

AHLMANN

OPERATING INSTRUCTIONS



Articulated Loader

AL 8

Ahlmann-Maschinenbau GmbH · D 2370 Rendsburg

P R E F A C E

This manual contains operating and servicing instructions and preventive maintenance procedures as well as a general technical description of the loader

Please read this manual carefully and follow the instructions. Important repair work should be done by properly trained service personnel.

An engine manual with maintenance instructions is also supplied with each machine. Please follow these instructions closely.

It is further recommended that you read the accident prevention instructions for excavators and loaders prepared by the German construction association (Tiefbau Berufsgenossenschaft).

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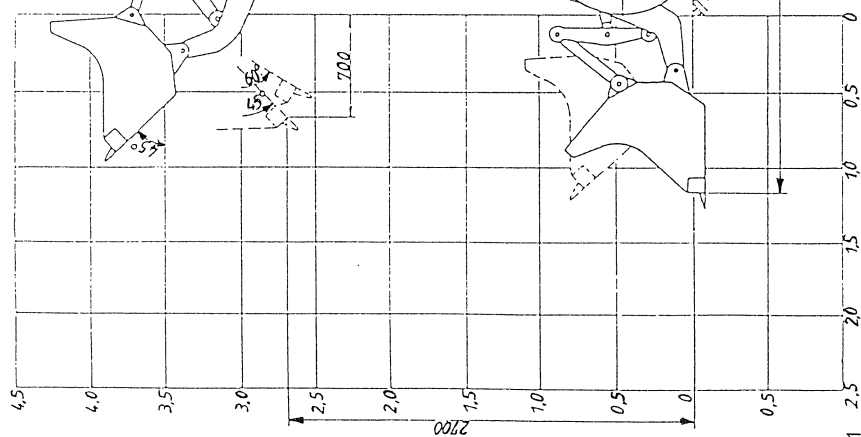
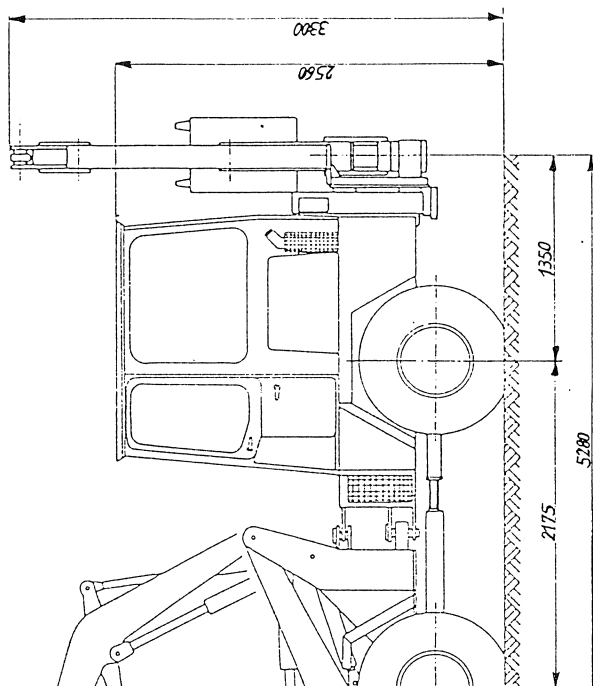


Illustration 1

1. AL 8 Dimensions



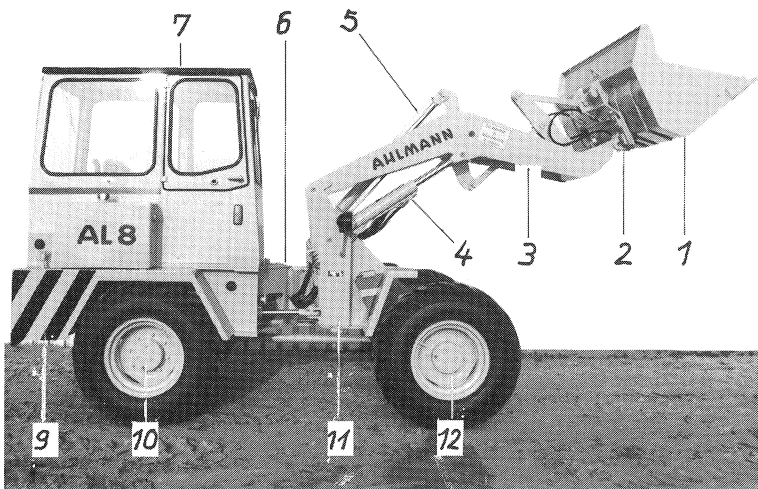


Illustration 2



Illustration 3

- | | |
|------------------------------|--------------------|
| 1 - bucket / attachment | 7 - driver's cabin |
| 2 - quick-change device | 8 - |
| 3 - shovel arm | 9 - rear frame |
| 4 - lifting cylinder | 10 - rear axle |
| 5 - tipping cylinder | 11 - front frame |
| 6 - oscillating articulation | 12 - front axle |

1.1 Description and technical datas

General notes

"Right" and "Left" are seen from the driver's cabin. Rights to alter vehicle specifications are reserved.

Diesel engine, air- or water-cooled

Air-cooled

- Air-cooled diesel engine Klöckner-Humboldt-Deutz, type F 3 L 912
- 3 cylinder, 4 stroke, direct injection
- Displacement 2826 cm³
- Bore Ø 100 mm, stroke 120 mm
- Output 40 kW (54,4 hp) at 2300 min⁻¹ acc. to DIN 6270 B continuous output
- Fuel consumption 228 grams/kW/h
- Starter Motor 2,2 kW (3,0 hp), 12 V
- Dry-air cleaner

Water-cooled

- Water-cooled diesel engine Perkins, type 3.1524
- 3 cylinder, 4 stroke, direct injection
- Displacement 2500 cm³
- Bore Ø 91,44 mm, stroke 127 mm
- Output 37 kW (49,3 hp) at 2500 min⁻¹ acc. to DIN 6270 B continuous output
- Fuel consumption 232 grams/kW/h
- Starter motor 2,3 kW (3,2 hp), 12 V
- Dry-air cleaner

Chassis

- Diesel engine
- The axial piston pump for travelling hydraulic is driven by the diesel engine.
- High pressure hoses connect the axial piston pump with the axial piston motor.
- The axial piston motor is directly connected with the reduction gear of the rear axle with hub reduction drive. The torque of the axial piston motor is transmitted via drive a shaft directly from the reduction gear in the rear axle to the front axle again fitted with hub reduction.

ATTENTION!

- The max. speed of the axial piston motor has been adjusted and set by the factory. Removing the seal results in loss of warranty.
- The front axle is equipped with a multiple-disk-self-locking differential. This self-locking differential is available as an optional extra for the rear axle if required, at extra cost.
- The loader is equipped with 4 tires of equal size. The standard tire is 12.5-18/6PR/TL. See following schedule for optional tires and tire pressure.

Tires Schedule

Tire sizes	Loader equipped					
	with - bucket		with - bucket - backhoe - rear-mounted grab		with - fork-lift attachment - telescopic high-lift	
	front bar	rear bar	front bar	rear bar	front bar	rear bar
12,5-18/MPT/6PR/ TL/L2 (tubeless - standard)	2,0	* 2,0	* 2,0	2,25	2,25	* 2,0
14,5-20/MPT/10PR/ TL/L2 (tubeless)	1,75	* 1,75	* 1,75	2,0	2,0	* 1,75

Other tire sizes on request

* Water-filling with anti-freeze

NOTE!

If backhoe and rear mounted grab are to be installed later, the water filled tires of the rear axle have to be mounted on the front axle.

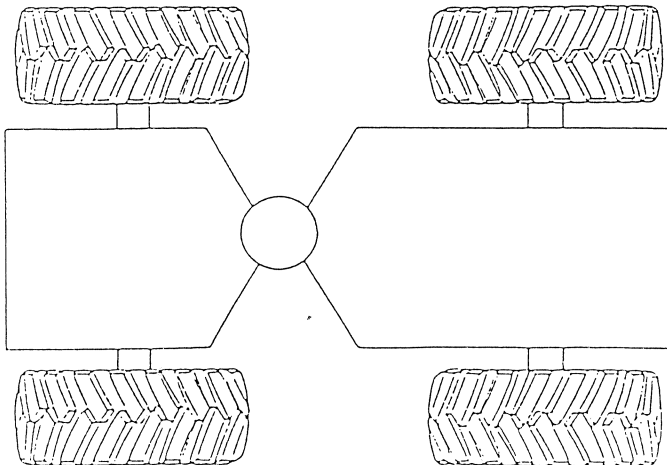


Illustration 4
Correct tire pattern

Operating characteristics, Axle loads, Weights

Operating characteristics (with standard tires)

- Working speed: 0 - 9 km/h
- Travelling speed: 0 - 20 km/h

Noise insulation: Conforming with current German regulations.

Pushing force
on dry, concrete surface 3450 daN

Gradeability
with payload without backhoe 54 %

Gradeability
with backhoe and water-filled
front tires 45 %

Minimum external turning radius R = 4270 mm

Oscillation (front frame) $\pm 11^\circ$, 280 mm difference in
height of wheels

Articulation (front frame) 40° left, 40° right

Axle loads / Weights (Road travel)

Front	1650 kg	} without backhoe and without payload with bucket and water-filling in the tires of the rear axle
Rear	2560 kg	
Total weight	4210 kg	

Front	1250 kg	} with backhoe/rear-mounted grab without payload, with bucket with water-filling in the tires of the front axle.
Rear	4300 kg	
Total weight	5550 kg	

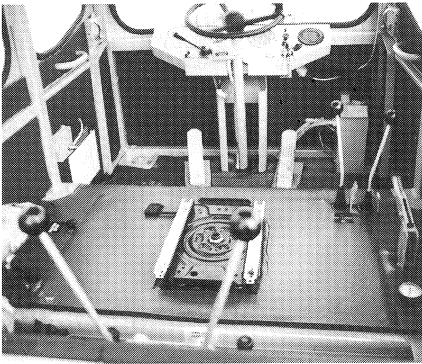
Steering system

Servo-assisted hydrostatic steering system fed by a gear pump which is flanged to the diesel engine.

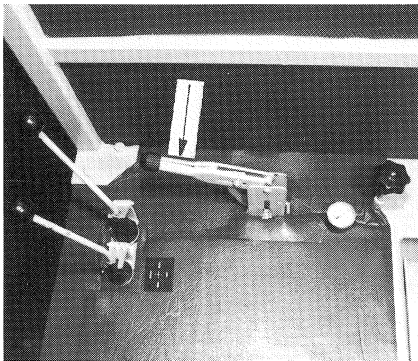
Max. steering pressure: 175 bar

Emergency steering

It is possible to steer the machine in the event of an engine failure, but without servo-assistance. The towing-speed should not exceed 5 km/h.



Ill. 5



Ill. 6

Braking system

Service brake

There is a foot brake located to the left of the steering column (ill. 5) which activates a valve in the hydrostatic pump via a bowden cable. The operator can the pump to slow down or stop the machine without having to adjust the speed of the engine.

