 screws (Fig. 313,3) on each side with spring lock washers and disks.

Installing the lifting cylinder, rod end

- Raise the lifting cylinder until the rod-end pin holders line up precisely.
- Drive in 1 pin (Fig. 311,2) in each case.
- In each case, screw in and tighten 1 screw (Fig. 311,1) with washer.
- Screw the hydraulic lines (Fig. 310,1 to 3) onto the connections on the front carriage and tighten.

Installing the tipping cylinder, rod end

- Carefully tilt the tipping cylinder forwards, lower it and curl it in until the pin holders at the rod end line up exactly.
- Drive in the pin (Fig. 309,1).
- Screw in and tighten the screw (Fig. 309,2) with the spring lock washer and washer.

Final work

- Lubricate the tipping cylinder bearings.
- Lubricate the lifting cylinder bearings.
- Lubricate the load arm bearings.

6.5.2 Replacing the bearings of the drawbar

▷ This section describes replacement of one bearing.
The second bearing is replaced in the same way.

Spare parts and auxiliary equipment

Designation	Quantity
Bearing	1
Lubricating grease	as req.

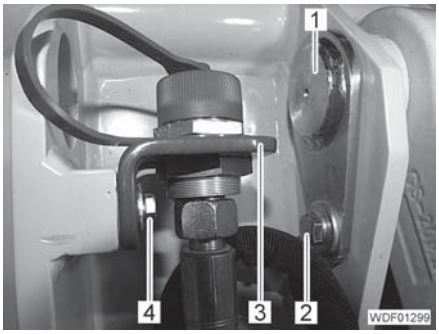


Fig. 314 Drawbar attachment

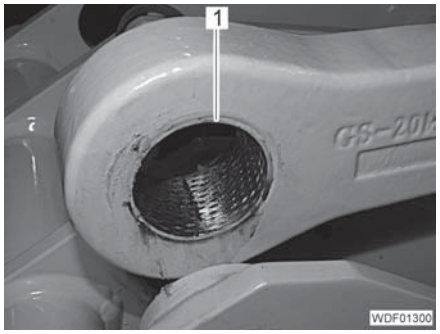


Fig. 315 Bearing

Removing the bearing

- Set down the tool attachment so that it cannot tip over (e.g. on the work bench).
- Unscrew the 2 screws (Fig. 314,4).
- Carefully place the hydraulic line with holder (Fig. 314,3) to one side.
- Unscrew the screw (Fig. 314,2).
- Drive out the pin (Fig. 314,1).
- Raise the drawbar until it is gripped at the sides by the tool attachment.
- Drive out the bearing (Fig. 315,1).

▷ Use a suitable tool to drive in the bearing without tilting it (see Part 2, "Driving bolts" section).

Installing the bearing

- Drive in the bearing (Fig. 315,1).
- Lower the drawbar until the pin holders line up precisely.
- Grease pin and bearing slightly.
- Drive in the pin (Fig. 314,1).
- Screw in and tighten the screw (Fig. 314,2) with the washer.

- Position the holders (Fig. 314,3) with hydraulic line.
- Insert and tighten 2 screws (Fig. 314,4) with spring lock washers and disks.

Final work

- Lubricate the drawbar bearing.

6.5.3 Replacing the bearing of the tipping lever

▷ This section describes replacement of one bearing.
The second bearing is replaced in the same way.

Spare parts and auxiliary equipment

Designation	Quantity
Bearing	2
Lubricating grease	as req.

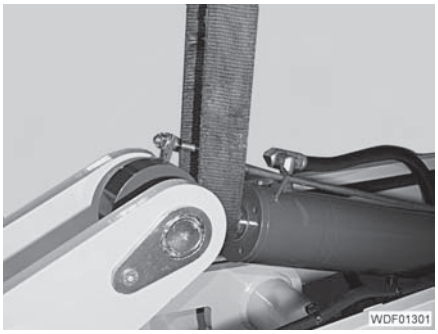


Fig. 316 Attaching the tipping cylinder

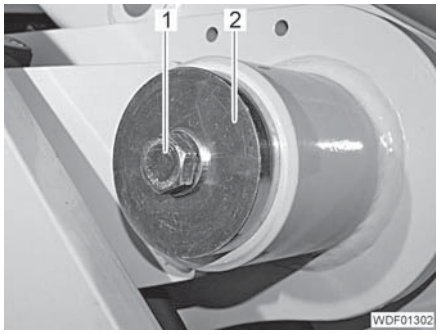


Fig. 317 Pin attachment

Removing the bearing

- Set down the tool attachment so that it cannot tip over (e.g. on the work bench).
- Attach the tipping lever to the piston rod (Fig. 316).
- Unscrew the screw (Fig. 317,1).
- Remove the washer (Fig. 317,2).

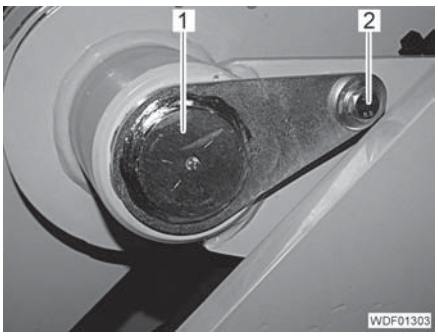


Fig. 318 Pin attachment

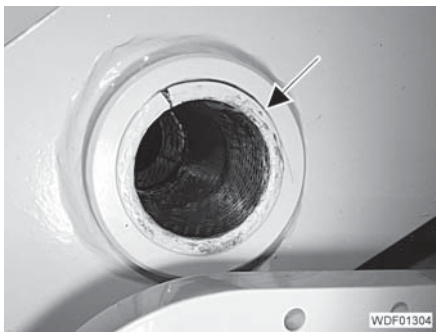


Fig. 319 Bearing of the reversing lever

- Unscrew the screw (Fig. 318,2).
- Drive out the pin (Fig. 318,1).
- Use suitable lifting gear to raise the tipping lever sufficiently far that the bearing (Fig. 319) is free.
- Drive out the bearing outwards.

▷ Use a suitable tool to drive in the bearing without tilting it (see Part 2, "Driving bolts" section).

Installing the bearing

- Drive in the bearing (Fig. 319) from the outside.
- Lower the tipping lever sufficiently far so that the pin holders line up precisely.
- Grease pin and bearing slightly.
- Drive in the pin (Fig. 318,1).
- Screw in and tighten the screw (Fig. 318,2) with the washer.
- Position the washer (Fig. 317,2).
- Screw in and tighten the screw (Fig. 317,1) with the spring lock washer and washer.

Final work

- Lubricate the tipping lever bearing.

6.5.4 Replacing the front bearing of the load arm

▷ This section describes replacement of one bearing.
The second bearing is replaced in the same way.

Spare parts and auxiliary equipment

Designation	Quantity
Bearing	2
Lubricating grease	as req.

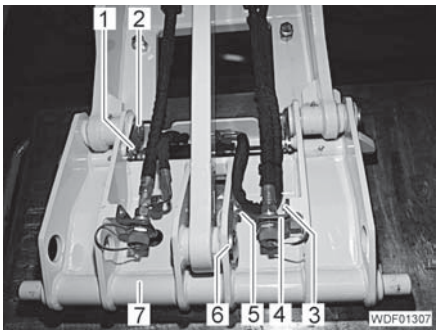


Fig. 320 Securing the tool attachment

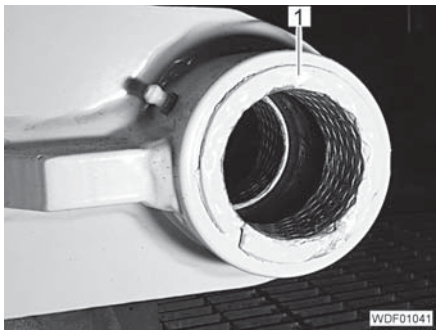


Fig. 321 Front bearing (right)

Removing the bearing

- Set down the tool attachment so that it cannot tip over (e.g. on the work bench).
- Unscrew 1 screw (Fig. 320,1) in each case.
- In each case, drive out 1 pin (Fig. 320,2) in an inwards direction.
- Carefully raise the load arm until the front bearings (Fig. 321) are free.
- Drive out the bearing (Fig. 321,1) outwards.

▷ Use a suitable tool to drive in the bearing without tilting it (see Part 2, "Driving bolts" section).

Installing the bearing

- Drive in a new bearing (Fig. 321,1) from the outside.
- Carefully lower the load arm so that the pin holders line up exactly.
- Grease pin and bearing slightly.
- In each case, drive in 1 pin (Fig. 320,2) from the inside.
- Screw in and tighten 1 screw (Fig. 320,1) on each side with spring lock washers and disks.

Final work

- Lubricate the load arm bearings.

6.5.5 Replacing the rear bearing of the load arm

▷ This section describes replacement of one bearing.
The second bearing is replaced in the same way.

Spare parts and auxiliary equipment

Designation	Quantity
Bearing	2
Lubricating grease	as req.

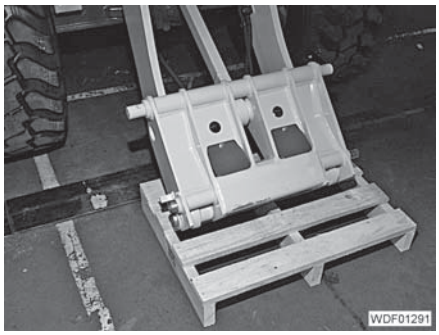


Fig. 322 Resting the tool attachment

Fig. 323 Securing the load arm

Securing the load arm

- Set down the tool attachment in a slightly raised position onto a suitable surface (e.g. pallets) (Fig. 322).
- Secure the load arm with suitable lifting gear (Fig. 323).

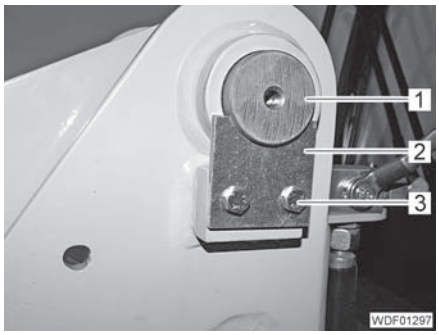


Fig. 324 Pin attachment

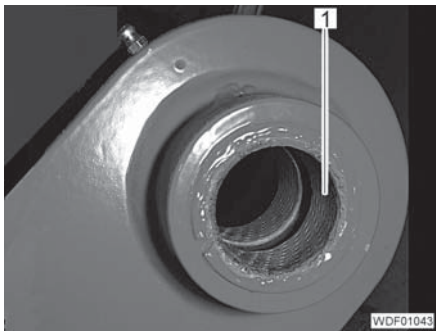


Fig. 325 Rear bearing (left)

Removing the bearing

- Unscrew the 2 screws (Fig. 324,3) and remove the locking plate (Fig. 324,2).
- In each case, drive out 1 pin (Fig. 324,1) in an outwards direction.
- Use suitable lifting gear to raise the load arm until the rear bearings (Fig. 325) are free.
- Drive out the bearing (Fig. 325,1) outwards.

▷ Use a suitable tool to drive in the bearing without tilting it (see Part 2, "Driving bolts" section).

Installing the bearing

- Drive in a new bearing (Fig. 325,1) from the outside.
- Carefully lower the load arm so that the pin holders line up exactly.
- Grease pin and bearing slightly.

- In each case, drive in 1 pin (Fig. 324,1) from the outside so that the groove for the locking plate points towards the screws (Fig. 324,3).
- Insert 1 locking plate (Fig. 324,2).
- Screw in and tighten 2 screws (Fig. 324,3) on each side with spring lock washers and disks.

Final work

- Lubricate the load arm bearings.

6.6 Tool attachment

6.6.1 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.

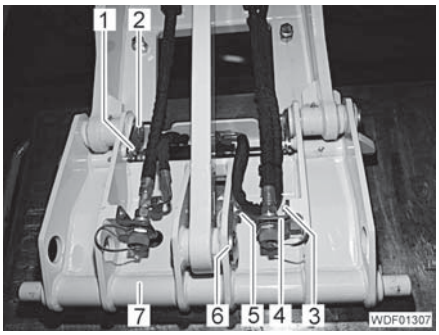


Fig. 326 Securing the tool attachment

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. 326,3).
- Carefully place the 2 hydraulic lines with holders (Fig. 326,4) to one side.
- Unscrew the 3 screws (Fig. 326,1 and 5).
- Drive out the pin (Fig. 326,6) on the drawbar.
- Tilt in the drawbar.
- Drive out the 2 pins (Fig. 326,2).
- Carefully raise the load arm until the tool attachment (Fig. 326,7) is free.

Installing the tool attachment

- Lower the load arm into the tool attachment (Fig. 326,7) so that the holes of the pin holders line up precisely.
- Grease pin and bearing slightly.
- Drive in the 2 pins (Fig. 326,2).
- Tilt out the drawbar until the pin holders line up precisely.
- Drive in the pin (Fig. 326,6).
- Tighten the 3 screws (Fig. 326,1 and 5).

- Position the 2 holders (Fig. 326,4) with hydraulic lines.
- Screw in and tighten 2 screws (Fig. 326,3) on each side with spring lock washers and disks.

Final work

- Check and, if necessary, adjust the curling to load and dumping stops (see Part 3, section "Checking and adjusting the curling to load and dumping stops").
- Lubricate the tool attachment bearings.
- If necessary, install the locking cylinder (see the section 3.8.1 "Replacing the locking cylinder").

6.6.2 Replacing the locking pin

▷ If the locking pin is rusty, check that guide is clean and grind it out if necessary.

Requirements

Ensure the following:

- The locking cylinder has been removed (see the section 3.8.1 "Replacing the locking cylinder").

Spare parts and auxiliary equipment

Designation	Quantity
Pin	2
Lubricating grease	as req.

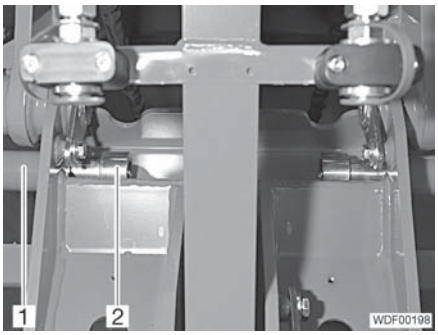


Fig. 327 Locking pin

Replacing the locking pin

- Remove the locking pin (Fig. 327,2) inwards out of the guide (Fig. 327,1).
- Grease the guide and pin slightly.
- Insert a new pin into the guide from the inside.

Final work

- Install the locking cylinder (see the section 3.8.1 "Replacing the locking cylinder").
- Lubricate the locking pin.

7.1 Seat

7.1.1 Replacing the driver's seat

Spare parts and auxiliary equipment

Designation	Quantity
Seat	1
Stop nut, hexagon	4

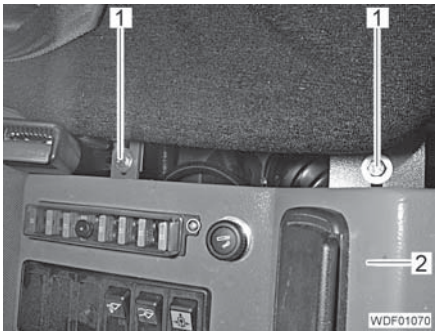


Fig. 328 Console attachment

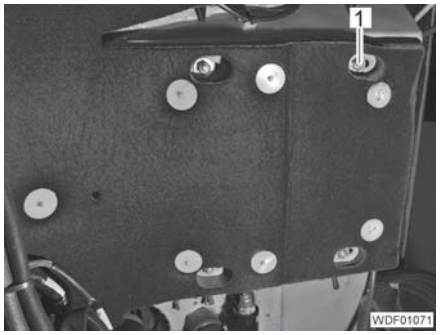


Fig. 329 Driver's seat attachment

Removing the driver's seat

- Mark the position of the driver's seat on the console (Fig. 328,2).
- Unscrew the 2 screws (Fig. 328,1).
- Remove the console (Fig. 328,2) and place it to one side.
- Tilt the operator's platform (see operator's manual "Tilting the operator's platform").
- Unscrew the 4 nuts (Fig. 329,1).
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Carefully lift the driver's seat out of the cab.

Installing the driver's seat

- Carefully lift the driver's seat into the cab.
- Tilt the operator's platform (see operator's manual "Tilting the operator's platform").
- Screw the 4 nuts (Fig. 329,1) with washers onto the screws.
- Align the driver's seat and tighten the nuts.
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Place the console (Fig. 328,2) into position.
- Screw in the screws (Fig. 328,1) with washers.
- Align the console and tighten the screws.

7.1.2 Replacing the complete seat belt

Spare parts and auxiliary equipment

Designation	Quantity
Seat belt	1

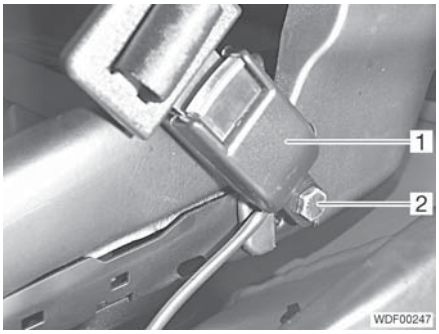


Fig. 330 Seat belt attachment

Removing the seat belt

- Unscrew 1 cap on both sides.
- Unscrew 1 screw (Fig. 330,2) on both sides.
- Remove the seat belt, including the belt buckle (Fig. 330,1).

Fitting the seat belt

- Position the new seat belt so that the belt buckle (Fig. 330,1) is on the left side.
- Screw in 1 screw (Fig. 330,2) on both sides and tighten.
- Fit 1 cap to each screw on both sides.

7.2 Frame

7.2.1 Removing the complete cab

▶ **DANGER**

Risk of death due to escaping refrigerant!

The lines to the air-conditioning unit (where applicable) must only be opened by specially trained personnel.

Never open any pipes, tubes or other components that contain refrigerant.

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

Requirements Ensure the following:

- The battery disconnect switch has been removed (see the section 8.2.1 "Replacing the battery disconnect switch").
- The hydraulic system is depressurized (see the section 3.7.1 "Depressurizing the control hydraulic").
- The hydraulic system is depressurized (see the section 3.1.1 "Depressurizing the hydraulic system").
- The lines to the vaporizer of the air-conditioning unit (where applicable) have been emptied and removed by specially trained personnel.

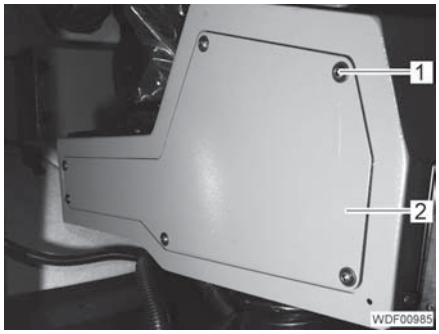


Fig. 331 Cover attachment

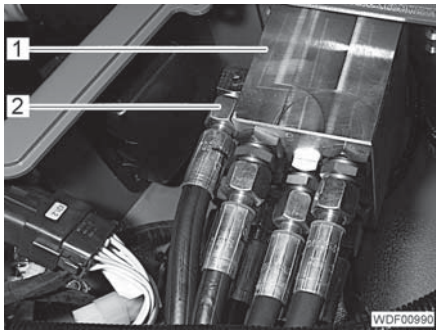


Fig. 332 Hydraulic lines

Disconnecting the lines of the control hydraulic

- Unscrew the 6 screws (Fig. 331,1).
- Remove the cover (Fig. 331,2).
- Mark the hydraulic lines in order to prevent mix-ups.
- Unscrew and close off the 8 hydraulic lines (Fig. 332,2).
- Tilt the operator's platform (see operator's manual "Tilting the operator's platform").

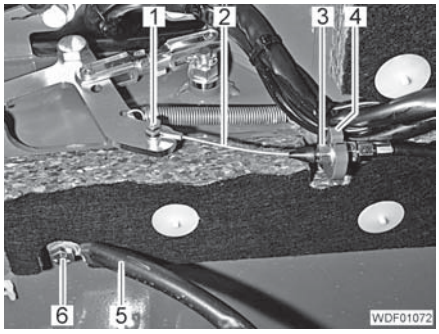


Fig. 333 Front attachment of the Bowden cable

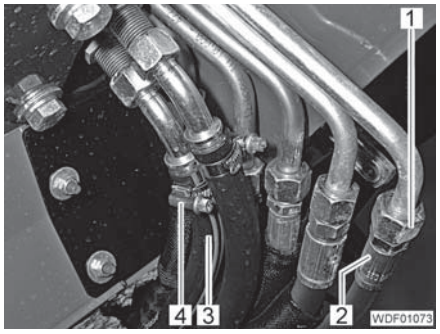


Fig. 334 Hydraulic connections

Disconnecting the lines

- Unscrew the screw (Fig. 333,6) and remove the grounding strip (Fig. 333,5).
- Unscrew the screw (Fig. 333,1).
- Undo the nut (Fig. 333,3) and remove the Bowden cable (Fig. 333,2) from the mount (Fig. 333,4).
- Unscrew 5 nuts (Fig. 334,1), remove and close off the hydraulic lines (Fig. 334,2).
- Close off the 2 heating lines (Fig. 334,3) (e.g. using hose clamps).
- Release the 2 clamps (Fig. 334,4) and detach the heating lines.

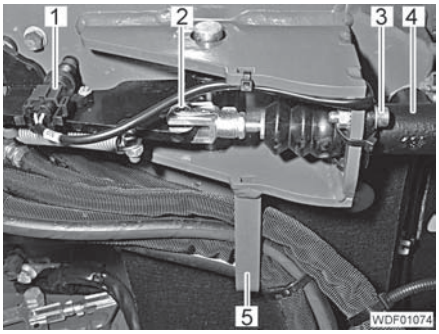


Fig. 335 Main brake cylinder

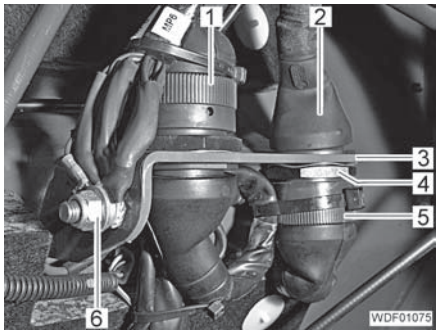


Fig. 336 Electrical plugs

Disconnecting the plugs

- Thread out all the lines from the bar (Fig. 335,5).
- Unplug the plug on the switch (Fig. 335,1) of the service brake.
- Unlock the pin (Fig. 335,2) and pull it out of the fork end.
- Unscrew the 2 screws (Fig. 335,3).
- Remove the main brake cylinder (Fig. 335,4) towards the back and place it on the rear carriage.
- Unscrew the nut (Fig. 336,6) from the grounding point and remove the cable.
- Unplug 2 plugs (Fig. 336,1 and 5).
- Unscrew the nut (Fig. 336,4) and unplug the plug (Fig. 336,2) from the holder (Fig. 336,3).

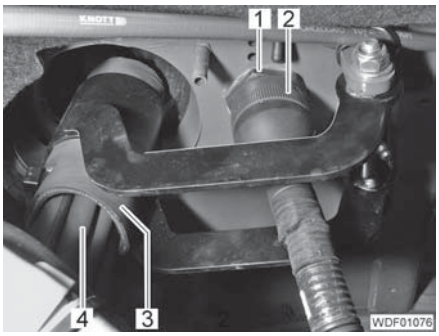


Fig. 337 Underside of the cab

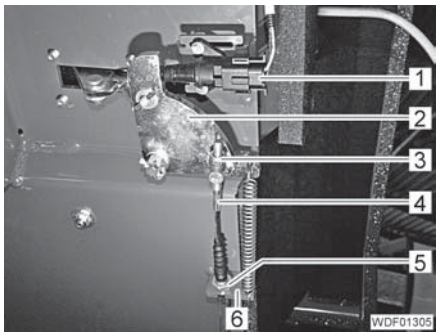


Fig. 338 Bowden cable attachment

Removing the Bowden cable of the parking brake

- Unplug the connector (Fig. 337,2).
- Carefully disconnect the hydraulic lines (Fig. 337,4) of the control hydraulic.
- Disconnect the plug from the switch (Fig. 338,1) of the parking brake.
- Unscrew the nut (Fig. 338,3) and pull the Bowden cable from the holder (Fig. 338,2).
- Undo the nut (Fig. 338,5).
- Remove the Bowden cable (Fig. 338,4) to the side from the holder (Fig. 338,6).
- Undo or remove all fastenings (e.g. cable ties) along the Bowden cables and cables.

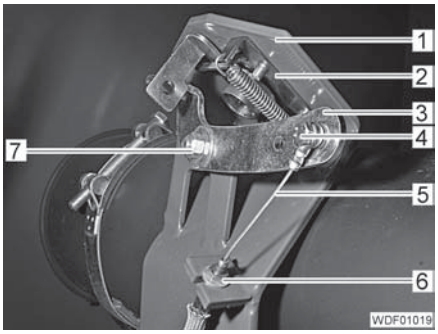


Fig. 339 Locking mechanism of engine hood

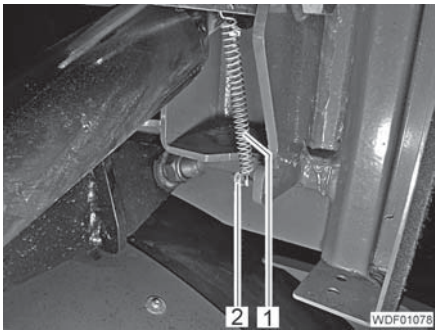


Fig. 340 Spring attachment

Unhooking the spring

- Unscrew the screw (Fig. 339,4).
- Loosen the nut (Fig. 339,6) and pull the Bowden cable forwards out of the mount (Fig. 339,1).
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Unscrew the nut (Fig. 340,2).
- Unhook the spring (Fig. 340,1).

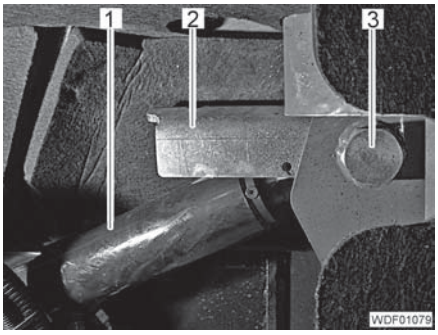


Fig. 341 Hydraulic cylinder attachment

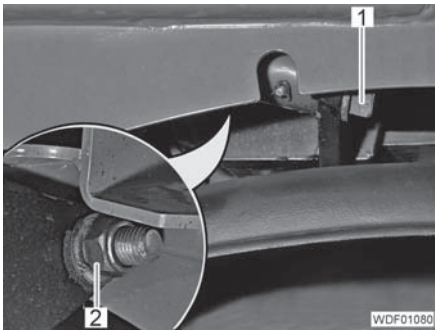


Fig. 342 Cab attachment (rear)

Lifting the cab

- Hook up the cab with suitable lifting gear (e.g. a crane).
- Unscrew the screw (Fig. 341,3).
- Unscrew the nut (Fig. 342,2).
- Drive out the hinge pins (Fig. 342,1) forwards.

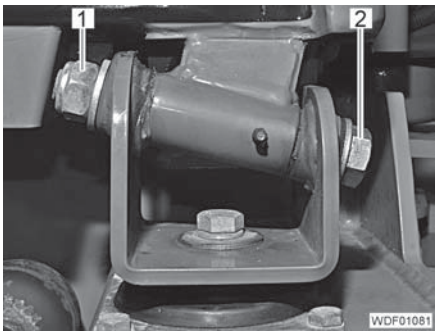


Fig. 343 Cab attachment (front)

- Unscrew the nut (Fig. 343,1).
- Drive out the hinge pins (Fig. 343,2) forwards.
- Carefully lift off the cab upwards with lifting gear.

7.2.2 Installing the complete cab

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

Spare parts and auxiliary equipment

Designation	Quantity
Cab	1

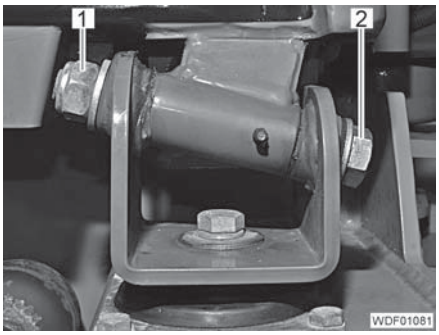


Fig. 344 Cab attachment (front)

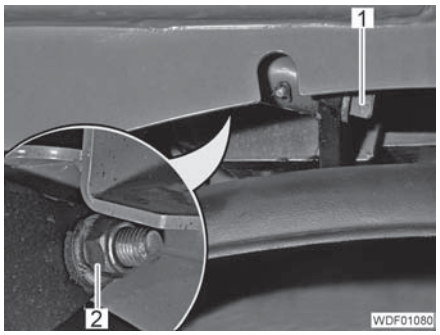


Fig. 345 Cab attachment (rear)

Placing the cab into position

- Hook up the cab with suitable lifting gear (e.g. a crane).
- Carefully place the cab onto the rear carriage from above so that the attachments are lined up.
- Drive in the hinge pins (Fig. 344,2) with washer from the front.
- Screw the nut (Fig. 344,1) with washer onto the hinge pin and tighten it so that the hinge pin can still be rotated.
- Drive in the hinge pins (Fig. 345,1) with washer from the front.
- Screw the nut (Fig. 345,2) with washer onto the hinge pin and tighten it so that the hinge pin can still be rotated.

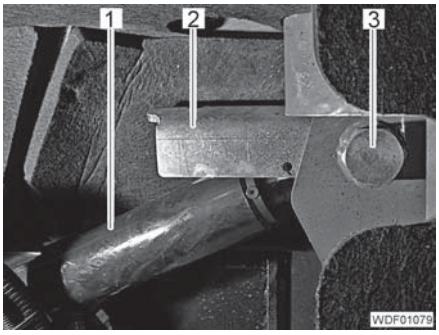


Fig. 346 Hydraulic cylinder attachment

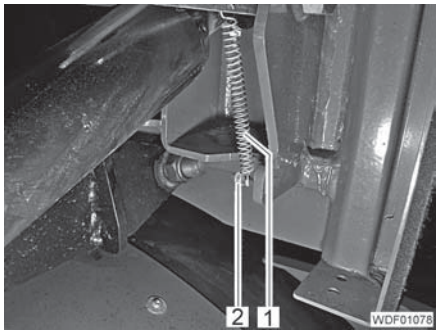


Fig. 347 Spring attachment

Hooking in the spring

- Position the cab securing device (Fig. 346,2) and hydraulic cylinder (Fig. 346,1).
- Screw in and tighten the screw (Fig. 346,3).
- Hook in the spring (Fig. 347,1).
- Screw the nut (Fig. 347,2) with washer onto the thread so that the spring can still be rotated.
- Tilt the operator's platform (see operator's manual "Tilting the operator's platform").

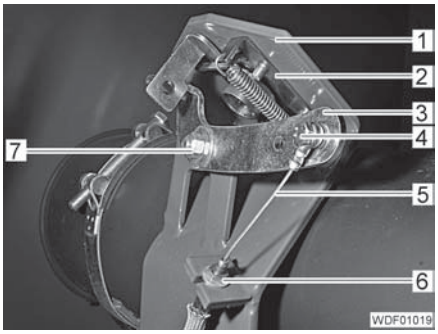


Fig. 348 Locking mechanism of engine hood

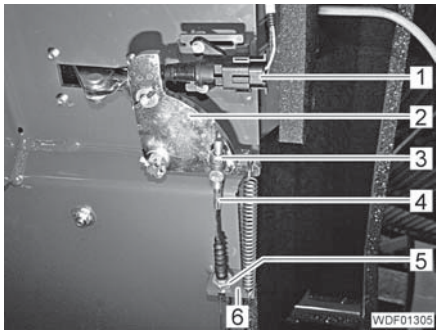


Fig. 349 Bowden cable attachment

Installing the Bowden cable of the parking brake

- Insert the Bowden cable (Fig. 348,5) into the mounting bracket (Fig. 348,1) from the front.
- Tighten the nut (Fig. 348,6).
- Screw in the screw (Fig. 348,4) with the eye and washer and tighten so that the eye can still be rotated.
- Insert the Bowden cable (Fig. 349,4) from the side into the mounting bracket (Fig. 349,6).
- Tighten the nut (Fig. 349,5).
- Insert the Bowden cable into the holder (Fig. 349,2).
- Screw the nut (Fig. 349,3) with washer onto the Bowden cable and tighten it so that the Bowden cable can still be rotated.
- Connect the plug to the switch (Fig. 349,1) of the parking brake.

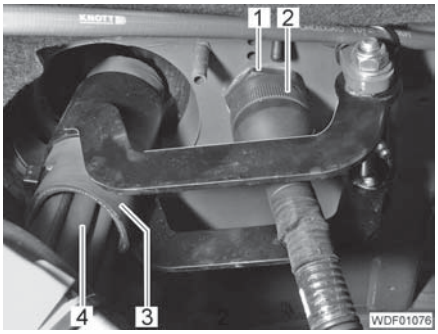


Fig. 350 Underside of the cab

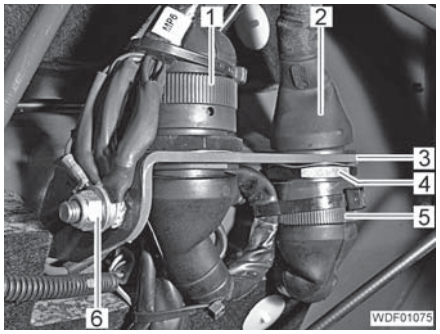


Fig. 351 Electrical plugs

Connecting the plug

- Carefully insert the hydraulic lines (Fig. 350,4) of the control hydraulic into the hose (Fig. 350,3).
- Insert the plug (Fig. 350,2).
- Insert the plug (Fig. 351,2) into the holder (Fig. 351,3).
- Screw the nut (Fig. 351,4) with the washer onto the connector and tighten.
- Attach the 2 plugs (Fig. 351,1 and 5).
- Attach the cable to the grounding point.
- Screw the nut (Fig. 351,6) with washer onto the thread of the grounding point and tighten.

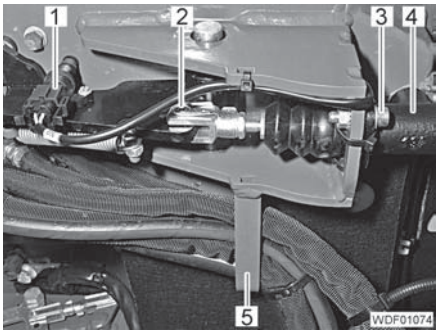


Fig. 352 Main brake cylinder

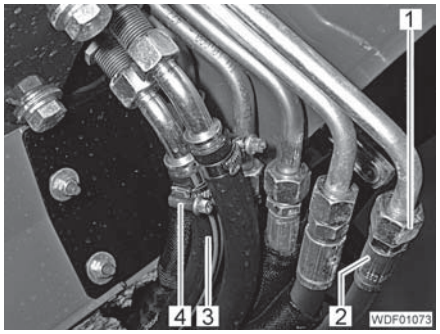


Fig. 353 Hydraulic connections

Connecting lines

- Carefully attach the main brake cylinder (Fig. 352,4) from the rear.
- Screw in 2 screws (Fig. 352,3) with washers and tighten.
- Push the pin (Fig. 352,2) through the fork end and secure.
- Attach the plug on the switch (Fig. 352,1) of the service brake.
- Attach 2 heating lines (Fig. 353,3) with clamps (Fig. 353,4).
- Tighten the 2 clamps (Fig. 353,4) and open the heating lines (e.g. remove hose clamps).
- Screw the 5 nuts (Fig. 353,1) onto the hydraulic lines (Fig. 353,2) and tighten.

