AHLMANN

OPERATING INSTRUCTIONS
SWING SHOVEL LOADER

23106208 **GB**

AS 70 / AS 90

Ahlmann Baumaschinen GmbH Am Friedrichsbrunnen 2 D-24782 Büdelsdorf
Telefon 04331/351-325 Internet: www.ahlmann-baumaschinen.de
Telefax 04331/351404 E-Mail: info@ahlmann-baumaschinen.de

Introduction

Preface

Ahlmann swing loaders, articulated loaders and front loaders are part of **Ahlmann** selection of heavy construction equipment, and design for a wide range of uses.

Years of experience in manufacturing earth-moving equipment and various auxilliary tools, modern construction and manufacturing approaches, careful testing and an stringent quality control assure the reliability of your **Ahlmann** wheel loader.

Scope of documentation supplied by manufacturer:

- Equipment Operating Manual
- Engine Operating Manual
- Parts List Equipment
- Parts List Engine
- EU Statement of Conformity

Operating Manual

The operating manual contains information required for safe operations and maintenance.

The "Maintenance" section contains details of all service tasks and functional checks, which must be performed by trained staff.

These do not include major servicing tasks which must be performed by technicians specially trained and authorized by the manufacturer. This specifically includes equipment subject to road safety, and safety at work regulations.

The manufacturer reserves the right to alter construction details, which may lead to some deviations between your actual equipment and the figures shown in this manual, but will not affect the accuracy of the contents.

Using the Manual

Terminology

- The terms **"left"** or **"right"** refer to the equipment as viewed from the driver´s cab facing in direction of travel.
- Optional
  means: Not included as standard equipment.

Note on Figures

- (3-35)
  means: Chapter 3, Fig. 35
- (3-35/1)
  means: Chapter 3, Fig. 35, Position 1
- (3-35/arrow)
  means: Chapter 3, Fig. 35, 

Abbreviations used

SW = Safety at work regulations

RS = Road safety regulations

Version: 09.2006
Printed: 09.2006

Table of contents

12 Technische Daten (Anbaugeräte)

13 Additional options, modifications, notes on inspection for loaders

Safety regulations

1 Fundamental safety instruction

1.1 Warnings and symbols

In this operation manual the following designations or symbols are used for important information.

NOTE

Special information for the economical use of the machine.

CAUTION

Special information for necessities and prohibitions for avoiding damages.

DANGER

Information or necessities and prohibitions for prevention of damage to persons or extensive damage to goods.

1.2 Use of the loader as authorized

1.2.1 This machine was designed according to the state of the art and recognized safety rules. Nevertheless the use of the machine may cause danger for the user or third parties or impairments to the machine or other real values.

1.2.2 The machine and attachments may only be used in a technical non-objectionable condition, taking all safety regulations especially with regard to the operating manuals (machine and engine). In particular defects which could have a detrimental effect on the safety of the machine should be eliminated immediately.

1.2.3 The machine is determined exclusively for the purposes described in this operating manual. Any other utilization is not permitted. The manufacturer is not liable for any damage caused in this connection. The user solely carries the risk.

The authorized use of the machine also requires the observation of the operating manual (machine and engine) as well as the observation of the inspection and maintenance conditions.

1.3 Organizational measures

1.3.1 The operating manual (machine and engine) must be available at all times and at the site where the machine is in operating condition.

1.3.2 In addition to the operating manual (machine and engine) the general applicable and other binding regulations for the prevention of accidents (especially the safety regulations of the German Trade Association - VBG 40) as well as the regulations for environment protection must be observed and the personnel must be accordingly instructed. Traffic regulations must also be observed.

1.3.3 The personnel in charge of working with the machine must read the operating manual (machine and engine) before start of work, especially the chapter concerning safety precautions.
This also applies to personnel working occasionally with the machine, e.g. during maintenance work.

1.3.4 The driver must wear a seat belt during operation.

1.3.5 Personnel working with the machine must not wear long flowing hair, loose clothing or jewelry including rings as this could cause injuries by getting caught up or pulled in by the machine.

1.3.6 All safety and danger plates on the machine must be observed.

1.3.7 All safety and danger plates must be attached to the machine and must be kept in legible condition.

1.3.8 In case of modifications to the machine, especially in case of damages or changes in the operating behavior of the machine which could influence the safety of the machine, stop the machine immediately and inform the competent person in charge about the incident.

1.3.9 Without the manufacturer's consent, do not make any modifications or conversions to the machine which could affect safety. This also applies to the installation and adjustment of safety devices, valves and welding work to supporting parts.

1.3.10 Check hydraulic system, especially hydraulic pipes, at regular intervals for defects. Immediately eliminate any defects found.

1.3.11 The prescribed inspection periods set down in the operating manual (machine and engine) and the maintenance plan must be observed.

1.4 Selection of personnel and necessary qualifications
Fundamental obligations

1.4.1 The machine may only be driven and maintained by personnel selected by the employer for this purpose.

These persons must:

- have attained the age of 18 years,
- be physically and intellectually suitable,
- have been instructed in the operation or maintenance of the machine and must have demonstrated their ability to their employer,
- must be expected to carry out the work conveyed to them in diligent manner.

1.4.2 Electrical work on the machine may only be carried out by a qualified electrician or persons supervised by a qualified electrician according to the electrotechnical regulations.

1.4.3 Only qualified specialists may carry out work on the transmission mechanism and to the hydraulic system.

1.4.4 Only personnel with special experience and the necessary know-how are permitted to carry out work on the hydraulic system.

1.5 Safety Information for Certain Operating Phases

1.5.1 Normal Operation

1.5.1.1 Other persons must not be transported!

1.5.1.2 Start and drive the machine from the driver's seat only!

1.5.1.3 During starting and switching-off operation observe the control lamps according to the operation manual (machine and engine)!

1.5.1.4 Before commencing work/driving check brakes, steering, signal lights and lights for their functioning!

1.5.1.5 Before moving the machine always check that the attachments are safely stowed so that no accident may occur!

1.5.1.6 Before commencing work make yourself familiar with the working environment. This means observing obstacles on the working site, quality and resistance of the soil ground, undertaking the necessary protection precautions between the building site and the public traffic.

1.5.1.7 Before starting the machine make sure that no person is endangered by the machine!

1.5.1.8 Take measures so that the machine can be operated in a safe and functional manner. The machine may only be operated when all safety devices, e. g. detachable safety devices, sound-absorption, exist and function.

1.5.1.9 Avoid any work operation which appears to be dangerous!

1.5.1.10 Persons must not be carried in the working equipment, e.g.in the attachments!

1.5.1.11 The operator may only carry out work with the machine when no persons are in the danger zone.

The danger zone means that area near the machine where persons may be injured

- by work-induced movements of the machine,
- by work attachments and devices,
- by loads swiveling out,
- by loads falling down,
- by attachments falling down from the machine.

1.5.1.12 In case of danger to persons the operator must give appropriate warning signs. It may be necessary to stop work.

1.5.1.13 In case of functional defects stop machine immediately and safeguard it. Eliminate defects immediately!

1.5.1.14 Check machine at least once every shift for external visible damage and defects with regard to any changes and to the operating behavior of the engine. Report any defects or changes immediately to the person in charge. If necessary stop the machine immediately and safeguard it.

1.5.1.15 The driver may only slew the attachments overhead driving, operating and working areas if these areas are suitably safeguarded by protective roofing. These protection roofs must offer appropriate safety against loads and goods falling down. In case of doubt, it should be assumed that they are **not** protective roofs.

1.5.1.16 When driving, the attachment is to be kept as close to the ground as possible.

1.5.1.17 Please observe the applicable traffic regulations when driving on public roads, paths or open spaces. The machine must be brought into road-worthy condition in beforehand.

1.5.1.18 In general, switch on lights in poor visibility and during darkness.

1.5.1.19 If lights of the machine are not adequate for the safe execution of certain work, additional lighting must be provided on the working site, especially at dumping points.

1.5.1.20 Should the driver's sight of his driving and working area be restricted due to work-induced influences, he must be given guidance or he must safeguard the working area by a firm barrier.

1.5.1.21 The person giving guidance must be a reliable person and must be informed about his tasks before commencement of the work.

1.5.1.22 The driver and guide must agree on signals for communication. These signals may only be given by the driver and guide.

1.5.1.23 The guide must be easily recognizable e.g. by wearing warning clothing and must always be in the driver's field of vision.

1.5.1.24 When passing subways, bridges, tunnels, electrical overhead lines make sure that there is adequate clearance!

1.5.1.25 Keep good clearance when working at the edge of quarries, pits, rubbish dumps and embankments to eliminate any danger of the machine plunging down. The contractor or his deputy must stipulate the distance from the edge taking the soil bearing capacity into consideration.

1.5.1.26 The machine may only be used at stationary dumping areas when firmly integrated installation are provided to prevent the machine from running or sliding down.

1.5.1.27 Avoid such work which could have detrimental effect on the stability of the machine.
The stability can be detrimented by:
- overloading,
- too soft ground,
- abrupt acceleration or deceleration of driving movement or working movement,
- reversing out of high driving speed,
- working on slopes,
- driving too quickly round sharp bends,
- driving the machine on rough terrain with the bucket arm swung.

1.5.1.28 Do not drive along slopes in traverse direction. Always carry working equipment and loads near the ground, especially when driving down slopes. Sudden cornering is forbidden!

1.5.1.29 On steep inclines and gradients, the load is to be carried on the uphill side.

1.5.1.30 Before the slope, reduce the speed and always adapt to the local conditions! Always adapt the speed of the machine to the environmental conditions when driving down slopes! Never change into low gear when driving on slopes but before entering the slope!

1.5.1.31 Reversing over a longer period must be avoided!

1.5.1.32 When leaving the machine always safeguard the machine to prevent it from unintentionally rolling away or prevent non-authorized persons from using it!

1.5.1.33 The driver must not leave the machine if the attachments are not lowered or safeguarded.

1.5.1.34 During work-brakes and after work hours the driver should endeavor to leave the machine on good bearing soil and if possible on level ground and safeguard the machine to prevent it from unintentionally rolling away.

1.5.2 Special work within the exploitation of the machine and elimination of defects during process or work; disposal

1.5.2.1 The prescribed dates for adjustment work, maintenance work and inspections laid down in the operating manual (machine and engine) must be strictly observed. This also applies to details regarding the interchanging of parts/ part equipment. This work may only be executed by skilled personnel.

1.5.2.2 For all work concerning the operation, conversion or adjustment of the machine and its safety devices as well as inspection, maintenance and repair work please observe the switching and stopping operation in accordance with the operating manual (machine and engine) as well as the related instructions for maintenance work.

1.5.2.3 The engine must be switched off before maintenance or repair work is carried out.

1.5.2.4 The stability of the machine or the attachments must be guaranteed at all times during maintenance and repair work.

1.5.2.5 Maintenance and repair work may only be carried out when the attachment is set down on the ground or supported or when equivalent measures against un-intentional movement were taken.

During maintenance and repair work under the bucket arm:
- the bucket arm support (1-1/arrow) must be inserted (the bucket arm support is in the tool box 4-1/13).
- secure the hand lever for the working and auxiliary hydraulics (1-2/arrow).
- the swing mechanism must be blocked. Remove the blocking wedge (1-3/arrow) out of the mounting, switch to swing blocking (1-4/arrow), and secure with spring pin.

1.5.2.6 If necessary, protect the maintenance area on a large scale.

1.5.2.7 The machine must be protected from unintentionally starting after it was switched off for maintenance and repair work:
- remove the ignition key
- attach warning sign at battery main switch.

This applies especially to works to the electrical equipment.

1.5.2.8 Individual pieces and large assemblies must be carefully secured to hoisting equipment when being substituted to avoid any damage. Only suitable and technical sound hoisting equipment may be used as well as crane equipment with adequate payload. Do not stand or work underneath suspended loads!

1.5.2.9 Only experienced personnel should be entrusted with the securing of loads!
Loads must be secured so that they cannot slip or fall down.

1.5.2.10 Attached loads may only be moved with the machine when the road is graded.

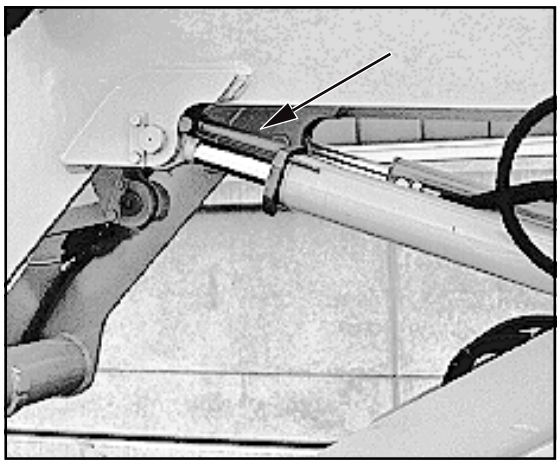


Figure 1-1

Figure 1-2

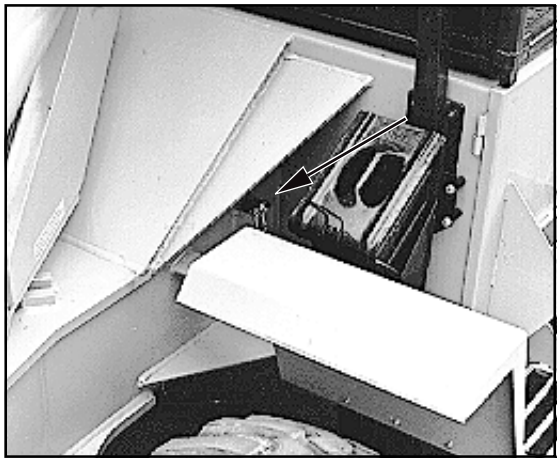


Figure 1-3

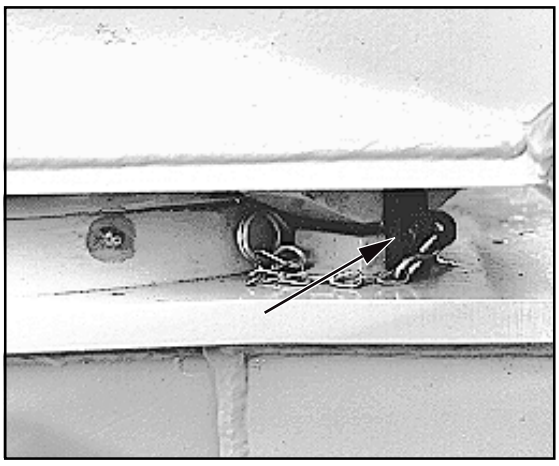


Figure 1-4

1.5.2.11 When working with hoisting equipment/elevators the slingers may only work with the approval of the driver and from the side of the boom. The driver may only give his consent if the machine is standing still and the working attachment is not being moved.

1.5.2.12 Persons assisting with the guidance of loads and slingers may only stay in visual or communication reach of the driver.

1.5.2.13 The operator must move the load as close to the ground as possible and avoid to swivel the load.

1.5.2.14 The operator may not move the load over the heads of persons.

1.5.2.15 In the case of erection work having to be carried out above normal human height, suitable safety ascent devices and working platforms must be used. Do not use engine parts as climbing and descending facilities. Use safety harnesses when working at very great heights.

All handles, steps, railings, podests, platforms, ladders must be kept free from dirt and ice.

1.5.2.16 Clean the machine, especially connections and screw connections before commencement of maintenance work and make sure that the machine is free from oil, fuel oil or dirt. Do not use aggressive detergents. Use lintless cleaning rags!

1.5.2.17 Before cleaning the machine with water or steam jet (high pressure cleaning unit) or with detergent protect all areas where water/ steam/ detergent may penetrate and affect the functions or safety of the machine by a suitable cover or by applying tape. In particular, such parts as engine components, e.g. injection pump, generator governor, starter are very delicate.

1.5.2.18 After cleaning completely remove all protection covering and tape.

1.5.2.19 After cleaning check all pipelines for fuel, engine oil and hydraulic oil for leakages, loose connections, abrased parts and damages. Eliminate defects immediately.

1.5.2.20 Always fasten screw connections after completion of maintenance and repair work.

1.5.2.21 Should it be necessary to dismantle safety devices during mounting, maintenance or repair work, these safety devices must be re-installed and checked carefully after completed maintenance and repair work.

1.5.2.22 Make sure that fuel, accessory material and interchanged parts are safely disposed of with no danger to the environment.

1.5.2.23 The machine should be checked by a specialist before commissioning. In addition, it should be checked after essential modifica-tions before it returns to service.

1.5.2.24 The machine must be checked by a specialist once a year. Furthermore, a specialist must check the machine whenever necessary because of operating conditions.

1.5.2.25 The test results must be recorded and kept in the archives at least until the following control date.

1.6 Instructions regarding special categories of danger

1.6.1 Electrical energy

1.6.1.1 Only use original fuses (mandatory current). Immediately switch off machine in case of breakdown of electrical supply.

1.6.1.2 When working near overhead lines and overhead wires, a safety clearance must be kept between the machine and its working equipment in order to prevent sparking over. The safety clearance depends on the nominal voltage of the overhead/wire line. This also applies to the distance between the lines and to the attachments and slung loads.
The following safety clearance must be observed, to meet the above mentioned requirement:

Nominal voltage				Safety clearance
(kilovolt)				(meter)
		up to	1 kV	1,0 m
above	1 kV	up to	110 kV	3,0 m
above	110 kV	up to	220 kV	4,0 m
above	220 kV	up to	380 kV	5,0 m
unknown nominal voltage				5,0 m

When approaching overhead lines all working movements of the machine must be taken into consideration, e.g. the position of jibs, the swinging of ropes and the dimensions of slung loads.

In addition, attention must be paid to any roughness of soil which could cause an inclined position of the machine thus getting it closer to the overhead line. The fact that overhead lines may swing out during windy weather and may reduce the distance must also be taken into consideration.

1.6.1.3 In the case of sparking over any work or movement must stop. Instructions to be followed:
bring the machine out of the danger area by lifting or lowering the attachments or by swiveling away or driving the machine out of the area. If this is not possible then the following rules must be observed:
- do not leave the driver's cabin
- warn persons standing near the machine not to approach or touch the machine
- give immediate instructions to have the power cut off
- leave the machine only when it is sure that the electricity in the damaged/contacted power line is switched off so that the line is dead!

1.6.1.4 Work on the electrical system or on the operating system may only be carried out by a skilled electrician or by personnel instructed or supervised by such trained electrician according to electrotechnical regulations.

1.6.1.5 The electrical installation of a machine must be reviewed/inspected at regular intervals. Any defects, e.g. loose connections or scorched cabling, must be eliminated immediately.

1.6.1.6 The cable must be disconnected from the negative pole of the battery before inspection, maintenance or repair of machine parts and components.

1.6.2 Hydraulic systems

1.6.2.1 Only experts may carry out work on the hydraulic system.

1.6.2.2 All pipelines, hoses and screw connections must be checked regularly for leakages and visible damages. Immediately eliminate such defects. Spurting hydraulic oil may cause injuries and fire.

1.6.2.3 Those hydraulic system segments which are to be opened must be made free of pressure before commencement of the repair work according to the assembly group description.

1.6.2.4 The hydraulic pipelines must be correctly laid and connected. Do not get the connections mixed up. The spare parts must be in an accordance with the technical requirements stipulated by the manufacturer. This is, of course, guaranteed when original spare parts are ordered.

1.6.3 Noise

Sound protection equipment must be in protective position during operation of the machine.

1.6.4 Oil, grease and other chemical substances

1.6.4.1 The relevant safety regulations must be observed when using oil, grease or other chemical substances.

1.6.4.2 Caution when working with hot fuel and other accessory material (danger of burning and scalding).

1.6.4.3 Caution when working with brake fluid and battery acid.

TOXIC AND CAUSTIC!

1.6.4.4 Be careful when working with fuel.

FIRE HAZARD!

- Before refuel, switch off engine and remove ignition key.
- Do not refuel in a closed operating area.
- Never refuel near open fire or sparks.
- Do not smoke during refueling.
- Immediately wipe up spilled fuel.
- Keep machine free of fuel, oil and grease.

1.6.5 Gas, dust, steam, smoke

1.6.5.1 The machine may only be started and run in closed operating areas where there is sufficient ventilation.

The regulations for the respective working site must be strictly observed.

1.6.5.2 Only carry out welding, burning and grinding work on the machine when this is explicitly approved. Otherwise danger of fire and explosion!

1.6.5.3 Before carrying out welding, burning and grinding work clean the machine and its vicinity from combustibles and make sure that the room is adequately ventilated.

Explosion hazard!

1.7 Transport and towing, restart

1.7.1 The machine may only be towed if the brakes and steering function.

1.7.2 Towing may be carried out only by means of an adequately dimensioned towing bar in connection with towing devices.

1.7.3 When towing drive slowly. Persons must not remain near the towing bar.

Figure 1-5

1.7.4 When the machine is loaded and transported the necessary auxiliary equipment must be fitted to prevent any unintended movement. The tires must be kept clean of mud, snow and ice so that the machine can drive on the ramp without danger of sliding.

1.7.5 Restart the machine strictly observing the regulations of the operating manual.

1.8 Safety information for the contractor or the contractor's authorized personnel

1.8.1 Organizational measures

1.8.1.1 We would like to emphasize that parts and accessories that are not supplied by us are also not tested and approved by us. Installation and/or use of such products can thus negatively affect the constructional qualities of your loader and thereby reduce the active and passive driving stability. The manufacturer cannot be held responsible for damage that results from the use of non-original parts and accessories.

1.8.1.2 Inform about the location/use of fire extinguishers (1-5/arrow) and first-aid kit (on the maintenance plate behind the driver's seat)!

1.8.2 Selection of personnel, qualifications; additional duties

1.8.2.1 Only reliable persons are allowed to work on/with the machine. The minimum legal age must be observed.

1.8.2.2 Only employ trained or instructed personnel. Clearly define the competencies of the personnel regarding operation, installation, maintenance and repair work. Ensure that only authorized personnel may work on/ with the machine.

1.8.2.3 Determine the driver's responsibility regarding traffic regulations. Authorize him to refuse instructions given by third parties when these instructions are detrimental to the safety of the driver and the machine.

1.8.2.4 Personnel that are being trained are permitted to operate the loader only if they are under constant supervision of an experienced person authorized by the employer!

Signs

2 Signs

2.1 Warning and information signs

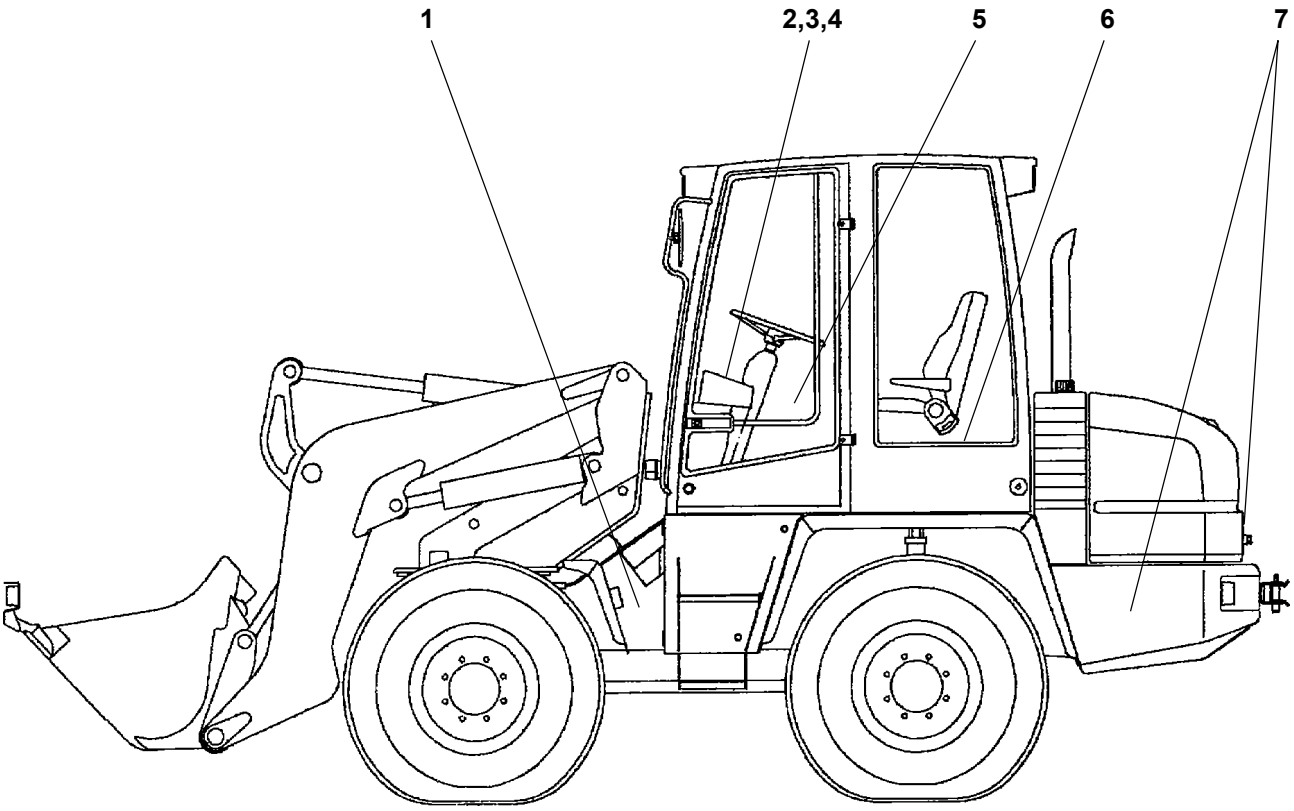


Figure 2-1

1 - Loader type plate (right-hand side)
» includes identification number of vehicle «
2 - **CAUTION!** - Steering only possible when engine is running!
3 - **CAUTION!** - When driving on public roads, only rear-wheel steering may be used!
4 - **CAUTION!** - The distribution gear may only be shifted when the loader is not moving. When shifting gears, set the drive direction lever to “0” (gear shift released after 5 sec.).
5 - Maintenance plan
6 - Use mineral oil: DIN 51524-HVLP 46 ISO VG 46 VI > 180
(to the right of the driver's seat on the maintenance flap)
7 - Maximum speed

2.2 Fuses (4-11/17)

1	Traction drive	10,0 A
2	Turn indicator	7,5 A
3	Hydraulics, brake lights	20,0 A
4	Heater	20,0 A
5	Rear window heater	20,0 A
6	High beams	15,0 A
7	Low beams	15,0 A
8	Tail light, left parking light, left	5,0 A
9	Tail light, right parking light, right	5,0 A
10	Hazard flasher	15,0 A
11	Windshield wiper/washer	20,0 A
12	Engine cut-off	5,0 A
13	Working lights	20,0 A
14	Warning beacon (option), signal horn, socket, interior lighting	30,0 A

View on the fuse box:

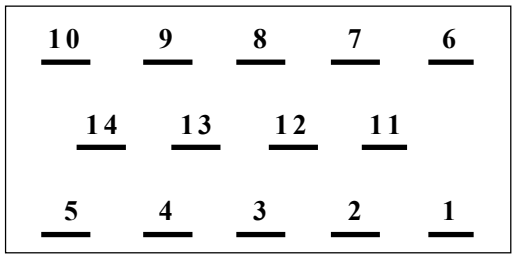


Figure 2-2

2.3 Symbols

Hand lever for working hydraulics (4-10/2)

Bucket arm
1 - lower
2 - raise
5 - float position

Quick-change device
3 - tilt up
4 - dump

Bucket
3 - tilt up
4 - dump

Fork-lift attachment
3 - tilt up forks
4 - tip forks

Grab
3 - tilt up grab
4 - tip grab

Lifting hook
3 - tilt up lifting hook
4 - tip lifting hook

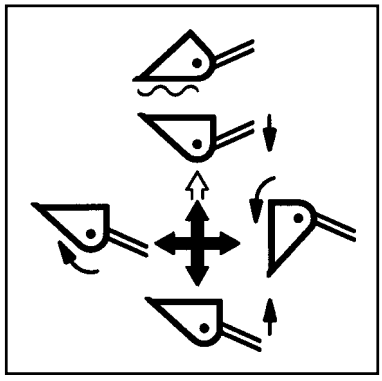


Figure 2-3

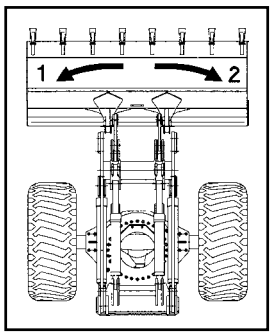


Figure 2-5

Foot pedal for swiveling (4-8/4)

1 - left

2 - right

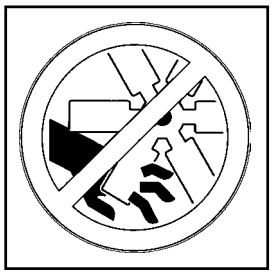


Figure 2-6

To be opened only when engine is stopped

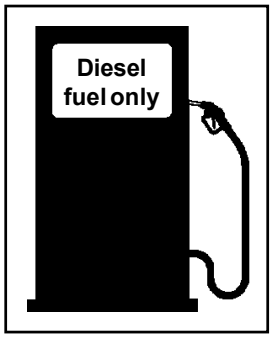


Figure 2-7

Fuel tank

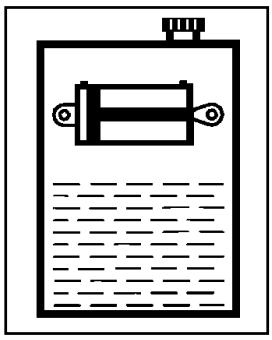


Figure 2-8

Hydraulic oil tank

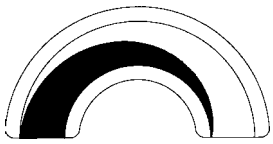


Figure 2-9

Heater

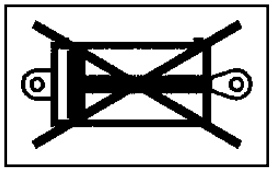


Figure 2-10

Ball block valve for working/auxiliary hydraulics closed

Steering mode switch (4-9/4)

Rear-wheel steering

Four-wheel steering

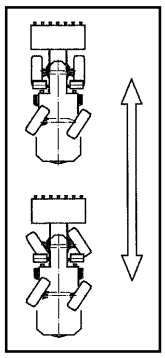


Figure 2-11

Hydraulic drive stages (4-10/1)
Hare symbol - fast
Turtle symbol - slow
Travel direction (4-10/3)
- forward
- 0
- reverse
Auxiliary hydraulics (4-10/11)
- upper pushbutton: - Lock attachment
  - Close multipurpose bucket
- bottom pushbutton: - Unlock attachment
  (only in conjunction with 4-11/2)
  - Open multipurpose bucket

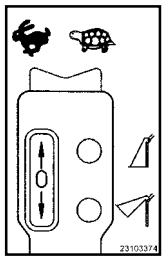


Figure 2-12

Lifting points for transport by crane

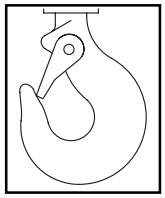


Figure 2-13

Fixing eyes for towing and lashing

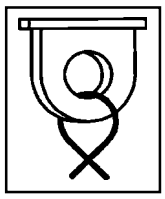


Figure 2-14

Quick-change device locked

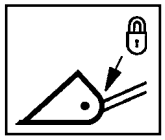
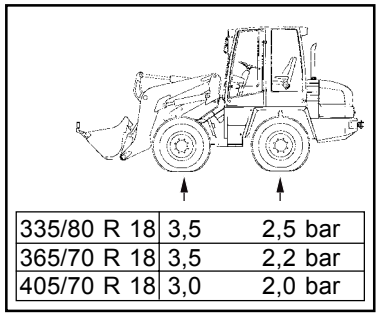


Figure 2-15

Read the operating instructions before starting the loader. Make sure that all other persons using the loader have also read these instructions!

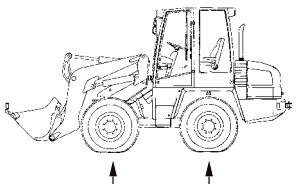
Figure 2-16

Reifendruck **AS 70**



335/80 R 18	3,5	2,5 bar
365/70 R 18	3,5	2,2 bar
405/70 R 18	3,0	2,0 bar

Figure 2-17



16/70 - 20	3,0	2,0 bar
550/45-22.5	2,5	2,5 bar
335/80 R 20	3,5	2,2 bar
365/80 R 20	3,5	2,2 bar
375/75 R 20	3,8	2,5 bar
405/70 R 20	3,0	2,0 bar
14.5 R 20	3,5	2,2 bar

Figure 2-18

Tire pressure **AS 90/AZ 85t**

Figure 2-19

Keep out of the danger zone

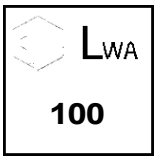


Figure 2-20

Noise level **AS 70**
Noise level outside: 100 dB(A)

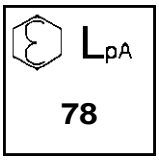


Figure 2-21

Noise level **AS 70**
Noise level in the cabin: 78 dB(A)

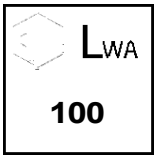


Figure 2-22

Noise level **AS 70**
Type “30/35 km/h”
Noise level outside: 100 dB(A)

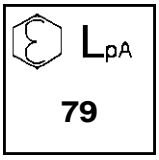


Figure 2-23

Noise level **AS 70**
Type “30/35 km/h”
Noise level in the cabin: 79 dB(A)

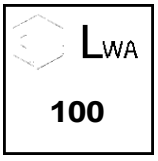


Figure 2-24

Noise level **AS 90**
Type “20 km/h”
Noise level outside: 100 dB(A)

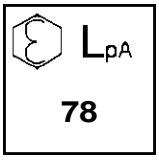


Figure 2-25

Noise level **AS 90**
Type “20 km/h”
Noise level in the cabin: 78 dB(A)

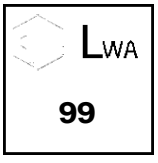


Figure 2-26

Noise level **AS 90/AZ 85t**
Type “30/40 km/h”
Noise level outside: 99 dB(A)

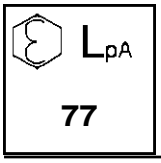


Figure 2-27

Noise level **AS 90/AZ 85t**
Type “30/40 km/h”
Noise level in the cabin: 77 dB(A)

UVV label
(annual check according to UVV)

Figure 2-28

Logo
- low-noise construction machine -

Figure 2-29

Working platform (opt.):
With working platform installed, set the ball valve of both lifting cylinders that the lever is at right angles to the flow direction

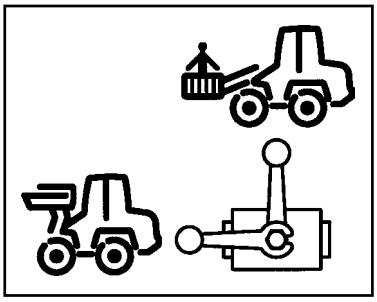


Figure 2-30

Working platform (opt.):
The key must not be inserted in the key-operated switch when the working platform is occupied.

