AHLMANN

OPERATING INSTRUCTIONS

Articulated Loader AL 6B AL 7

Ahlmann-Maschinenbau GmbH · D 2370 Büdelsdorf

P R E F A C E

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

Please read this manual carefully and adhere to 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 observe these instructions exactly.

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

Ahlmann-Maschinenbau GmbH
Am Friedrichsbrunnen 2

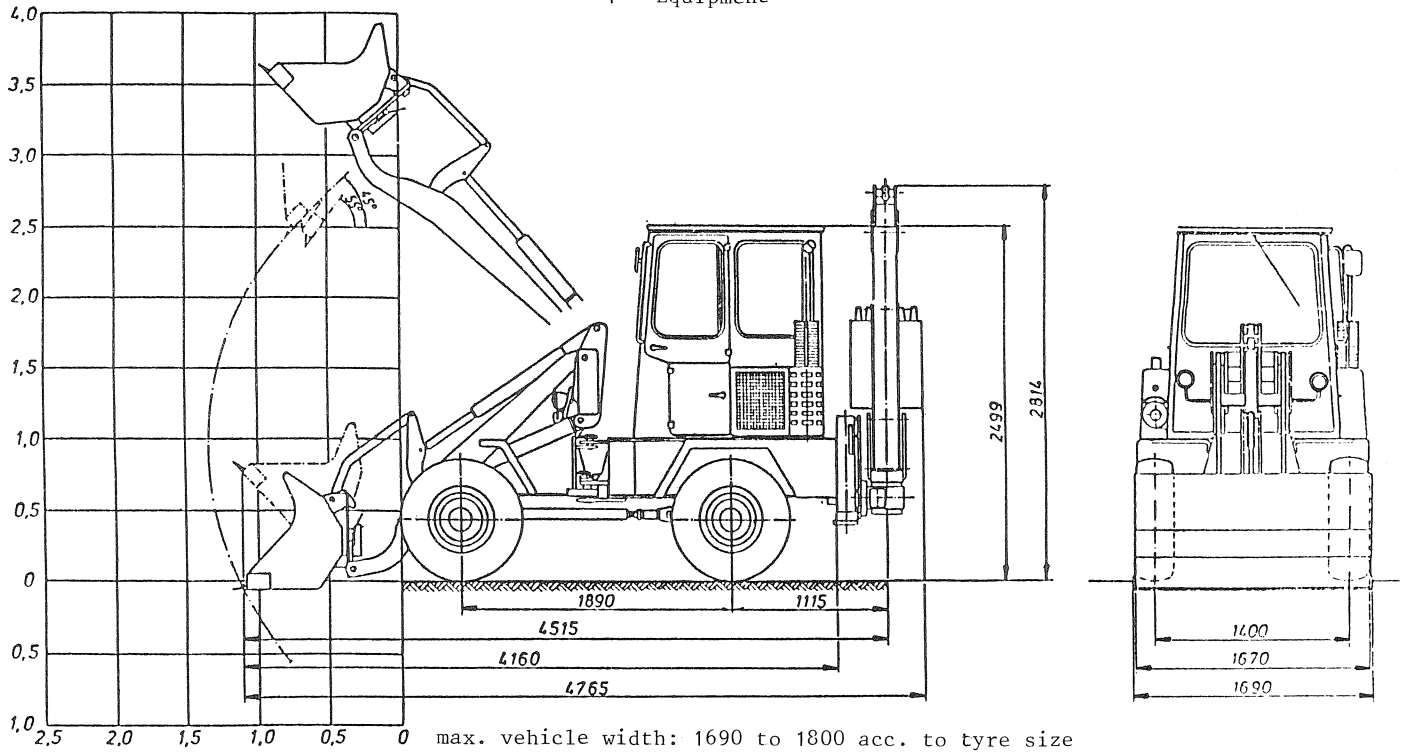
D-2370 Büdelsdorf

Telephone: (4331)3510

Teletex: 433 111

Issue: 10/1985 - starting with chassis-no. 47105100

C O N T E N T S



max. vehicle width: 1690 to 1800 acc. to tyre size

Illustration 1

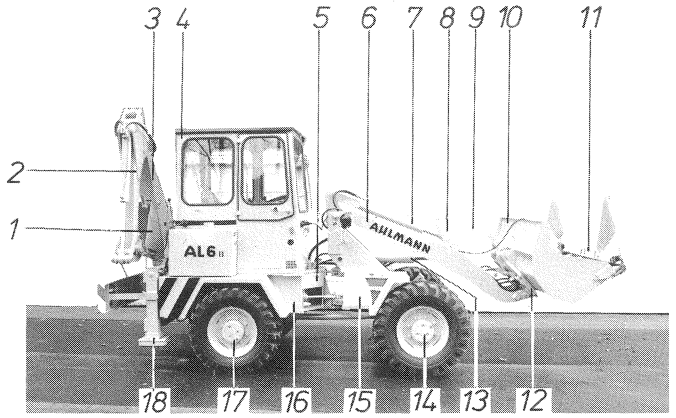


Illustration 2

Illustration 3

1 - rear-mounted backhoe
2 - rod
3 - outrigger
4 - driver's cabin
5 - oscillating articulation
6 - shovel arm
7 - tipping cylinder
8 - shift lever
9 - drag-link
10 - bucket/attachments
11 - bucket protection
12 - quick-change frame
13 - lifting cylinder
14 - front axle
15 - front chassis
16 - rear chassis
17 - rear axle
18 - rear-mounted backhoe support
19 - rear-mounted backhoe slewing unit
20 - anti-collision protection

General informations

"Right" and "Left" for basic vehicle are seen from driver's stand. "Right" and "Left" for rear-mounted backhoe are seen from driver's seat in working position.

Rights to alter vehicle specifications are reserved.

1.1 Description and technical datas

Diesel engine, air-cooled or water-cooled

air-cooled

- air-cooled diesel engine, Klöckner-Humboldt-Deutz, type F2L511,
- 2 cylinder, 4-stroke, direct fuel injection,
- displacement 1650 cm^3
- bore 100 mm, stroke 105 mm
- output 25,7 kW (35 hp) at 3000 min^{-1}, acc. to DIN 6270 continuous rating B,
- fuel consumption 225 g/kW/h,
- starter 2,4 kW (3,3 hp), 12 V,
- dry air cleaner
- three-phase generator 33 A, 12 V,

water-cooled

- water-cooled diesel engine, Perkins, type 3.1524,
- 3 cylinder, 4 stroke, direct fuel injection,
- displacement 2500 cm^3
- bore 91,44 mm, stroke 127 mm,
- output 33 kW (45 hp), at 2000 min^{-1}, acc. to DIN 6270 continuous rating B,
- fuel consumption 232 g/kW/h,
- starter 2,3 kW (3,2 hp), 12 V,
- dry air cleaner
- three-phase generator 45 A, 12 V,

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 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 excavator is equipped with 4 equal sized tyres.

  Standard tyres are:

  - 12,5-18/MPT/6PR for loader excavator with water-cooled engine
  - 10,5-18/6PR for loader excavator with air-cooled engine

tyre size	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)	1,8	* 1,8	* 1,8	2,0	2,0	* 1,8
10,5-18/6PR/TL (tubeless)	2,0	* 2,0	* 2,0	2,5	2,5	2,0
15,5/55-R18/14PR	1,8	* 1,8	* 1,8	2,0	2,0	2,0

* Water-filling with anti-freeze

Other tyre sizes upon request

NOTE!

If backhoe or rear-mounted grab will be installed later, the water filled tyres have to be mounted from the rear axle to the front axle. (The rear right wheel against the front left wheel and the rear left wheel against the front right wheel).

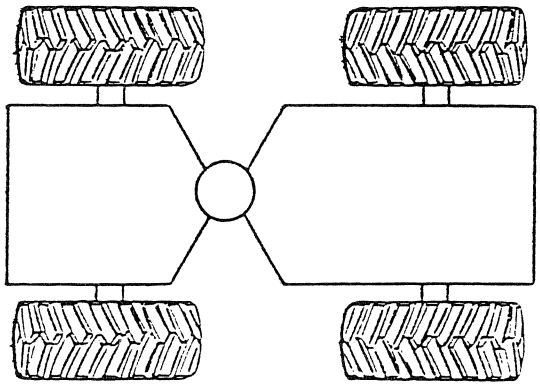


Illustration 4

Tread positioning

Operating characteristics

Operating characteristics (with standard tyres)

- working speed 0 - 9 km/h
- Travelling speed 0 - 20 km/h

Noise insulation: Conform with the current German regulations.

Pushing force
on dry concrete surface 2400 daN

Gradeability
with payload without backhoe 54 %

Gradeability
with backhoe and water filling
in front tyres 45 %

Ground clearance: 280 to 325 mm acc. to tyre size

Minimum external turning radius R = 3800 mm

Oscillation of front chassis 11° up, 11° down
height difference of the
wheels 260 mm

Articulation of front chassis 40° to the left, 40° to the right

Axle loads/Weights

	with air cooled engine	with water cooled engine	
front	1450 kg	1400 kg	without backhoe and without
rear	2150 kg	2400 kg	payload, with standard bucket/
total weight	3600 kg	3800 kg	quick-change frame and water filling in the rear mounted tyres
front	1100 kg	1050 kg	with backhoe, rear-mounted grab
rear	3400 kg	3750 kg	without payload, with standard
total weight	4500 kg	4800 kg	bucket/quick-change frame and water filling in the front mounted tyres

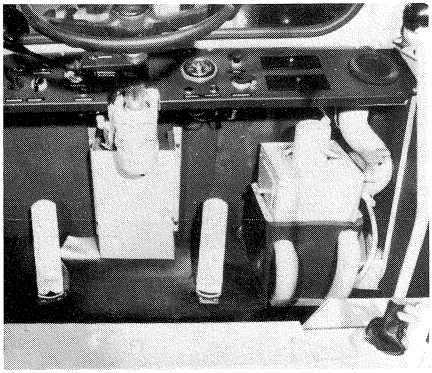
Steering System

The hydrostatic steering system is fed by a gear pump via a priority valve. The oil flow is led via a servo valve into the steering cylinder by means of a little expenditure of energy at the steering wheel.

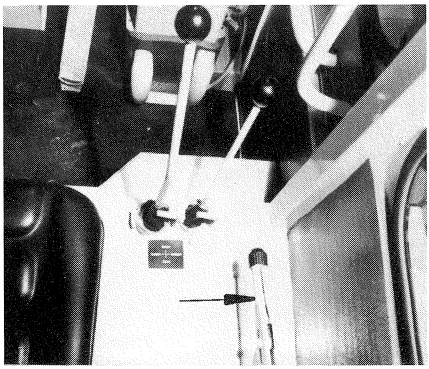
Max. steering pressure 175 bar

Emergency steering

It is possible to steer the vehicle in the event of an engine failure, but with a much higher expenditure of energy at the steering wheel. The towing speed should not exceed 5 km/h.



Ill. 5



Ill. 6

Braking System

Service brake

Foot operated service brake acts via a foot pedal which is mounted at the left side of the steering column and via a Bowden cable on a throttle in the axial piston pump. The driving speed will be slowed down or the vehicle will be stopped by adjustment of the throttle, which is independent on the driving speed.

NOTE !

When the foot pedal is fully pressed down the drum brake of the parking brake becomes operative and prevents movement of the vehicle.

Parking brake

The loadeer excavator is equipped with a parking brake which is manually actuated. The parking brake becomes operative via a Bowden cable on the reduction gear (rear axle) by actuating the hand lever wich is placed at the right side of the driver's seat.

Electrical Installation

Voltage 12 V

Battery 66/88 Ah 12 V standard

Three-phase current generator capacity see engine

Starter capacity see engine

Hourmeter

2 head lights, front

Emergency flash device

Direction flash lights

Tail lights

Working lights not standard

The light unit complies with German road travel regulations.