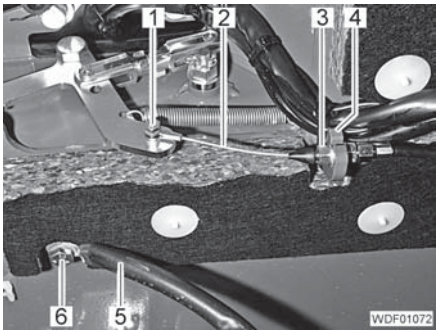


Fig. 354 Front attachment of the Bowden cable

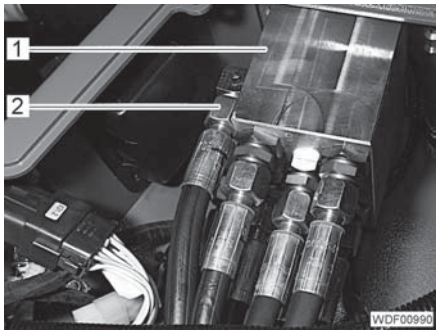


Fig. 355 Hydraulic lines

Connecting the lines of the control hydraulic

- Insert the Bowden cable (Fig. 354,2) into the holder (Fig. 354,4).
- Tighten the nut (Fig. 354,3).
- Screw in the screw (Fig. 354,1) with the eye and washer and tighten so that the eye can still be rotated.
- Attach the grounding strip (Fig. 354,5).
- Screw in and tighten the screw (Fig. 354,6) with the serrated washer.
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Screw the 8 hydraulic lines (Fig. 355,2) onto the connections of the pilot control (Fig. 355,1) and tighten.

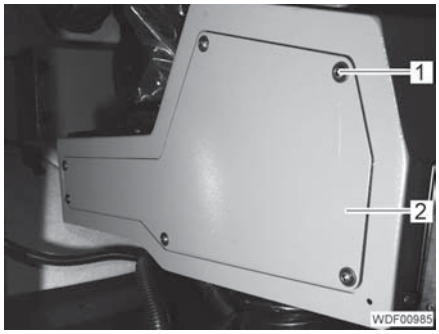


Fig. 356 Cover attachment

- Position the cover (Fig. 356,2).
- Screw in and tighten the 6 screws (Fig. 356,1).

Final work

- Tighten or replace loose or missing fastenings (e.g. cable ties) along the Bowden cables and cables.
- Install the battery disconnect switch (see the section 8.2.1 "Replacing the battery disconnect switch").
- Have the connections to the vaporizer of the air-conditioning unit (where applicable) connected by specially trained personnel.
- Have the air-conditioning unit (where applicable) filled by specially trained personnel.

7.2.3 Replacing the front rubber buffers of the cab

▷ Do not damage any electrical or hydraulic lines when lifting the cab.
Work very carefully.

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
Rubber buffer	2

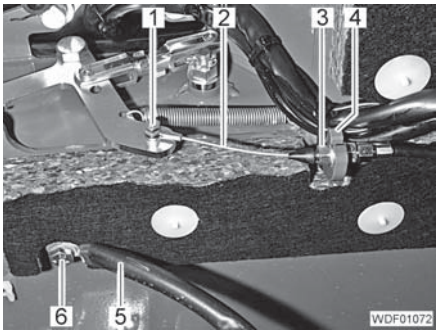


Fig. 357 Underside of the cab

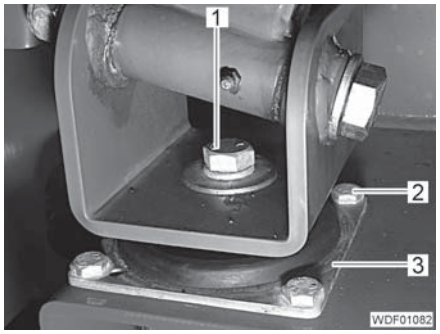


Fig. 358 Cab attachment

Removing the rubber buffers

- Unscrew the screw (Fig. 357,6) and remove the grounding strip (Fig. 357,5).
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Unscrew 4 screws (Fig. 358,2) on both sides.
- Loosen 1 screw (Fig. 358,1) on both sides.
- Using suitable lifting gear (e.g. a crane) carefully raise the cab at the front so that the rubber buffers (Fig. 358,3) can be removed.
- Unscrew 1 screw (Fig. 358,1) on each side and remove 1 rubber buffer (Fig. 358,3) on each side.

Installing the rubber buffers

- Attach 1 rubber buffer (Fig. 358,3) from below to the cab on each side and screw in 1 screw (Fig. 358,1) on each side with spring lock washers and disks.
- Carefully lower the cab so that the rubber buffers engage with the rear carriage.
- Screw in and tighten 4 screws (Fig. 358,2) in each case.
- Tighten the screw (Fig. 358,1).
- Tilt the operator's platform (see operator's manual "Tilting the operator's platform").
- Attach the grounding strip (Fig. 357,5).
- Screw in and tighten the screw (Fig. 357,6) with the serrated washer.

Final work

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

7.2.4 Replacing the rear rubber buffers of the cab

Requirements

Ensure the following:

- The cab has been removed (see the section 7.2.1 "Fully removing the cab").

Spare parts and auxiliary equipment

Designation	Quantity
Rubber buffer	2

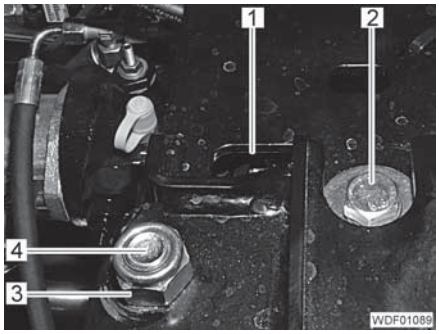


Fig. 359 Traverse attachment

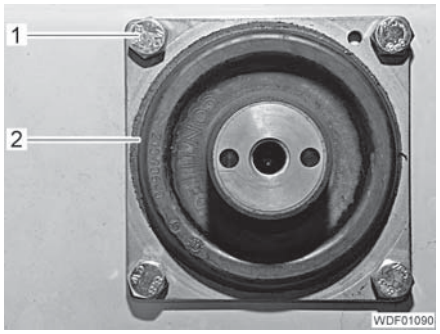


Fig. 360 Rubber buffer attachment

Removing the rubber buffers

- Unscrew 1 nut (Fig. 359,3) on both sides.
- Unscrew 1 screw (Fig. 359,2) on both sides.
- Remove the traverse (Fig. 359,1).
- Unscrew 4 screws (Fig. 360,1) on both sides.
- Remove 1 rubber buffer (Fig. 360,2) on both sides.

Installing the rubber buffers

- Insert 1 rubber buffer (Fig. 360,2) on each side.
- Screw in and tighten 4 bolts (Fig. 360,1) with spring lock washers and disks.
- Fit the traverse (Fig. 359,1).
- Screw in and tighten 1 screw (Fig. 359,2) on each side with spring lock washers and disks.
- Insert 1 screw (Fig. 359,4) from below through the traverse on each side and secure with 1 nut (Fig. 359,3) on each side.

Final work

- Install the cab (see the section 7.2.2 "Installing the complete cab").

7.2.5 Replacing the roof grille of the cab

Spare parts and auxiliary equipment

Designation	Quantity
Roof grille	1
Stop nut, M10	4

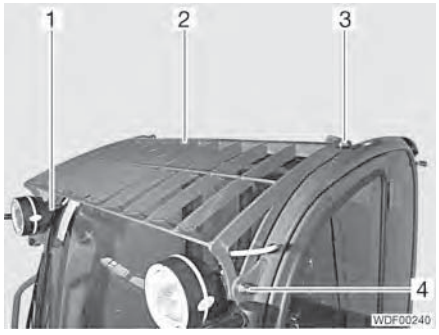


Fig. 361 Roof grille attachment

Removing the roof grille

- Unplug 1 plug (Fig. 361,1) from the headlight on each side.
- Remove 4 caps (Fig. 361,3).
- Unscrew the 4 nuts (Fig. 361,4).
- Remove the roof grille (Fig. 361,2).

Installing the roof grille

- Place the roof grille carefully into position.
- Screw the 4 nuts (Fig. 361,4), with washers, onto the bolts and tighten.
- Fit the 4 caps (Fig. 361,3) onto the nuts.
- Plug 1 plug (Fig. 361,1) onto the headlight on each side.

7.2.6 Replacing the floor mats

▷ 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 3.7.1 "Depressurizing the control hydraulic").
- The driver's seat has been removed (see the section 7.1.1 "Replacing the driver's seat").
- The operator's platform is tilted (see operator's manual "Tilting the operator's platform").

Spare parts and auxiliary equipment

Designation	Quantity
Floor mat	2
Expansion rivet, plastic	21

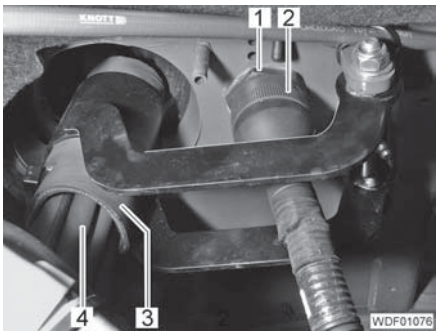


Fig. 362 Underside of the cab

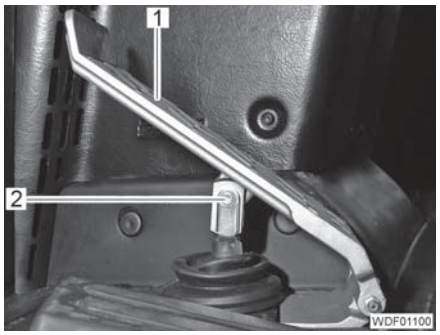


Fig. 363 Brake pedal

Unplugging the connector

- Unplug the connector (Fig. 362,2).
- Unscrew the nut (Fig. 362,1).
- Carefully push the plug upwards through the floor mat.
- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Unlock the pin (Fig. 363,2) and pull it out of the fork end.
- Fold the pedal (Fig. 363,1) upwards.

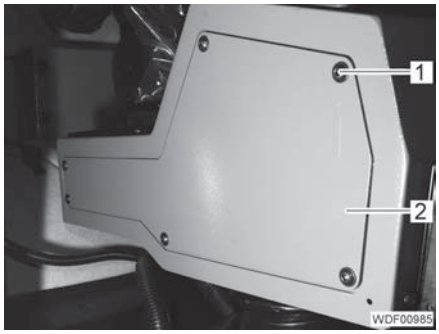


Fig. 364 Cover attachment

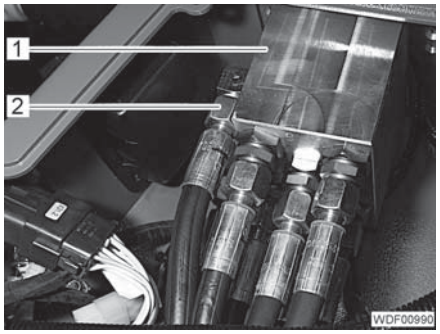


Fig. 365 Hydraulic lines

Disconnecting the lines of the control hydraulic

- Unscrew the 6 screws (Fig. 364,1).
- Remove the cover (Fig. 364,2).
- Mark the hydraulic lines in order to prevent mix-ups.
- Unscrew and close off the 8 hydraulic lines (Fig. 365,2).

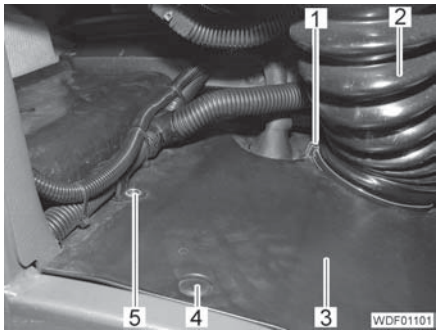


Fig. 366 Floor mat attachment (rear)

Removing the floor mats

- Removing the fixing (Fig. 366,1) of the bellows (Fig. 366,2).
- Carefully remove the hydraulic lines of the control hydraulic from the bellows.
- Unscrew the screw (Fig. 366,5).
- Pull out the 21 expansion rivets (Fig. 366,4).
- Remove the rear (Fig. 366,3) and front floor mat.

Fit the floor mats

- Insert the front floor mat into the cab and push the pedal (Fig. 363,1) through the floor mat.
- Insert the rear floor mat (Fig. 366,3) into the cab and push the hydraulic lines of the control hydraulic through the floor mat.
- Push in the 21 expansion rivets (Fig. 366,4).
- Place the clamp in position, screw in and tighten the screw (Fig. 366,5).
- Insert the hydraulic lines of the control hydraulic into the bellows (Fig. 366,2).
- Replace the fixing (Fig. 366,1) of the bellows.

Connecting the lines of the control hydraulic

- Screw the 8 hydraulic lines (Fig. 365,2) onto the connections of the pilot control (Fig. 365,1) and tighten.
- Position the cover (Fig. 364,2).
- Screw in and tighten the 6 screws (Fig. 364,1).

Fitting the connector

- Fold the pedal (Fig. 363,1) forwards.
- Push the pin (Fig. 363,2) through the fork end and secure.
- Tilt the operator's platform (see operator's manual "Tilting the operator's platform").
- Carefully push the plug through the floor mat from above.
- Screw the nut (Fig. 362,1) with the washer onto the connector and tighten.
- Insert the plug (Fig. 362,2).

Final work

- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Install the driver's seat (see the section 7.1.1 "Replacing the driver's seat").

7.2.7 Replacing the radio console

Spare parts and auxiliary equipment

Designation	Quantity
Console	1
Stop nut, M5	4

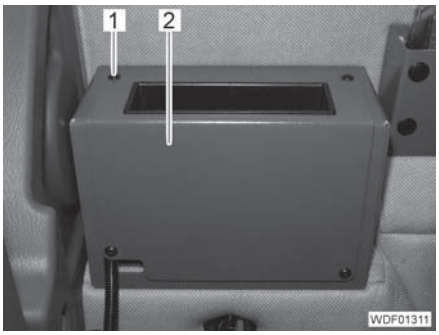


Fig. 367 Cover of the console

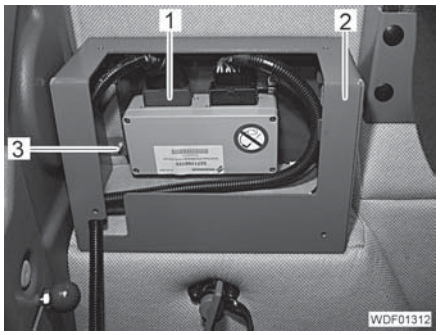


Fig. 368 Console attachment

Removing the console

- Unscrew the 4 screws (Fig. 367,1).
- Remove the cover (Fig. 367,2).
- Unplug the connector (Fig. 368,1).
- Unscrew the 4 nuts (Fig. 368,3).
- Remove the console (Fig. 368,2).

Fitting the console

- Position the console (Fig. 368,2) so as not to trap any cable.
- Screw the 4 nuts (Fig. 368,3) onto the threads and tighten.
- Insert the plug (Fig. 368,1).
- Position the cover (Fig. 367,2).
- Screw in and tighten the 4 screws (Fig. 367,1).

7.2.8 Replacing the sun visor

Spare parts and auxiliary equipment

Designation	Quantity
Sun visor	1

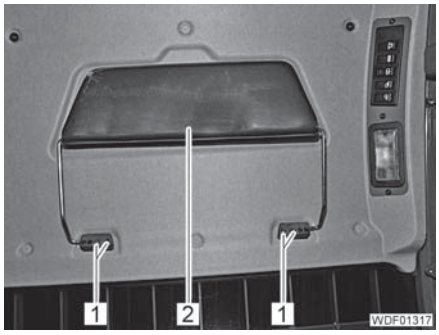


Fig. 369 Sun visor

Removing the sun visor

- Unscrew the 4 screws (Fig. 369,1).
- Remove the sun visor (Fig. 369,2).

Fitting the sun visor

- Position the sun visor (Fig. 369,2).
- Screw in and tighten the 4 screws (Fig. 369,1).

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

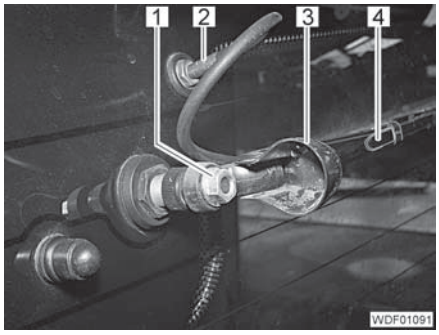


Fig. 370 Rear windshield wiper arm

Removing the rear windshield wiper arm

- Mark the position of the windshield wiper arm.
- Pull off the hose (Fig. 370,2) of the windshield washer system.
- Fold the cap (Fig. 370,3) away from the fastening.
- Undo the nut (Fig. 370,1).
- Press the windshield wiper arm (Fig. 370,4) against the nut with a lever.
- Remove the nut and windshield wiper arm.

Fitting the rear windshield wiper arm

- Fit a new windshield wiper arm onto the bolt.
- Screw the nut (Fig. 370,1) onto the bolt and tighten it.
- Check the function.
- Readjust the windshield wiper arm if the desired wiping area is not covered.
- Fold the cap (Fig. 370,3) over the nut.
- Attach the hose (Fig. 370,2) to the connection at the top edge of the windshield.

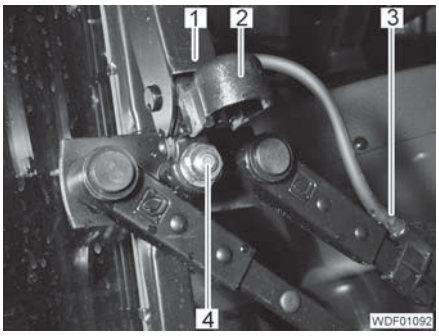


Fig. 371 Fixing the upper windshield wiper arm

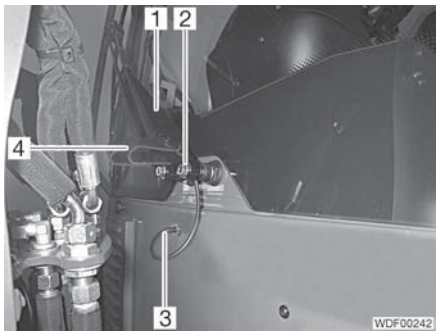


Fig. 372 Front windshield wiper arms

Removing the upper windshield wiper arm

- Mark the position of the windshield wiper arm.
- Pull off the hose (Fig. 371,3) of the windshield washer system.
- Fold away the cap (Fig. 371,2) on the fastening.
- Undo the nut (Fig. 371,4).
- Press the windshield wiper arm (Fig. 371,1) against the nut with a lever.
- Remove the nut and windshield wiper arm.

Removing the front windshield wiper arms

- Mark the position of the windshield wiper arms.
- Pull off the hose (Fig. 372,3) of the windshield washer system.
- Fold the 2 caps (Fig. 372,4) away from the fastening.
- Undo the 2 nuts (Fig. 372,2).
- Press both windshield wiper arms (Fig. 372,1) against the nuts with a lever.
- Remove the nuts and windshield wiper arms.

Fitting the front windshield wiper arms

- Fit new windshield wiper arms onto the bolts.
- Screw the 2 nuts (Fig. 372,2) onto the bolts and tighten.
- Check the function.
- Readjust the windshield wiper arms if the desired wiping area (the center of the front windshield) is not covered.
- Fold the 2 caps (Fig. 372,4) over the nuts.
- Insert the hose (Fig. 372,3) onto the connection below the windshield.

Fitting the upper windshield wiper arm

- Fit a new windshield wiper arm onto the bolt.
- Screw the nut (Fig. 371,4) onto the bolt and tighten it.
- Fold the cap (Fig. 371,2) over the nut.
- Attach the hose (Fig. 371,3) to the connection on the lower windshield wiper arms.

7.3.2 Replacing the windshield washer container

Spare parts and auxiliary equipment

Designation	Quantity
Windshield washer container	1

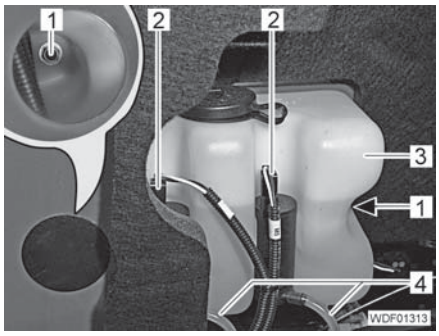


Fig. 373 Windshield washer container

Removing the windshield washer container

- In each case, detach 1 plug (Fig. 373,2) from each of the washer water pumps.
- In each case, unplug 1 transparent hose (Fig. 373,4) from the two washer water pumps and close them off.
- Unscrew the 2 screws (Fig. 373,1) and remove the windshield washer container (Fig. 373,3).

Installing the windshield washer container

- Put the windshield washer container (Fig. 373,3) into position.
- Screw in 2 screws (Fig. 373,1) with washers and tighten.
- In each case, connect 1 transparent hose (Fig. 373,4) to the two washer water pumps.
- Attach 1 connector (Fig. 373,2) to the two washer water pumps.

Final work

- Top up the washing water (see operator's manual "Filling the container for the windshield washer system").
- Check that the washer water pump is working.

7.3.3 Replacing a bonded-in window

▶ **WARNING**

Risk of injury from glass splinters.

Wear protective gloves and safety goggles.

▶ **WARNING**

Risk of injury by falling window.

Windows can be very heavy and unwieldy.

Use suitable lifting gear, or get a second person to assist you.

▷ Always follow the glass manufacturer's fitting instructions.

▷ Always follow the adhesive manufacturer's fitting instructions.

▷ This section describes replacement of a bonded-in window.
All other bonded-in windows are replaced in the same way.

Spare parts and auxiliary equipment

Designation	Quantity
Window	1
Adhesive set	1

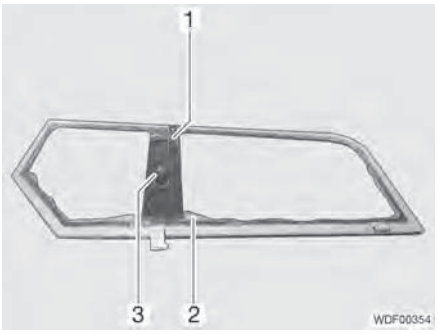


Fig. 374 Remains of the window

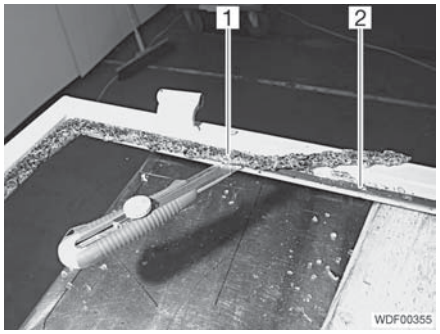


Fig. 375 Glass and residual beading

Removing glass remains

- Remove and set aside fittings under which there are splinters, e.g. door handle (Fig. 374,1).
- Remove and clean the seals (Fig. 374,3) and place them aside.
- Remove loose glass splinters.

▶ **DANGER**
Risk of injury from slipping with the cutting tool.
Work very carefully and wear cut-resistant work clothing.

- Cut open the adhesive between the glass remains (Fig. 375,1) and the door.
- Remove the glass remains.
- Scrape off the residual beading (Fig. 375,2) so that it is smooth, leaving approx. 1 mm.
- If necessary, touch up minor paint damage on the frame.
- Clean the bonding surfaces on the door thoroughly.

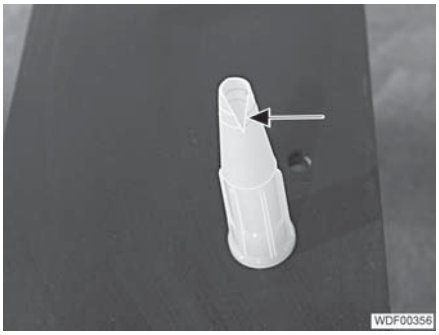


Fig. 376 Adhesive dispenser

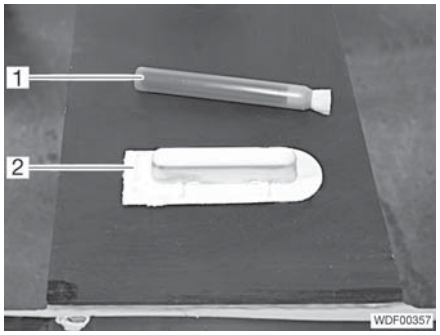


Fig. 377 Primer and activator

Preparation for bonding

- Place the window into the door to check the fit.
- Clean the bonding surfaces of the window thoroughly.

- Cut off the end of the adhesive dispenser (Fig. 376) and make a notch (see the adhesive manufacturer's instructions).
- Touch up minor damage on the door's black UV protective coating with the primer (Fig. 377,1) and allow it to dry thoroughly.
- Break the small glass tube inside the activator (Fig. 377,2) to activate the activator.
- Using the yellow fleece, apply the activator to the bonding surfaces of the door and window, and allow it to dry.

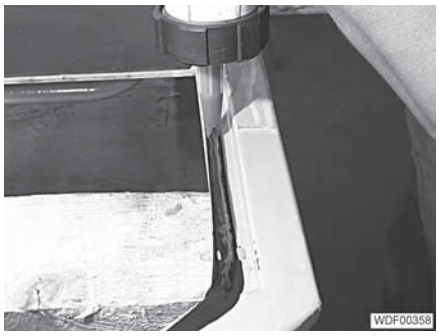


Fig. 378 Adhesive bead

Bonding in the window

- Apply the adhesive in a bead (Fig. 378) along the bonding surface of the door.

▷ Do not touch the bonding surfaces of the window.

▷ When performing vertical installation, use spacers to the edge until the adhesive has hardened.

▷ When performing vertical installation, secure the window in place until the adhesive has hardened.

- Place the window onto the adhesive bead, align it and press it on until the window is flush against the door.
- Allow the adhesive to harden (see the adhesive manufacturer's instructions).
- Fit the seals and attachments, e.g. door handle.
- If necessary, seal individual points with sealant (e.g. silicone).

7.3.4 Replacing the door

▷ The hinges are lined with plastic washers.

Take off the plastic washers after removal and put them back during installation.

Spare parts and auxiliary equipment

Designation	Quantity
Door	1
Stop nuts	2

Fig. 379 Door of cab (right)

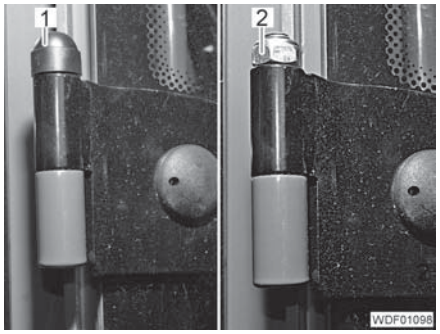


Fig. 380 Securing the windshield

Removing the windshield

- Remove the cap (Fig. 380,1).
- Unscrew the nut (Fig. 380,2).
- Open the windshield (Fig. 379,1).
- Carefully lift the windshield up and remove it.

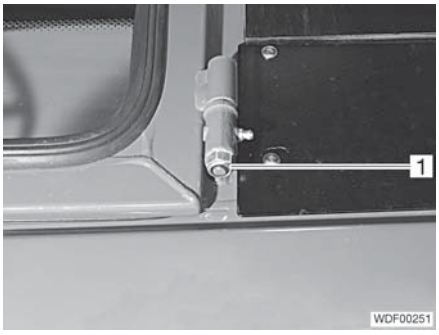


Fig. 381 Securing the door

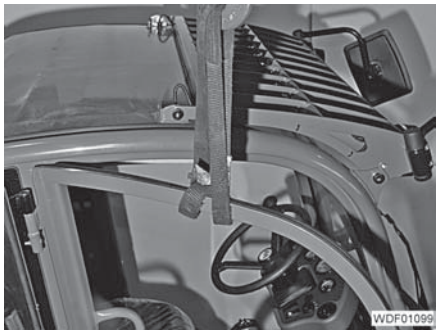


Fig. 382 Attaching lifting gear to the door

Removing the door

- Unscrew the nut (Fig. 381,1).
- Open the door (Fig. 379,2) and attach suitable lifting gear (e.g. a crane) to it (Fig. 382).
- Carefully lift the door up and remove it.

Installing the door

- Carefully insert the door (Fig. 379,2) from above first into the upper and then into the lower hinge.
- Close the door.
- Screw the nut (Fig. 381,1) onto the bolt and tighten it.

Fitting the windshield

- Carefully insert the windshield (Fig. 379,1) from above first into the upper and then into the lower hinge.
- Close the windshield.
- Screw the nut (Fig. 380,2) onto the bolt and tighten it.
- Fit cap (Fig. 380,1) onto nut.

Final work

- Grease the hinges of the door.

7.3.5 Replacing the door lock

Spare parts and auxiliary equipment

Designation	Quantity
Lock	1
Handle	1

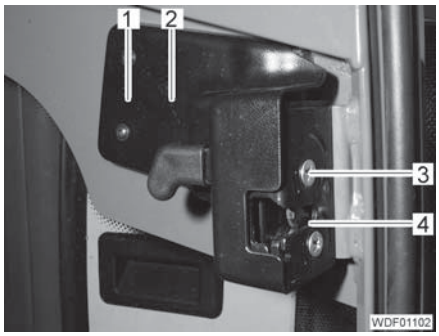


Fig. 383 Door lock

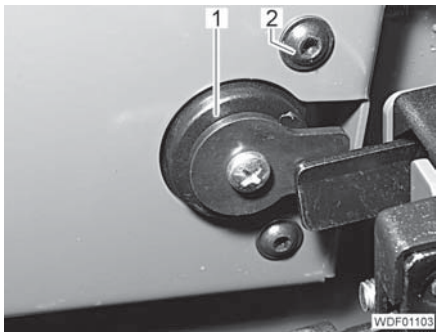


Fig. 384 Door handle attachment

Removing the door lock

- Unscrew the 2 screws (Fig. 383,1).
- Remove the cover (Fig. 383,2).
- Unscrew the 2 screws (Fig. 383,3).
- Remove the lock (Fig. 383,4).

Replacing the door handle

- Unscrew the 2 screws (Fig. 384,2).
- Remove the handle (Fig. 384,1) outwards.
- Position a new handle from the outside.
- Screw in and tighten the 2 screws (Fig. 384,2).

Fitting the door lock

- Place on the lock (Fig. 383,4) into position.
- Screw in and tighten the 2 screws (Fig. 383,3).
- Place on the cover (Fig. 383,2).
- Screw in and tighten the 2 screws (Fig. 383,1).

7.3.6 Replacing the door stay

Requirements

Ensure the following:

- The console of the radio has been removed (see section 7.2.7 "Replacing the radio console").

Spare parts and auxiliary equipment

Designation	Quantity
Door stay	1
Stop nut, M5	3
Expansion rivet, plastic	4

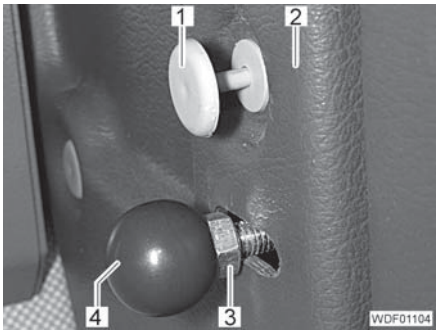


Fig. 385 Handle attachment

Fig. 386 Door stay attachment

Removing the cover

- Undo the nut (Fig. 385,3).
- Unscrew the handle (Fig. 385,4).
- Unscrew the nut (Fig. 385,3).
- Pull out the 4 expansion rivets (Fig. 385,1).
- Remove the cover (Fig. 385,2).

Replacing the door stay

- Unscrew the screw (Fig. 386,4).
- Unscrew the 3 nuts (Fig. 386,2).
- Remove the door stay (Fig. 386,1) outwards.
- Insert the new door stay from the outside so that the handle points down.
- Screw the 3 nuts (Fig. 386,2) onto the bolts and tighten.
- Insert the screw (Fig. 386,4) through the handle into the rod (Fig. 386,3) and tighten.

Fitting the cover

- Place on the cover (Fig. 385,2).
- Push in the 4 expansion rivets (Fig. 385,1).
- Screw the nut (Fig. 385,3) onto the bar.
- Screw the handle (Fig. 385,4) onto the bar and secure it with the nut.

Final work

- Fit the radio console (see section 7.2.7 "Replacing the radio console").

7.3.7 Replacing the window stop

Spare parts and auxiliary equipment

Designation	Quantity
Window stop	1
O-ring	1

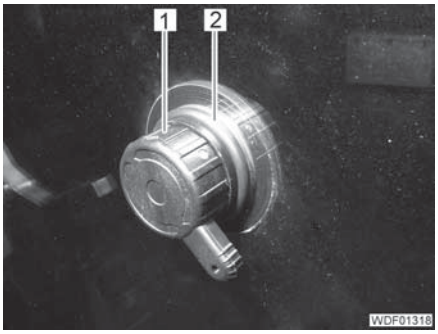


Fig. 387 Window stop

Removing the window stop

- Remove the O-ring (Fig. 387,2).
- Remove the window stop (Fig. 387,1).

Fitting the window stop

- Insert the window stop (Fig. 387,1) from outside into the pane.
- Fix the window stop with new O-ring (Fig. 387,2).

7.4 Steering column

7.4.1 Replacing the steering column

Spare parts and auxiliary equipment

Designation	Quantity
Steering column	1

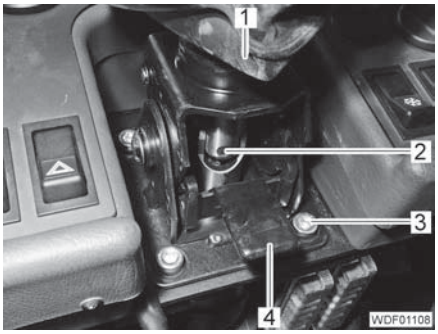


Fig. 388 Steering column attachment

Removing the steering column

- Carefully pull the bellows (Fig. 388,1) upwards over the lever (Fig. 388,4).
- Unscrew the 4 screws (Fig. 388,3).
- Carefully remove the steering column (Fig. 388,2) upwards.

Installing the steering column

- Carefully set down the steering column (Fig. 388,2) from above.
- Screw in and tighten the 4 screws (Fig. 388,3).
- Carefully pull the bellows (Fig. 388,1) downwards over the lever (Fig. 388,4).

7.4.2 Replacing the cladding of the steering column

Spare parts and auxiliary equipment

Designation	Quantity
Cladding	2

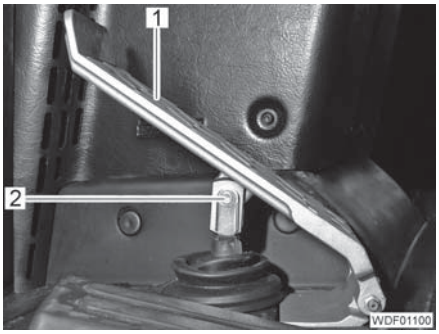


Fig. 389 Brake pedal

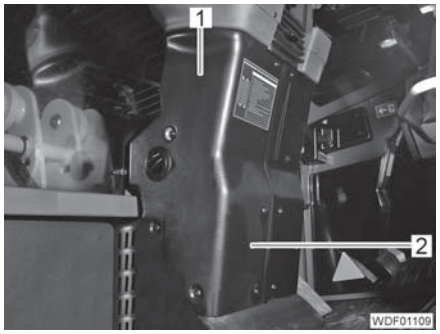


Fig. 390 Cladding attachment (left)

Removing the left-hand cladding

- Unlock the pin (Fig. 389,2) and pull it out of the fork end.
- Fold the pedal (Fig. 389,1) upwards.
- Unscrew the 6 screws (Fig. 390,1).
- Carefully remove the cladding (Fig. 390,2) to the left.