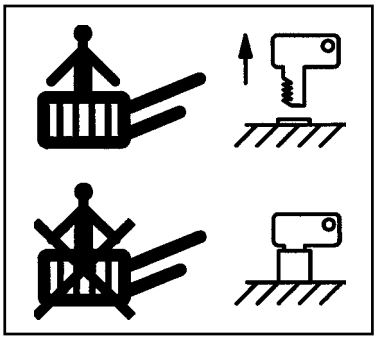


Figure 2-31

Warning sign for pipe break protection (opt.)

ACHTUNG!
Beim Betrieb der Schaufelarmdämpfung ist die Rohrbruchsicherung der Hubzylinder außer Funktion.

Figure 2-32

opt. = Option

Protection against theft

Figure 3-1

3 Protection against theft

Instances where construction machines were stolen have considerably increased in recent years.
To make it possible for the police, customs and other authorities to find and identify machines much faster, **Ahlmann** construction machines are fitted with the following identifying features:

3.1 Identifying features on the loader

(1) Loader type plate (3-1/arrow). Among other details, the loader type plate also gives the 17-digit **FIN** number (truck identification number) starting with W09.
(2) The **FIN** number is also stamped into the front part (3-2/arrow) of the loader.
(3) ROPS plate (3-3/arrow).
This plate gives the name of the manufacturer as well as details on the ROPS type, the loader type and the permissible overall weight.

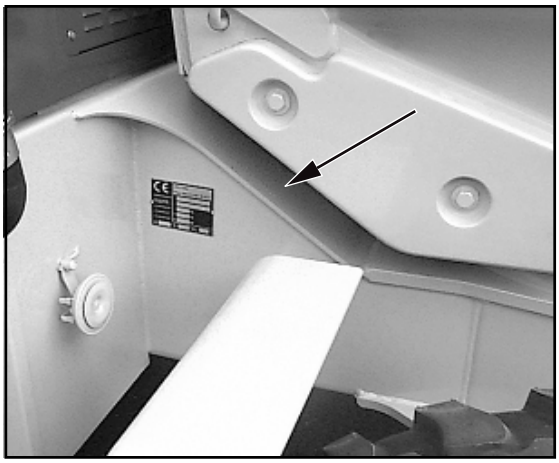


Figure 3-2

3.2 Parking the loader

(1) Turn the steering wheel fully to the left or the right.

(2) Apply the parking brake (4-10/8).

(3) Tip the quick-change device until
- the tines of the bucket,
- the tines of the fork-lift attachment or
- the boom of the lifting hook

is placed on the ground.

(4) Close the ball block valve for the working and auxiliary hydraulics (1-2/arrow).

(5) Set the drive switch (4-10/3) to "forward" or "reverse".

(6) Set hydraulic drive stage "I" (4-10/1).
(7) Set transmission stage "I" (4-11/13) »only for fast loaders«.

(8) Remove the ignition key.

(9) Remove the battery main switch (4-10/5).

(10) Switch on the working lights (4-11/1). *

(11) Switch on the warning beacon (opt.) (4-11/11). *

(12) Switch on the hazard flasher (4-11/10). *

(13) Set the steering column switch (4-10/1) to "High beams". *

(14) Lock both doors.
(15) Lock the engine hood.
(16) Lock the tank lid.

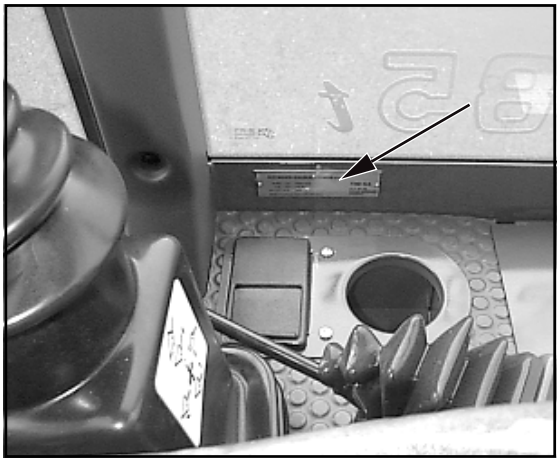


Figure 3-3

* These measures are to make spectators aware of the unusually lit machine if it is hot-wired.

3.3 Transponder for drive-away interlock

(Option)
The "transponder for drive-away interlock" is an electronic drive-away interlock that deactivates vital loader functions. If the transponder (e.g. a tag at the iginition key) is taken away from the receiver unit (in the immediate vicinity of the ignition lock), these vital functions are interrupted.

Advantages if an event insured against occurs:

The transponder for drive-away interlock meets the new, stricter requirements of the insurance companies.
Ask your insurance company for the appropriate details!

Description

4 Description

4.1 Overview

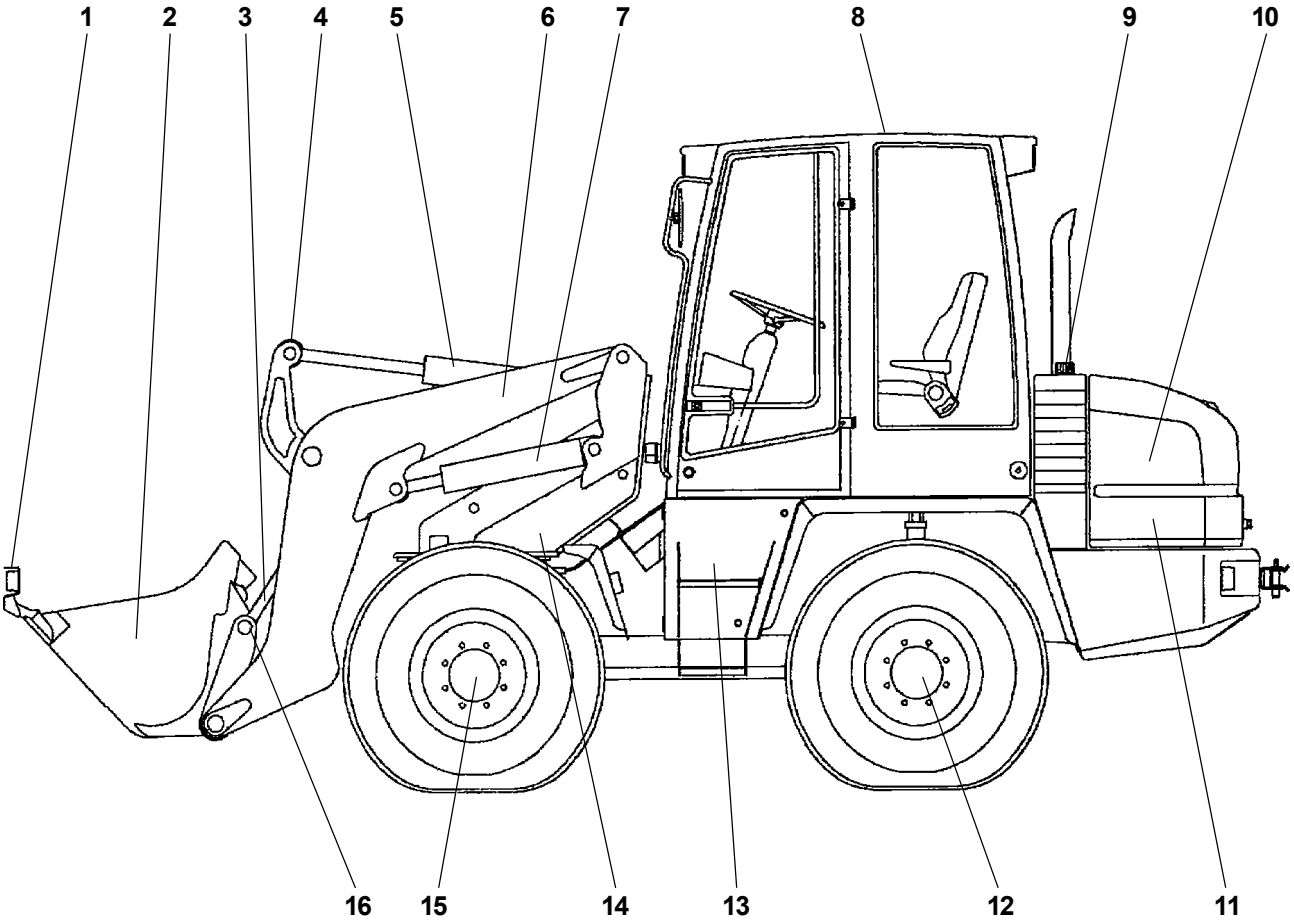


Figure 4-1

1 - Bucket protection
2 - Bucket/attachment
3 - Tip lever/tip shaft
4 - Tilt lever
5 - Tip cylinder
6 - Bucket arm
7 - Lift cylinder
8 - Operator's cabin
9 - Hydraulic oil reservoir/filling cap
10 - Drive unit
11 - Battery compartment (right-hand side of the loader)
12 - Rear axle
13 - Tool compartment
(contains tool box and bucket arm support)
14 - Revolving seat
15 - Front axle
16 - Quick-change device
17 - Fuel tank, ladder on right-hand side of vehicle (not shown)

4.2 Loader

Undercarriage

The axial piston pump for the hydraulic drive is driven by the diesel engine. Pressure hoses for extremely high pressure connect the axial piston pump with the axial piston engine. The axial piston engine is flanged to the axle distribution gear. The torque of the axial piston engine is transmitted by the cardan shaft to the front and rear axles, both with planetary gears.

CAUTION

The maximum speed of the axial piston engine is governed by settings made at the factory. Any adjustment will render the warranty invalid.

The front axle is equipped with a self-locking differential (locking value 45%).

As standard, the rear axle is delivered without a self-locking differential. A self-locking differential (locking value 45%) is special equipment.

Tires

The following tires are permitted:

335/80 R 18	365/80 R 20
365/70 R 18	375/75 R 20
405/70 R 18	405/70 R 20

All four tires are of equal size. For the travel direction, if available, see Figure 4-2.

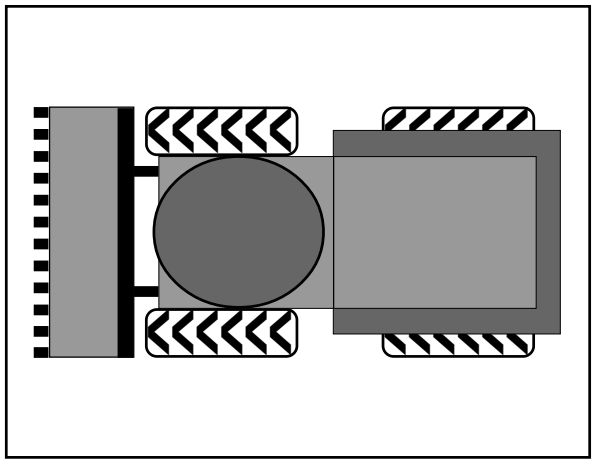


Figure 4-2

Steering system

The power for the hydrostatic steering system is supplied via a priority valve from a gear-type pump. With a minimum of effort on the steering wheel, the oil flow is directed by a steering unit into the steering cylinder.
Four-wheel and rear-wheel steering can be selected using a switch-over valve.

Emergency steering

The hydrostatic steering system can also be used in a limited way if the diesel engine fails. The loader can be steered using a considerable amount of manual effort.

NOTE

See chapter 7, “Towing the loader”.

Brake system

Service brake / inching

The foot-actuated service brake is operated by a pedal (4-8/3). There is a fully hydraulically working wet lamella brake in the front axle. When the pedal is pressed down, the pilot pressure of the drive pump is relieved to the tank by an inching leverage and the hydraulic pressure is built up in the main brake cylinder. This means that the service barke is supported by the hydrostatic drive. Under normal working conditions, accelerating and braking is carried out with the accelerator pedal. Continuous inching is required if a high lifting speed (high diesel engine speed) is necessary at low traction speeds (inching).

Parking brake

The loader is equipped with a parking brake which is actuated manually via a hand lever (4-10/8), located to the right of the operator's seat, which applies the wet lamella brake at the front axle using a Bowden wire. When the parking brake is applied, the indicator lamp lights up (4-11/25) and the traction drive is electrically switched off.

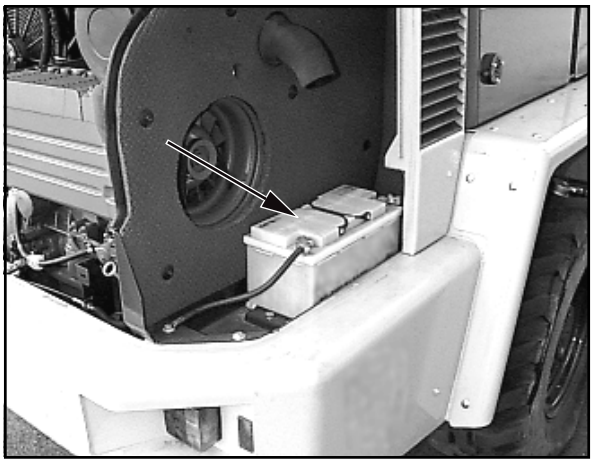


Figure 4-3

Battery

The battery compartment contains a maintenance-free battery (4-3/arrow) according to DIN with an increased cold start performance. The battery is to be kept clean and dry. Lightly grease the terminals with acid-free and acid-resistant grease.

CAUTION

Electric welding operations may only be performed if the battery main switch (4-10/5) has been pulled out.

Fuel supply system

The fuel tank is located on the right frame side bar. An electrical fuel gauge (4-11/7) in the operator's cabin monitors the fuel level in the tank. The filler neck (4-4/arrow) is located on the right side in the cabin access area.

Figure 4-4

Air filter device

Dry air filter device with safety cartridge and dust discharge valve.

Lift and tip devices

Via a control valve, a double-acting gear-type pump feeds

- two lift cylinders and
- one tip cylinder.

All movements of the bucket arm, the bucket, the attachments and the quick change device are controlled from the operator's seat by pilot valves. The pilot valves provide continuous speed control from "slow" to "fast".

Swivel mechanism and axle support

Two single-acting swivel cylinders are fed by a separate gear-type pump via a control valve. The revolving seat is connected with the cylinders by a chain drive. There is no play at all. The swivel and the lifting movements of the bucket arm can take place simultaneously and independently.

The bucket assembly can be swung 90° to the left or right.

When the bucket assembly is swivelled, the axle support is automatically switched on when the bucket arm position is ca. 30°. The support cylinder on the load side acting on the rear axle is thus loaded with hydraulic pressure by the load pressure via the support valve; it acts counter to the swivelled load.

NOTE

The axle support is deactivated when the arm is swung back.

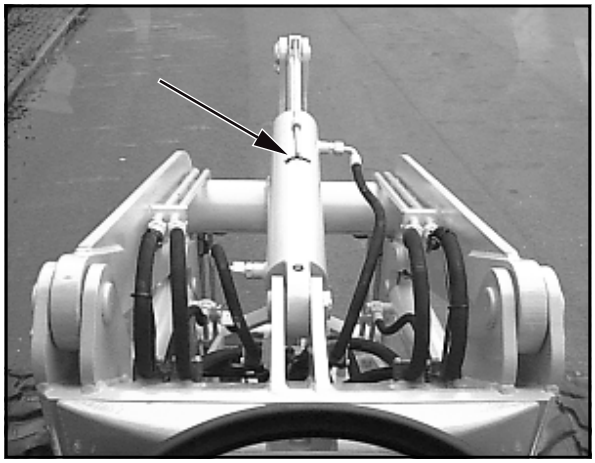


Figure 4-5

Bucket position indicator

Colored markings on the tip cylinder allow the driver to determine the bucket position. The bucket floor is parallel to the ground when the markings on the tip cylinder and the end of the indicator rod (4-5/arrow) are in line.

Float position

The loader is equipped with a floating position function that allows works such as leveling (scraping) to be performed on uneven ground. To use this, the hand lever for the working hydraulics (4-10/2) must be pressed beyond its pressure point into the forward poisition. The hand lever remains locked in this position until it is moved in the opposite direction lo lift the bucket arm again.

DANGER

The floating position function must only be switched on in the lowermost bucket arm position.

Lifting device suspension

(Option)
When the loader must be driven over larger distances, especially with a loaded bucket, the lifting device suspension (4-11/15) should be activated to avoid resonant motion. This becomes even more important with increasing unevenness of the terrain and increasing speed of the loader.

Pipe break safety device

(Option)
A pipe break safety valve is installed on the bottom side of each lift and tip cylinder. In the event of a pipe or hose break in the lift and/or tip system, the movements of the bucket arm and of the tipping rod are blocked until the damage is repaired.

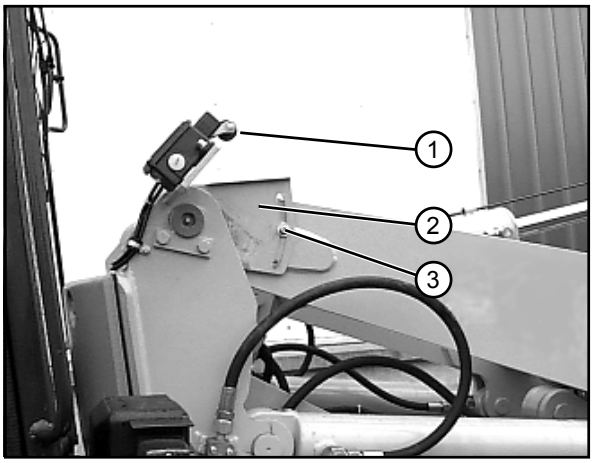


Figure 4-6

Lifting height restriction

(Option)
A device allowing the maximum lifting height to be restricted is installed at the junction of the bucket unit and the center support.

Adjustment:

(1) Lift the bucket arm to the desired height.

(2) Shut down the engine and close the ball block valves for the working and auxiliary hydraulics (1-2/arrow).

(3) Loosen the hex screw (size 10) (4-6/3) of the shift gate and turn the shift gate (4-6/2) towards the roller switch (4-6/1) until it switches audibly.

(4) Tighten the hex screw of the shift gate.

DANGER

Perform a function check before starting work with the lifting height restriction. Observe the lifting height restriction from the driver's seat during work.

Equipment

Operator's cabin

Standard ROPS design with EEC conformance certificate. Comfortable entry and exit from both sides, good all-round vision, lockable doors, sun visor, front and rear windscreen wipers/washers, rear window heater, multi-speed heating/ventilation system, heating and ventilation filter.

Driver's seat

The driver's seat is hydraulically mounted and provided with weight compensation. Individual seat adjustments for safety and comfort can be made for horizontal and height positioning as well as for backrest and seat inclination. The seat belt, the fold-up arm rests and the ergonomically formed seat and back rest assure a safe and comfortable seat position.

4.3 Changing a wheel

(1) Park the loader on solid ground.

(2) Set the drive switch (4-10/3) to “0”.

(3) Apply the parking brake (4-10/8).

(4) Changing a front wheel:

- Lift the bucket arm and insert the bucket arm support (1-1/arrow).
- Block the swivel mechanism by inserting the blocking wedge (1-3/arrow) in the swivel blocking device (1-4/arrow) and secure it using the spring cotter pin.

(4) Changing a rear wheel:
Place the attachment on the ground.

(5) Turn the ignition key (4-11/19) to the left to the “0” position.

(6) Secure the ball hand lever for the working and auxiliary hydraulics (1-2/arrow).

(7) Secure the machine by placing two wedges under one wheel of the axle where **no** wheel is to be changed.

(8) Loosen the wheel nuts of the wheel to be changed until further loosening does not require a large torque.

(9) Fit an appropriate jack (minimum capacity = 2.0 t) from the side under the axle bridge in the vicinity of the axle fixture so that it is centered and cannot slip (4-7). Lift the front/rear axle from the side until the wheel does not have any contact to the ground.

Figure 4-7

DANGER

- Block the jack by a suitable support to prevent any penetration into the ground.

- Make sure that the jack is fitted well.

(10) Loosen the wheel nuts completely and remove them.

(11) Lower the loader slightly with the jack until the wheel bolts are free.

(12) Push off the wheel from the wheel hub by moving it back and forth. Remove the wheel and roll it aside.

(13) Push the new wheel on to the planetary axle.

NOTE

- Pay attention to the profile position.
- If the profile position of the replacement wheel does not fit, the replacement wheel must only be used until an appropriate one can be fitted as soon as possible.

(14) Fit the wheel nuts by hand.

(15) Lower the front/rear axle using the jack.

(16) Tighten the wheel nuts with a torque wrench to 500 Nm.

CAUTION

Tighten the wheel nuts after the first 8-10 operating hours.

4.4 Controls

1 - Locking lever for steering column adjustment
  - forward/backward
  - higher/lower
2 - Accelerator pedal
3 - Double pedal for service brake/inching
4 - Foot pedal for swiveling
5 - Steering column switch
  - to the front: Turn indicator, right
  - to the rear: Turn indicator, left
  - up - Low beam
  - down - High beam
  - pushbutton - Signal horn

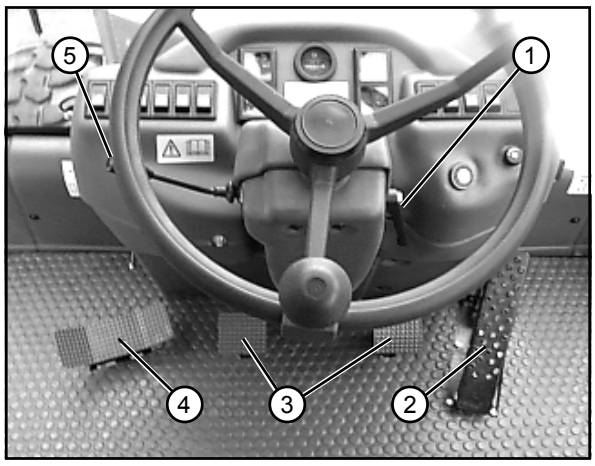


Figure 4-8

To the left of operator's seat:

1 - Door handle
2 - Water tank for wiper system
3 - Maintenance door
4 - Switch lever for steering

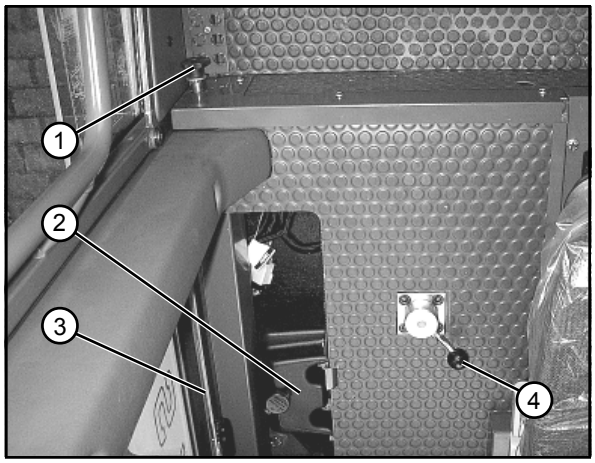


Figure 4-9

To the right of operator's seat:

1 - Hydraulic driving steps:
  - right - speed I: slow
  - left - speed II: fast
2 - Pilot valve for working hydraulics
3 - Drive switch: forward/0/reverse
4 - Compensation tank for brake fluid
5 - Battery main switch
6 - Maintenance door
7 - Holder
8 - Hand lever for parking brake
9 - Handwheel, console adjustment of pilot valve for working hydraulics
10 - Door handle
11 - Actuator for auxiliary hydraulics:
  - upper pushbutton:
    - Lock attachment
    - Close multipurpose bucket
  - bottom pushbutton:
    - Unlock attachment
      » in conjunction with 4-10/2 «
    - Open multipurpose bucket

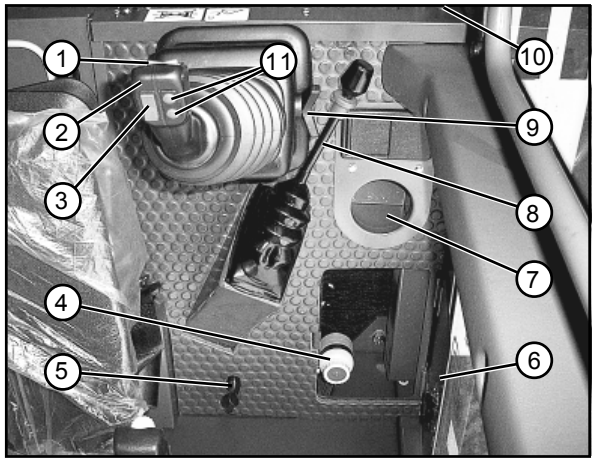


Figure 4-10

4.5 Instrument panel

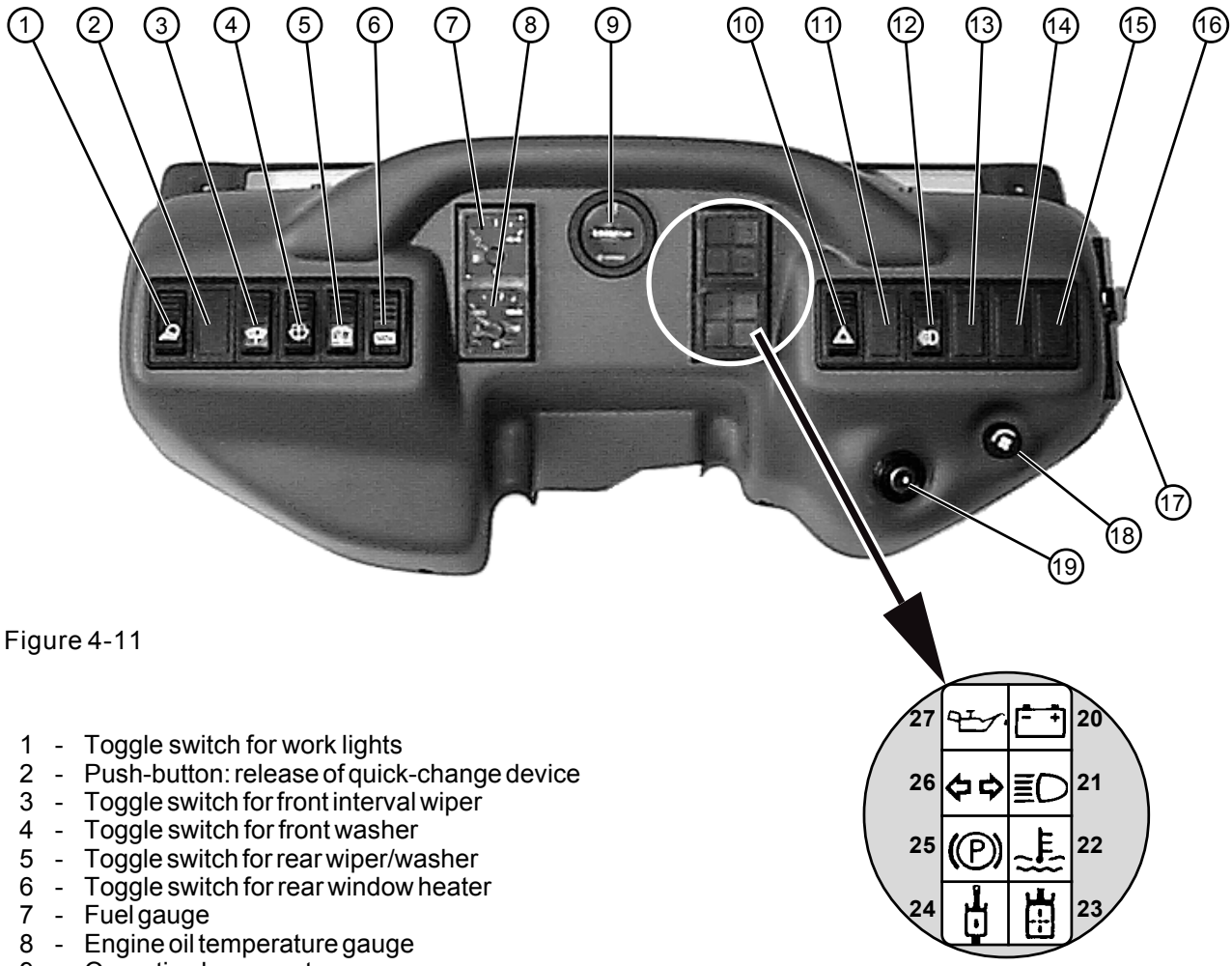


Figure 4-11

1 - Toggle switch for work lights
2 - Push-button: release of quick-change device
3 - Toggle switch for front interval wiper
4 - Toggle switch for front washer
5 - Toggle switch for rear wiper/washer
6 - Toggle switch for rear window heater
7 - Fuel gauge
8 - Engine oil temperature gauge
9 - Operating hours meter
10 - Toggle switch for hazard flasher
11 - Toggle switch for warning beacon (option)
12 - Toggle switch for road lights
13 - Gear switch (only for fast loaders)
up: gear step II, down: gear step I
14 - Not used
15 - Toggle switch for lifting device suspension (option)
16 - Socket
17 - Fuse box
18 - Rotary switch for heating/fan
19 - Starter switch
20 - Battery charge control lamp
21 - Control lamp for high beams
22 - Control lamp for cooling water temperature
23 - Hydraulic oil filter clogging indicator
24 - Control lamp for hydraulic oil temperature
25 - Control lamp for parking brake
26 - Control lamp for directional indicator
27 - Control lamp for engine oil pressure

Operation

5 Operation

5.1 Checks before start-up

- Engine oil level (see Engine Operating Instructions)
- Brake fluid level
- Hydraulic oil level
- Tire pressure
- Profile depth
- Battery fluid level
- Lighting system
- Seat position
- Swivel mechanism blocking device, remove if necessary »only if work is to be commenced«
- Bucket arm support (1-1/arrow); remove if unnecessary
- Open ball block valve for working and auxiliary hydraulics if necessary » only if work is about to begin «
- General status of loader, e.g. leaks
- Check that
  - a first aid kit
  - a warning traingle
  - a warning flashlight

  are available.

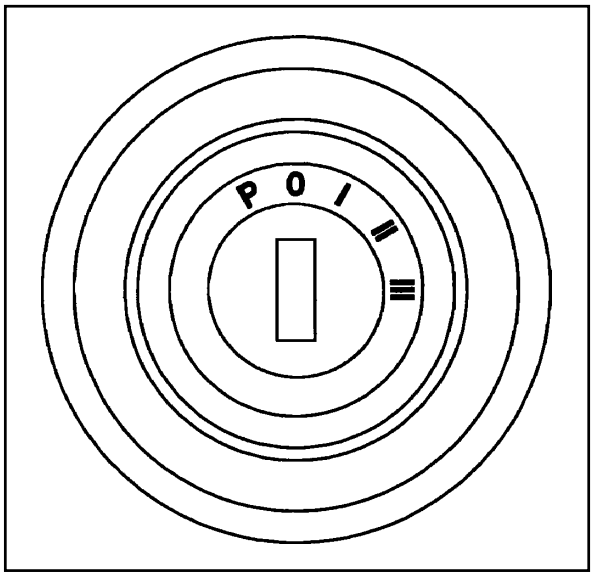


Figure 5-1

5.2 Starting up

5.2.1 Starting the diesel engine

(1) Pull the lever for the parking brake (4-10/8).

(2) Set the drive switch (4-10/3) to position “0” (starter interlock!).

(3) Insert the ignition key into the starter switch (4-11/19) and turn the key clockwise to the position “I” (5-1).

NOTE

- The control lamp for battery charging, the parking brake indicator lamp and the engine oil pressure lamp light up. The fuel gauge, the engine oil temperature gauge and the operating hour meter function.
- Start the engine in the neutral position.

(4) Turn the ignition key clockwise to position “III”. As soon as the engine starts, release the ignition key.

NOTE

- If the engine has not started after two attempts, determine the cause using the malfunction table in the Engine Operating Instructions (section 7.1).
- For operation at extremely low temperatures, see the Engine Operating Instructions.
- The clogging indicator (4-11/23) may light up prematurely after a cold start. It will go out when the hydraulic oil warms up. Operate the loader at a **low** speed until the indicator lamp (4-11/23) goes out. Never subject the loader to full loads in this state.

