AHLMANN

OPERATING INSTRUCTIONS ARTICULATED LOADER

GB

AL 80/AL 100/AL 100turbo/AL 120

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Introduction

Preface

Ahlmann's swivel shovel loaders, telescopic loaders, articulated loaders and front loaders are machines included in the vast product range of **Ahlmann's** Baumaschinen covering a wide variety of working tasks.

Decades of experience in the construction of earth-moving machines, the wide range of attachments available as well as modern production facilities, careful testing and highest quality demands guarantee the highest degree of reliability of your **Ahlmann** machine.

The extent of documentation delivered by the manufacturer includes the following:

- Loader operating instructions
- Engine operating instructions
- Loader spare parts list
- Engine spare parts list
- EC conformity declaration

Operating instructions

The operating instructions contain all the information which the user requires for operation and maintenance.

In the "Maintenance" section, all maintenance work and operation tests are described which can be carried out by trained personnel.

This section does not cover more extensive maintenance work that is reserved to personnel authorized and trained by the manufacturer. In particular, this applies to facilities governed by Motor Vehicle Construction and Use Regulations and the Regulations for the Prevention of Accidents.

Due to the construction modifications reserved by the manufacturer, there may be differences in the figures; however, this has no influence on the technical contents.

How to use this manual

Explanations

- The designations **"left" and** "**right**" are to be seen from the driver's seat in driving direction.
- Optional equipment:
  means: not fitted in series.

Information about illustrations

- (3-35)
  means: chapter 3, fig. 35
- (3-35/1)
  means: chapter 3, fig. 35, item 1
- (3-35/arrow)
  means: chapter 3, fig. 35, ◄

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Abbreviations used:

UVV = Unfallverhütungsvorschrift (Accident Prevention Regulations)

StVZO = Straßenverkehrzulassungsordnung (German Traffic Regulations)

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11 Technical data (loader)

Safety regulations

1 Fundamental safety instructions

1.1 Warnings and symbols

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

NOTE

Special information regarding the economic 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 Proper use of the loader

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 manufacturer-approved 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 use going beyond these purposes is regarded as being improper use. The manufacturer is not liable for any damage caused in this connection. The risk is solely with the user.

The authorized use of the machine also requires the operating manual (machine and engine) is heeded and the inspection and maintenance conditions are complied with.

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.Also heed all regulations governing public traffic.

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. Danger of injuries, e.g. by getting caught or being pulled in.

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 Do not make any modifications or conversions to the machine which could affect safety without the manufacturer's consent,. 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 and 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; basic responsibilities

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 electro technical regulations.

1.4.3 Only qualified specialists may carry out work on the chassis, the brake and steering 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 Observe the control lamps according to the operation manual (machine and engine) during starting and switching-off operation!

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 moving 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 action 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 swinging out,
- by dropping loads,
- 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. Report any defects (including changes in the operational behavior) 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. If you are in doubt assume no protection roofs are present.

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 beforehand.

1.5.1.18 Make sure to always 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 installations 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 following may affect the stability:

- 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.

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 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 breaks and after work hours the driver must park the machine on solid and if possible level ground and safeguard it against unintentionally rolling away.

Figure 1-1

1.5.2 Special work in the context of machine operation and elimination of defects during process or work; disposal

1.5.2.1 The 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 replacement 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 switch-on and switch-off procedures 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 unintentional movement were taken.
During maintenance and repair work under the bucket arm:
- The bucket arm must be mechanically supported.
  For example: Remove the bucket arm protection (option) after loosening of the fixing screw and insert it into the lift cylinder (1-1/arrow).
- The ball block valve for working and additional hydraulic (1-2/arrow) must be closed (horizontal position).

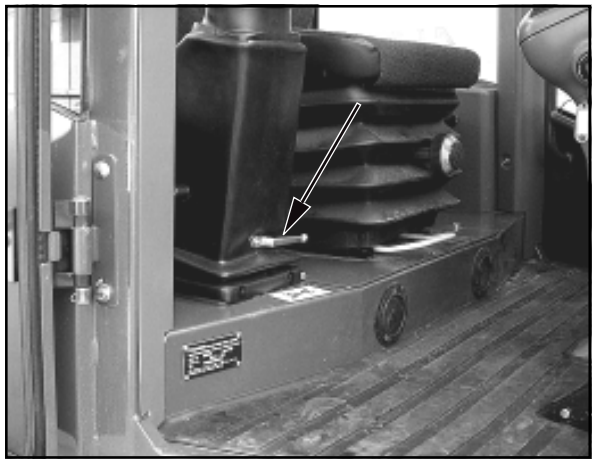


Figure 1-2

1.5.2.6 Immobilize the articulated link when performing maintenance and repair work on it.
Remove the articulation safeguard (1-3/arrow) after loosening the fixing screw, insert the bend in protection into the articulated link (1-4/arrow) and fasten it.

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

1.5.2.8 The machine must be protected from unintentionally starting after it was switched off for maintenance and repair work:

- remove the ignition key and
- attach at warning sign at the disconnected battery or at the battery main switch.

This applies especially to works to the electrical equipment.