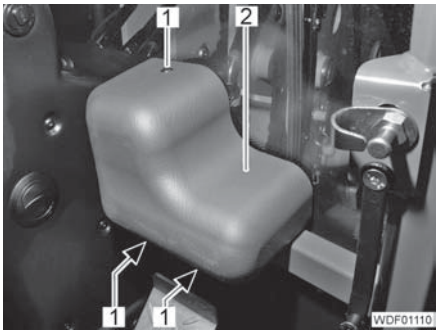


Fig. 391 Cover attachment

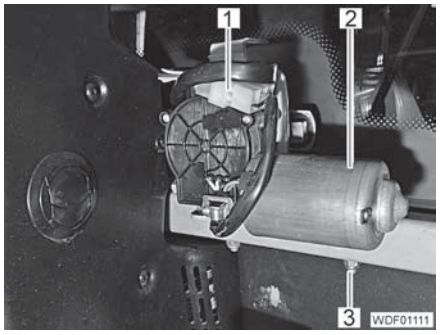


Fig. 392 Windshield wiper motor attachment

Removing the windshield wiper motor

- Unscrew the 3 screws (Fig. 391,1).
- Remove the cover (Fig. 391,2).
- Unscrew the 2 nuts (Fig. 392,3).
- Remove the windshield wiper motor (Fig. 392,2), pivot it to one side and fix it temporarily (e.g. using a strap).

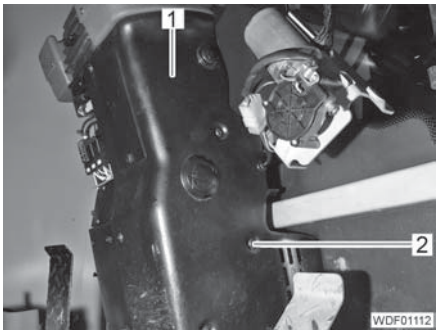


Fig. 393 Cladding attachment

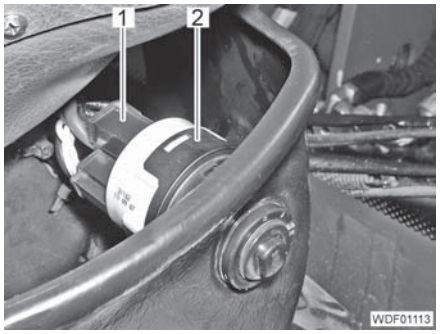


Fig. 394 Ignition lock

Removing the right-hand cladding

- Unscrew the 6 screws (Fig. 393,2).
- Carefully remove the cladding (Fig. 393,1) far enough for the connectors of the ignition lock (Fig. 394,2) to be accessible.
- Remove the plug (Fig. 394,1) from the ignition lock.
- Carefully remove the cladding (Fig. 393,1) to the right.

Fitting the right-hand cladding

- Carefully position the cladding (Fig. 393,1) from the right-hand side for the contacts of the ignition lock (Fig. 394,2) to be accessible.
- Attach the connector (Fig. 394,1) to the contact of the ignition lock.
- Position and adjust the cladding (Fig. 393,1).
- Screw in and tighten the 6 screws (Fig. 393,2).

Fix the windshield wiper motor

- Position the windshield wiper motor (Fig. 392,2).
- Screw the 2 nuts (Fig. 392,3) onto the screws and tighten.
- Place on the cover (Fig. 391,2).
- Screw in and tighten the 3 screws (Fig. 391,1).

Fit the left-hand cladding

- Carefully position the cladding (Fig. 390,2) from the left.
- Screw in and tighten the 6 screws (Fig. 390,1).
- Fold the pedal (Fig. 389,1) forwards.
- Push the pin (Fig. 389,2) 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. 395 Cover

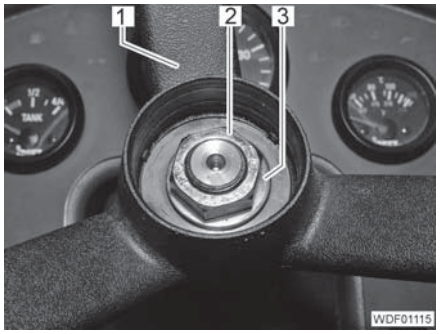


Fig. 396 Steering wheel attachment

Removing the steering wheel

- Remove the cap (Fig. 395,1).
- Unscrew the nut (Fig. 396,2).
- Remove the washer (Fig. 396,3).

Fig. 397 Pulling off the steering wheel

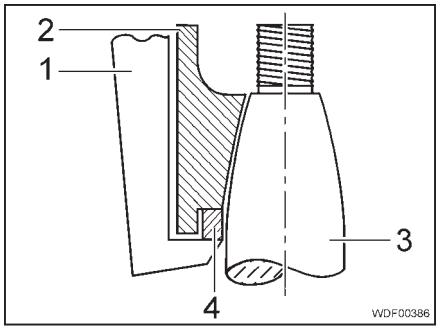


Fig. 398 Position of the half-shells

- Insert the 2 half-shells (Fig. 398,4) from below and hold them in place.
- Position a three-armed puling device (Fig. 398,1) on the steering wheel.
- Carefully pull the steering wheel (Fig. 398,2) off the steering column (Fig. 398,3).

Installing the steering wheel

- Fit the steering wheel (Fig. 396,1) to the steering column.
- Screw the nut (Fig. 396,2) with the washer (Fig. 396,3) onto the steering column and tighten it with a tightening torque of 15 Nm.
- Put the cap (Fig. 395,1) onto the steering wheel.

Final work

- Install the steering column switch (see the section 8.2.8 "Replacing the steering column switch").

7.5 Heater and air-conditioning unit

7.5.1 Replacing the Bowden cable of the temperature sensor

Requirements

Ensure the following:

- The heater blower has been removed (see the section 8.1.5 "Replacing the heater blower").
- The steering column switch has been removed (see the section 8.2.8 "Replacing the steering column switch").

Spare parts and auxiliary equipment

Designation	Quantity
Bowden cable	1

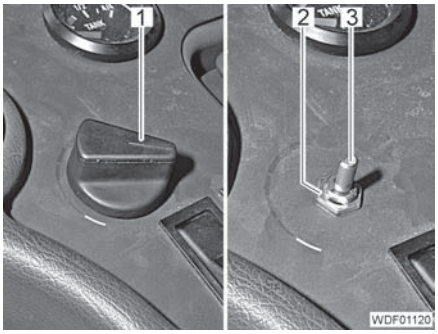


Fig. 399 Knob of the temperature controller

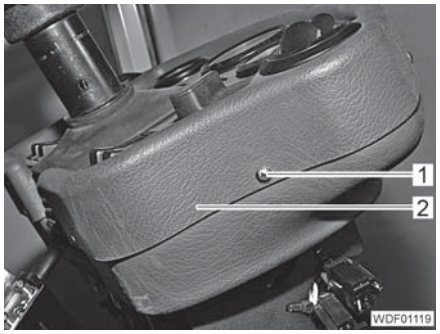


Fig. 400 Fixing of the instrument panel

Opening the instrument panel

- Remove the knob (Fig. 399,1) of the temperature controller.
- Unscrew the nut (Fig. 399,2).
- Unscrew the 6 screws (Fig. 400,1).
- Carefully lift up the instrument panel (Fig. 400,2) until the temperature controller is accessible.

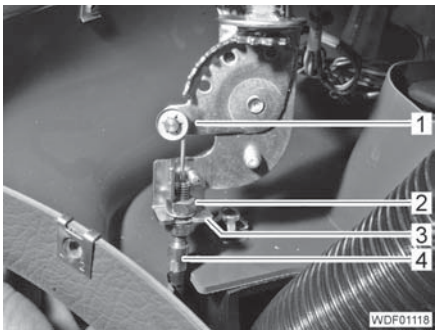


Fig. 401 Top fixing of Bowden cable

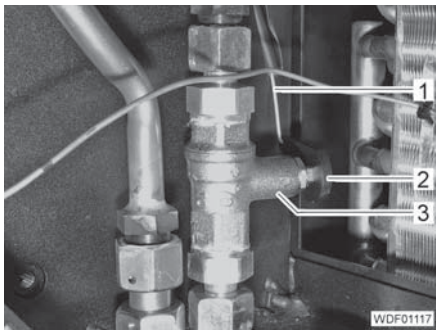


Fig. 402 Bottom fixing of Bowden cable

Removing the Bowden cable

- Undo the nut (Fig. 401,2).
- Disconnect the Bowden cable (Fig. 401,4) from the operating part (Fig. 401,1).
- Remove the Bowden cable to the side from the holder (Fig. 401,3).
- Unscrew the screw on the lever (Fig. 402,2).
- Remove the lever and unhook the Bowden cable (Fig. 402,1).
- Undo or remove all fastenings (e.g. cable ties) along the Bowden cable.

Fitting the Bowden cable

- Pull the Bowden cable up and out and simultaneously feed in a new Bowden cable.
- Hook in the Bowden cable (Fig. 402,1) on the lever (Fig. 402,2).
- Fit the lever onto the shut-off valve (Fig. 402,3).
- Screw in and tighten the screw on the lever (Fig. 402,2).
- Insert the Bowden cable (Fig. 401,4) from the side into the holder (Fig. 401,3).
- Connect the Bowden cable to the operating part (Fig. 401,1).
- Tighten the nut (Fig. 401,2) with washer.

Closing the instrument panel

- Carefully position the instrument panel (Fig. 400,2) so that the operating part (Fig. 399,3) protrudes through the hole.
- Screw in and tighten the 6 screws (Fig. 400,1).

- Screw the nut (Fig. 399,2) onto the operating part (Fig. 399,3) and tighten it hand-tight.
- Fit the knob (Fig. 399,1) onto the operating part.

Final work

- Tighten or replace undone or removed fastenings (e.g. cable ties) along the Bowden cable.
- Install the steering column switch (see the section 8.2.8 "Replacing the steering column switch").
- Installing the heater blower (see the section 8.1.5 "Replacing the heater blower").

7.5.2 Removing and installing the vaporizer of the air-conditioning unit

▶ **DANGER**

Risk of death due to escaping refrigerant!

The lines to the air-conditioning unit (where applicable) must only be opened by specially trained personnel.

Never open any pipes, tubes or other components that contain refrigerant.

Requirements Ensure the following:

- The lines to the vaporizer of the air-conditioning unit have been emptied and removed by specially trained personnel.
- The heater blower has been removed (see the section 8.1.5 "Replacing the heater blower").
- The cab ventilation filter has been removed (see operator's manual "Maintaining the cab ventilation filter").

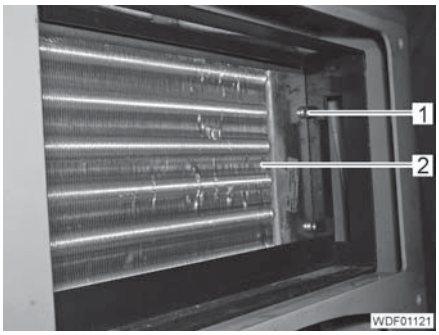


Fig. 403 Fixing the vaporizer

Removing the vaporizer

- Unscrew the 4 screws (Fig. 403,1).
- Carefully remove the vaporizer (Fig. 403,2) towards the front.

Fitting the vaporizer

- Carefully insert the vaporizer (Fig. 403,2) from the front.
- Screw in and tighten the 4 screws (Fig. 403,1).

Final work

- Fit the cab ventilation filter (see operator's manual "Maintaining the cab ventilation filter").
- Install the heater blower (see the section 8.1.5 "Replacing the heater blower").

- Have the connections to the vaporizer of the air-conditioning unit connected by specially trained personnel.
- Have the air-conditioning unit filled by specially trained personnel.

7.5.3 Removing and installing the air-conditioning compressor

▶ **DANGER**

Risk of death due to escaping refrigerant!

The lines to the air-conditioning unit (where applicable) must only be opened by specially trained personnel.

Never open any pipes, tubes or other components that contain refrigerant.

Requirements

Ensure the following:

- The base plate has been removed (see the section 6.2.2 "Replacing the base plate").
- The suction hose has been removed (see the section 2.3.1 "Replacing the suction hose").
- The cooling system is empty (see operator's manual "Replacing the coolant").

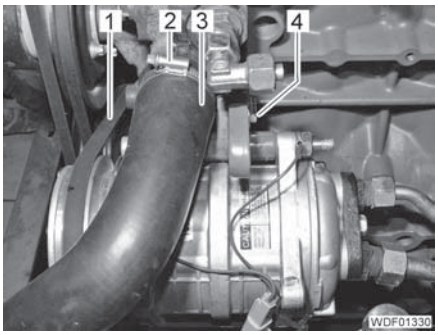


Fig. 404 Motor of the air-conditioning compressor

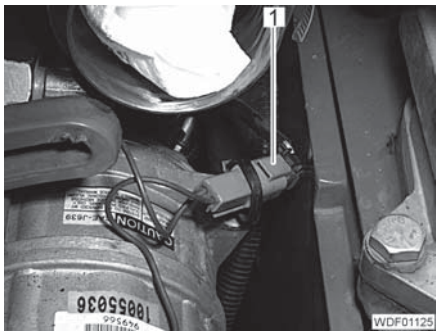


Fig. 405 Electrical plug

Removing the air-conditioning compressor

- Undo the clamp (Fig. 404,2) and pull off the hose (Fig. 404,3).
- Unscrew the screw (Fig. 404,4).
- Disconnect the plug (Fig. 405,1).

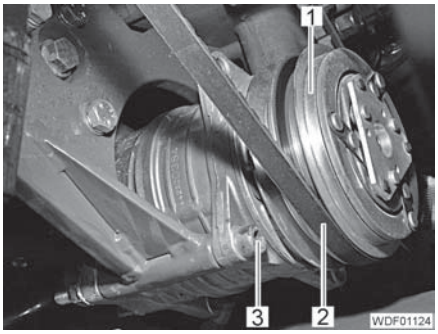


Fig. 406 Air-conditioning compressor attachment

- Unscrew the screw (Fig. 406,3).
- Remove the air-conditioning compressor (Fig. 406,1) from the V-belt (Fig. 406,2) and place to one side.

Fitting the air-conditioning compressor

- Mount the air-conditioning compressor (Fig. 406,1) in the V-belt (Fig. 406,2) and attach.
- Screw in the screw (Fig. 406,3).
- Screw in the screw (Fig. 404,4).
- Tension the V-belt pulley (Fig. 404,1) and tighten the screw (Fig. 404,4).
- Connect the plug (Fig. 405,1).
- Tighten the screw (Fig. 406,3).
- Attach the hose (Fig. 404,3) with clamps (Fig. 404,2) onto the connector on the engine.
- Tighten the clamp (Fig. 404,2).

Final work

- Attach the suction hose (see section 2.3.1 "Replacing the suction hose").
- Install the base plate (see the section 6.2.2 "Replacing the base plate").
- Fill the cooling system (see operator's manual "Replacing the coolant").

7.5.4 Removing and installing the dryer

▶ **DANGER**

Risk of death due to escaping refrigerant!

The lines to the air-conditioning unit (where applicable) must only be opened by specially trained personnel.

Never open any pipes, tubes or other components that contain refrigerant.

Requirements

Ensure the following:

- The base plate has been removed (see the section 6.2.2 "Replacing the base plate").
- The battery has been removed (see operator's manual "Disconnecting and connecting the battery/changing the battery").

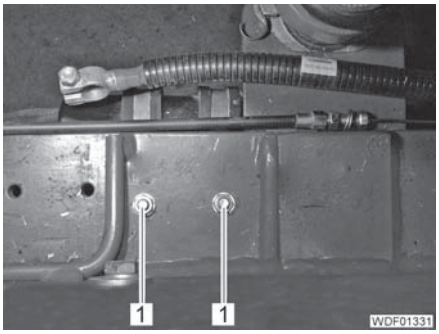


Fig. 407 Dryer attachment

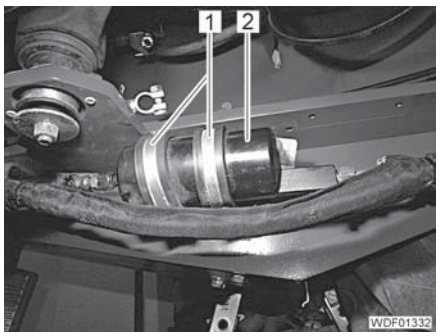


Fig. 408 Dryer

Removing the dryer

- Unscrew the 2 nuts (Fig. 407,1).
- Remove the dryer (Fig. 408,2).
- Remove the 2 clamps (Fig. 408,1).

Mounting the dryer

- Fit 2 clamps (Fig. 408,1) to the dryer.
- Position the dryer (Fig. 408,2) on the rear carriage.
- Screw 2 nuts (Fig. 407,1) onto the screws.
- Align the dryer and tighten the nuts.

Final work

- Install the battery (see operator's manual "Disconnecting and connecting the battery/changing the battery").
- Install the base plate (see the section 6.2.2 "Replacing the base plate").

7.5.5 Removing and installing the air-conditioning unit condenser

▶ **DANGER**

Risk of death due to escaping refrigerant!

The lines to the air-conditioning unit (where applicable) must only be opened by specially trained personnel.

Never open any pipes, tubes or other components that contain refrigerant.

Requirements

Ensure the following:

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

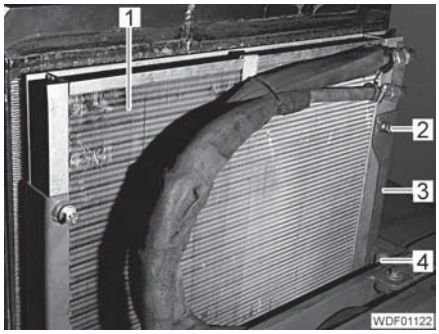


Fig. 409 Condenser attachment

Removing the condenser

- Unscrew the 2 screws (Fig. 409,2).
- Carefully lift the condenser (Fig. 409,1) up and out and place it to one side.

▷ The blades of the condenser are very fragile and can be easily damaged.

If the condenser remains removed for a long period: protect the blades against knocks using a suitable material, e.g. cardboard.

Replacing the holder

- Unscrew 2 screws (Fig. 409,4) on both sides.
- Remove the holder (Fig. 409,3).
- Put a new holder in position.
- Screw in 2 screws (Fig. 409,4) with spring lock washers and disks on both sides and tighten.

Fitting the condenser

- Carefully insert the condenser (Fig. 409,1) from above into the holder taking care not to bend or squeeze the lines.
- Tighten the 2 screws (Fig. 409,2).

Final work

- Close the engine hood.

7.6 Cab lift hydraulic

7.6.1 Replacing the hand pump

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

Requirements

Ensure the following:

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

Spare parts and auxiliary equipment

Designation	Quantity
Hand pump	1

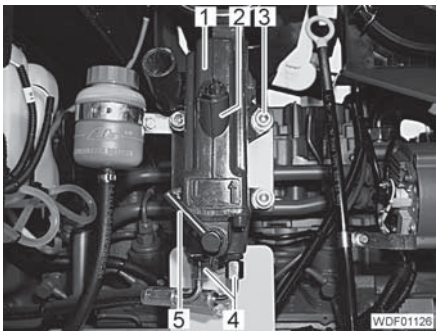


Fig. 410 Hand pump attachment

Depressurizing the cab lift hydraulic

- To depressurize the cab lift hydraulic, move the switching lever (Fig. 410,5) up and down a number of times.

Removing the hand pump

- Unscrew and close off the 2 hydraulic lines (Fig. 410,4).
- Unscrew the 4 screws (Fig. 410,3).
- Remove the hand pump (Fig. 410,1).

Installing the hand pump

- Position the hand pump (Fig. 410,1).
- Screw in 4 screws (Fig. 410,3) with washers and tighten.
- Screw the 2 hydraulic lines (Fig. 410,4) onto the connections of the hand pump and tighten.

Checking the oil level

- Tilt the operator's platform back and forth several times (see operator's manual "Tilting the operator's platform").
- Unscrew the plug (Fig. 410,2) from the filler neck.

▷ The hydraulic fluid must just be level with the thread of the filler neck.

- Check the oil level and fill with hydraulic fluid if necessary.
- Screw in the plug (Fig. 410,2) into the filler neck and tighten hand-tight.

Final work

- Close the engine hood.

7.6.2 Replacing the hydraulic cylinder

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

Requirements

Ensure the following:

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

Spare parts and auxiliary equipment

Designation	Quantity
Hydraulic cylinder	1

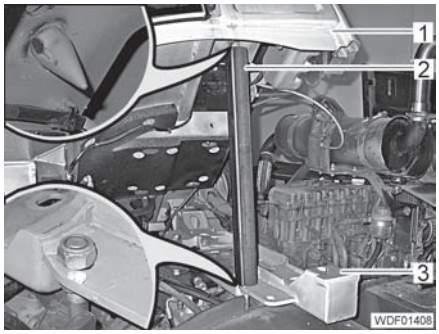


Fig. 411 Support of cab

Supporting the cab

- Support the cab (Fig. 411,1) using an appropriate device (e.g. steel tube, Fig. 411,2) against the traverse (Fig. 411,3) in such a way that the cab cannot accidentally tilt back.

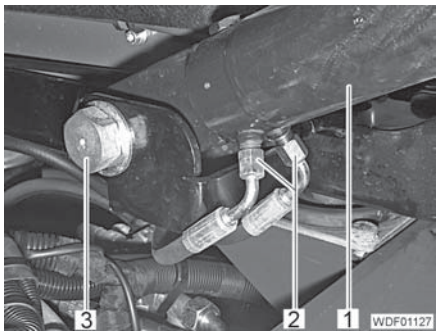


Fig. 412 Connections of the hydraulic cylinder

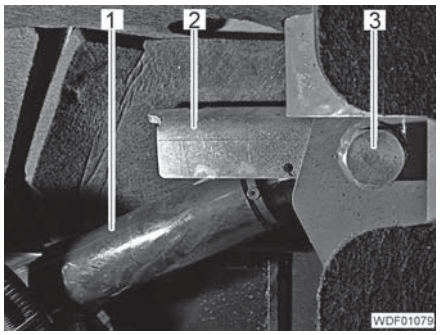


Fig. 413 Hydraulic cylinder attachment

Removing the hydraulic cylinder

- Unscrew and close off the 2 hydraulic lines (Fig. 412,2).
- Unscrew the screw (Fig. 412,3).
- Unscrew the screw (Fig. 413,3).
- If necessary remove the fixing the Bowden cable.
- Lift out the hydraulic cylinder (Fig. 413,1).

Installing the hydraulic cylinder

- Position the cab securing device (Fig. 413,2) and hydraulic cylinder (Fig. 413,1).
- Screw in and tighten the screw (Fig. 413,3).

- Lift up the hydraulic cylinder (Fig. 412,1) screw in and tighten the screw (Fig. 412,3).
- Screw the 2 hydraulic lines (Fig. 412,2) onto the connections on the hydraulic cylinder and tighten.
- Fix the Bowden cable, if appropriate.

Final work

- Check the oil level (see the section 7.6.1 "Replacing the hand pump").
- Close the engine hood.

7.6.3 Replacing the Bowden cable of the cab lift hydraulic

▶ **CAUTION**

Risk of crush injury from component flying back.

The cab securing device is tensioned by a spring.

Work carefully, and guide spring-pretensioned parts slowly into their end position.

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
Bowden cable	1

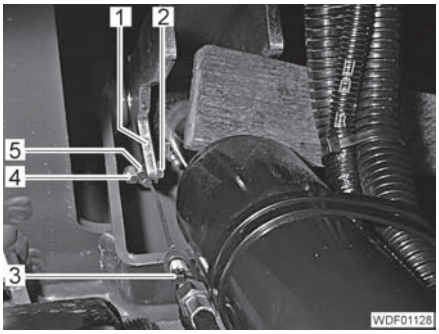


Fig. 414 Fixing on the cab securing device

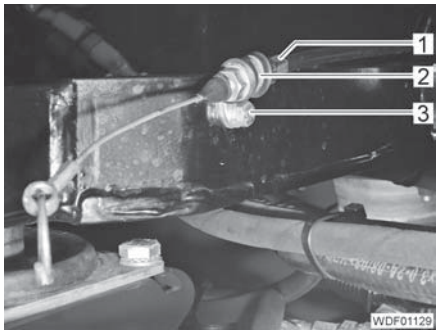


Fig. 415 Bowden cable attachment

Removing the Bowden cable

- Secure the cab with suitable lifting gear (e.g. a crane).
- Lift up the cab securing device (Fig. 414,1) and temporarily fix in position by suitable means (e. g. a block of wood).
- Unscrew the nut (Fig. 414,4).
- Remove the eye (Fig. 414,5).
- Remove the fixing (Fig. 414,3).
- Unscrew the screw (Fig. 415,3).
- Remove the clamp (Fig. 415,2).
- Detach the Bowden cable (Fig. 415,1).

Installing the Bowden cable

- Place the Bowden cable (Fig. 415,1) in position.
- Place the clamp (Fig. 415,2) into position.

- Screw in and tighten the screw (Fig. 415,3) with the spring lock washer and washer.
- Fit the eye (Fig. 414,5) onto the bolt (Fig. 414,2).
- Screw the nut (Fig. 414,4) onto the bolt and tighten so that the eye can still be turned.
- Replace the fixing (Fig. 414,3).

Final work

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

8.1 Generator, battery and motors

8.1.1 Replacing the generator (Deutz)

▶ **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**

Hot parts can cause burns.

Never work on the engine when it is at operating temperature.

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").
- The battery has been disconnected (see "Disconnecting and connecting the battery/changing the battery" in the operator's manual).

Spare parts and auxiliary equipment

Designation	Quantity
Generator	1

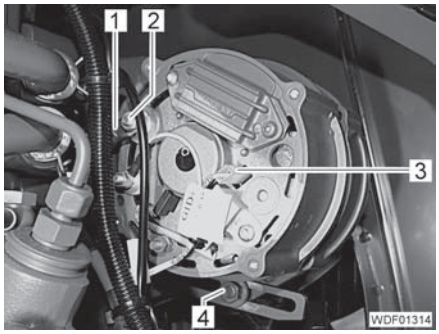


Fig. 416 Generator connections

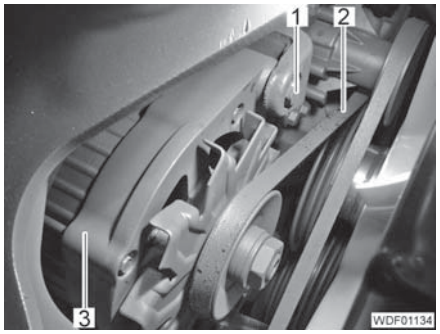


Fig. 417 Generator attachment

Removing the generator

- Unscrew the 2 nuts (Fig. 416,2) and remove the 2 cables (Fig. 416,1).
- Remove the plug (Fig. 416,3).
- Undo the nut (Fig. 416,4).
- Undo the screw (Fig. 417,1).
- Screw the generator (Fig. 417,3) sufficiently far towards the engine that the V-belt (Fig. 417,2) is free.
- Unscrew the nut (Fig. 416,4).
- Unscrew the screw (Fig. 417,1).
- Lift out the generator.

Installing the generator

- Insert the generator (Fig. 417,3).
- Screw in the screw (Fig. 417,1).
- Screw the nut (Fig. 416,4) with the washer onto the screw.
- Place the V-belt (Fig. 417,2) over the drive pulley.

- Pull the generator sufficiently far out so that the V-belt is taut and tighten the nut (Fig. 416,4).
- Tighten the screw (Fig. 417,1).
- Insert the plug (Fig. 416,3).
- Connect the 2 cables (Fig. 416,1), screw the 2 nuts (Fig. 416,2) with the washers onto the connections and tighten them.

Final work

- Check the tension of the V-belt (see the engine manufacturer's workshop manual "Checking and replacing the V-belt").
- Connect the battery (see "Disconnecting and connecting the battery/ changing the battery" in the operator's manual).
- Replace the fixings (e.g. cable ties) on the generator.
- Close the engine hood.

8.1.2 Replacing the starter

▶ **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.

Requirements

Ensure the following:

- The battery has been disconnected (see "Disconnecting and connecting the battery/changing the battery" in the operator's manual).

Spare parts and auxiliary equipment

Designation	Quantity
Starter	1

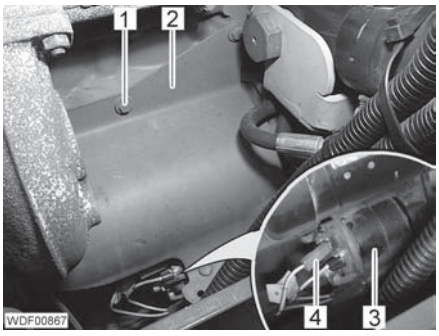


Fig. 418 Starter

Fig. 419 Starter attachment

Removing the starter

- Unscrew the 3 screws (Fig. 418,1) and remove the metal plate (Fig. 418,2).
- Disconnect the electrical cables (Fig. 418,4) from the starter (Fig. 418,3).
- Unscrew the 2 screws (Fig. 419,1).
- Remove the starter.

Fig. 420 Installation opening

Checking the starter ring gear

- Mark the starter ring gear on the installation opening (Fig. 420) (e.g. with chalk).
- Check the teeth of the starter ring gear to make sure they are clean and undamaged.
- Continue to carefully turn the engine manually until all teeth have been checked.
- If any teeth of the starter ring gear are damaged, replace the starter ring gear (see the engine manufacturer's workshop manual).

Installing the starter

- Insert the starter into the installation opening (Fig. 420).
- Screw in 2 screws (Fig. 419,1) with washers and tighten.
- Connect the electrical cables (Fig. 418,4) to the starter (Fig. 418,3).
- Position the metal plate (Fig. 418,2).
- Screw in 3 screws (Fig. 418,1) with washers and tighten.

Final work

- Connect the battery (see "Disconnecting and connecting the battery/ changing the battery" in the operator's manual).

8.1.3 Replacing the rear windshield wiper motor

Spare parts and auxiliary equipment

Designation	Quantity
Windshield wiper motor	1

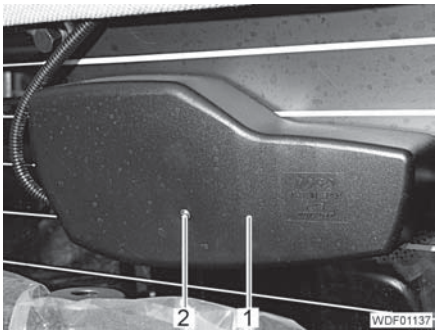


Fig. 421 Cover attachment

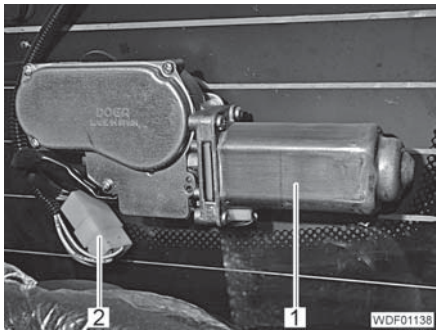


Fig. 422 Electrical connection

Removing the cover

- Unscrew the screw (Fig. 421,2).
- Remove the cover (Fig. 421,1).
- Disconnect the plug (Fig. 422,2).

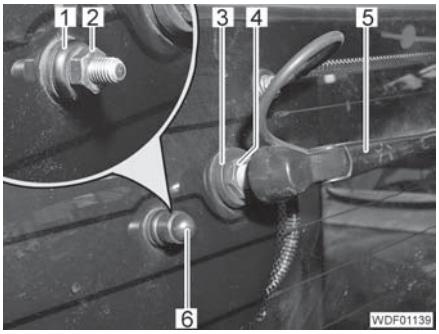


Fig. 423 Windshield wiper motor attachment

Removing the windshield wiper motor

- Remove the windshield wiper arm (Fig. 423,5) (see the section 7.3.1 "Replacing the windshield wiper arms").
- Remove the cap (Fig. 423,6).
- Undo the 2 nuts (Fig. 423,2 and 4).
- Hold the windshield wiper motor (Fig. 422,1) and unscrew the 2 nuts (Fig. 423,2 and 4).
- Remove the seals (Fig. 423,1 and 3) and reuse them.
- Remove the windshield wiper motor (Fig. 422,1).

Installing the windshield wiper motor

- Position the windshield wiper motor (Fig. 422,1).
- Screw on 2 nuts (Fig. 423,2 and 4) with seals (Fig. 423,1 and 3) onto the threads and tighten.
- Fit cap (Fig. 423,6) onto the nut (Fig. 423,2).

Fitting the cover

- Connect the plug (Fig. 422,2).
- Place on the cover (Fig. 421,1).
- Screw in the screw (Fig. 421,2) and tighten hand-tight.

Final work

- Switch the rear windshield wiper motor on and off in order to bring the windshield wiper motor into its end position.
- Install the windshield wiper arm (Fig. 423,5) (see the section 7.3.1 "Replacing the windshield wiper arms").

8.1.4 Replacing the front windshield wiper motor

Spare parts and auxiliary equipment

Designation	Quantity
Windshield wiper motor	1

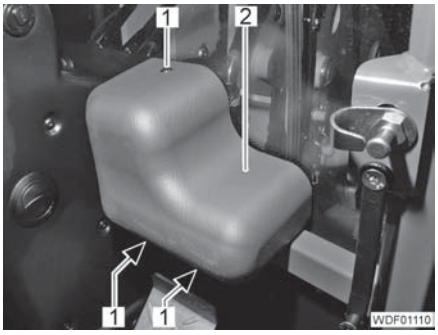


Fig. 424 Cover

Removing the cover

- Unscrew the 3 screws (Fig. 424,1).
- Remove the cover (Fig. 424,2).

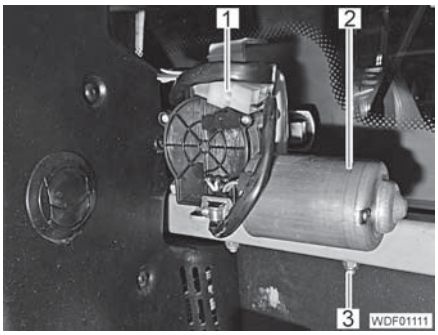


Fig. 425 Electrical wire and holder

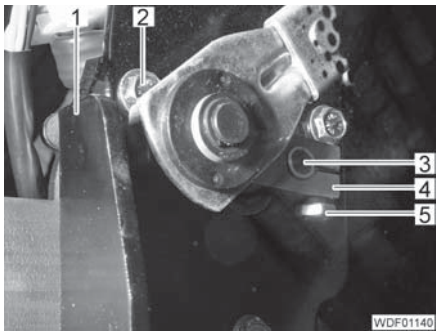


Fig. 426 Windshield wiper motor attachment

Removing the windshield wiper motor

- Disconnect the plug (Fig. 425,1).
- Unscrew the 2 nuts (Fig. 425,3).
- Undo the screw (Fig. 426,5).
- Pull the rod (Fig. 426,4) off the shaft (Fig. 426,3).
- Unscrew the 3 screws (Fig. 426,2).
- Remove the windshield wiper motor (Fig. 425,2).

Installing the windshield wiper motor

- Insert the windshield wiper motor (Fig. 425,2) into the holder (Fig. 426,1).
- Screw in and tighten the 3 screws (Fig. 426,2).
- Connect the plug (Fig. 425,1).
- Switch the front windshield wiper on and off in order to bring the windshield wiper motor into its end position.
- Attach the rod (Fig. 426,4) horizontally onto the shaft (Fig. 426,3).
- Tighten the screw (Fig. 426,5).
- Place the holder (Fig. 426,1) into position.
- Screw the 2 nuts (Fig. 425,3) onto the bolts and tighten.
- Check the function of the windshield wiper motor.

Fitting the cover

- Place on the cover (Fig. 424,2).
- Screw in and tighten the 3 screws (Fig. 424,1).

8.1.5 Replacing the heater blower

Requirements

Ensure the following:

- The cladding of the steering column is removed (see section 7.4.2 "Replacing the cladding of the steering column").

Spare parts and auxiliary equipment

Designation	Quantity
Heater blower	1

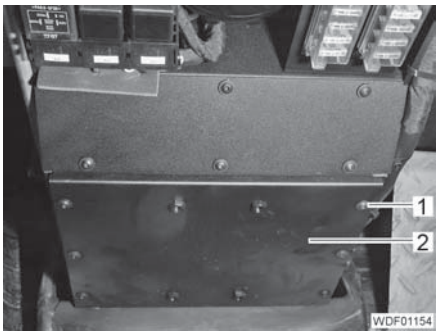


Fig. 427 Cover attachment

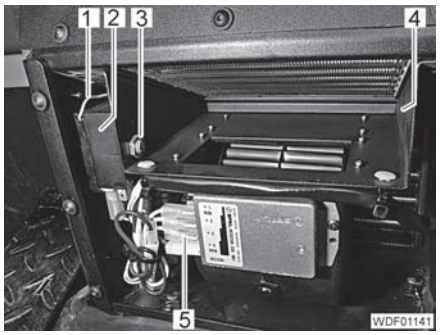


Fig. 428 Connections of the heater blower

Removing the heater blower

- Unscrew 6 screws (Fig. 427,1) and remove the cover (Fig. 427,2).
- Mark the connectors in order to prevent mix-ups.
- Remove the plug (Fig. 428,5) from the heater blower.
- Undo or remove all fastenings (e.g. cable ties) along the cable.