NOTE!

When the foot brake is fully depressed the parking drum brake becomes operative and prevents movement of the loader.

Parking brake

The loader is equipped with a parking brake which is manually actuated. The parking brake is operated by hand lever (ill. 6/ arrow) located at the right side of the driver's seat and this tightens the drum brake at the reduction gear (rear axle) via bowden cable.

Electrical installation

Voltage 12 V
 Battery 88 Ah 12V standard
 (110 AH on request)
 Alternator
 Starter (output see engine)
 Fuel gauge
 Hourmeter (combination unit with control lamps)
 2 headlights, front
 Emergency flashers
 Direction indicators
 Taillamps
 Working lights (optional Extra)

Lights comply with German road travel regulations.

Battery

A sealed for life heavy duty battery is fitted (acc.to DIN). This battery requires no topping up.

The battery has to be kept dry and clean.

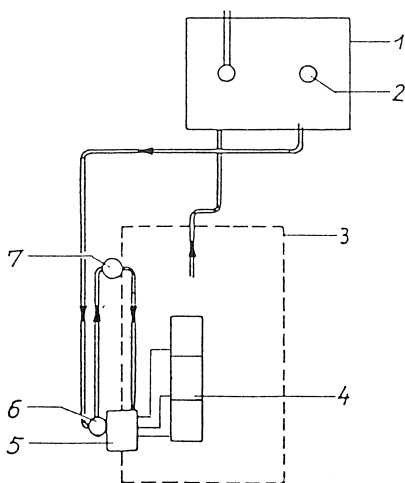
Terminals should be covered with a thin layer of acid-free grease which must not touch the acid.

ATTENTION!

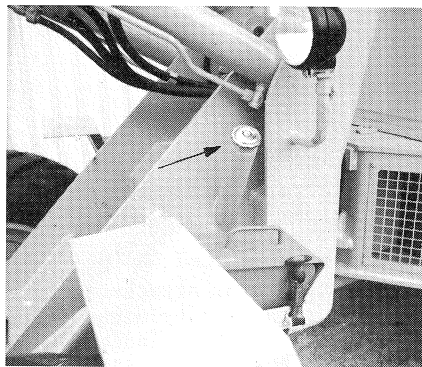
Electrical welding equipment may only be used on the loader after the battery terminals have been disconnected.

Fuel supply

The fuel tank (70 litres) is positioned to the left under the cabin. The level can be checked on a gauge which is inside the cabin. The filler is on the left-hand side of the machine (ill. 8/arrow).



- 1 Fuel tank
 - 2 Fuel filler nozzle
 - 3 diesel engine
 - 4 Injection nozzles
 - 5 Injection Pump
 - 6 Supply pump
 - 7 Fuel filter
- Ill. 7



Ill. 7

Ill. 8

Loader hydraulics

A gear pump with a capacity of 26 cm³/r is driven via a toothed belt drive which supplies hydraulic oil under pressure to a control valve.

- a lift cylinder $\varnothing 80/45$ mm
 - a tilt cylinder $\varnothing 80/45$ mm
- } double acting

Maximum relief pressure: 200 ± 5 bar

The lift and tilt functions and the speed of these operations are controlled by a single lever (ill. 8/24) which is linked to the control valve. Operation is smooth and easy to regulate. Both loader functions can be performed simultaneously.

Bucket angle

- Backward tilt 45°
- Dumping 60° (bucket raised to full height)

Loader performance

- | | |
|--|---------------|
| - Lifting capacity | 3200 daN max. |
| - Breakout force at bucket edge | 4000 daN |
| - Thrust on dry, concret ground | 3400 daN |
| - Tipping load: | |
| - with standard bucket. shovel arm elongated | 3400 kg |
| - machine articulated, shovel arm elongated | 3000 kg |

Cycle times:

- Lifting 3,8 sec
- Lowering 2,5 sec
- Dumping 2,8 sec
- Tilting 2,0 sec

Position of bucket resp.
attachment

The driver can read the position of the bucket or attachment from the driver's seat by means of coloured marks and an indicator on the tipping cylinder (ill. 8a/arrow).

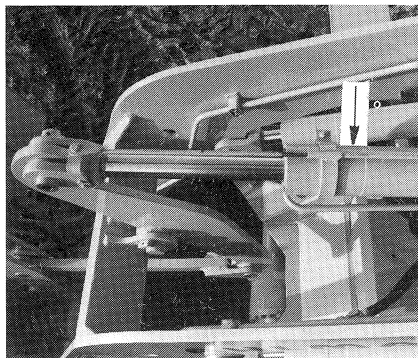


Illustration 8

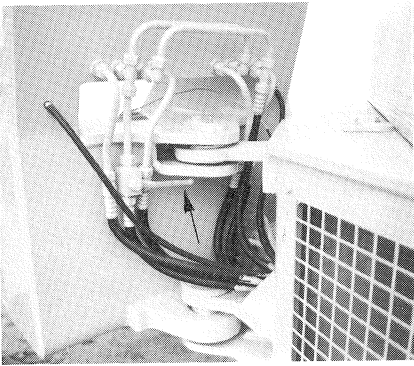
Equipment

Comfortable driver's seat:	with shock absorber and weight adjustment, mounted on sliding rails; adjustable back-rest; can be turned 180° for backhoe operation.
Well arranged dashboard:	electrical hourmeter as combination unit with several control lamps, electrical fuel gauge, 12 V socket, pull switch for emergency flashers.
Driver's cabin:	ROPS cabin, lockable side doors, left door with lock, if required with hinged rear window, easy access from the left side, front- and rear windscreen wipers, sun shade, defroster nozzle for front window, excellent all-round visibility, heating.
One set of tools,	
One articulation lock,	
Two wheel chocks	
Extras: All-round lighting	
Radio	

NOTE!

The standard equipment as supplied by the factory is in line with the norm in Germany. Local regulations in Germany and elsewhere may require the installation of additional equipment. It is the user's/distributor's responsibility to ensure that this equipment is added.

In accordance with transport regulations, the loader is supplied with a minimum amount of fuel

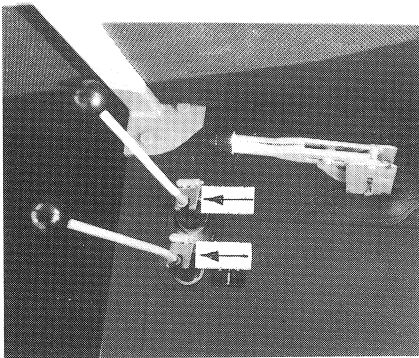


Ill. 9

2 Driving on public roads

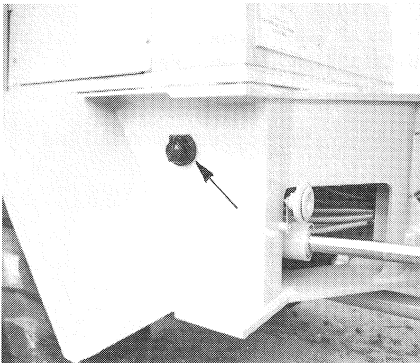
2.1 Driving on public roads without backhoe

Before beginning to drive in public traffic the following safety precautions have to be taken.



Ill. 10

- Lift the shovel arm and tilt the bucket. The lowest point of the shovel arm resp. bucket has to be at least 30 cm (12") above the roadway.
- Close ball-block valve (ill. 9/ arrow). Illustration shows closed position.
- Block both operating levers in driver's cabin by means of flip over locks(ill.10/arrow).



Ill. 11

- The bucket edge/teeth must be covered by a protector (if it is required in the country). Connect the electrical installation of the bucket guard with the socket plug on rear frame (ill.11/ arrow) and test of the flashing warning lamps.

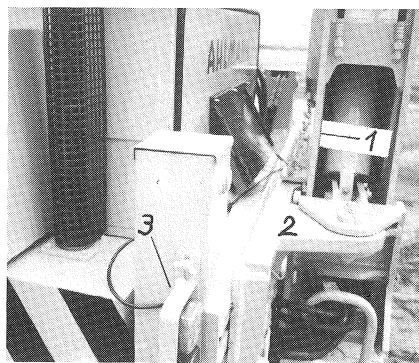
ATTENTION!

Driving on public roads with a filled bucket is not allowed.

2.2 Driving on public roads with backhoe

Before beginning to drive in public traffic the safety precautions as described in para 2.1 have to be observed in addition to the safety precautions below.

- Slew the backhoe to the left and shift it lateraly. Pivot the bucket to the stop. Bring the digger arm and boom in as close as possible to the rear of the unit. Connect boom (ill.12/1) and traversing gear carrier (ill. 12/2) with a bolt which is provided for this. This bolt is a part of the service tool kit. Hang the lighting set, which corresponds to the German traffic regulations on to both sides (ill.12/3) and fix it on.
- Hang the open-link chain to the bucket and boom and tighten it with the tension lock (ill. 13/arrow). Raise stabilizers to the stop position.



Ill. 12



Ill. 13

- Connect the plug for the lighting which corresponds with the German traffic regulations with the socket (ill. 14/arrow) and make test.

NOTE!

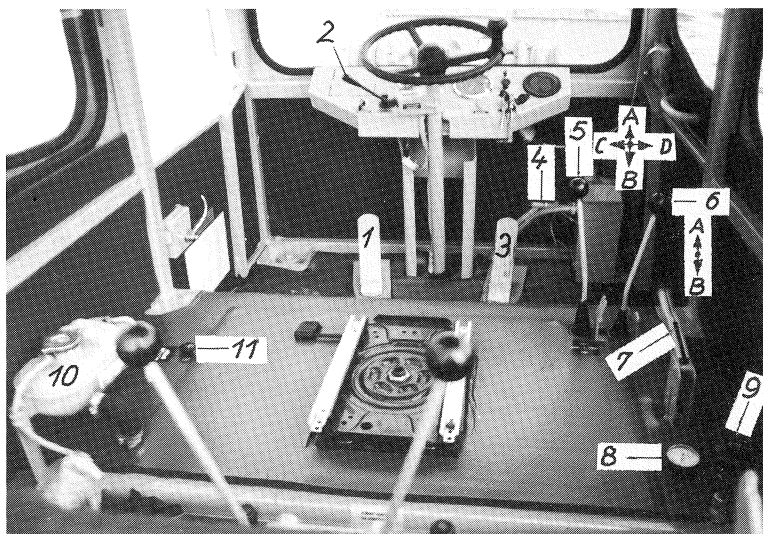
If loader with backhoe is to be transported a longer distance the loading height has to be considered. The loading space can be limited on a minimum by removing the backhoe.