Battery

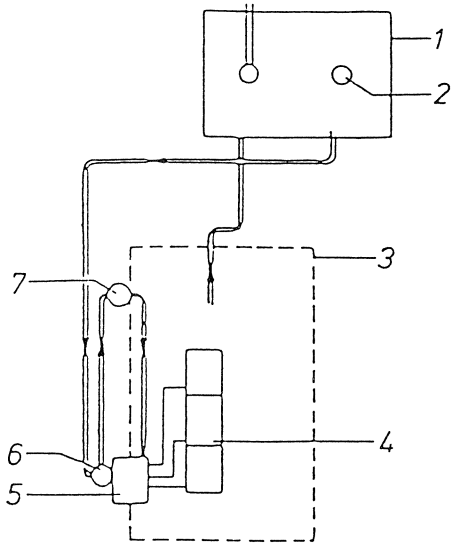
The loader excavator is equipped with a battery which is maintenance free acc. to DIN and which has a higher cold starting capacity. This battery needs no topping up.

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!

Welding at the loading excavator with electrical welding equipment has to be done only then when the battery terminals have been disconnected before starting the welding.



1 Fuel tank

2 Fuel filler socket

3 Diesel engine

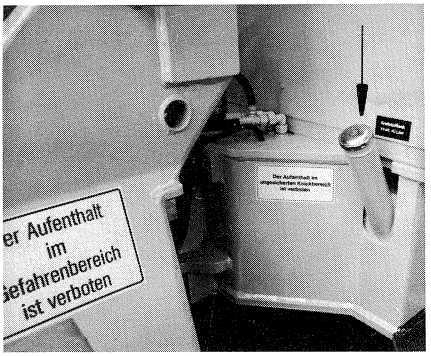
4 Injection nozzle
(2 cylinders resp.
3 cylinders)

5 Injection pump

6 Fuel supply pump

7 Fuel filter

Ill. 7



Ill. 8

Fuel delivery unit

The fuel tank is placed at the left side under the cabin. The fuel level in the tank will be checked by means of an electrical fuel gauge inside the cabin. The filler socket is at the left side of the at the rear side of the chassis (ill. 8/ arrow).

Lifting and Tipping System

- a lifting cylinder 100/55 mm
- a tipping cylinder 80/45 mm

} double acting

will be fed from a gear pump with a capacity of 57 l/min via a pilot valve.

Max. operating pressure - 190 plus, minus 5 bar with aircooled engine
- 200 plus, minus 5 bar with watercooled engine.

All movements of the shovel arm and of the shovel are controlled via a hand lever during sitting on the driver's seat. The hand lever is directly connected with the pilot valve via a linkage and this enables a stepless handling starting with very slow to maximum speed.

Shovel position

- tilt angle 45°
- dump out angle 55° (in highest position)

Lifting and clearing capacity

	aircooled engine	watercooled engine
- lifting capacity	3250 daN max.	3450 daN max.
- breakout capacity at shovel edge	3600 daN	3800 daN
- thrust capacity on dry concret ground	2400 daN	2400 daN
- tipping load		
- vehicle not articulated, shovel arm with standard shovel, max. elongation	2750 kg	3200 kg
- vehicle articulated, shovel arm with standard shovel, max. elongation	2420 kg	2800 kg

Cycle times

- lifting 5,0 sec.
- lowering 3,0 sec.
- dumping out 2,8 sec.
- tilting 2,0 sec.

Position of bucket resp. attachment

The driver can read the position of the bucket resp. attachment, if he sits on the driver's seat, by means of coloured marks on the connecting rod and on the shift lever.
The bucket bottom is set parallel to the ground if the marks on the shift lever and on the connecting rod show one line.

Outfit

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 instrument board

Electrical hourmeter, electrical fuel gauge, 12 V socket, pull switch for anti-collision light and several control lights.

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 allround visibility, heating.

One set of service tools

One articulation lock

Two wheel chocks

Extras: Allround light
Radio

NOTE!

The standard equipment as supplied by the factory, is in line with the usual standard. Local regulations in Germany or 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 of fuel.

2 Driving on public roads

2.1 Driving on public roads (without backhoe)

The driver has to have at least a driver's license class IV. The driver has to have the driver's license and the working permission with special licence with himself.

Following safety precautions have to be taken before starting a travel on public roads:

- Remove both connecting pins from the storage bin (Ill.9/1), insert them in the bracket (Ill.9/2) and secure them with the spring cotter pin.

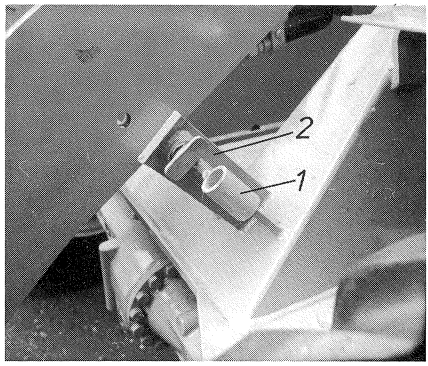
- Lower the shovel arm till the arm rests on the connecting pins.

- Block both operating levers in the driver's cabin by means of the settings (Ill.10/arrows).

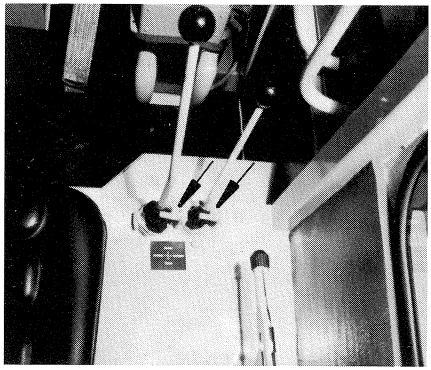
- Cover the bucket edge / bucket teeth with the bucket protection. Connect the electrical device of the bucket protection with the socket plug at the rear frame (Ill.11/arrow) and make a function test of the blinker marking lamps.

ATTENTION !

Driving on public roads with filled bucket is forbidden.



Ill. 9



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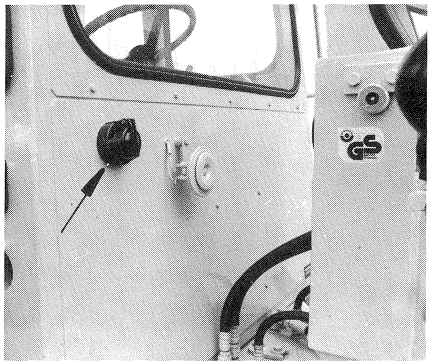

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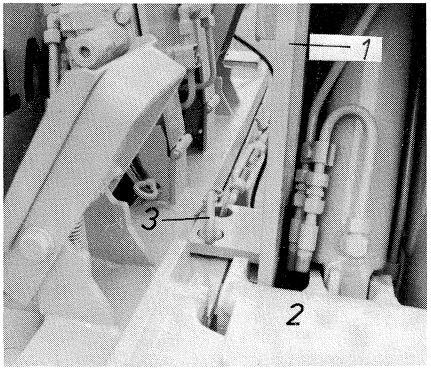

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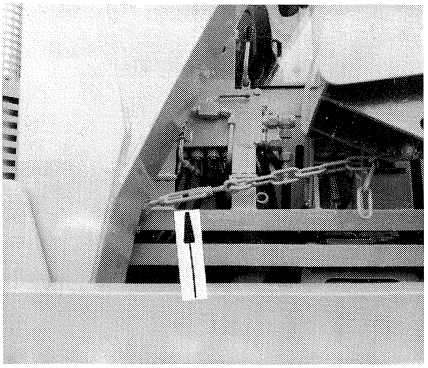

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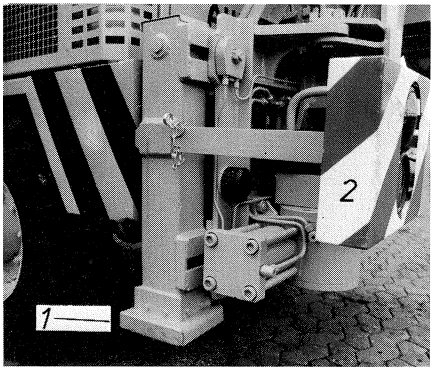


Ill. 14

2.2 Driving on public roads with backhoe

The safety precautions have to be done as written in 2.1 and additionally following precautions are to do before starting the travel on public roads:

- Swing the backhoe to the left and shift it laterally. Pivot the bucket to the stop. Bring the digger arm and boom in the closest distance. Connect boom (Ill.12/1) and traversing gear carrier (Ill.12/2) with the provided bolt (Ill.12/3) and secure it with the spring cotter pin. The bolt belongs to the service tools.

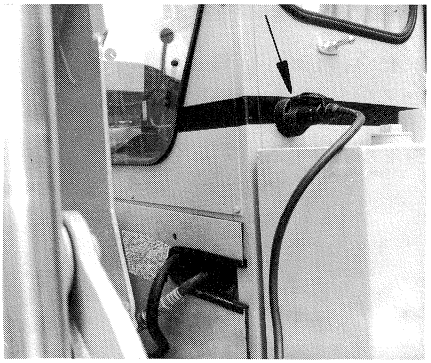
- Hang the open-link chain to the bucket and boom and tighten it with the tension lock (Ill.13/arrow). Raise the stabilizers up to the stop position (Ill.14/1).

- Fasten the lighting equipment, which corresponds with the German traffic regulations, together witch anti-collison protection at the backhoe. (Ill.14/2)

- Connect the wire plug for the lighting acc. to the German traffic regulations with the socket plug (Ill.15/arrow) and make a function test.

NOTE!

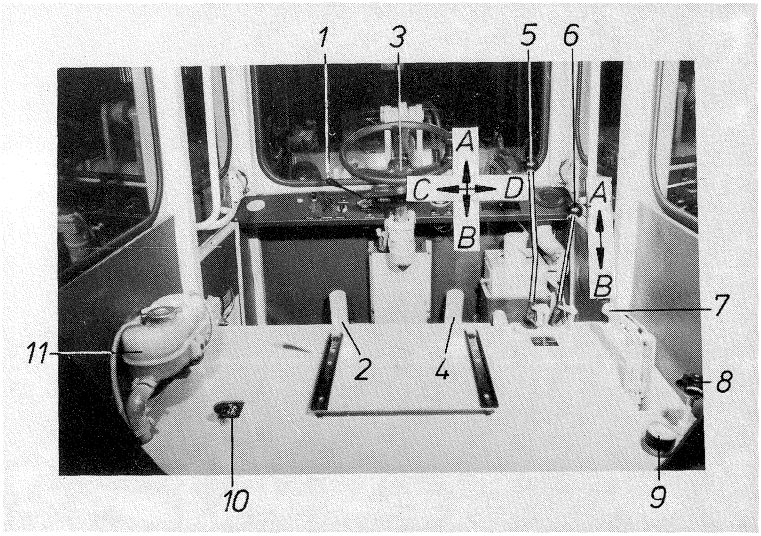
The loading height has to be considered if the the loader excavator with back-hoe shall be transported a longer route.
The loading space can be limited on a minimum by removing the backhoe.