▷ The sensor tube (Fig. 428,1) must not be bent or damaged.

Do not disconnect the temperature switch (Fig. 428,2) of the air-conditioning unit (if it exists) from the sensor tube.

- Unscrew the nut (Fig. 428,3).
- Carefully place the temperature switch (Fig. 428,2) to one side.
- Carefully remove the heater blower (Fig. 428,4) from above at the back.

Installing the heater blower

- Carefully insert the heater blower (Fig. 428,4) from above at the back.
- Carefully place the temperature switch (Fig. 428,2) into position.
- Screw the nut (Fig. 428,3) onto the temperature switch and tighten it.
- Attach the connector (Fig. 428,5) to the connections of the heater blower.
- Position the cover (Fig. 427,2), screw in 6 screws (Fig. 427,1) and tighten.

Final work

- Tighten or replace loose or missing fastenings (e.g. cable ties) along the cable.

8.2 Switches

8.2.1 Replacing the battery disconnect switch

Requirements

Ensure the following:

- The battery has been disconnected (see "Disconnecting and connecting the battery/changing the battery" in the operator's manual).

Spare parts and auxiliary equipment

Designation	Quantity
Switch	1

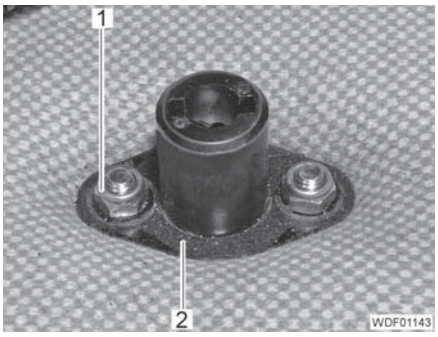


Fig. 429 Battery disconnect switch attachment

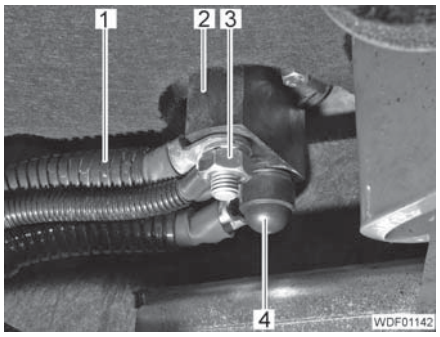


Fig. 430 Electrical connections

Removing the battery disconnect switch

- Undo the 2 nuts (Fig. 429,1) and unscrew the 2 screws on the underside.
- Remove the metal plate (Fig. 429,2).
- Remove the battery disconnect switch (Fig. 430,2) out of the step plate from below.
- Remove the 2 caps (Fig. 430,4).
- Unscrew the 2 nuts (Fig. 430,3).
- Disconnect the cable (Fig. 430,1) from the battery disconnect switch.

Installing the battery disconnect switch

- Connect the cable (Fig. 430,1) to the battery disconnect switch.
- Tighten the 2 nuts (Fig. 430,3).
- Fit the 2 caps (Fig. 430,4) onto the nuts.
- Insert the battery disconnect switch (Fig. 430,2) through the step plate from below.
- Fit 2 screws, each with 1 washer, from the underside through the battery disconnect switch.
- Position the metal plate (Fig. 429,2).
- Attach 1 nut with washer (Fig. 429,1) to each of the 2 screws and tighten.

Final work

- Connect the battery (see "Disconnecting and connecting the battery/ changing the battery" in the operator's manual).

8.2.2 Replacing the ignition lock

Requirements

Ensure the following:

- The battery has been disconnected (see "Disconnecting and connecting the battery/changing the battery" in the operator's manual).
- The cladding of the steering column is removed (see section 7.4.2 "Replacing the cladding of the steering column").

Spare parts and auxiliary equipment

Designation	Quantity
Ignition lock	1

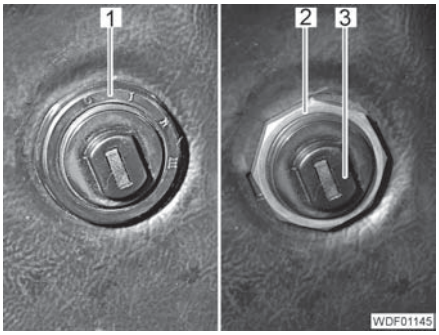


Fig. 431 Ignition lock attachment

Replacing the ignition lock

- Carefully remove the ring (Fig. 431,1).
- Unscrew the nut (Fig. 431,2).
- Remove the ignition lock (Fig. 431,3).
- Insert a new ignition lock.
- Screw the nut (Fig. 431,2) onto the ignition lock and tighten it.
- Fit the ring (Fig. 431,1) onto the ignition lock.

Final work

- Fit the cladding of the steering column (see section 7.4.2 "Replacing the cladding of the steering column").
- Connect the battery (see "Disconnecting and connecting the battery/ changing the battery" in the operator's manual).

8.2.3 Replacing the engine temperature sensor

▶ **WARNING**

Hot parts can cause burns.

Never work on the engine when it is at operating temperature.

Allow the engine to cool down or wear protective gloves.

▶ **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.

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.

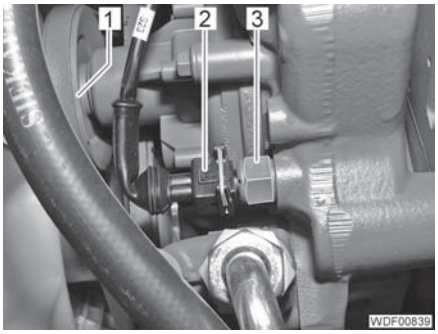


Fig. 432 Temperature sensor

Replacing the temperature sensor

- Open the radiator cap briefly in order to depressurize the cooling system.
- Remove the plug (Fig. 432,1).
- Unscrew the temperature sensor (Fig. 432,2) 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.

Fig. 433 Connections on the hydraulic fluid tank

▶ **CAUTION**

Hazard from escaping hydraulic fluid.

Wear suitable protective clothing (e.g. gloves, protective goggles etc.) to protect yourself against the hydraulic fluid.

▷ Before starting work, wrap the thread of the new temperature sensor in sealant so that you can install it quickly.

Replacing the temperature sensor

- Remove the plug (Fig. 433,1).
- Unscrew the temperature sensor (Fig. 433,2) and close off the opening in the hydraulic fluid tank.
- Screw the new temperature sensor into the hydraulic fluid tank and tighten it.
- Plug the plug onto the temperature sensor.

Final work

- Install the base plate (see the section 6.2.2 "Replacing the base plate").
- Check the hydraulic fluid level (see operator's manual "Checking the hydraulic fluid level").

8.2.5 Replacing the return filter overpressure switch

▷ 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 3.1.1 "Depressurizing the hydraulic system").

Spare parts and auxiliary equipment

Designation	Quantity
Switch	1

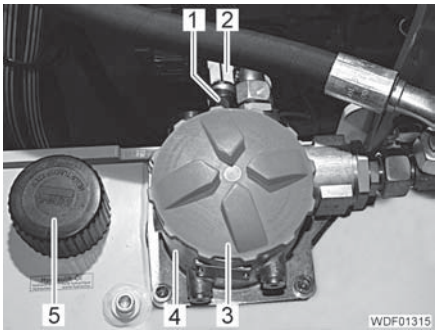


Fig. 434 Return filter

Replacing the overpressure switch

- Open the cap (Fig. 434,5).
- Briefly open the cap (Fig. 434,3) so that the fluid can flow out of the return filter and into the hydraulic fluid tank.
- Close the 2 caps (Fig. 434,3 and 5).
- Remove the 2 plugs (Fig. 434,2).
- Unscrew the overpressure switch (Fig. 434,1).
- Screw a new overpressure switch into the return filter (Fig. 434,4) and tighten it.
- Connect the 2 plugs (Fig. 434,2) onto the overpressure switch.

8.2.6 Replacing the parking brake switch

▷ Install the switch so that the parking brake indicator lamp lights up no later than after the third catch.

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
Parking brake switch	1

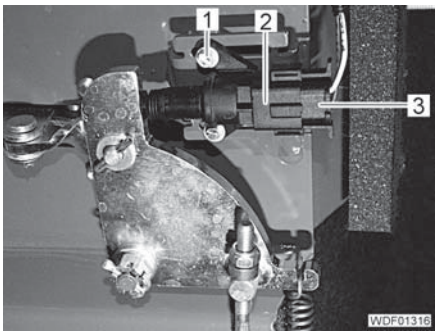


Fig. 435 Switch attachment

Replacing the switch

- Remove the plug (Fig. 435,3).
- Mark the position of the switch (Fig. 435,2) on the step plate.
- Unscrew the 2 screws (Fig. 435,1).
- Remove the switch (Fig. 435,2).

- Put a new switch in place.
- Screw in 2 screws (Fig. 435,1) with spring lock washers and disks.
- Attach the plug (Fig. 435,3) onto the switch.

Final work

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

8.2.7 Replacing the switch of the service brake

▷ Adjust the switch so that the brake lights come on when the pedal is depressed by 7 mm (Fig. 436).

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
Service brake switch	1

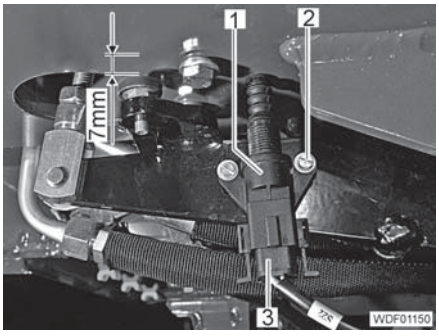


Fig. 436 Switch attachment

Replacing the switch

- Mark the position of the switch on the brake linkage.
- Remove the plug (Fig. 436,3).
- Unscrew the 2 screws (Fig. 436,2).
- Remove the switch (Fig. 436,1).
- Put a new switch in place.
- Screw in the 2 screws (Fig. 436,2) with washers.
- Align the switch and tighten the 2 screws (Fig. 436,2).

Final work

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

8.2.8 Replacing the steering column switch

Spare parts and auxiliary equipment

Designation	Quantity
Steering column switch	1

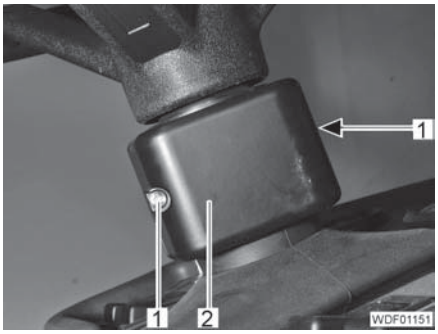


Fig. 437 Cover attachment

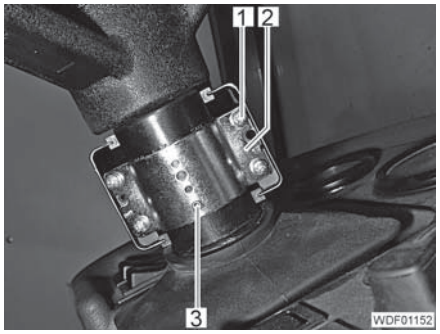


Fig. 438 Steering column switch attachment

Removing the steering column switch

- Unscrew the 2 screws (Fig. 437,1).
- Remove the cover (Fig. 437,2).
- Unscrew the 4 screws (Fig. 438,1).
- Remove the clamp (Fig. 438,2).
- Carefully place the steering column switch to one side.

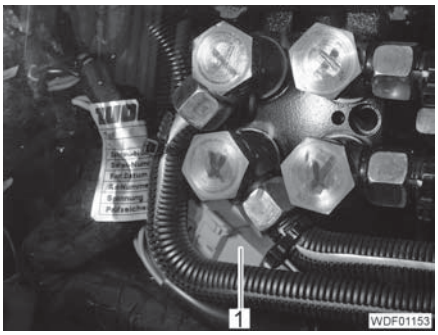


Fig. 439 Electrical connection

Replacing the steering column switch

- Remove the cladding of the steering column (see section 7.4.2 "Replacing the cladding of the steering column").
- Disconnect the plug (Fig. 439,1).
- To prevent mix-ups, note the position of the contacts in the connector housing.
- Remove the contacts with the electrical contact key (see Part 2, "Electrical contact key") from the connector housing, pull out and thread out the cable below the instrument panel.
- Remove the steering column switch.
- Thread in the cable of the new steering column switch without the connector housing through the hole in the instrument panel.
- Insert the contacts into the connector housing.
- Connect the plug (Fig. 439,1).
- Fit the cladding of the steering column (see section 7.4.2 "Replacing the cladding of the steering column").

Fitting the steering column switch

- Position the steering column switch from the left-hand side.
- Position the clamp (Fig. 438,2) in such a way that the rivet (Fig. 438,3) catches in the hole on the steering column.
- Screw in 4 screws (Fig. 438,1) with washers and tighten.

- Place on the cover (Fig. 437,2).
- Screw in and tighten the 2 screws (Fig. 437,1).

8.2.9 Replacing the switches in the cab

▷ This section describes how to replace a switch.
The remaining switches are replaced in the same way.

Spare parts and auxiliary equipment

Designation	Quantity
Switch	as req.

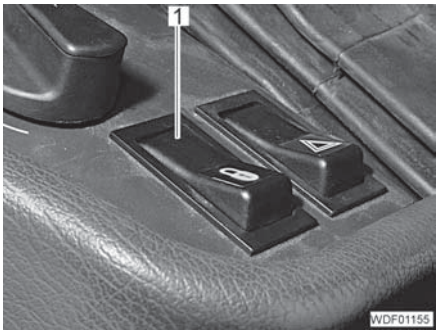


Fig. 440 Switch

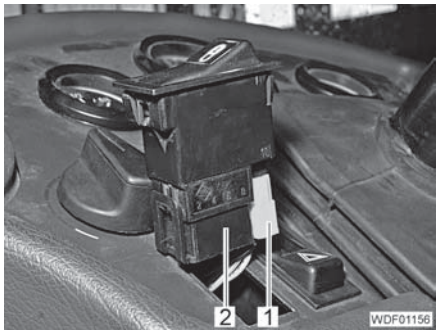


Fig. 441 Electrical connections

- Carefully pull out the switch (Fig. 440,1).
- Unplug the connector of (Fig. 441,1) the switch illumination (if it exists).
- Remove the plug (Fig. 441,2).
- Attach the connector onto the new switch.
- Attach the connector of (Fig. 441,1) the switch illumination (if it exists) onto the switch.
- Carefully push in the switch (Fig. 440,1).

8.3 Sensors

8.3.1 Replacing the fuel level sensor

▶ **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.

▷ If the fuel tank is too full, fuel can escape from the fuel level sensor opening.
Empty the fuel tank until the fuel level is below the tank sensor opening.

Spare parts and auxiliary equipment

Designation	Quantity
Fuel level sensor	1

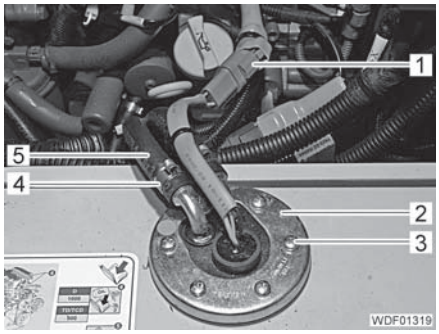


Fig. 442 Fuel level sensor attachment

Removing the fuel level sensor

- Disconnect the plug (Fig. 442,1).
- Mark the fuel lines (input and output side) in order to prevent mix-ups.
- Close off the fuel lines (Fig. 442,5).
- Remove the 2 clamps (Fig. 442,4).
- Pull off the fuel lines.
- Unscrew the 6 screws (Fig. 442,3).
- Pull out the fuel level sensor (Fig. 442,2).

Installing the fuel level sensor

- Insert the fuel level sensor (Fig. 442,2) into the fuel tank.
- Screw in and tighten the 6 screws (Fig. 442,3).
- Plug the fuel lines (Fig. 442,5) with clamps (Fig. 442,4) onto the fuel level sensor.
- Secure the 2 clamps (Fig. 442,4).
- Open the fuel lines.
- Connect and secure the plug (Fig. 442,1).

Final work

- Tilt the operator's platform back (see operator's manual "Tilting the operator's platform").
- Vent the fuel system (see operator's manual "Venting the fuel system").

8.3.2 Replacing the vacuum gauge

Requirements

Ensure the following:

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

Spare parts and auxiliary equipment

Designation	Quantity
Vacuum gauge	1

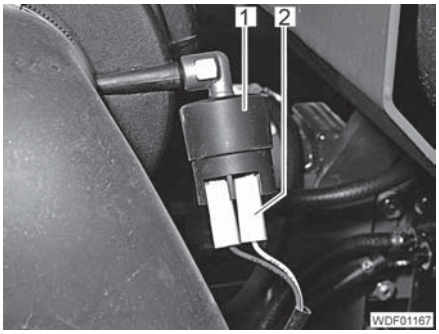


Fig. 443 Vacuum gauge

Replacing the vacuum gauge

- Remove the 2 plugs (Fig. 443,2).
- Unscrew the vacuum gauge (Fig. 443,1).
- Screw the new vacuum gauge onto the connector on the air filter.
- Connect the 2 connectors (Fig. 443,2) to the vacuum gauge.

Final work

- Close the engine hood.

8.4 Relays, coils and fuses

8.4.1 Replacing a relay

▷ This section describes replacement of one relay.
The other relays are replaced in the same way.

Requirements

Ensure the following:

- The cladding of the steering column is removed (see section 7.4.2 "Replacing the cladding of the steering column").

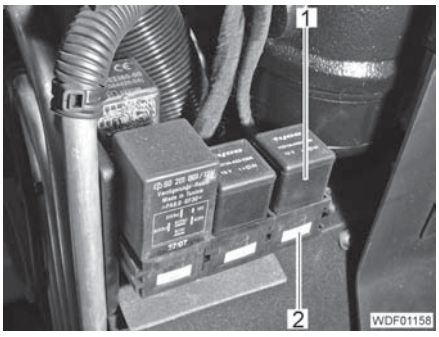


Fig. 444 Relay

Replacing the relay

- Pull out the relay (Fig. 444,1).
- Insert new relay into the plug-in base (Fig. 444,2).

Final work

- Fit the cladding of the steering column (see section 7.4.2 "Replacing the cladding of the steering column").

8.4.2 Replacing the solenoid valve of the variable displacement pump

▷ 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 3.1.1 "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
Solenoid valve	1

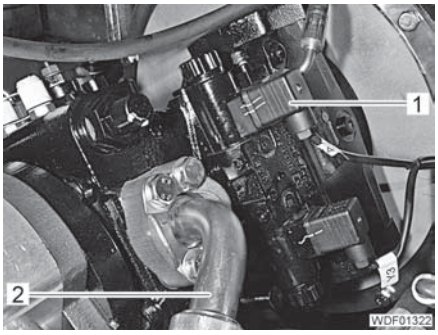


Fig. 445 Variable displacement pump

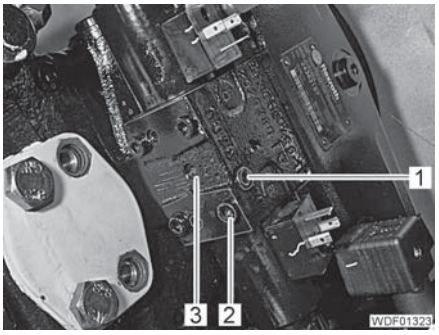


Fig. 446 Solenoid valve attachment

Removing the solenoid valve

- Mark the connectors in order to prevent mix-ups.
- Unscrew 1 screw on each of the connectors (Fig. 445,1).
- Remove the 2 connectors.
- Undo 4 screws on each of the flange halves of the high pressure line (Fig. 445,2) and remove the flange halves.
- Remove and close off the high pressure line.
- Unscrew the 4 screws (Fig. 446,2).
- Unscrew the screw (Fig. 446,1).
- Remove the solenoid valve (Fig. 446,3).

Installing the solenoid valve

- Clean the contact surfaces of the variable displacement pump.
- Place the solenoid valve (Fig. 446,3) with new O-rings and a new seal onto the variable displacement pump and press it into place.

▷ Tighten the retaining screws alternately so that both contact surfaces are sealed.

- Screw in the screw (Fig. 446,1).
- Screw in the 4 screws (Fig. 446,2).
- Tighten the screws evenly.

- Put each flange half for securing the high pressure line (Fig. 445,2) into position and loosely screw in 2 screws with spring lock washers.
- Press high pressure line (Fig. 445,2) under each flange half and align so that the second flange half can be put into position.
- Locate the second flange-half in position, screw in 2 screws with spring lock washers and tighten 4 bolts.
- Plug the 2 connectors (Fig. 446,1) onto the connections on the solenoid valve and secure with 1 screw for each.

Final work

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

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

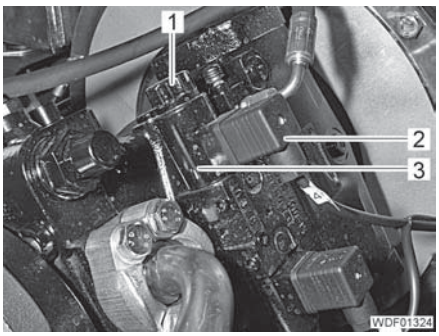


Fig. 447 Variable displacement pump solenoid valve

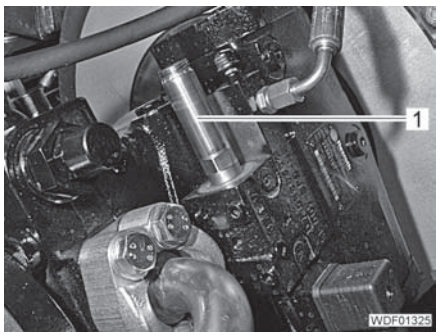


Fig. 448 Core

Removing the coil

- Unscrew the screw (Fig. 447,2) on the connector.
- Disconnect the plug.
- Unscrew the nut (Fig. 447,1).
- Pull off the coil (Fig. 447,3).

Replacing the core

- Unscrew the core (Fig. 448,1).
- Screw a new core into the solenoid valve and tighten it.

Installing the coil

- Attach the new coil (Fig. 447,3) onto the core of the solenoid valve.
- Screw the nut (Fig. 447,1) with the O-ring onto the core of the solenoid valve and tighten it hand-tight.
- Plug the plug (Fig. 447,2) 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").

Spare parts and auxiliary equipment

Designation	Quantity
Solenoid (coil and core)	2

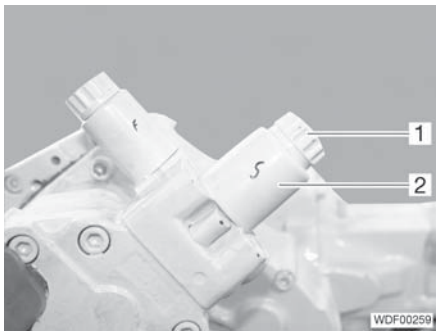


Fig. 449 Coil attachment

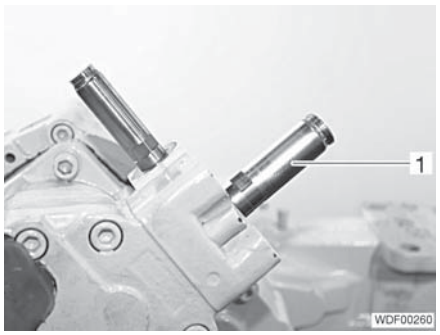


Fig. 450 Drives

Removing the drives

- Unscrew the 2 nuts (Fig. 449,1).
- Pull off the 2 coils (Fig. 449,2).
- Unscrew the 2 cores (Fig. 450,1).

Installing the drives

- Screw in and tighten the 2 cores (Fig. 450,1).
- Connect the 2 coils (Fig. 449,2) onto the drives.
- Screw the 2 nuts (Fig. 449,1), each with an O-ring, onto the cores and tighten hand-tight.

Final work

- Install the variable displacement motor (see the section 3.2.4 "Replacing the variable displacement motor").

8.4.5 Replacing the control unit

Spare parts and auxiliary equipment

Designation	Quantity
Control unit	1

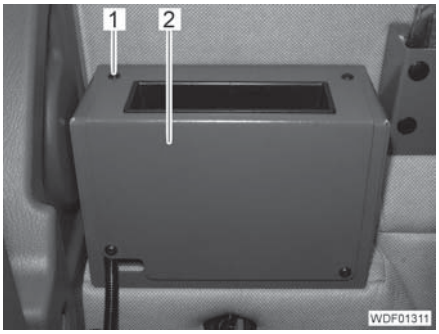


Fig. 451 Cover of the console

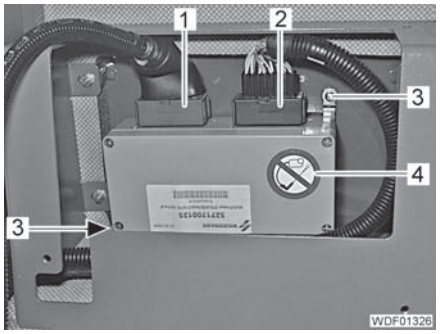


Fig. 452 Control unit attachment

Removing the control unit

- Unscrew the 4 screws (Fig. 451,1).
- Remove the cover (Fig. 451,2).
- Mark the plugs in order to prevent mix-ups.

▷ The plugs on the control unit are locked.

To release the lock, simultaneously press in the two red webs on the front face of the plug, and pull on the red plate on the opposite side of the plug.

- Pull 2 plugs (Fig. 452,1 and 2) off the control unit.
- Unscrew the 2 screws (Fig. 452,3).
- Remove the control unit (Fig. 452,4).

Installing the control unit

- Place the control unit (Fig. 452,4) into position.
- Screw in 2 screws (Fig. 452,3) with spring lock washers and disks.
- Insert 2 plugs (Fig. 452,1 and 2) on the control unit.
- Position the cover (Fig. 451,2).
- Screw in and tighten the 4 screws (Fig. 451,1).

8.5 Indicator lamps, audible reverse warning device and instruments

8.5.1 Replacing the engine-hour indicator

▷ Always follow the manufacturer's installation instructions.

Requirements

Ensure the following:

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

Spare parts and auxiliary equipment

Designation	Quantity
Engine-hour indicator	1

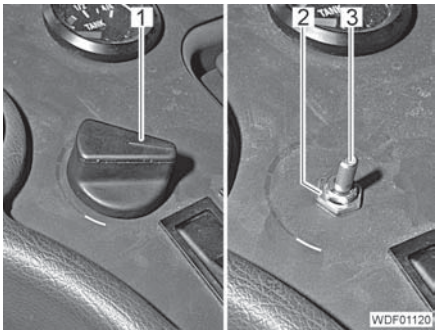


Fig. 453 Knob of the temperature sensor

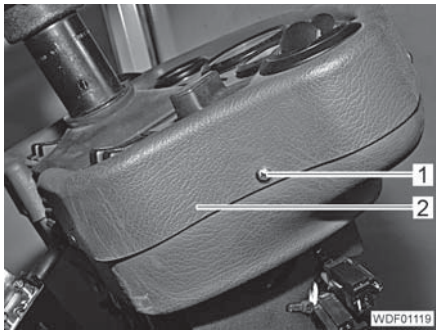


Fig. 454 Instrument panel attachment

Opening the instrument panel

- Pull off the knob (Fig. 453,1) of the temperature sensor.
- Unscrew the nut (Fig. 453,2).
- Unscrew the 6 screws (Fig. 454,1).
- Carefully lift up the instrument panel (Fig. 454,2) until the engine-hour counter is accessible.

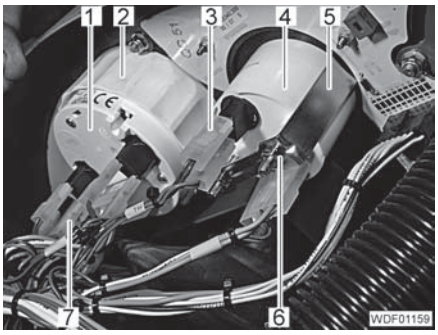


Fig. 455 Instruments attachment

Replacing the engine-hour indicator

- Remove the plugs (Fig. 455,7).
- Unscrew the nut (Fig. 455,2).
- Carefully push the engine-hour indicator (Fig. 455,1) to the front side and out of the instrument panel.
- Carefully insert the new engine-hour indicator (Fig. 455,1) into the instrument panel from the front side.
- Screw the nut (Fig. 455,2) onto the engine-hour indicator.
- Align the engine-hour indicator in the instrument panel so that it can be read easily.
- Tighten the nut (Fig. 455,2).
- Attach the connector (Fig. 455,7) onto the engine-hour indicator.
- Adjust the engine-hour indicator (see adjusting instructions in Part 6, chapter "Electrical Components").

Closing the instrument panel

- Carefully position the instrument panel (Fig. 454,2) so that the operating part (Fig. 453,3) protrudes through the hole.
- Screw in and tighten the 6 screws (Fig. 454,1).
- Screw the nut (Fig. 453,2) onto the operating part (Fig. 453,3) and tighten it hand-tight.
- Fit the knob (Fig. 453,1) onto the operating part.

Final work

- Install the steering column switch (see the section 8.2.8 "Replacing the steering column switch").

8.5.2 Replacing the fuel tank gauge

▷ Always follow the manufacturer's installation instructions.

▷ This section describes how to replace the fuel tank gauge.
The temperature gauge is replaced in the same way.

Requirements

Ensure the following:

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

Spare parts and auxiliary equipment

Designation	Quantity
Fuel tank gauge	1
or temperature gauge	1

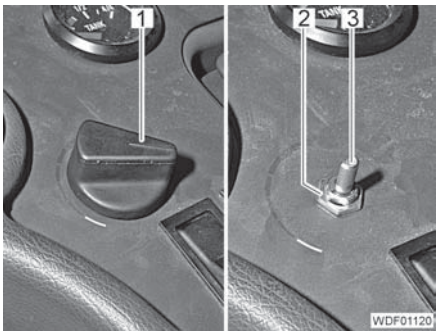


Fig. 456 Knob of the temperature sensor

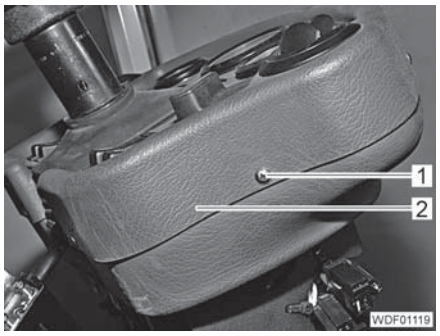


Fig. 457 Instrument panel attachment

Opening the instrument panel

- Pull off the knob (Fig. 456,1) of the temperature sensor.
- Unscrew the nut (Fig. 456,2).
- Unscrew the 6 screws (Fig. 457,1).
- Carefully lift up the instrument panel (Fig. 457,2) until the fuel tank gauge is accessible.

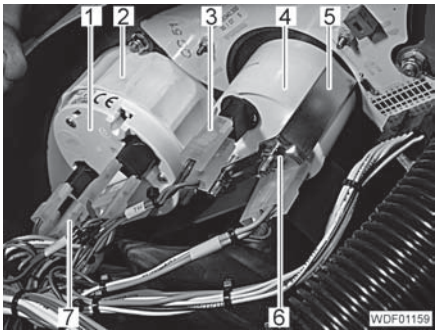


Fig. 458 Instruments attachment

Removing the fuel tank gauge

- Remove the plugs (Fig. 458,3).
- Unscrew the 2 nuts (Fig. 458,6).
- Remove the bar (Fig. 458,5).
- Carefully push the fuel tank gauge (Fig. 458,4) to the front side and out of the instrument panel.

Installing the fuel tank gauge

- Carefully insert the fuel tank gauge (Fig. 458,4) from the front side into the instrument panel.
- Place the bar (Fig. 458,5) into position.
- Screw the 2 nuts (Fig. 458,6) with spring lock washers onto the thread.
- Adjust the fuel tank gauge in the instrument panel so that it can be easily read.
- Tighten the 2 nuts (Fig. 458,6).
- Attach the connectors (Fig. 458,3) to the fuel tank gauge.

Closing the instrument panel

- Carefully position the instrument panel (Fig. 457,2) so that the operating part (Fig. 456,3) protrudes through the hole.
- Screw in and tighten the 6 screws (Fig. 457,1).
- Screw the nut (Fig. 456,2) onto the operating part (Fig. 456,3) and tighten it hand-tight.
- Fit the knob (Fig. 456,1) onto the operating part.

Final work

- Install the steering column switch (see the section 8.2.8 "Replacing the steering column switch").

8.5.3 Replacing the instrument lighting

▷ This section describes replacing the instrument lights of one analog device. The other instrument lights are replaced in the same way.

Requirements

Ensure the following:

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

Spare parts and auxiliary equipment

Designation	Quantity
Bulb	as req.

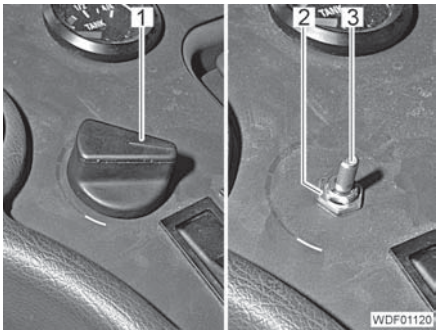


Fig. 459 Knob of the temperature sensor

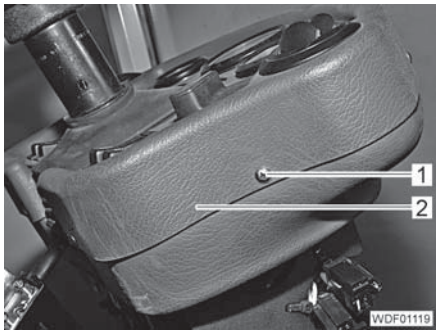


Fig. 460 Instrument panel attachment

Opening the instrument panel

- Pull off the knob (Fig. 459,1) of the temperature sensor.
- Unscrew the nut (Fig. 459,2).
- Unscrew the 6 screws (Fig. 460,1).
- Carefully lift up the instrument panel (Fig. 460,2) until the instrument lighting are accessible.

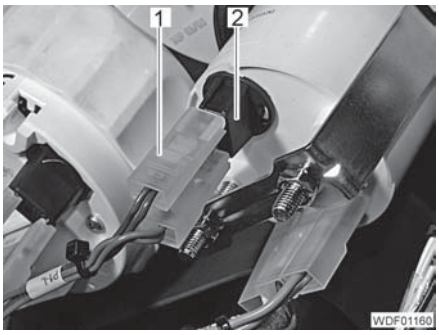


Fig. 461 Instrument lighting

- Remove the 2 plugs (Fig. 461,1).
- Rotate the locking mechanism (Fig. 461,2) counter-clockwise and remove it.
- Pull out the bulb.
- Insert a new bulb.
- Carefully insert the locking mechanism (Fig. 461,2) into the instrument and rotate clockwise until it locks.
- Attach the 2 plugs (Fig. 461,1) to the contacts.

Closing the instrument panel

- Carefully position the instrument panel (Fig. 460,2) so that the operating part (Fig. 459,3) protrudes through the hole.
- Screw in and tighten the 6 screws (Fig. 460,1).
- Screw the nut (Fig. 459,2) onto the operating part (Fig. 459,3) and tighten it hand-tight.
- Fit the knob (Fig. 459,1) onto the operating part.

Final work

- Install the steering column switch (see 8.2.8 "Replacing the steering column switch").