5.2.2 Winter operation

CAUTION

If the outside temperature is below 0 °C, the machine must be properly "warmed up" to avoid damage to certain assemblies. To do so, actuate all cylinders (lifting, tipping and swivelling cylinders) for some time (depending on the ambient temperature) with the machine idling.

Proper operation of the machine can only be guaranteed even for subzero temperatures if the following measures have been taken:

5.2.2.1 Fuel

At low temperatures, paraffin precipitating from the fuel can cause the fuel system to clog up.
For this reason, always use winter diesel fuel (suitable for temperatures down to -15 °C) when the outside temperature is below 0 °C.

NOTE

The fuelling stations normally start offering winter diesel fuel in good time before the cold season starts. Often, they offer diesel fuel that can be used down to temperatures of -20 °C (super-grade diesel fuel).
If the temperature is below -15 °C or -20 °C, paraffin oil must be added to the diesel fuel. For the mixture ratio, refer to the diagram (5-2).

I = Summer diesel fuel
II = Winter diesel fuel
III = Super-grade diesel fuel

CAUTION

Only mix the ingredients in the tank! First, fill in the required amount of paraffin oil, then top up with diesel fuel.

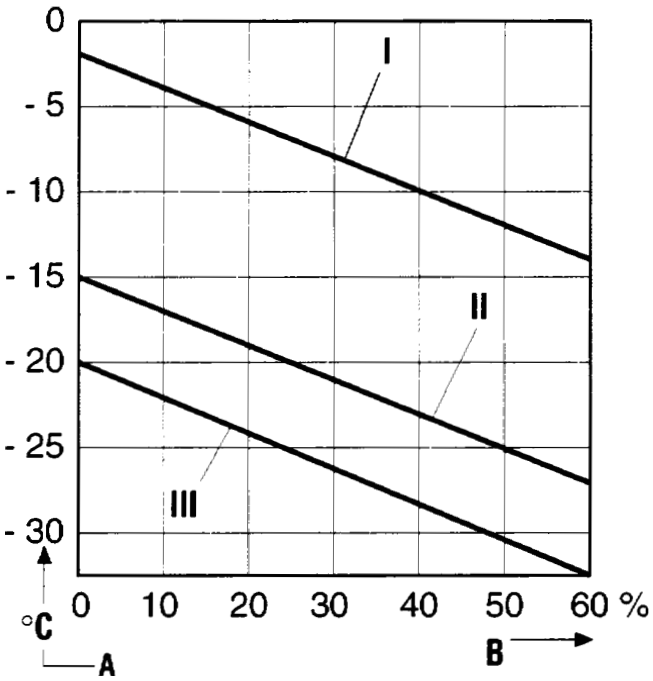


Figure 5-2

5.2.2.2 Engine oil change

See the operating instructions for the engine and the operating instructions for the machine (section 8.2.4).

5.2.2.3 Changing the oil in the hydraulic system

CAUTION

The viscosity of the hydraulic oil changes according to the temperature; therefore, the ambient temperature in the place where the machine will be used determines what viscosity class (SAE class) must be chosen. If the hydraulic oil used matches the expected ambient temperature, optimum operating conditions can be attained. Therefore, use hydraulic oil of an appropriate grade if required.

See section 8.2.6 for the oil change procedure required for the hydraulic system.

5.2.2.4 Anti-freezing agent for the windshield washer system

CAUTION

If the temperature is expected to drop below 0 °C, add a sufficient amount of anti-freezing agent to the water in the windshield washer system (4-9/2) to prevent it from icing up.
Heed the instructions provided by the manufacturer for the mixture ratio.

5.2.3 Driving the loader on public roads

CAUTION

- Driving on public roads is **only** permitted with a standard, multi-purpose or lightweight material bucket (1,0 m³) and **only** with bucket protection. The front-end excavator may also be transported if it has been lashed down in the bucket.
- The maximum permissible speed is 30 km/h with the driving light switched on. The driving light only serves to illuminate the road.
- The driving steps of the distributor transmission may only be selected when the loader is at a standstill and only if the travel direction switch (4-10/3) is set to "0" (only for fast loaders).

The driver of the loader must possess a valid driver's license.

The driver must carry his driving license (original) with him as well as the operating permit (original).

Before driving on public roads, the following safety measures for public road traffic are to be taken:

Figure 5-3

5.2.3.1 Transporting a bucket

(1) Lower the bucket arm until the lowest point of the bucket arm or the bucket is at least 30 cm above the road (5-3).

(2) Close the ball block valve for the working and auxiliary hydraulics (1-2/arrow).

CAUTION

When closed, the hand levers for the ball block valves are perpendicular to the direction of flow. This prevents the bucket arm from being lowered and the bucket from tipping while driving.

(3) Block the swivel mechanism by inserting the blocking wedge (1-3/arrow) in the swivel blocking device (1-4/arrow) and secure it using the spring cotter pin.

(4) Cover the bucket cutting edge and teeth with the bucket protector (5-3/arrow).

(5) Insert the plug of the bucket protector into the socket (5-4/arrow).

(6) Check that the lighting system functions correctly.

(7) Close both doors.

(8) Switch the change-over lever of the steering system to “rear axle steering” (4-9/4).

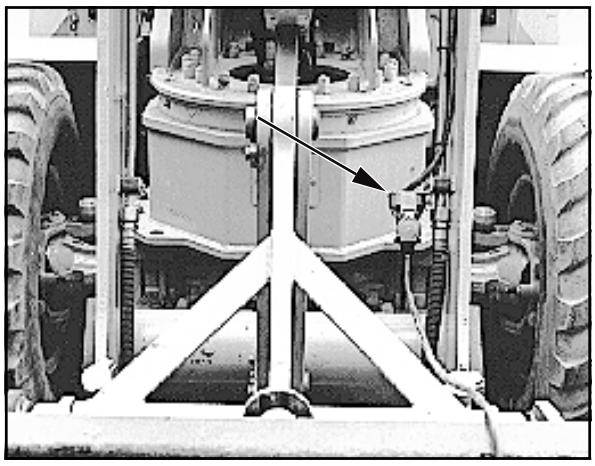


Figure 5-4

DANGER

- Driving on public roads with the bucket filled is forbidden.
- The working lights must be switched off (4-11/1).

(9) Release the parking brake (4-10/8).

(10) Set the gear shift to “II” (4-11/13) - only for fast loaders.

CAUTION

The driving steps of the distributor transmission may only be selected when the loader is at a standstill and only if the travel direction switch (4-10/3) is set to "0" (only for fast loaders).

(11) Preselect hydraulic travel speed II (4-10/1).

(12) Preselect the travel direction (4-10/3).

(13) Press the accelerator pedal (4-8/2).

CAUTION

- The service brake is activated by depressing the brake pedal (4-8/3).
- Changing the travel direction during driving is **not** allowed to avoid any danger to other road users.

5.2.3.2 Transport of an excavator in the bucket

(1) Pick up the front-end excavator with totally closed backhoe as described in section 6.2.2.

(2) Swivel the sufficiently lifted bucket arm to the left till it stops.

(3) Swing the shaft of the front-end excavator (in or out) using the hand lever for additional hydraulics (4-9/5) until the markings (5-5/1) match.

(4) Swivel the bucket arm into the drive direction.

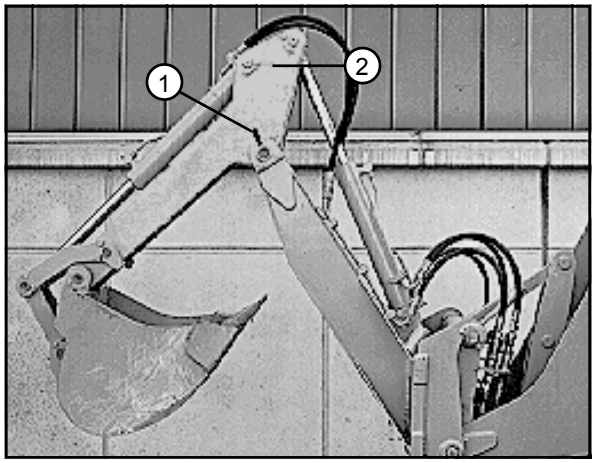


Figure 5-5

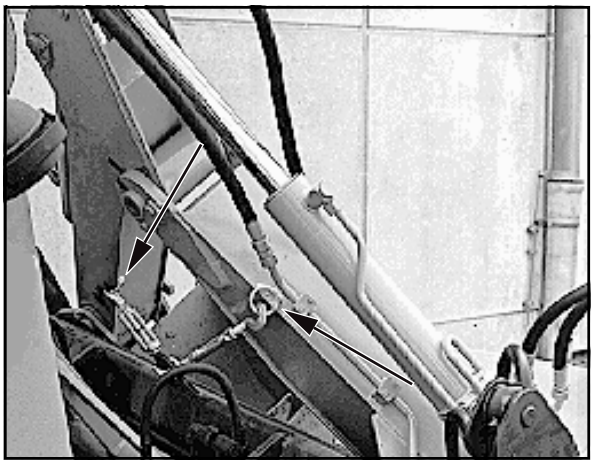


Figure 5-6

(5) Put the front-end excavator on solid ground (see section 6.2.2).
(6) Pick up the front-end excavator with suitable lifting gear (5-5/2) and put it into the bucket.
(7) Use two turnbuckles to fasten the front-end excavator in the bucket (5-6/arrows).
(8) Lift the bucket with the secured front-end excavator (see section 6.1.1 or 6.2.1). Tilt it until the excavator almost touches the shift lever of the loader (5-7/arrow).
(9) Lower the bucket arm until the lowest point of the bucket arm or the bucket is at least 30 cm above the road (5-3).
(10) Close the ball block valve for the working and auxiliary hydraulics (1-2/arrow).

CAUTION

When closed, the hand levers for the ball block valves are perpendicular to the direction of flow. This prevents the bucket arm from being lowered and the bucket from tipping while driving.

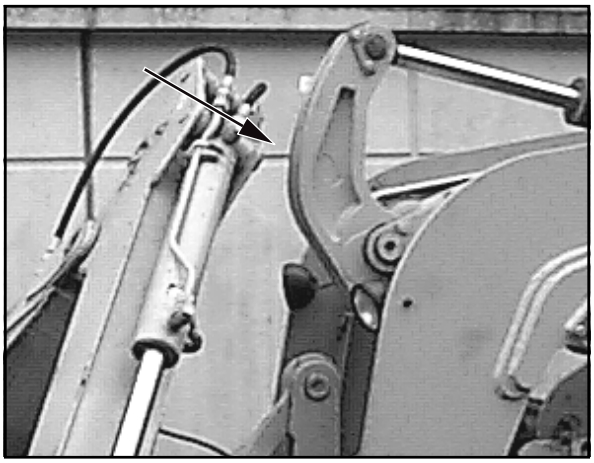


Figure 5-7

(11) Block the swivel mechanism by inserting the blocking wedge (1-3/arrow) in the swivel blocking device (1-4/arrow) and secure it using the spring cotter pin.
(12) Cover the bucket cutting edge and teeth with the bucket protector (5-3/arrow).
(13) Insert the plug of the edge protector into the socket (5-4/arrow).
(14) Check that the lighting system functions correctly.
(15) Close both doors.
(16) Switch the change-over lever of the steering system to “rear axle steering” (4-9/4).

DANGER

Make sure to switch off the working lights (4-11/1).

(17) Release the parking brake (4-10/8).
(18) Set the gear shift to “II” (4-11/13) - only for fast loaders.

CAUTION

The driving steps of the distributor transmission may only be selected when the loader is at a standstill and only if the travel direction switch (4-10/3) is set to "0" (only for fast loaders).

(19) Preselect hydraulic travel speed II (4-10/1).
(20) Preselect the travel direction (4-10/3).
(21) Actuate the accelerator pedal (4-8/2).

NOTE

The loader starts. The driving speed is determined by the position of the accelerator pedal.

CAUTION

- The service brake is activated by depressing the brake pedal (4-8/3).
- Changing the driving direction during driving is **not** allowed to avoid any danger to other road users.

5.2.4 Working with the loader

Normally, all work is executed in hydraulic drive stage **"II"** (4-10/1) and a transmission step that matches the working conditions (4-11/13) (only for fast loaders).

CAUTION

The driving steps of the distributor transmission may only be selected when the loader is at a standstill and only if the travel direction switch (4-10/3) is set to "0" (only for fast loaders).

For special tasks which ask for a more sensitive control of the speed or a higher engine speed at reduced travel speed, hydraulic drive stage "I" (4-10/1) can be selected. The travel speed can thus be reduced to 6 km/h.

To attain full performance, the combined action of propulsion and of the hydraulic loader functions is necessary. It is up to the operator to control the available power using the accelerator, the inching function and the hand lever for the hydraulic loader functions.

NOTE

The hydraulic travel speed can be switched from I to II or vice versa while driving. However, switching from hydraulic travel speed II to I when driving at high speeds is not recommended since the loader is then braked very abruptly.

(1) Close both doors.

(2) Release the parking brake (4-10/8).

(3) Preselect the gear travel speed (4-11/13) (only for fast loaders).

(4) Preselect the hydraulic travel speed (4-10/1).

(5) Select the desired travel direction (4-10/3).

(6) Press the accelerator pedal (4-8/2).

NOTE

- The travel speed and the thrust force are altered exclusively by depressing the accelerator pedal.
- When driving up gradients, the travel speed decreases in spite of full throttle in favor of the thrust force.
- The thrust forces and travel speeds are the same in forward and reverse direction.

Figure 5-8

CAUTION

- The hydraulic quick-change device must only be **locked** if an attachment has been mounted.

- If the control lamp for the hydraulic oil temperature (4-11/23) lights up during operation, the loader must be switched off immediately, the cause must be determined by a hydraulics expert and the malfunction must be eliminated.

DANGER

If it is necessary during special types of work to drive with the bucket arm swiveled, the bucket or the attachment must be kept close above the wheel and the travel distance must be kept as short as possible. If because of rough terrain a wheel is raised off the ground by the stabilizer equipment, the bucket arm must be briefly swiveled in the direction of travel so that the axle lock is deactivated.

Figure 5-9

5.2.5 Heating and ventilation system

5.2.5.1 Adjusting the amount of air

(1) Turn the rotary switch (5-8/arrow) for the blower to position 0, 1 or 2, depending on the amount of air desired.

(2) Adjust the direction of the air flow by means of the lateral nozzles (5-9/arrow).

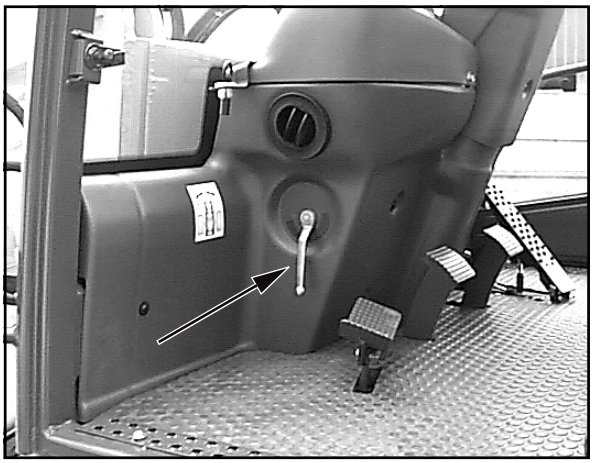


Figure 5-10

5.2.5.2 Switching on the heater

(1) Depending on the heating requirement, turn the ball valve (5-10/arrow) into a vertical or horizontal position.

NOTE

Lever vertical - warm.

Lever horizontal - cold.

(2) Adjust the amount of air as described under 5.2.5.1.

5.3 Stopping loader operation

5.3.1 Parking the loader

(1) Stop the loader on solid ground; if possible, not on a slope.

(2) Place the bucket or the front-mounted attachment on the ground.

(3) Set the drive switch (4-10/3) to “0”.

(4) Apply the parking brake (4-10/8).

DANGER

If parking on a slope or gradient cannot be avoided, wheel chocks must be used and placed on the sloping side of the front axle wheels **in addition to** applying the parking brake.

5.3.2 Switching off the engine

CAUTION

If the diesel engine is very hot, let the engine idle for a short time before switching it off.

Turn the ignition key to the left to the “0” position (5-1) and remove the key.

NOTE

In the “P” position, the parking light and the dashboard illumination remain switched on.

5.3.3 Switching off the heating and ventilation system

(1) Shut off the warm air supply (5-10/arrow).

(2) Turn the rotary switch (5-8/arrow) to the “0” position.

5.3.4 Leaving the loader

(1) Secure the ball hand lever for the working and auxiliary hydraulics (1-2/arrow).

(2) Remove the ignition key and lock the doors.

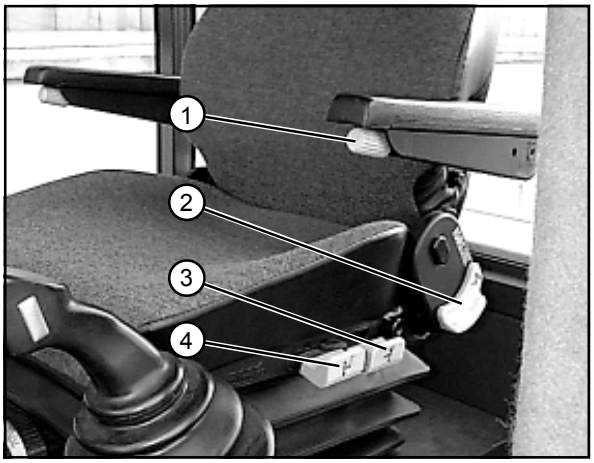


Figure 5-11

5.4 Adjusting the operator's seat

5.4.1 Isri seat

(1) Adjust the inclination of the backrest or swing forward the back support using the hand lever (5-11/2).

(2) Adjust the rear seat height and tilt by lifting the hand lever (5-11/3).

(3) Adjust the front seat height and tilt by lifting the hand lever (5-11/4).

(4) The seat suspension may be adjusted to the driver's weight (40 ... 130 kg) using the hand wheel (5-12/1).

(5) Adjust the height of the arm rest by turning the knob (5-11/1).

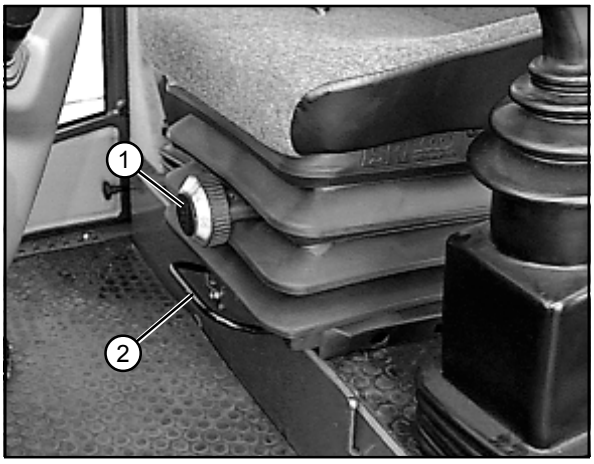


Figure 5-12

(6) If necessary, readjust the position of the valve levers for the working hydraulics (4-10/9) and the auxiliary hydraulics (4-9/6).

(7) The operator's seat may be adjusted in the horizontal direction to suit the driver's requirements by lifting the handle (5-12/2) and moving the seat forward or backward.

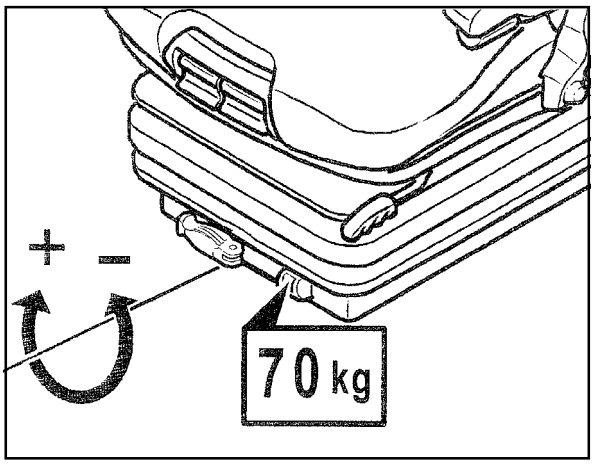


Figure 5-13

5.4.2 Grammer seat

(1) **Weight adjustment:**
Adjust the seat to the driver's weight by actuating the weight adjustment lever. The set driver's weight is visible in the ispection window (5-13).

(2) **Height adjustment:**
The height can be adjusted in several steps.
Lift the driver's seat to the desired height until it can be heard to engage. The seat returns to the lowest position when it is lifted over the topmost position (stop) (5-14).

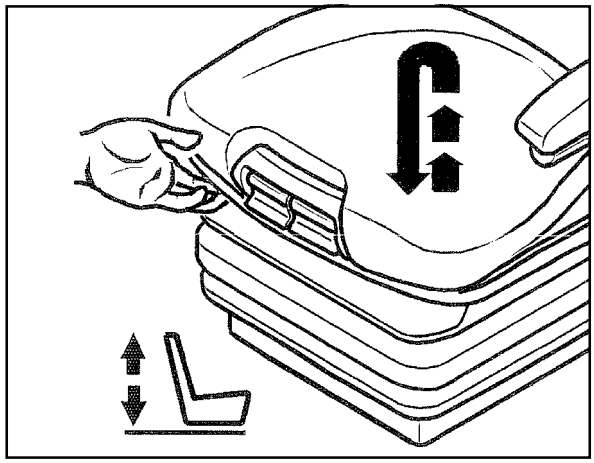


Figure 5-14

(3) **Armrest inclination:**
Turn the handwheel (5-15/arrow) to adjust the armrest in longitudinal direction.

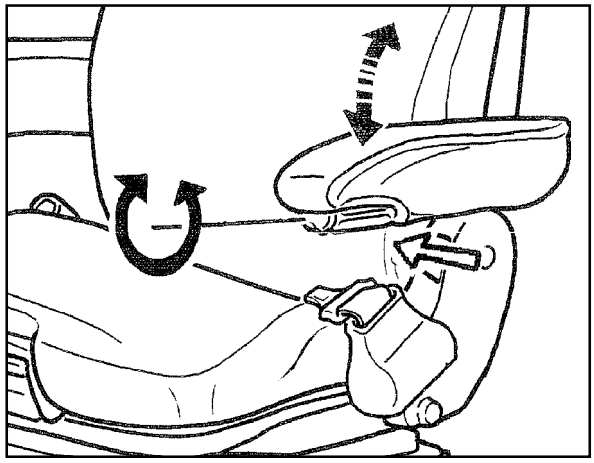


Figure 5-15

(4) **Armrests:**
If desired, you can swing the armrests to the rear and adjust their height.

To adjust the armrest height, remove the round cap (5-16/ arrow) in the covering.

Loosen the hex nut (wrench size 13 mm), set the armrest as desired and tighten the nut again. Push the removed cap onto the nut again.

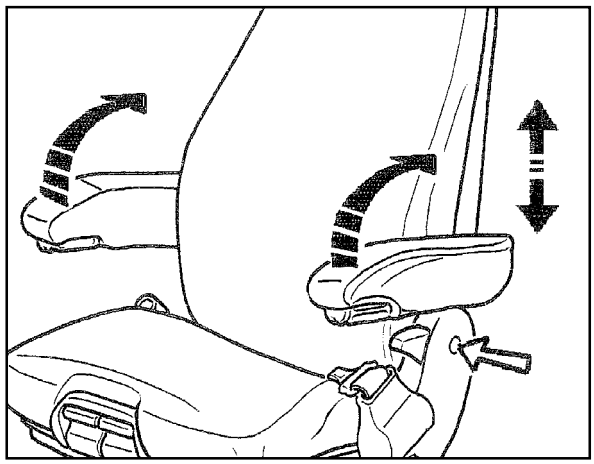


Figure 5-16

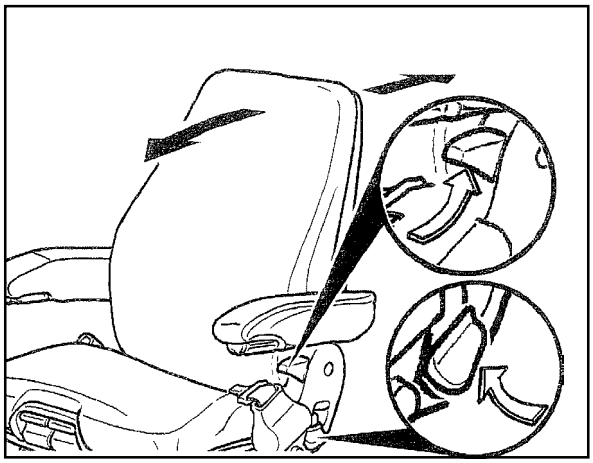


Figure 5-17

(5) **Adjusting the backrest:**
Use the locking lever (5-17/arrow) to adjust the backrest.

NOTE

The locking lever must engage in the desired position. It must be impossible to move the backrest to another position when the lever has engaged.

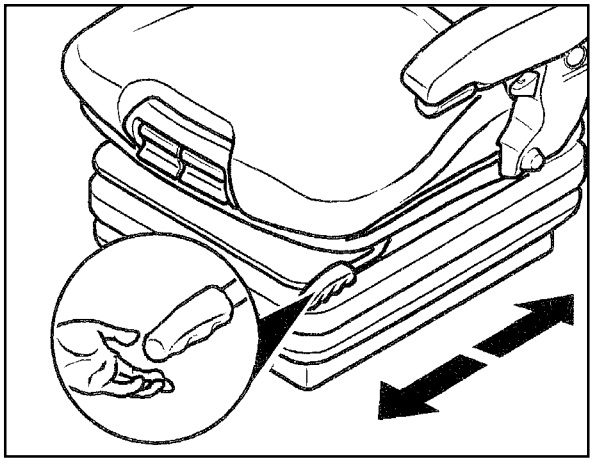


Figure 5-18

(6) **Longitudinal adjustment:**
You can adjust the seat in longitudinal direction when you pull the lever (5-18) upwards.

NOTE

The locking lever must engage in the desired position. It must be impossible to move the driver's seat to another position when the lever has engaged.

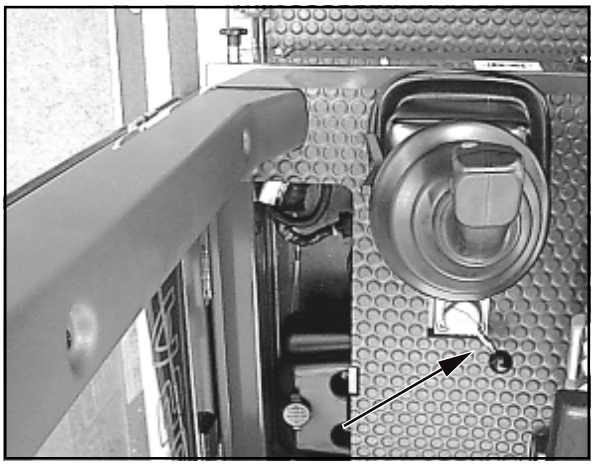


Figure 5-19

5.5 Changing the steering

CAUTION

- The wheels of the rear axle must be straight before operating the change-over switch (5-19/arrow).
- The steering may only be changed when the **machine** is **stationary**. For changing the steering, move the hand lever forward (rear-axle steering) or backward (four-wheel steering).

Attachments

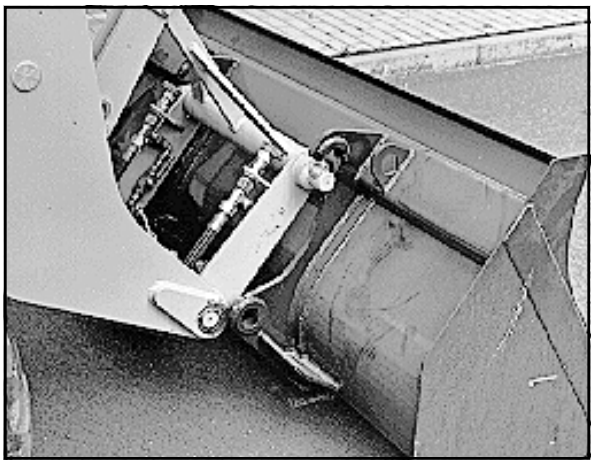


Figure 6-1

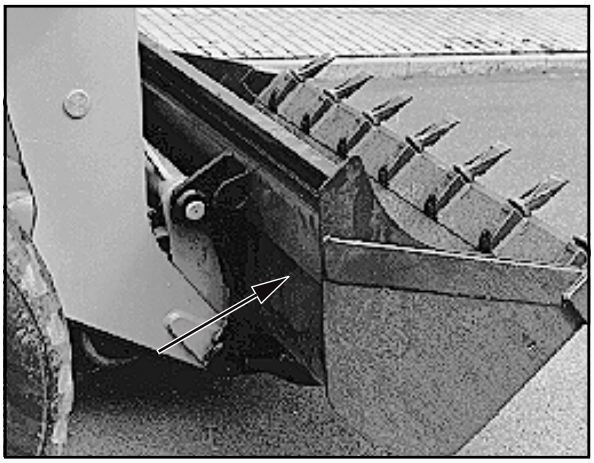


Figure 6-2

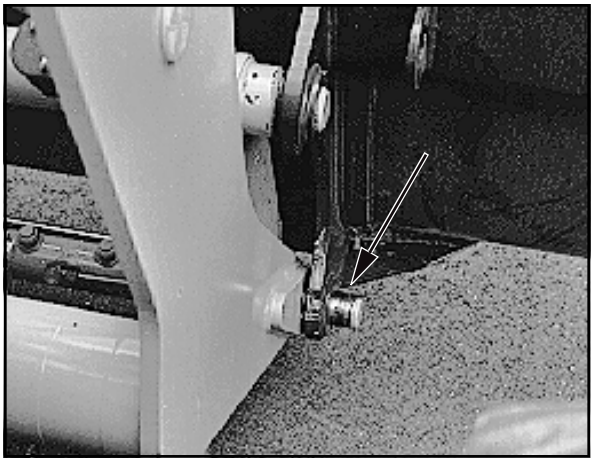


Figure 6-3

6 Attachments

6.1 Mounting and dismounting the attachments without hydraulic connections

6.1.1 Standard/lightweight bucket

Mounting

(1) Bring the bucket arm to its lowest position and tip the quick-change device.

(2) Drive the loader up to the bucket (6-1).

(3) Pick up the bucket using the quick-change device and, by simultaneously tilting the quick-change device, raise the bucket until the quick-change device is next to it (6-2).

(4) Lock the bucket with the upper pushbutton for the auxiliary hydraulics (4-10/11).

(5) Check the connection and the lock on both sides.

DANGER

Both bolts of the quick-change device must be in the boreholes of the bucket support and must be clearly visible (6-3/arrow).

Dismounting

(1) Place the bucket firmly on the ground.

(2) Press the release button for the quick-change device (4-11/2) and, while keeping the upper buttons for the auxiliary hydraulics (4-10/11) pressed, unlock the bucket.

CAUTION

The hydraulic quick-change device must only be **locked** when an attachment has been mounted.

(3) Tilt the quick-change device and reverse out.

6.1.2 Fork-lift attachment

NOTE

Mounting and dismounting are carried out in the same way as for the standard/lightweight bucket (section 6.1.1).

DANGER

- Both bolts of the quick-change device must be in the boreholes of the fork-lift attachment and must be clearly visible (6-4/2).
- Distribute the weight equally on both fork tines and secure it against moving and falling off.
- Rest the load at the rear of the fork and tilt the fork-lift attachment.
- Position both fork tines at an equal distance from the center (6-5/arrows) and lock them.

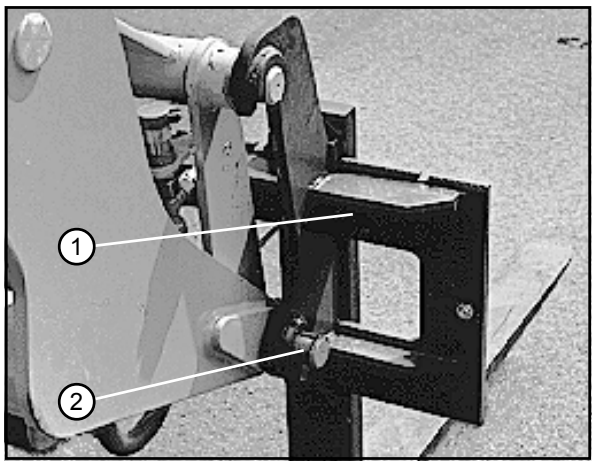


Figure 6-4

CAUTION

The hydraulic quick-change device must only be **locked** when an attachment has been mounted.

NOTE

- The fork tines are locked correctly when the two tiltable locking levers are fully positioned on the fork carrier.
- The type plate is on the rear of the upper fork support (6-4/1).

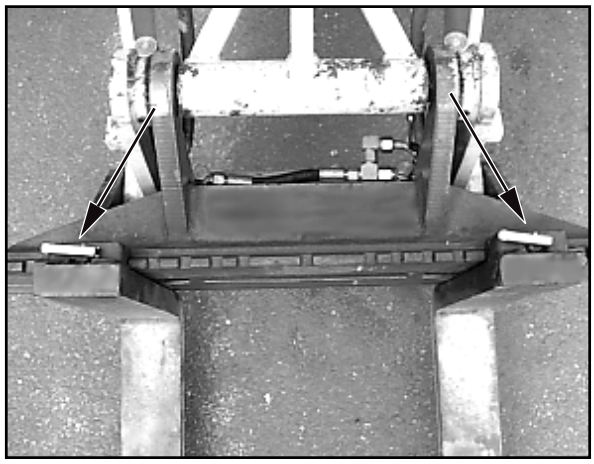


Figure 6-5

6.1.3 Lifting hook

NOTE

Mounting and dismounting are carried out in the same way as for the standard bucket (chapter 6.1.1).