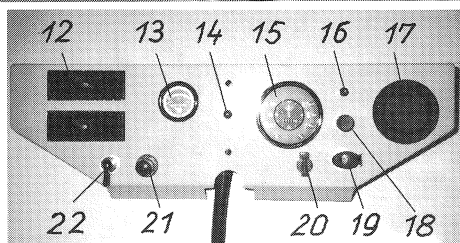
Ill. 14

3. Operating- and controlling elements

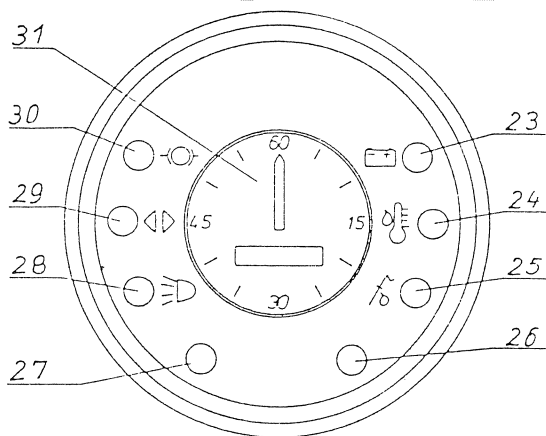
3.1 Operating and controls on the dash-board and in the driver's cabin.



III. 15



III. 16



III. 17

Operating- and controlling elements on the dash-board
and in the driver's cabin

- 1 Brake pedal (service brake and parking brake on slopes)
- 2 Steering column switch
 - Direction-controller "forward - backward"
 - Gear shifting " Travelling gear - Working gear"
- 3 Accelerator pedal
- 4 Valve for radiator (oil cooler heating see ill. 20)
- 5 Control lever for working hydraulics
- 6 Control lever for front auxiliary hydraulics
- 7 Parking brake lever
- 8 Pressure gauge, hydraulic filter (intake)
- 9 Manual throttle (optional)
- 10 Water-tank for cooling system
- 11 Bowden cable, engine cut-off
(with air-cooled engine on the right side of driver's seat)
- 12 Fuse boxes
- 13 Fuel gauge
- 14 Pull-switch, working lights (optional)
- 15 Instrument cluster (Ill. 17)
- 16 Pull switch, heater fan
- 17 Hot air outlet
- 18 Starter pull-switch resp. push-button
- 19 Ignition-light switch
- 20 Socket 12 V
- 21 Pull-switch, emergency flashers
- 22 Indicator switch
- 23 Battery-charging tell-tale (red)
- 24 Temperature, cooling water (red)
resp. engine temperature if air-cooled
- 25 Oil pressure (red)
- 26 Free
- 27 Free
- 28 Full beam (blue)
- 29 Direction indicator (green)
- 30 Parking brake (red)
- 31 Hourmeter
- 32 Pilot valve for backhoe (see backhoe)

Tell-tales

Operating the bucket resp. front-mounted attachments

Working with fitted bucket

Hand lever (ill. 15/5) in direction A - Lowering shovel arm
Hand lever (ill. 15/5) in direction B - Lifting shovel arm
Hand lever (ill. 15/5) in direction C - Tilting bucket
Hand lever (ill. 15/5) in direction D - Dumping bucket

Working with fitted multi-purpose bucket

Hand lever (ill. 15/5) in direction A - Lowering shovel arm
Hand lever (ill. 15/5) in direction B - Lifting shovel arm
Hand lever (ill. 15/5) in direction C - Tilting bucket
Hand lever (ill. 15/5) in direction D - Dumping bucket
Hand lever (ill. 15/6) in direction A - Opening bucket
Hand lever (ill. 15/6) in direction B - Closing bucket

Working with fitted fork-lift

Hand lever (ill. 15/5) in direction A - Lowering shovel arm
Hand lever (ill. 15/5) in direction B - Lifting shovel arm
Hand lever (ill. 15/5) in direction C - Tipping forks
Hand lever (ill. 15/5) in direction D - Tilting forks

Working with fitted high-lift

Hand lever (ill. 15/5) in direction A - Lowering shovel arm
Hand lever (ill. 15/5) in direction B - Lifting shovel arm
Hand lever (ill. 15/5) in direction C - Tipping high-lift
(Press button on lever at the same time)
Hand lever (ill. 15/5) in direction D - Tilting high-lift
Hand lever (ill. 15/6) in direction A - Lowering forks
Hand lever (ill. 15/6) in direction B - Lifting forks

NOTE!

The hydraulic functions can be carried out simultaneously.

Engage the hand brake if the loader is working in a stationary position (ill. 15/7).

Lower bucket to ground and engage hand brake when not actually working with the machine (even if it is only a short break).

3.2 Operating elements in driver's cabin for using the backhoe

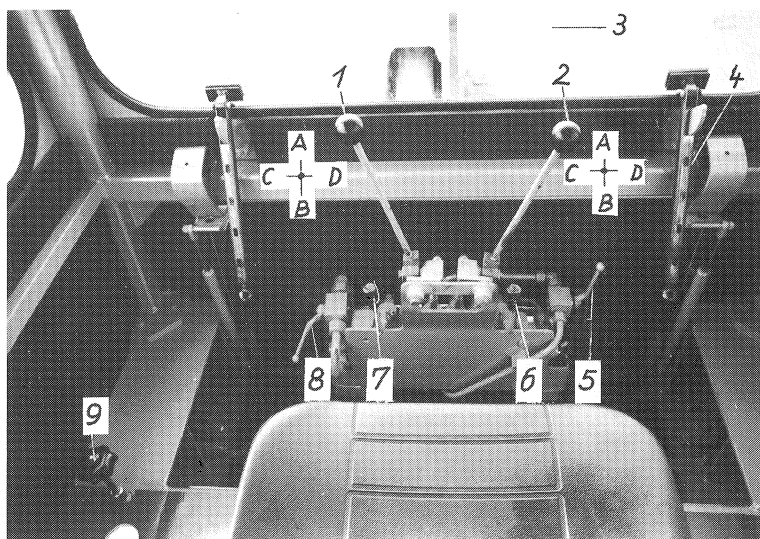


Illustration 18

- 1 Hand lever for boom and bucket
- 2 Hand lever for dipper stick and slewing
- 3 Hinged rear window
- 4 Adjusting guide rail for rear window
- 5 Ball valve for clamping device
- 6 Right backhoe stabilizer
- 7 Left backhoe stabilizer
- 8 Ball valve for using the backhoe (optionally above the right mudguard of the rear frame on the rapid coupling)
- 9 Hand throttle pull-turn button
 - pull in steps locked
 - fine adjusting within the steps by turning



Illustration 19

Using the backhoe

Before the backhoe can be used or the hydraulic power will be needed for attaching unit

- the ball valve (ill. 18/8) has to be opened (is the ball valve installed above the right mudguard then it has to be closed for operation). If there is a longer break with using the backhoe, for example driving on public roads, close the ball valve or open it if the ball valve is above the mudguard.

NOTE!

Hydraulic hoses are connected via rapid couplings with the loader.

- The driver's seat to be turned at 180°.

Hand lever (ill. 18/1) in direction A - Lowering the boom

Hand lever (ill. 18/1) in direction B - Lifting the boom

Hand lever (ill. 18/1) in direction C - Emptying the bucket

Hand lever (ill. 18/1) in direction D - Filling the bucket

Hand lever (ill. 18/2) in direction A - Extending dipperstick

Hand lever (ill. 18/2) in direction B - Folding dipperstick

Hand lever (ill. 18/2) in direction C - Swinging to the left

Hand lever (ill. 18/2) in direction D - Swinging to the right

Hand lever (ill. 18/6) -- Extending resp. folding the right backhoe stabilizer

Hand lever (ill. 18/7) - Extending resp. folding the left backhoe stabilizer

Ball valve (ill. 18/5) for clamping device (lateral shifting)

Loosen the clamping:

- Open the ball valve
- Dump the bucket till to the stop (hand lever//ill.18/1// in direction C).
- Hand lever (ill.18/1) in end position C, hold, and close ball valve.

Lock the clamping:

- Open the ball valve
- Pull the bucket till to the stop (hand lever//ill.18/1// in pos. D).
- Hand lever (ill.18/1) in end position D, hold, and close ball valve.

NOTE!

When the clamps are loosened, the backhoe can be shifted to the side. For this the boom will be lowered till the bucket touches the ground. By means of the hydraulic force and bucket supporting the backhoe will be shifted laterally (ill.19).

ATTENTION!

Use the backhoe only after extending both backhoe stabilizers and standing on hard ground.

4. Start-up

4.1 Starting the engine

- (1) Engage parking brake (ill. 15/7).
- (2) Place steering column direction switch in neutral position(ill.15/2).
- (3) Turn ignition key to the right to pos. 1 (battery and oil warning lamps light up) (ill. 15/19).
- (4) Press accelerator pedal (ill. 15/3) to the bottom.
- (5) - Press starter button (if air-cooled enging//ill.15/18//). Release if engine starts.

- Pull draw-button (if water-cooled engine//ill. 15/18//) till to the limit. Release draw-button if engine starts. If there are low temperatures pull draw-button till to the first lock-in position and hold it 10 - 20 seconds. After this 10-20 seconds pull draw-button till to limit.

NOTE!

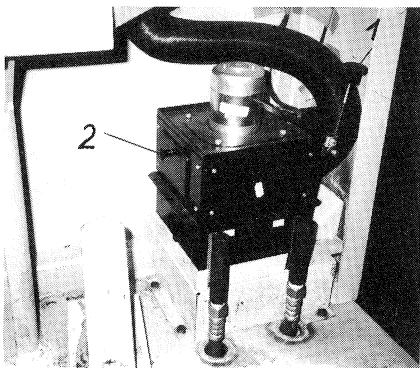
The engine cannot be started by towing the loader.

4.2 Cabin heater

4.2.1 Standard heater (air-cooled engine)

Utilization:

- (1) Open hot air outlet (ill.16/17).
- (2) Bring draw-button (ill.20/1) in "winter position" (pull draw-button upwards).
- (3) Open flap (ill.20/2) if leg-room shall be heated (swing flap to the left).



IMPORTANT!

The ventilator in the heating system works continually and is connected to the hydraulic oil cooler, the hot air is diverted out of the cabine when not required. Do not disconnect this.

4.2.2 Standard heater (water-cooled engine)

Utilization:

- (1) Open hot air outlet (ill. 16/17).
- (2) Open shut-off valve.
- (3) Open flap on the radiator if leg-room shall be heated.

4.2.3 Auxiliary heater and ventilation


Technical specification:


- Eberspächer D 1 L
- Diesel consumption approx. 0,21 l/h
- Voltage 12 V
- Output 1700 W

The installation can be used to provide fresh air or additional heating.

Instructions:

Turn switch (ill.21)

Pos.  = fresh air

Pos.  = blower with
(red) heater

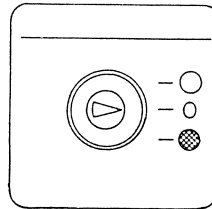


Illustration 21

The control lamp (arrow) lights up in both positions.

The warm air or fresh air can be led either only to the front window or at the same time to front window and foot compartment.

Malfunctions can be overcome by repeating the start-up procedure.

If the heater fails to start, check the fuse under the cover flap and replace if necessary.