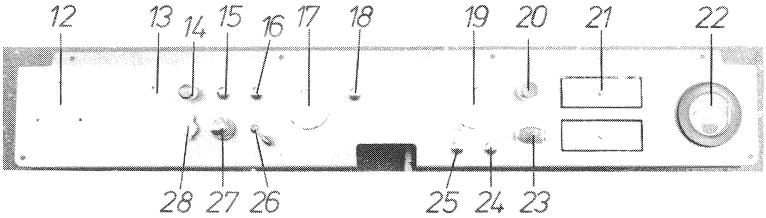
Ill. 15

3 Operation- and Control Elements

3.1 Operation- and control elements on the dashboard and inside the driver's cabin



Ill. 16



Ill. 17

Operation- and control elements on the dashboard and inside the driver's cabin (Ill. 16 and 17)

1 Steering arm switch
- Controller "forward - backward"
- Gear shift "road- (below) - and working gear (above)"

2 Brake pedal

3 Push-button for signal horn

4 Accelerator (also diesel engine stop with aircooled engine)

5 Hand lever for working hydraulic (with press-button for tipping protection)

6 Hand lever for additional hydraulic (not standard)

7 Parking brake lever

8 Hand throttle (not standard)

9 Vacuum gauge for suction hydraulic filter

10 Choke with aircooled engine
engine stop with watercooled engine

11 Expansion tank

12 Hot air outlet for additional heating (not standard)

13 Rotary switch for additional heating (not standard)

14 Pull switch for heating unit (standard heating)

15 Telltale lamp for head light

16 Telltale lamp for blinker

17 Fuel gauge

18 Telltale lamp for temperature of cooling water (only with watercooled engine)

19 Hourmeter

20 Engine start
- push button with aircooled engine
- preheat switch with watercooled engine (pull switch)

21 Fuse boxes

22 Hot air outlet (standard heating)

23 Ignition-light switch

24 Charging indicator light

25 Warning light engine oil pressure

26 Direction blinker switch

27 Pull switch for vehicular hazard warning signal flasher

28 Socket 12 V

29 Toggle switch for windshield wiper (not illustrated)
- pull knob for standard heating (see ill. 22)
- lid for food area heating (see ill. 22)
- Setting for hand lever (see ill. 10)

Operation of the bucket resp. attachments

Working with mounted bucket

Hand lever (Ill.16/5) in direction A - Lowering shovel arm
Hand lever (Ill.16/5) in direction B - Lifting shovel arm
Hand lever (Ill.16/5) in direction C - Tipping bucket
Hand lever (Ill.16/5) in direction D - Dumping bucket

Working with mounted multi-purpose bucket

Hand lever (Ill.16/5) in direction A - Lowering shovel arm
Hand lever (Ill.16/5) in direction B - Lifting shovel arm
Hand lever (Ill.16/5) in direction C - Tipping bucket
Hand lever (Ill.16/5) in direction D - Dumping bucket
Hand lever (Ill.16/6) in direction A - Opening bucket
Hand lever (Ill.16/6) in direction B - Closing bucket

Working with mounted forklift attachment

Hand lever (Ill.16/5) in direction A - Lowering shovel arm
Hand lever (Ill.16/5) in direction B - Lifting shovel arm
Hand lever (Ill.16/5) in direction C - Tilting tynes
(Press at the same time button at the lever)
Hand lever (Ill.16/5) in direction D - Tipping tynes

Working with mounted highlift

Hand lever (Ill.16/5) in direction A - Lowering shovel arm
Hand lever (Ill.16/5) in direction B - Lifting shovel arm
Hand lever (Ill.16/5) in direction C - Tilting highlift
(Press at the same time button at the lever)
Hand lever (Ill.16/5) in direction D - Tipping highlift
Hand lever (Ill.16/6) in direction A - Lowering tynes
Hand lever (Ill.16/6) in direction B - Lifting tynes

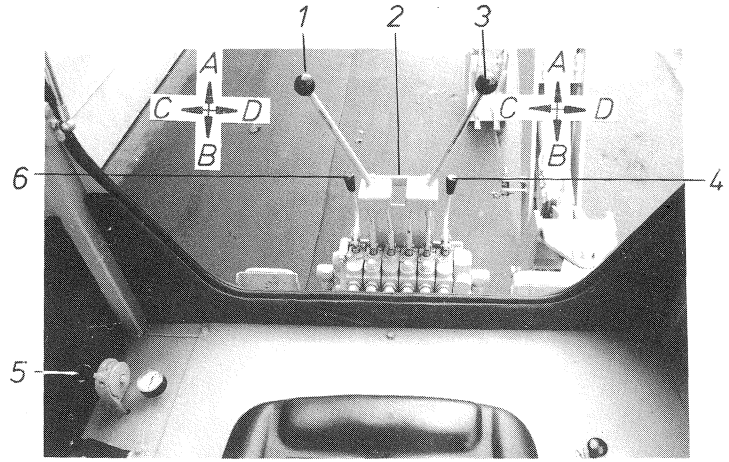
NOTE!

The movements can also be done combined, e.g. simultaneous lifting and tilting.

Engage the parking brake if loader is working in a stationary position (Ill. 16/7).

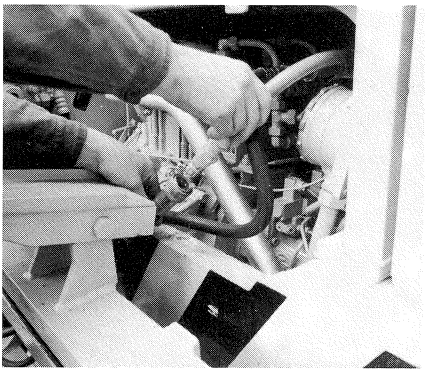
Engage the parking brake and lower the bucket or the attachment to the ground if you stop working.

3.2 Operation elements inside driver's cabin for backhoe



Ill. 18

1 Hand lever for boom and bucket
2 Ball stopcock for clamping device (at pilot valve)
3 Hand lever for digger arm and slewing
4 Right backhoe stabilizer
5 Hand throttle pull-rotary knob
  - pull in steps locked
  - fine adjustment within the steps by rotating or hand throttle lever operation with self-locking
6 Left backhoe stabilizer
  - Rear window can be hinged (not positioned)



Ill.19

Operation of the backhoe

Before the backhoe can be used or the hydraulic power will be needed for mounting the backhoe, the hydraulic hoses (Ill.19/arrow) have to be connected at their quick-couplings.

Hand lever (I11.18/1) in direction A - Lowering boom
Hand lever (I11.18/1) in direction B - Lifting boom
Hand lever (I11.18/1) in direction C - Emptying bucket
Hand lever (I11.18/1) in direction D - Filling bucket

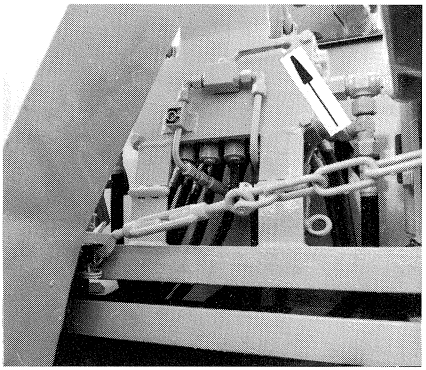
Hand lever (I11.18/3) in direction A - Extending digger arm
Hand lever (I11.18/3) in direction B - Folding digger arm
Hand lever (I11.18/3) in direction C - Slewing left
Hand lever (I11.18/3) in direction D - Slewing right

Hand lever (I11. 18/4) - Extending resp. folding the right backhoe stabilizer

Hand lever (I11. 18/6) - Extending resp. folding the left backhoe stabilizer

Laterally shifting

The shifting saddle of the backhoe is hydraulically locked and has to be loosened before shifting.



I11. 20

Loosening of the locking

- open the ball stopcock (I11.20/arrow),
- dump the bucket till to the stop, that means hand lever (I11.18/1) moved in direction "C" and hold in this position,
- close ball stopcock, release hand lever (I11.18/1)

Setting the locking

- open the ball stopcock (I11. 20/arrow),
- pull the bucket till to the stop, that means hand lever (I11.18/1) moved in direction "D" and hold in this position,
- close ball stopcock, release hand lever (I11.18/1).

I11.21

NOTE

The backhoe can be laterally shifted if locking is loosened. The boom has to be lowered for that purpose till the bucket touches the ground. The backhoe will be laterally shifted by means of the hydraulic power and support of the bucket (I11.21)

ATTENTION

The backhoe shall be used only after extension of the backhoe stabilizers and if these stabilizers are standing on hard soil (I11.21/arrow).

4 Start-up

4.1 Starting the diesel engine

(1) Pull the hand lever of parking brake (I11.16/7).

(2) Put steering arm switch (I11.16/1) in "0"-position.

(3) Insert the driving key in the ignition-light switch (I11.16/23) and turn to the right in position "1" (charging control lamp and warning light for oil pressure light up).

(4) Press the accelerator (I11.16/4) totally down.

(5) Operate push-button "start" (with aircooled engine I11. 1/20). Release push-button as soon as engine starts.

Pull the pull-knob (with watercooled engine I11.17/20) till to the end stop. Release pull-knob as soon as engine starts.

4.1.1 Cold start of the diesel engine

If there are low outside temperatures following has to be done:

- aircooled engine: pull the choke (Ill. 16/10) and release it (don't hold).
- watercooled engine: pull the preheat switch (Ill.17/20) to the first catch and hold it for 10 to 20 seconds before you pull it to the end stop.

NOTE!

The diesel engine cannot be started by towing the loader excavator.

4.2 Heating installation

4.2.1 Standard heating

Actuating:

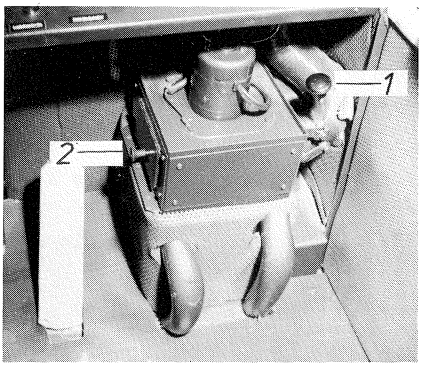
(1) Open hot air outlet (Ill. 17/22)

(2) Bring pull-knob (Ill.22/1) in "winter position" (pull knob upwards)

NOTE

The shut off valve in the warm water line has to be openend with watercooled engine.

(3) If the foot area shall be heated open the lid (Ill. 22/2) (swing the lid to the left).



Ill. 22

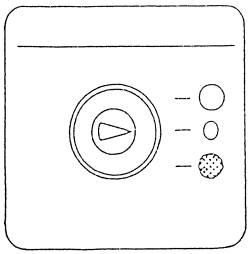
ATTENTION!

The blower in the heating installation runs with air-cooled engine also in summer operation, don't switch off.

4.2.2 Auxilliary heating- and ventilation installation

Technical datas:
- Eberspächer D 1 L
- diesel fuel approx. 0,21 1/h
- voltage 12 V
- heating capacity 1700 W

The installation can be used as heating as well as fresh air unit.



Actuating:

Turn rotary switch (I11.23)

Position ◯ = fresh air

Position ▨ (red) = blower with heater

I11. 23

The telltale lamp in the rotary switch (arrow) lights in both positions.

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

Malfunctions at the heating- resp. fresh air unit can be cleared by repeating the actuating procedure, as described above.

Does the heating not ignite check the fuse at the heating unit unter the protecting cap and replace respectively.

Switching off

The switching off takes place by turning the rotary switch (I11.23) to "0".

NOTE!

Leave the current flow from battery to heater for 3 minutes more after switching off. Don't interrupt current current flow.

WARNING!

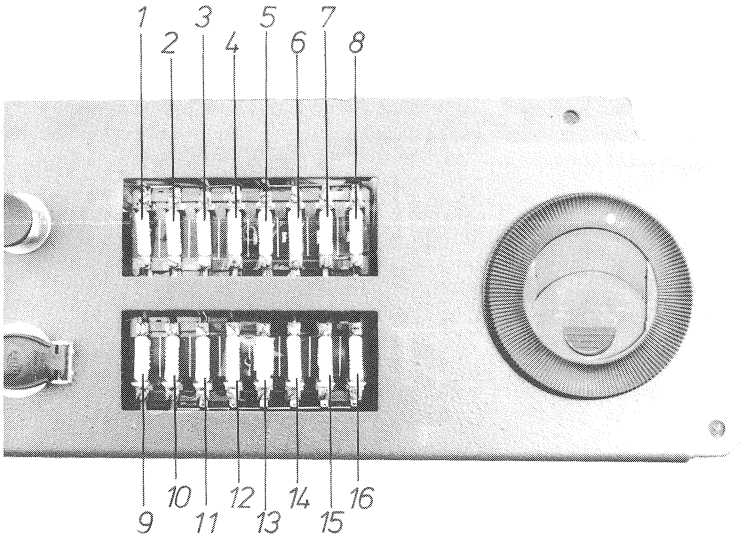
Do not actuate and use the heating in closed rooms and during the refuelling.