DANGER

- Both bolts of the quick-change device must fit in the boreholes of the lifting hook attachment and must be clearly visible.
- Check the safety flap on the crane hook for proper functioning.

CAUTION

The hydraulic quick-change device must only be **locked** when an attachment has been mounted.

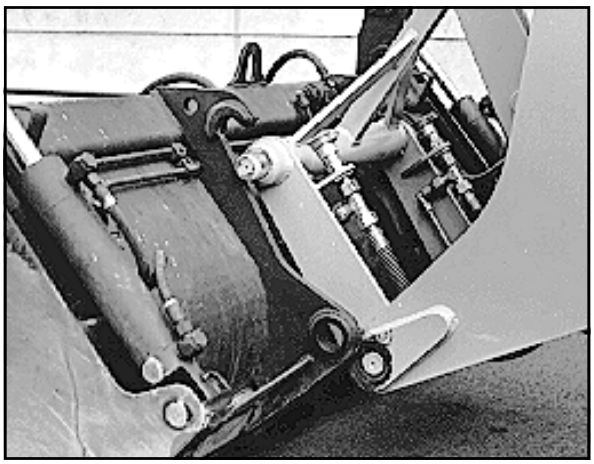


Figure 6-6

6.2 Mounting and dismounting attachments with a hydraulic connection

6.2.1 Multi-purpose bucket

Mounting

(1) Bring the bucket arm to its lowest position and tip the quick-change device.

(2) Drive the loader up to the bucket (6-6).

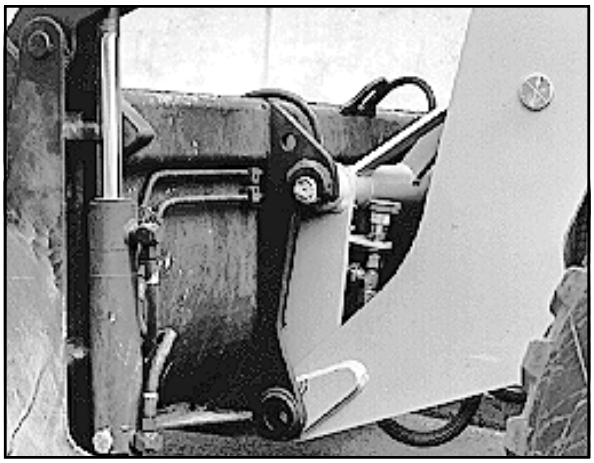


Figure 6-7

(3) Pick up the bucket using the quick-change device and, by simultaneously tilting the quick-change device, raise the bucket until the quick-change device is next to it (6-7).

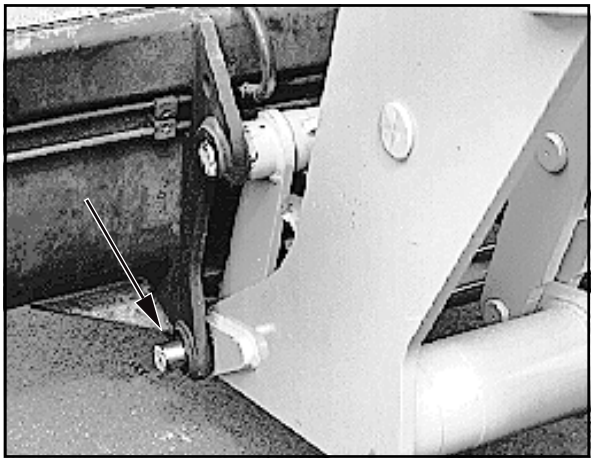


Figure 6-8

(4) Lock the bucket with the upper pushbutton for the auxiliary hydraulics (4-10/11).

(5) Check the connection and the lock on both sides.

DANGER

Both bolts of the quick-change device must fit in the boreholes of the bucket support and must be clearly visible (6-8/arrow).

(6) Shut down the engine and turn the ignition key to “I“.

(7) Depressurise the hydraulic lines. For this purpose, press both pushbuttons for the auxiliary hydraulics (4-10/11) alternately several times.

(8) Remove the protective caps from the hoses of the quick-change device (6-9/1).

(9) Swing up the protective flaps of the quick-action couplings of the multi-purpose bucket (6-9/2) and connect them with the hydraulic hoses of the quick-change device (6-9) by pushing them firmly in.

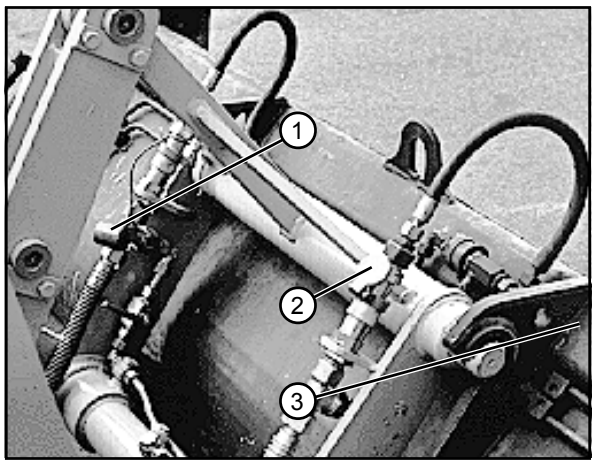


Figure 6-9

NOTE

Use the outermost connections if the loader is equipped with the second auxiliary hydraulics circuit (option).

CAUTION

When making connections, pay attention that the hydraulic connections are clean and complete.

Dismounting

(1) Place the multi-purpose bucket firmly on the ground.

(2) Shut down the engine and turn the ignition key to “I“.

(3) Depressurise the hydraulic lines. For this purpose, press both pushbuttons for the auxiliary hydraulics (4-10/11) alternately several times.

(4) Dismounting takes place in the reverse order of mounting. However, to unlock the multi-purpose bucket, the release button for the quick-change device (4-11/2) must be used.

CAUTION

The hydraulic quick-change device must only be **locked** when an attachment has been mounted.

NOTE

The type plate is on the rear of the bucket, on the right below the cross arm (6-9/3).

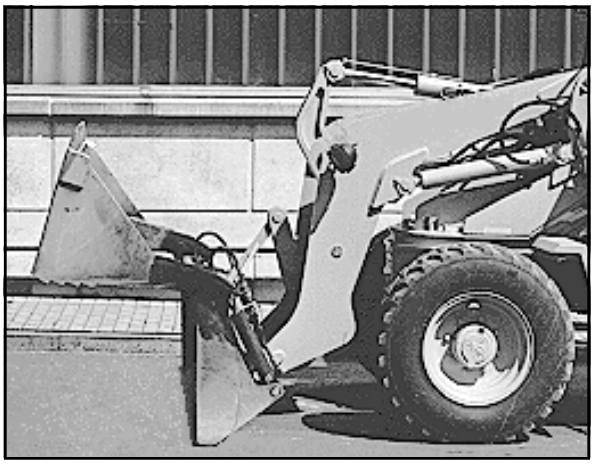


Figure 6-10

Notes on the application of the multi-purpose bucket

The multi-purpose bucket can be used for:

- peeling (6-10)

Figure 6-11

- scraping (6-11)

Figure 6-12

- grabbing (6-12) and
- in bucket operation.

6.2.2 Front-end excavator

NOTE

Only for loaders with second auxiliary hydraulics circuit.

Mounting

Mounting is carried out in the same way as for the multi-purpose bucket (section 6.2.1 (1) ...(9)), with the exception that **all four** hydraulic hoses of the front-end excavator must be connected to the four quick-action couplings of the quick-change device.

DANGER

Both bolts of the quick-change device must be in the boreholes on both sides of the front-end excavator mount and must be clearly visible (6-13/arrow).

CAUTION

When making connections, pay attention that the hydraulic connections are clean and complete.

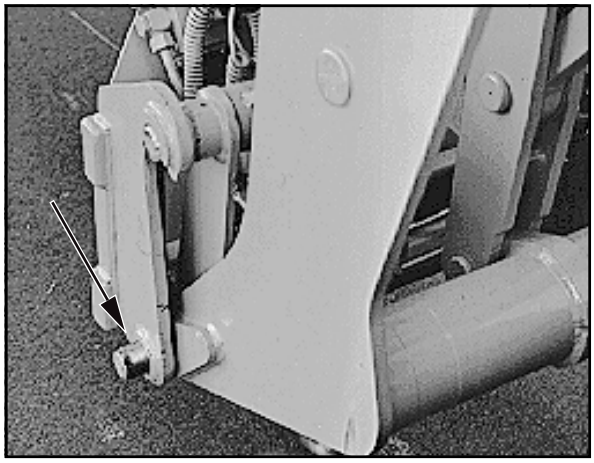


Figure 6-13

Dismounting

Dismounting is carried out in the same way as for the multi-purpose bucket (section 6.2.1), with the exception that all four hydraulic hoses of the front-end excavator must be uncoupled from the quick-action couplings of the quick-change device.

CAUTION

The hydraulic quick-change device must only be **locked** when an attachment has been mounted.

NOTE

The type plate is on the right side of the shaft, near the support plate.

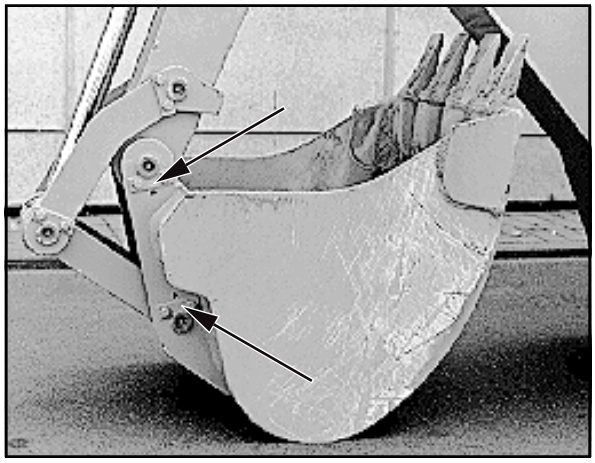


Figure 6-14

6.2.2.1 Changing the backhoe

(1) Lift the bucket arm and fit the bucket arm support (1-1/arrow).
(2) Bring the front-end excavator into a position so that the backhoe rests with its back on the ground.
(3) Switch off the engine.
(4) Remove the pressure from the hydraulic lines by moving the hand lever for the auxiliary hydraulics (6-19b/5) back and forth.
(5) Close both ball block valves (6-19a/arrows).
(6) Unscrew the safeguards for the bolts (size 19) (6-14/arrows).
(7) Knock out the bearing pin (6-15/arrows) and take off the backhoe.
(8) Fitting takes place in reverse order of dismounting.

NOTE

The type plate is on the left outer side of the backhoe.

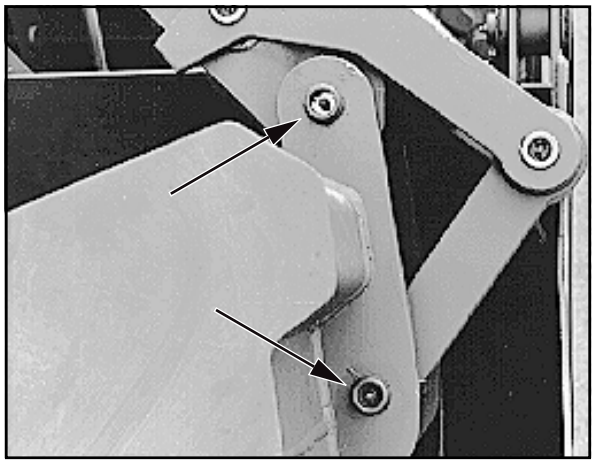


Figure 6-15

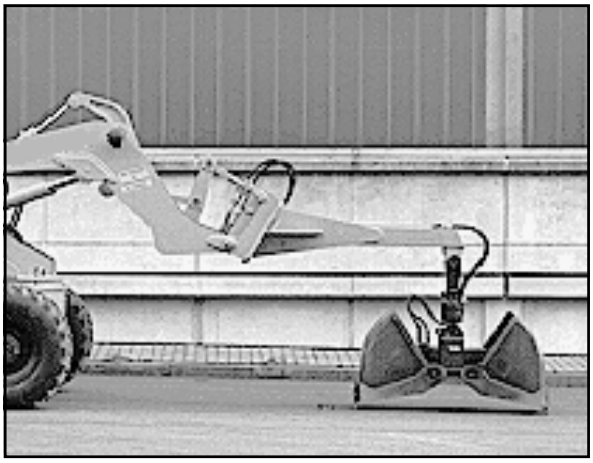


Figure 6-16

6.2.3 Grab

NOTE

- Only for loaders with second auxiliary hydraulics circuit.

- Fig. 6-16 shows the loader with the grab in its most far-reaching position at the start of digging.

- The grab movements are shown on the symbol for the hand lever of the auxiliary hydraulics (6-25).

- The grab may be continuously swiveled around its vertical axis in the clockwise and counterclockwise directions.

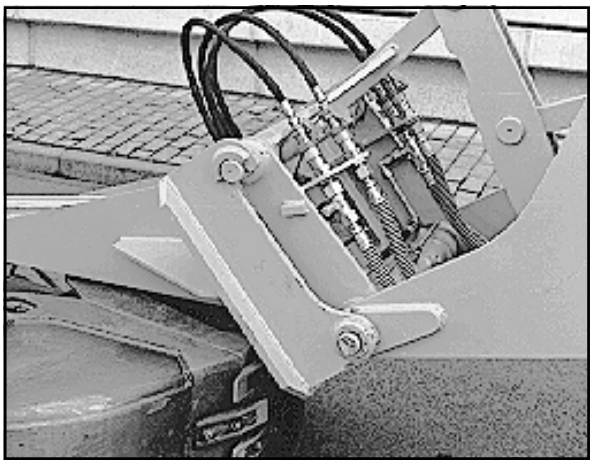


Figure 6-17

Mounting

Mounting is carried out in the same way as for the multi-purpose bucket (section 6.2.1 (1) ...(9)), with the exception that **all four** hydraulic hoses of the grab must be connected to the four quick-action couplings of the quick-change device.

When doing so, make sure to connect the inner hoses on the grab arm to the inner quick-action couplings of the quick-change device and the outer hoses to the outer quick-action couplings of the quick-change device (6-17).

NOTE

The grab movements will not match those shown on the label (6-25) if the hydraulic hoses are connected incorrectly.

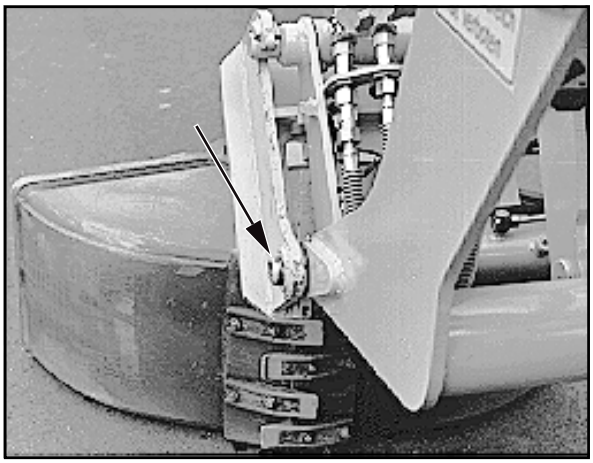


Figure 6-18

DANGER

Both bolts of the quick-change device must be in the boreholes on both sides of the grab arm and must be clearly visible at both sides (6-18/arrow).

Dismounting

Dismounting is carried out in the same way as for the multi-purpose bucket (section 6.2.1).

CAUTION

- The grab must be laid down on level ground with closed grab blades to avoid damage to hoses or joints.
- The hydraulic quick-change device must only be **locked** when an attachment has been mounted.

NOTE

The type plate is located on the upper side of the shaft, near the support plate.

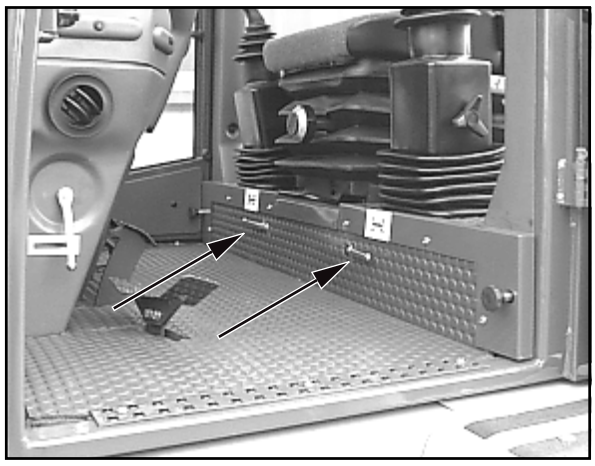


Figure 6-19a

6.2.4 Temporary use of a working platform

NOTE

Only for loaders with second auxiliary hydraulics circuit.

DANGER

- Only experienced, reliable operators that have been specially trained for this work may be charged with driving the carrier with attached working platform.
- The working platform may only be entered or left when the the operator has given the permission and when the machine is at a standstill.
- If the operator leaves the driver's seat when the working platform is occupied, he must secure the carrier against inadvertent movements.
- Platforms must be equipped with an appropriate overhead guard when they are operated in areas where there is a danger of objects dropping down from above, e.g. in unsecured tunnel sections or during demolishing work.
- Platforms used for work under ground must be equipped with a device that protects personnel working on the platform from being squeezed.
- When working under ground, the operator must not leave the driver's seat before all personnel has left the platform.
- The platform must be used in such a manner that the operator always has an unobstructed view on the platform.
- During work, reliable communication between the operator and the personnel on the platform must always be ensured.
- Prior to each ,the operator must check the working platform for perfect and safe condition.
- Before commissioning and when significant modifications were made to the platform, it must be checked by a specialist. Regular checks at intervals that depend on the frequency of application must also be performed.

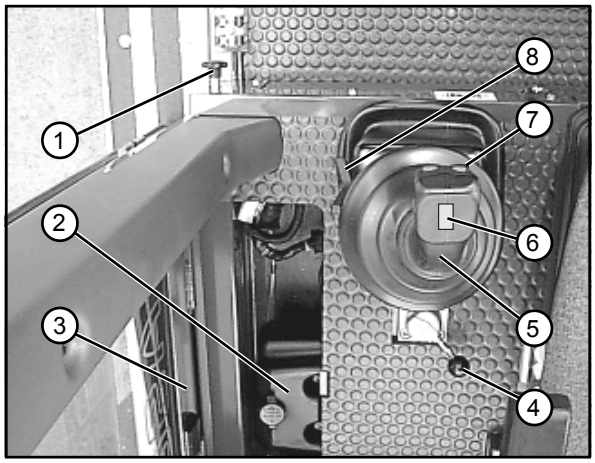


Figure 6-19b

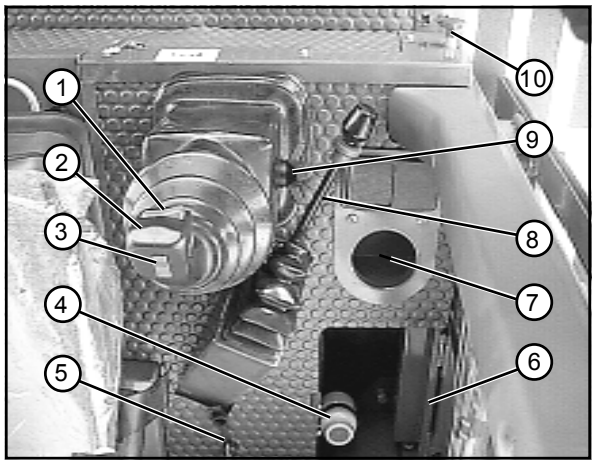


Figure 6-19c

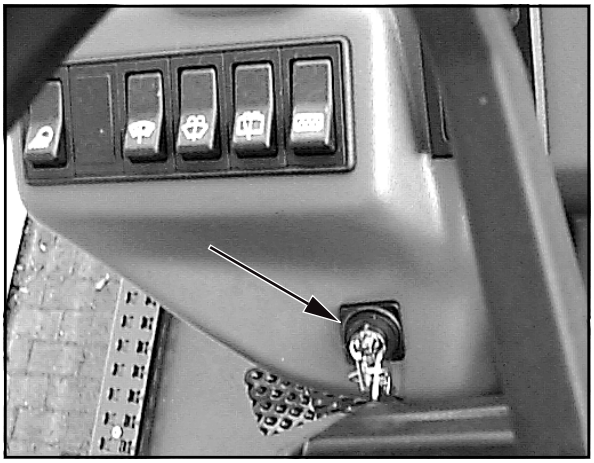


Figure 6-20

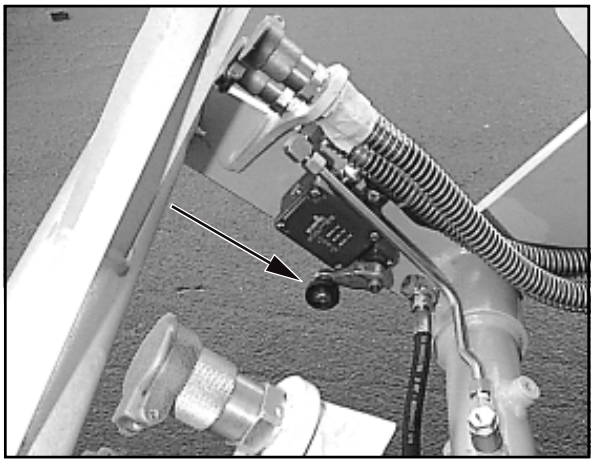


Figure 6-21

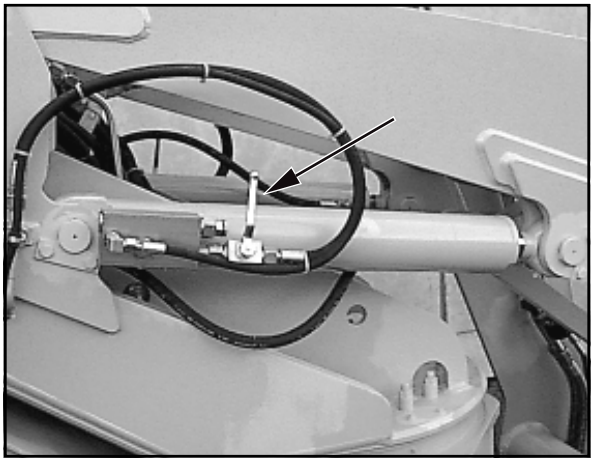


Figure 6-22

Mounting the working platform

(1) Insert the key in the key-operated switch (6-20/arrow).

NOTE

Insert the key only when the loader is at a standstill.

(2) Move the bucket arm to the lowermost position, keep the actuator for the dump interlock on the pilot valve for the auxiliary hydraulics (6-19b/5) pressed and tilt down the quick-change device using the pilot valve for the working hydraulics (6-19c/2).

(3) Move the loader to the working platform.

(4) Keep the actuator for the dump interlock on the pilot valve for the auxiliary hydraulics (6-19b/5) pressed, pick up the working platform with the quick-change device and lift it while tilting the quick-change device until the working platform makes contact with the quick-change device.

NOTE

The bucket's swiveling radius is now restricted to 25° to the right or to the left.

(5) Use the hand lever for the auxiliary hydraulics (6-19b/5) to lock the working platform.

(6) Check that the device is mounted and locked correctly on both sides.

DANGER

Both bolts of the quick-change device must be in the boreholes of the working platform carrier and must be clearly visible on both sides.

(7) Move the bucket arm to a straight forward position.

(8) Take the key out of the key-operated switch (6-20/arrow).

NOTE

- Take out the key only when the loader is at a standstill.
- The lifting suspension and tilting up/dumping are now blocked. Drive stage “I” is set.

(9) Perform a function check. To do so, actuate the pilot valve for the working hydraulics (6-19c/2) for tilting up/dumping (section 2.3) and the swiveling pedal (4-8/4).

CAUTION

Check the position of the switch contact (6-21/arrow)

- if the lifting suspension oscillates,
- if the quick-change devcie tilts up or dumps,
- or if the support system switches on (in this case, the bucket swivels by far more than 25°).

(10) Change the position of the ball block valves on the lifting cylinders (6-22/arrow).

DANGER

- During work, the key must be removed from the key-operated switch (6-20/arrow).
- Access to the platform may only be permitted by the operator if steps (1) to (11) have been completely carried out.
- The operator must not move the loader until all persons have left the platform. If the loader must be moved during work, this must be done so slowly that personnel on the platform is not endangered.

NOTE

Figure 6-23 shows the labels on the lifting cylinders, figure 6-24 the labels on the key-operated switch.

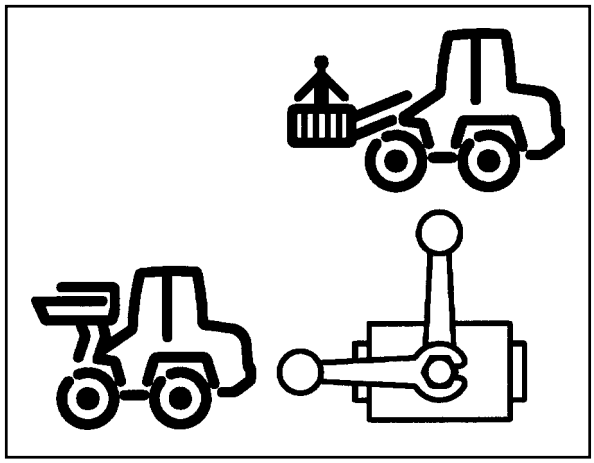


Figure 6-23

CAUTION

The hydraulic quick-change device must only be **locked** when an attachment has been mounted.

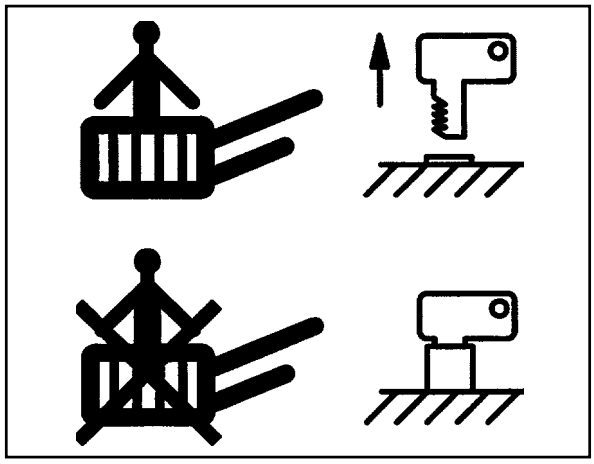


Figure 6-24

6.3 Using other attachments

DANGER

1. Only those attachments described in the present operating instructions may be used.

2. We emphasize that attach-ments that are not supp-lied by us are also not tested and approved by us. Use of such products can under certain conditions negatively influence the preset constructional qualities of your loader and thus limit the active and passive driving stability. The manufacturer cannot be held responsible for damage that occurs through the use of such products.

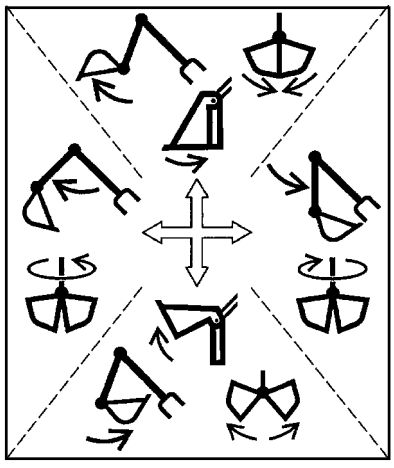


Figure 6-25

Rescue, towing, lashing, lifting by crane

7 Rescue, towing, lashing, lifting by crane

7.1 Rescue, towing, lashing

7.1.1 Rescue/towing of the swivel loader if the engine or drive has failed

CAUTION

The loader must not be tow-started. Any attempt to tow-start leads to damage.

DANGER

Secure the rescue location if it is on a public road.

NOTE

- Towing is only permitted to clear the area of use or a street.
- Preparation for towing depends on whether the engine has failed, thus causing a failure of the entire hydraulic system, or if only the drive has failed and the engine can drive the rest of the hydraulic system.

7.1.1.1 Towing the swivel loader if the engine has failed

(1) Press the toggle switch for the hazard flasher (4-11/10).

(2) Set the drive switch (4-10/3) to position "0".

NOTE

The preparation in points (3), (5), (6) and (11) is only to be carried out if the rescue location is **not** on a public road.

(3) Switch the toggle lever for the steering system (4-9/4) of the front axle to the “rear-wheel steering” position; the wheels of the front axle must be in the straight position.

(4) Set the parking brake (4-10/8).

CAUTION

If the rescue location is on a slope, wheel chocks must be placed on the sloping side of both front axle wheels in addition to applying the parking brake.

(5) Cover the bucket cutting edge and teeth with the bucket protector (5-3/arrow).

(6) Insert the plug of the bucket protector in the socket (5-4/arrow).

(7) Unlock the pilot valve for the working hydraulics (4-10/2) and push it beyond its pressure point into the forward position.

(8) Using a suitable lifting device, e.g. a second loader with an attached bucket, lift the bucket arm of the loader to be towed until the bucket arm support can be inserted into the loader to be towed (7-1).

Figure 7-1

(9) Insert the bucket arm support (1-1/arrow) and lower the bucket arm onto the bucket arm support.

(10) Close the ball block valve for the working and auxiliary hydraulics (1-2/arrow).

(11) Block the swivel mechanism by inserting the blocking wedge (1-3/arrow) in the swivel blocking mechanism (1-4/arrow).

(12) Attach the towing rod to the loader to be towed [(7-2/1 - for towing forwards) or (7-4/1 - for towing backwards)] and to the towing vehicle.

CAUTION

If the loader does not have a forward ranging and towing coupling, the loader must only be towed backwards.

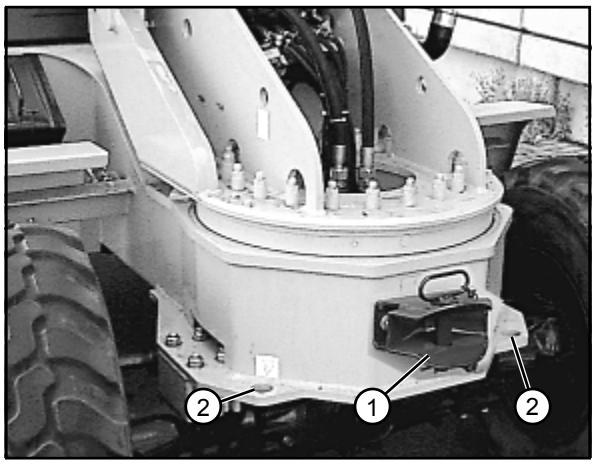


Figure 7-2

(13) Switch the hydrostatic drive to free oil circulation before towing. For this purpose, the screws (7-3/arrows) on the two high-pressure limiting valves of the traction pump must be screwed in until they are in line with the lock nuts loosened beforehand (size 13). Then tighten the lock nuts again.

NOTE

After towing is finished, loosen the nuts and screw out the screws of the two high-pressure limiting valves all the way.Then tighten the lock nuts again.

(14) If necessary, remove the chocks.

(15) Release the parking brake (4-10/8).

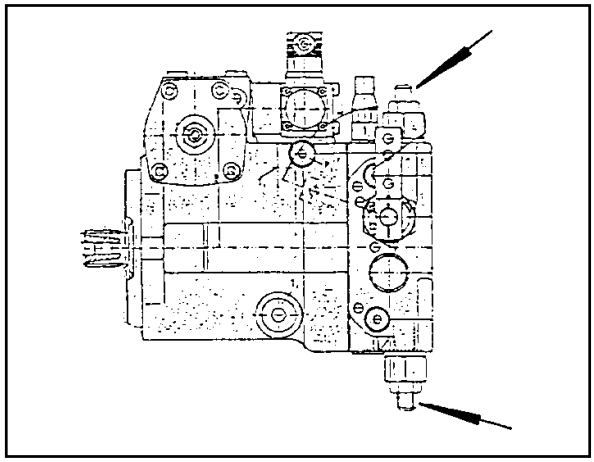


Figure 7-3

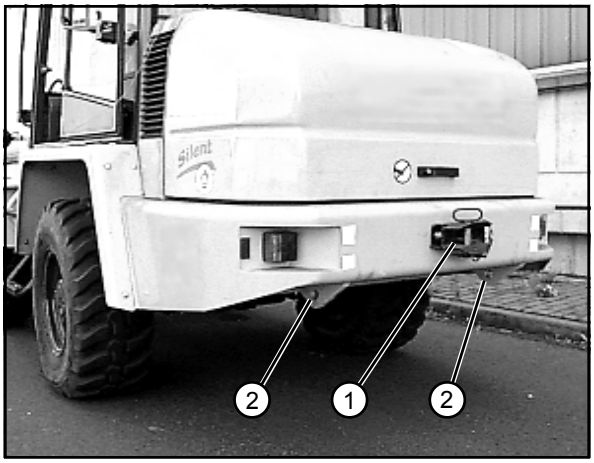


Figure 7-4

DANGER

- More power is required to steer if the engine has failed.
- Tow the loader at walking speed (2 km/h).
- The towing distance should not exceed 1 km.
- For a longer distance, the defective loader must be loaded onto a truck (for the lashing points, see 7-2/1 and 7-2/2, 7-4/1 and 7-4/2).
  - The max. permitted load of the forward ranging and towing coupling (7-2/1) is 8.0 t horizontally in the longitudinal direction.
  - The max. permitted load of the rear ranging and towing coupling (7-4/1) is 8.0 t horizontally in the longitudinal direction.
  - The max. permitted load of the lashing points/load-bearing points (7-2/2 and7-4/2) is 2.0 t at an assumed bracing angle of 45°.