Figure 1-3

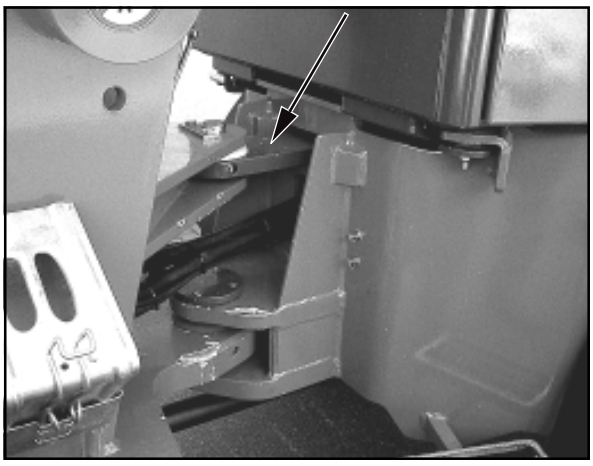


Figure 1-4

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

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

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

1.5.2.12 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.

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

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

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

1.5.2.16 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, platforms, scaffolds , ladders must be kept free from dirt and ice.

1.5.2.17 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!

1.5.2.18 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. alternator, generator governor, starter, air filter, cables and hoses are very delicate.

1.5.2.19 After cleaning completely remove all protection covering and tape.

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

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

1.5.2.22 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.

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

1.5.2.24 The machine should be checked by a specialist before commissioning and after essential modifications before it returns to service.

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

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

1.6 Instructions regarding special categories of danger

1.6.1 Electrical energy

1.6.1.1 Only use original fuses with stipulated ratings. 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)			(meters)
	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 attached 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 the driver must 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 danger 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 electro technical 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.

1.6.1.7 Electric welding operations may only be performed if the battery main switch (8-35/3) has been pulled out.

1.6.2 Hydraulics

1.6.2.1 Only experts with special expertise and experience 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 repair 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 depressurized 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. Spare parts must meet the technical requirements of the manufacturer. Original spare parts ensure the fulfillment of these requirements.

1.6.2.5 The factory settings of hydraulic components (e.g. the maximum permissible speed of the axial piston engine) must not be altered. Any adjustment will render the warranty invalid.

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 handling 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 refuelling.
- 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 be operated in closed rooms only if sufficient ventilation is ensured! Ensure sufficient ventilation prior to starting the machine!
The regulations for the respective working site must be strictly observed.

1.6.5.2 Carry out welding, burning and grinding work on the machine only 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, recommissioning

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 Start towing at a low speed. Persons must not remain near the towing bar.

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 Strictly observe the operating manual during recommissioning.

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

1.8.1 Organizational measures

1.8.1.1 We emphasize that attachments that are not supplied by us are also not tested and approved by us. Use of such products can under certain conditions adversely affect the present constructional qualities of your loader and thus limit the active and passive driving safety. The manufacturer cannot be held responsible for damage that occurs through the use of such products.

1.8.1.2 Make known the position and operation/handling of fire extinguisher (left C-column) first aid kit!

1.8.1.3 When travelling on public roads, a first aid kit, a warning triangle and a warning lamp must be available on the vehicle.

1.8.2 Selection of personnel and necessary qualifications; basic responsibilities

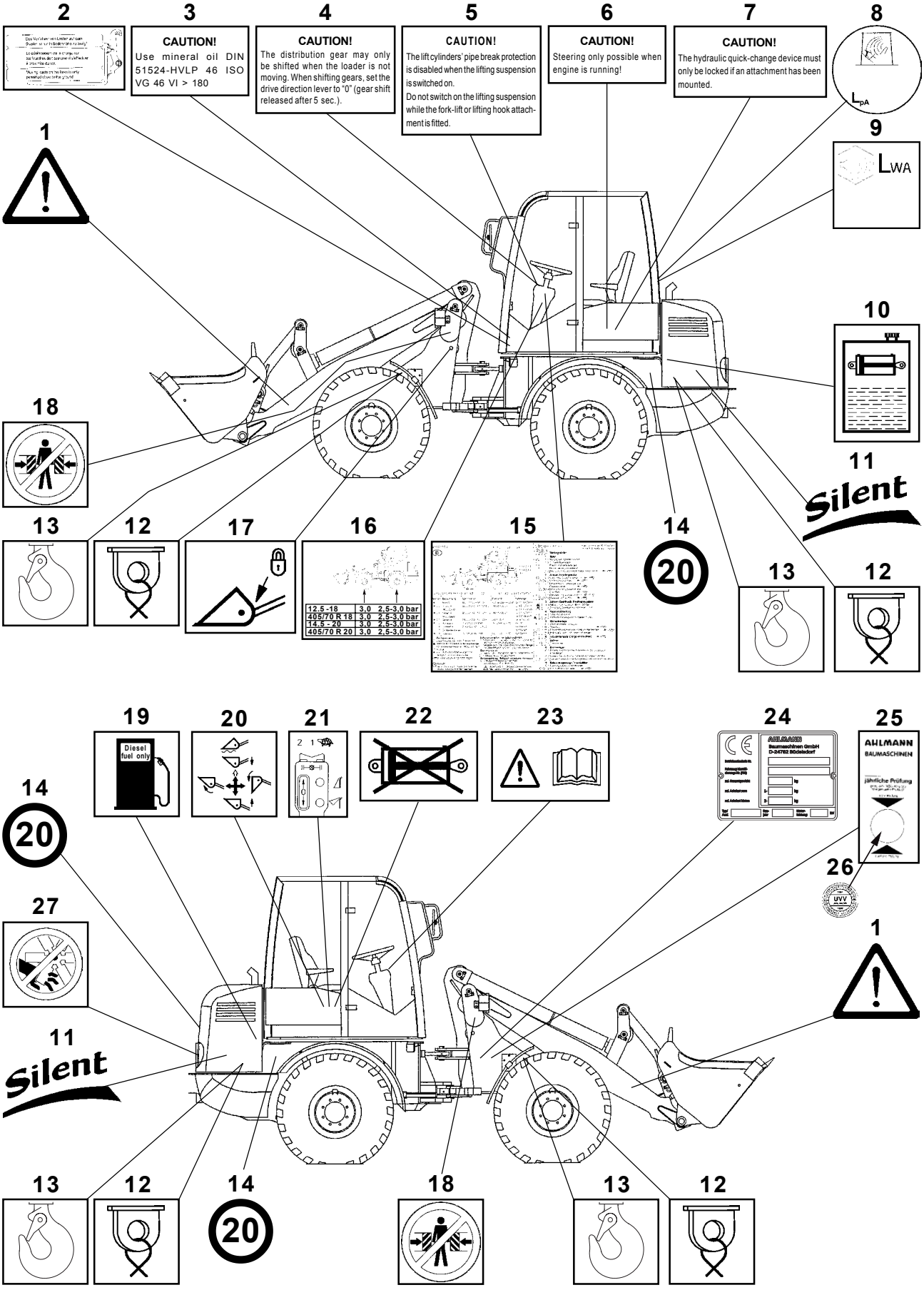
1.8.2.1 Only reliable persons are allowed to work on / with the machine. The minimum legal age must be observed.