4.3 Light installation

The light installation will be switched with the ignition key which is inserted in the ignition-light switch (Ill.17/23).

Position "1" - Ignition system switched on
Position "2" - Parking light switched on
Position "3" - Head light switched on
Position "4" - Bright light switched on

Electrical fuses



Ill. 24

1 - Bright light, right
2 - Bright light, left
3 - Anti-dazzle light, right
4 - Anti-dazzle light, left
5 - Boundary light, right
6 - Boundary light, left
7 - Tail lamp, right
8 - Tail lamp, left
9 - Vehicular hazard warning signal flasher
10 - Blinker light
11 - Drive
12 - Signal horn
13 - Instrumentation lights and indicator lights
14 - Standard heating
15 - Windshield wiper
16 - Brake light

4.4 Activities during driving the loader excavator

(1) Release parking brake (I11. 16/7),

(2) Preselect operation gear resp. transport gear (I11.16/1),

(3) Preselect driving direction (I11.16/1),

(4) Operate accelerator (I11.16/4).

Loader excavator 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 direction switch can be done also during driving, but avoid it at high driving speed because of strong braking effect.

4.5 Activities during working with the loader excavator

Driving with the loader excavator is no problem. The loader -excavator can be used both in operation gear and in road gear from Zero to max. speed. Selection of gear depends on working conditions.

NOTE!

Switching from operation gear to road gear, or reversed, can also be done during driving. It is advised not to switch from road gear to operation gear during high driving speed.

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

Propulsive forces and driving speeds are "forward" and "backward" the same.

Driving with load

In order to use the full driving ability of the loader excavator, the filled bucket resp. the attachment will be hold close to the ground during driving.

Scraping/Levelling

Lower the shovel arm totally for scraping. The bucket position will be adjusted by the driver acc. to size of tyres and to ground conditions.

Scraping and levelling can be done both in operation gear and in road gear. Levelling will be done generally in backward motion with suitable bucket position.

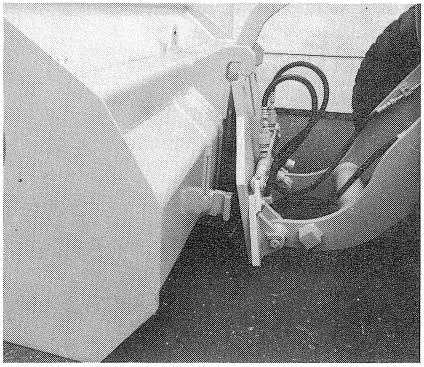
Bucket size/Payload

Never exceed operating capacity independent on the bucket size and bucket design.

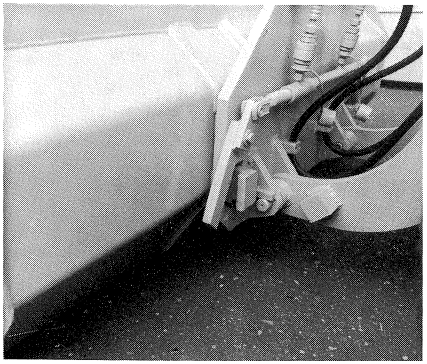
5 Dismounting and Mounting of buckets and attachments

(1) Bring shovel arm in lowest position and tip the changing frame (I11.25).

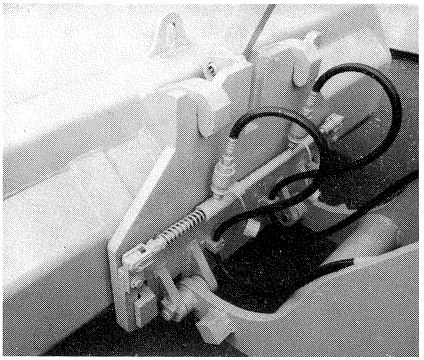
(2) Pick-up bucket resp. attachment with changing frame and lift, while tilting the changing frame at the same time, the bucket resp. the attachment till the changing frame (I11.26) fits.



I11.25



Ill. 26



Ill. 27

(3) Lock bucket resp. attachment (Ill. 27) with hand lever (Ill. 16/6).

ATTENTION!
Check correct suspension and locking.

(4) If a hydraulically operated attachment will be mounted, the hydraulic system of the attachment has to be connected with the changing frame after carrying out point (1) to (2).

- Remove safety caps from the quick couplings at the attachment.
- Detach quick couplings from the cylinder at the changing frame and screw them on the quick couplings of the attachment.
- Screw safety caps on the cylinder connections.

ATTENTION!
Pay attention to cleanness and tight connections.

5.1 Bucket types / Bucket sizes

- Compact buckets with or without teeth, sizes from 0,6 m^3 to 1,0 m^3
- Hydraulically operated multi-purpose buckets 0,5 resp. 0,6 m^3
- High-tip buckets and stone forks.

5.2 Attachments

Backhoe

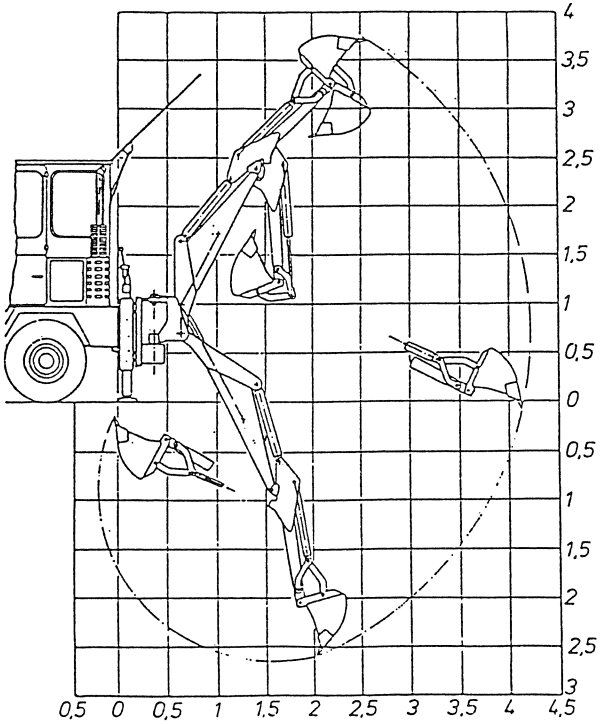
Backhoe, laterally shiftable, with hydraulic lock, slewable at 90° to the right and to the left.

Bucket widths from 260 to 500 mm
Bucket capacity 260 wide = 57 ltr.
300 wide = 40 ltr.
400 wide = 55 ltr.
500 wide = 70 ltr.

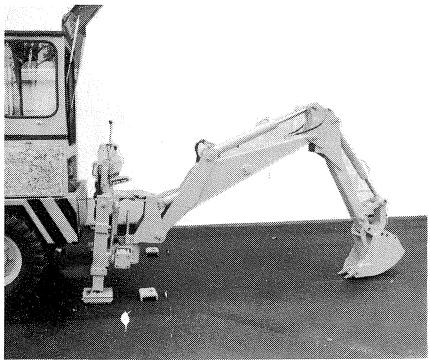
Breakout force with digger arm max. - 1800 daN with aircooled engine
- 1900 daN at watercooled engine

Breakout force at the bucket edge - 4300 daN with aircooled engine
- 4500 daN at watercooled engine

Diagram of reach



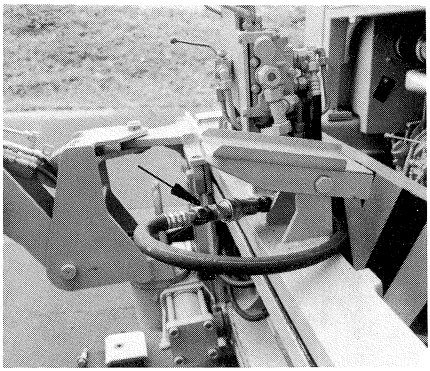
Ill. 28



Ill. 29

Mounting of the backhoe

Ill. 29 shows a basic unit with mounted backhoe.

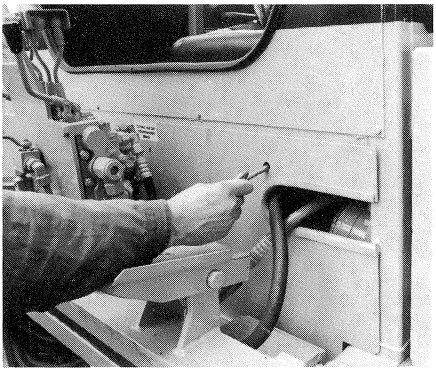


Ill. 30

Both hydraulic hoses at the backhoe are screwed together via quick couplings (Ill. 30/ arrow).

ATTENTION

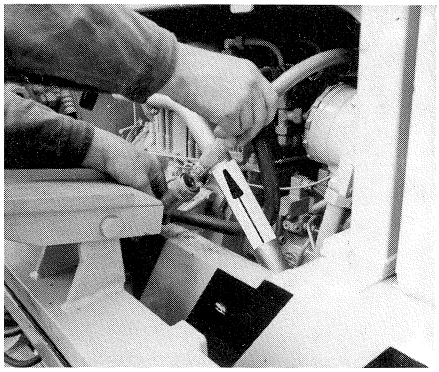
Pay attention to cleanness at the quick couplings.



Ill. 31

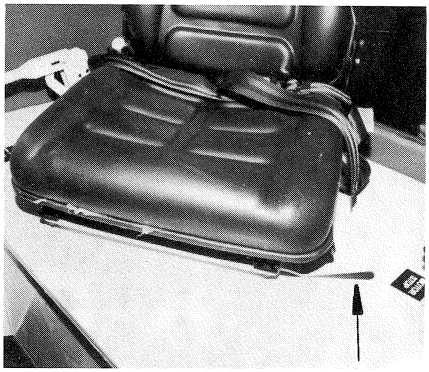
Unlock the engine cover and remove it from the basic unit (Ill. 31).

Decouple closed hydraulic hose in the basic unit. Connect both hydraulic hoses of the backhoe with the basic unit. Connect one hydraulic hose of the backhoe with the pipe connection in the basic unit and one hydraulic hose of the backhoe with the hydraulic hose of the basic unit. (quick coupling I11.32).



I11. 32

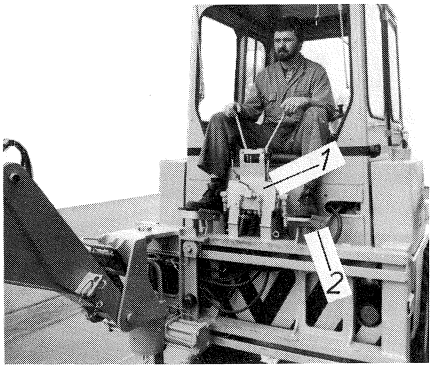
Unlock driver's seat (pull the lever up I11.33/arrow) and turn the driver's seat at 180°. Unlock rear window out of the inside of driver's cabin and open it completely to the outside.



I11. 33

Start engine and align the backhoe by means of its hydraulic system in such a way that the backhoe can be hung in at the counterweight plate in the lower part and that the clamping shoes (I11.34) can be put in and tightened in the upper part without problems. Check the tight fit and tighten up respectively.

I11.34



I11. 35

Pivot the pilot valve (I11.35/1) and flap the foot rest (I11.35/2) down.

Backhoe is ready to work.

ATTENTION

Both feet have to be put on the foot rest during working and at the same time to be retracted as far as possible.

NOTE

All grease points of the backhoe have to be greased thoroughly before working with the backhoe resp. all 10 working hours. The slewing gear will be greased thoroughly from the oil circuit and is therefore free of maintenance.

Fork-lift attachment

The fork-lift attachment can only be used in connection with the changing frame. Mounting and dismounting have to be done acc. to para. 5.

Pay attention to an exact mechanical connection at the changing frame if you mount the fork-lift attachment.