Cut-off

Cutting off by turning the switch (ill.21) to "0".

NOTE!

Leave flow of current from battery to heater for 3 minutes after switching off the blower. Do not cut-off.

WARNING!

The heater may not be used in closed rooms or while the loader is being refuelled.

4.3 Lights

The lights are switched on by turning the ignition key (ill. 16/19).

Position "1" - Ignition

Position "2" - Parking lights

Position "3" - Head lamps

Position "4" - Full beam

Electrical fuses

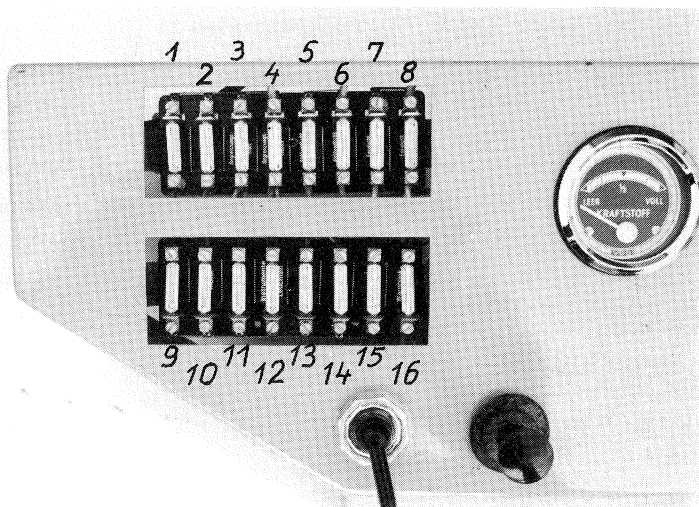


Illustration 22

1 - Tail light, left	9 - Stop light
2 - Tail light, right	10 - Wipers
3 - Lateral light, left	11 - Standard heater
4 - Lateral light, right	12 - Dash board
5 - Low beam, left	13 - Hooter
6 - Low beam, right	14 - Drive
7 - Full beam, left	15 - Direction indicator
8 - Full beam, right	16 - Emergency flashers

4.4 Driving the loader

- (1) Release parking brake (ill. 15/7).
- (2) Select gear (ill. 15/2) working or road travel speed depending on the application.
- (3) Select forward or reverse drive (ill.15/2)
- (4) Press the accelerator (ill. 15/3).

Loader starts. Driving speed and braking retardation is determined by accelerator position. The brake pedal will be pressed down only for full stop or for holding the loader on a slope.

NOTE!

Actuation of the switch for forward or reverse drive can be done also during driving, but avoid it at high driving speed because of the strong braking effect.

4.5 Working with the loader

Driving with the loader is no problem. The loader can be used both in working gear and in travel gear from Zero to max. speed.. It depends on the working conditions which gear will be selected.

Driving speed resp. propulsive force will be changed in the selected gear only by pressing the accelerator. When driving up a slope the speed decreases in favour of the propulsive force even in full throttle. propulsive force will be reached in working gear with a driving speed of almost "0" km/h.

Propulsive forces and travelling speed are the same both forward and backward.

Driving with load

In order to use the complete driving ability of the loader, the filled bucket or attachment has to be held close to the ground during driving.

Scraping and levelling

Place lift arms in lowest position. Adjust bucket angle according to wheel size and ground conditions.

Both jobs can be done in working or travel gear. Levelling is best done, while driving backwards.

Bucket size / Operating capacity (Payload)

Never exceed operating capacity, no matter which bucket is used.

5. Dismounting and mounting of bucket and attachments

- (1) Put shovel arm in lowest position and operate the quick-change frame (ill.23) to drop buckets.
- (2) Pick-up bucket or attachment with quick-change frame and lift bucket or attachment with simultaneous tilting of the quick-change frame till the frame sits close to the bucket or attachment. Lock bucket or attachment with hand lever (ill.15/6) and ill. 24/arrow.

ATTENTION!

Check correct suspension and locking.

- (3) If a multi-purpose bucket is fitted, the hydraulic unit of the bucket has to be connected with the hydraulic line of the quick-change frame after carrying out operations 1 and 2 (ill.25).
 - Unscrew safety caps from rapid couplings at the bucket.
 - Separate rapidly couplings from the cylinder at the quick-change frame and screw them to the rapid couplings of the shovel.
 - Screw safety caps on the cylinder connections.

ATTENTION!

Keep connections clean and check for tightness.

5.1 Type of buckets/size of buckets

0,8 m³ standard bucket
1,2 m³ lightweight material bucket

0,7 m³ multi-purpose bucket
all buckets with or without teeth

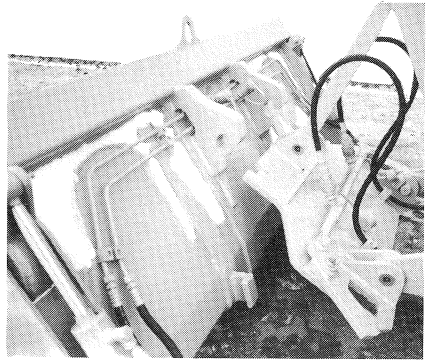


Illustration 23

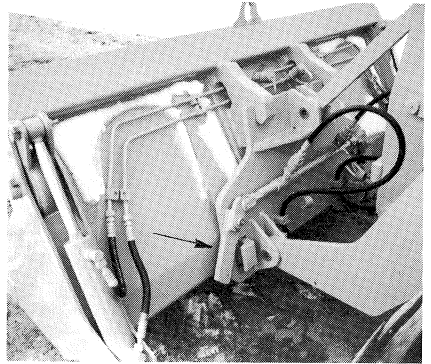


Illustration 24

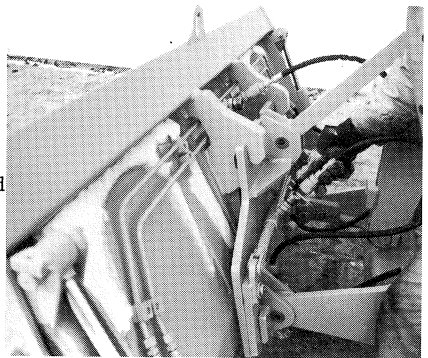


Illustration 25

5.2 Attachments

Backhoe, laterally displaceable with hydraulic lock, slewable at 90° to the left or to the right.

Shovel widths from 280 to 600 mm

Shovel capacity from 75 to 145 litres (acc.to SAE)

Break-out-force at dipper arm max. 1870 daN

Break-off-force at shovel cutting edge 4000 daN

Diagram of reach

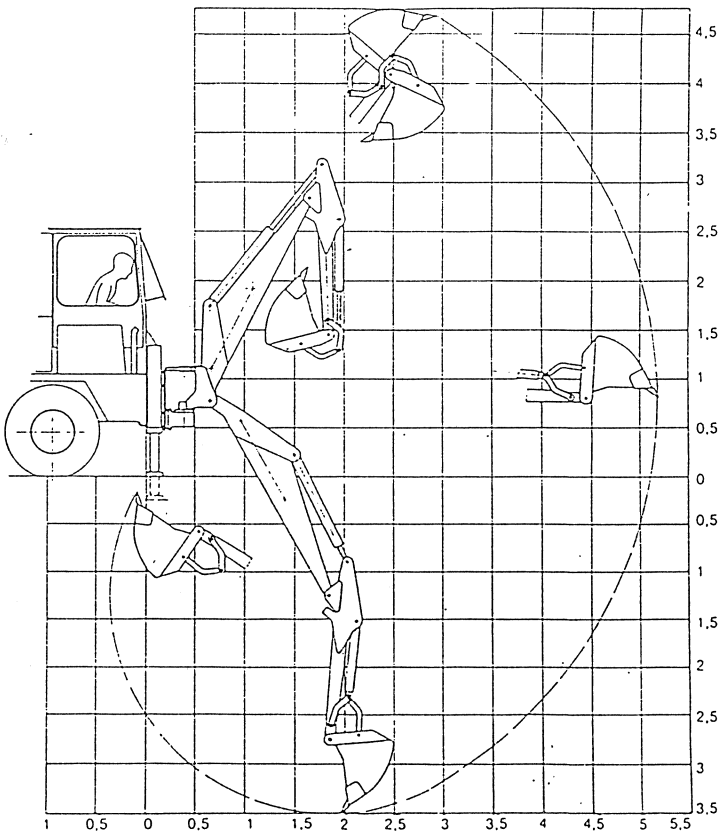
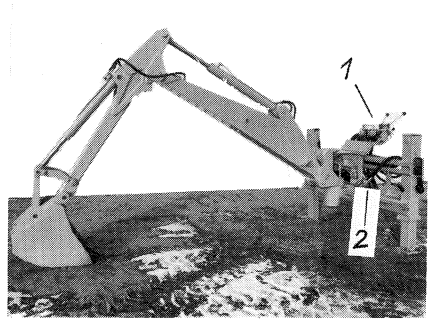


Illustration 26

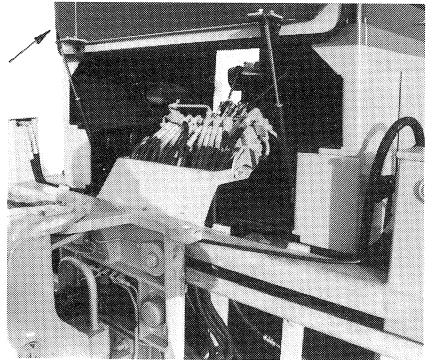
Mounting of backhoe

Ill. 27 shows a backhoe mounted on the basic machine. The control valve (ill.27/1) is slewed down and the hydraulic connection (ill.27/2) provided with a safety cap. The backhoe is prepared for mounting.



Ill. 27

- (1) Unlock the rear screen of the loader and push it upwards (ill.28/arrow).
- (2) Drive the loader in such a way to the backhoe that the recesses for clamping jaws of loader and backhoe are in line.

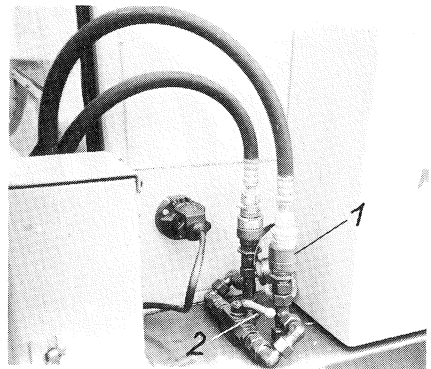


Ill. 28

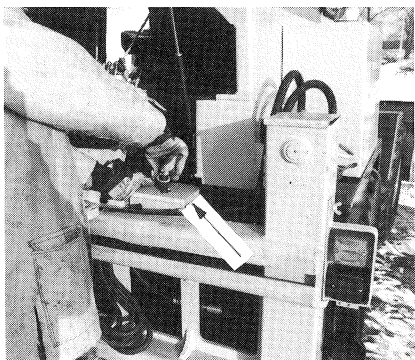
- (3) Unscrew the safety caps of the rapid coupling on the backhoe and at the loader, connect the rapid couplings (ill.29/1), close ball stopcock (ill.29/2).