7.1.1.2 Towing the swivel loader when the drive has failed

(1) Press the toggle switch for the hazard flasher (4-11/10).

(2) Set the drive switch (4-10/3) to the “0” position.

NOTE

The preparation in points (3), (5), (6) and (9) is only to be carried out if the rescue location is **not** on a public road.

(3) Switch the toggle lever for the steering system (4-9/4) to the “rear-wheel steering” position; the wheels of the front axle must be in a straight position.

(4) Set the parking brake (4-10/8).

CAUTION

If the rescue location is on a slope, wheel chocks must be placed on the sloping side of both front axle wheels in addition to applying the parking brake.

(5) Cover the bucket cutting edge and teeth with the bucket protector (5-3/arrow).

(6) Insert the plug of the bucket protector in the socket (5-4/arrow).

(7) Lift the bucket arm, insert the bucket support (1-1/ arrow) and lower the bucket arm by activating the hand lever for the working hydraulics (4-10/2) until the bucket arm rests on the bucket support.

(8) Close the ball block valve for the working and auxiliary hydraulics (1-2/arrow).

(9) Block the swivel mechanism by inserting the blocking wedge (1-3/arrow) in the swivel blocking mechanism (1-4/arrow).

(10) Attach the towing rod to the loader to be towed [(7-2/1 - for towing forwards) or (7-4/1 - for towing backwards)] and to the towing vehicle.

CAUTION

If the loader does not have a forward ranging and towing coupling, the loader must only be towed backwards.

(11) Switch the hydrostatic drive to free oil circulation before towing. For this purpose, the screws of the two high-pressure limit valves (7-3/arrows) of the traction drive must be screwed in until they are in line with the lock nuts loosened beforehand (size 13). Then tighten the lock nuts again.

NOTE

After towing is finished, loosen the nuts and screw out the screws of the two high-pressure limiting valves all the way.Then tighten the lock nuts again.

(12) If necessary, remove the chocks.

(13) Release the parking brake (4-10/8).

DANGER

- Tow the loader at walking speed (2 km/h) with the engine running.
- The towing distance should not exceed 1 km.
- For a longer distance, the defective loader must be loaded onto a truck (for the lashing points, see 7-2/1 and 7-2/2, 7-4/1 and 7-4/2).

NOTE

See page 7-4 for the max. permitted load of the lashing/load-bearing points.

7.2 Lifting by crane

The loader to be lifted is to be prepared as follows:

(1) Set the drive switch (4-10/3) to the “0” position.

(2) Set transmission stage "I" (4-11/13) (only for fast loaders).

(3) Set hydraulic drive stage "I" (4-10/1).

(4) Set the parking brake (4-10/8).

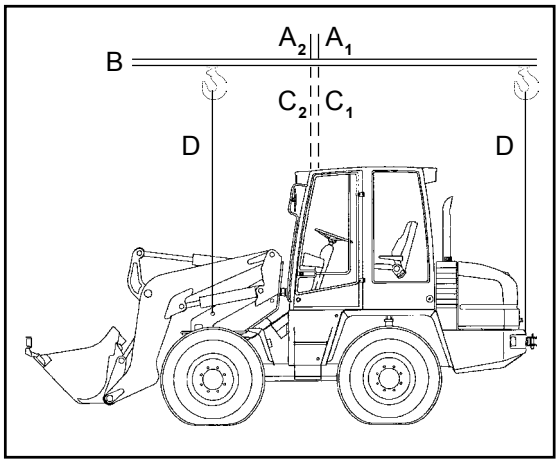


Figure 7-5

(5) Lift or lower the bucket arm until the lowest point of the bucket arm or the bucket is at least 30 cm above the road (5-2).

(6) Close the ball block valve for the working and auxiliary hydraulics (1-2/arrow).

(7) Block the swivel mechanism by inserting the blocking wedge (1-3/arrow) in the swivel blocking mechanism (1-2/arrow).

(8) Lock the doors.

(9) Fold the outside mirror inwards.

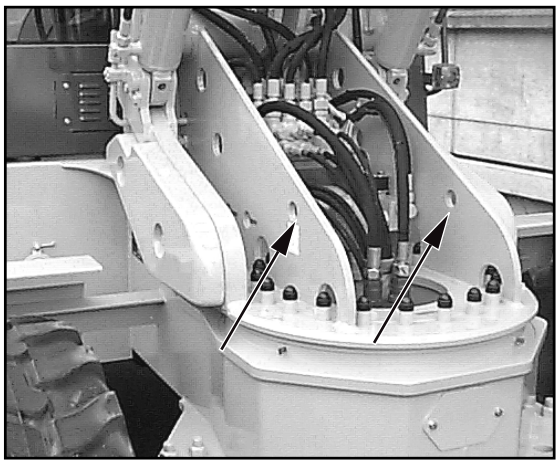


Figure 7-6

CAUTION

The following items must be observed when lifting the loader by crane (Figure 7-5):

- The lifting point (A_1 - loader without standard bucket or A_2 - loader with standard bucket) of the lifting device (B) must be precisely vertically over the centre of gravity (C_1 or C_2) of the loader so that the lifting device is **horizontally** above the longitudinal axis of the loader.

- The lifting gear (D) must lead vertically upwards from the lifting points of the loader (7-6/arrows and 7-7/arrows).

DANGER

The lifting gear must have a lifting capacity of at least 3.0 t.

Figure 7-7

Maintenance

8 Maintenance

8.1 Maintenance notes

DANGER

- The engine must be turned off.
- For work to be carried out under the bucket arm:
  - the bucket must be emptied or the attachment must be relieved,
  - the bucket arm support (1-1/arrow) is to be inserted,
  - the ball block valve for the working and auxiliary hydraulics (1-2/arrow) must be closed,
  - the swivel mechanism is to be blocked (1-4/ arrow).
- The loader is to be secured against rolling by using the parking brake (4-10/8) and by setting the drive direction switch (4-10/3) to the “0” position. In addition, wedges must be placed on both sides of one of the two wheels of the front axle.

CAUTION

- Change the oil when the units are lukewarm.
- Perform maintenance work when the loader is on level ground and the bucket arm is in its lowest position.
- Replace damaged filter inserts and gaskets immediately.
- Clean pressure lubrication fittings before lubricating.

NOTE

- All necessary maintenance work is to be taken from the maintenance plan.
- Damage which is traceable to non-observance of the maintenance plan is not covered by the guarantee.
- The lubricants mentioned in the maintenance plan can be used at an ambient temperature from **-15°** to **+40°C**.

CAUTION

For ambient temperatures below -15° C, refer to the description in chapter 5.2.2 “Winter operation”.

NOTE

If a hose and/or pipe break occurs, the two lids of the hydraulic oil filter (8-20/arrows) must be loosened because the loader does not have a shut-off valve that could prevent large amounts of hydraulic oil from escaping.

8.2 Maintenance work

8.2.1 Checking the engine oil level

See Engine Operating Instructions.

8.2.2 Checking the oil level in the axles

8.2.2.1 Rear axle of the slow loader » 20 km/h «

(1) Unscrew the plugs from the axle arch (8-1/arrow) and the intermediate gear (8-2/arrow).

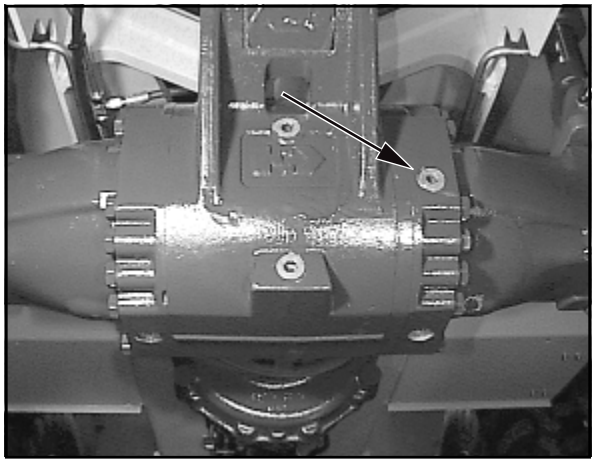


Figure 8-1

NOTE

- The axle arch and the intermediate gear do not have a common oil reservoir.
- The oil level must reach the plug bores.
- Collect any escaping oil.

(2) Replace the plugs.

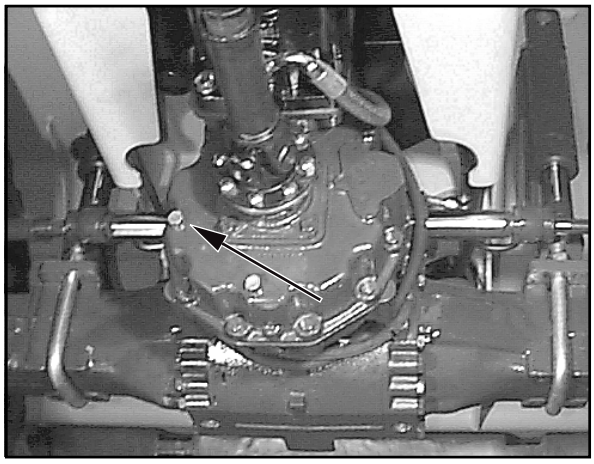


Figure 8-2

8.2.2.2 Rear axle of the » fast loader «

(1) Unscrew the plugs from the axle arch (8-3/arrow) and the distribution gear (8-4/arrow).

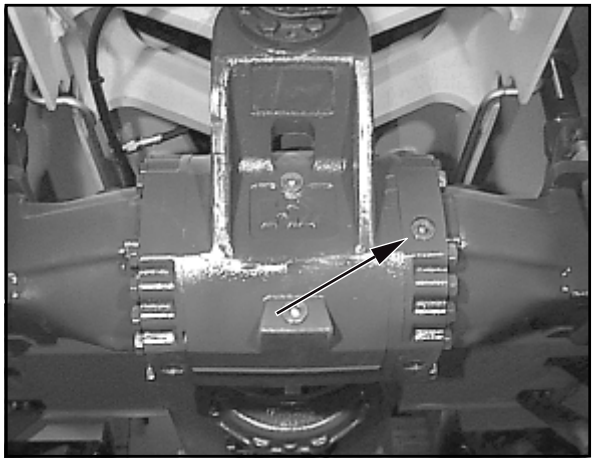


Figure 8-3

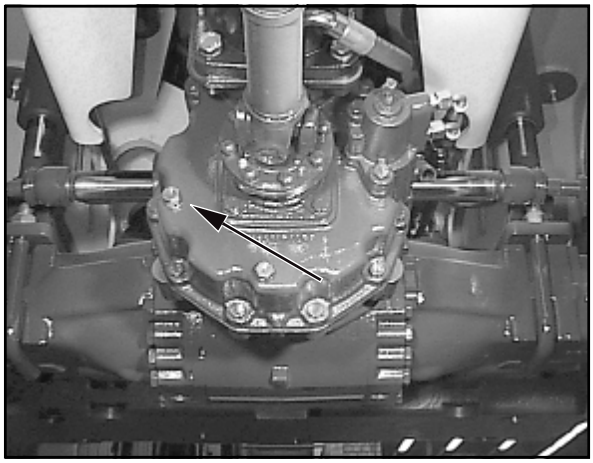


Figure 8-4

NOTE

- The axle arch and the distribution gear do not have a common oil reservoir.
- The oil level must reach the plug bores.
- Collect any escaping oil.

(2) Replace the plugs.

Figure 8-5

8.2.2.3 Planetary gear

(1) Move the loader until the marking line “OIL LEVEL” is horizontal and the plug is located above the top left of the marking line (8-5/arrow).

(2) Unscrew the plug.

NOTE

- The oil level must reach the plug bore.
- Collect any escaping oil.

(3) Fit a new gasket and replace the plug.

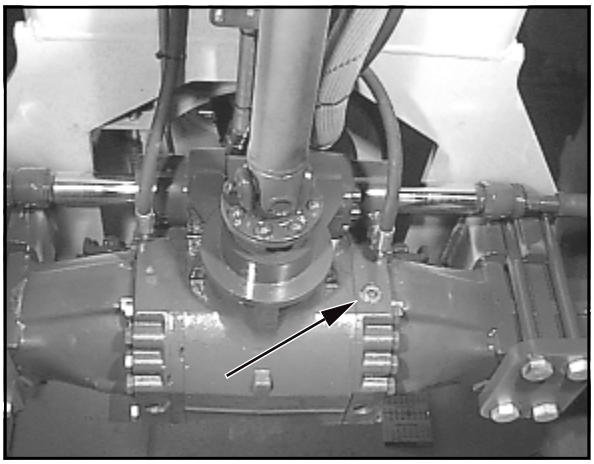


Figure 8-6

8.2.2.4 Front axle

(1) Unscrew the plug (8-6/arrow) from the axle arch.

NOTE

- The oil level must reach the plug bore.
- Collect any escaping oil.

(2) Replace the plug.

8.2.3 Checking the oil level in the hydraulic oil reservoir

(1) Park the loader in a level position.

(2) Move the bucket to its lowest position.

(3) Tilt the quick-change device and move out the locking bolts using the hand lever for the auxiliary hydraulics (4-9/5).

(4) Open the motor cover.

(5) Check the oil level in the sight glass.

NOTE

The oil level must be visible in the upper quarter of the sight glass (8-7/arrow). If necessary, fill oil into the filler neck (8-18/arrow).

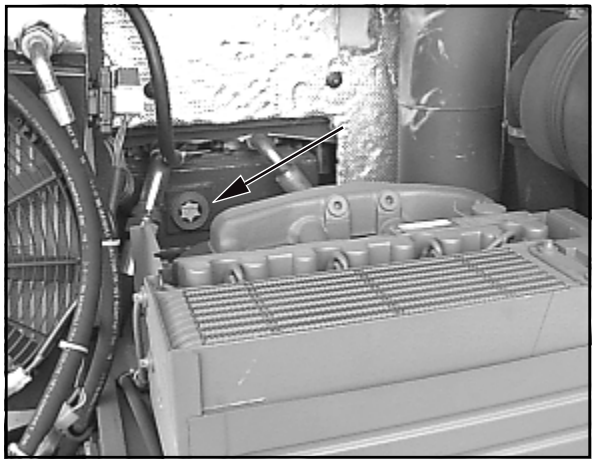


Figure 8-7

8.2.4 Changing the engine oil

(1) Unscrew the maintenance flap from the motor protection (size 13) (8-8/arrow).

(2) Place a sufficiently large oil drain pan underneath the motor oil sump.

(3) Open the motor cover.

(4) Unscrew the cover of the oil drain plug on the motor.

(5) Screw the drainage nozzle with hose from the tool box (4-1/13) to the oil drain plug.

(6) Remove the cover cap from the hose.

(7) Further procedures are to be found in the Engine Operating Manual.

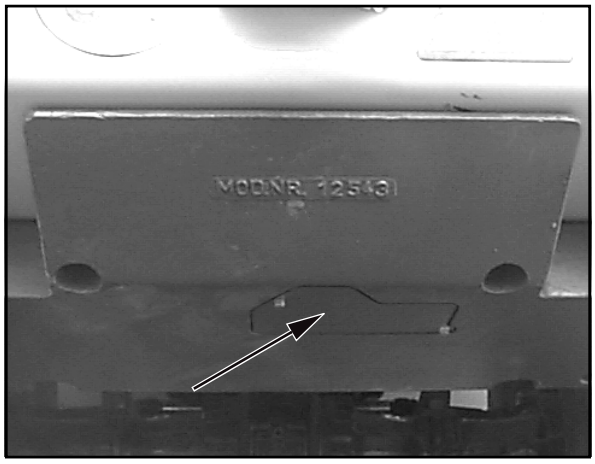


Figure 8-8

8.2.5 Changing the oil in the axles

8.2.5.1 Rear axle of the »slow loader » 20 km/h «

(1) Place a sufficiently large oil drain pan underneath the axle.

(2) Unscrew the plugs from the axle arch (8-9/1, 8-9/2, 8-9/3 and 8-9/4) and the intermediate gear (8-10/1 and 8-10/2) and let the oil drain out.

CAUTION

Waste oil must be disposed of in such a way that it will not cause pollution!

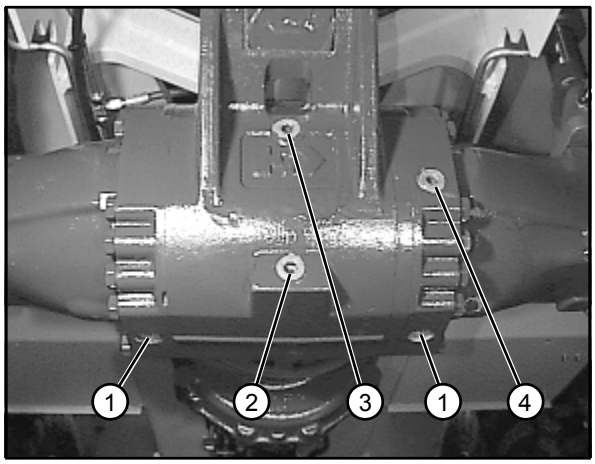


Figure 8-9

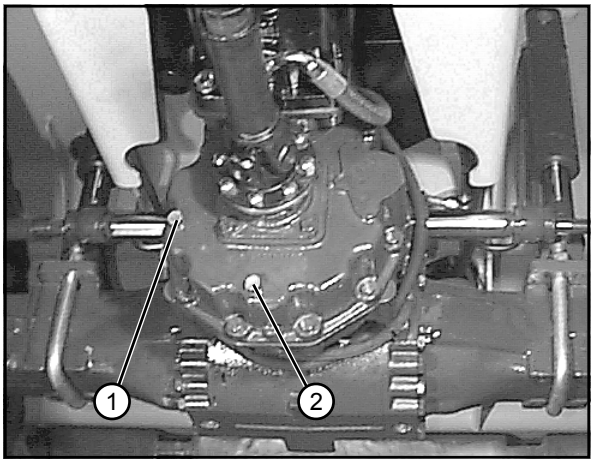


Figure 8-10

(3) Replace the plugs for the axle arch (8-9/1 and 8-9/2) and the intermediate gear (8-10/2).

(4) Fill oil into the plug bore of the axle arch (8-9/3) and of the intermediate gear (8-10/1) until the oil reaches the opening (8-9/4 or 8-10/1).

NOTE

- The axle arch and the intermediate gear do not have a common oil reservoir.
- Information about the quantity of oil is given in the maintenance plan (chapter 8.4).
- After a few minutes, when the oil level has lowered, top up the oil until the oil level reaches the marked level and remains stable.

(5) Replace the plugs for the axle arch (8-9/3 and 8-9/4) and the intermediate gear (8-10/1).

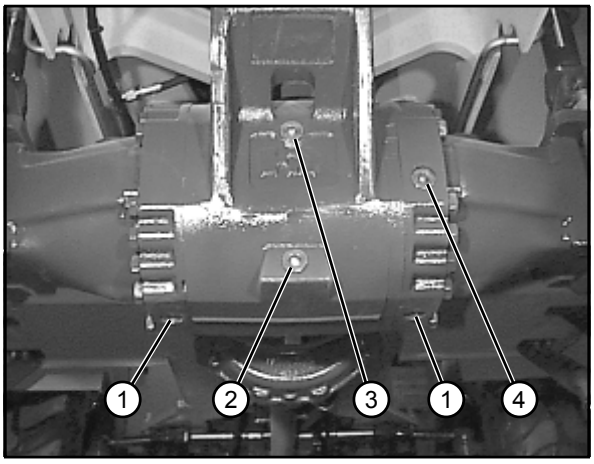


Figure 8-11

8.2.5.2 Rear axle of the » fast loader «

(1) Place a sufficiently large oil drain pan underneath the axle.

(2) Remove the plugs from the axle arch (8-11/1, 8-11/2, 8-11/3 and 8-11/4) and the distribution gear (8-12/1 and 8-12/2) and drain the oil.

CAUTION

Waste oil must be disposed of in such a way that it will not cause pollution.

(3) Replace the plugs for the axle arch (8-11/1 and 8-11/2) and the distribution gear (8-12/2).

(4) Fill in oil via the plug hole in the axle arch (8-11/3) and the distribution gear (8-12/1) until the oil reaches the opening (8-11/4 or 8-12/1).

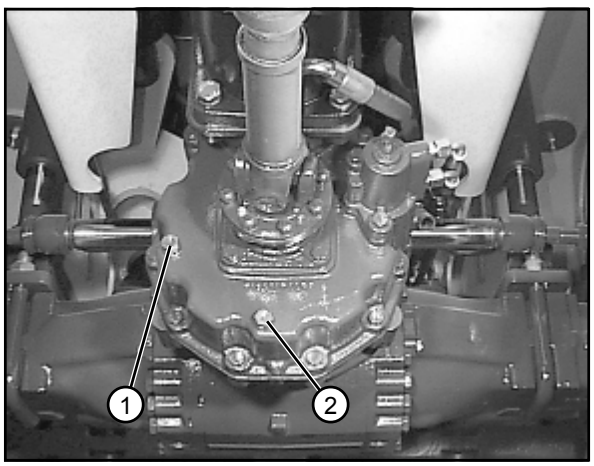


Figure 8-12

NOTE

- The axle arch and the distribution gear do not have a common oil reservoir.
- Information about the quantity of oil is given in the maintenance plan (chapter 8.4).
- After a few minutes, when the oil level has lowered, top up the oil until the oil level reaches the marked level and remains stable.

(5) Replace the plugs for the axle arch (8-11/3 and 8-11/4) and the distribution gear (8-12/1).

8.2.5.3 Planetary gear

(1) Move the loader so that the plug (8-13/arrow) is positioned at 6 o'clock.

(2) Place an oil drain vessel with a drain channel underneath the gear.

(3) Unscrew the drain plug and let the oil drain out.

CAUTION
Waste oil must be disposed of in such a way that it will not cause pollution.

Figure 8-13

(4) Move the loader until the marking line “OIL LEVEL” is horizontal and the plug is located above the top left of the marking line (8-14/arrow).

(5) Fill in oil via the plug bore until the oil level reaches the opening.

(6) Use a new gasket when replacing the plug.

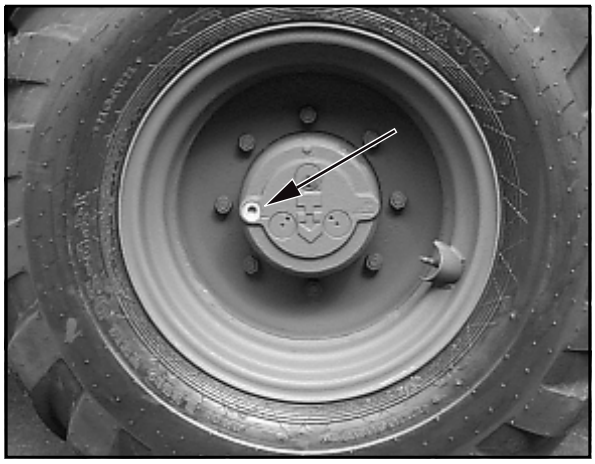


Figure 8-14

8.2.5.4 Front axle

(1) Place a sufficiently large oil drain pan underneath the axle.

(2) Unscrew the plugs from the axle arch (8-15/1, 8-15/2, 8-15/3, 8-16/1 and 8-16/2) and drain the oil.

CAUTION
Waste oil must be disposed of in such a way that it will not cause pollution.

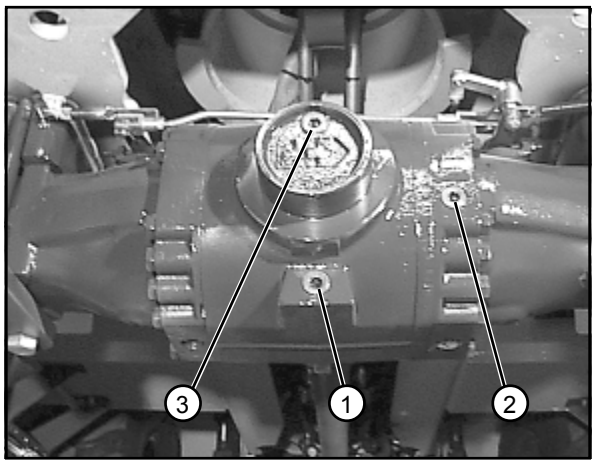


Figure 8-15

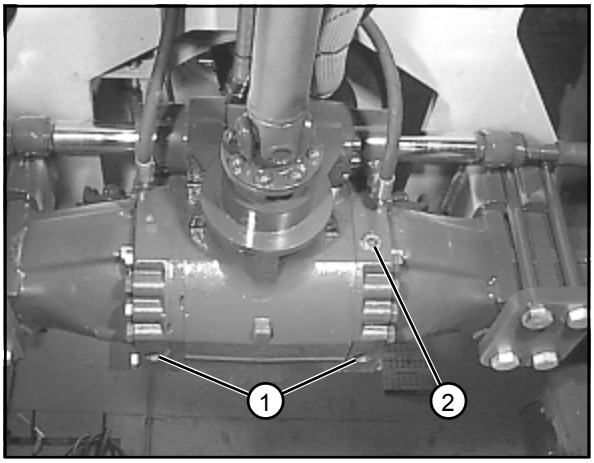


Figure 8-16

(3) Replace the plugs (8-15/1 and 8-16/1).
(4) Fill in oil via the plug bore (8-15/3) until the oil level reaches the opening (8-15/2 or 8-16/2).

NOTE

- Information about the quantity of oil is given in the maintenance plan (chapter 8.4).
- After a few minutes, when the oil level has lowered, top up the oil until the oil level reaches the marked level and remains stable.

(5) Replace the plugs (8-15/2 and 8-15/3 and 8-16/2).

8.2.6 Changing the oil in the hydraulic system

(1) Have an oil pan ready (at least 130 l).
(2) Unscrew the cap of the oil drain (8-17/arrow).
(3) Screw the drainage nozzle with hose from the tool box (4-1/13) to the oil drain plug.
(4) Remove the cover cap from the hose.
(5) Drain the oil into the drain pan.

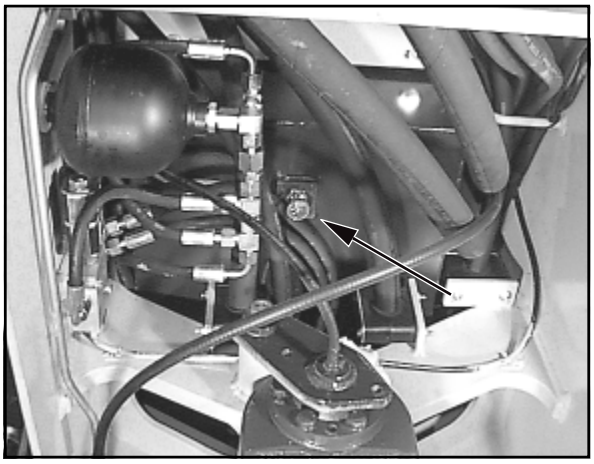


Figure 8-17

CAUTION

Waste oil must be disposed of in such a way that it will not cause pollution!

(6) Remove the nozzle with the hose and replace the cover cap on the hose.
(7) Replace the cap on the oil drain.
(8) Change the hydraulic oil filter inserts (section 8.2.7).
(9) Fill in oil into the filler neck (8-18/arrow).

CAUTION

For those loaders which are fitted to run with biodegradable hydraulic oil (synthetic hydraulic oil on ester basis - viscosity class ISO VG 46 VI > 180) (designation can be found on the hydraulic oil tank and on the dashboard), only this type of oil may be used for oil changes.

Mineral and biodegradable oils must **never** be mixed.

Biodegradable hydraulic oil must be changed every **1000 operating hours**.
Changing the oil type from mineral oil to biodegradable oil must be performed according to the VDMA 24 569 conversion guidelines!

Figure 8-18

CAUTION

The service brake must only be operated with mineral oil!

(10) Check the oil level at the sight glass (8-7/arrow).

(11) Close the filling nozzle.

8.2.7 Changing the hydraulic oil filter inserts

CAUTION

Change the filter inserts according to the maintenance plan or when the clogging indicator lamp (4-11/23) lights up.

NOTE

The clogging indicator lamp may light up briefly after a cold start but will go out when the hydraulic oil has reached its operating temperature.

(1) Move the seat to the frontmost position (5-12/2).

(2) Tilt the backrest of the seat completely forward (5-11/2).

(3) Fold back the insulation mats to the left and the right of the driver's seat, unscrew the four screws (size 13) (8-19/arrows) that fix the maintenance plate and remove the plate.

(4) Loosen the lids of the hydraulic oil filters (8-20/arrows) and replace the filter inserts by new ones.

Figure 8-19

CAUTION

Waste hydraulic oil filter inserts must be disposed of in such a way that they will not cause pollution.

(5) Lock the lids of the hydraulic oil filters.

(6) Fasten the maintenance plate.

(7) Restore the individual seat position.

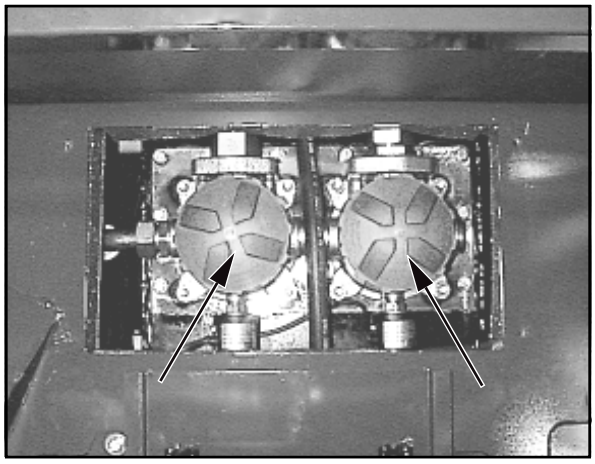


Figure 8-20

8.2.8 Maintaining/replacing the air filter

NOTE

Maintenance of the filter cartridge is necessary when either the red range is visible in the maintenance indicator (8-21/1) or after 12 months, whichever is sooner.

(1) Open the engine cover.

(2) Loosen the three spring-loaded catches on the air filter lid (8-21/2) and remove the air filter lid.

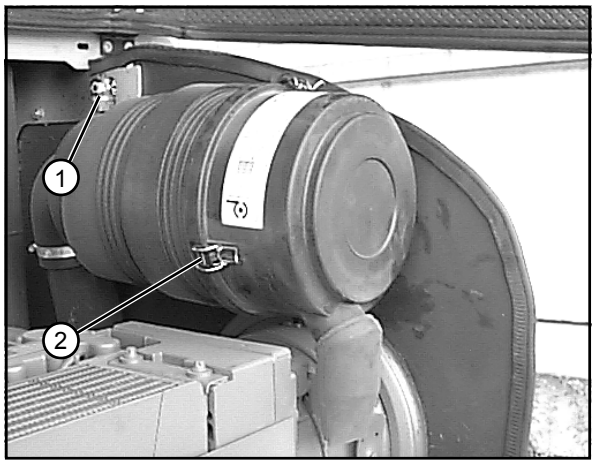


Figure 8-21

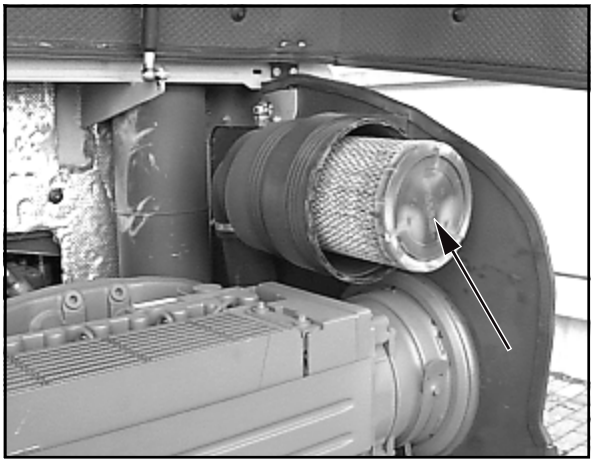


Figure 8-22

(3) Pull out the filter cartridge (8-22/arrow) by carefully turning it back and forth.

(4) Clean the filter cartridge.

CAUTION

- For cleaning, use a compressed air gun to which a pipe (angled at 90°) has been attached. The pipe must be sufficiently long to reach the cartridge bottom. Use dry compressed air of no more than 5 bar to blow out the cartridge by moving the pipe back and forth in the interior of the cartridge. Cleaning can be stopped when dust formation ceases.

- Do not use petrol or hot liquid for cleaning.

(5) Use a hand-held lamp to check the filter cartridge for damage to the cartridge paper or the rubber gasket. If the cartridge or seals are damaged, replace the cartridge.

(6) Carefully insert the filter cartridge.

(7) Install the air filter lid on the filter housing in such a way that the direction arrow in the marking **"OBEN-TOP"** points towards half past one.

NOTE

The dust removal valve must be checked from time to time and cleaned if necessary.

(8) When the indicator field becomes red (8-21/1), push the reset button. The field becomes clear.

CAUTION

Check all connection pipes and hoses of the air filter system for damage before starting the engine.

8.2.9 Changing the safety cartridge

CAUTION

- The safety cartridge must not be cleaned.
- The safety cartridge must be replaced after the filter cartridge has been maintained/cleaned 5 times, at the latest after two years.
- Make sure that no dirt or dust can enter the filter housing during replacement of the safety cartridge.