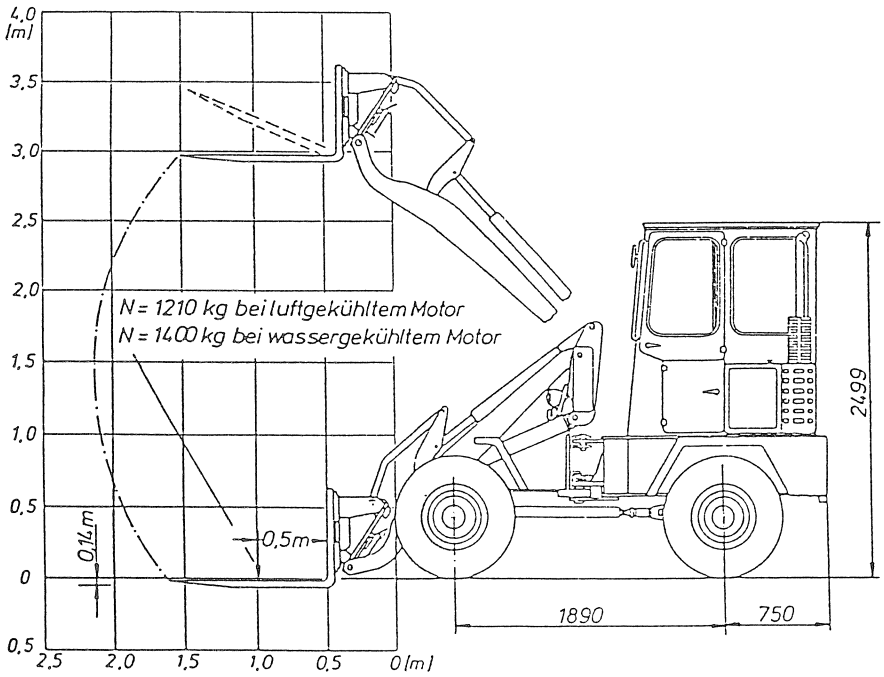
A lateral adjustment of the tynes is possible in steps.

Tynes distance: max. 216 mm
min. 1054 mm

Locking groove distances are measured acc. to DIN 15173, load capacity category 2, row 2, in fork centre.

Adjust both fork tynes in the same distance to the centre, make sure that the load is centered and placed on both tynes.

Diagram of reach



Ill. 36

Telescopic high-lift

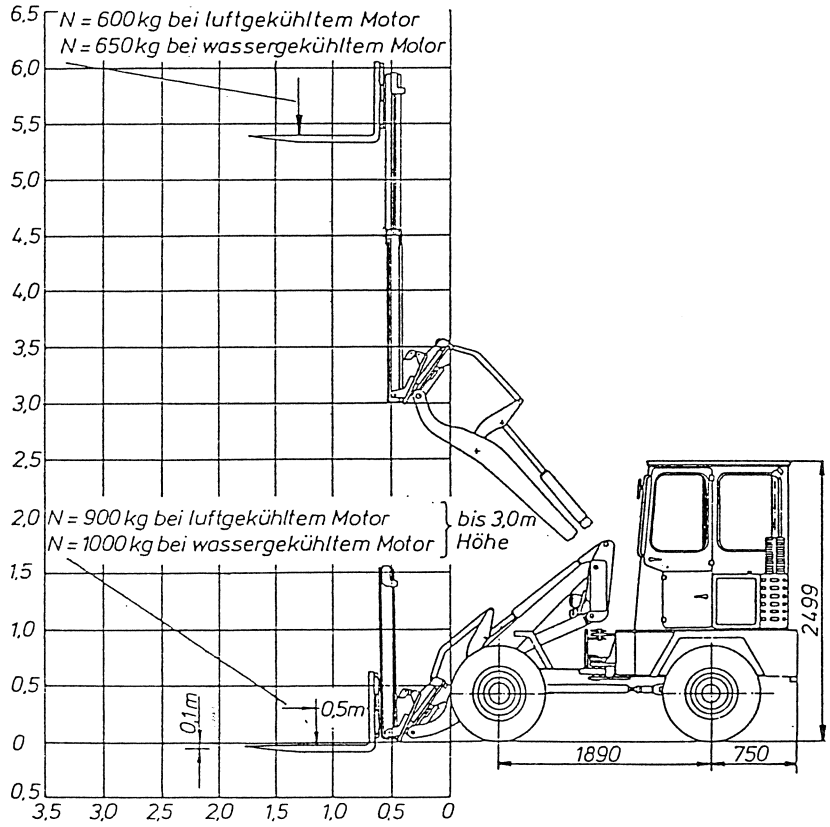
The telescopic high-lift can only be used in connection with the changing frame and tilt cylinder lock. Mounting and dismounting has to be done acc. to the instruction. Pay attention to an exact mechanical connection. A lateral shifting of the tynes is possible. Adjust both fork tynes in the same distance to the centre and make sure that the load is centered and placed on both tynes.

Tynes distance: min. 216 mm
max. 1054 mm

Locking groove distances are measured acc. to DIN 15173, load capacity category 2, row 2, in fork centre.

All grease points have to be greased thoroughly before each use resp. all 10 working hours.

Diagramm of reach



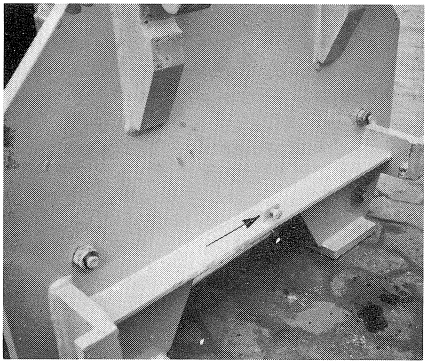
Ill. 37

Mounting the telescopic high-lift

(1) Check that contact screw at the changing frame is tight (I11.38/arrow).

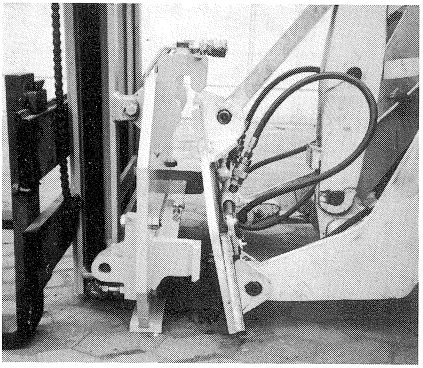
NOTE

Tighten contact screw if loosened before mounting the attachment.
Adjust contact screw after mounting. See point (3).



I11.38

(2) Pick-up the telescopic high-lift by means of the changing frame, (I11.39) lift up and tilt the changing frame back till the high-lift is completely lying against the frame. Lock the high-lift with the changing frame by means of the hand lever (I11.16/6).

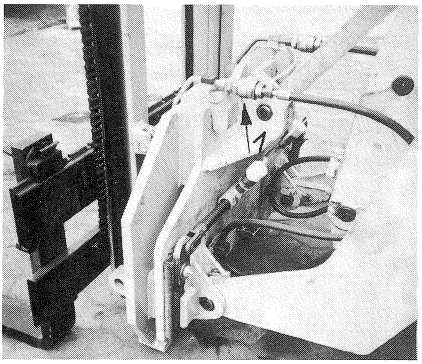


I11.39

(3) Arrange the hydraulic connections between loader and high-lift by means of rapid couplings (I11.40/1). Make a function test of the E switch.

NOTE
The contact screw (I11. 38/ 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 make a function test.



I11.40

Multi-purpose bucket

The multi-purpose bucket can be fitted directly to the shovel arm or to the changing frame depending on the construction.

It can be scrapped, peeled, worked as grab or as bucket with the multi-purpose bucket.

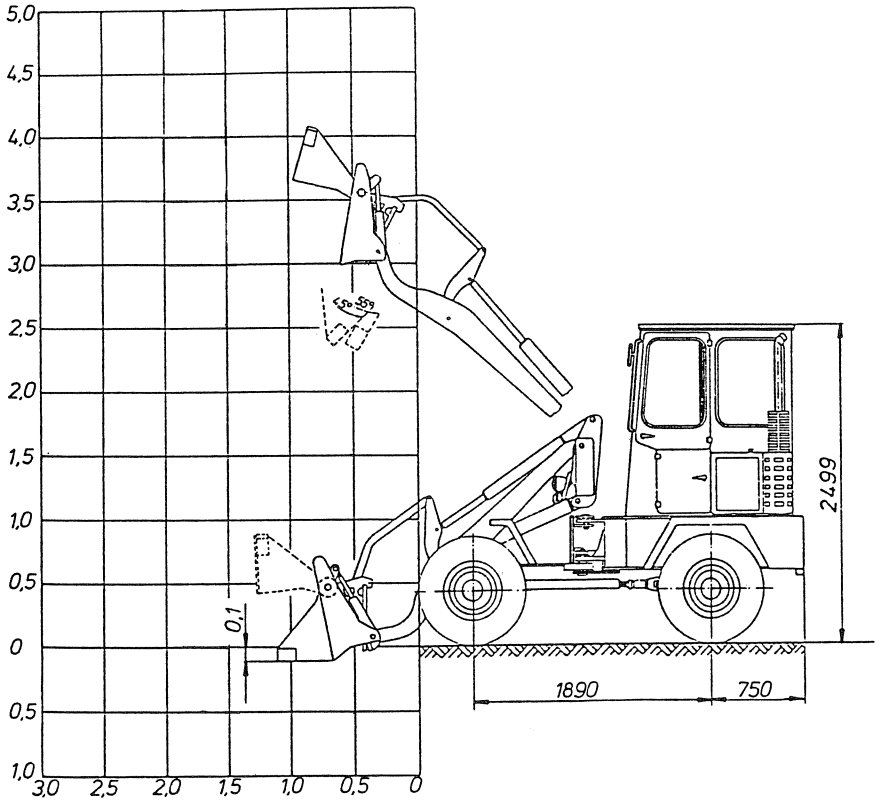
Mounting and dismounting has to be done acc. to para. 5.

ATTENTION!

Check that the quick couplings are absolutely clean and tight connected. Close open coupling halfs with safety caps.

Grease thoroughly all grease points before each use resp. all 10 working hours.

Diagram of reach



Ill. 41

6 Putting the loader out of action

(1) Park the loader-excavator on a hard surface, if possible not on slopes.

(2) Lower the bucket resp. the front-mounted attachment to the ground.

(3) If a rear-mounted backhoe is fitted bring the backhoe in transport position.

(4) Set the direction switch on "0".

(5) Tighten parking brake.

ATTENTION

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.

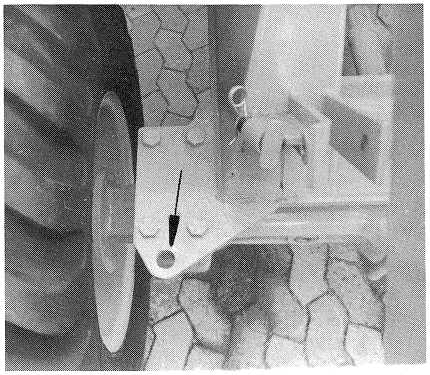
(6) Stop the engine:

- with the aircooled engine,the accelerator (I11.16/4) will be pressed down at the heel support so long till the engine stops.

- with watercooled engine, the stop cable (I11.16/10) will be pulled so long till engine stops.

If diesel engine is very hot let the diesel run 2 - 3 minutes more in idling before stopping.

(7) Turn the ignition key completely to the left and withdraw.

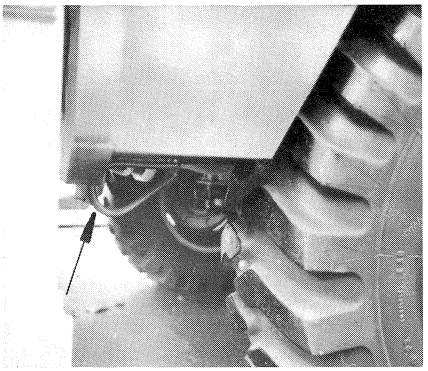


Ill. 42

7 Towing the loader -excavator

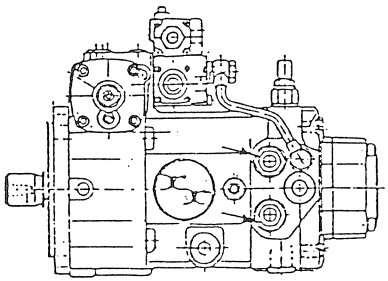
The loader-excavator has to be prepared acc. to para. 2. Additionally the shovel arm has to be lifted that dimension which is needed for the unblocking the tow bar.