1.8.2.2 Employ trained or instructed personnel only. 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 Authorize the drive 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 who are to be trained, instructed or working on/ with the machine in the scope of professional training must not work on/ with the machine, unless they are supervised by an experienced person.

Signs


2
3
CAUTION!
Use mineral oil DIN 51524-HVLP 46 ISO VG 46 VI > 180
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
CAUTION!
The lift cylinders' pipe break protection is disabled when the lifting suspension is switched on.
Do not switch on the lifting suspension while the fork-lift or lifting hook attachment is fitted.
6
CAUTION!
Steering only possible when engine is running!
7
CAUTION!
The hydraulic quick-change device must only be locked if an attachment has been mounted.
8
LpA
9
LWA
1
10
18
11
Silent
13
12
17
16
15
14
20
13
12
12.5-18 3,0 2,5-3,0 bar
405/70 R 18 3,0 2,5-3,0 bar
14.5 - 20 3,0 2,5-3,0 bar
405/70 R 20 3,0 2,5-3,0 bar
19
Diesel fuel only
20
21
22
23
24
25
AHLMANN
BAUMASCHINEN
jährliche Prüfung
26
14
20
27
11
Silent
1
13
12
14
20
18
13
12

1 Symbol: Stay out of the danger zone
2 Sign: **CAUTION!** - Moving loads is only permitted close to the ground!
3 Sign: Use mineral oil DIN 51524-HVLP 46 ISO VG 46 VI > 180
4 Sign: **» Only for fast loaders - 30 km/h «**
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 Sign: **» Only for loaders with pipe break protection «**
CAUTION!
The lift cylinders’ pipe break protection is disabled when the lifting suspension is switched on.
Do not switch on the lifting suspension while the fork-lift or lifting hook attachment is fitted.
6 Sign: **CAUTION!** - Steering only possible when engine is running!
7 Sign: **CAUTION!**
The hydraulic quick-change device must only be locked if an attachment has been mounted.
8 Sign: Noise pressure level (chapt. 11.1.17, 11.2.17, 11.3.17, 11.4.17)
9 Sign: Sound power level (chapt. 11.1.17, 11.2.17, 11.3.17, 11.4.17)
10 Symbol: Hydraulic oil tank
11 Sign: Lettering “Low-noise construction machine”
12 Symbol: Lashing eyes
13 Symbol: Lifting hook
14 Sign: Maximum speed
15 Sign: Maintenance plan
16 Sign: Tire pressure
17 Symbol: Quick-change device locked
18 Symbol: Stay out of the unprotected articulation area
19 Symbol: Fuel tank
20 Symbol: Hand lever for working hydraulics (4-12/6)
- Hand lever forward - Lower bucket arm
- Hand lever to the rear - Lift bucket arm
- Hand lever to the left - Tilt up quick-change device/attachment
- Hand lever to the right - Tilt down quick-change device/attachment

21 Symbol: Standard-Joystick
- Drive switch (4-12/5)
  - Drive direction - forward
    - 0
    - backward
- Pusbutton for auxiliary hydraulics (4-12/3)
  - Quick-change device
    - upper pushbutton - lock
    - bottom pushbutton - unlock
      (only in conjunction with 4-10/1)
  - Multi-purpose bucket
    - upper pushbutton - close
    - bottom pushbutton - open
- Pushbutton for differential lock (4-12/2)
- Hydraulic drive stages (4-12/1)
  - Hare symbol - fast
  - Turtle symbol - slow

22 Symbol: Ball block valve for working/auxiliary hydraulics closed
23 Symbol: Read and observe the operating instructions before commissioning.
Make sure that all other users have also read the safety instructions!
24 Machine type label (includes the identification number of the vehicle)
25 Sign: Annual inspection as per UVV
26 Sign: UVV badge
27 Symbol: Open only when the engine is not running

Protection against theft

Figure 3-1

3 Protection against theft

Instances where construction machines were stolen have con-siderably 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.