ATTENTION!

Keep the connections clean and check for tightness.

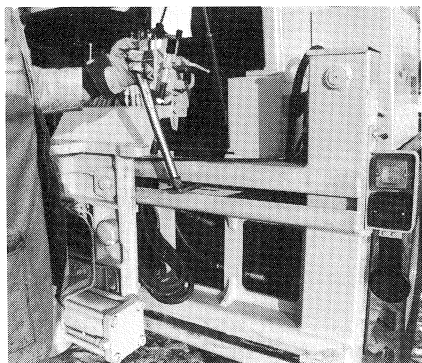


Ill. 29



Ill. 30

- (4) Start engine of loader and align backhoe in such a way that the clamping jaws can be fastened without problems (ill.30/arrow). Check if clamping jaws are tightened.

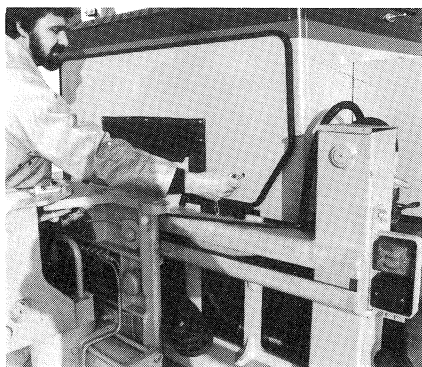


Ill. 31

- (5) The position of a distance piece will be changed with a hexagonal recess spanner in such a way that the tolerance between the backhoe and the loader can be limited on a minimum (ill. 31).

ATTENTION!

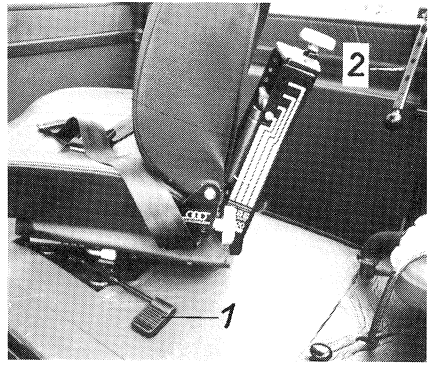
Check, tighten-up if necessary resp. adjust the tolerance between backhoe and loader as well as the clamping jaws after a short test use.



Ill. 32

- (6) Close and lock the rear lid of the loader (ill. 32)

- (7) Turn driver's seat 180°
Unlock, by pressing down,
the locking device (ill.
33/1) before turning. The
control valve will be
slewed high acc. to the
seat position and faste-
ned with the winged screws
which are lateraly fitted.
- (8) The rear window can be
closed, if wanted, or
slewed out in steps by
means of the adjusting
guide rail (ill.33/2).



I11. 33

NOTE!

- Operation with backhoe
described on page 19.
- All grease points of the
backhoe are to be lubri-
cated before using the
backhoe and after each
10 hours of continuous
work.

Pallet forks

The pallet forks can only be used in connection with quick-change frame. Mounting acc. to para 5.

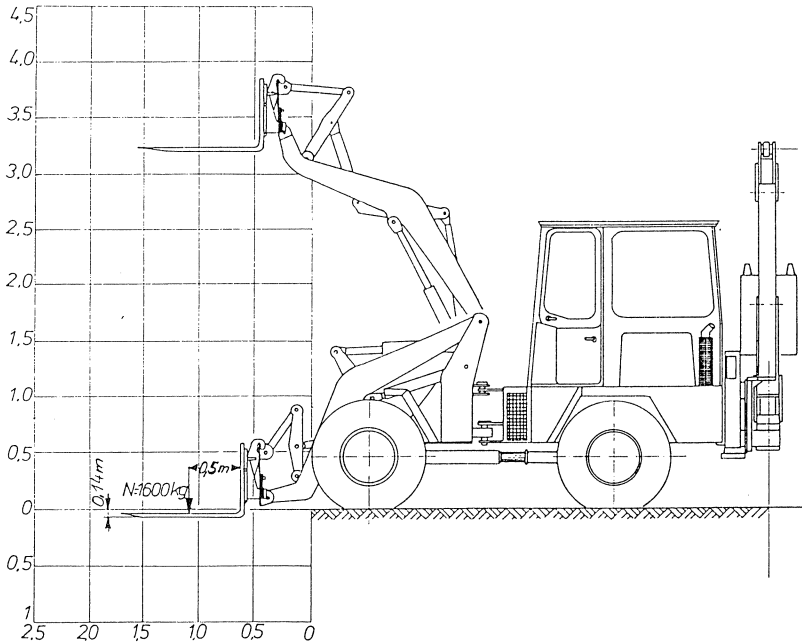
Ensure that there is a good connection to the quick-change frame if mounting the pallet forks.

A lateral adjustment of the forks is possible in steps.

Fork tines distance: min. 216 mm } Locking groove distances are
max. 1054 mm } measured acc.to DIN 15173, load
capacity category 2, row 2, in
fork centre.

Adjust both fork tines at the same distance to the center, make sure the load is centered and placed on both tines.

Diagram of reach



III. 34

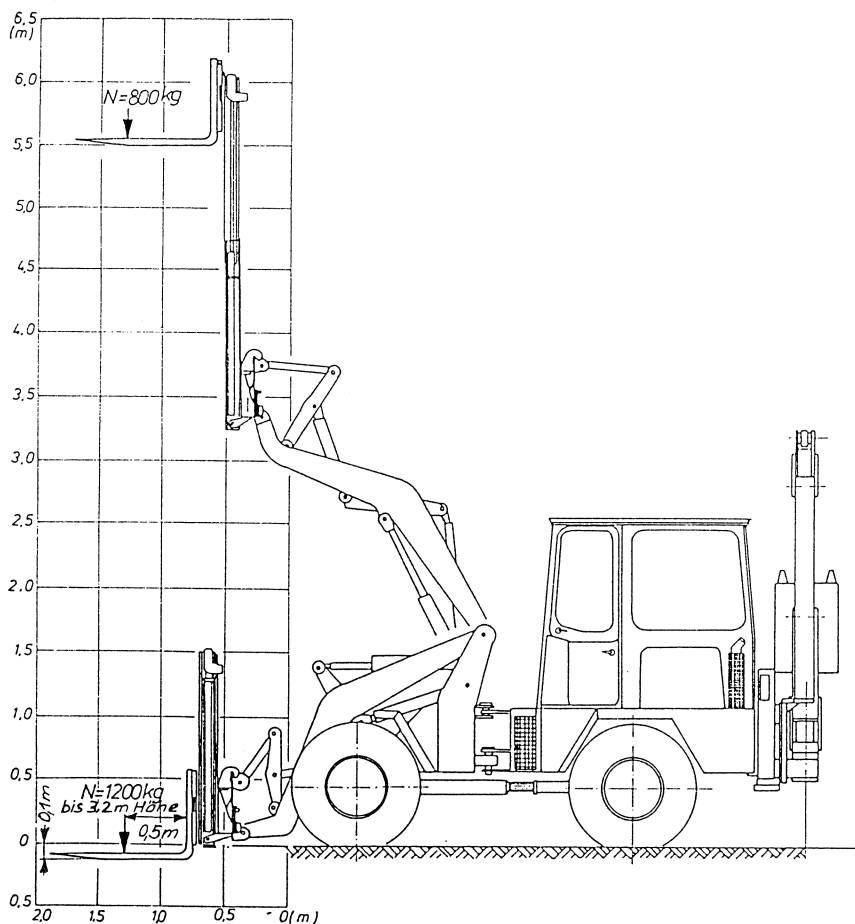
Telescopic high-lift

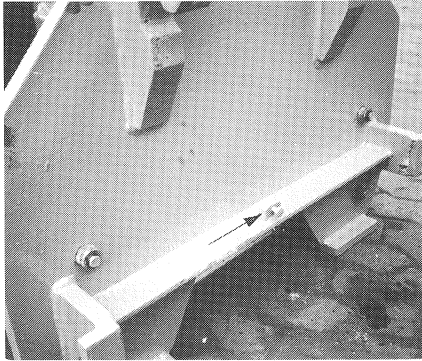
The high-lift can only be used in connection with the quick-change frame and tilt cylinder lock. Mounting acc. to description on page 32. Ensure that there is a good connection of the high-lift to the quick-change plate during mounting. A lateral adjustment of the fork tines is possible. Adjust both tines at the same distance to the center, make sure the load centered and placed on both fork tines.

Fork tines distance: min. 216 mm } Locking groove distances are
max. 1054 mm } measured acc. to DIN 15173,
load capacity category 2,
row 2, in fork tines center.

All grease points are to be lubricated before using attachment or every 10 working hours.

Diagram of reach





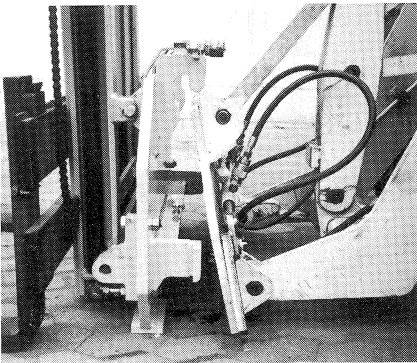
111. 36

Mounting the telescopic high-lift

- (1) Check that contact screw is tight (ill. 36/arrow).

NOTE!

Tighten contact screw, if loose before mounting the attachment. Adjust the screw afterwards, see point (3).



111. 37

- (2) Pick-up the telescopic high-lift with the quick-change frame, (ill.37) lift up and tilt the quick-change frame back till the high lift is laying completely against the frame. Lock the high lift with the frame by means of the hand lever (ill.15/6).

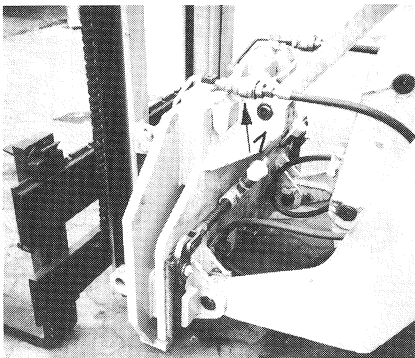
- (3) Arrange the hydraulic connections between loader and high lift by means of rapid couplings (ill.38/1). Make a function test of the E-switch.

NOTE!

The contact screw (ill.36/arrow) has to press the indexing bolt of the E-switch deeply enough that the switch point is reached. Don't exceed the free-play of the E-switch, otherwise the E-switch will be destroyed.

ATTENTION!

Check correct mounting, secure wedging, tilt locking system and that the attachment is working properly before operation.



111. 38

Multi-purpose bucket

The multi-purpose bucket can be fitted to the quick-change frame or directly to the loader lift arms.

The multi-purpose bucket can be used for digging, scraping, loading or as a grab.