8.5.4 Replacing the horn

Spare parts and auxiliary equipment

Designation	Quantity
Horn	1

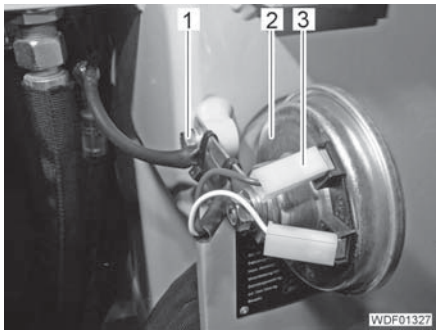


Fig. 462 Horn

Replacing the horn

- Unscrew the screw (Fig. 462,1).
- Remove the 2 plugs (Fig. 462,3) from the horn (Fig. 462,2).
- Connect the 2 plugs (Fig. 462,3) to the new horn.
- Screw in and tighten the screw (Fig. 462,1) with the spring lock washer and washer.

8.5.5 Replacing the audible reverse warning device

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
Audible warning generator	1

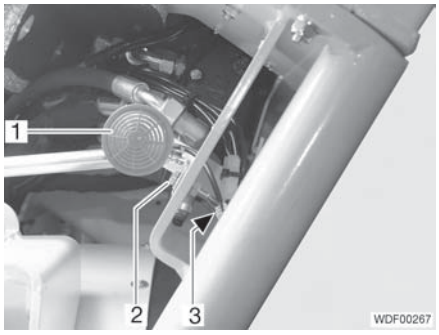


Fig. 463 Audible reverse warning device

- Unplug the plug (Fig. 463,3).
- Unscrew the screw (Fig. 463,2).
- Remove the audible reverse warning device (Fig. 463,1).
- Put a new audible reverse warning device into place.

- Screw in and tighten the screw (Fig. 463,2) with the washer.
- Connect and secure the plug (Fig. 463,3).

8.6 Lighting system

8.6.1 Replacing a complete headlamp with indicator

Spare parts and auxiliary equipment

Designation	Quantity
Headlamp	1

Fig. 464 Headlamp attachment

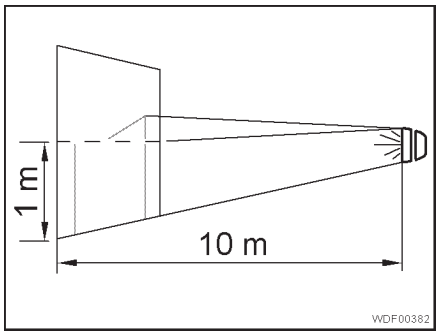


Fig. 465 Alignment dimensions

Replacing a headlamp

- Remove the plug (Fig. 464,3).
- Unscrew the nut (Fig. 464,1).
- Remove the headlamp (Fig. 464,2).
- Place a new headlamp into position.
- Screw the nut (Fig. 464,1), with the washer, onto the thread and tighten.
- Connect the plug (Fig. 464,3) to the connection on the headlamp.

Adjusting the headlamp

- Park the loader parallel at a distance of 10 meters from a suitable (even) wall (Fig. 465).
- Switch on the dipped beam.
- Undo the nut (Fig. 464,1).
- Align the headlamp so that the light/dark border of the dipped beam is 1 m above the ground (Fig. 465).
- Tighten the nut (Fig. 464,1).

8.6.2 Replacing a complete tail lamp

Spare parts and auxiliary equipment

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

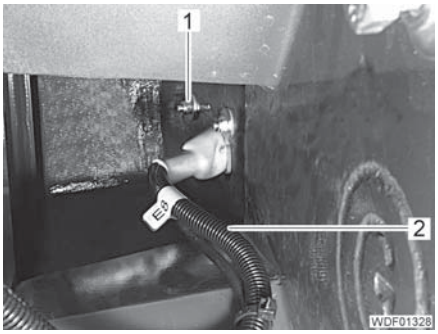


Fig. 466 Tail lamp attachment

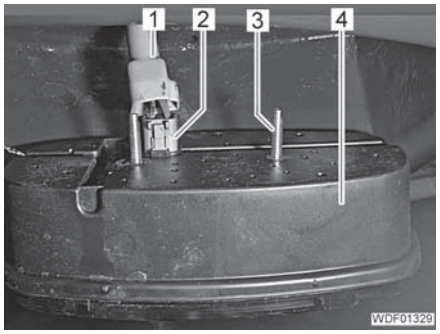


Fig. 467 Electrical plug

Removing the tail lamp

- Unscrew the 2 nuts (Fig. 466,1).
- Push the cable (Fig. 466,2) through the hole in the rear weight and carefully remove the tail lamp (Fig. 467,4) towards the back.
- Push back the rubber bushing (Fig. 467,1).
- Unplug the connector (Fig. 467,2).

Installing the tail lamp

- Plug in the connector (Fig. 467,2) on the tail lamp (Fig. 467,4).
- Push the rubber bushing (Fig. 467,1) over the connector.
- Coat the 2 threads (Fig. 467,3) with locking agent.
- Carefully locate the tail lamp from the back, simultaneously pulling the cable (Fig. 466,2) inwards.
- Screw the 2 nuts (Fig. 466,1) with washers onto the thread and tighten.

Final work

- Check that the lighting system is working.

8.6.3 Replacing the headlight

▷ This section describes replacement of a suspended headlight.
The vertically mounted headlight is replaced in the same way.

Spare parts and auxiliary equipment

Designation	Quantity
Headlight	1

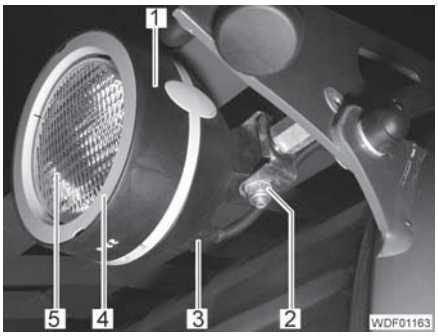


Fig. 468 Headlight

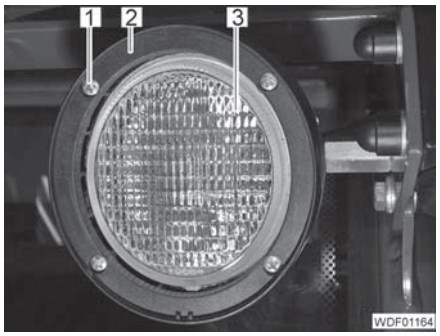


Fig. 469 Lamp glass attachment

Removing the headlight

- Remove the plug (Fig. 468,3).
- Unscrew the nut (Fig. 468,2).
- Remove the headlight (Fig. 468,1).

Fitting the headlight

- Place the new headlight (Fig. 468,1) into position.
- Screw the nut (Fig. 468,2) onto the thread and tighten it.
- Attach the connector (Fig. 468,3) onto the headlight.

▷ The lamp glass (Fig. 468,5) must be aligned so that the lettering is not upside down. Align the lamp glass as necessary.

Aligning the lamp glass

- Remove the cover (Fig. 468,4).
- Unscrew the 4 screws (Fig. 469,1).
- Remove the frame (Fig. 469,2).
- Rotate the lamp glass (Fig. 469,3) into the desired position.
- Place the frame (Fig. 469,2) in position.
- Tighten the 4 screws (Fig. 469,1).
- Insert the cover (Fig. 468,4).

Final work

- Check that the lighting system is working.

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

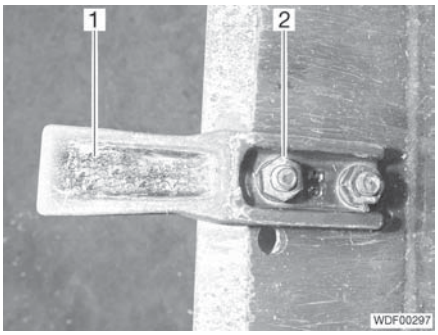


Fig. 470 Digging tooth attachment

- Unscrew the 2 nuts (Fig. 470,2).
- Remove the digging tooth (Fig. 470,1).
- Put a new digging tooth into place.
- Screw the 2 nuts (Fig. 470,2) 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

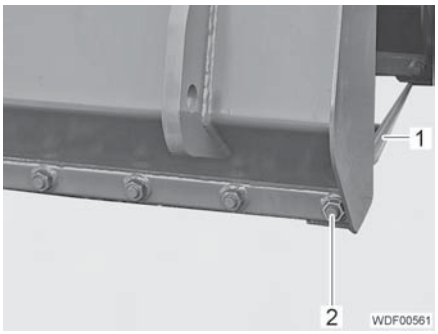


Fig. 471 Securing the prong

Replacing prong

- Unscrew the nut (Fig. 471,2).
- Pull out the prong (Fig. 471,1).

- Insert the new prong (Fig. 471,1).
- Grease the thread of the prong.
- Screw the nut (Fig. 471,2) onto the prong and tighten.

9.3 Replacing the hydraulic cylinder of the fork & grab

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

▷ This section describes replacement of a hydraulic cylinder.
The second hydraulic cylinder is replaced in the same way.

Requirements

Ensure the following:

- The hydraulic system of the fork & grab is not pressurized (e.g. as a result of decoupling the fork & grab).

Spare parts and auxiliary equipment

Designation	Quantity
Hydraulic cylinder	1

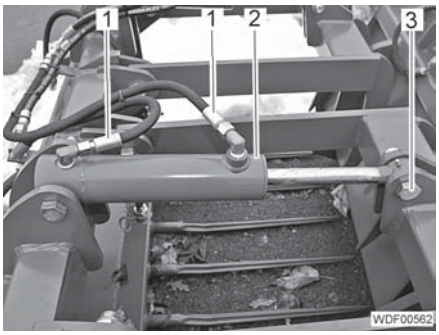


Fig. 472 Hydraulic cylinder of the fork & grab

Replacing the hydraulic cylinder

- Unscrew and close off the 2 hydraulic lines (Fig. 472,1).
- Unscrew the 2 bolts (Fig. 472,3).
- Remove the hydraulic cylinder (Fig. 472,2).
- Replace the screw attachments if necessary.
- Insert a new hydraulic cylinder.
- Screw in and tighten 2 bolts (Fig. 472,3).
- Screw the 2 hydraulic lines (Fig. 472,1) onto the connections on the hydraulic cylinder and tighten.

Final work

- Lubricate the hydraulic cylinder bearings.

9.4 Replacing the hydraulic cylinder of the multi-purpose bucket

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

▷ This section describes replacement of a hydraulic cylinder.
The second hydraulic cylinder is replaced in the same way.

Requirements

Ensure the following:

- The hydraulic system of the multi-purpose bucket is not pressurized (e.g. as a result of decoupling the multi-purpose bucket).
- The multi-purpose bucket is secured against accidental opening and closing.

Spare parts and auxiliary equipment

Designation	Quantity
Hydraulic cylinder	1

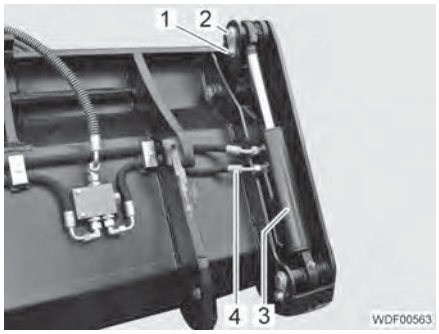


Fig. 473 Hydraulic cylinder of the multi-purpose bucket

Replacing the hydraulic cylinder

- Unscrew and close off the 2 hydraulic lines (Fig. 473,4).
- Unscrew the 2 screws (Fig. 473,1).
- Drive out the 2 pins (Fig. 473,2).
- Remove the hydraulic cylinder (Fig. 473,3).
- Insert a new hydraulic cylinder.
- Drive in the 2 pins (Fig. 473,2).
- Screw in the 2 screws (Fig. 473,1) with spring lock washers and tighten.
- Screw the 2 hydraulic lines (Fig. 473,4) onto the connections on the hydraulic cylinder and tighten.

Final work

- Lubricate the hydraulic cylinder bearings.

9.5 Replacing the valve of the multi-purpose bucket

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

Requirements

Ensure the following:

- The hydraulic system of the multi-purpose bucket is not pressurized (e.g. as a result of decoupling the multi-purpose bucket).
- The multi-purpose bucket is secured against accidental opening and closing.

Spare parts and auxiliary equipment

Designation	Quantity
Valve	1

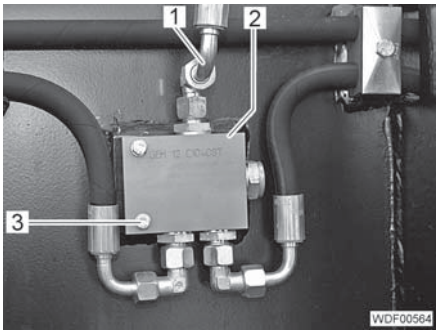


Fig. 474 Valve attachment

Replacing the valve

- Unscrew and close off the 3 hydraulic lines (Fig. 474,1).
- Unscrew the 2 screws (Fig. 474,3).
- Remove the valve (Fig. 474,2).
- Put a new valve into position.
- Screw in 2 screws (Fig. 474,3) with washers and tighten.
- Screw 3 hydraulic lines (Fig. 474,1) onto the connections of the valve and tighten.

A

B

C

D

E

F

G

H

I

T

V

W

Repair Manual for Wheel Loader WL 48 / WL 50

Part 5

Circuit diagrams and technical descriptions

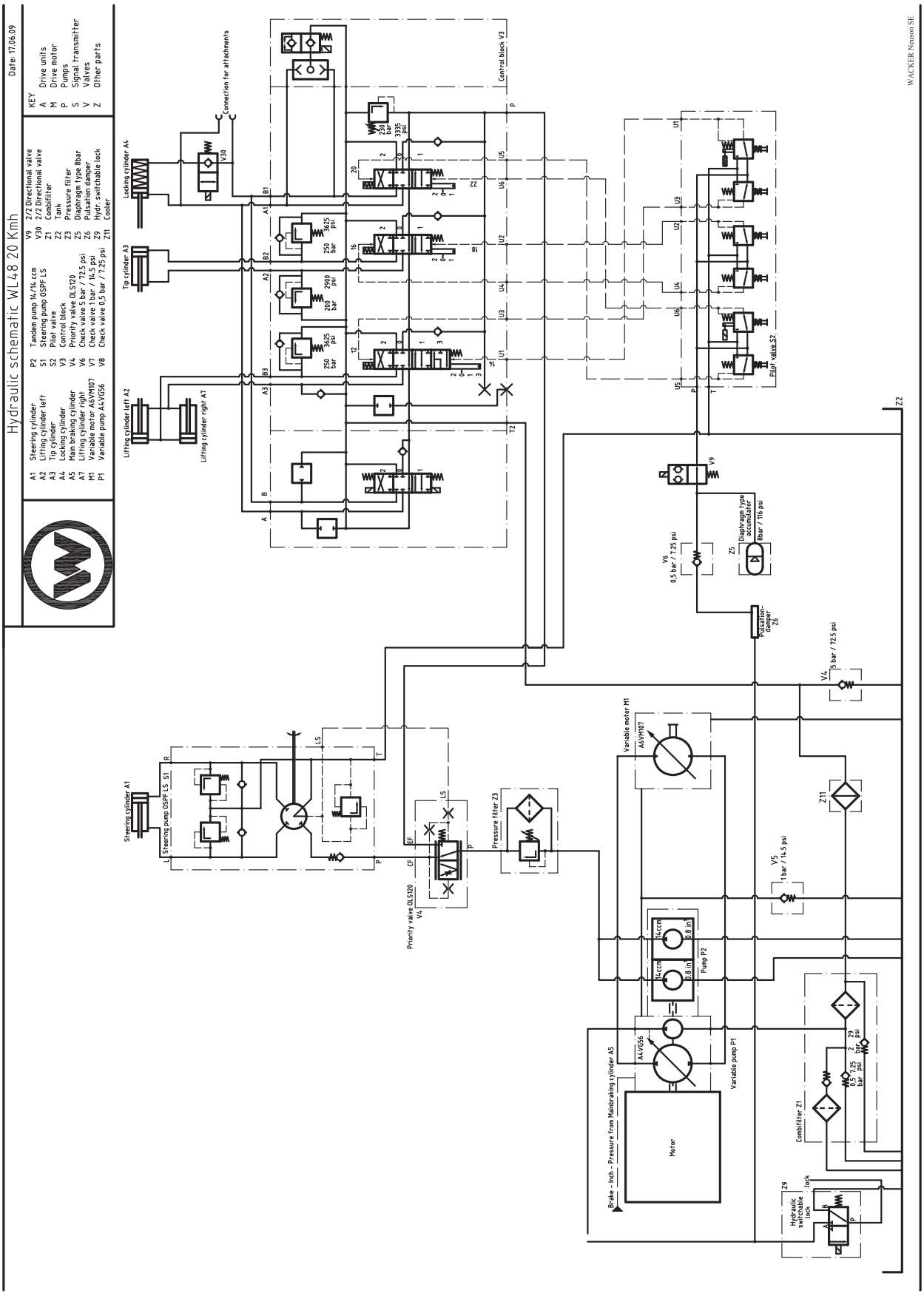
Translation of the original repair manual

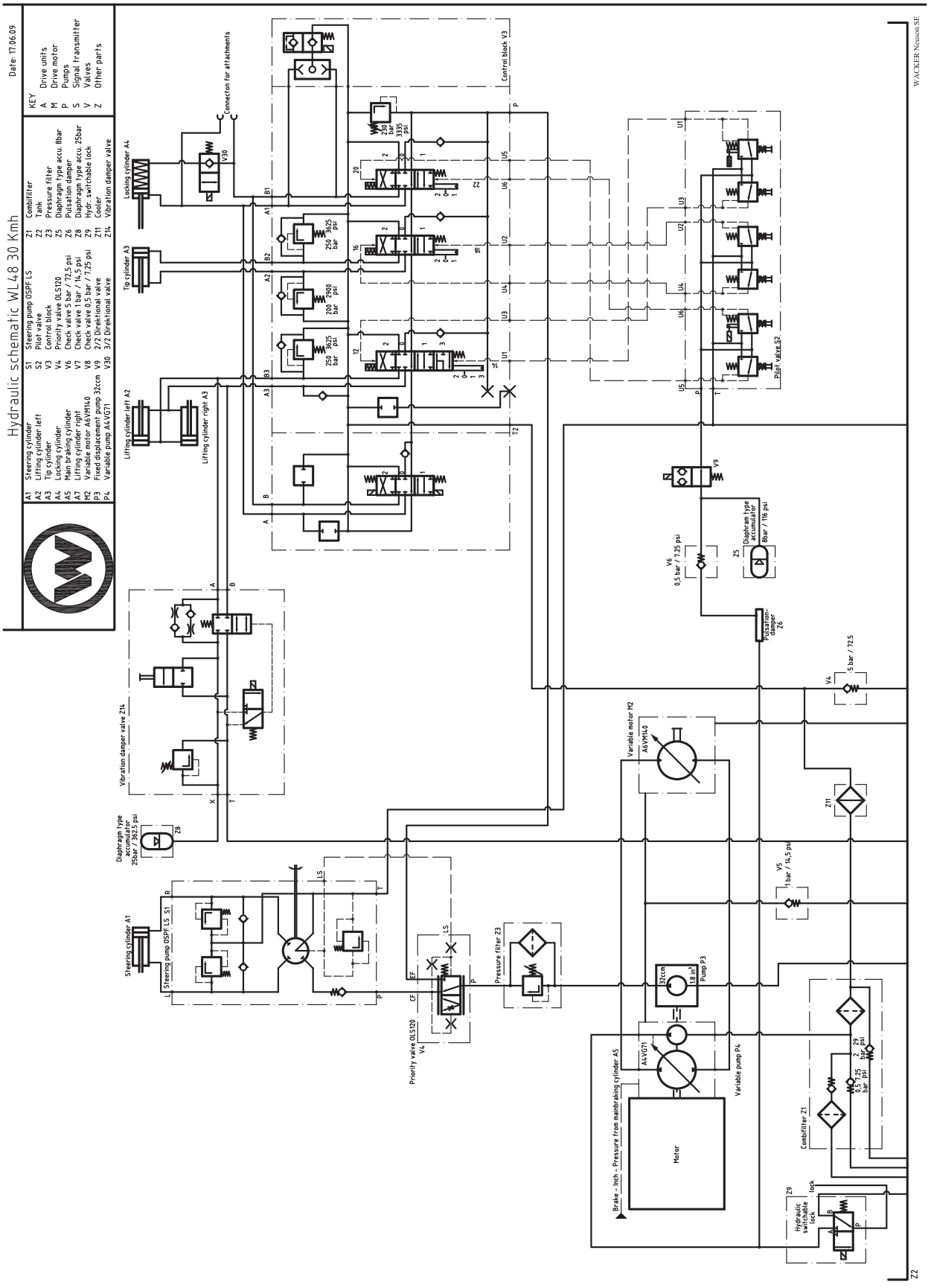
WDF-6009-00EN
2009
Edition 07/2009-1

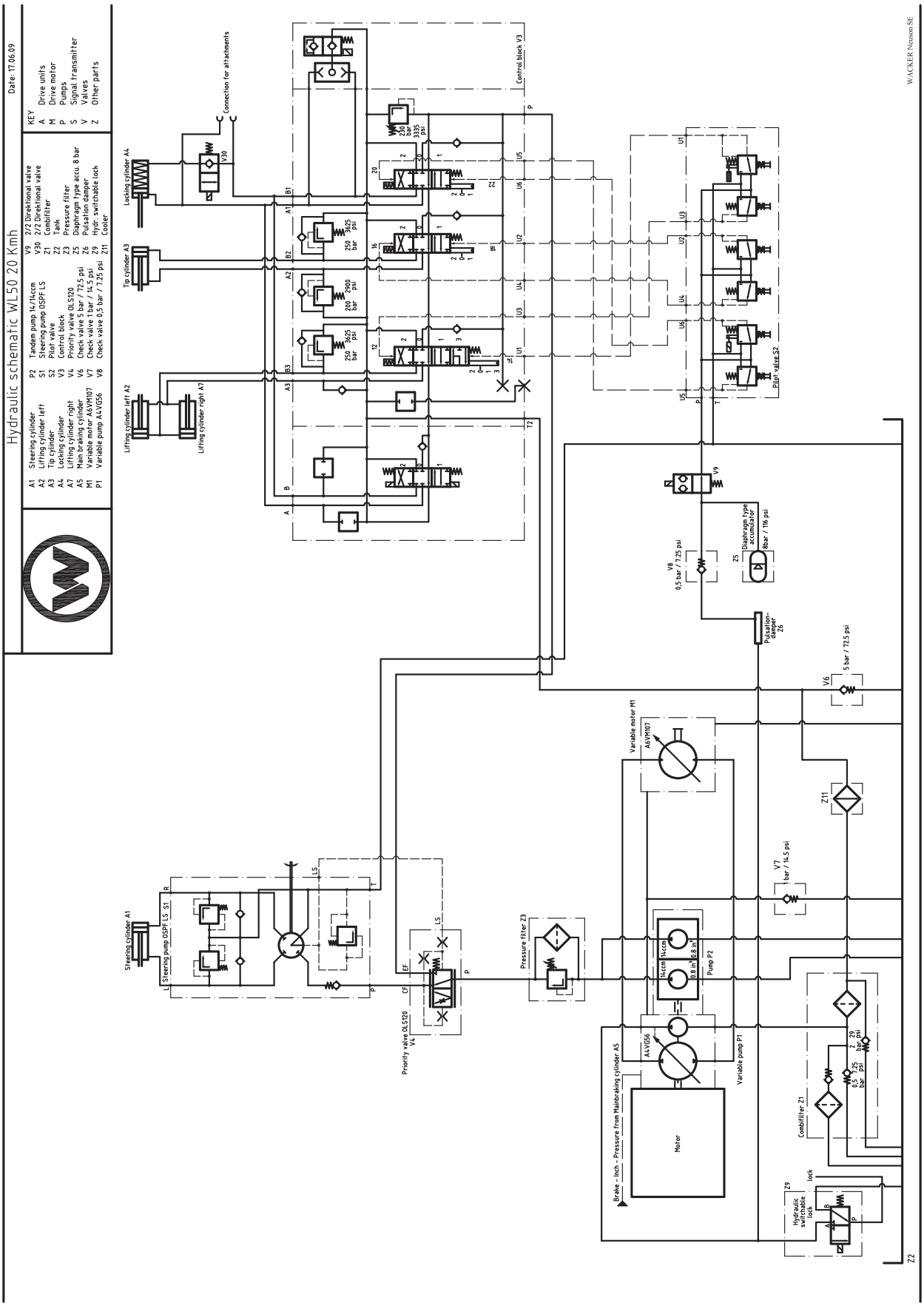
This part of the repair manual contains circuit diagrams and drawings that are required for fault searches and troubleshooting.

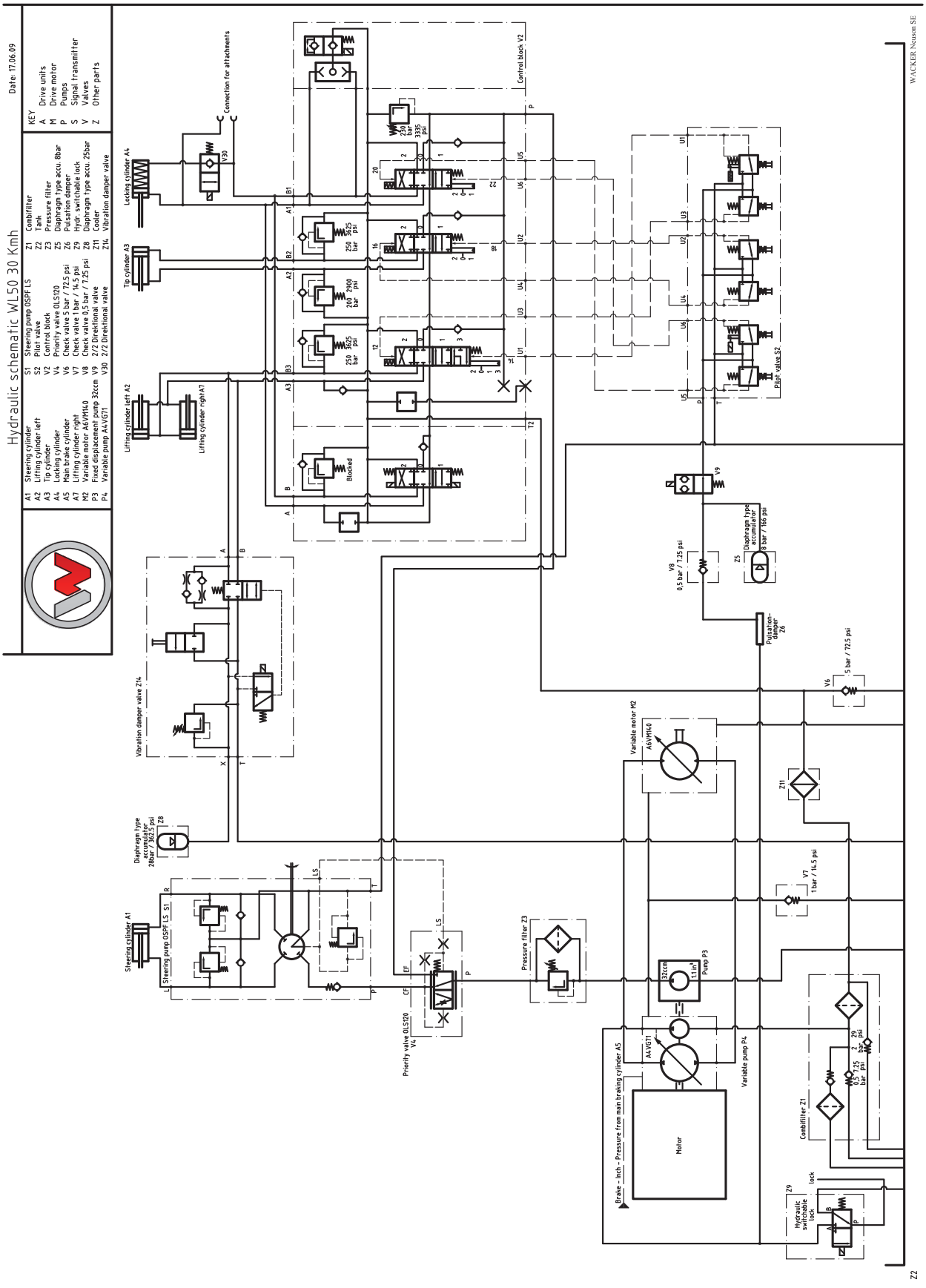
Additional features

Some of the circuit diagrams contain additional functions that are not installed in all loaders.


Hydraulic schematic WL48 20 Kmh
Date: 17.06.09
A1 Steering cylinder
A2 Lifting cylinder left
A3 Tip cylinder
A4 Locking cylinder
A5 Main braking cylinder
A7 Lifting cylinder right
M1 Variable motor A6VM107
P1 Variable pump A4VG56
P2 Tandem pump 14/14 ccm
S1 Steering pump OSPF LS
S2 Pilot valve
V2 Control block
V4 Priority valve OLS120
V6 Check valve 5 bar / 72.5 psi
V7 Check valve 1 bar / 14.5 psi
V8 Check valve 0.5 bar / 7.25 psi
V9 2/2 Directional valve
V30 2/2 Directional valve
Z1 Combifilter
Z2 Tank
Z3 Pressure filter
Z5 Diaphragm type 8bar
Z6 Pulsation damper
Z9 Hydr. switchable lock
Z11 Cooler
KEY
A Drive units
M Drive motor
P Pumps
S Signal transmitter
V Valves
Z Other parts
Connection for attachments
Locking cylinder A4
Tip cylinder A3
Lifting cylinder left A2
Lifting cylinder right A7
Control block V3
Pilot valve S2
Steering cylinder A1
Steering pump OSPF LS S1
Priority valve OLS120 V4
Pressure filter Z3
Variable motor M1
A6VM107
A4VG56
Variable pump P1
Pump P2
14ccm
0.8 in3
Motor
Brake - Inch - Pressure from Mainbraking cylinder A5
Combifilter Z1
Hydraulic switchable lock
Diaphragm type accumulator 8bar / 116 psi
Pulsation-damper Z6
V4 5 bar / 72.5 psi
V5 1 bar / 14.5 psi
V6 0.5 bar / 7.25 psi
WACKER Neuson SE

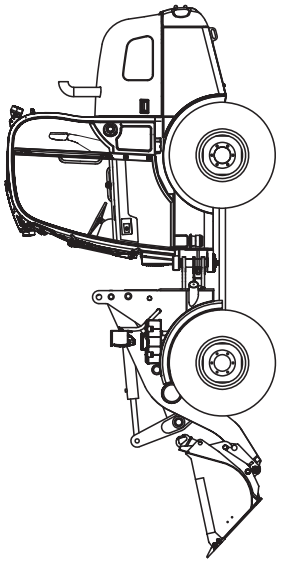

Hydraulic schematic WL48 30 Kmh
Date: 17.06.09
A1 Steering cylinder
A2 Lifting cylinder left
A3 Tip cylinder
A4 Locking cylinder
A5 Main braking cylinder
A7 Lifting cylinder right
M2 Variable motor A6VM140
P3 Fixed displacement pump 32ccm
P4 Variable pump A4VG71
S1 Steering pump OSPF LS
S2 Pilot valve
V3 Control block
V4 Priority valve DLS120
V6 Check valve 5 bar / 72,5 psi
V7 Check valve 1 bar / 14,5 psi
V8 Check valve 0,5 bar / 7.25 psi
V9 2/2 Direktional valve
V30 3/2 Direktional valve
Z1 Combifilter
Z2 Tank
Z3 Pressure filter
Z5 Diaphragm type accu. 8bar
Z6 Pulsation damper
Z8 Diaphragm type accu. 250bar
Z9 Hydr. switchable lock
Z11 Cooler
Z14 Vibration damper valve
KEY
A Drive units
M Drive motor
P Pumps
S Signal transmitter
V Valves
Z Other parts
Connection for attachments
Control block V3
Locking cylinder A4
Tip cylinder A3
Lifting cylinder left A2
Lifting cylinder right A3
Pilot valve S2
Diaphragm type accumulator
Vibration damper valve Z14
Steering cylinder A1
Steering pump OSPF LS S1
Priority valve DLS120 V4
Pressure filter Z3
Variable motor M2
A6VM140
Variable pump P4
A4VG71
Pump P3
32ccm
1.8 in³
Motor
Brake - Inch - Pressure from mainbraking cylinder A5
Combifilter Z1
Hydraulic switchable lock
Diaphragm type accumulator
8bar / 116 psi
Pulsation-damper Z6
Cooler
WACKER Neuson SE


Hydraulic schematic WL50 20 Kmh
Date: 17.06.09
A1 Steering cylinder
A2 Lifting cylinder left
A3 Tip cylinder
A4 Locking cylinder
A5 Lifting cylinder right
A7 Main braking cylinder
M1 Variable motor A6VM107
P1 Variable pump A4VG56
P2 Tandem pump 14/14ccm
S1 Steering pump OSPF LS
S2 Pilot valve
V3 Control block
V4 Priority valve OLS120
V6 Check valve 5 bar / 72.5 psi
V7 Check valve 1 bar / 14.5 psi
V8 Check valve 0,5 bar / 7.25 psi
V9 2/2 Direktional valve
V30 2/2 Direktional valve
Z1 Combifilter
Z2 Tank
Z3 Pressure filter
Z5 Diaphragm type accu. 8 bar
Z6 Pulsation damper
Z9 Hydr. switchable lock
Z11 Cooler
KEY
A Drive units
M Drive motor
P Pumps
S Signal transmitter
V Valves
Z Other parts
Control block V3
Connection for attachments
Locking cylinder A4
Tip cylinder A3
Lifting cylinder left A2
Lifting cylinder right A1
Pilot valve S2
Diaphragm type accumulator 8bar / 116 psi
Pulsation-damper Z6
Variable motor M1
A6VM107
Pump P2
Pressure filter Z3
Steering cylinder A1
Steering pump OSPF LS S1
Priority valve OLS120 V4
Variable pump P1
A4VG56
Motor
Brake - Inch - Pressure from Mainbraking cylinder A5
Combifilter Z1
Hydraulic switchable lock
WACKER Neuson SE

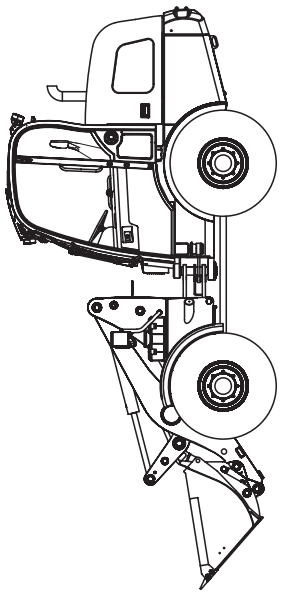

Hydraulic schematic WL50 30 Kmh
Date: 17.06.09
A1 Steering cylinder
A2 Lifting cylinder left
A3 Tip cylinder
A4 Locking cylinder
A5 Main brake cylinder
A7 Lifting cylinder right
M2 Variable motor A6VM140
P3 Fixed displacement pump 32ccm
P4 Variable pump A4VG71
S1 Steering pump OSPF LS
S2 Pilot valve
V2 Control block
V4 Priority valve OLS120
V6 Check valve 5 bar / 72.5 psi
V7 Check valve 1 bar / 14.5 psi
V8 Check valve 0,5 bar / 7.25 psi
V9 2/2 Directional valve
V30 2/2 Directional valve
Z1 Combifilter
Z2 Tank
Z3 Pressure filter
Z5 Diaphragm type accumulator
Z6 Pulsation damper
Z8 Diaphragm type accumulator
Z9 Hydr. switchable lock
Z11 Cooler
Z14 Vibration damper valve
KEY
A Drive units
M Drive motor
P Pumps
S Signal transmitter
V Valves
Z Other parts
Connection for attachments
Locking cylinder A4
Tip cylinder A3
Lifting cylinder left A2
Lifting cylinder right A7
Control block V2
Pilot valve S2
Vibration damper valve Z14
Steering cylinder A1
Steering pump OSPF LS S1
Diaphragm type accumulator 28bar / 362.5 psi Z8
Priority valve OLS120 V4
Pressure filter Z3
Variable motor M2 A6VM140
Variable pump P4 A4VG71
Motor
Brake - Inch - Pressure from main braking cylinder A5
Combifilter Z1
Hydraulic switchable lock Z9
Diaphragm type accumulator 8 bar / 116 psi Z5
Pulsation-damper Z6
V6 5 bar / 72.5 psi
V7 1 bar / 14.5 psi
V8 0,5 bar / 7.25 psi
V9
Z11
Pump P3
WACKER Neuson SE
Z2