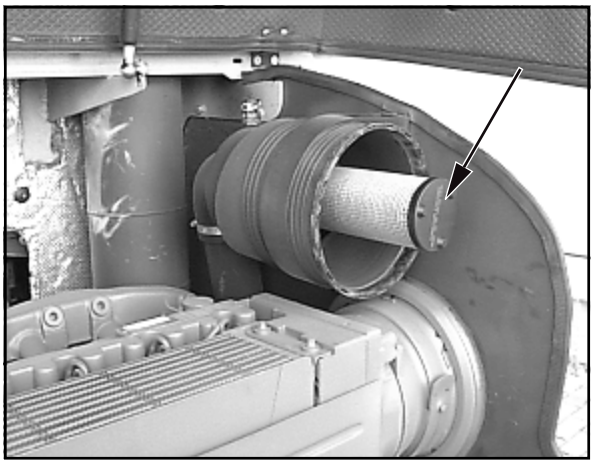


Figure 8-23

(1) Remove the filter cartridge (section 8.2.8).

(2) Pierce the seal of the safety cartridge (8-23/arrow) from the inside by using a screwdriver or similar tool and pull up both strips.

(3) Hold the safety cartridge by both strips and pull it out by carefully turning it back and forth. Replace the safety cartridge and the filter cartridge by new ones.

(4) The remaining installation is performed as described in section 8.2.8 (6)-(8).

8.2.10 Replacing the fuel filter

See the Engine Operating Instructions.

8.2.11 Exchanging the starter battery

NOTE

The starter battery is a maintenance-free part according to DIN 72311, section 7. It is located to the right in the motor compartment.

(1) Pull off the battery main switch (4-10/5).
(2) Open the motor hood.
(3) Remove the fastening screw (size 17) (8-24/1) of the battery holder.
(4) Loosen and remove the connecting cables (8-24/2) from the battery (size 13).

DANGER

Always remove the negative pole cable first and then the positive cable. Installation is in the reverse order.

(5) Remove the battery and replace it.

(6) Apply grease to the connecting cables before fastening them.

(7) Installation is in the reverse order.

DANGER

Make sure the fastenings are secure.

(8) Close the motor hood.

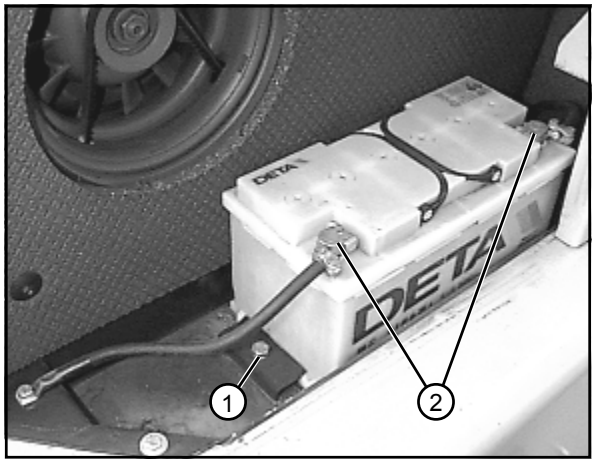


Figure 8-24

8.2.12 Maintaining/replacing the fresh air filter

(1) Lift the bucket arm, insert the bucket arm support and swivel the bucket arm all the way to the right or to the left.

(2) Loosen the four fastening screws (size 10) (8-25/ arrows) of the heater cover and remove the cover.

(3) Remove the filter elements (8-26/arrows) and clean them with compressed air.

CAUTION

Do not use any petrol, hot fluids or compressed air for cleaning.

(4) Check the filter elements for damage.

NOTE

The filter elements must be replaced when they are damaged or every **1500 operating hours**.

(5) Insert the filter elements and install the heater cover.

Figure 8-25

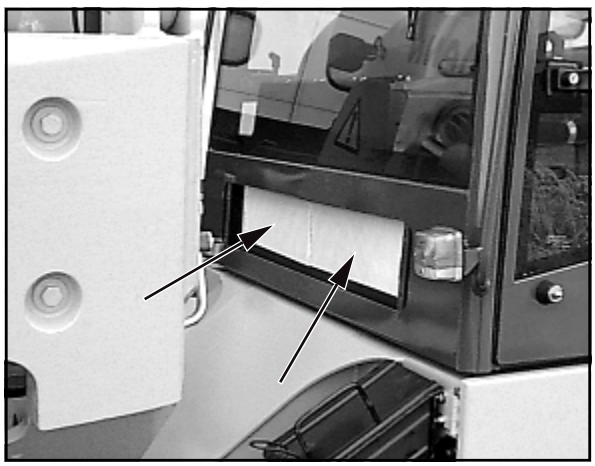


Figure 8-26

Figure 8-27

8.2.13 Checking/adjusting the parking brake play

DANGER

- All work on the brake system must only be carried out by authorized personnel.
- Oil loss (leaks) in the brake system must be immediately reported to authorized personnel.

(1) Check the brake's hydraulic oil level (4-10/4) and top up if necessary.

(2) Pull the parking brake lever (8-27/arrow) and release it again (lowest position).

CAUTION

The parking brake should become effective on the third catch.

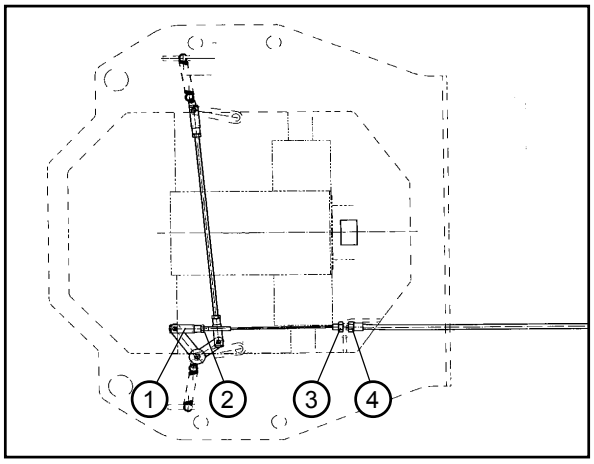


Figure 8-28

If the path the parking brake lever must travel before the parking brake becomes effective is significantly longer, the following work must be carried out:

NOTE

Figure 8-28 shows a top view of the front axle/chassis area.

1st possibility of an adjustment:
(3) Loosen the adjusting screw on the cable (8-28/3) from the holder and turn it until the visible end of the thread is reached.

(4) Tighten the adjusting screw (8-28/4) until it touches the holder.

2nd possibility of an adjustment:
(5) Loosen the counter nut (8-28/2) at the steering head (8-28/1).

(6) Unhook the steering head and turn it in clockwise direction.

(7) Hook the steering head in again.

(8) Tighten the counter nut again.

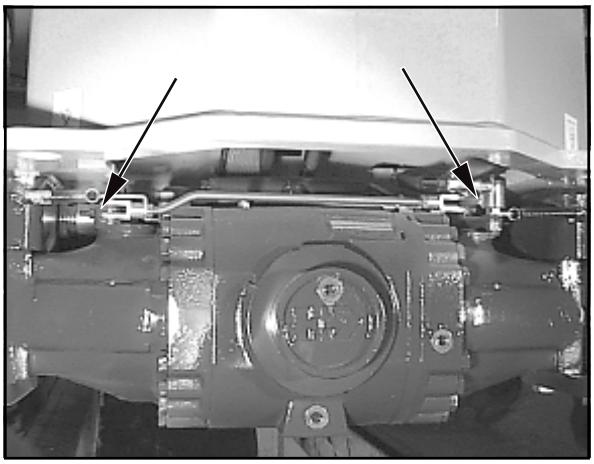


Figure 8-29

CAUTION

- While adjusting the leverage, make sure to check from time to time whether or not the parking brake becomes effective on the 3rd catch.
- The parallel leverage must make contact with the abutments (8-29/arrows) when the parking brake is released.

(9) Perform a functional check.

8.3 Grease/oil lubrication points

- Item 8 of the maintenance plan.
- Marked in red on the loader.

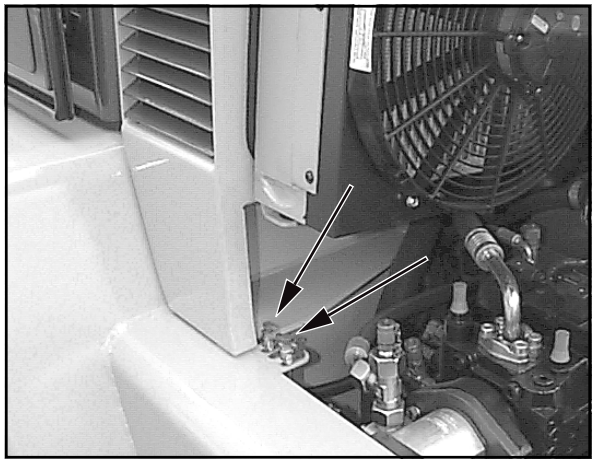


Figure 8-30

8.3.1 Rear axle pivot bolt (8-30/arrows)

CAUTION

The rear axle pivot bolt must be lubricated every **50 operating hours**.

8.3.2 Rear axle (8-31/arrows)

CAUTION

The spindle bolts must be lubricated every **50 operating hours**.

NOTE

Lubricate the top and the bottom of the axle spindle bolts on both sides of the axle.

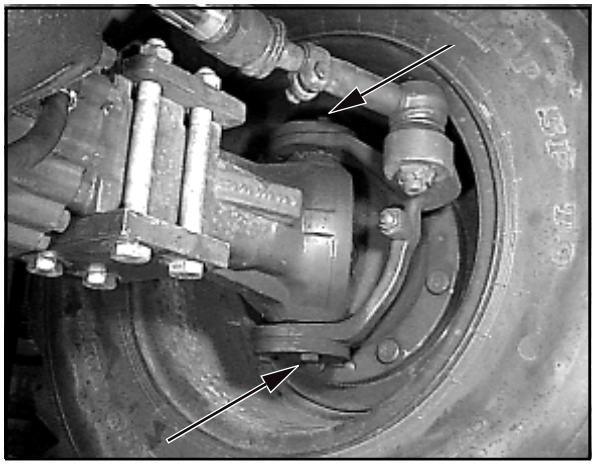


Figure 8-31

8.3.3 Front axle (8-32/arrows)

CAUTION

The spindle bolts must be lubricated every **50 operating hours**.

NOTE

Lubricate the top and the bottom of the axle spindle bolts on both sides of the axle.

Figure 8-32

Figure 8-33

8.3.4 Bucket motor (8-33 and 8-34)

CAUTION

The support bolts of the bucket motor must be lubricated every **10 operating hours**.

Items	1 + 2	Swivel unit/bucket motor
Item	3	Toggle lever
Items	4 + 5	Bucket motor/quick-change device
Items	6 + 7	Tip rod bolt
Item	8	Tip lever
Item	9	Tip lever
Item	10	Deflection lever
Item	11	Deflection lever

Figure 8-34

8.3.5 Ball bearing ring

The grease filling is to avoid friction, and to provide sealing and protection against corrosion. Therefore, the ring must be lubricated **every 10 operating hours** until grease becomes visible on the outside. Swivel the bucket arm in steps of 20° while lubricating the ball bearing ring and make sure to inject grease in each of the four grease nipples (8-35/arrows). It is absolutely necessary to lubricate the machine before and after a longer period of inactivity.

Figure 8-35

DANGER

- Before you start lubricating, insert the bucket arm support (1-1/arrow), apply the parking brake (4-10/8) and set the drive direction switch (4-10/3) to the "0" position.
- **During** swiveling, no-one may be present in the swivel area of the bucket arm.

8.3.6 Driver's cabin doors (8-36/arrows)

CAUTION

The hinges of the driver's cabin doors must be lubricated **every 50 operating hours**.

NOTE

Lubricate the hinges on both doors of the driver's cabin.

Figure 8-36

8.3.7 Multi-purpose bucket

CAUTION

The bearing bolts of the multi-purpose bucket must be lubricated **every 10 operating hours**.

NOTE

- The bolt (8-37/arrow) must be lubricated on both sides of the multi-purpose bucket.

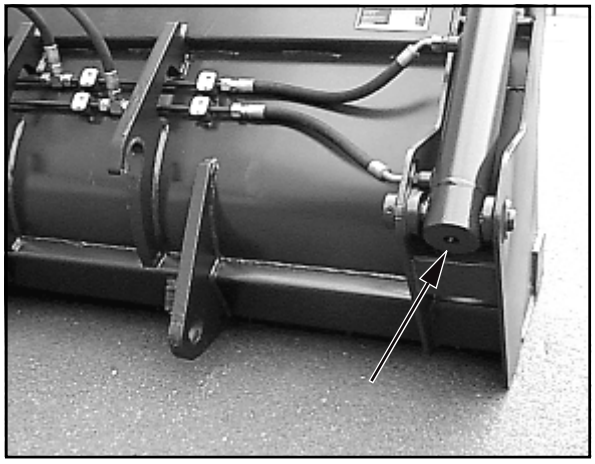


Figure 8-37

- The bolts (8-38/arrows) must be lubricated on both sides of the multi-purpose bucket.

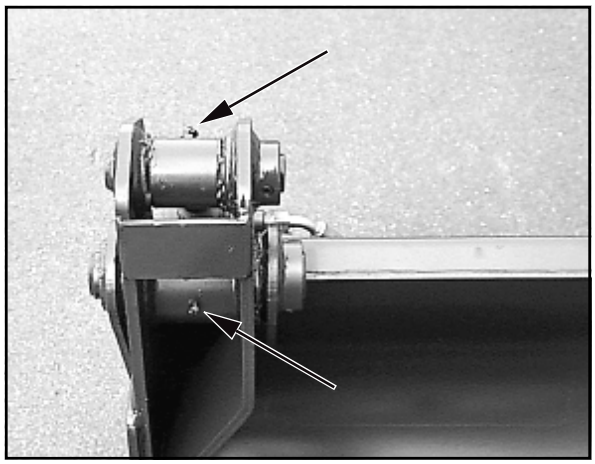


Figure 8-38

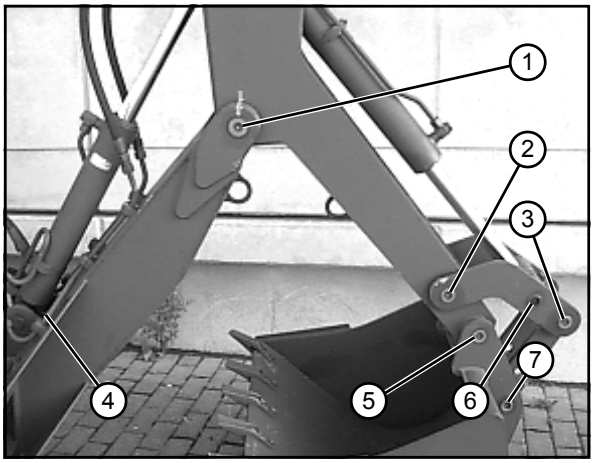


Figure 8-39

8.3.8 Front-end excavator

CAUTION

The bearing bolts of the front-end excavator must be lubricated **every 10 operating hours**.

NOTE

- Lubricate the bolts (8-39/1, 8-39/2, 8-39/3, 8-39/5 and 8-39/7) at both ends.
- Item 8-39/4 shows the lubricating point of the shaft cylinder.
- Item 8-39/6 shows the lubricating point of the bucket cylinder.

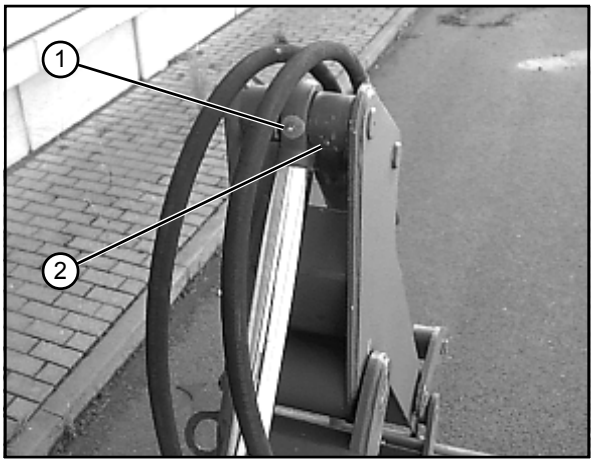


Figure 8-40

- Item 8-40/1 shows the lubricating point of the shaft cylinder.
- Item 8-40/2 shows the lubricating point of the bucket cylinder.

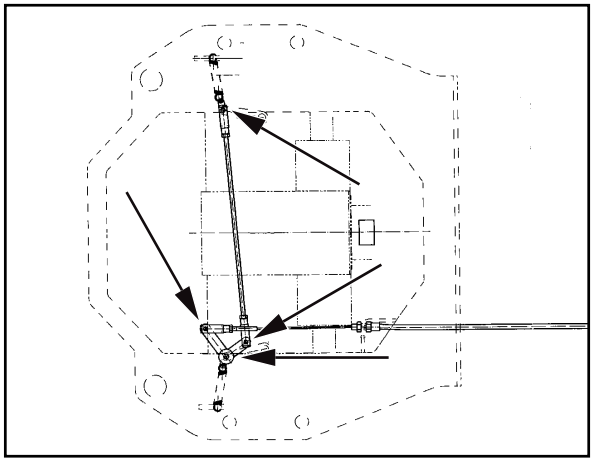


Figure 8-41

8.3.9 Oil lubrication points

8.3.9.1 Parking brake

CAUTION

Use engine oil to lubricate the joints and deflection levers every 50 operating hours (8-41/arrows).

NOTE

Figure 8-41 shows a top view of the front axle/chassis area.

8.3.9.2 Supporting valve activation (8-42/ arrow)

CAUTION

The leverage of the supporting valve activation must be lubricated with engine oil **every 50 operating hours**.

NOTE

Lubricate only the visible surface of the spring housing piston rod.

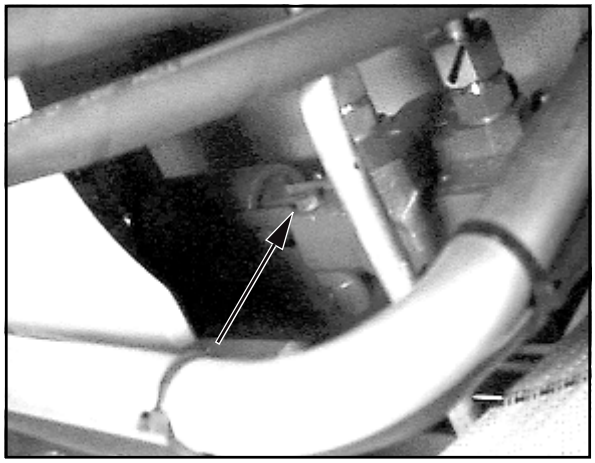


Figure 8-42

8.4 Maintenance Plan

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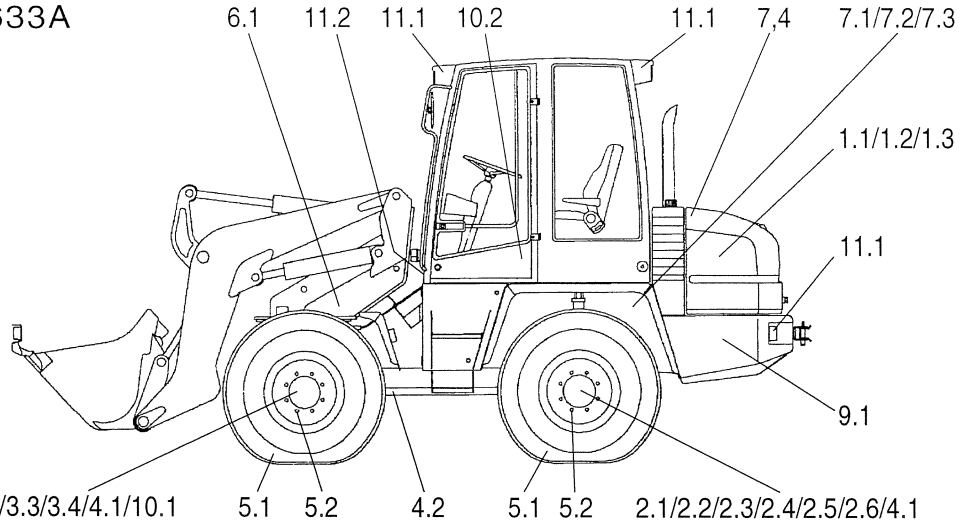


Item	Designation	Specification	Viscosity	Filling amount
* 1	Motor oil	MIL-L-2104 C = API-CD	acc. to manufacturer	ca. 10 l with oil filter
* 2.2	Transmission oil	MIL-L-2105 D = API-GL5-6	SAE 85 W 90	ca. 6,25 l
* 2.4	Transmission oil	MIL-L-2105 D = API-GL5-6	SAE 85 W 90	ca. 2 x 0,75 l
* 2.6	Transmission oil	MIL-L-2105 D = API-GL5-6	SAE 85 W 90	ca. 1,9 l (20 km/h)
				ca. 1,6 l (30 km/h)
* 3.2	Transmission oil with LS additive	MIL-L-2105 D = API-GL5-6-LS	SAE 85 W 90-LS	ca. 6,25 l
* 3.4	Transmission oil	MIL-L-2105 D = API-GL5-6	SAE 85 W 90	ca. 2 x 0,75 l
* 7.3	Hydraulic oil (4)	DIN 51524, HVLP 46	ISO VG 46, VI > 180	ca. 120 l
8	Grease	DIN 51825 - KPF 1/2 N-20		as required
9	Distilled water			as required
* 10	Mineral oil	DIN 51524, HVLP 46	ISO VG 46, VI > 180	as required

Key to symbols

△ First oil change / first filter replacement
▲ first check; eliminate any determined problems
○ Check; eliminate any determined problems
◇ Change
* The markings, filling and check plugs are binding
Refer to operating instructions

Caution
When carrying out maintenance work, heed the accident prevention regulations!

Lubrication points (indicated in red)
1. Lubricate bolts every 10 operating hours with grease DIN 51825 - KPF 1/2 N-20.
2. Lubricate glide points as required and always after cleaning, using grease DIN 51825 - KPF 1/2 N-20.

Oil lubrication points
3. Lubricate joints and toggle levers every 50 operating hours wih engine oil MIL-L-2104 C.

Optional features: Biodegradable hydraulic oil
4. Ester-based synthetic hydraulic oil. Viscosity class ISO VG 46 VI > 180 →

CAUTION Use only mineral oil for the service brake!

Every x operating hours — max. permitted intervals or shorter (depending on use)

10	50	500	1500	Item	Maintenance points
				1.	**Engine**
○	△			1.1	Maintenance according to manufacturer's regulations
				1.2	Dry air filter system
	○				Activate dust removal valve
	○				Check maintenance display
				1.3	Replace filter element if maintenance display is red →
				2	**Rear axle with axle power shift gear or gear shift**
	○			2.1	Check oil level in axle gear (control screw)
		△	◇	2.2	Change oil in axle gear →
	○			2.3	Check oil level in planetary gear (control screw)
		△	◇	2.4	Change oil in planetary gear →
	○			2.5	Check oil level in power shift gear (control screw)
		△	◇	2.6	Change oil in power shift gear →
				3	**Front axle**
	○			3.1	Check oil level in axle gear (control screw)
		△	◇	3.2	Change oil in axle gear →
	○			3.3	Check oil level in planetary gear (control screw)
		△	◇	3.4	Change oil in planetary gear →
				4	**Axles / cardan shaft(s)**
	▲	○		4.1	Check fastening of axles (385Nm)
	▲	○		4.2	Check fastening of cardan shaft(s) (32 Nm)
				5	**Wheels and tyres**
	○			5.1	Check air pressure
▲		○		5.2	Check fastening of wheel nuts (385 Nm)
				6	**Ball bearing slewing ring (swivel loader only)**
	▲	○		6.1	Check fastening (300 Nm)
				7	**Hydraulic system**
	△		◇	7.1	Replace filter inserts, observe electric control lamp →
○				7.2	Oil level check (view glass)
			◇	7.3	Oil change →
○				7.4	Check and clean hydraulic oil cooler
				8	**Lubrication points (indicated in red)** →
				9	**Battery**
		○		9.1	Visual check
				10	**Brake system**
				10.1	Service and parking brake: Take function and visual check before starting work
○				10.2	Service brake: visually check compensation tank
		○		10.3	Parking brake: check and adjust if required →
				11	**Lighting system / fresh air filter**
				11.1	Take function test before starting work
		○	◇	11.2	Check fresh air filter

Malfunctions, causes and remedies

9 Malfunctions, causes and remedies

NOTE

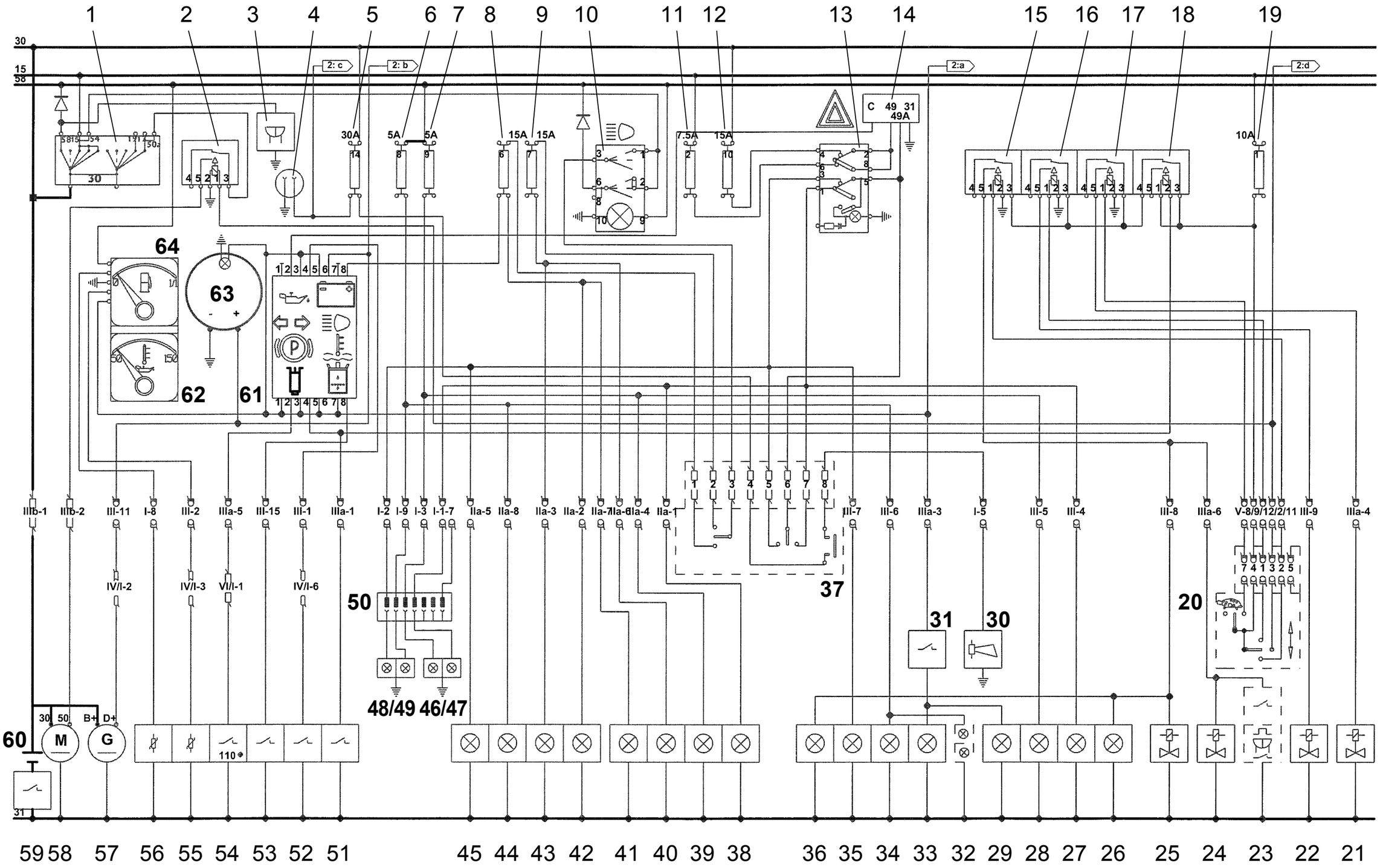
*) Malfunctions may only be remedied by authorized personnel

Malfunction	Possible cause	Remedy
Engine		See Engine Operating Instructions
Engine does not start	Drive switch (4-10/3) is not in the neutral position	Switch into neutral position
Bucket arm cannot be raised/lowered	Pressure relief valve in the control valve is open	Completely dismantle and clean the pressure relief valve; readjust *
	Pilot valve for the working hydraulics (4-10/2) is locked	Unlock the pilot valve (1-2/arrow)
	Pilot pressure is not present or is too low	Open the pressure relief valve in the control cable, clean it and readjust it *
	Diesel engine has failed	Using storage pressure, it is possible to bring the bucket arm to its lower-most position directly after an engine failure. » Not with built-in pipe break safety device «
Steering requires increased effort	Pressure relief valve in the control valve is open	Completely dismantle and clean the pressure relief valve; readjust *
	Pusher in the priority valve is stuck	Replace the priority valve *
Swivel mechanism does not swivel	Block wedge blocks swiveling (1-4/arrow)	Remove block wedge and place it in its holder
	Pressure relief valve in the control valve is open	Completely dismantle and clean the pressure relief valve; readjust *
Stabilizer fails	The stop valve leverage in the frame under the revolving seat is jammed	Bring the bucket arm in the direction of travel; make leverage moveable
Stabilizer fails when bucket arm is lowered in the swiveled position	Non-return valve in the pressure line is open	Bring the bucket arm in the direction of travel; remove and clean the non-return valve; if necessary, replace *

Malfunction	Possible cause	Remedy
Defects in the drive and working hydraulics	The filter is clogged	Replace filter insert
	Lack of oil in the hydraulic oil reservoir	Refill oil
	Electrical connections to the axial piston pump are loose, disconnected or oxydized	Connect according to the wiring diagram or clean
	High pressure valves are soiled	Clean
Defects in the braking system	Parking brake does not hold the loader	Check settings; if necessary, adjust*
		Check whether the electric traction drive interlock is connected to the brake lever
Generator does not charge	Plug connection is loose	Push in plug connection and secure
	V-belt torn	Replace V-belt
	Generator speed too low	Check V-belt tension; if necessary, tighten
Heating/ventilation fails	Fuse in the fuse box is defective	Replace fuse system
Hose couplings on attachments cannot be connected	Increased pressure resulting from influence of heat on the attachment	**Carefully** loosen the coupling at the hose end above the quick-action coupling; oil sprays off; excess pressure drops; tighten coupling **NOTE** Make sure that the collected oil cannot cause any pollution!
	Increased pressure in basic unit	Stop the engine. Remove the pressure in the lines by moving the hand lever on the pilot valve (4-9/5) several times circularly

Wiring and Hydraulics

10.1 - 02.05 (11.1) Elektrik-Schaltplan/Schéma électrique/Wiring diagramm/Elektrisch schakelschema/El-oversigt/Diagrama de conexiones eléctricas/ Sähkökytkentäkaavio/Elektrisk koblingsskjema/El-kopplingsschema



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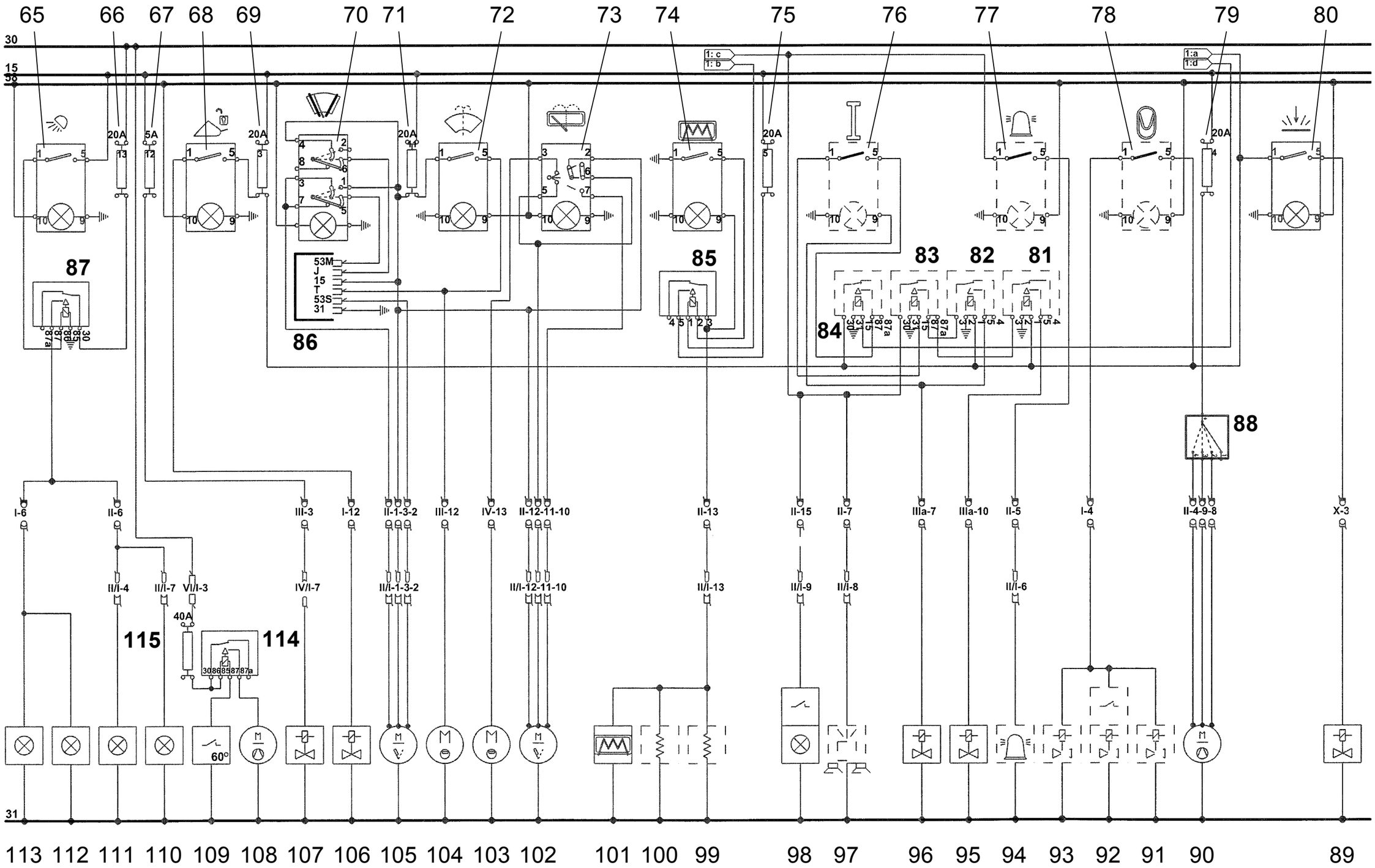