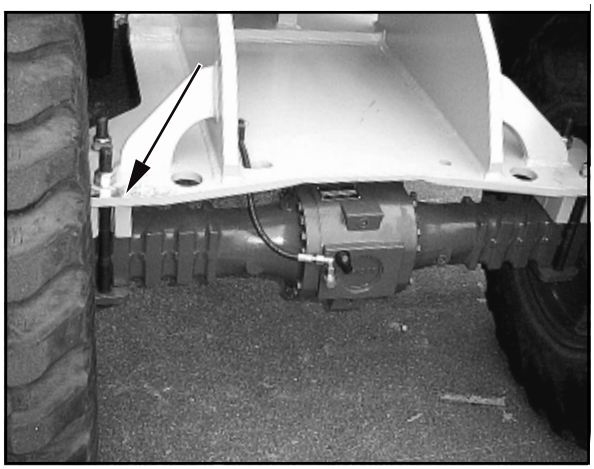


Figure 3-2

3.2 Parking the loader

(1) Turn the steering wheel fully to the left or the right.
(2) Apply the parking brake (4-12/7).
(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) (horizontal position).
(5) Set the drive switch (4-12/5) to “forward” or “reverse”.
(6) Set hydraulic drive stage „I“ (4-12/1).
(7) Remove the ignition key.
(8) Remove the battery main switch (8-31/3).
(9) Switch on the working lights (4-13/1). *
(10) Switch on the warning beacon (opt.) (4-13/12). *
(11) Switch on the hazard flasher (4-8/7). *
(12) Push the steering column switch (4-8/4) to the “High beam” position. *
(13) Lock both doors.
(14) Lock the tank lid.
(15) Lock the engine hood.

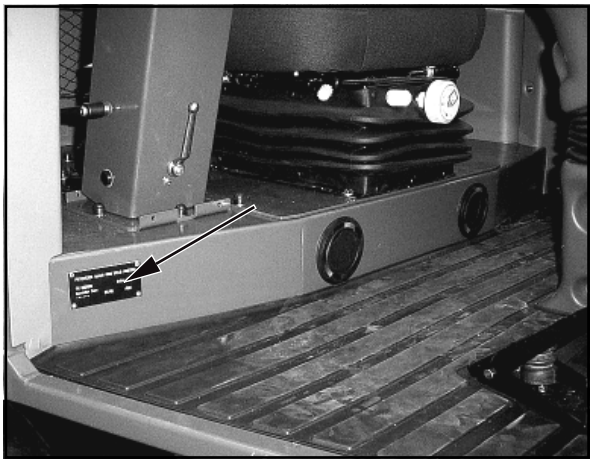


Figure 3-3

* In case of hot-wiring, persons in the vicinity are to be made aware of the extraordinarily lighted machine.

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 ignition key) is taken away from the receiver unit (in the immediate vicinity of the ignition lock), these vital functions are interrupted.

Advantages in case of an insured event:

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

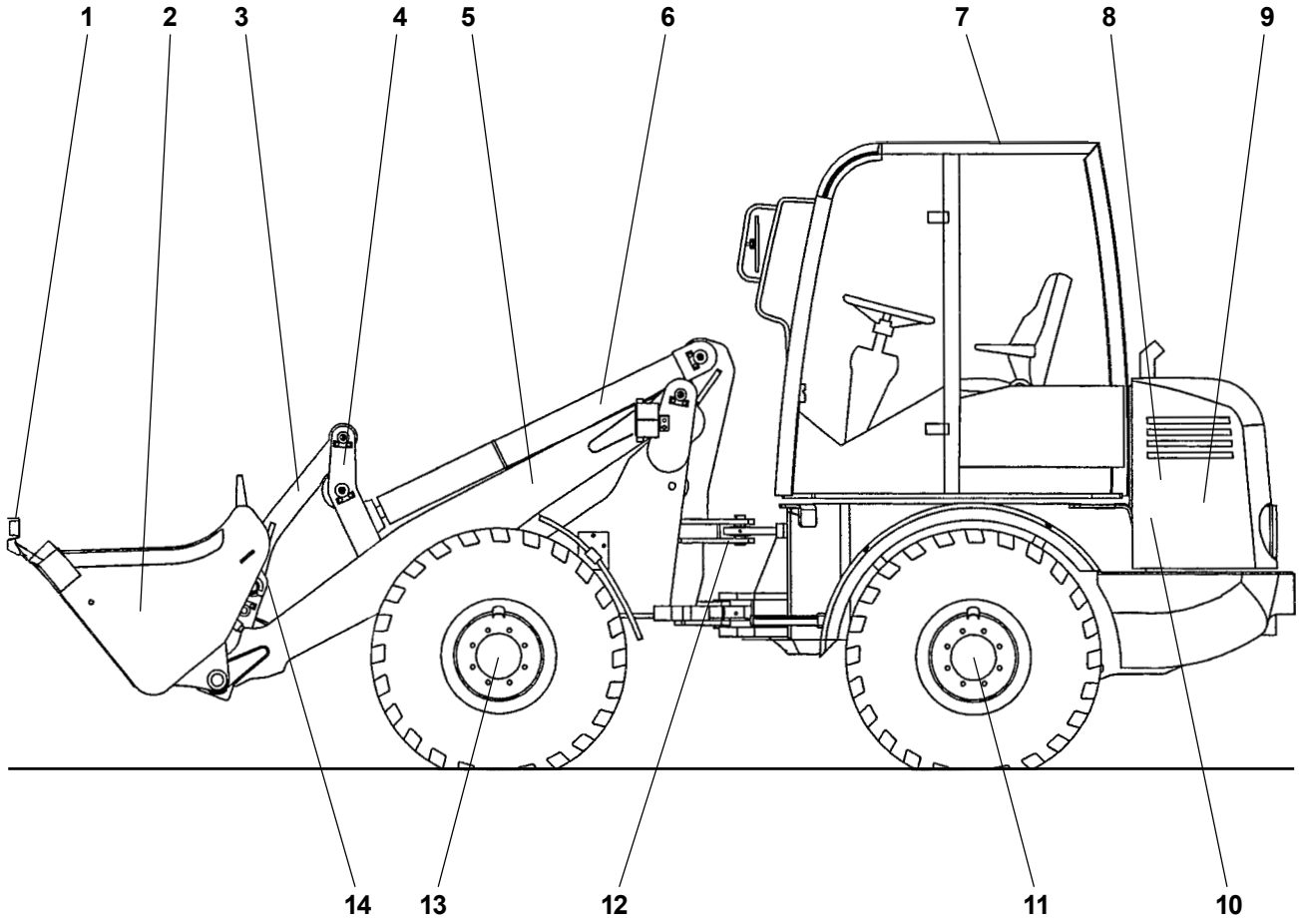


Figure 4-1

1 - Bucket protection
2 - Bucket/attachment
3 - Tip lever
4 - Deflection lever
5 - Bucket arm
6 - Tip cylinder
7 - Driver's cab
8 - Fuel tank (right loader side underneath the engine hood)
9 - Drive motor
10 - Hydraulic oil reservoir
11 - Rear axle
12 - Articulated pendulum joint
13 - Front axle
14 - Quick-change device

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 distribution/ intermediate gear of the rear axle (with planetary gear). The distribution/intermediate gear transmits the torque of the axial piston engine directly to the rear axle and to the front axle (with planetary gear).

CAUTION

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

Tires

The following tires are permitted:

12.5 - 18	**AL 80**
14.5 - 20	**AL 100 / AL 100 turbo / AL 120**
405/70 R 20	**AL 80 / AL 100 / AL 100 turbo / AL 120**

For the running direction, see Fig. 4-2.

NOTE

All four tires must be identical and have be same PR rating (PR = ply rating: number of textile plies).

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.

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”.

Differential lock

To enhance the traction of soft slippery ground, you can enable the differential lock acting on all four wheels by pressing pushbutton (4-12/2) and keeping it pressed.

CAUTION

Enable the differential lock only when the loader is at a standstill.

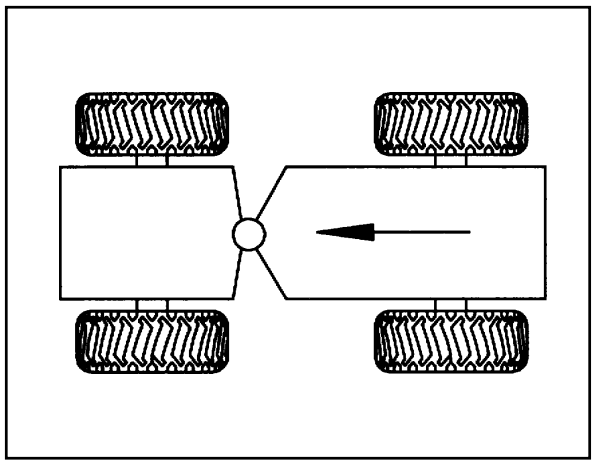


Figure 4-2

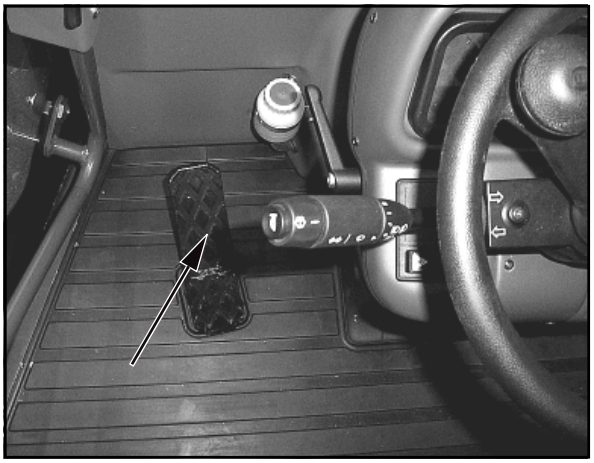


Figure 4-3

Make sure the differential lock engages by releasing the accelerator and steering movements if only one wheel of an axle rotates with the differential lock enabled.
You may disable the differential lock while the loader is moving.

CAUTION

Make sure to disable the differential lock when driving on solid ground, in particular when taking bends.

Service and parking brake

The service brake is actuated with a pedal (4-3/arrow) located to the left of the steering column. The service brake is actuated hydraulically by applying a pressure (max. 80 bar) through a feed bore. The brake piston movement simultaneously acts on the differential discs and on the brake discs. Thus braking occurs between the differential housing and the axle body. The differential lock ensures uniform braking, i.e. the brake force is evenly distributed between the two axle segments.