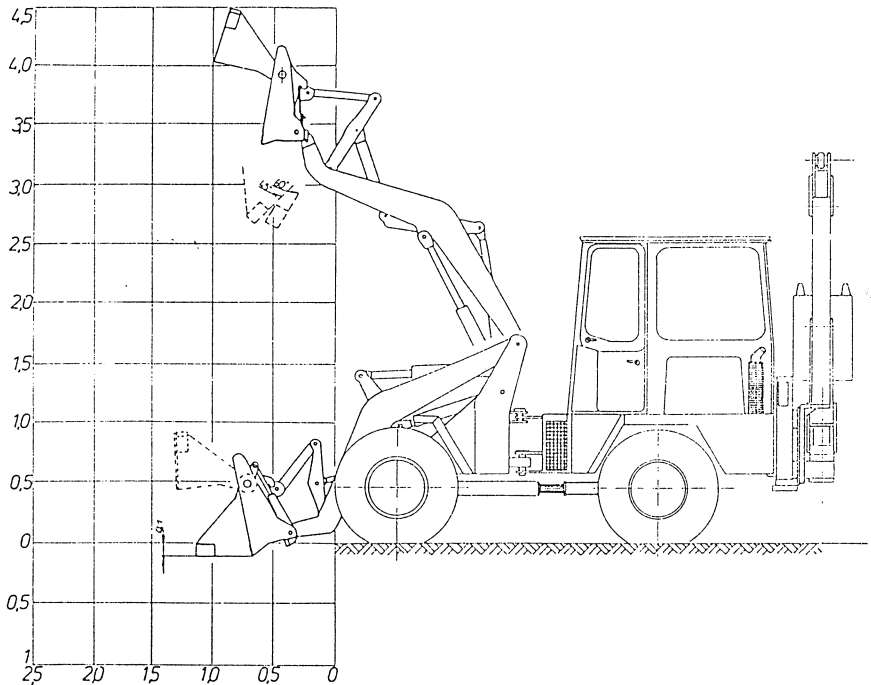
The procedure for attaching the bucket to the machine is described in para 5.

ATTENTION!

Check that the rapid couplings are clean and make sure they are firmly connected.

Lubricate the grease points each time before using the attachment or every 10 hours of operation.

Diagram of reach



6. Switching off the loader

- (1) Park the machine on a hard surface and , whenever possible, on flat ground.
- (2) Lower bucket or attachment to the ground.
- (3) Place backhoe in "transport position".
- (4) Put drive-control lever into neutral "0" position.
- (5) Engage parking brake.

WARNING!

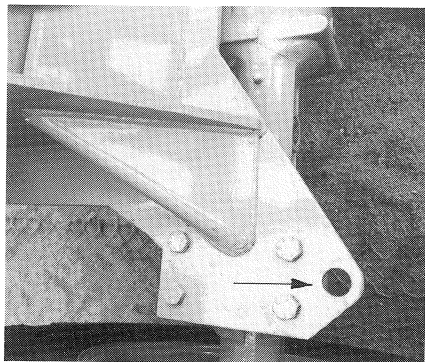
If parking on a slope cannot be avoided then it is necessary to place, in addition to the parking brake, in front of 2 wheels a wedge each and insert the articulation lock.

- (6) Pull the switch "engine stop" till engine stops. If diesel engine is very hot lt the diesel engine run 2 - 3 minutes more in idling before cutting-off.
- (7) Turn ignition key completely to the left and withdraw.

7. Towing the loader

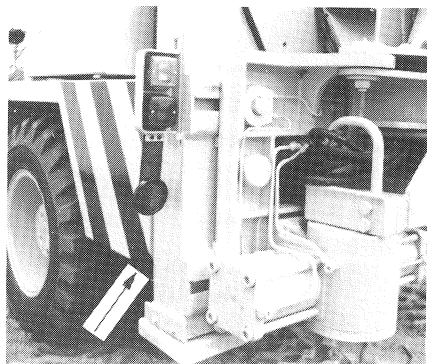
Prepare the loader acc. to para 2. Additionally the shovel arm has to be raised slightly to make space for the tow-bar.

If vehicle shall be towed forward, connect the tow-bar at the frame above the right axle fin (ill.40/arrow).



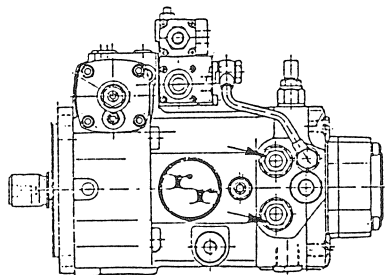
I11. 40

If vehicle has to be towed backward, connect the tow-bar in the eyelet under the the counterweight (ill.41/ arrow).



I11. 41

The hydrostatic transmission has to be switched to free-oil-flow before towing the machine. Unscrew the spring cage of both high-pressure-limit-valve 2 turns. Use fixed spanner NW22 (ill.42/ arrow).



I11. 42

Towing speed has to be adjusted to the emergency steering



8. Maintenance

WARNING!

Do not remove engine covers or carry out maintenance with engine running. All necessary maintenance works can be seen in the maintenance schedule. We point out that all faults which are resulting out of not observing maintenance schedule will not be repaired under warranty.

Ill.43

A shovel arm support is to be put between frame and shovel arm before maintenance works, which are to be done in the area of the shovel arm.

Do not carry out maintenance work near the articulation joint without engaging the articulation lock (ill. 45/arrow).

Secure the vehicle against moving away by means of wedges.

Do the oil-level checks when the loader is in a horizontal position and the shovel arm in the lowest position.

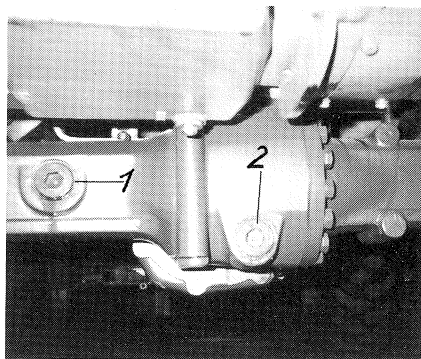
Do the oil change at working temperature of vehicle.

Clean grease nipples before greasing.

Oil from time to time rod links and hinges for which a greasing is not provided.

Oil check in the axles

- (1) Unscrew the plug out of the axle bracket (ill.44/1). The oil level should reach to the plug bore.
- (2) Unscrew the plug out of the planetary gear (ill. 45/arrow). The oil level should reach to the plug bore



Ill. 44

Oil change in the axle

- (1) Unscrew the plug out of the axle center gear (ill.44/2).
- (2) Turn the wheel in such a way that the plug (ill. 45/arrow) comes to the lowest position, unscrew plug.

WARNING!

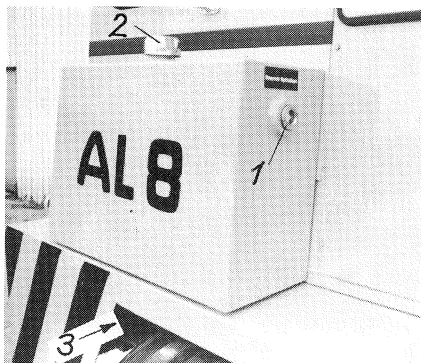
Collect leaking oil.



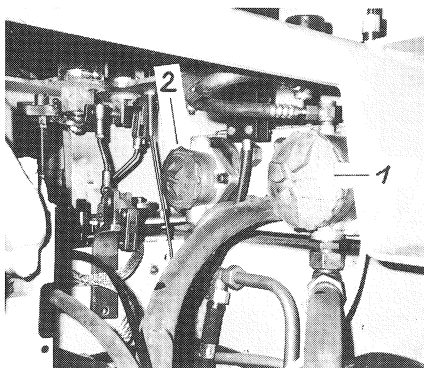
Ill. 45

Hydraulic oil reservoir

Capacity of hydraulic oil reservoir is 75 litres. If the oil level sinks so far that the oil gauge (ill.46/1) is free if the loader is in horizontal position and the shovel arm in lowest position, oil has to be refilled. The filler cap is on top of the hydraulic reservoir (ill.46/2), the drain plug is at the reservoir bottom and can be reached via mudguard space (ill.46/3).



Ill. 46



Ill. 47

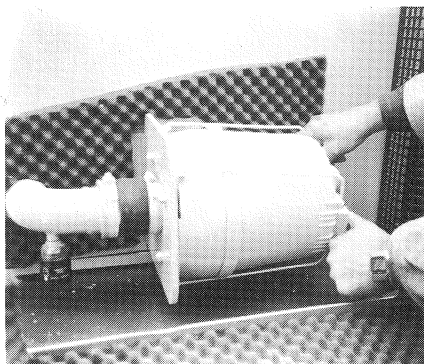
Hydraulic filter

The induction filter (ill.47/1) and the return filter (ill.47/2) are connected to the hydraulic tank and can be reached via the engine compartment.

Unscrew the cap to change the filters. The oil flow in the filters is shut-off automatically during replacing the filters. Smear the seal with oil before inserting a new element.

WARNING!

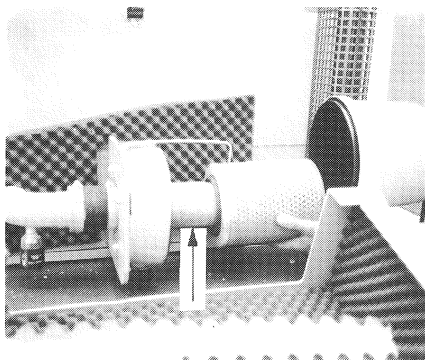
Collect oil which is running out of filter housing.



Ill. 48

Air filter

- (1) Swing out air intake cowl to the side.
- (2) Push the filter clamps away to the side (ill.48).



Ill. 49

- (3) Remove dust collecting pot and filter element (ill.49).
- (4) Clean dust collecting pot.
- (5) Clean filter element and replace if necessary.

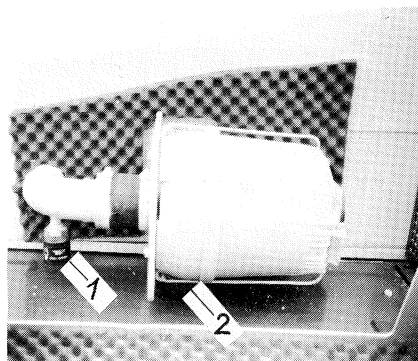
NOTE!

- Don't blow with dry compressed air higher than 5 bars from inside to outside.
- Does the condition indicator show red after maintenance, if so the inner cartridge (ill.49/arrow) has to be replaced.

ATTENTION!

Check that seal is undamaged before installing the filter element. Press the condition indicator button (ill.50/1) till the red warning sign - which shows up when the filter is clogged and needs service - springs back. Check air circulation lead between filter and engine if it is o.k. and replace if necessary.

- (6) Dust outlet valve (ill.50/2) squeeze the dust outlet valve approx. every 10 working hours several times by hand. The valve is accessible through the mud-guard space.