The tow bar will be fastened at the chassis above the right axle fin (Ill.42/arrow) if towed forward.



Ill. 43

If vehicle has to be towed backward, the tow bar will be fastened in the eyelet at the right under the counter-weight (Ill.43/arrow).



Ill. 44

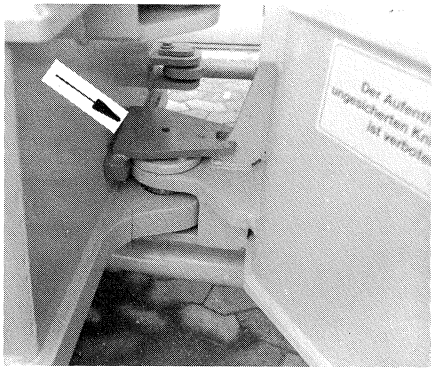
The hydrostatic transmission has to be switched to free-oil-flow before towing the vehicle. Unscrew the spring cage of both high-pressure limit valves 2 turns. Use fixed spanner NW22 (Ill.44/arrow).

The towing speed has to be adjusted to the emergency steering.

ATTENTION!

Engine is cut-off.

All necessary service and maintaining works at the basic unit can be quoted from the servicing schedule. We point out that faults, resulting from not observing the servicing schedule, will not be repaired under warranty.



I11.45

Before doing service- and maintaining works, done under the shovel arm, a shovel arm support has to be put between frame and shovel arm.

Articulation lock (I11.45/arrow) has to be secured before doing service- and maintaining works in the articulation area.

Guard the vehicle against rolling away by wedges; one wedge for each axle.

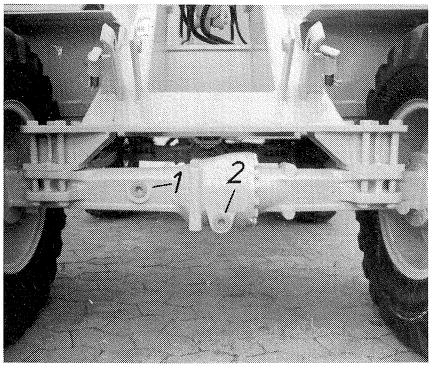
Do the oil checks if loader excavator is in a horizontal position and shovel arm in lowest position.

Do oil check if vehicle has working temperature.

Change demaged filters immediately.

Clean grease nipples before greasing.

Lubricate rod links and hinges for which a greasing is not provided from time to time with oil.

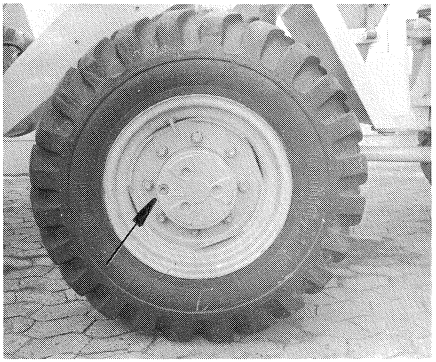


Ill. 46

Checking axle oil

(1) Unscrew plug out of the axle bracket (Ill.46/1). Oil level should reach to the plug bore.

(2) Unscrew the plug out of the planetary gear (Ill. 47/arrow). Oil level should reach to the plug bore.



Ill. 47

Changing axle oil

(1) Unscrew plug out of axle center gear (Ill.46/2).

(2) Turn the wheel in such a way that the plug (Ill.47/ arrow) is placed in the lowest position. Unscrew plug.

ATTENTION!

Collect leaking oil.

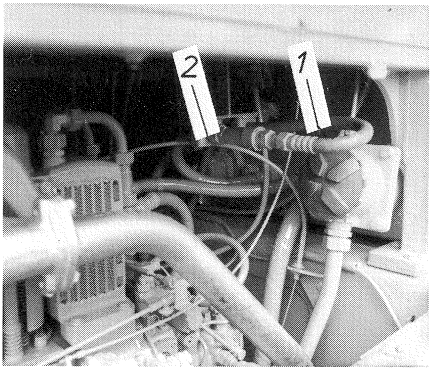
Ill. 48

Hydraulic oil reservoir

Capacity of hydraulic oil reservoir is 40 litres. If oil level sinks so low that the oil gauge (Ill.48/1) is empty if loader excavator is in horizontal and shovel arm in lowest position, oil has to be refilled. The filler cap is on top of the hydraulic oil reservoir (Ill.48/2), the drain plug is at the reservoir bottom and can be reached via mudguard area.

Hydraulic filter

The suction filter (I11.49/1) and the return flow filter (I11.49/2) are installed in the side wall of the hydraulic oil reservoir (accessible from engine area). Unscrew cover before changing filters.
The oil supply to the filter housing is cut-off automatically during filter changing. Smear the seal with oil before inserting the new element.



I11. 49

ATTENTION!

Collect leaking oil which is running out of filter housing.

Air filter (for air-cooled engine)

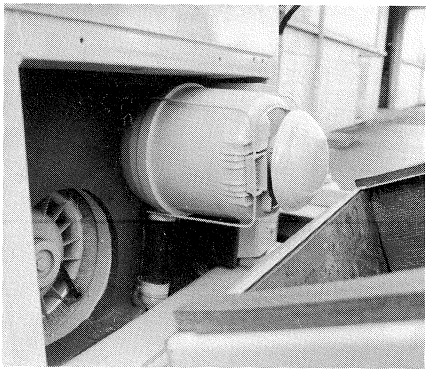
(1) Swing air-intake cap to the side.

(2) Push the filter clamps to the side.

(3) Remove dust collecting pot (I11.51/1) and filter element (I11.52/2).

(4) Clean dust collecting pot.

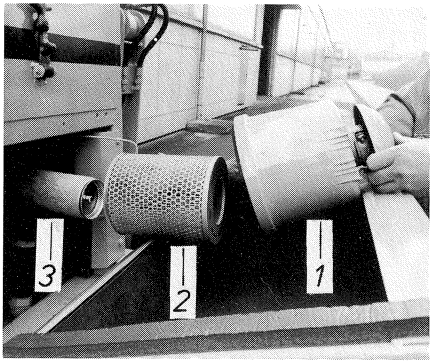
(5) Clean filter element and replace if necessary.


I11. 50

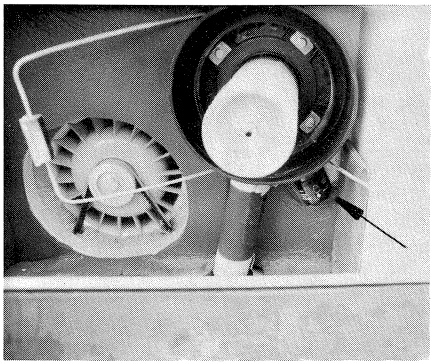
NOTE!

- Don't blow with compressed air with a higher pressure than 5 bar from inside to outside.

- Shows the servicing indicator after done maintenance still red, change also the inner cartridge (I11.51/3).



I11. 51



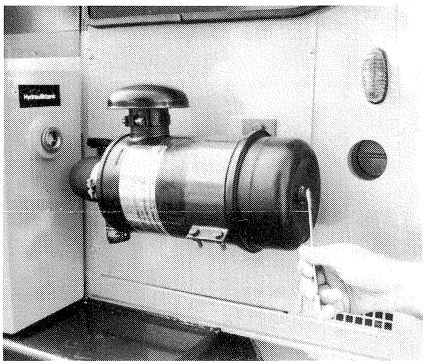
I11. 52

ATTENTION!

Check if packing is damaged before installing filter element.Press releasing knob of the vacuum indicator (I11.52/ arrow) till red clogging indicator rebounds. Check air-conducting between filter and engine and replace if necessary.

(6) Dust separation valve

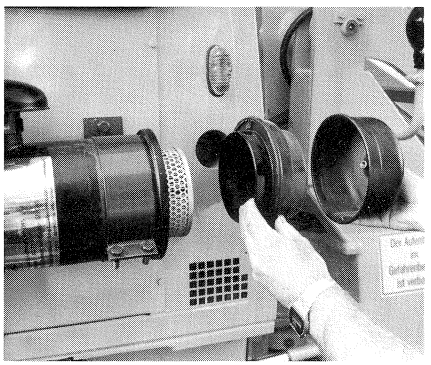
The dust separation valve (rubber spout) shall be compressed several times by hand approx. all 10 working hours. The dust separation valve is in the motor area on the left side in the air conducting.



I11. 53

Air filter (for water-cooled engine)

(1) Screw fixing screw out of the dust collecting pot (I11.53).



I11. 54

(2) Remove dust collecting pot lift the cyclone inset out off the dust collecting pot and clean both parts (I11.54)

NOTE!

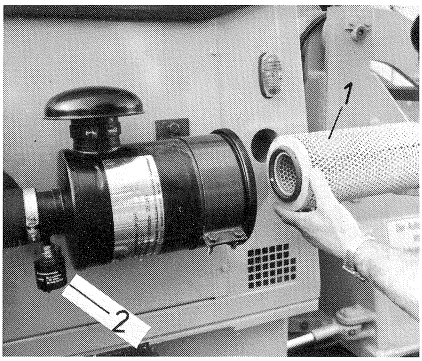
Please pay attention on correct installation of cyclone inset.

(3) Remove filter element, clean, replace if necessary (I11.55/1).

NOTE!

- Don't blow with compressed air with a higher pressure than 5 bar from inside to outside.

- Shows the servicing indicator (I11.55/2) after done maintenance red again change filter element.



I11. 55

ATTENTION!

Check if packages are damaged before fitting the filter element. Press releasing knob of the vacuum indicator (I11. 55/2) till red clogging indicator rebounds. Check air-conducting between filter and engine and replace if necessary.

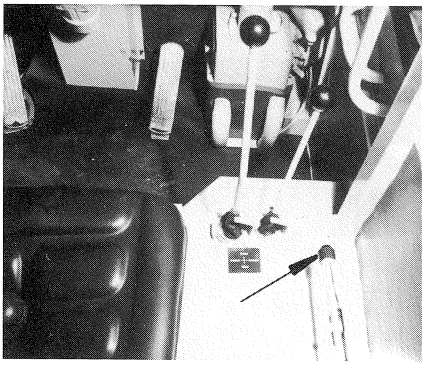
Braking system

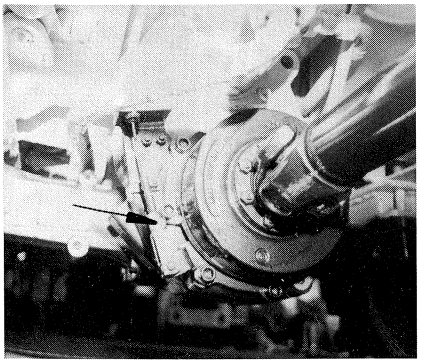
Service brake

Service brake is maintenance free (hydrostatic drive). The service brake has to be checked before each use of the loader excavator. Braking retardation forward same as backward.

Parking brake

Adjustment of the parking brake will be done at the turning handle of the hand lever (I11.56/arrow).


I11. 56



I11.57

Adjustment

- Turn hand lever in its released position (I11.56)

- Adjust initial stress by control grip

- The initial stress is correctly adjusted if the lever can be put without much force from its horizontal position to the vertical position.

- Do a braking test. The brake effect has to be so strong that the vehicle, being in road gear, will be hold if giving full throttle.

- Is the adjustment at the control grip impossible because of a too wide setting way, the coarse adjustment has to be done at the bracket head of the supplementary gear (I11.57/arrow).