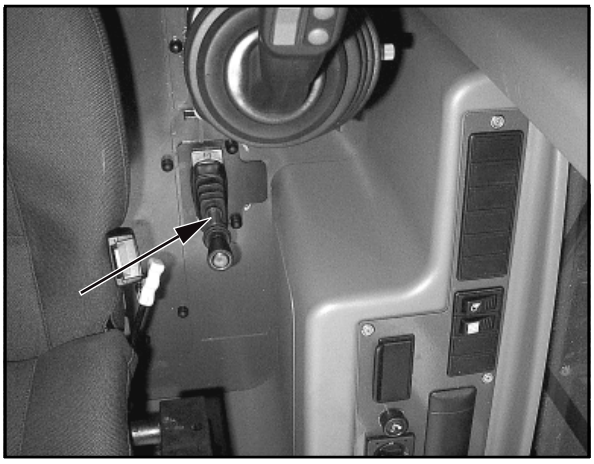


Figure 4-4

The parking brake is actuated with a hand lever (4-4/arrow) located to the right of the driver's seat. The negative parking brake is actuated by the Belleville springs acting on the brake pistons. To release the brake, a minimum pressure of 15 bar (max. 30 bar) must be supplied through a feed bore. This pressure allows the clearance between the brake discs and the differential lock to be opened by pushing back the brake piston, acting against the force of the Belleville springs.

The Belleville springs push back the spring-loaded brake piston and cause the loader's emergency stop if a pressure loss problem occurs in the hydraulic brake system. To release the negative spring-loaded brake after an emergency stop, the release screws provided for this purpose must be actuated.

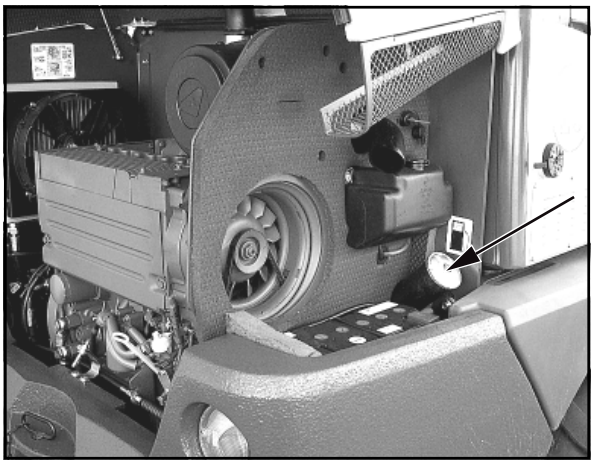


Figure 4-5

Fuel supply system

The fuel tank is located on the right-hand side of the loader rear. An electrical fuel gauge (4-9/2) in the operator's cabin monitors the fuel level in the tank. The filler neck (4-5/arrow) is located beneath the engine hood on the right loader side.

Air filter device

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

Lift and tip devices

Via a servo valve a double-acting gear-type pump drives
- one lift cylinder
- 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.
These pilot valves provide continuous speed control from "slow" to "fast".

Floating position

(option for AL 80)
The loader features a floating position. It is activated by moving the hand lever (4-12/6) beyond its pressure point to the front position. The hand lever remains in this position until it is pulled back.

DANGER
The floating position may only be activated when the bucket arm is in the lowermost position.

NOTE
The floating position is disabled if the loader is equipped with a pipe break protection.

Pipe break protection

(option)
A pipe break safety valve is installed underneath 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 the tipping rod are blocked until the damage is repaired.

Lifting device suspension

(option)
When the loader must be driven over larger distances, especially with a loaded bucket, the lifting device suspension (4-13/3) should be activated to avoid resonant motion. This becomes even more important with increasing unevenness of the terrain and increasing speed of the loader.

CAUTION
The lifting device suspension must only be used **for driving over long distances,** but not for working with the loader.

Bucket position indicator

The driver can see the position of the bucket by the colored markings on the pivot arm and the tip lever. When the colored marks (4-6/arrow) form a line, the bucket floor is parallel to the ground.

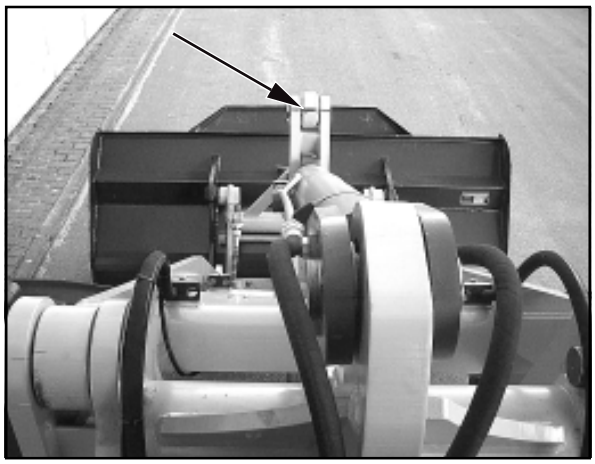


Figure 4-6

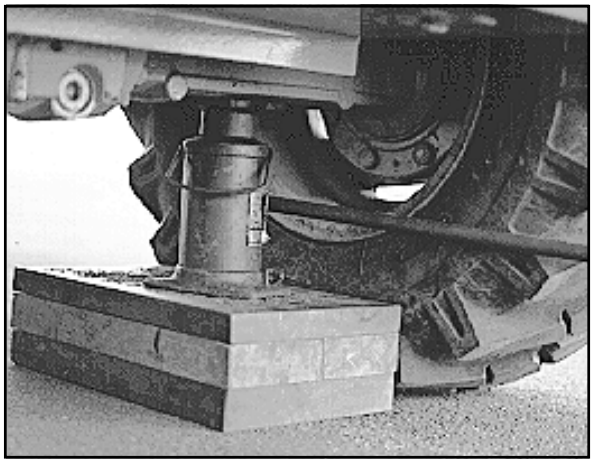


Figure 4-7

4.3 Wheel change

DANGER

Before changing a wheel on public roads, the danger area must be properly marked.