Ill. 50

Brake system

(1) Service brake

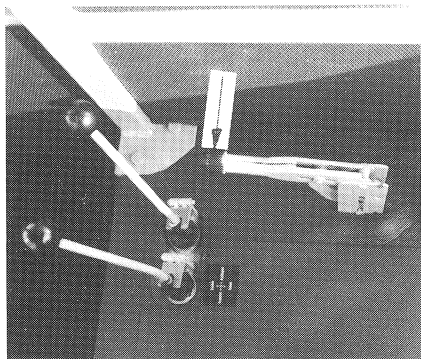
The service brake is maintenance free (hydrostatic transmission). The service brake has to be checked each time before using the loader. The braking retardation is the same forward or backward.

(2) Parking brake

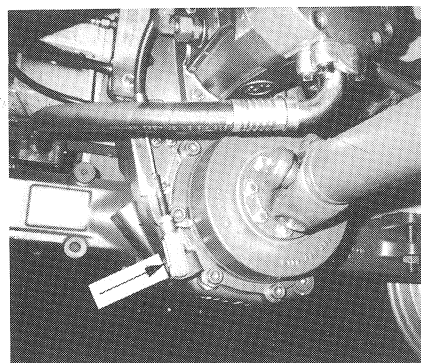
The adjustment of the parking brake will be done at the turning handle of the hand lever (ill.51/arrow).

Adjustment:

- Turn the hand lever in its released position (ill.51).
- Adjust pretension by means of the turning handle.
- The pretension is correctly adjusted if the lever can be turned out of the horizontal position over the point of its self-locking without so much force.
- Make a brake test. The braking efficiency has to be so high that the vehicle will be held back in travelling gear with full throttle.
- Is the adjustment at the turning handle impossible because of a setting way which is too big, the coarse adjustment has to be done at the bracket head of the supplementary gear (ill. 52/arrow).



Ill. 51



Ill. 52

Water filling in tires

The filling of the tires, with prepared mixture, will be done as follows:

1. Turn wheel so that the tire valve is in the highest possible position.
2. Unscrew the valve and insert a connecting nut (ill.53).
3. Screw the filling valve into the nut.
4. Run the fluid into the tire from a raised tank (ill.54).
5. Periodically press air-release knob on the filling valve (ill. 54).
6. Unscrew filling valve, replace the tire valve and pump up the tire with air.
7. Check the filling:

Turn wheel so that the valve is in a horizontal position (ill. 55). Fluid should then run out if the valve is opened.

Mixture: 46 l water
27 l magnesium-chloride

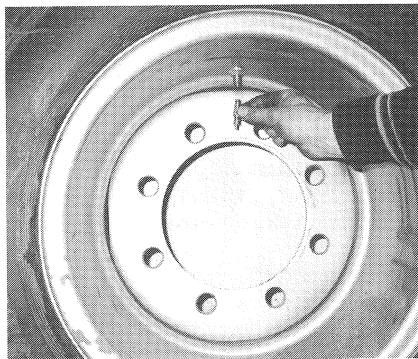
WARNING!

The magnesiumchloride must be added to the water, never the other way round.

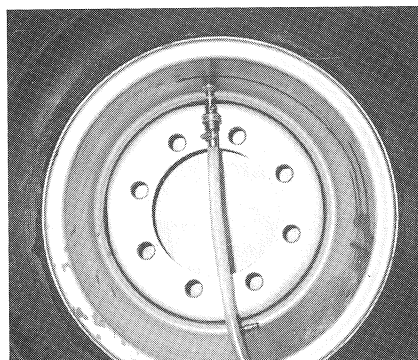
Make sure the solution does not come into contact with eyes, skin or clothing.

NOTE!

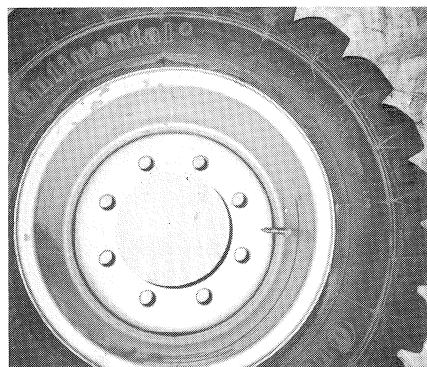
For correct tire pressure acc. to tire size, see page 6.



I11. 53



I11. 54



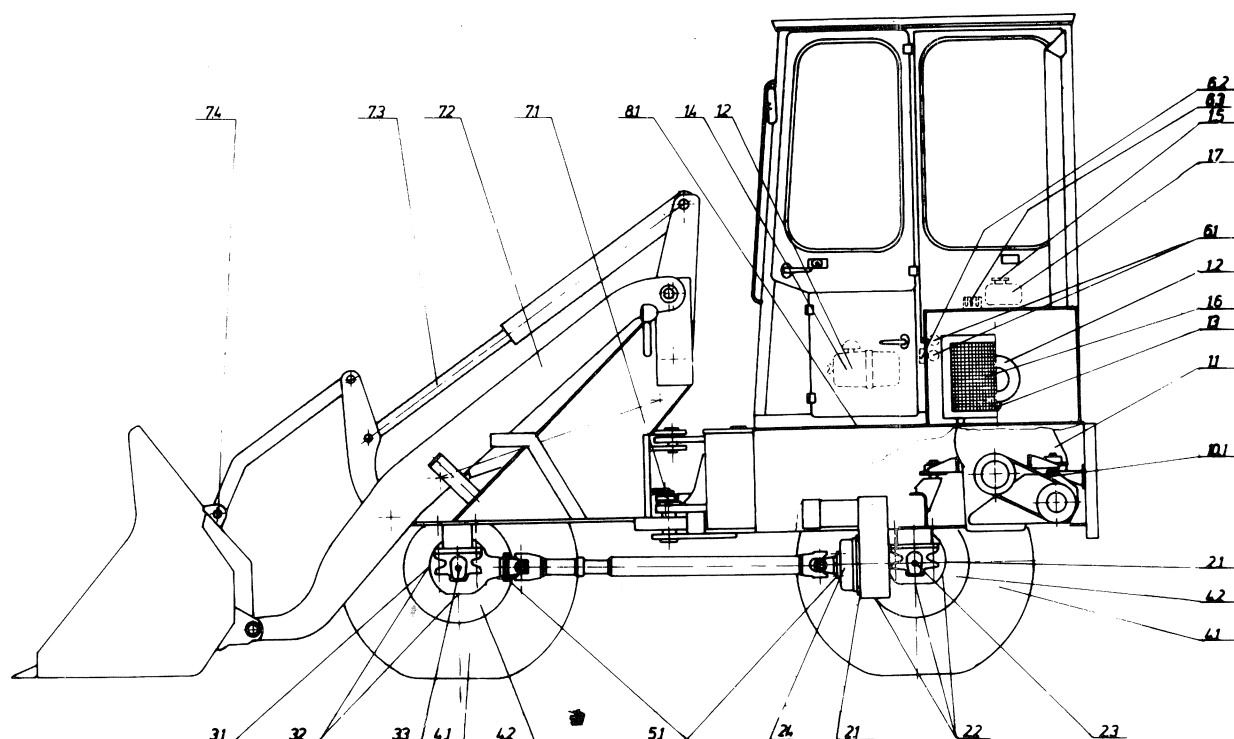
I11. 55

9. Failure, Cause and Remedy

Failure	Possible Cause	Remedy
Engine	-	See special operating instructions for engine
Shovel arm can't be lifted resp. lowered	Ball cock at limber is closed	Open ball cock
	Pressure relief valve in the control valve is open	Screw out, clean and re-adjust pressure relief valve (200 - 10 bar)
Increased steering force necessary	Pressure relief valve in servo steering valve is open	Screw out, clean and re-adjust pressure relief valve (170 - 10 bar)
	Sliding valve in priority valve jams	Change priority valve
No steering possibility	Locking bar is in position	Remove locking bar
Failures in drive and working hydraulic	Obstruction of filter	Change filter inserts
	Oil deficiency in hydraulic reservoir	Refill
	Electric connections at the axial piston pump or axial piston motor are not tightened or totally disconnected	Connect the nach connections acc. to electric wiring diagram
	Blown electric fuses	Change fuses
Failures at brake system	Parking brake does not hold the loader	Check adjustment and re-adjust or change brake liners whatever is necessary
	Service brake works irregularly	Check inch cartridge in the axial piston pump; check cords and function of brake cylinder

Failure	Possible Cause	Remedy
Generator does not charge	Electric connections are loose	Tighten connections
	V-belt torn	Change V-belt
	Generator speed too low	Check tension of V-belt and re-adjust it if necessary
Additional heater break-down	Fuse in fuse box or in heating unit defective	Change fuse
	Control device switches off	Set rotary switch into position "0" and repeat starting procedure
Hose couplings of attachments cannot be connected	Increased pressure due to heat influence to the attachment	Loose carefully screwed connection at the rapid action hose coupling, oil sprays off, the increased pressure breaks down. Tighten screwed connection. <u>NOTE!</u> Collect the oil
	Increased pressure in the basic unit	Make lines unpressurized by moving the control valve lever back and forth.
Working movements with backhoe impossible	Ball cock in the high pressure passing-over-line is opened	Close ball cock (above the mudguard)
	Pressure relief valve in pilot valve is open	Screw out, clean and re-adjust pressure relief valve
	Outrigger cannot be slewed	Safety bolt for road travelling has to be removed.

SERVICE PLAN



Position	Description	Specification	Filling quantity
1	Motor oil acc. to manufact instruction	MIL-L-2105C	approx 7l, with oil filter 75l
14	Cooling liquid	anti freezing and anti corrosive acc. to requirement	approx 12l
22	Gear oil SAE 90 Hypoid	MIL-L-2105B	approx 6l
23	Planetary drive SAE 90 Hypoid	MIL-L-2105B	2x0,7l
32	Gear oil SAE 90 Hypoid	MIL-L-2105B	approx 4l
33	Planetary drive SAE 90 Hypoid	MIL-L-2105B	2x0,7l
63	Hydraulic oil	ATF Suffix A or equivalent HLP-oil acc. ISO VG 46	ca 45l
7	Multipurpose grease lubrication	DIN 51502 K 2K	acc. to requirement
8	Distilled water		acc. to requirement