Water-filling in the tyres

Tyre filling with prepared mixture will be done as follows:

1. Turn wheel so that valve is in topmost position.

2. Unscrew valve inset and screw-in connecting nut (I11.58)

3. Screw tyre inflator valve on the connecting nut.

4. Let the mixture flow in from a higher positioned reservoir (I11.59).

5. Actuate air-release-knob at the tyre inflator valve from time to time (I11.59).

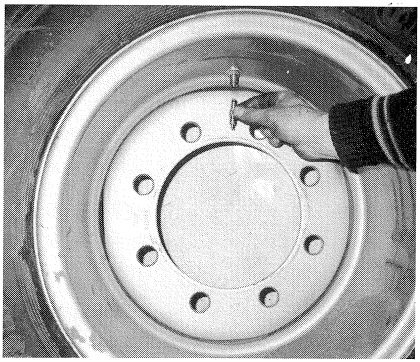
6. Unscrew tyre inflator valve, screw-in valve inset and blow up tyres with pneumatic pressure.

7. Check filling
   Turn wheel till valve is in a horizontal position (I11.60)

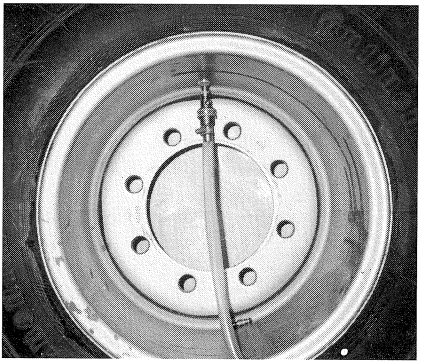
   In this position mixture has to come out if actuating the valve.
   Mixture: 46 l water
   27 l magnesium-chloride

   ATTENTION!
   Pour magnesiumchloride in the water and never water in the magnesiumchloride. Don't let drop mixture in the eyes, on the skin or on the clothing.

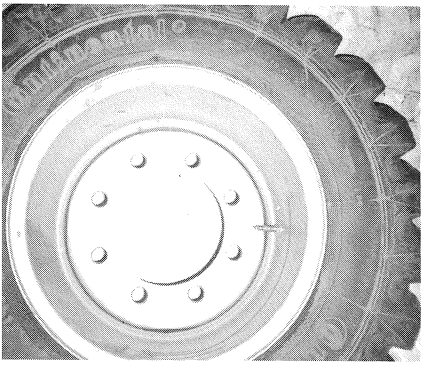
   NOTE!
   Tyre pressure acc. to the tyre size. See table



I11. 58



I11. 59



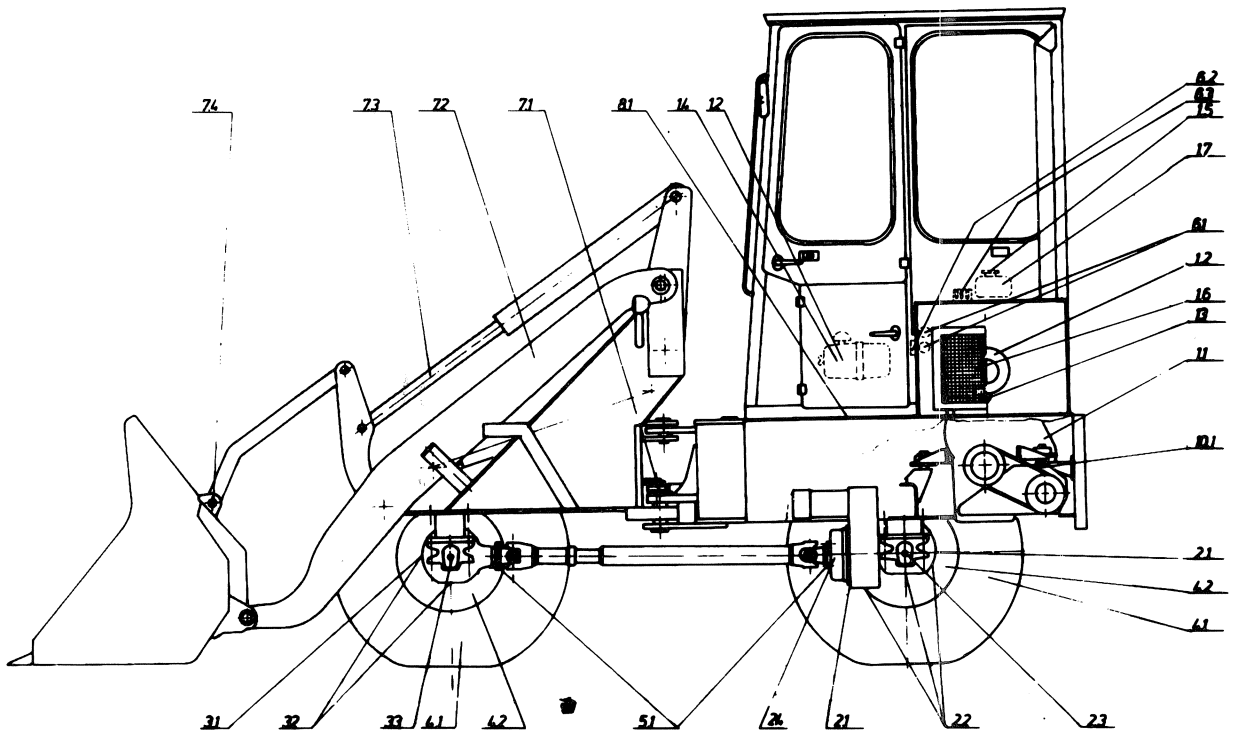
I11.60

9. Failure, Cause and Remedy

Failure	Possible Cause	Remedy
Engine	-	See engine specific instructions
Shovel arm can't be lifted resp. lowered	Blowoff valve in the control valve is open	Disassemble blowoff valve completely and clean, new adjustment
Higher steering force necessary	Blowoff valve in servo mechanism is open	Disassemble blowoff valve completely and clean, new adjustment
	Slide valve in priority valve gets jammed	Exchange priority valve
No steering	Articulation protection is locked	Remove articulation protection
Failures in the drive- and working hydraulic	Filter clogged	Change filters
	Oil deficiency in hydraulic reservoir	Refill
	Electric connections at the axial piston pump or axial piston motor are not tightened or completely loose.	Connect acc. electric wiring diagram
	Blown electric fuses	Change fuses
Failures at the braking system	Parking brake does not hold back the loader excavator	Check and re-adjust if necessary or change brake liners, whatever is necessary
	Service brake does not work correctly	Check inch cartridge in the axial piston pump, check actuating cable and function of the brake cylinder

Failure	Possible Cause	Remedy
Dynamo does not charge	Electric connections are losse	Tighten connections
	V-belt chapped	Change V-belt
	Dynamo speed to low	Check V-belt tension and re-adjust if necessary
Auxilliary heating broke down (auxilliary heating is not standard)	Fuse in fuse box or in the heating unit defective	Change fuse
	Control device switches off	Set rotary switch in "0" position and start again
Hose couplings of the attachments cannot be connected	Increased pressure due to heat influence on the attachment	Loosen carefully the screwing at the hose end which is placed above the rapid coupling, oil sprays off, the increased pressure collaps. tighten screwing. NOTE! Collect the oil
	Increased pressure in the basic unit	Making the conducting pressureless by moving the hand lever at the control valve
Working operations with backhoe impossible	Ball stopcock for hydr. locking is opened	Close ball stopcock
	Pressure relief valve in control valve is opened	Dismount pressure relief valve completely, clean and re-adjust
	Outrigger cannot be slewed	Remove safety bolt for road travel

10 SERVICE PLAN



Position	Description	Specification	Filling quantity
1	Motor oil acc to manufact instruction	MIL-L-2105C	approx 7l, with oil filter 7,5l
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	2×0,7l
32	Gear oil SAE 90 Hypoid	MIL-L-2105B	approx 4l
33	Planetary drive SAE 90 Hypoid	MIL-L-2105B	2×0,7l
6.3	Hydraulic oil	ATF Suffix A or equivalent HLP-oil acc. ISO VG 46	ca 45l
7	Multipurpose grease lubrication	DIN 51502 K2K	acc. to requirement
8	Destilled 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!

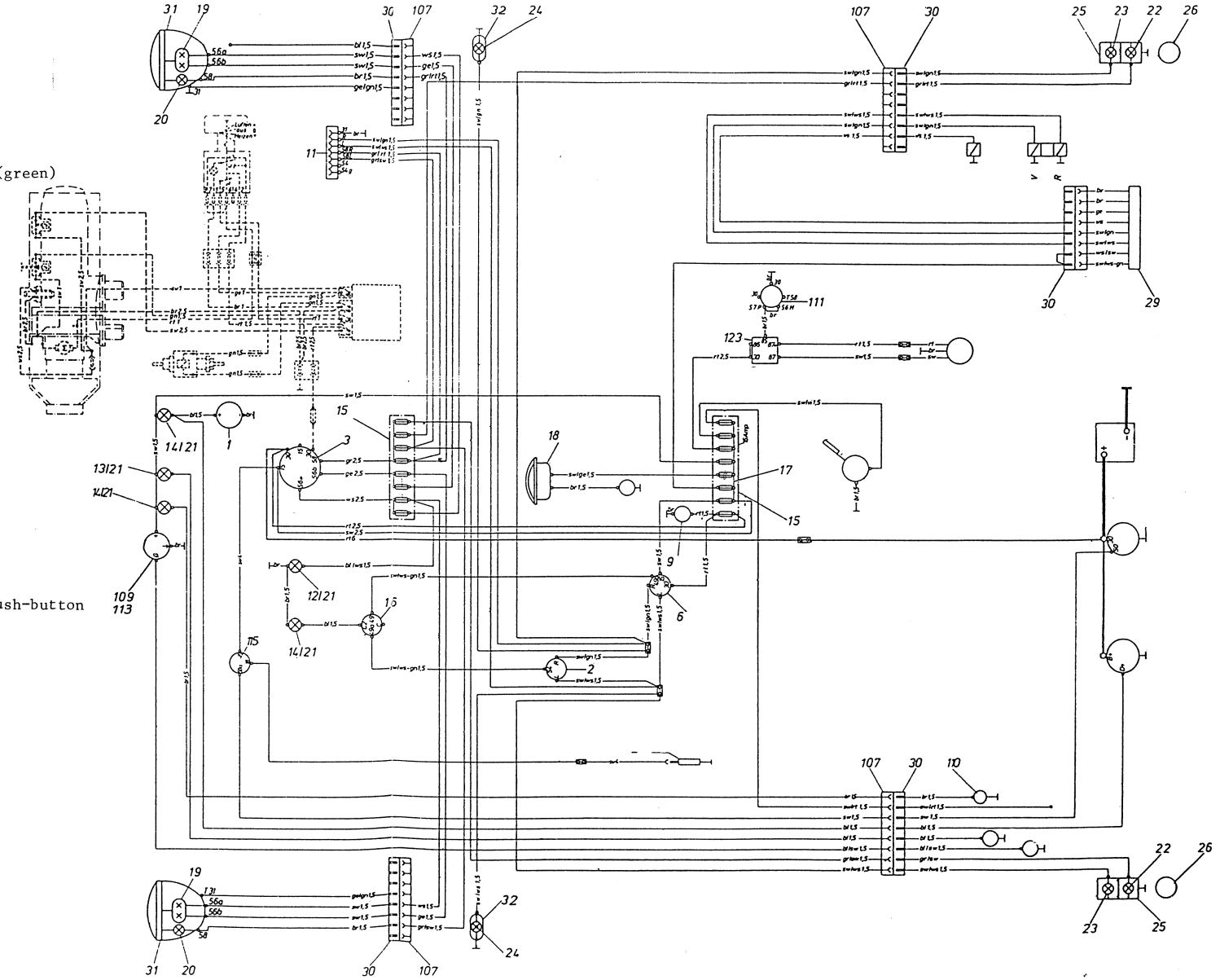
Please pay attention to safety rules when servicing the unit