WACKER NEUSON

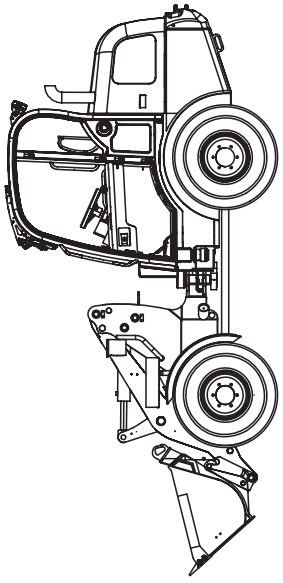
Elektric circuit diagram WL 36, 37, 48, 50, 55, 57



WL 48, 50



WL 55, 57



WL 36, 37

Component list Elektric circuit diagram WL 36,37,48,50,55,57			Date: 01.10.08	P1
ID	Component	Path		

ID	Component	Path
	Control unit, radio	
A1	Control unit, traveling drive, hydraulics	113-115
A3	Control leaver	110-111
A4	Radio	154-155
	Converters	
B1	Fuel gauge sensor	40
B2	Cooling water / engine oil temp. Emitter	42
B3	Horn	83
B5	Loudspeaker left	153
B6	Loudspeaker right	155-156
	Lights - headlights	
E1	Front left headlight	137
E2	Front right headlight	138
E3	Left rear work light	140
E4	Right rear work light	141
E5	Left front headlight acc. To the Road Traffic Licensing Regulations	85,86,92,99
E6	Right front headlight acc. To the Road Traffic Licensing Regulations	88,89,93,100
E7	Left rear headlight acc. To the Road Traffic Licensing Regulations	91,98,106
E8	Right rear light acc. To the Road Traffic Licensing Regulations	94,101,107
E9	Cab inside light	157-158
E10	Rotating beacon	150-152
E13	Licence plate light	102
	Fuses	
	Fittings	
F1	Shut off valve, fuel pump	14/21
F2	Cab power relay	51
F3	Instrument, indicator, switch lights	39
F4	Front windscreen wiper, horn	69
F5	Heater fan	58
F8	Free	65
F9	Free	67
F10	Blinker KL49	91
F11	Warning blinker KL49	91

ID	Component	Path
F12	Switch für brake light	107
F13	Left side lamp	99
F14	Right side lamp	100
F15	Left & right dipped beam	88
F16	Left & right main beam	86
	Cab	
F17	Switches 9, 10, 11, 12, seat bracket	114
F18	Switches 13 & 14, seat bracket, control unit	117
F19	Front headlights	138
F20	Rear work lights	141
F21	Rear windscreen wipers, relay K6, K7	148
F22	Heated rear window	144
F23	Rotating beacon, radio	151
F24	KL30 Cigarette lighter, inside light, radio	157
F30a	Main fuse, fittings	7
F30b	Main fuse, cab	8
F30c	Heater coil 1	9
F30d	Heater coil 2	10
	Power supply	
G1	Generator, 12V 65A Perkins, 55A Deutz	2
G2	Starter battery, 12V 74Ah	4
	Indicator light	
H1	Preheating	29
H2	Electrical connection	131
H3	Hydraulic oil contamination	44
H5	Fuel reserve	39
H6	Cooling water, hydraulic oil temperature	37
H7	Battery, generator	31
H8	Blinker	95
H9	Main beam	90
H10	Engine oil pressure	34
H11	Parking brake	48
H12	Air filter contamination	46
H13	Overdrive	121
H14	Crawler gear	122
H15	Forward gear	125
H16	Reverse gear	126

ID	Component	Path
	Relay	
K1	Relief relay, lightning, 20A	83-84
K2	Wiping, wasching, interval-time relay	72-75
K3	Flasher	93-94
K4	Air conditioner relay	56-58
K5	Relief relay, cab	109-111
K8	Heating time control relay	20-22
K9	Preheater relay	21-23 / 24-26
K10	Loading arm stop	185-186,167-168
	Enginge	
M1	Starter	9
M2	Front windscreen wiper	70
M3	Rear windscreen wiper	147
M4	Front windscreen washer pump	77
M5	Rear windscreen washer pump	148
M6	Heater fan max. 18A	61
	Instrument	
P1	Fuel gauge	40
P2	Time meter, tachometer	32-33
P3	Engine temperature display	42
	Resistance	
R1	Heater plug indicator, 12V 28A (Perkins)	17
R2	Heater plugs (Perkins); Heater coil 1 (Deutz)	18 / 22-23 / 21
R3	Resistance, exciter circuit	30
R4	Rear window heating	144
R5	Heater coil 2 (deutz R2)	25
	Switch	
S1	Battery cut-off switch	6
S2	Heater start switch	14-19 / 13-18
S4	Fittings, warning blinker	90-93
S5	Fittings, air conditioner	56-58
S6	Light fittings acc to the Road Traffic Licensing Regulations	87-88
S7	Fittings, light, windscreen wiper, horn, blinker	70-93
S8	Fittings, heater fan	56-59

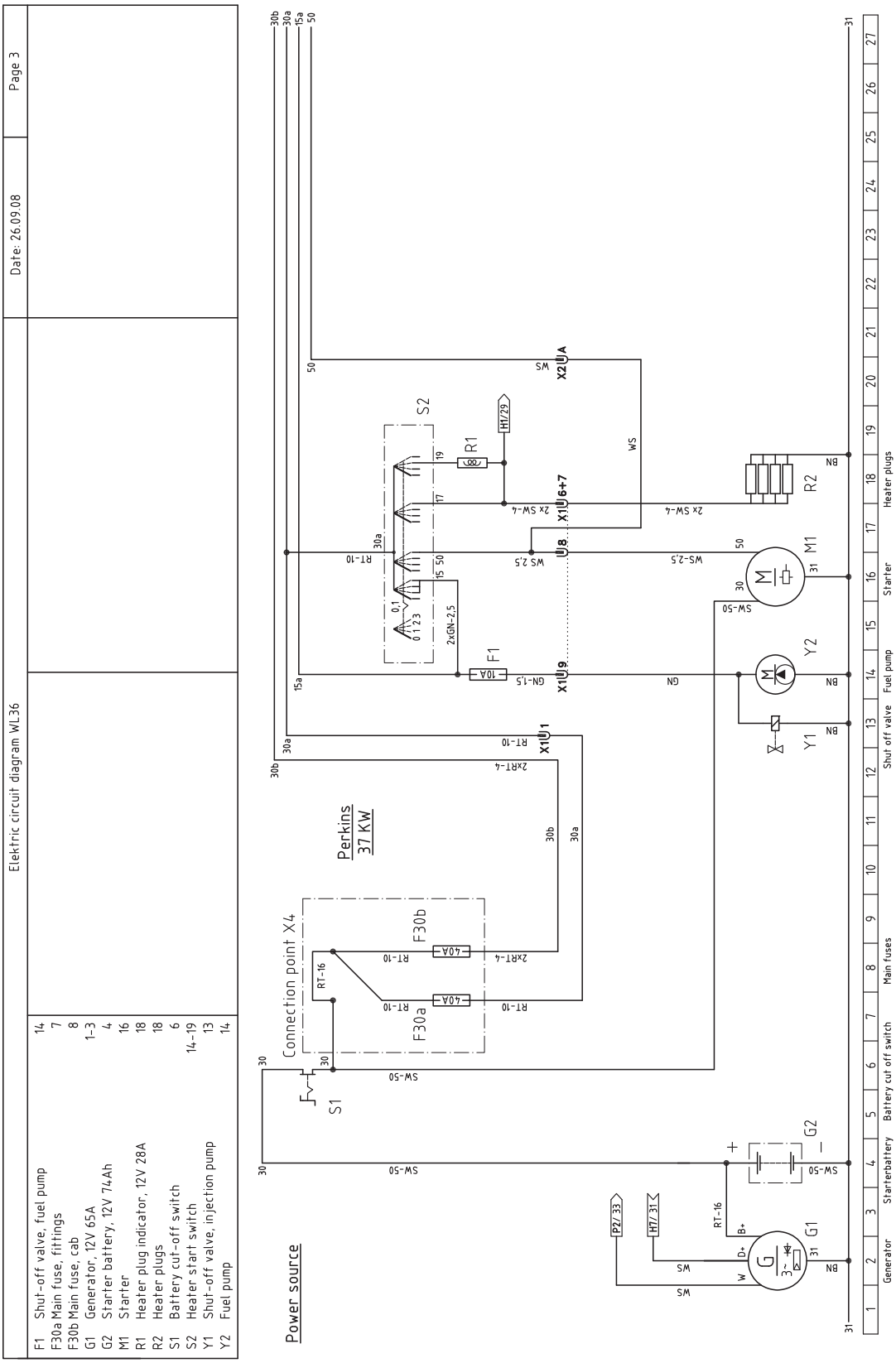
Component list Elektric circuit diagram WL 36,37,48,50,55,57

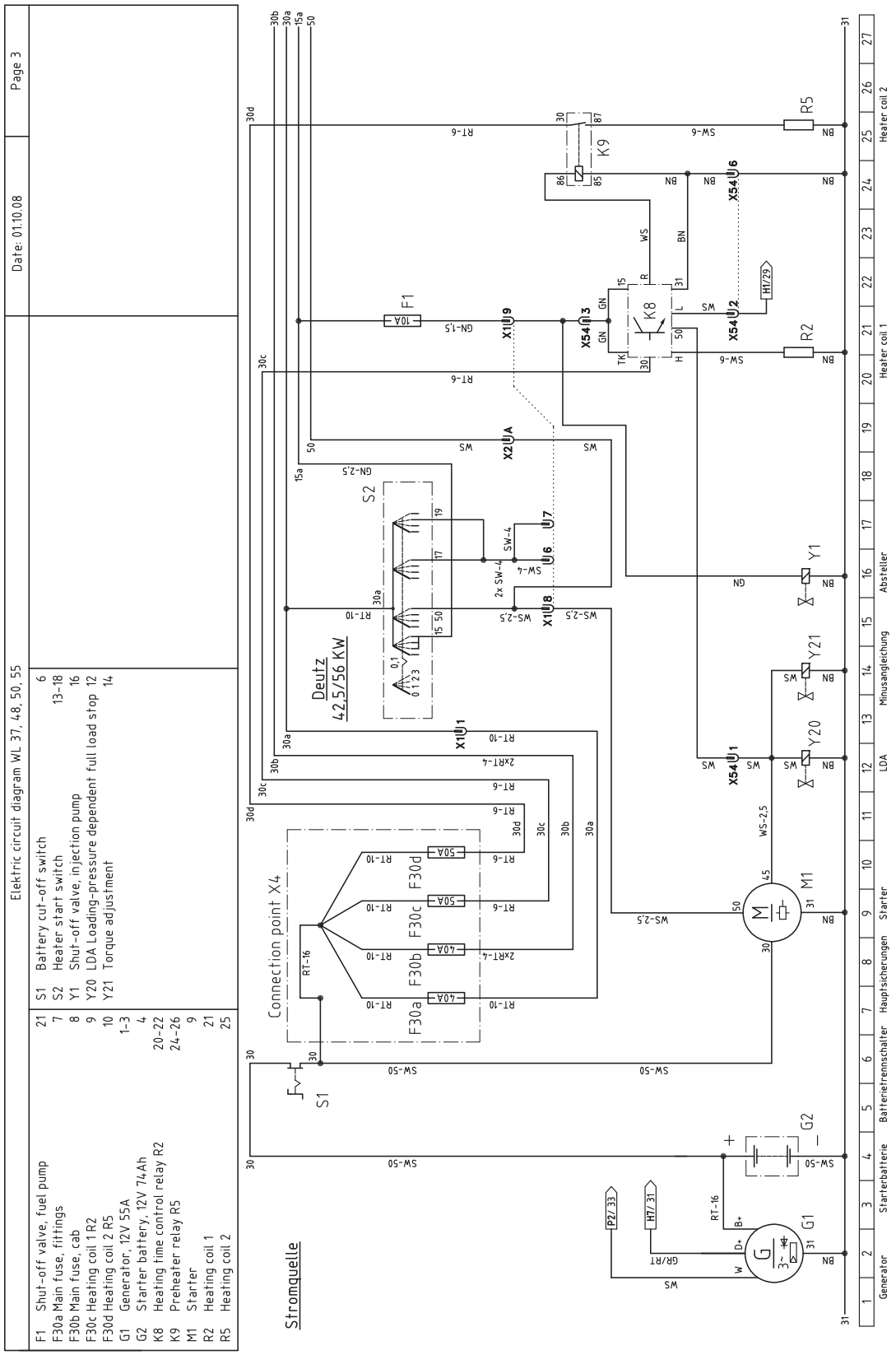
Date: 01.10.08 — P2

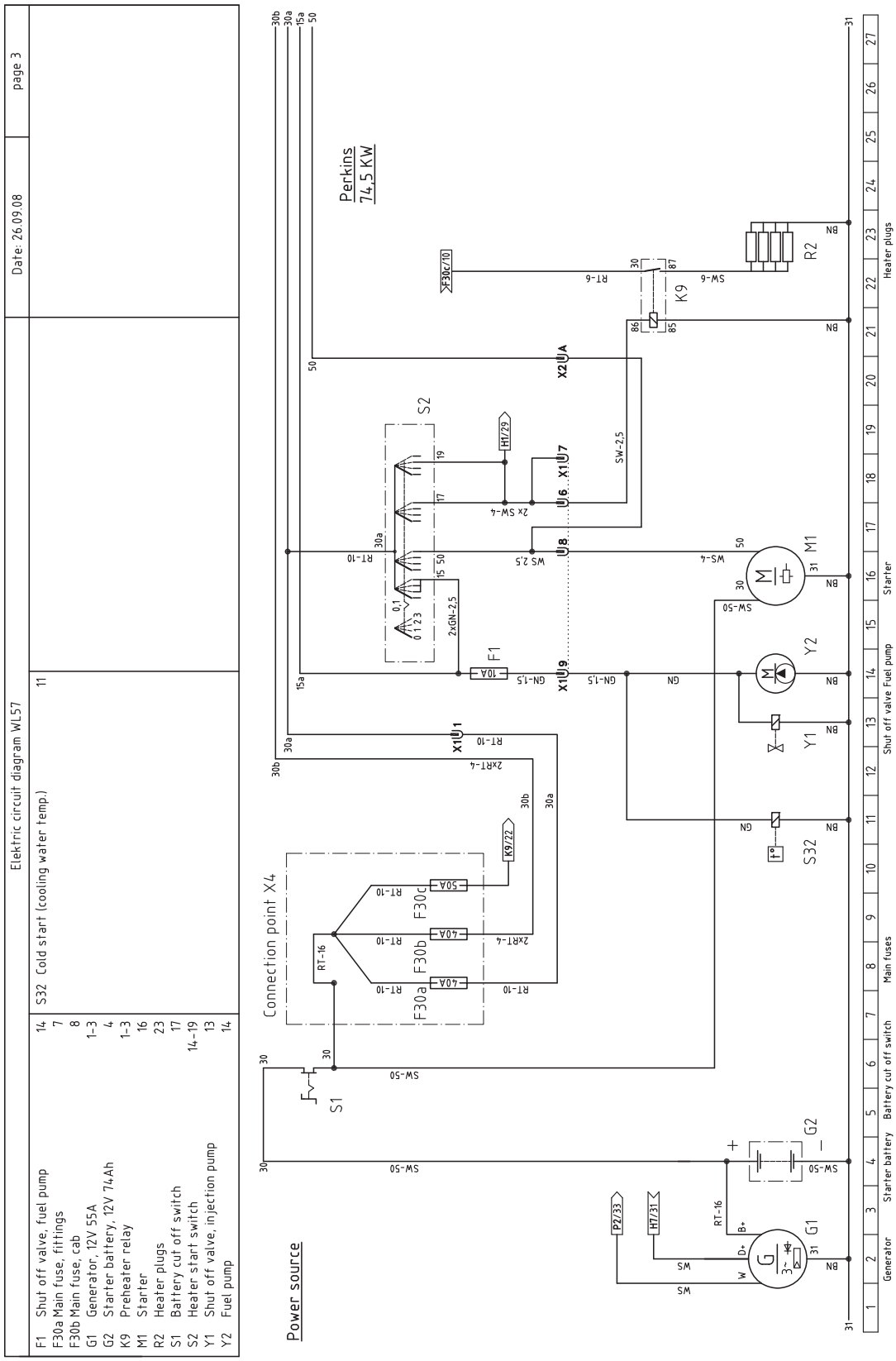
ID	Component	Path
S9	Seat bracket, pressure relief, hydroconnection	134-135
S11	Seat bracket, loading arm stop	133-166
S12	Seat bracket, electrical connection	131-132
S15	Cab roof, Front headlights	138
S16	Cab roof, Rear work lights	141
S17	Cab roof, Rear windscreen wiper/washer	146-148
S18	Cab roof, Heated rear window	144
S19	Cab roof, Rotating beacon	151
S21	Parking brake, handbrake	48
S22	Driving brake, footbrake	107
S23	Cooling water / engine oil temperature	36
S24	Engin oil pressure	34
S25	Fuel reserve	39
S26	Air filter, positiv pressure	46
S27	Hydraulic oil filter, positive pressure	44
S28	Air conditioner temperature	63
S29	Hydraulic oil temperature	37
S30	Coolant pressure, air conditioner	63
S32	Cold start (cooling water temp.)	11
S41	Taster	174
S42	Steuerventil	127
S43	Schrittrelais	173-175

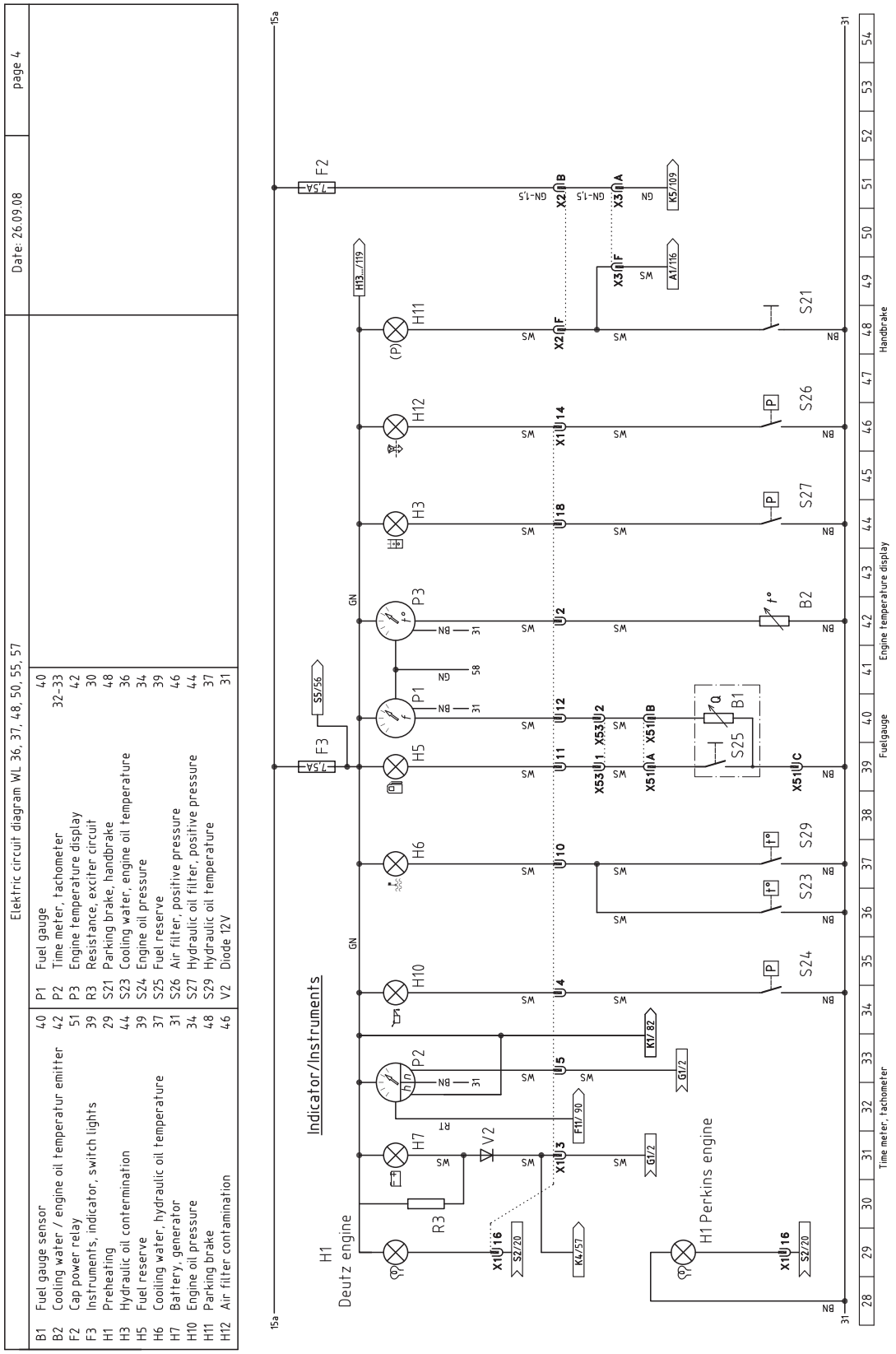
ID	Component	Path
	Diode	
V1	Freewheeling diode heater fan 12V	58
V2	Diode 12V	31
	Aerial	
W1	Radio aerial	154
	Socket	
X1	Socket, cigarette lighter, 12V 5A	159-161
X2	3 pole plug, 12V, max 5 amps	131-132
	Solenoid valve/pump	
Y1	Shut off valve, injection pump	16/13
Y2	Fuel pump	14
Y3	Forward gear	124
Y4	Reverse gear	125
Y5	Overdrive	120
Y6	Dirive direction detector	122
Y7	Locking differential	130
Y8	Pressure relief	135
Y9	Loading arm stop	133
Y13	By-pass lowering brake valves	168
Y14	By-pass lowering brake valves	170

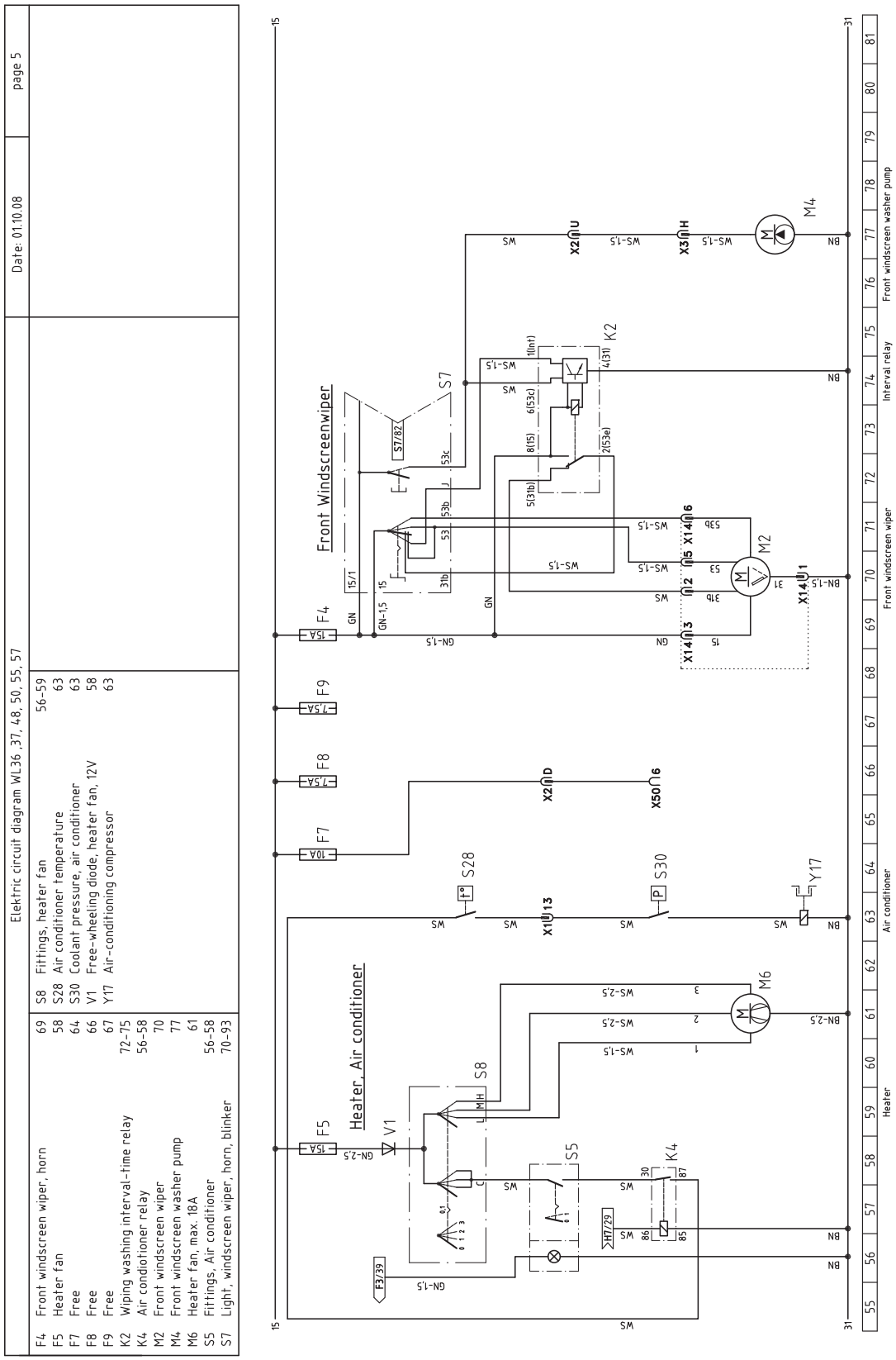
ID	Component	Path


Elektric circuit diagram WL36
Date: 26.09.08
Page 3
F1 Shut-off valve, fuel pump 14
F30a Main fuse, fittings 7
F30b Main fuse, cab 8
G1 Generator, 12V 65A 1-3
G2 Starter battery, 12V 74Ah 4
M1 Starter 16
R1 Heater plug indicator, 12V 28A 18
R2 Heater plugs 18
S1 Battery cut-off switch 6
S2 Heater start switch 14-19
Y1 Shut-off valve, injection pump 13
Y2 Fuel pump 14
Power source
Perkins 37 KW
Connection point X4
Generator
Starterbattery
Battery cut off switch
Main fuses
Shut off valve
Fuel pump
Starter
Heater plugs


Elektric circuit diagram WL 37, 48, 50, 55
Date: 01.10.08
Page 3
F1 Shut-off valve, fuel pump 21
F30a Main fuse, fittings 7
F30b Main fuse, cab 8
F30c Heating coil 1 R2 9
F30d Heating coil 2 R5 10
G1 Generator, 12V 55A 1-3
G2 Starter battery, 12V 74Ah 4
K8 Heating time control relay R2 20-22
K9 Preheater relay R5 24-26
M1 Starter 9
R2 Heating coil 1 21
R5 Heating coil 2 25
S1 Battery cut-off switch 6
S2 Heater start switch 13-18
Y1 Shut-off valve, injection pump 16
Y20 LDA Loading-pressure dependent full load stop 12
Y21 Torque adjustment 14
Stromquelle
Deutz 42,5/56 KW
Connection point X4
Generator
Starterbatterie
Batterietrennschalter
Hauptsicherungen
Starter
LDA
Minusangleichung
Absteller
Heater coil 1
Heater coil 2


Elektric circuit diagram WL57
Date: 26.09.08
page 3
F1 Shut off valve, fuel pump 14
F30a Main fuse, fittings 7
F30b Main fuse, cab 8
G1 Generator, 12V 55A 1-3
G2 Starter battery, 12V 74Ah 4
K9 Preheater relay 1-3
M1 Starter 16
R2 Heater plugs 23
S1 Battery cut off switch 17
S2 Heater start switch 14-19
Y1 Shut off valve, injection pump 13
Y2 Fuel pump 14
S32 Cold start (cooling water temp.) 11
Perkins 74,5 KW
Power source
Connection point X4
Generator
Starter battery
Battery cut off switch
Main fuses
Shut off valve Fuel pump
Starter
Heater plugs


Elektric circuit diagram WL 36, 37, 48, 50, 55, 57
Date: 26.09.08
page 4
B1 Fuel gauge sensor 40
B2 Cooling water / engine oil temperatur emitter 42
F2 Cap power relay 51
F3 Instruments, indicator, switch lights 39
H1 Preheating 29
H3 Hydraulic oil contermination 44
H5 Fuel reserve 39
H6 Cooling water, hydraulic oil temperature 37
H7 Battery, generator 31
H10 Engine oil pressure 34
H11 Parking brake 48
H12 Air filter contamination 46
P1 Fuel gauge 40
P2 Time meter, tachometer 32-33
P3 Engine temperature display 42
R3 Resistance, exciter circuit 30
S21 Parking brake, handbrake 48
S23 Cooling water, engine oil temperature 36
S24 Engine oil pressure 34
S25 Fuel reserve 39
S26 Air filter, positive pressure 46
S27 Hydraulic oil filter, positive pressure 44
S29 Hydraulic oil temperature 37
V2 Diode 12V 31
Indicator/Instruments
H1 Deutz engine
H1 Perkins engine
Time meter, tachometer
Fuelgauge
Engine temperature display
Handbrake