(1) Park the loader on solid ground and not on inclines if possible.

(2) Lower the attachment to the ground.

(3) Set the drive switch (4-12/5) to “0”.

(4) Apply the parking brake (4-12/7).

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

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

(7) Insert the articulation safeguard into the articulation joint (1-3/arrow).

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

(9) Loosen the wheel nuts of the wheel to be changed so that they can be turned manually.

(10) Fit a suitable jack (minimum capacity 3.0 tons) from the side under the axle bridge in the vicinity of the axle fixture so that it is centred and cannot slip (4-7). Lift the front/rear axle until the wheel does not have any contact to the ground.

DANGER

- Secure the jack by a suitable support to prevent it from sinking into the ground.
- Make sure that the jack is fitted well.

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

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

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

(14) Mount the new wheel onto the planetary axle.

(15) Tighten the wheel nuts by hand.

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

(17) Tighten the wheel nuts with a torque wrench to 440 Nm.

CAUTION

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

4.4 Controls

1 - Brake hydraulic oil reservoir
2 - Lock lever for steering column adjustment
  - to the front/rear
  - in axial steering column direction
3 - Foot pedal for service brake/ inching
4 - Steering column switch
  - to the front: Turn signal, right
  - to the rear: Turn signal, left
  - up: Dipped beam
  - down: High beam
  - Pushbutton: Signal horn
  - Turn, step 1: Interval windshield wiper, front
  - Turn, step 2: Windshield wiper, front
  - Push upper ring in axial direction: Windshield washer, front
5 - free
6 - free
7 - Toggle switch for hazard flasher system

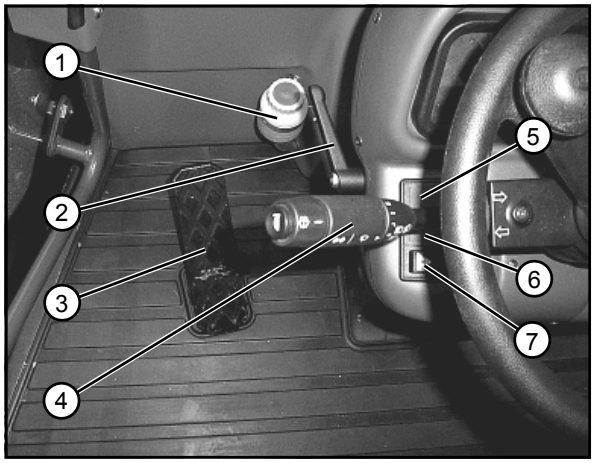


Figure 4-8

1 - Indicator lamp assembly
2 - Fuel gauge
3 - Engine oil temperature gauge
4 - Operating hours meter
5 - RPM meter
6 - Service interval indicator lamp (option)
7 - Turn signal indicator lamp
8 - High beam indicator lamp
9 - Engine oil pressure indicator lamp
10 - Low cooling water indicator lamp
11 - Parking brake indicator lamp
12 - Hydraulic oil temperature indicator lamp
13 - Transmission stage indicator lamp »fast« (only for fast loaders)
14 - Battery charge indicator lamp
15 - Glow start system (option)
16 - free
17 - Hydraulic oil filter clogging indicator
18 - Transmission stage indicator lamp »slow« (only for fast loaders)

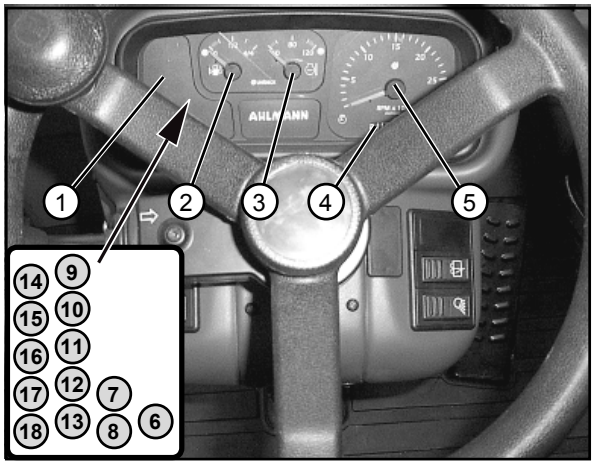


Figure 4-9

1 - Pushbutton for releasing the quick-change device (option)
2 - Toggle switch for rear windshield wiper/washer
3 - Accelerator
4 - Starter switch
5 - Toggle switch for driving lights
  - Position I: Parking light
  - Position II: Road light