Explanations of symbols

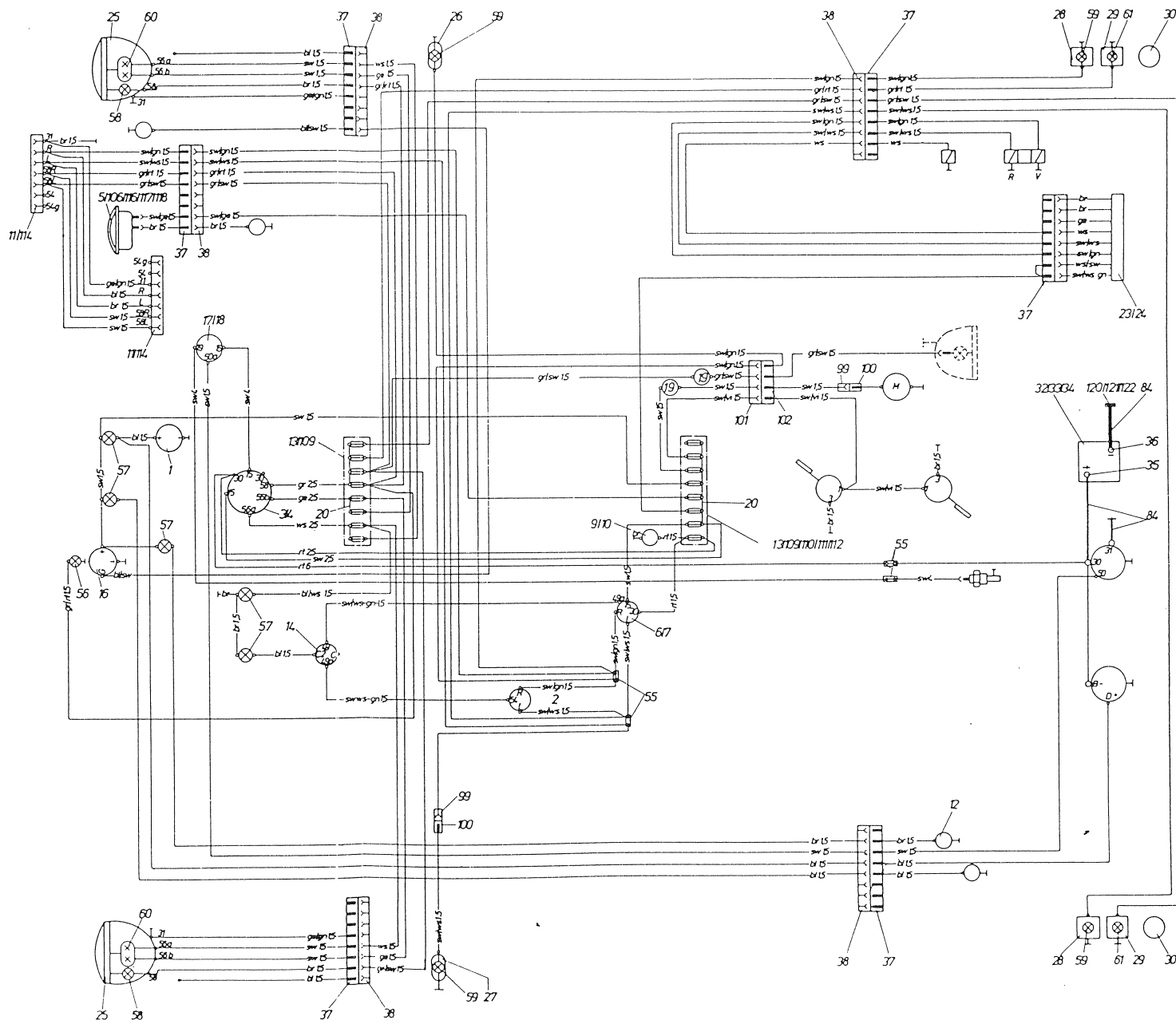
- △ first oil change resp. first filter change resp. first control
- control resp. greasing
- ◆ change at 1000 working hours or annually

CAUTION!

Please pay attention to safety rules when servicing the unit

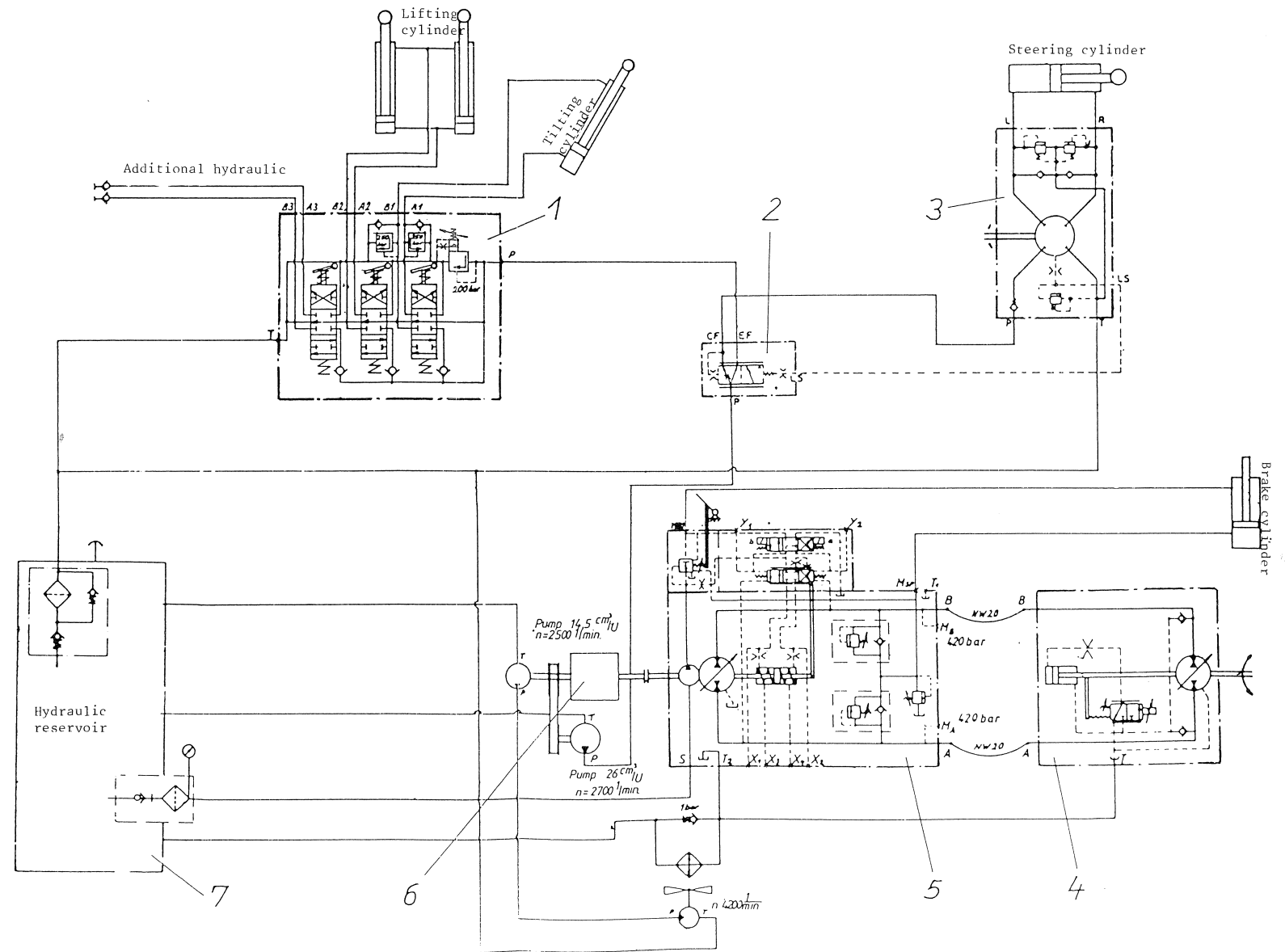
10	50	100	200	1000	Pos	
					1	Motor (air-cooled resp. water-cooled) air-cooled
					11	Maintenance acc. to manufacturers instructions (open motor cover)
					12	Dry-air filter (open air suction hood) Observe stop indicator during operation. Change filter element if indicator indicates "red"
○					13	Press dust valve (rubber bushing) several times
						water cooled
					11	Maintenance acc. to manufacturers instructions (open motor cover)
					12	Dry air-filter Observe stop indicator during operation. Change filter element if indicator indicates "red"
○					14	Empty dust collecting device
	○				15	Control water level in compensator reservoir and refill if necessary
					16	Test cooling water hose connection for leaks
				◆	17	Test coolant before winter for protection effect
						2 Rear axle with transmission
△			○		21	Axle gear/Distribution gear oil-level check (control screw)
				◆	22	Axle gear/Distribution gear oil change
			○		23	Planetary drive oil level check (control screw)
△				◆	23	Planetary drive oil change
○					24	Control resp. adjust parking brake
						3 Front axle
△			○		31	Axle gear oil level check (control screw)
				◆	32	Axle gear oil change
			○		33	Planetary drive oil level check (control screw)
△				◆	33	Planetary drive oil change
						4 Wheels and Tyres
△			○		41	Control inflation-pressure
					42	Control wheel-nuts
						5 Cardan shaft
			○		51	Control fixing
						6 Hydraulic system
△				◆	61	Change filter cartridges, observe low pressure barometer in the cab, max 0,2 bar at operating temperature 60°C
					62	Oil-level check (sight glass)
				◆	63	Oil change
						7 Places for grease (red marked)
					71	Articulated oscillating link
○					72	Shovel unit
	○				73	Hydraulic cylinder
○					74	Attachments
						8 Battery
				○	81	Sight control
						9 Brake systems
					91	Operating brake (hydrostatic drive) and parking brake function control before operation
						10 Toothed belt
				○	101	Control resp. adjust toothed belt tension

- Pos. 1 Instrument Cluster
 Pos. 2 Indicator Switch
 Pos. 3 Ignition light switch
 Pos. 5 Horn
 Pos. 6 Warning light transmitter
 Pos. 9 Socket
 Pos. 11 Attaching socket 7-poles
 Pos. 12 Temperature switch
 Pos. 13 Fuse box 8-poles
 Pos. 14 Blinker unit
 Pos. 16 Fuel gauge
 Pos. 17 Push button
 Pos. 18 Hot-tube ignition switch
 Pos. 19 Pull switch
 Pos. 20 Connecting band
 Pos. 23 Steering column switch
 Pos. 24 Clamping ring half
 Pos. 25 Attaching head light
 Pos. 26 Blink lamp, orange R
 Pos. 27 Blink lamp, orange L
 Pos. 28 Blink lamp, orange
 Pos. 29 Tail light, red
 Pos. 30 Reflector, red
 Pos. 32 Battery 12 V 88 Ah
 Pos. 37 Plug housing
 Pos. 38 Adapter plug housing
 Pos. 55 Cable sleeve
 Pos. 56 Bulb 12 V 2W
 Pos. 57 Bulb 12 V 2W
 Pos. 58 Bulb 12 V 4W
 Pos. 59 Bulb 12 V 21 W
 Pos. 60 Bulb 12 V 35/35 W
 Pos. 61 Tubular lamp
 Pos. 84 Electric lead 35mm²
 Pos. 99 Adapter plug housing
 Pos. 100 Plug housing
 Pos. 101 Adapter plug housing
 Pos. 102 Plug housing



12 HYDRAULIC - DIAGRAM

- 1 Control valve
- 2 Priority valve
- 3 Servo steering valve
- 4 Hydro-engine } hydrostatic
- 5 Hydro-pump } drive
- 6 Internal combustion engine
- 7 Hydraulic oil reservoir



13. General hints

The following is supplied together with the unit:

- Operating instructions for the engine. Please take all detail regarding the engine from these operating instructions.
- A valid copy of "Safety rules for excavators, loaders dozers, scrapers, and special machines for excavation work".
- A list of spare parts.