Elektric circuit diagram WL36 ,37, 48, 50, 55, 57
Date: 01.10.08
page 5
F4 Front windscreen wiper, horn 69
F5 Heater fan 58
F7 Free 64
F8 Free 66
F9 Free 67
K2 Wiping washing interval-time relay 72-75
K4 Air condiotioner relay 56-58
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S30
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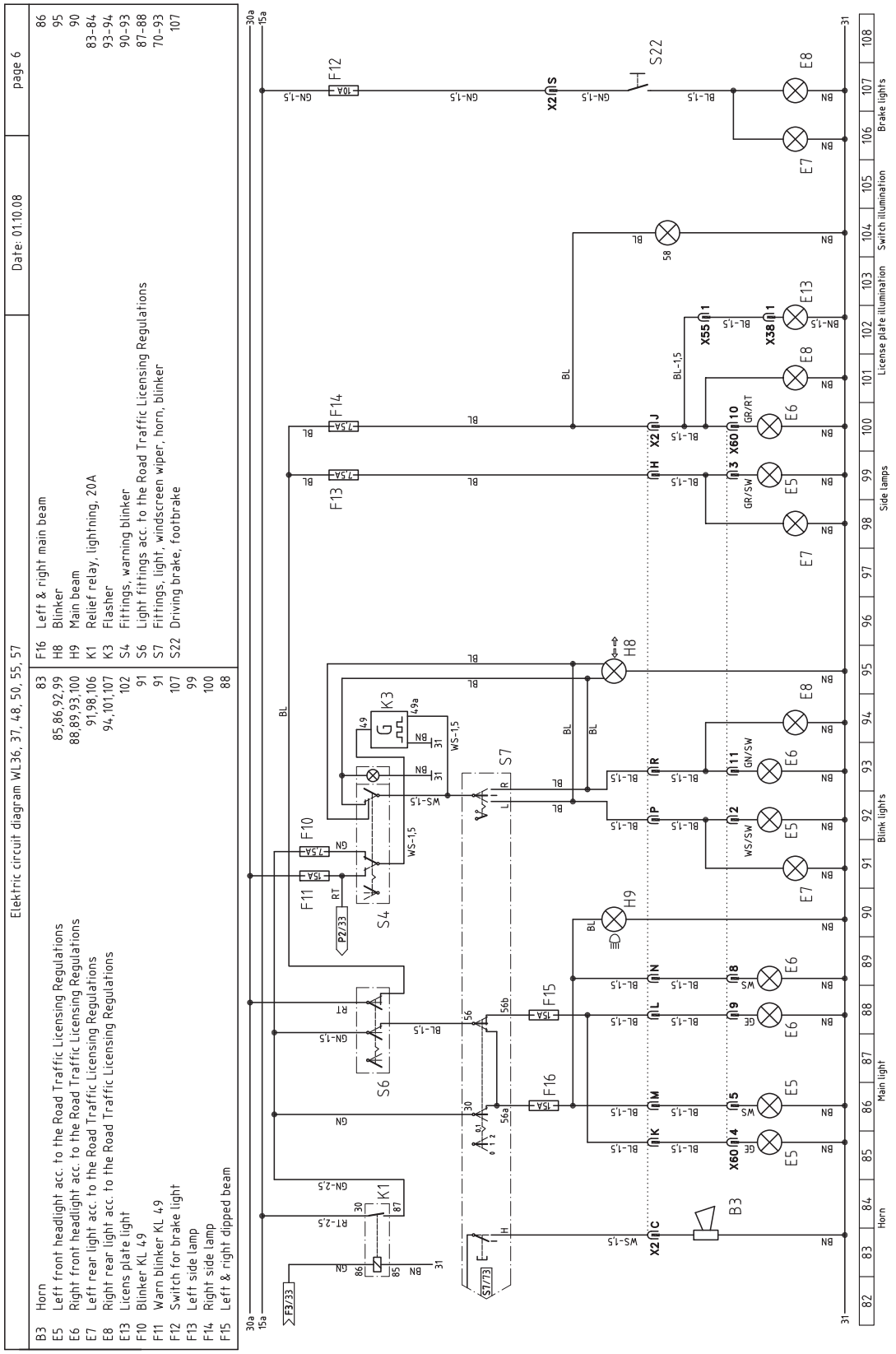
K2
M2
M4
M6
Y17
Front windscreen wiper
Interval relay
Front windscreen washer pump
Air conditioner
Heater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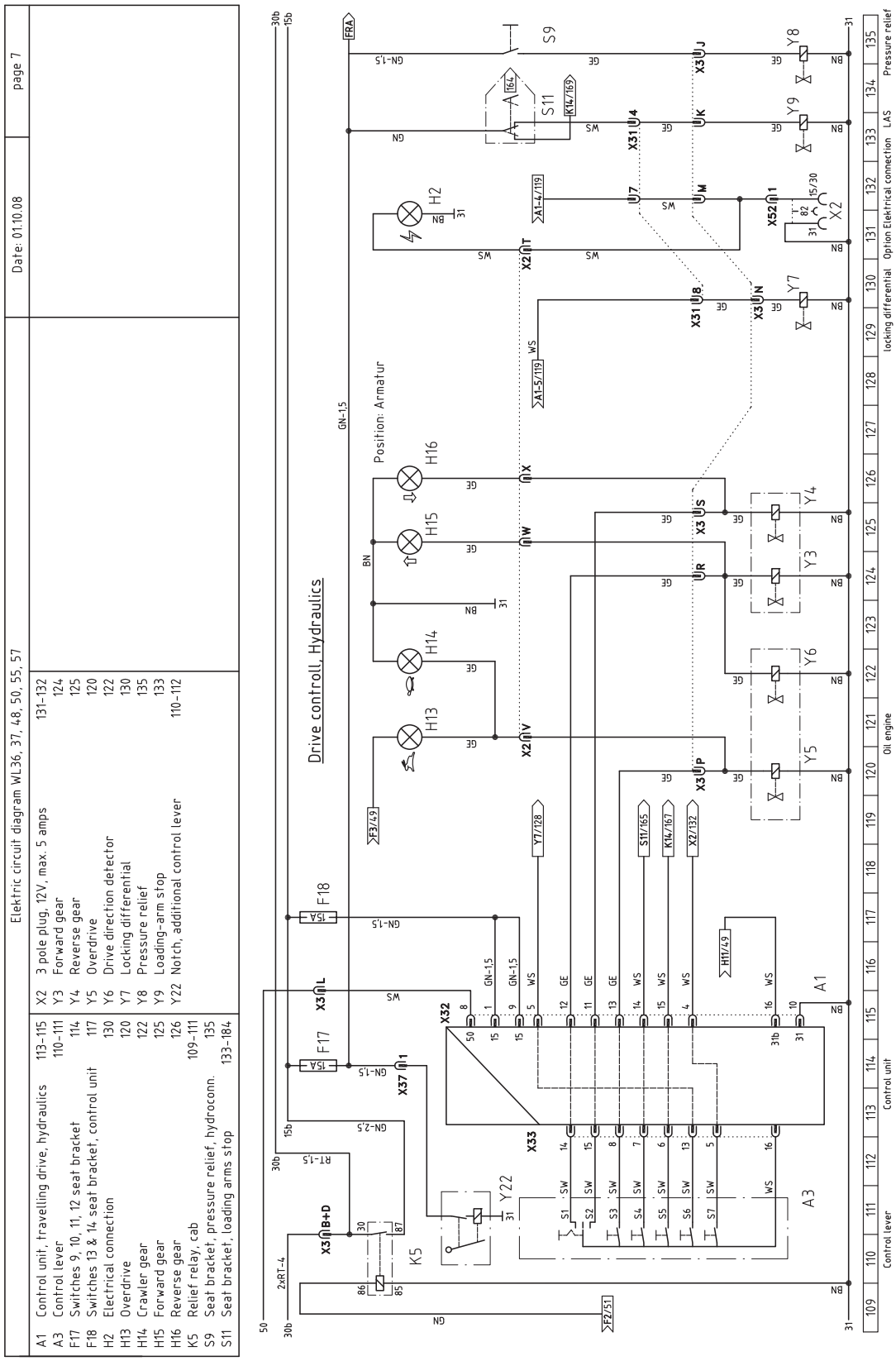
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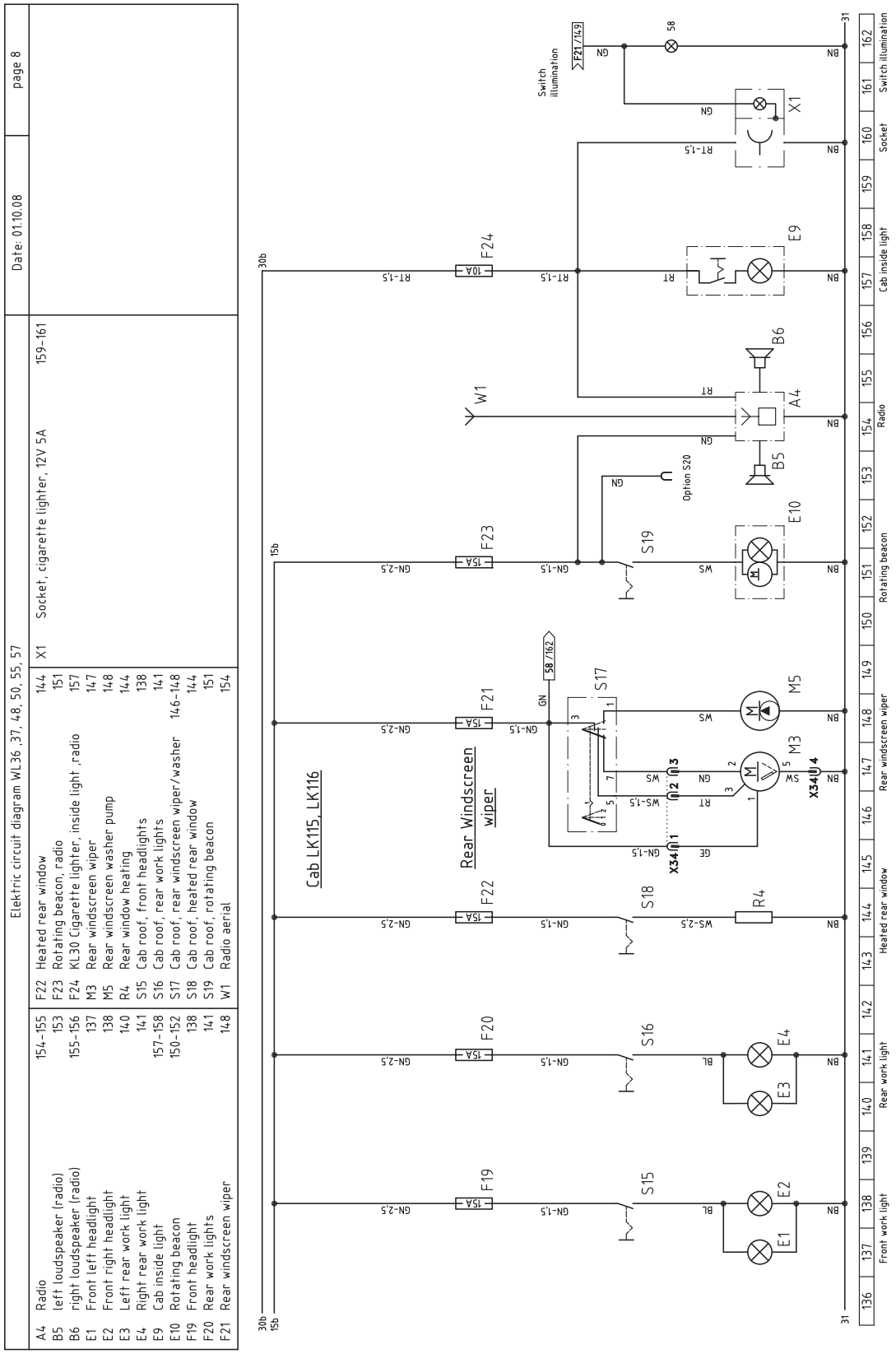
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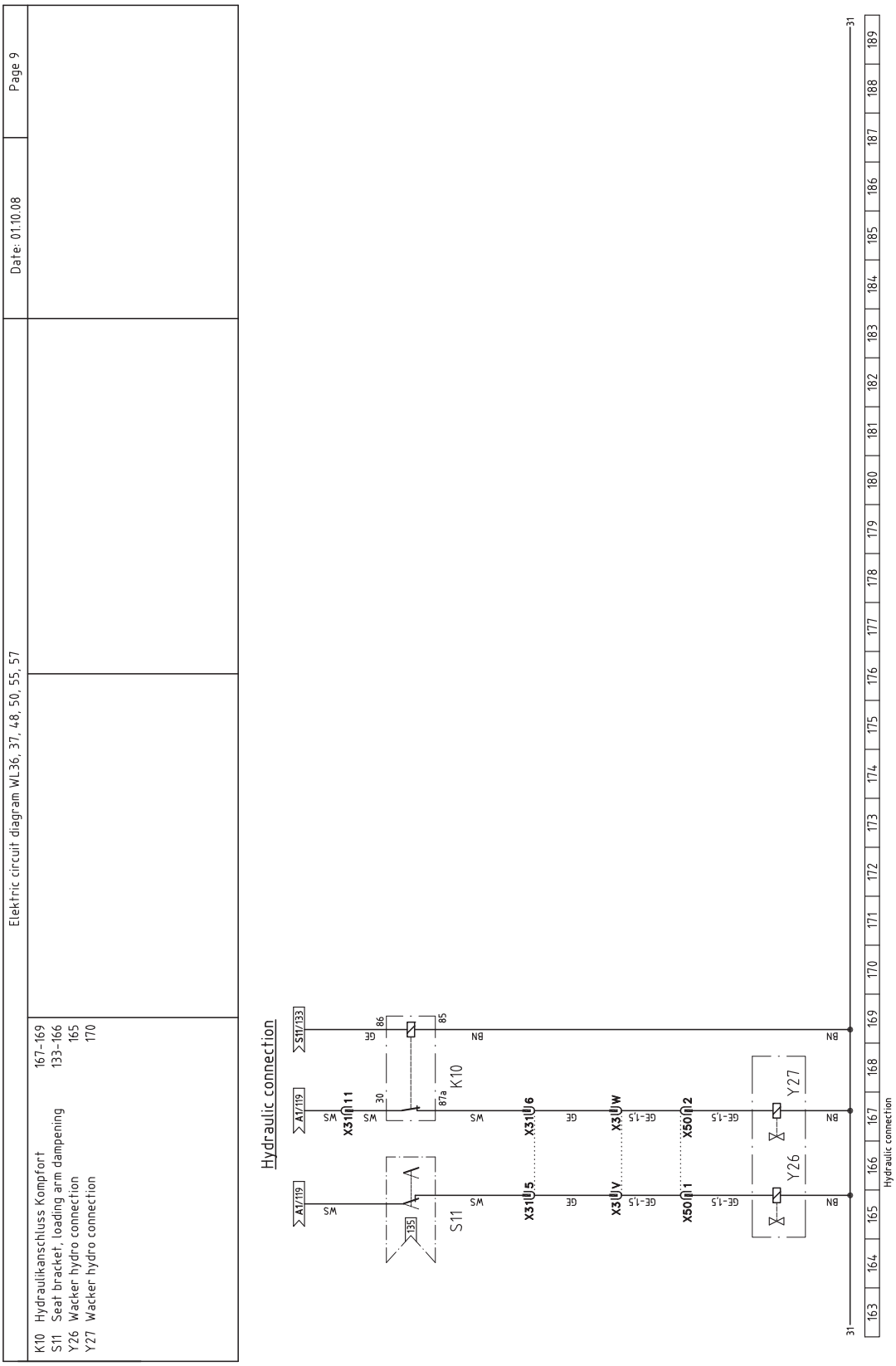
Socket
Switch illumination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Hydraulic connection

This chapter contains detailed information about the loader's electrical system.

Plug assignment

Plug connectors connect electrical cables to each other or to permanently installed electrical components (e.g. temperature sensors).

The plug assignments are listed in tables.

The contacts are shown from the cable side (Fig. 1).

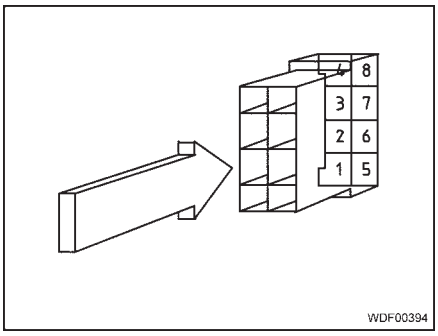


Fig. 1 Depiction of the contacts

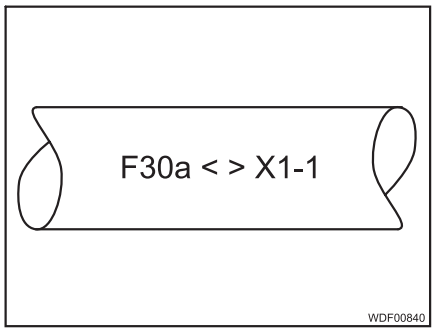


Fig. 2 Print (example)

Contact assignment

The contact assignments of electrical components (e.g. of the control unit) are shown in tables.

Printing

The wires of the wiring harnesses are printed (Fig. 2). The imprint names the originating and target connection of the wire. The example (Fig. 2) shows a wire that leads from the main fuse F30a to the connector X1, contact 1. If multiple originating or target connections are possible, only one of the options is printed.

3.1 Plug assignments

The plug connectors are divided into five groups:

- Main plug connections fitting & cab
- Plug connections instrument steering column
- Plug connections - cab
- Plug connections - machine
- Plug connections - lighting

Main plug connections fitting & cab

The following plug connections are main plug connections fitting & cab:

No.	Designation
X1	Fitting - engine
X2	Fitting - machine
X3	Cab & console

Instrument steering column

The following plug connectors are part of the plug connections for the instrument steering column:

No.	Designation
X10	Option
X11	Instrument panel (XA1)
X12	Instrument panel (XA2)

No.	Designation
X13	Steering column switch
X14	Windshield wiper, front
X15	Display and sensor (where applicable)

Cab The following plug connectors are part of the plug connections for the cab:

No.	Designation
X31	Switch & control unit
X32	Control unit
X33	Multi-function lever
X34	Windshield wiper, rear
X35	Radio
X36	Radio (loudspeaker)
X37	Additional control lever

Machine The following plug connectors are part of the plug connections for the machine:

No.	Designation
X50	Operation of solenoid valves (where applicable)
X51	Fuel tank
X52	Option
X53	Fuel tank gauge
X54	Pre-heating system

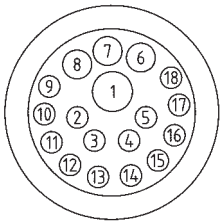
Lighting The following plug connectors are part of the plug connectors for lighting:

No.	Designation
X55	License plate illumination
X60	Lighting

3.1.1 Main plug connections fitting & cab

All main plug connections are located on the underside of the cab.

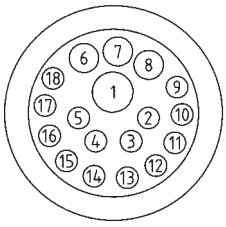
The assignment of the pin contacts (P) and the assignment of the socket contacts (S) are listed separately.



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

X1

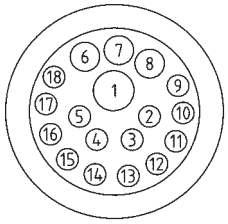
P	Color	Ø [mm²]	Designation
1	RD	10	S2 Preheater starting switch, terminal 30
2	WH	1	P3 Instrument engine temperature
3	WH	1	Relay K4-86 H7 Indicator lamp, generator
4	WH	1	H10 Indicator lamp, engine oil pressure
5	WH	1	P2 Rev counter
6	BK	4	S2 Preheater starting switch, terminal 17
7	BK	4	S2 Preheater 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

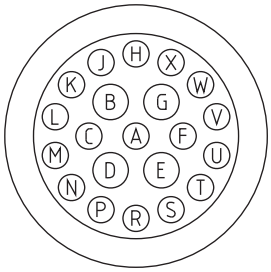
X1

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



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

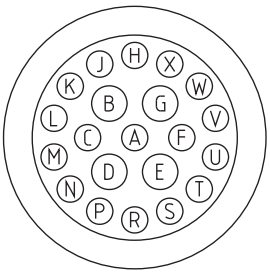
S	Color	Ø [mm²]	Designation
6	BK	4	R2 Glow plugs (Perkins diesel engine only) K9-86 Relay (Perkins turbo-diesel engine only)
7	BK	4	R2 Glow plugs (Perkins diesel engine only)
8	WH	2.5	M1 Starter terminal 50
9	GN	1.5	Y1 Shut-off Y2 Fuel pump (Perkins only) X54-3 15 Pre-heating system S32 Switch (Perkins turbo-diesel engine only)
10	WH	1	S23 Switch for coolant temperature S29 Switch for hydraulic oil temperature
11	WH	1	S25 Fuel level sensor, fuel reserve switch
12	WH	1	B1 Fuel level sensor, fuel supply
13	WH	1	Y17 Compressor coupling - air-conditioning unit
14	WH	1	S26 Switch air filter overpressure
15	WH	1	X54-4 Option
16	WH	1.5	Relay K8-L (Deutz only)
17	WH	1.5	Option
18	WH	1	S27 Switch hydraulic oil filter overpressure



Deutsch 21-pole
Art. No. HDP 24-24-21-PE

X2

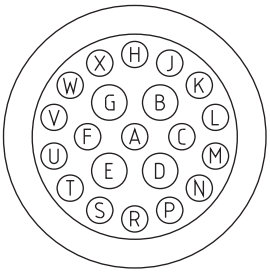
P	Color	Ø [mm²]	Designation
A	WH	1	A1 Control unit
B	GN	1.5	K5 Line relay seat console
C	WH	1	B3 Horn
D	GN	1.5	Option
E	WH	1.5	Headlight, front
F	WH	1	S21 Switch, parking brake contact 4
G	WH	1.5	K10-87a Relay load arm locking system Y11 Solenoid valve (where applicable)



Deutsch 21-pole
Art. No. HDP 24-24-21-PE

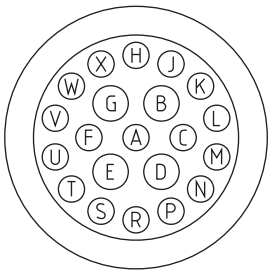
P	Color	Ø [mm²]	Designation
H	BL	1.5	E5 Sidelight, left front E7 Sidelight, left rear
J	BL	1.5	E6 Sidelight, right front E8 Sidelight, right rear E13 License plate lamp
K	BL	1.5	E5 Dipped beam, left
L	BL	1.5	E6 Dipped beam, right
M	BL	1.5	E5 Main beam, left
N	BL	1.5	E6 Main beam, right
P	BL	1.5	E5, E7 Indicator, left
R	BL	1.5	E6, E8 Indicator, right
S	GN	1.5	S22 Switch service brake
T	WH	1	A1 Control unit electrical connection 1
U	WH	1	M4 Windshield washer pump front
V	YE	1	A1 Control unit overdrive
W	YE	1	A1 Control unit, forwards driving
X	YE	1	A1 Control unit, reversing

X2



Deutsch 21-pole
Art. No. HDP 26-24-21-SE

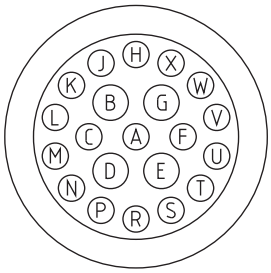
S	Color	Ø [mm²]	Designation
A	WH	1	S1 Preheater starting switch terminal 50
B	GN	1.5	F2 Fuse
C	WH	1	S7 Horn button
D	GN	1.5	F7 Fuse
E	WH	1.5	Option
F	WH	1	H11 Indicator lamp, parking brake
G	WH	1.5	Option
H	BL	1.5	F13 Fuse sidelight left



Deutsch 21-pole
Art. No. HDP 26-24-21-SE

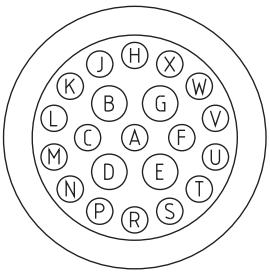
S	Color	Ø [mm²]	Designation
J	BL	1.5	F14 Fuse sidelight right
K	BL	1.5	F15 Fuse dipped beam left
L	BL	1.5	F15 Fuse dipped beam right
M	BL	1.5	F16 Fuse main beam left
N	BL	1.5	F16 Fuse main beam right
P	BL	1.5	S7 Steering column switch terminal L
R	BL	1.5	S7 Steering column switch terminal R
S	GN	1.5	F12 Fuse service brake
T	WH	1	H2 Indicator lamp, electrical connection 1
U	WH	1	S7 Button windshield washer pump front
V	YE	1	H13 Indicator lamp, overdrive H14 Indicator lamp, crawling
W	YE	1	H15 Indicator lamp, forwards driving
X	YE	1	H16 Indicator lamp, reversing

X3



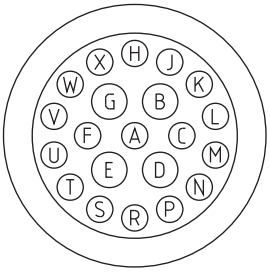
Deutsch 21-pole
Art. No. HDP 26-24-21-PE

P	Color	Ø [mm²]	Designation
A	GN	1	K5 Power relay terminal 86
B	RD	4	K5 Power relay terminal 30 & F8 fuse
C	WH	1	K7 Relay (where applicable) terminal 85
D	RD	4	K5 Power relay terminal 30
E	BL	1.5	K6 Relay - Backup light terminal 87
F	WH	1	A1 Control unit contact 16
G	YE	1.5	X31.2 Plug connector, contact 3
H	WH	1	M4 Windshield washer pump, front windshield
J	YE	1	S9 Switch pressure release, button, contact 3
K	YE	1	S11 Switch load arm locking system, contact 7
L	WH	1	A1 Control unit contact 8



Deutsch 21-pole
Art. No. HDP 26-24-21-PE

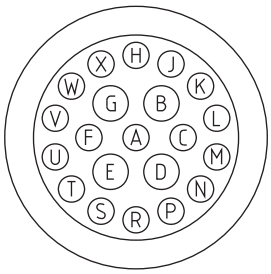
P	Color	Ø [mm²]	Designation
M	WH	1.5	A1 Control unit contact 4
N	YE	1	A1 Control unit contact 5
P	YE	1	A1 Control unit contact 13
R	YE	1	A1 Control unit contact 12
S	YE	1	A1 Control unit contact 11
T	YE	1	S10 Switch float control contact 1
U	YE	1.5	S10 Switch float control contact 2
V	YE	1.5	A1 Control unit contact 14 via S11 load arm locking system contact 8
W	YE	1.5	K10-87a Relay load arm locking system
X	YE	1	K7 Relay (where applicable) terminal 87



Deutsch 21-pole
Art. No. HDP 26-24-21-SE

X3

S	Color	Ø [mm²]	Designation
A	GN	1	F2 Fuse fitting
B	RD	4	F30b Main fuse cab
C	WH	1	S31 Switch (where applicable)
D	RD	4	F30b Main fuse cab
E	BL	1.5	E7, E8 Backup light left, right H17 Audible reverse warning device
F	WH	1	H11 Indicator lamp, parking brake S21 Parking brake
G	YE	1.5	X50-5 Y18 Changeover valve X52-4 Y18 Changeover valve
H	WH	1	S7 Fitting steering column switch washer pump front
J	YE	1	Y8 Solenoid valve pressure release
K	YE	1	Y9 Load arm locking system
L	WH	1	S2 Fitting preheater starting switch terminal 50



Deutsch 21-pole
Art. No. HDP 26-24-21-SE

S	Color	Ø [mm²]	Designation
M	WH	1.5	X52-1 X2 Socket electrical connection 1 H2 Fitting indicator lamp electrical connection 1
N	YE	1	Y7 Solenoid valve differential lock
P	YE	1	Y5 Solenoid valve overdrive H13, H14 Fitting indicator lamp Overdrive/crawling
R	YE	1	Y3 Solenoid valve forward gear Y6 Solenoid valve driving direction recognition H15 Fitting indicator lamp, forward gear
S	YE	1	Y4 Solenoid valve backup gear Y6 Solenoid valve driving direction recognition (optional) H16 Fitting Indicator lamp, backup gear
T	YE	1	Y12 Load arm damping
U	YE	1.5	Y13, 14, 15 Solenoid valve bypass load holding control valve
V	YE	1.5	Y10 Solenoid valve (where applicable) X52-5 Electrical connection 2 (optional)
W	YE	1.5	Y11 Solenoid valve (where applicable) X10.1-4 Option
X	YE	1	Y16 Solenoid valve (where applicable)

3.1.2 Plug connections instrument steering column

The plug connections are located in or on the instrument steering column.

The assignment of the pin contacts (P) and the assignment of the socket contacts (S) are listed separately.

JPT 6-pole
Art. No. on request

	P	Color	Ø [mm²]	Designation
X10	1	BK	1	H1 Indicator lamp, preheating (Perkins only)
	2	WH	1.5	H1 Indicator lamp, preheating (Deutz only)
	3	WH	1.5	Option
	4	WH	1.5	Option
	5	WH	1.5	H4 Optional indicator lamp minus
	6	WH	1	H4 Optional indicator lamp plus

X10

			JPT 6-pole Art. No. on request
S	**Color**	**Ø [mm²]**	**Designation**
1	BK	1	S2 Preheater starting switch terminal 19
2	WH	1.5	K8-L (Deutz only)
3	WH	1.5	Option X60 contact 6
4	WH	1.5	Option X50 contact 2 Option X31.2 contact 5
5	WH	1.5	Option X54 contact 5
6	WH	1	Option X54 contact 4

X11

			Molex XXX Art. No. on request
S	**Color**	**Ø [mm²]**	**Designation**
1	WH	1	H2 Indicator lamp, electrical connection
2	GN	1	H1, H3, H5, H6, H7 Plus
3	BL	1	Terminal 58 Backlighting
4	BN	1	GND H1, H2, H8 ground
5	-	-	GND
6	BL	1	H8 Indicator lamp, indicator left
7	BL	1	H8 Indicator lamp, indicator right
8	BK	1	H1 Preheat indicator lamp, plus and minus switchable
9	WH	1	H3 Indicator lamp hydraulic fluid clogging
10	WH	1	H4 Reserve minus
11	WH	1	H4 Reserve plus
12	WH	1	H5 Indicator lamp, fuel reserve
13	WH	1	H6 Indicator lamp, cooling water temperature/hydraulic oil temperature
14	WH	1	H7 Indicator lamp, battery

X12

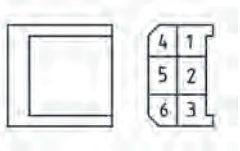
			Molex XXX Art. No. on request
S	**Color**	**Ø [mm²]**	**Designation**
1	WH	1	H10 Indicator lamp, engine oil pressure
2	BN	1	GND H9, H14, H15, H16 ground
3	-	-	GND
4	-	-	GND
5	WH	1	H13 Indicator lamp, forwards driving
6	BL	1	Terminal 58 Backlighting
7	BL	1	H9 Indicator lamp, main beam
8	WH	1	H11 Indicator lamp, parking brake
9	WH	1	H12 Indicator lamp, air filter clogging

			Molex XXX Art. No. on request
S	**Color**	**Ø [mm²]**	**Designation**
10	GN	1	H10, H11, H12, H13 Plus
11	WH	1	H13, H14 Indicator lamp, overdrive/crawling
12	WH	1	H16 Indicator lamp, reversing
13	-	-	Not assigned
14	-	-	Not assigned

X13

			AMP 15-pole Junior Power Timer 1-967 623-3 Art. No. on request
P	**Color**	**Ø [mm²]**	**Designation**
1	WH	1	S3 Hazard warning switch contact 5
2	GN	1.5	F4 Fuse
3	GN	1	F4 Fuse
4	BL	1.5	K1 Load-shedding relay lighting
5	GN	1	K1 Load-shedding relay lighting
6	BL	1.5	F16 Fuse
7	BL	1.5	F15 Fuse
8	WH	1.5	K2 Wipe/wash/interval relay
9	WH	1.5	M2 Windshield wiper front, level 2
10	WH	1.5	M2 Windshield wiper front, level 1
11	WH	1.5	K2 Wipe/wash/interval relay interval level
12	WH	1	M4 Windshield washer pump front K2 Wipe/wash/interval relay contact 6
13	WH	1.5	B3 horn
14	BL	1	E5, E7 Indicator, left
15	BL	1	E6, E8 Indicator, right

X14

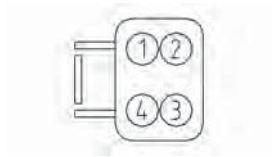


			Plug connector, 6-pole, push-on receptacle Art. No. 5359510061
P	**Color**	**Ø [mm²]**	**Designation**
1	BN	1.5	MP1 Grounding point fitting terminal 31
2	WH	1	K2 Interval relay, contact 5, terminal 31b
3	GN	1	K2 Interval relay, contact 8, terminal 15
4	-	-	Not assigned
5	WH	1.5	S7 Switch windshield wiper level 1 terminal 53
6	WH	1.5	S7 Switch windshield wiper level 2 terminal 53b

Deutsch 4-pole
Art. No. DT 04-04 Pxxx

X15

P	Color	Ø [mm²]	Designation
1	RD	1	Display (where applicable)
2	BN	1	Display (where applicable)
3	YE	1	Display (where applicable)
4	GN	1	Display (where applicable)



Deutsch 4-pole
Art. No. DT 06-04 Sxxx

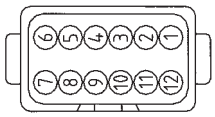
X15

S	Color	Ø [mm²]	Designation
1	GN	1	Ground terminal 31
2	BN	1	F6 Fuse
3	BN	1	Sensor (where applicable)
4	BL	1	Sensor (where applicable)

3.1.3 Plug connections - cab

The plug connections are located in the rear section of the cab.

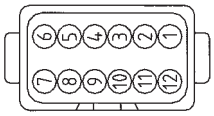
The assignment of the pin contacts (P) and the assignment of the socket contacts (S) are listed separately.



Deutsch 12-pole
Art. No. DT 04-12 P

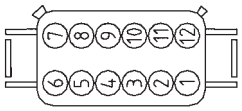
X31.2

P	Color	Ø [mm²]	Designation
1	WH	1	Y12 Load arm damping
2	WH	1	Y13, Y14, Y15 Solenoid valve bypass load holding control valves
3	YE	1	Y18 Changeover valve (option)
4	YE	1	Y9 Load arm locking system
5	WH	1	Y10 Solenoid valve (where applicable)
6	WH	1	Y11 Solenoid valve (where applicable)
7	WH	1	X2 Socket electrical connection 1 H2 Fitting indicator lamp electrical connection 1
8	YE	1	Y7 Solenoid valve differential lock
9	-	-	Not assigned



Deutsch 12-pole
Art. No. DT 04-12 P

P	Color	Ø [mm²]	Designation
10	-	-	Not assigned
11	WH	1	Relay K10 (previously K8), contact 30
12	-	-	Not assigned

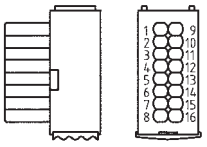


Deutsch 12-pole
Art. No. DT 06-12 S

X31.1

S	Color	Ø [mm²]	Designation
1	YE	1	S10 Switch float control contact 1
2	YE	1	S10 Switch float control contact 2
3	(WH) [1]	1	(A1 Control unit contact 15) [1] (A1 Control unit contact 4) [1]
4	YE	1	S11 Switch load arm locking system, contact 7
5	WH	1	A1 Control unit contact 14 via S11-8
6	YE	1	Relay K10 (previously K8), contact 87a
7	WH	1.5	A1 Control unit contact 4 (S12 Switch electrical connection contact 5) [1]
8	WH	1	A1 Control unit contact 5
9	WH	1.5	S12 Switch option
10	(WH) [1]	1	(A1 Control unit contact 4) [1]
11	WH	1	A1 Control unit contact 15
12	-	-	Not assigned

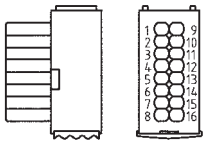
[1] Variances if equipped with hydro connection comfort (optional).



Rack, 16-pin
Art. No. 5931632171

X32

S	Color	Ø [mm²]	Designation
1	GN	1.5	Fuse F18
2	-	-	Not assigned
3	-	-	Not assigned
4	WH	1	X2 Socket electrical connection 1 H2 Fitting indicator lamp electrical connection 1 (Y18 changeover valve) [1]

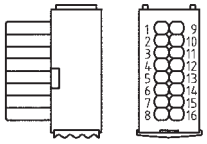


Rack, 16-pin
Art. No. 5931632171

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

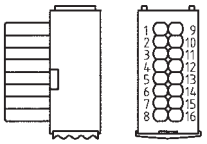
[1)] Variances if equipped with hydro connection comfort (optional).

X33



Rack, 16-pin
Art. No. 5931632171

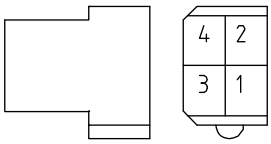
S	Color	Ø [mm²]	Designation
1	-	-	Not assigned
2	-	-	Not assigned
3	-	-	Not assigned
4	-	-	Not assigned
5	BK	1	Electrical connection or changeover valve
6	BK	1	Y11 Solenoid valve (where applicable) (electrical connection or changeover valve) [1)]
7	BK	1	Y10 Solenoid valve (where applicable) (differential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



Rack, 16-pin
Art. No. 5931632171

S	Color	Ø [mm²]	Designation
11	-	-	Not assigned
12	-	-	Not assigned
13	BK	1	Electrical connection or differential lock
14	BK	1	Control unit, forwards
15	BK	1	Control unit reverse
16	BK	1	Control unit

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



Rack, 4-pin
Art. No. on request

X34

S	Color	Ø [mm²]	Designation
1	GN	1	Fuse F21
2	WH	1	S17 Switch windshield wiper back, contact 5
3	WH	1	S17 Switch windshield wiper back, contact 7
4	BN	1	31 Ground

Rack, 8-pin (brown)
Art. No. 963121-1

X35

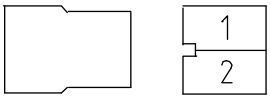
S	Color	Ø [mm²]	Designation
1	-	-	Not assigned
2	-	-	Not assigned
3	-	-	Not assigned
4	RD	1	Fuse F24 30
5	-	-	Not assigned
6	-	-	Not assigned
7	GN	1	Fuse F23 15
8	BN	-	31 Ground

Rack, 8-pin (gray)
Art. No. 963120-1

X36

S	Color	Ø [mm²]	Designation
1	-	-	Not assigned
2	-	-	Not assigned
3	BK	1	Plus loudspeaker left

			Rack, 8-pin (gray) Art. No. 963120-1
S	**Color**	**Ø [mm²]**	**Designation**
4	RD/BK	1	Minus loudspeaker left
5	BK	1	Plus loudspeaker right
6	RD/BK	1	Minus loudspeaker right



Rack, 2-pin
Art. No. on request

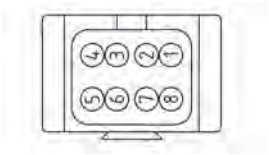
X37

S	**Color**	**Ø [mm²]**	**Designation**
1	GN	1	15 Additional control lever
2	BN	1	31 Additional control lever

3.1.4 Plug connections - machine

The following plug connections are located on the front carriage or on the rear carriage.

The assignment of the pin contacts (P) and the assignment of the socket contacts (S) are listed separately.

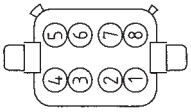


Deutsch 8-pole
Art. No. DT 04-08 Pxxx

X50

P	**Color**	**Ø [mm²]**	**Designation**
1	YE	1	Y10 Solenoid valve (where applicable) (Y26 solenoid valve) [1)]
2	YE	1	Y11 Solenoid valve (where applicable) (Y27 Solenoid valve) [1)]
3	YE	1	Y16 Solenoid valve (where applicable)
4	YE	1	Y12 Load arm damping
5	YE	1.5	Y18 Optional changeover valve
6	-	-	Free
7	BN		31 Ground
8	-	-	Free

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

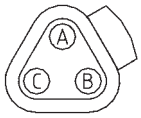


Deutsch 8-pole
Art. No. DT 06-08 Sxxx

X50

S	Color	Ø [mm²]	Designation
1	YE	1	Y15 Load holding control valve X31.2-5 via X3-V (Y26 Hydraulic connection comfort S11) [1]
2	YE	1	K10 previously K8, contact 87a X10-4 via X2-G (Y27 Hydraulic connection comfort K14) [1]
3	YE	1	R7 Relay (where applicable) KL87
4	YE	1	S10 Switch float control contact 1
5	YE	1.5	Y18 Changeover valve X31.2 Plug connector, contact 3
6	-	-	F7 Fuse
7	BN		Grounding point step plate
8	-	-	Grounding point step plate

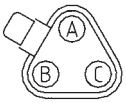
[1] Variances if equipped with hydro connection comfort (optional).