10.1 Wiring diagram

Item Designation

01 Starter switch
02 Start blocking relay
03 Parking light warning buzzer
04 Socket on instrument panel
05 Fuse (chapter 2.2, item 14)
06 Fuse (chapter 2.2, item 8)
07 Fuse (chapter 2.2, item 9)
08 Fuse (chapter 2.2, item 6)
09 Fuse (chapter 2.2, item 7)
10 Switch for driving lights required by German traffic regulations
11 Fuse (chapter 2.2, item 2)
12 Fuse (chapter 2.2, item 10)
13 Hazard flasher light switch
14 Flasher transmitter
15 Relay for performance adaptation, backwards
16 Relay for performance adaptation, forwards
17 Relay for performance adaptation, fast/slow
18 Drive cut-off relay
19 Fuse (chapter 2.2, item 1)
20 Activation of: fast/slow driving stages, forwards/backwards
21 Valve, slow/fast driving speed
22 Valve, forward drive direction
23 Reversing warning indicator (opt.)
24 Valve, reverse drive direction
25 Valve, determination of direction (opt.)
26 Reversing light, right
27 Turn indicator light, rear right
28 Rear light, right
29 Brake light, right
30 Horn
31 Brake light switch
32 License plate illumination (opt.)
33 Brake light, left
34 Rear light, left
35 Turn indicator light, rear left
36 Reversing light, left
37 Steering column switch
38 Turn indicator light, front right
39 Parking light, right
40 Dipped beam, right
41 High beam, right
42 High beam, left
43 Dipped beam, left
44 Parking light, left
45 Turn indicator light, front left

Bucket protection:
46 Turn indicator, right
47 Contour light, right
48 Contour light, left
49 Turn indicator, left

50 Socket, 7-pin
51 Parking brake switch
52 Switch, engine oil pressure
53 Switch, hydraulic oil filter

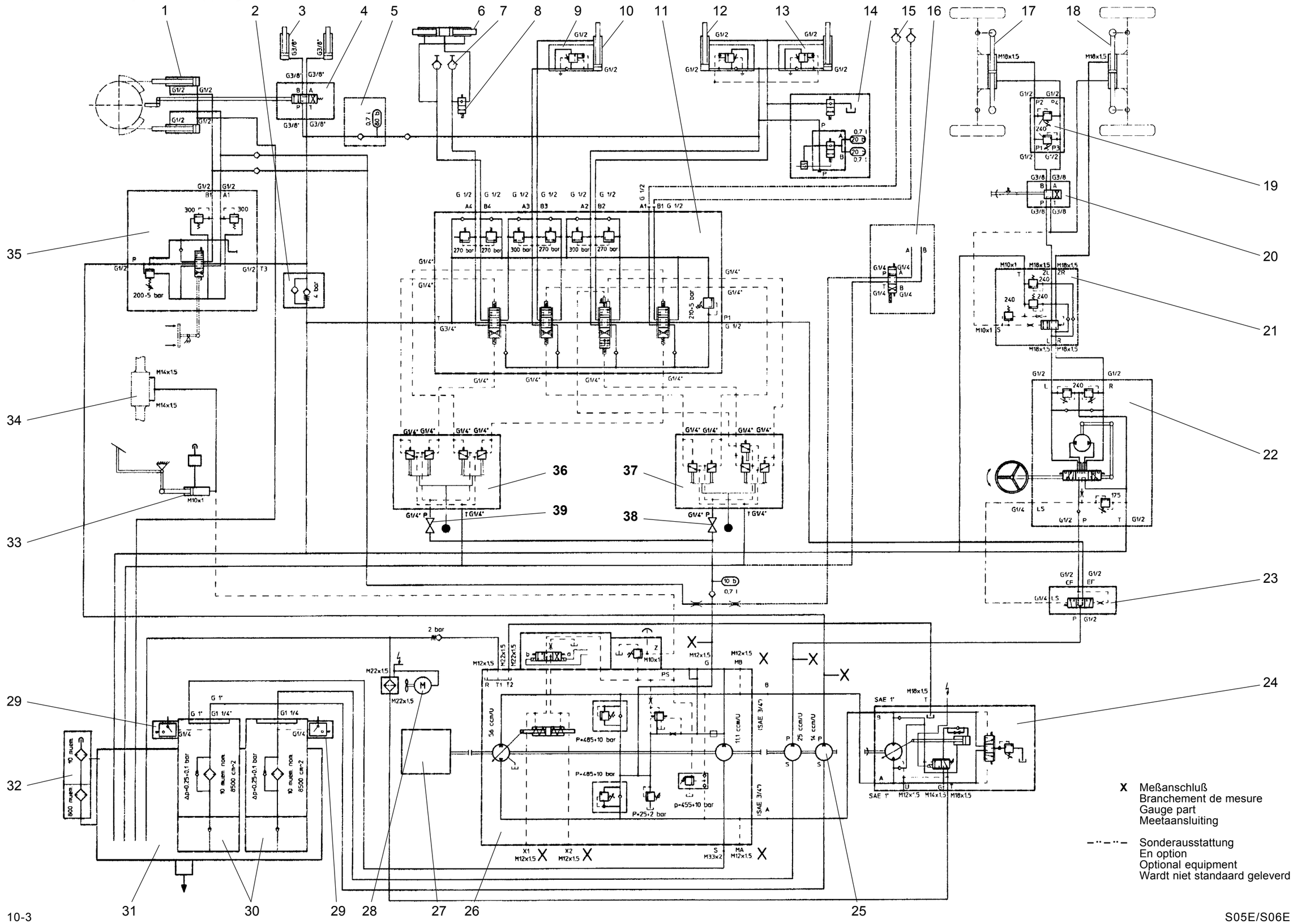
Item Designation

54 Switch, hydraulic oil temperature
55 Engine oil pressure sensor
56 Immersion tube sensor
57 Generator
58 Starter motor
59 Battery main switch
60 Battery
61 Indicator light unit
63 Operating hour meter
62 Engine oil temperature display
64 Fuel level display

Item	Designation
65	Activation of working lights
66	Fuse (chapter 2.2, item 13)
67	Fuse (chapter 2.2, item 12)
68	Activation of release for quick-change device
69	Fuse (chapter 2.2, item 3)
70	Activation of front interval wiper
71	Fuse (chapter 2.2, item 11)
72	Activation of front washer
73	Activation of rear wiper/washer
74	Activation of rear window heater
75	Fuse (chapter 2.2, item 5)
76	Activation of switch gear (opt.)
77	Activation of beacon light (opt.)
78	Activation of lifting device suspension
79	Fuse (chapter 2.2, item 4)
80	Activation of permanent operation of auxiliary hydraulics (opt.)
81	Micro relay 2nd gear (opt)
82	Micro relay 1st gear (opt)
83	Gear shift impulse relay (opt)
84	Gear shift timer relay (opt)
85	Relay, rear window heater
86	Interval transmitter
87	Relay for working lights
88	Activation of ventilation/fan
89	Valve, permanent operation of auxiliary hydraulics (opt.)
90	Fan motor, heating
91	Reservoir valve, lifting device suspension
92	Reservoir valve, lifting device suspension
93	Combination valve: pipe break protection / lifting device suspension (opt)
94	Beacon light (opt.)
95	Valve, gear stage 2 (opt.)
96	Valve, gear stage 1 (opt.)
97	Radio (opt.)
98	Interior lights
99	Heatable rearview mirror, right (opt.)
100	Heatable rearview mirror, left (opt.)
101	Rear window heater
102	Motor, rear wiper
103	Motor, rear washer
104	Motor, front washer
105	Motor, front wiper
106	Valve, release for quick-change device
107	Valve, engine switch-off
108	Ventilation motor, oil cooler
109	Temperature switch, oil cooler
110	Working light, rear left
111	Working light, rear right
112	Working light, front left
113	Working light, front right
114	Relay, oil cooler
115	Fuse (oil cooler)

opt. = optional equipment

10.2 - 06.2001 Hydraulikschaltplan/Schéma hydraulique/Hydraulisch schakelschema/Hydraulic circuit diagram/Hydraulikoversigt/Plano de conexiones hidráulicas/Hydraulisk koblingsskjema/
(11.2) Hydraulik kopplingsschema AS 70 / AS 90 / AZ 85t



10.2 Hydraulic circuit diagram

Item	Designation
01	Swivel cylinder DW 100/50/620/960
02	Servo pressure valve (option)
03	Supporting cylinder EW 50/145/438
04	Supporting valve
05	Reservoir system, pipe break protection (option)
06	Locking cylinder DW 63/50/274
07	Auxiliary hydraulics, external circuit
08	Electrical locking device
09	Pipe break protection, tilt cylinder (option)
10	Tilt cylinder DW 90/50/465/783 (AS 70) Tilt cylinder DW 100/50/465/783 (AS 90 / AZ 85t)
11	4-way valve
12	Lift cylinder DW 80/50/555/857 (AS 70) Lift cylinder DW 90/50/555/857 (AS 90 / AZ 85t)
13	Pipe break protection, lift cylinder (option)
14	Lifting device suspension
15	Auxiliary hydraulics, internal circuit (option)
16	Gear shift (fast loader)
17	Steering cylinder, front
18	Steering cylinder, rear
19	Double shock valve
20	Steering switching valve
21	Blocking valve (option)
22	Steering unit, 200/100 cm^3/rev.
23	Priority valve
24	Drive motor A6VM 107 HA
25	Gear-type pump, (25 + 14) cm^3/rev. (AS 70) Gear-type pump, (32 + 14) cm^3/rev. (AS 90 / AZ 85t)
26	Drive pump A4VG 56 DA
27	Drive motor KHD BF4L 1011 FT (AS 70) Drive motor KHD BF4L 1011F (AS 90 / AZ 85t)
28	Hydraulic oil cooler with electric fan
29	Electric contamination indicator
30	Suction filter
31	Hydraulic oil tank
32	Filling/ventilation filter
33	Stepped main brake cylinder
34	Lamella brake
35	1-way valve
36	Control pressure transmitter, auxiliary hydraulics
37	Control pressure transmitter, working hydraulics
38	Shut-off valve, working hydraulics
39	Shut-off valve, auxiliary hydraulics

Technical Data (Equipment)

11 Technical Data

11.1 AS 70

NOTE

All technical data refer to tire size 365/70 R18.

11.1.1 Loader

- Height	2720 mm
- Width	1940 mm
- Wheel base	1900 mm
- Track width	1580 mm
- Operation weight without attachments	5430 kg
- Ground clearance	
- Differential	320 mm
- Turning radius (over rear)	3660 mm
- Steering angle	+/- 33 °
- Oscillation path	+/- 10 °
- Embankment angle	26 °
- Climbing ability with payload	60 %
- Perm. tow load at a max. perpend. force of 100 kg	
- braked	3500 kg
- unbraked	750 kg
- Max. lifting force	32 kN
- Max. shunting force	40.6 kN

11.1.2 Engine

- Oil/air-cooled diesel engine	
- 4-cylinder, 4-stroke, direct injection	
- Displacement	2732 cm^3
- Power acc. to ISO 9249	44 kW at 2500 rpm
- Exhaust emission according to RL 97/68 EC, level 1 + EPA	

11.1.3 Starter

- 2.2 kW, 12 V

11.1.4 Alternator

- 80 A, 14 V

11.1.5 Hydrostatic drive unit

Type “20 km/h”

- Travel speed I	0 ..... 5 km/h
- Travel speed II	0 .....20 km/h

Type “30 km/h”

1st gear

- Travel speed I	0 .....6 km/h
- Travel speed II	0 .....17 km/h

2nd gear

- Travel speed I	0 ...10.5 km/h
- Travel speed II	0 .....30 km/h

Type “35 km/h”

1st gear

- Travel speed I	0 .....6 km/h
- Travel speed II	0 .....17 km/h

2nd gear

- Travel speed I	0 ...10.5 km/h
- Travel speed II	0 .....35 km/h

11.1.6 Axle loads

- Permitted axle loads in accordance with StVZO	
- Front	4500 kg
- Rear	4500 kg
- Permitted total weight in accordance with StVZO	7300 kg

11.1.7 Tires

The following tire sizes are permitted:

- Size		335/80 R 18
- Tire pressure	- front	3.5 bar
	- rear	2.5 bar
- Size		365/70 R 18
- Tire pressure	- front	3.5 bar
	- rear	2.2 bar
- Size		405/70 R 18
- Tire pressure	- front	3.0 bar
	- rear	2.0 bar

11.1.8 Steering system

- Four-wheel (can be switched to rear-wheel)
- Hydrostatic via priority valve
- Pressure max. 170 bar

11.1.9 Brake system

- Hydrostatic service brake (front axle: wet lamella brake). Acting as an inching brake in the first fraction of the pedal travel.

- Parking brake/auxiliary brake system: wet lamella brake in the front axle.

11.1.10 Electrical system

- Battery 88 Ah

11.1.11 Hydraulic system

- Capacity	120 l
- Hydraulic oil tank	86 l
- Flow	62.5 + 35.0 l/min
- Max. operating pressure	200 bar
- 2 lift cylinders, diameter	80 mm
- 1 tip cylinder, diameter	90 mm
- Times acc. to DIN ISO 7131	
Raise (with payload)	5.8 s
Lower (without load)	3.5 s
Dump 90°	2.0 s
Tilt up 45°	1.5 s

11.1.11.1 Swivel mechanism

- Flow	35.0 l/min
- Max. operating pressure	200 bar
- 2 swivel cylinders, diameter	100 mm
- Swivel time 180°	7.0 s

11.1.11.2 Stabilizers

- Operating press. load-controlled	
- 2 stabilizer cylinders, plunger diameter	50 mm

11.1.12 Fuel supply system

- Capacity, fuel tank	75.0 l

11.1.13 Heating and ventilation system

- Oil heater	COBO
- Type	2/9008/COMB-10/A45
- Heat output, 3-speed	Q_{80} max.: 10.5 kW at $\dot{V}_{oil}$: 30 l/min
- Blower output, 3-speed	max. 785 m³/h

11.1.14 Full flow suction filter

- Grade of filtration	10 µm nom.
- By-pass reaction pressure	Δp = 0.25 bar

11.1.15 Electrical contamination indicator

- Switch pressure	Δp = 0.15 bar

11.1.16 Oil cooler with thermostat control

- Power	max. 17 kW
- Flow rate	28 l/min

11.2 AS 90/AZ 85t

NOTE

All technical data refer to tire size 365/80 R 20.

11.2.1 Loader

- Height	2770 mm
- Width	2030 mm
- Wheel base	1900 mm
- Track width	1680 mm
- Operation weight without attachments	5845 kg
- Ground clearance	
- Differential	370 mm
- Turning radius (over rear)	3660 mm
- Steering angle	+/- 33 °
- Oscillation path	+/- 10 °
- Embankment angle	29 °
- Climbing ability with payload	60 %
- Perm. tow load at a max. perpend. force of 100 kg	
- braked	3500 kg
- unbraked	750 kg
- Max. lifting force	40 kN
- Max. shunting force	42.8 kN

11.2.2 Engine

- Oil/air-cooled diesel engine	
- 4-cylinder, 4-stroke, direct injection	
- Displacement	2732 cm^3
- Power acc. to ISO 9249	51.5 kW at 2500 rpm
- Exhaust emission according to RL 97/68 EC, level 1 + EPA	

11.2.3 Starter

- 2.2 kW, 12 V

11.2.4 Alternator

- 80 A, 14 V

11.2.5 Hydrostatic drive unit

Type “20 km/h”

- Travel speed I	0..... 6 km/h
- Travel speed II	0.....20 km/h

Type “30 km/h”

1st gear

- Travel speed I	0.....6 km/h
- Travel speed II	0.....17 km/h

2nd gear

- Travel speed I	0 ...10,5 km/h
- Travel speed II	0.....30 km/h

Type “40 km/h”

1st gear

- Travel speed I	0.....6 km/h
- Travel speed II	0.....17 km/h

2nd gear

- Travel speed I	0 ...10,5 km/h
- Travel speed II	0.....40 km/h

11.2.6 Axle loads

- Permitted axle loads in accordance with StVZO	
- Front	4500 kg
- Rear	4500 kg
- Permitted total weight in accordance with StVZO	7300 kg

11.2.7 Tires

The following tire sizes are permitted:

- Size		14.5 R 20
- Tire pressure	- front	3,5 bar
	- rear	2,2 bar
- Size		16/70 - 20
- Tire pressure	- front	3,0 bar
	- rear	2,0 bar
- Size		550/45 - 22.5
- Tire pressure	- front	2,5 bar
	- rear	2,5 bar
- Size		335/80 R 20
- Tire pressure	- front	3,5 bar
	- rear	2,2 bar
- Size		365/80 R 20
- Tire pressure	- front	3,5 bar
	- rear	2,2 bar
- Size		375/75 R 20
- Tire pressure	- front	3,8 bar
	- rear	2,5 bar
- Size		405/70 R 20
- Tire pressure	- front	3,0 bar
	- rear	2,0 bar

11.2.8 Steering system

- Four-wheel (can be switched to rear-wheel)	
- Hydrostatic via priority valve	
- Pressure	max. 170 bar

11.2.9 Brake system

- Hydrostatic service brake (front axle: wet lamella brake). Acting as an inching brake in the first fraction of the pedal travel.

- Parking brake/auxiliary brake system: wet lamella brake in the front axle.

11.2.10 Electrical system

- Battery	88 Ah

11.2.11 Hydraulic system

- Capacity	130 l
- Hydraulic oil tank	86 l
- Flow	82.5 + 35.0 l/min
- Max. operating pressure	200 bar
- 2 lift cylinders, diameter	90 mm
- 1 tip cylinder, diameter	100 mm
- Times acc. to DIN ISO 7131	
Raise (with payload)	5.8 s
Lower (without load)	3.5 s
Dump 90°	2.0 s
Tilt up 45°	1.5 s

11.2.11.1 Swivel mechanism

- Flow rate	35.0 l/min
- Max. operating pressure	200 bar
- 2 swivel cylinders, diameter	100 mm
- Swivel time 180°	7.0 s

11.2.11.2 Stabilizers

- Operating press. load-controlled	
- 2 stabilizer cylinders, plunger diameter	50 mm

11.2.12 Fuel supply system

- Capacity, fuel tank	75.0 l

11.2.13 Heating and ventilation system

- Oil heater	COBO
- Type	2/9008/COMB-10/A45
- Heat output, 3-speed	Q_{80} max.: 10.5 kW at $\dot{V}_{oil}$: 30 l/min
- Blower output, 3-speed	max. 785 m³/h

11.2.14 Full flow suction filter

- Grade of filtration	10 µm nom.
- By-pass reaction pressure	Δ p = 0.25 bar

11.2.15 Electrical contamination indicator

- Switch pressure	Δ p = 0.15 bar

11.2.16 Oil cooler with thermostat control

- Power	max. 17 kW
- Flow rate	28 l/min

Technical Data (Attachments)

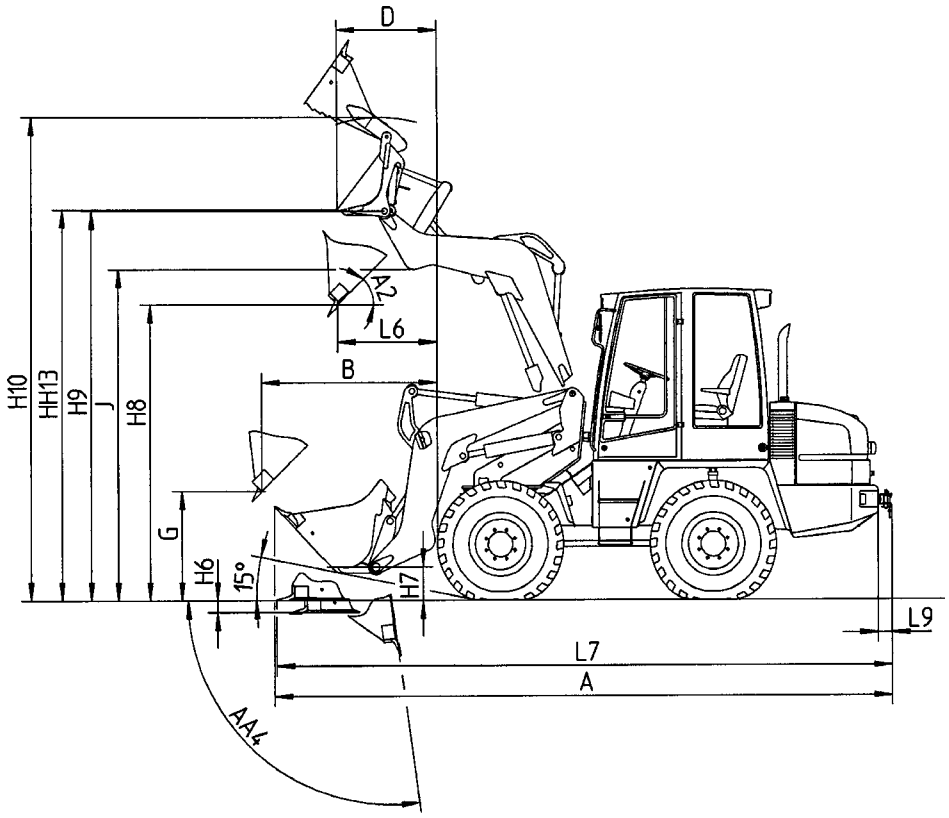
12.1 AS 70

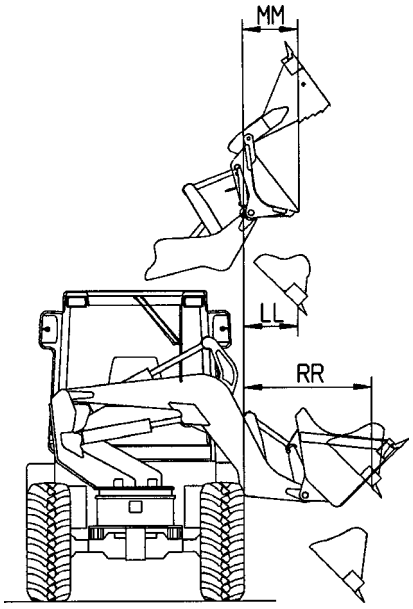
NOTE

- All technical data refer to tire size 365/70 R 18.

12.1.1 Buckets

- Dimensions acc. to ISO 7131/35



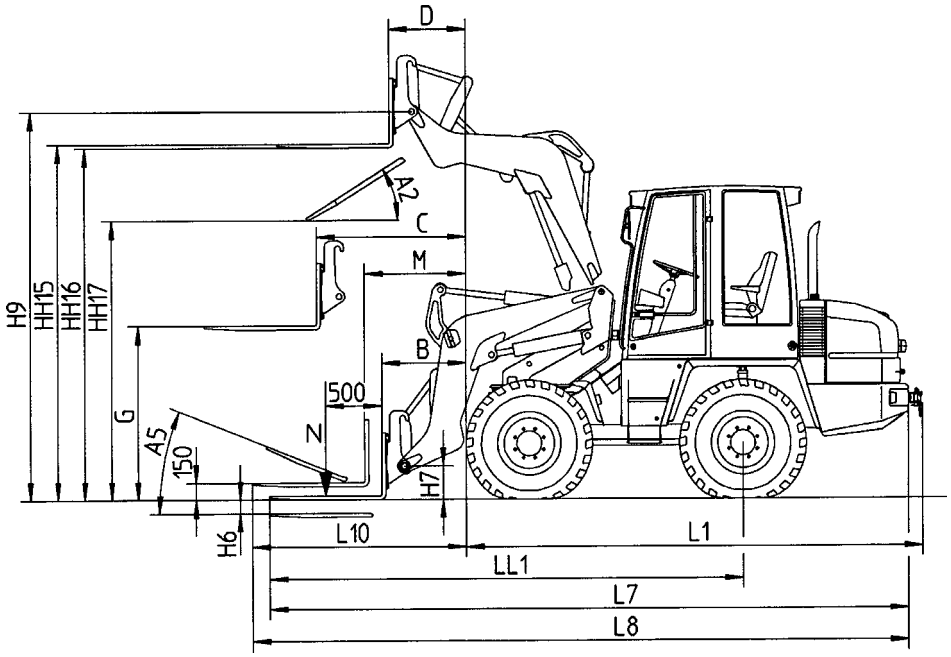


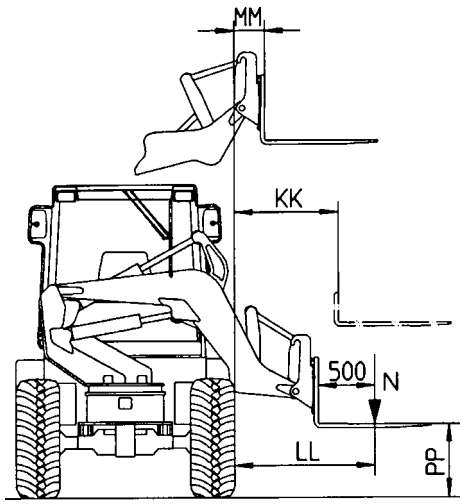
12.1.1 Buckets

Bucket type			Standard bucket	Lightweight bucket	Multi-purpose bucket
Bucket volume acc. to DIN/ISO 7546		m³	**0,70**	**1,0**	**0,55**
Bucket width		mm	1950	2000	1870
Dead weight		kg	262	302	410
Loads according to DIN 24094					
Bulk density		t/m³	2,0	1,45	2,0
Tip load					
- frontal		kg	3060	2900	2760
- swiveled		kg	3040	2880	2740
Payload					
- frontal		kg	1530	1450	1380
- swiveled		kg	1520	1440	1370
Loads according to ISO 8313					
Bulk density		t/m³	1,75	1,15	2,0
Tip load					
- frontal		kg	2800	2720	2560
- swiveled		kg	2460	2300	2200
Payload					
- frontal		kg	1400	1360	1280
- swiveled		kg	1230	1150	1100
Tear-out force acc. to ISO 8313		kN	40	36	42
A	Total length	mm	5660	5800	5630
AA4	Max. dump angle	°	105	105	105
A2	Dump angle	°	45	45	45
B	Max. dumping distance at dumping angle 45°	mm	1500	1540	1570
G	Dumping height at max. dumping width and dump angle 45°	mm	1050	930	930
H6	Depth of feed-in	mm	95	140	120
H7	Distance to the bolt center (quick-change device)	mm	495		460
H8	Dumping height at max. lifting height and dump angle 45°	mm	2660	2540	2550
H9	Distance to the bolt center (quick-change device)	mm	3450	3450	3450
H10	Maximum working height	mm	4280		4100
J	Free lift height	mm	2930	2930	2930
LL	Dumping distance at max. lifting height and dumping angle 45°	mm	360	400	430
L6	Dumping distance at max. lifting height and dumping angle 45°	mm	850	890	925
L7	Total length	mm	5555		5680
L9	Shunting and trailer coupling	mm	125	125	125
RR	Max. dumping distance at dumping angle 45°	mm	1030	1070	1100
Multi-purpose bucket opened:					
D	Dumping distance at max. lifting height and tilted bucket	mm	-	-	960
HH13	Max. dumping height with tilted upbucket	mm	-	-	3400
MM	Dumping distance at max. lifting height and tilted bucket	mm	-	-	470

12.1.2 Fork-lift attachment

- Dimensions acc. to ISO 7131/35





12.1.2 Fork-lift attachment

Fork length	1100 mm
Fork height	45 mm
Fork spacing (center - center)	
- min.	216 mm
- max.	1054 mm
Dead weight	210 kg

Perm. payload N acc. to DIN 24094

frontal	
- level terrain (stability safety factor 1.25)	2080 kg
- rough terrain (stability safety factor 1.67)	1560 kg
swiveled	
- level terrain (stability safety factor 1.25)	1900 kg
- rough terrain (stability safety factor 1.67)	1430 kg

Perm. payload N acc. to ISO 8313

frontal	
- level terrain (stability safety factor 1.25)	1950 kg
- rough terrain (stability safety factor 1.67)	1465 kg
swiveled	
- level terrain (stability safety factor 1.25)	1590 kg
- rough terrain (stability safety factor 1.67)	1190 kg

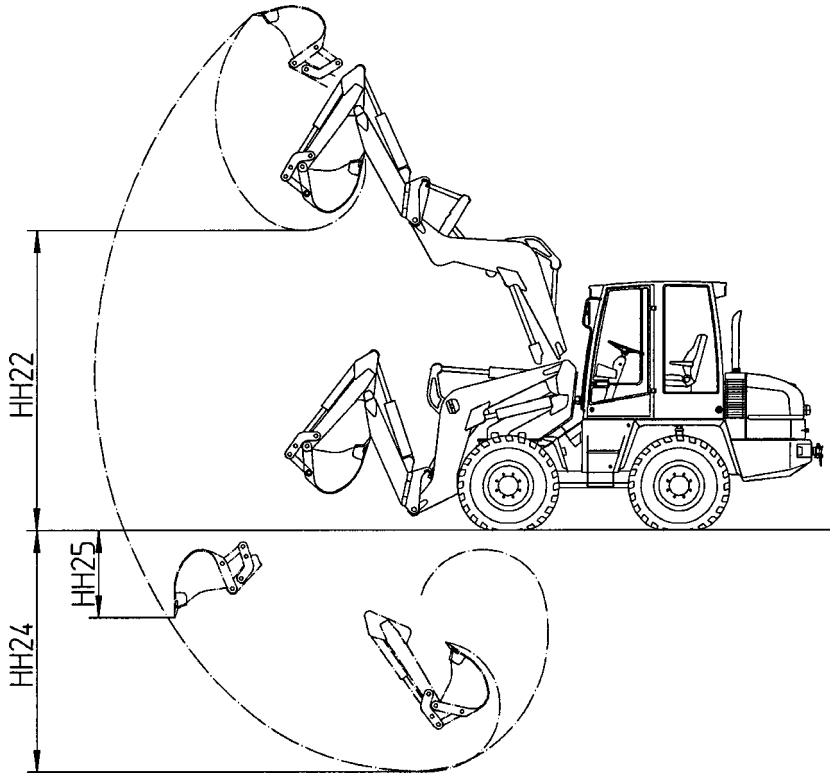
Permissible payload N acc. to ISO 8313 **(height of upper tine edge: 150 mm)**

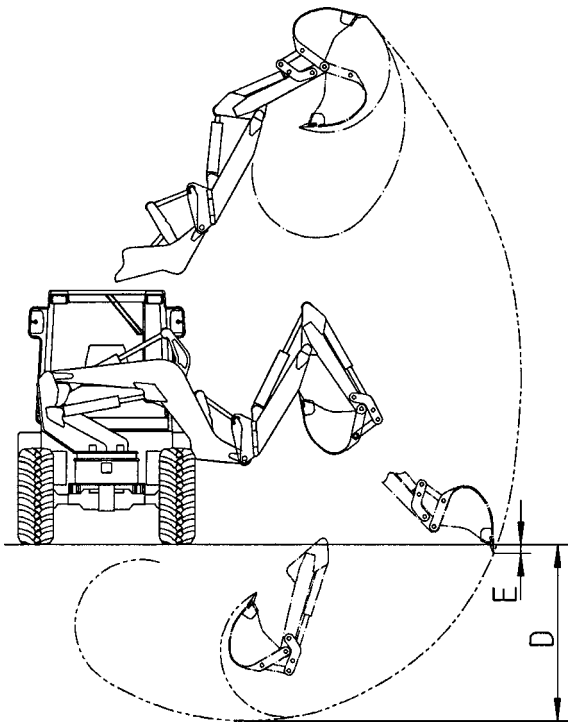
frontal	
- level terrain (stability safety factor 1.25)	2290 kg
- rough terrain (stability safety factor 1.67)	1720 kg