10	50	100	200	1000	Pos	
					1	Motor (air-cooled resp. water-cooled)
						air-cooled
					1.1	Maintenance acc. to manufacturers instructions (open motor cover)
					1.2	Dry-air filter (open air suction hood) Observe stop indicator during operation. Change filter element if indicator indicates "red"
○					1.3	Press dust valve (rubber bushing) several times
						water cooled
					1.1	Maintenance acc. to manufacturers instructions (open motor cover)
					1.2	Dry air-filter Observe stop indicator during operation. Change filter element if indicator indicates "red"
		○			1.4	Empty dust collecting device
○					1.5	Control water level in compensator reservoir and refill if necessary
	○				1.6	Test cooling water hose connection for leaks
				◆	1.7	Test coolant before winter for protection effect
			○		2	Rear axle with transmisson
				◆	2.1	Axle gear/Distribution gear oil-level check (control screw)
	△				2.2	Axle gear/Distribution gear oil change
			○		2.3	Planetary drive oil-level check (control screw)
	△			◆	2.3	Planetary drive oil change
	○				2.4	Control resp. adjust parking brake
			○		3	Front axle
				◆	3.1	Axle gear oil level check (control screw)
	△				3.2	Axle gear oil change
			○		3.3	Planetary drive oil level check (control screw)
	△			◆	3.3	Planetary drive oil change
					4	Wheels and Tyres
	○				4.1	Control inflation-pressure
△			○		4.2	Control wheel-nuts
		○			5	Cardan shaft
					5.1	Control fixing
					6	Hydraulik system
	△			◆	6.1	Change filter cartridges, observe low pressure barometer in the cab, max 0,2 bar at operating temperature 60°C
○					6.2	Oil-level check (sight glass)
				◆	6.3	Oil change
					7	Places for grease (red marked)
	○				7.1	Articulated oscilating link
○					7.2	Shovel unit
	○				7.3	Hydraulic cylinder
○					7.4	Attachments
					8	Battery
				○	8.1	Sight control
					9	Brake systems
					9.1	Operating brake (hydrostatic drive) and parking brake function control before operation
					10	Toothed belt
	○				10.1	Control resp. adjust toothed belt tension

11 Electric Wiring Diagram

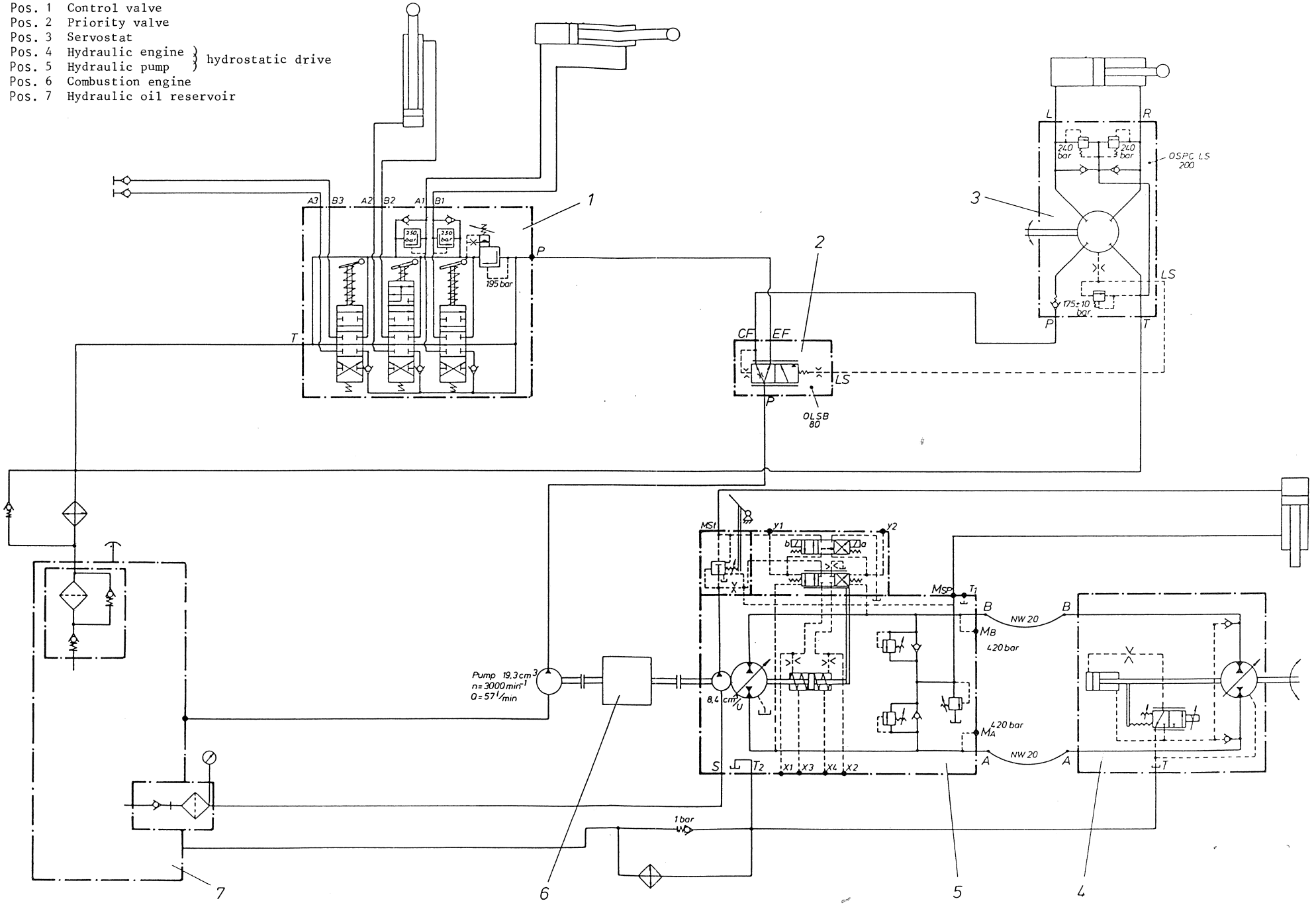
for air-cooled and water-cooled engine

Pos. 1 Hourmeter
Pos. 2 Blinker switch
Pos. 3 Light-ignition switch
Pos. 6 Warning light pick-up
Pos. 9 Socket
Pos. 11 Outwork socket
Pos. 12 Head light indicator lamp (blue)
Pos. 13 Engine oil pressure indicator lamp (green)
Pos. 14 Indicator lamp (red)
Pos. 15 Fuse box 8-poles
Pos. 16 Blinker unit
Pos. 17 Bus bar
Pos. 18 Signal horn
Pos. 19 Bulb form B 12V 35/35W
Pos. 20 Bulb form HL 12V 4W
Pos. 21 Bulb form H 12V 2W
Pos. 22 Bulb form Gi 12V 10W
Pos. 23 Bulb form RL 12V 21W
Pos. 24 Bulb form K 12V 18W
Pos. 25 Rear flashing light
Pos. 26 Reflector
Pos. 29 Steering arm switch
Pos. 30 Plug
Pos. 31 Build-on headlight
Pos. 32 Blinker light (yellow)
Pos. 59 Battery 12V 18W
Pos. 107 Plug housing
Pos. 109 Fuel gauge
Pos. 110 Temperature switch
Pos. 111 Light tumble switch
Pos. 113 Bulb 12V 2W
Pos. 115 Heater plug starting switch resp. push-button
Pos. 123 Minor relay 12V



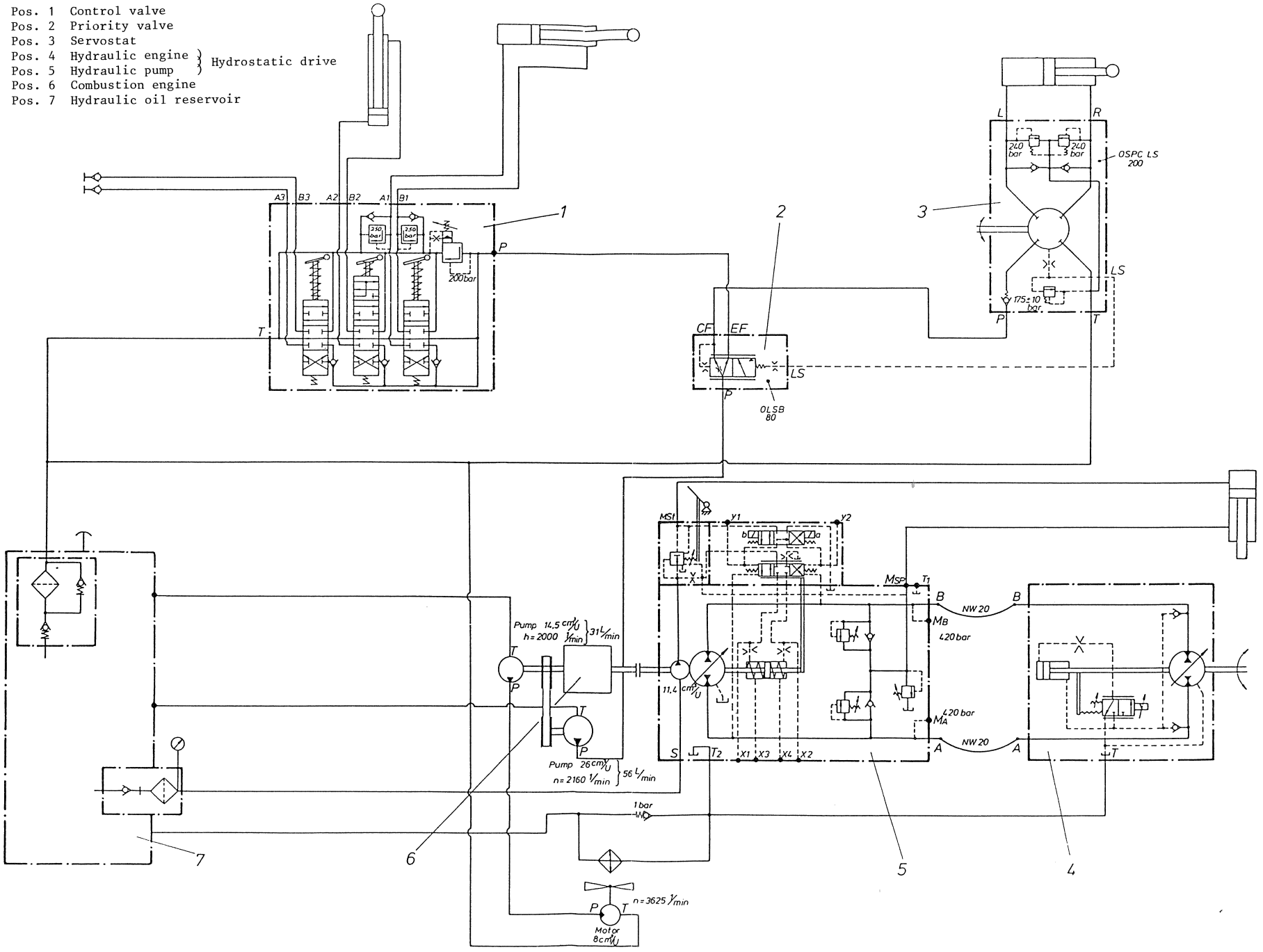
12 Hydraulic Diagram for air-cooled engine

Pos. 1 Control valve
Pos. 2 Priority valve
Pos. 3 Servostat
Pos. 4 Hydraulic engine } hydrostatic drive
Pos. 5 Hydraulic pump }
Pos. 6 Combustion engine
Pos. 7 Hydraulic oil reservoir



13 Hydraulic Diagram for water-cooled engine

Pos. 1 Control valve
Pos. 2 Priority valve
Pos. 3 Servostat
Pos. 4 Hydraulic engine } Hydrostatic drive
Pos. 5 Hydraulic pump }
Pos. 6 Combustion engine
Pos. 7 Hydraulic oil reservoir



14 General Notes

Following will be supplied together with machine:

- An operating instructions for the engine. Please quote all details concerning the engine from these engine operating instructions.

- A current "Safety rules for excavators, loaders, dozers, scrappers and special machines for excavation works".

- A spare parts list