Deutsch 3-pole
Art. No. DT 04-03 Pxxx

X51

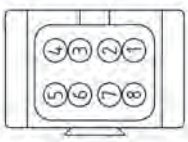
P	Color	Ø [mm²]	Designation
A	BK/GN	1	S25 Fuel level sensor, fuel reserve switch
B	OR	1	B1 Fuel level sensor, fuel supply
C	BK	1	Ground fuel level sensor



Deutsch 3-pole
Art. No. DT 06-03 Sxxx

X51

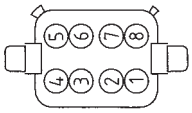
S	Color	Ø [mm²]	Designation
A	WH	1	H5 Indicator lamp, fuel reserve
B	WH	1	P1 Fuel tank gauge
C	BN	-	Grounding point step plate



Deutsch 8-pole
Art. No. DT 04-08 Pxxx

X52

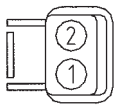
P	Color	Ø [mm²]	Designation
1	BL	1	X2 Socket electrical connection (option)
2	GR	1	Y15 Solenoid valve bypass load holding control valves
3	WH	1	Y13 & Y14 Solenoid valve bypass load holding control valves
4	YE/GN	1	Y18 Changeover valve (option)
5			Option
6	BK	1	S31 Switch (where applicable)
7	BN	1	Ground
8	BK	1	Ground



Deutsch 8-pole
Art. No. DT 06-08 Sxxx

X52

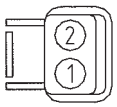
S	Color	Ø [mm²]	Designation
1	BL	1	A1 Control unit contact 4 H2 Indicator lamp electrical connection 1
2	GR	1	S10 Switch float control contact 2
3	WH	1	S10 Switch float control contact 2
4	YE/GN	1	Y18 Changeover valve X31.2 Plug connector, contact 3
5		1	A1 Control unit contact 14 Y10 Solenoid valve (where applicable)
6	BK	1	R7 Relay (where applicable) KL85
7	BN	1	Grounding point step plate
8	BK	1	Grounding point step plate



Deutsch 2-pole
Art. No. DT 04-02 Pxxx

X53

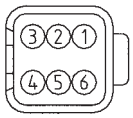
P	Color	Ø [mm²]	Designation
1	WH	1	H5 terminal Fuel reserve
2	WH	1	P1 Fuel tank gauge



Deutsch 2-pole
Art. No. DT 06-02 Sxxx

X53

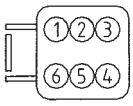
S	Color	Ø [mm²]	Designation
1	WH	1	S25 Fuel reserve
2	WH	1	B1 Fuel level sensor



Deutsch 6-pole
Art. No. DT 04-06 Pxxx

X54

P	Color	Ø [mm²]	Designation
1	WH	1	K8 Relay, contact 50
2	WH	1	K8 Relay, contact L
3	GN	1	K8 Relay, contact 15/TK
4	-	-	Not assigned
5	-	-	Not assigned
6	BN	1	Relay K8 contact 31 ground



Deutsch 6-pole
Art. No. DT 06-06 Sxxx

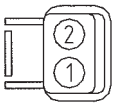
X54

S	Color	Ø [mm²]	Designation
1	WH	1	M1 Contact 45
2	WH	1	H1 Indicator lamp, pre-heating system
3	GN	1	F1 Fuse
4	WH	1	H4 Indicator lamp plus (**1**) option
5	WH	1	H4 Indicator lamp minus (**1**) option
6	BN	1	Ground

3.1.5 Plug connections - lighting

The following plug connections are located on the front carriage or on the rear carriage.

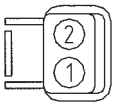
The assignment of the pin contacts (P) and the assignment of the socket contacts (S) are listed separately.



Deutsch 2-pole
Art. No. DT 04-02 Pxxx

X55

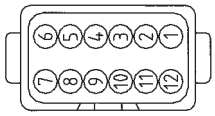
P	Color	Ø [mm²]	Designation
1	BL	1	E13-1 License plate lamp plus
2	BN	1	E13-2 License plate lamp ground



Deutsch 2-pole
Art. No. DT 06-02 Sxxx

X55

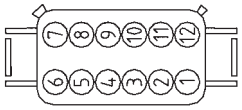
S	Color	Ø [mm²]	Designation
1	BL	1	F14 Fuse
2	BN	1	Grounding point 6



Deutsch 12-pole
Art. No. DT 04-12 Pxxx

X60

P	Color	Ø [mm²]	Designation
1	BN	1	E5 Headlamp left ground
2	BK/WH	1	E5 Headlamp left indicator
3	GR/BK	1	E5 Headlamp left parking light
4	YE	1	E5 Headlamp left dipped beam
5	WH	1	E5 Headlamp left main beam
6	-	-	Headlight front (optional)
7	-	-	Ground (optional)
8	WH	1	E6 Headlamp right main beam
9	YE	1	E6 Headlamp right dipped beam
10	GR/RD	1	E6 Headlamp right parking light
11	BK/GN	1	E6 Headlamp right indicator
12	BN	1	E6 Headlamp right ground



Deutsch 12-pole
Art. No. DT 06-12 Sxxx

X60

S	Color	Ø [mm²]	Designation
1	BN	1	MP6 Grounding point
2	BL	1	E7 Indicator S7 Steering column switch terminal L
3	BL	1	E7 Tail light S6 F13 Fuse sidelight left
4	BL	1	S7 F15 Fuse dipped beam left
5	BL	1	S7 F16 Fuse main beam left
6	WH	1	X10 Contact 3
7	BN	1	MP6 Grounding point
8	BL	1	S7 F16 Fuse main beam right
9	BL	1	S7 F15 Fuse dipped beam right
10	BL	1	E8 Tail light S6 F14 Fuse sidelight right E13 License plate illumination
11	BL	1	E8 Indicator S7 Steering column switch terminal R
12	BN	1	MP6 Grounding point

3.2 Contact assignments

The plug components are divided into two groups:

- Instrument steering column
- Cab

▷ The numbers in the tables below refer to the associated plug connectors that are inserted on the component.

Instrument steering column

The following components are part of the instrument steering column or are located in the immediate vicinity thereof:

No.	Designation
X13	Steering column switch
X14	Windshield wiper motor, front

Cab

The following components are located in the rear section of the cab:

No.	Designation
X32	Control unit
X33	Multi-function lever
X34	Windshield wiper motor, rear

No.	Designation
X35	Radio
X36	Radio
X37	Extra lever

3.2.1 Components of the instrument steering column

All of the following components are fitted in the instrument steering column or in the immediate vicinity thereof:

▷ The numbers in the tables below refer to the associated plug connectors that are inserted on the component.

▷ If no colors are defined, these may vary depending on the type.

X13

S	Color	Ø [mm²]	Designation
1	WH/BK	1	L/49a Indicator pulse
2	WH	1	15 Plus switch windshield wiper
3	GN/WH	1	15/1 Plus button horn & button automatic washer
4	GR	1	56 Plus dipped beam/main beam
5	GR/RD	1	30 Plus headlamp flasher
6	GN/BK	1	56a Switch, main beam
7	GR/BK	1	56b Switch, dipped beam
8	OR	1	31b Switch windshield wiper limit stop
9	BL	1	53b Switch windshield wiper level 2
10	GN	1	53 Switch windshield wiper level 1
11	RD	1	J Switch windshield wiper interval circuit
12	BK	1	53c Button windshield washers
13	VI	1	H Button horn
14	BL/BK	1	L Switch indicator left
15	BL (light)	1	R Switch indicator right

X14

1	BK	1	Ground terminal 31
2	GN	1	Terminal 31b
3	YE	1	Terminal 15
4	-	1	-
5	RD	1	Level 1, terminal 53
6	BL	1	Level 1, terminal 53b

3.2.2 Components of the cab

All of the following components are installed in the rear section of the cab.

Control unit, X32

P	Color	Ø [mm²]	Designation
1	GN	1.5	Power supply, control unit
2	-	-	Not assigned
3	-	-	Not assigned
4	WH	1	Output actuated by multi-function lever X33-5, S7
5	WH	1	Output actuated by multi-function lever X33-13, S6
6	-	-	Not assigned
7	-	-	Not assigned
8	WH	1	Signal input, starter
9	GN	1.5	Power supply, control unit
10	BN	1	Ground, control unit
11	YE	1	Output actuated by multi-function lever X33-15, S2
12	YE	1	Output actuated by multi-function lever X33-14, S1
13	YE	1	Output actuated by multi-function lever X33-8, S3
14	WH	1	Output actuated by multi-function lever X33-7, S4
15	WH	1	Output actuated by multi-function lever X33-6, S5
16	WH	1	Signal input drive interrupter

Multi-function lever

The following figures show the arrangement (Fig. 3) and function (Fig. 4) of the switching elements of the multi-function lever.

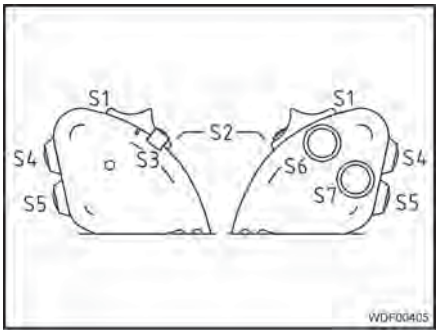


Fig. 3 Arrangement of the switching elements

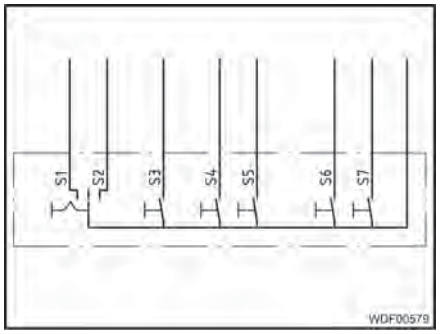


Fig. 4 Circuit diagram

	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

The loader consists of the vehicle frame, the drive and the axles. The vehicle frame houses all drive and control units in the loader's standard configuration. The vehicle frame consists of the front carriage with the lift frame and the rear carriage, which houses the drive unit. The front and rear carriages are connected by an articulated pendulum link.

Engine

A Diesel engine provides the necessary power. The Diesel engine drives both the variable displacement pump for the driving hydraulics, as well as the gear pump for the working and steering hydraulics.

The figure below shows the engine's control and output end (example).

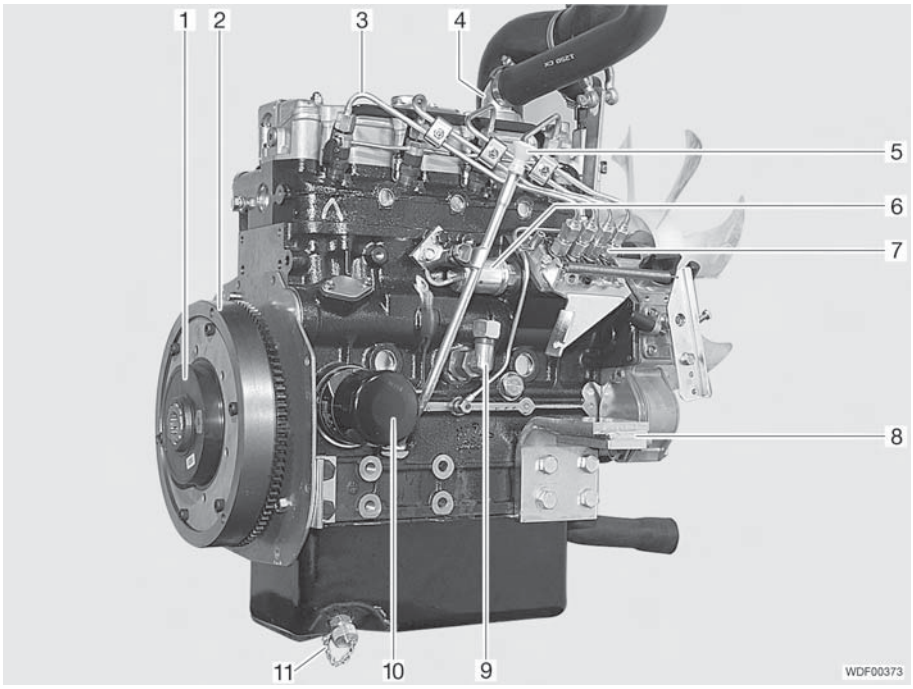


Fig. 5 Control and output end of the engine

1 Elastic clutch
2 Flywheel with starter ring gear
3 Injection line
4 Oil filler neck
5 Oil dipstick
6 Cutoff solenoid
7 Injection pump
8 Attachment flange
9 Heater connection
10 Oil filter
11 Oil drainage screw

The figure below shows the engine's exhaust and fan side (example).

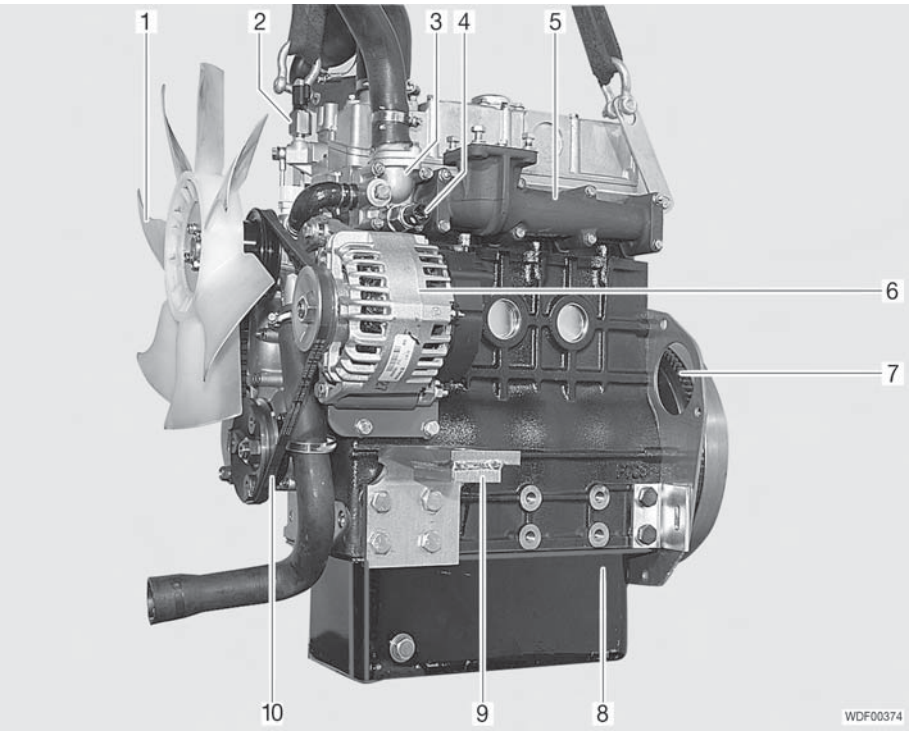


Fig. 6 Exhaust and fan side of the engine

1 Fan wheel
2 Oil pressure switch
3 Thermostat housing
4 Temperature sensor
5 Exhaust manifold
6 Generator
7 Installation opening for starter
8 Oil sump
9 Attachment flange
10 V-belt

Hydraulic systems

The loader has two hydraulic systems that are supplied from a hydraulic fluid tank:

- Hydrostatic drive
- Steering and working hydraulics

The hydrostatic drive consists of an axial piston variable displacement pump that drives an axial piston variable displacement motor. The axial piston variable displacement pump is mounted on the Diesel engine, and the axial piston variable displacement motor is mounted on the pto gear.

The figures below show the connections and adjustment devices of the variable displacement pump.

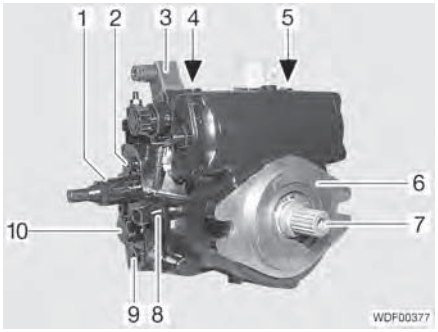


Fig. 7 Drive end of the variable displacement pump

1 Control valve
2 Measuring point, high pressure M_B
3 Solenoid valve connector
4 Measuring point, positioning pressure X_1
5 Measuring point, positioning pressure X_2
6 Attachment flange
7 Drive
8 Transposition
9 Measuring point, high pressure M_A
10 Supply pressure valve

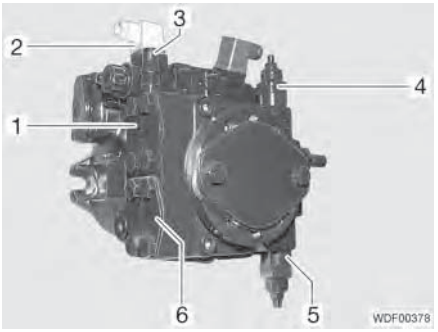


Fig. 8 Output end of the variable displacement pump

1 High-pressure connection B
2 Solenoid valve connector
3 Pressure cut-off
4 High-pressure valve (B)
5 High-pressure valve (A)
6 High pressure connection A

The figure below shows the configuration of the pressure cut-off.

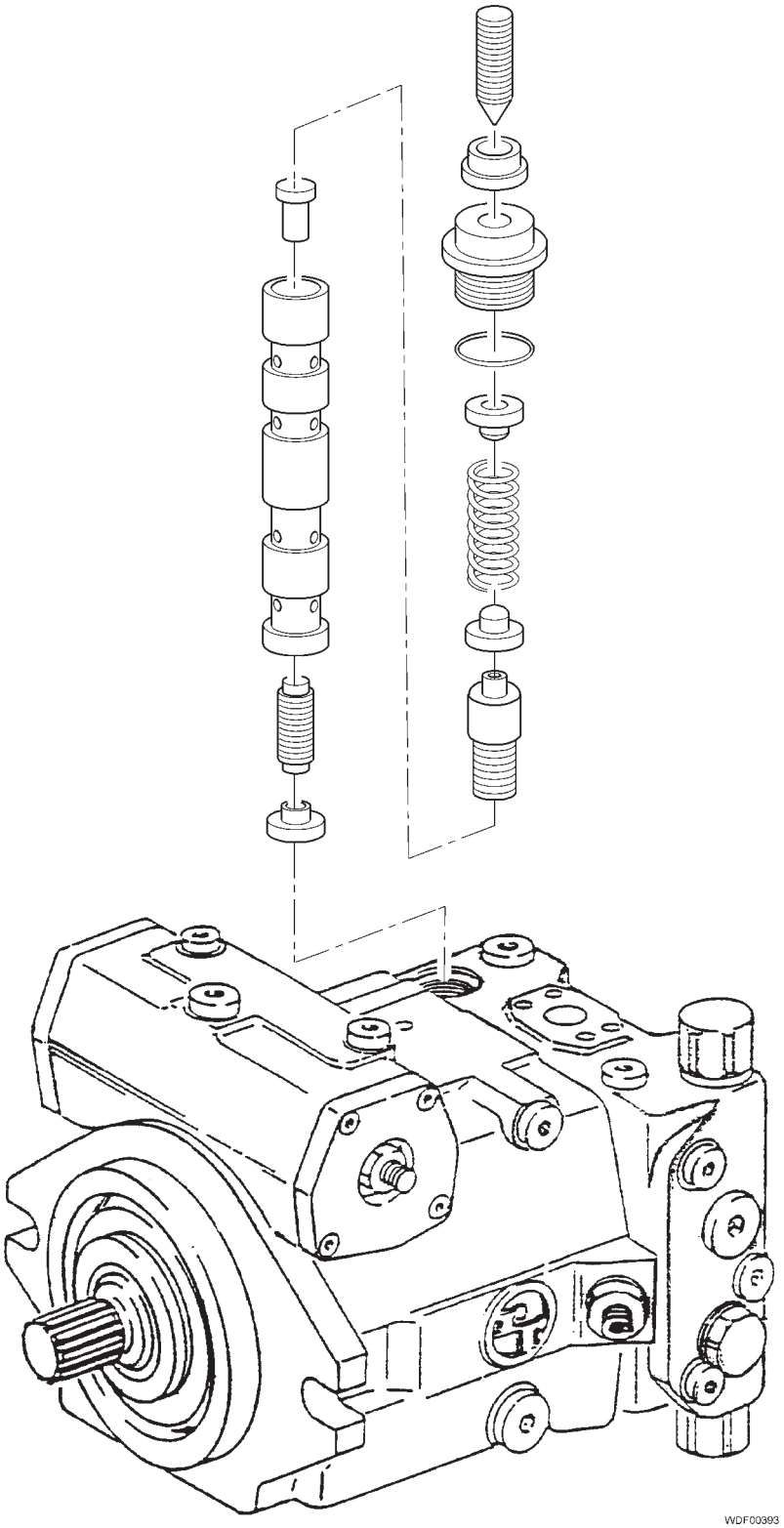


Fig. 9 Pressure cut-off configuration

The adjustment is performed automatically and steplessly, but is dependent on the speed and load. The driving speed depends on the engine speed and the unit's load. Driving begins with the setpoint speed and ends with the max. engine speed by pressing the accelerator pedal. Depending on the loader's load, the variable displacement pump is automatically reduced, so that the most favorable speed is maintained. The greater the load on the loader (during loading work or driving uphill), the more the driving speed is reduced. This regulation makes optimum use of the entire power range. Pressing the inching pedal (inching delay, pedal in the left driving direction) enables the regulation to be additionally influenced, with the result that at any engine speed, the loader can be gradually slowed down until it comes to a standstill.

The figures below show the connections and adjustment devices of the variable displacement motor.

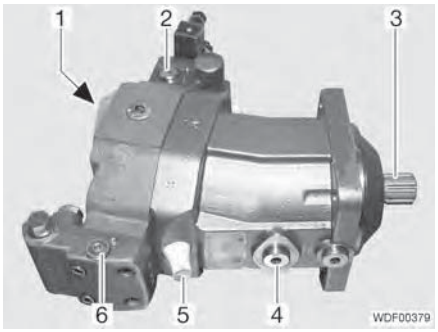


Fig. 10 Underside of the variable displacement motor

1 High pressure connection A
2 Measuring point, driving pressure G
3 Output
4 Cross flushing connection
5 Volume adjustment in overdrive
6 Measuring point, reversing pressure M_1

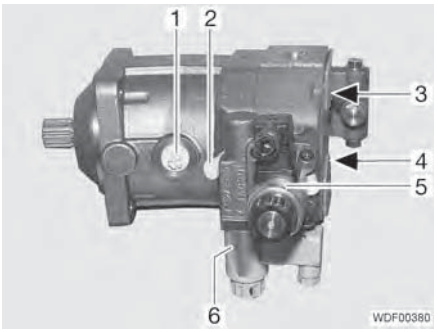


Fig. 11 Topside of the variable displacement motor

1 Cross flushing connection
2 Volume adjustment in working gear
3 High pressure connection A
4 High-pressure connection B
5 Gear selection solenoid valve
6 Driving direction recognition

The steering and working cylinders are supplied with fluid by a hydraulic gear pump. The gear pump is mounted on the variable displacement pump of the drive.

The hydraulic system is equipped with pressure control valves, filters and an oil cooler.

The steering is designed as fully-hydraulic articulated pendulum steering via a dual-action cylinder.

Drive and axles

The pto gear, which transfers the power to the rear axle and (via a drive shaft) to the front axle, is driven via the driving hydraulics.

The axles are configured as rigid axles.

Brakes

The drive also functions as the service brake. The service brake acts on the front and rear axle, and is actuated via the braking inching pedal. The drum brake on the differential is also actuated via the braking inching pedal. The parking brake acts mechanically on the drum brake via a Bowden cable.

Vehicle frame and load arm

The loading equipment consists of the lift frame with an integrated mechanical or hydraulic quick-change attachment, lifting and tipping cylinders and the corresponding attachments.

The loader has a rollover protective structure (ROPS structure).

Electrical system The electrical system has an operating voltage of 12 Volts. The loads and their supply cables are protected by fuse elements.

C

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E

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P

T

Repair Manual for Wheel Loader WL 48 / WL 50

Part 6

Supplier service manuals

Translation of the original repair manual

WDF-6009-00EN
2009
Edition 07/2009-1

This part of the repair manual lists the documents of the assembly or component suppliers.

Add to the list of documents as necessary, and keep the list up to date.

If you require additional documents, consult the loader manufacturer's or the supplier's Customer Service department (see "Service Address").

Recommended documents are:

- The engine manufacturer's workshop manual
- The variable displacement pump manufacturer's repair instructions
- The variable displacement motor manufacturer's repair instructions
- The axle manufacturer's workshop manual
- Installation instructions for the electrical components

Werkstatthandbuch

Kompetenzklasse 2

2011

0312 4002 de

DEUTZ

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

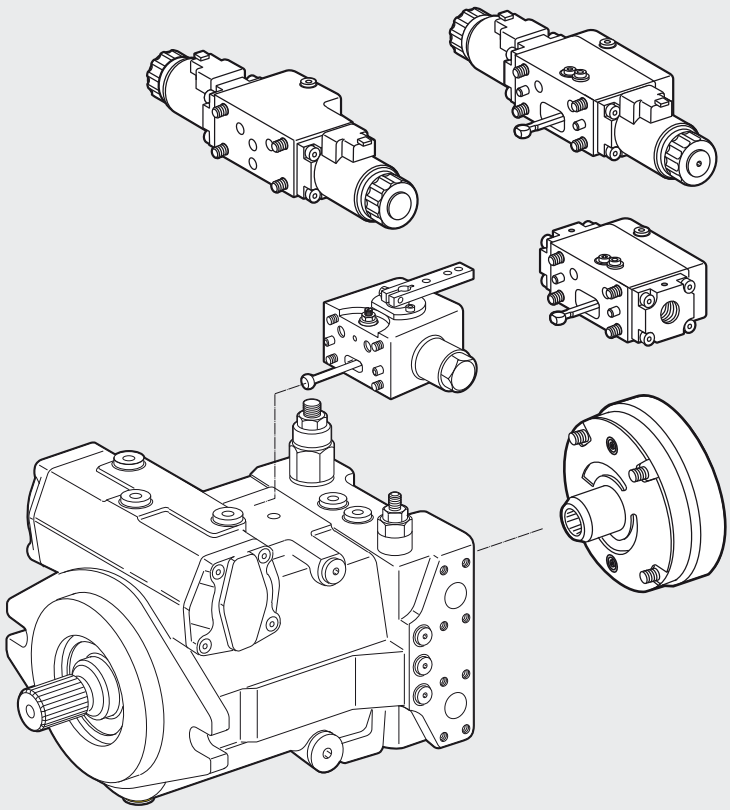
Rexroth
Bosch Group

Verstellpumpe A4VG 28
Variable Pump A4VG 28
Baureihe/Series 32

RDE 92003-41-R/02.08
ersetzt/replaces 03.06

R1

Reparaturanleitung / Repair Manual
Baugruppen / Assembly Groups



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

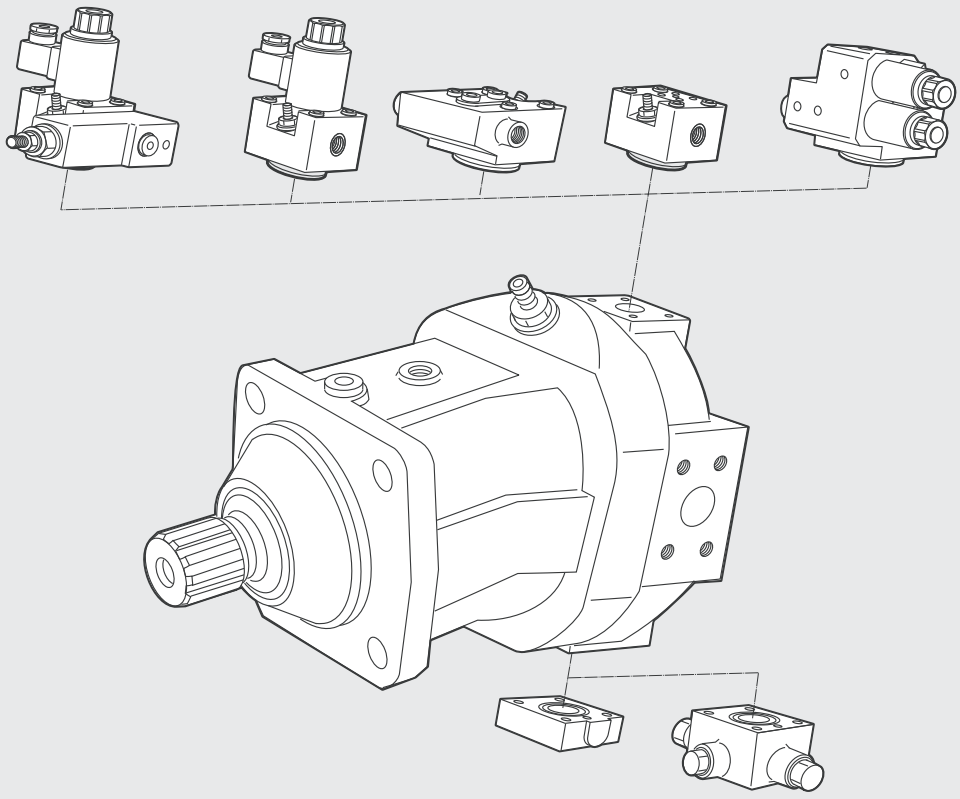
Rexroth
Bosch Group

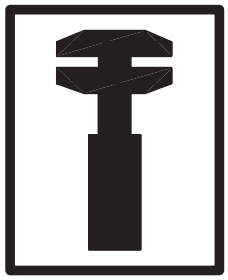
Verstellmotor A6VM NG 28–200
Variable Displ. Motor A6VM NG 28–200
Baureihe/Series 63

RDE 91 604-11-R/03.06

R1

Reparaturanleitung / Repair Manual
Baugruppen / Assembly Groups





Bestell-Nr.: 5871 419 001

ZF-PLANETENACHSE

AP-R 715

ZF Passau GmbH
Donaustr. 25 - 71
D- 94 034 Passau

Ausgabe: 2001/07

Bestell-Nr.: 5871 419 901

Schmier- und Wartungsvorschrift

ZF - PLANETENACHSE

AP-R 715

ZF Passau GmbH
Donaustr. 25 - 71
D- 94034 Passau

Arbeitsmaschinen-Antriebstechnik
und Achssysteme

Achsen für Arbeitsmaschinen **Schmierstoffliste TE-ML 05**

Produktgruppen	Schmierstoffklassen für die Service-Befüllung (1)	
	ohne	mit
	Lamellenbremsen und / oder Lamellensperrdifferentialen	
1. Achsen (Ausnahmen siehe Punkte 2-5) Achsmittentriebe Radköpfe Achseinsätze	ZF-Powerfluid 05A / 05B / 05C / 05D 05F / 05G / 05H	ZF-Powerfluid 05C / 05D / 05F / 05G / 05H
2. Achsen mit Hypoidtrieb (AP 420R; AV230; MT-C 3025; MT-C 3035; MT-C 3075)	05A / 05B / 05C / 05D	05C / 05D
3. MT-D 3105 (nur Ölkreislauf Bremse) MT-L 3xxx (mit Sinterbremsbelägen) MT-L 3xxx (Belastungsklasse 3) (2) MT-G 3075; MT-G 3085	---	ZF-Powerfluid 05F / 05G / 05H
4. MS-T 3025, MS-T 3035, MS-T 3045, MS-T 3055, MS-T 3060 MT-T 3025, MT-T 3035, MT-T 3045 MT 2075 (alt: AP 2075), MT 2085 (alt: AP 2085)	ZF-Powerfluid 05A / 05B / 05C / 05D 05F / 05G / 05H	ZF-Powerfluid 05F / 05G / 05H
5. ZF-Halbachsen (Planetenendabtriebe) für Traktorengetriebe T-7000	05A / 05B / 05C / 05D	---
6. APL-300 AS-3000	---	05C / 05D

(1) Freigegebene Handelsprodukte siehe Folgeseiten.
(2) Belastungsklassen siehe Tabelle auf Seite 2.

An Fettschmierstellen ist ein lithiumverseiftes, mineralölmischbares Mehrzweckfett der NLGI-Klasse 2 zu verwenden (Fettkennzeichnung KP2K-30 nach DIN 51825 bzw. ISO-L-XCCHB2 nach ISO 6743-9).

Zusatzmittel, ganz gleich welcher Art, die dem Öl **nachträglich** hinzugefügt werden, verändern das Öl in nicht kalkulierbarer Weise und sind deshalb nicht zulässig. Für alle aus der Verwendung derartiger Zusatzmittel resultierenden Schäden besteht keinerlei Haftung von ZF.

Die Schmierstoffliste TE-ML 05, **Ausgabe 08.01.2007** ersetzt alle früheren Ausgaben. Die jeweils aktuelle Liste kann bei jeder ZF-Kundendienststelle angefordert und im Internet unter www.zf.com eingesehen werden.	**ZF Passau GmbH** D-94030 Passau Telefon: + 49 7541 77 3505 Telefax: + 49 7541 77 7319	**ZF Friedrichshafen AG** D-88038 Friedrichshafen

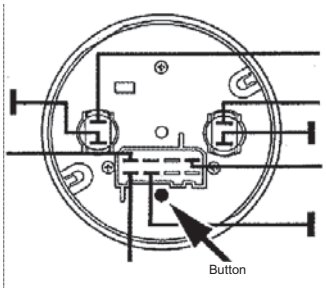
Seite 1 von 13

The following pages contain the installation and operating instructions for electrical components.

Adjusting instructions for round engine-hour indicator with rev counter
Wacker Neuson Art. No. 2842449
Weidemann Art. No. 1000212334

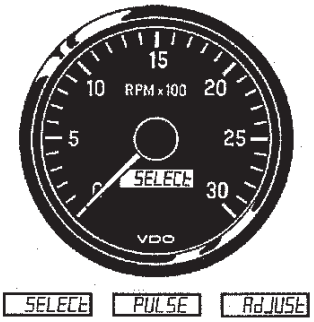
After replacing, the new engine-hour indicator must be calibrated.
To do so, proceed as follows:

1.



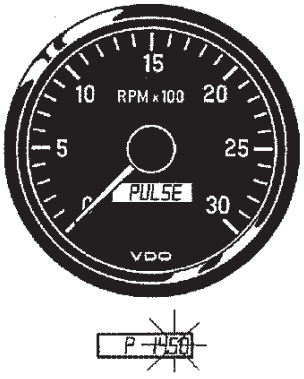
There is a button below the electrical connection on the rear side of the engine-hour indicator. Press the button and hold it in position.
Then switch on the operating voltage (ignition).

2.



"SELECt", "PULSE" and "AdJUSt" appear alternately every 3 seconds on the display. The function "PULSE" is required for Weidemann machines.

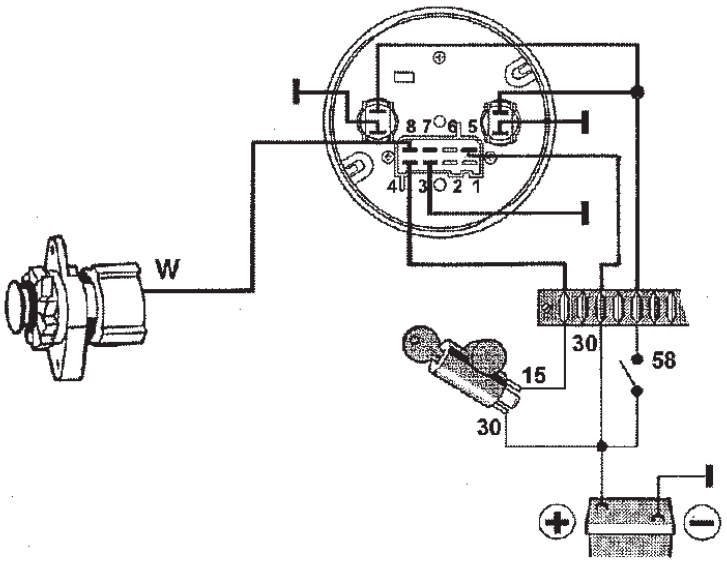
3.



If the function "PULSE" has been selected, "P 14.50" (14.50 impulses per revolution) appears on the display after approx. 3 seconds. The last digit flashes. Enter the calculated impulse value for the respective type of Weidemann loader now.

Machine type	Impulse value
WL 36, 2070 CX50	10.70
WL 37, WL 48, WL 50, WL 55, 2070 CX80, 3070 CX60, 3070 CX80, 4070 CX80	14.10
WL 57, 4070 CX100	14.70

The flashing digit can be changed by pressing the button. After adjusting the impulse value per revolution, the display shows the engine-hour indicator. The calibration is completed.



Electrical connection diagram:

Terminal 3 = Ground

Terminal 4 = Plus, 15 from the ignition lock

Terminal 8 = Signal terminal W from the generator

05.2009 cst

E

P

V