A2	Dump angle	28 °
A5	Tilt angle	20 °
B	Min. operating span	900 mm
C	Max. operating span	1410 mm
D	Operating span at max. lifting height	720 mm
G	Free lift height at max. reach	1350 mm
H6	Depth of feed-in	250 mm
H7	Distance to the bolt center (quick-change device)	530 mm
H9	Distance to the bolt center (quick-change device)	3430 mm
HH15	Free lift height at max. lifting height (upper edge of tines)	3000 mm
HH16	Free lift height at max. lifting height (lower edge of tines)	2955 mm
HH17	Height with maximum lifting height and tilted tines	2400 mm
KK	Max. operating span	950 mm
LL	Distance between tires and rated load	1250 mm
LL1	Length	4510 mm
L1	Length	4000 mm
L7	Total length	6000 mm
L8	Total length	6060 mm
L10	Distance between tire and tine point (height of upper tine edge: 150 mm)	2175 mm
M	Reach (height of upper tine edge: 150 mm)	980 mm
MM	Reach at max. lifting height	280 mm
PP	Min. free lift height	380 mm

12.1.3 Front-end excavator

- Dimensions acc. to ISO 7131/35





12.1.3 Front-end excavator

Max. break-out force at bucket cutting edge 3200 daN
Max. tear-out force with bucket cutting edge 2900 daN

Bucket volume acc. to DIN ISO 7451	Bucket widths acc. to DIN ISO 7451	Dead weight
0.16 m³	600 mm	85 kg
0.21 m³	800 mm	95 kg

Dead weight
- Front-end excavator without bucket 290 kg

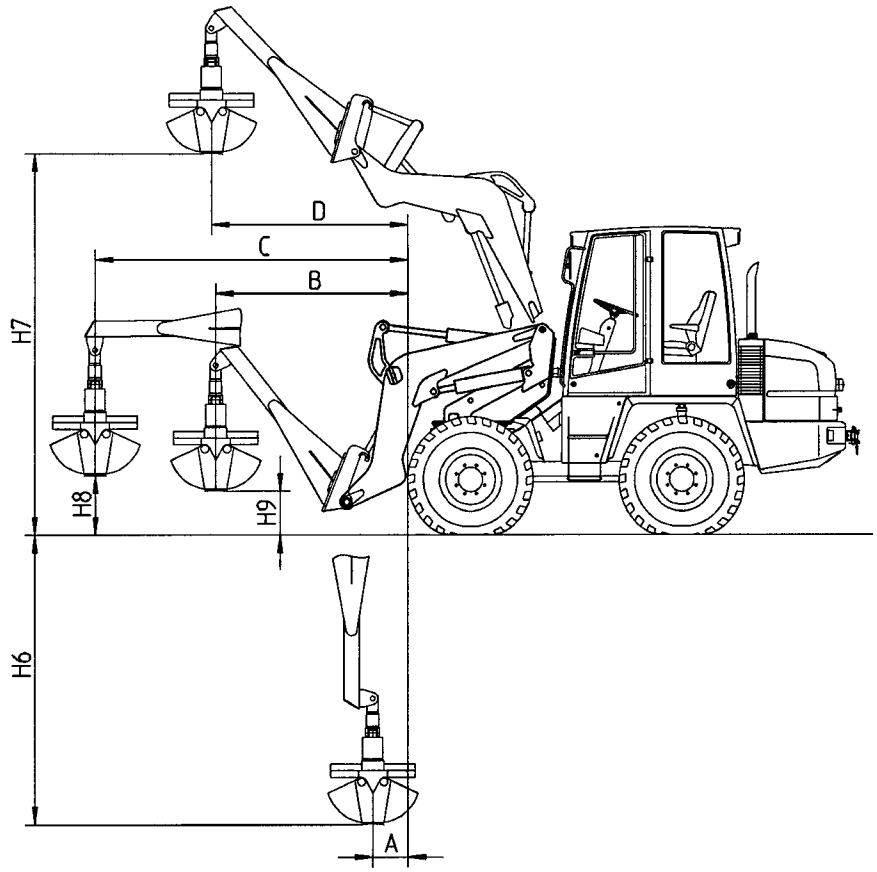
D	Max. digging depth over cutting edge acc. to DIN ISO 7135	2070 mm
E	Feed-in depth	150 mm
HH22	Max. dumping height acc. to DIN ISO 7135	3280 mm
HH24	Max. digging depth over cutting edge acc. to DIN ISO 7135	2710 mm
HH25	Feed-in depth	980 mm

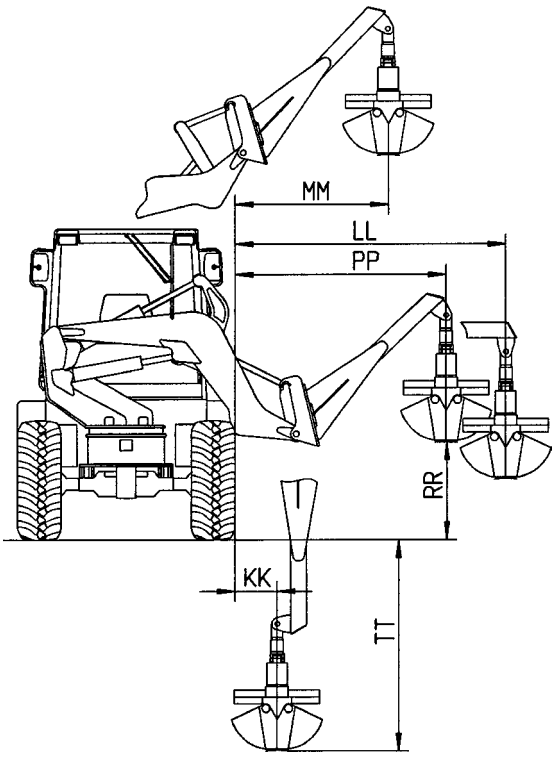
Operating times at $n_{Motor\ max.}$:

- Extend shaft 1.3 s
- Retract shaft 2.1 s
- Open bucket 1.2 s
- Close bucket 2.0 s

12.1.4 Grab

- Dimensions acc. to ISO 7131/35





12.1.4 Grab

Grab type	Grab volume	Grab blade width	Dead weight
KM 626	0.05 m³	250 mm	90 kg
KM 626	0.07 m³	350 mm	100 kg
KM 626	0.09 m³	250 mm	110 kg
KM 626	0.10 m³	450 mm	125 kg
KM 626	0.125 m³	350 mm	130 kg
KM 626	0.16 m³	450 mm	140 kg

- Turning range of the turn drive: continuous
- Dead weight of grab arm 165 kg

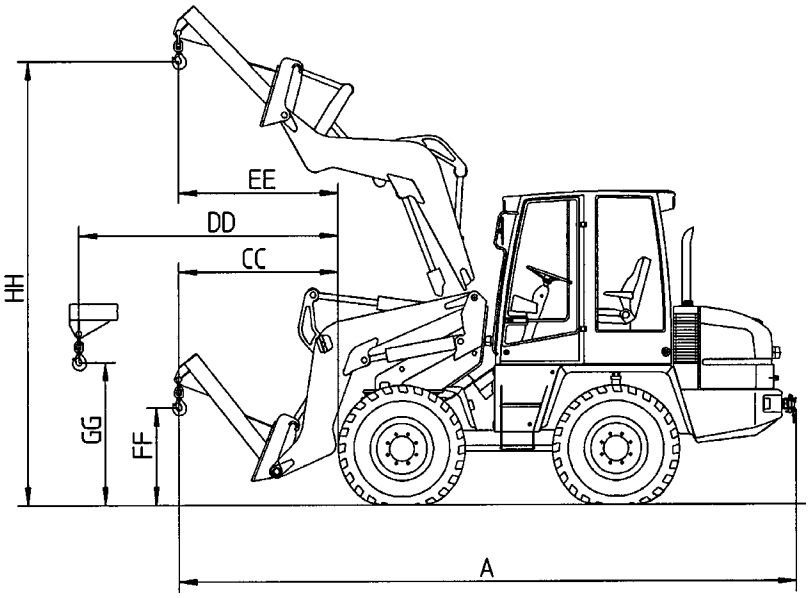
A	Reach at max. digging depth	540 mm
B	Min. dumping width	1940 mm
C	Max. dumping width	2890 mm
D	Dumping reach at max. overload height	2010 mm
H6	Max. digging depth above cutting edge	2750 mm
H7	Max. free lift over shell bottom	3120 mm
H8	Free lift height above shell bottom at max. dumping reach	650 mm
H9	Overload height above shell bottom at min. dumping reach	20 mm
KK	Reach at max. digging depth	450 mm
LL	Max. dumping width	2400 mm
MM	Dumping reach at max. overload height	1540 mm
PP	Min. dumping width	2080 mm
RR	Free lift height at min. dumping reach	650 mm
TT	Max. digging depth above cutting edge	2050 mm

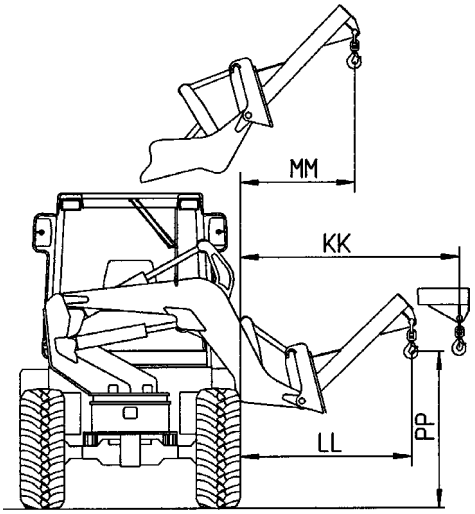
NOTE

Only the grabs listed in the above table may be mounted onthe loader.

12.1.5 Lifting hook

- Dimensions acc. to ISO 7131/35





12.1.5 Lifting hook

Permissible payload according to DIN EN 474-3
(Measurement analog to ISO 8313)

- Max. reach (stability safety factor 2)	
- front	880 kg
- swiveled	640 kg
Dead weight	162 kg

A	Total length	5950 mm
CC	Min. reach	1940 mm
DD	Max. reach	2880 mm
EE	Reach at max. lifting height	2010 mm
FF	Min. lifting height with tilted quick-change device	975 mm
GG	Lifting height at max. reach	1520 mm
HH	Max. lifting height	4080 mm
KK	Max. reach	2430 mm
LL	Min. reach	2080 mm
MM	Reach at max. lifting height	1520 mm
PP	Lifting height at min. reach	1610 mm

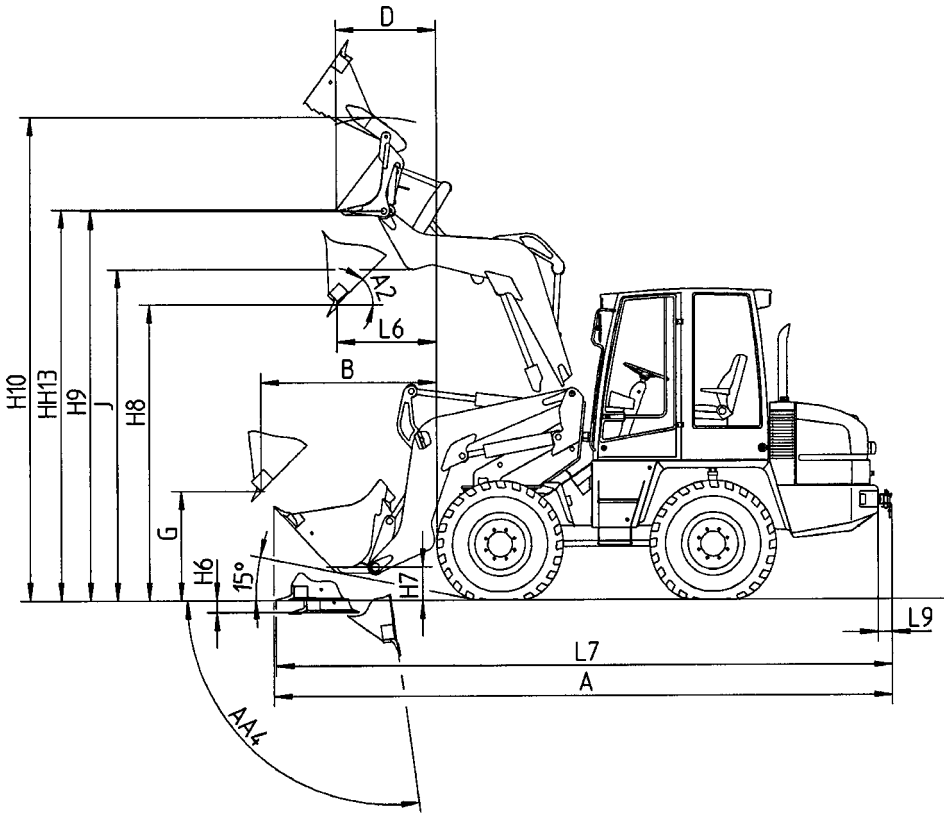
12.2 AS 90/AZ 85t

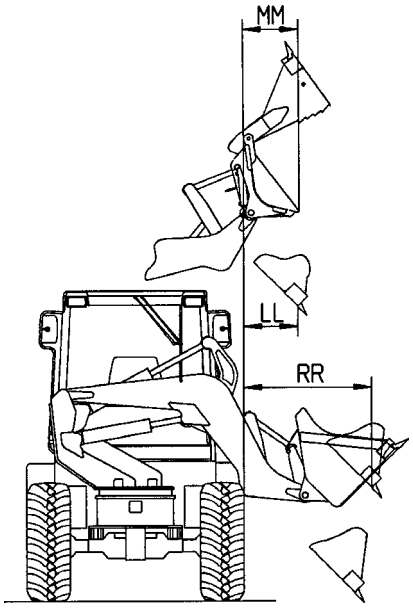
NOTE

- All technical data refer to tire size 365/80 R 20.

12.2.1 Buckets

- Dimensions acc. to ISO 7131/35



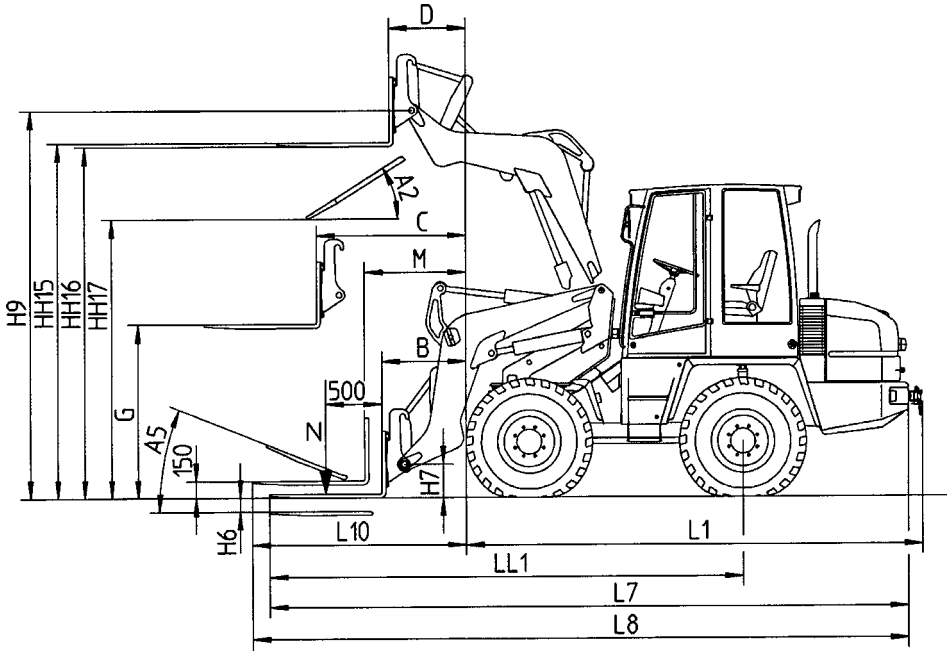


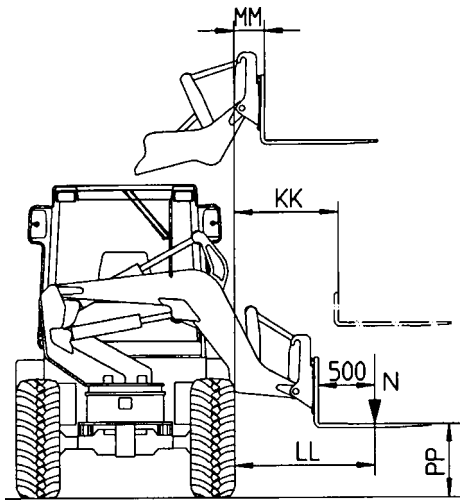
12.2.1 Buckets

Bucket type			Standard	Lightweight bucket	Multi-purpose bucket
bucket					
Bucket volume acc. to DIN/ISO 7546		m³	**0,9**	**1,2**	**0,8**
Bucket width		mm	2100	2000	2100
Dead weight		kg	288	378	500
Loads according to DIN 24094					
Bulk density		t/m³	1,8	1,3	1,9
Tip load					
- frontal		kg	3240	3180	3140
- swiveled		kg	3660	3460	3420
Payload					
- frontal		kg	1620	1590	1570
- swiveled		kg	1830	1730	1710
Loads according to ISO 8313					
Bulk density		t/m³	1,65	1,15	1,75
Tip load					
- frontal		kg	3020	2880	2820
- swiveled		kg	2960	2800	2760
Payload					
- frontal		kg	1510	1440	1410
- swiveled		kg	1480	1400	1380
Tear-out force acc. to ISO 8313		kN	45,5	42,5	43,5
A	Total length	mm	5695	6105	5665
AA4	Max. dump angle	°	105	105	105
A2	Dump angle	°	45	45	45
B	Max. dumping distance at dumping angle 45°	mm	1415	1645	1500
G	Dumping height at max. dumping width and dump angle 45°	mm	1050	900	970
H6	Depth of feed-in	mm	95	35	70
H7	Distance to the bolt center (quick-change device)	mm	550		430
H8	Dumping height at max. lifting height and dump angle 45°	mm	2650	2500	2610
H9	Distance to the bolt center (quick-change device)	mm	3500	3500	3500
H10	Maximum working height	mm	4370		4180
J	Free lift height	mm	2940	2940	2940
LL	Dumping distance at max. lifting height and dumping angle 45°	mm	300	530	380
L6	Dumping distance at max. lifting height and dumping angle 45°	mm	780	1010	860
L7	Total length	mm	5530		5640
L9	Shunting and trailer coupling	mm	125	125	125
RR	Max. dumping distance at dumping angle 45°	mm	980	1210	1050
Multi-purpose bucket opened:					
D	Dumping distance at max. lifting height and tilted bucket	mm	-	-	900
HH13	Max. dumping height with tilted upbucket	mm	-	-	3470
MM	Dumping distance at max. lifting height and tilted bucket	mm	-	-	420

12.2.2 Fork-lift attachment

- Dimensions acc. to ISO 7131/35





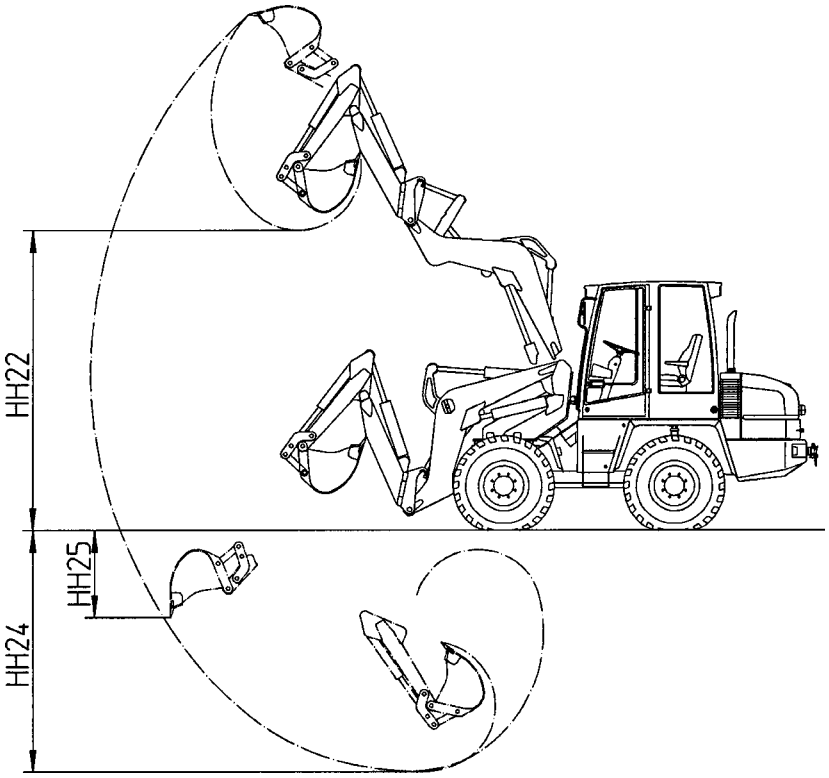
12.2.2 Fork-lift attachment

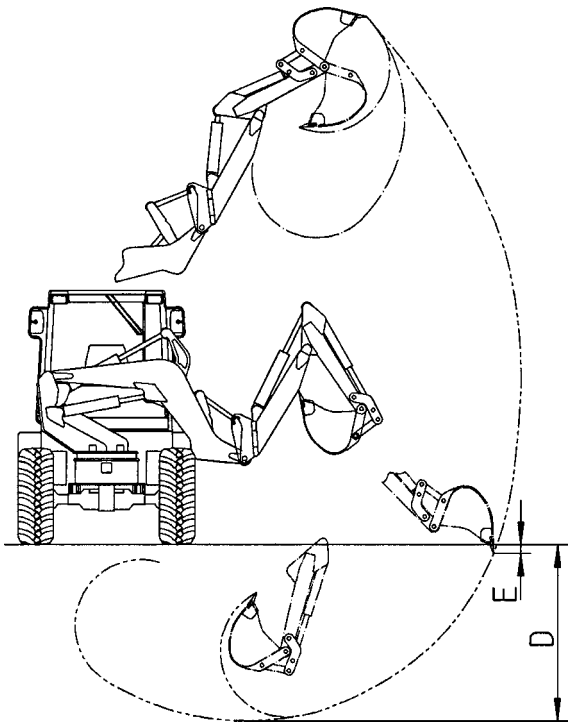
Fork length	1100 mm
Fork height	45 mm
Fork spacing (center - center)	
- min.	216 mm
- max.	1054 mm
Dead weight	210 kg
Perm. payload N acc. to DIN 24094	
frontal	
- level terrain (stability safety factor 1.25)	2300 kg
- rough terrain (stability safety factor 1.67)	1725 kg
swiveled	
- level terrain (stability safety factor 1.25)	2350 kg
- rough terrain (stability safety factor 1.67)	1760 kg
Perm. payload N acc. to ISO 8313	
frontal	
- level terrain (stability safety factor 1.25)	2135 kg
- rough terrain (stability safety factor 1.67)	1600 kg
swiveled	
- level terrain (stability safety factor 1.25)	1965 kg
- rough terrain (stability safety factor 1.67)	1470 kg
Permissible payload N acc. to ISO 8313 **(height of upper tine edge: 150 mm)**	
frontal	
- level terrain (stability safety factor 1.25)	2550 kg
- rough terrain (stability safety factor 1.67)	1910 kg

A2	Dump angle	28 °
A5	Tilt angle	20 °
B	Min. operating span	900 mm
C	Max. operating span	1350 mm
D	Operating span at max. lifting height	660 mm
G	Free lift height at max. reach	1400 mm
H6	Depth of feed-in	170 mm
H7	Distance to the bolt center (quick-change device)	530 mm
H9	Distance to the bolt center (quick-change device)	3500 mm
HH15	Free lift height at max. lifting height (upper edge of tines)	3050 mm
HH16	Free lift height at max. lifting height (lower edge of tines)	3005 mm
HH17	Height with maximum lifting height and tilted tines	2460 mm
KK	Max. operating span	900 mm
LL	Distance between tires and rated load	1240 mm
LL1	Length	4440 mm
L1	Length	4060 mm
L7	Total length	5930 mm
L8	Total length	6000 mm
L10	Distance between tire and tine point (height of upper tine edge: 150 mm)	2065 mm
M	Reach (height of upper tine edge: 150 mm)	980 mm
MM	Reach at max. lifting height	245 mm
PP	Min. free lift height	600 mm

12.2.3 Front-end excavator

- Dimensions acc. to ISO 7131/35





12.2.3 Front-end excavator

Max. break-out force at bucket cutting edge	3200 daN
Max. tear-out force with bucket cutting edge	2900 daN

Bucket volume acc. to DIN ISO 7451	Bucket widths acc. to DIN ISO 7451	Dead weight
0.16 m³	600 mm	85 kg
0.21 m³	800 mm	95 kg

Weight

- Front-end excavator without bucket	290 kg

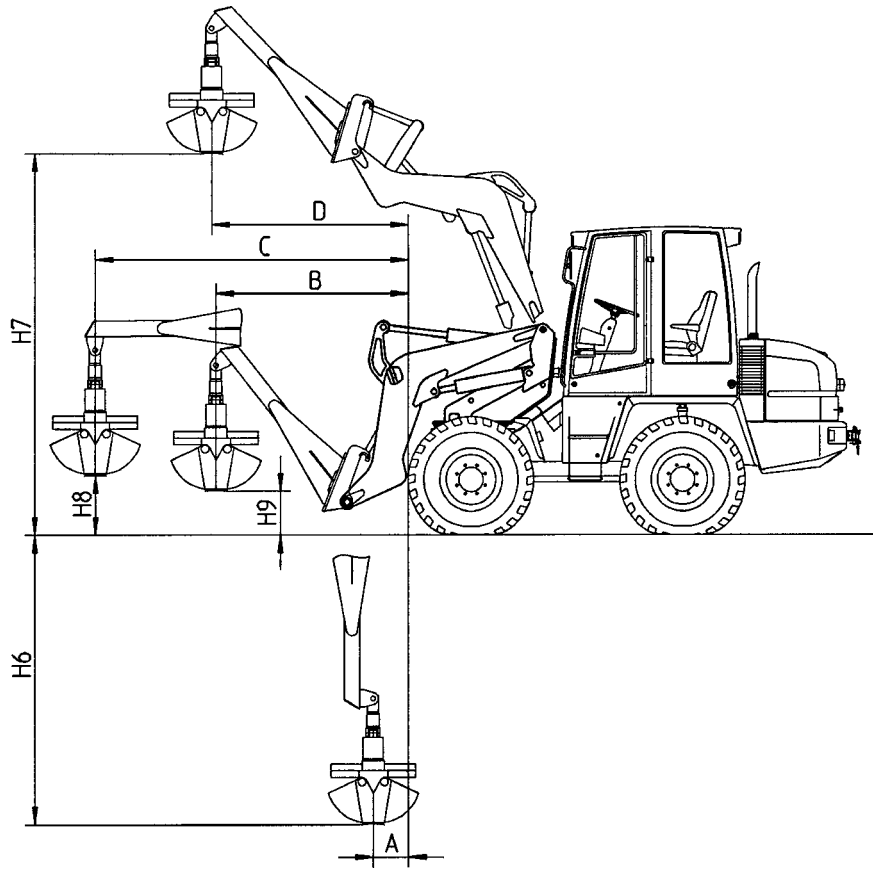
D	Max. digging depth over cutting edge acc. to DIN ISO 7135	2020 mm
E	Feed-in depth	100 mm
HH22	Max. dumping height acc. to DIN ISO 7135	3330 mm
HH24	Max. digging depth over cutting edge acc. to DIN ISO 7135	2660 mm
HH25	Feed-in depth	930 mm

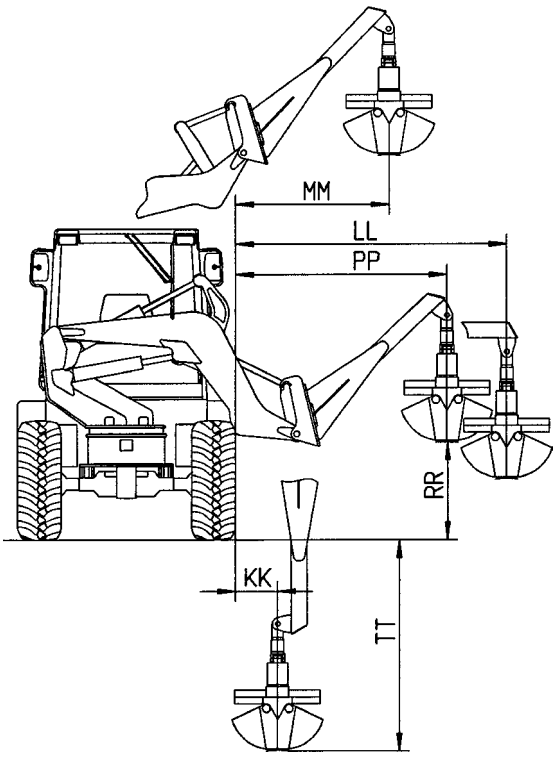
Operating times at $n_{Motor\ max.}$:

- Extend shaft	1.3 s
- Retract shaft	2.1 s
- Open bucket	1.2 s
- Close bucket	2.0 s

12.2.4 Grab

- Dimensions acc. to ISO 7131/35





12.2.4 Grab

Grab type	Grab volume	Grab blade width	Dead weight
KM 626	0,05 m³	250 mm	90 kg
KM 626	0,07 m³	350 mm	100 kg
KM 626	0,09 m³	250 mm	110 kg
KM 626	0,10 m³	450 mm	125 kg
KM 626	0,125 m³	350 mm	130 kg
KM 626	0,16 m³	450 mm	140 kg
KM 605	0,15 m³	325 mm	235 kg
KM 605	0,20 m³	400 mm	250 kg
KM 605	0,25 m³	500 mm	270 kg

- Turning range of the turn drive: continuous
- Dead weight of grab arm 165 kg

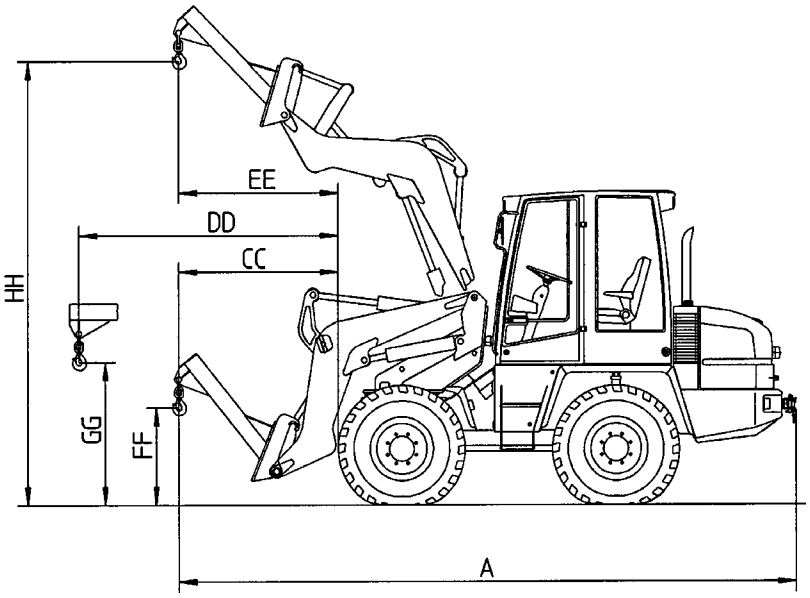
A	Reach at max. digging depth	490 mm
B	Min. dumping width	1880 mm
C	Max. dumping width	2830 mm
D	Dumping reach at max. overload height	1950 mm
H6	Max. digging depth above cutting edge	2680 mm
H7	Max. free lift over shell bottom	3140 mm
H8	Free lift height above shell bottom at max. dumping reach	700 mm
H9	Overload height above shell bottom at min. dumping reach	70 mm
KK	Reach at max. digging depth	540 mm
LL	Max. dumping width	2350 mm
MM	Dumping reach at max. overload height	1470 mm
PP	Min. dumping width	2030 mm
RR	Free lift height at min. dumping reach	700 mm
TT	Max. digging depth above cutting edge	1980 mm

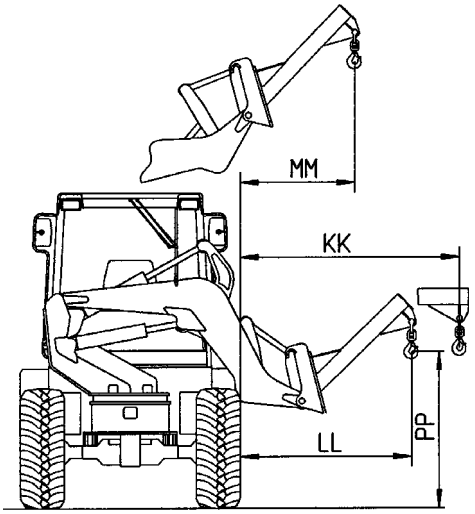
NOTE

- Only the grabs listed in the above table may be mounted on the loader.
- The values given for **"A"** to **"TT"** refer to the KM 626 grab.

12.2.5 Lifting hook

- Dimensions acc. to ISO 7131/35





12.2.5 Lifting hook

Permissible payload according to
DIN EN 474-3
(Measurement analog to ISO 8313)

- Max. reach (stability safety factor 2)	
- front	960 kg
- swiveled	780 kg
Dead weight	162 kg

A	Total length	5950 mm
CC	Min. reach	1880 mm
DD	Max. reach	2820 mm
EE	Reach at max. lifting height	1950 mm
FF	Min. lifting height with tilted quick-change device	1030 mm
GG	Lifting height at max. reach	1580 mm
HH	Max. lifting height	4100 mm
KK	Max. reach	2380 mm
LL	Min. reach	2030 mm
MM	Reach at max. lifting height	1470 mm
PP	Lifting height at min. reach	1660 mm

Optional Extras, Changes

13 Additional options, modifications, notes on inspection for loaders

13.1 Additional options

none

13.2 Modifications

none