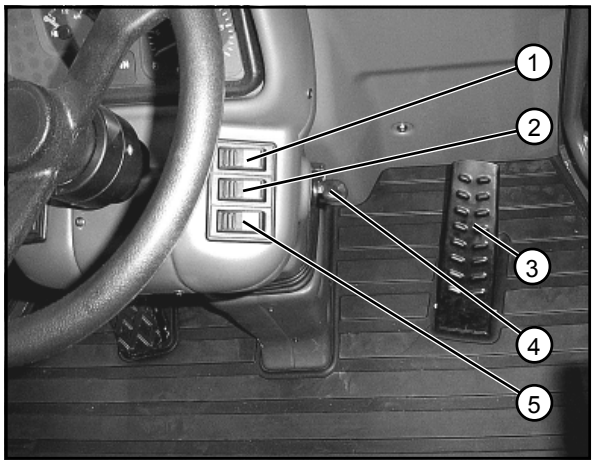


Figure 4-10

Figure 4-11

1 - Door release
2 - Storage compartment
3 - 2-pole socket

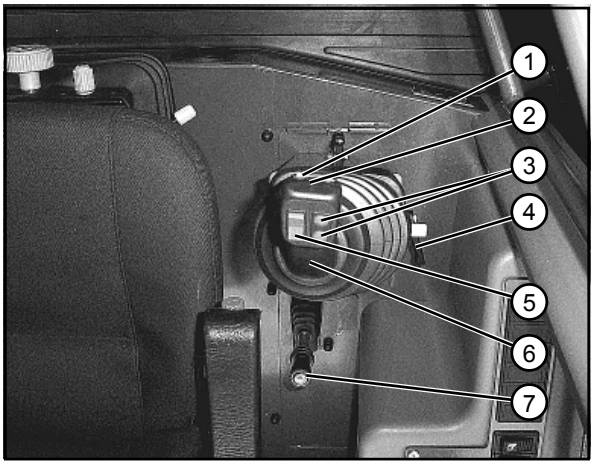


Figure 4-12

1 - Hydraulic drive stages:
  - right - Stage I: slow
  - left - Stage II: fast
2 - Two pushbuttons for differential lock, wired in series
  - Pushbuttons pressed:
    Differential lock enabled
  - Pushbuttons not pressed:
    Differential lock disabled

CAUTION

The differential lock may only be enabled when the loader is not moving.

3 - Actuator for auxiliary hydraulics:
  - upper pushbutton: - Lock attachment
    - Close multipurpose bucket
  - bottom pushbutton: - Unlock attachment » only in conjunction with 6-4/ arrow or 4-10/1 (opt) «
    - Open the multipurpose bucket.
4 - Lever for console adjustment
5 - Drive switch:
forward/0/reverse
6 - Pilot valve for working hydraulics
7 - Hand lever for parking brake

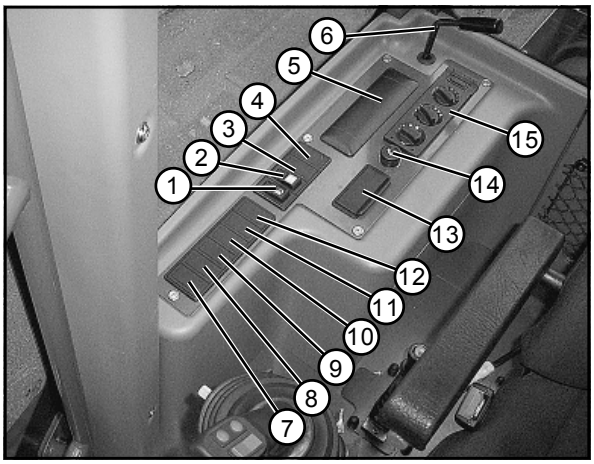


Figure 4-13

1 - Toggle switch for work lights
2 - Toggle switch for rear window heater
3 - Toggle switch for lifting device suspension (option)
4 - Toggle switch for permanent auxiliary hydraulics (option)
5 - Radio (option)
6 - Door release
7 - free
8 - free
9 - free
10 - free
11 - Pushbutton for gear shift (only for fast loaders)
12 - Toggle switch for warning beacon (option)
13 - Ash tray
14 - Cigarette lighter
15 - Heater/ventilation/air-conditioning system (option)

4.5 Fuses

NOTE

Fuses, relays, turn signal relay, interval timer, etc. are located at the right behind the driver's seat (4-17). To access them, push the seat to its frontmost position, tilt the backrest forward and remove the cover.

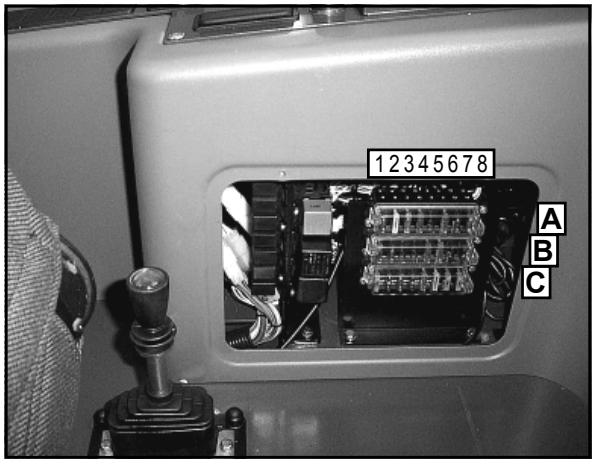


Figure 4-14

Fuse strip A:

1	-	Hydraulics	20.0 A
2	-	Heater	20.0 A
3	-	Air conditioning system (option)	25.0 A
4	-	Motor stopper	5.0 A
5	-	free	
6	-	Brake lights	5.0 A
7	-	Rear window heater	20.0 A
8	-	Traction drive	10.0 A

Fuse strip B:

1	-	Turn indicator	7.5 A
2	-	Windshield wiper/washer	20.0 A
3	-	free	
4	-	free	
5	-	Parking light, left	5.0 A
6	-	Parking light, right	5.0 A
7	-	Light indicator diode	
8	-	Light indicator diode	

Fuse strip C:

1	-	Hazard flasher	15.0 A
2	-	Warning beacon (opt.), headlamp flasher	30.0 A
3	-	2-pole socket	20.0 A
4	-	Cigarette lighter	30.0 A
5	-	Interior lighting	5.0 A
6	-	Working lights	30.0 A
7	-	Dipped beam	15.0 A
8	-	High beam	15.0 A

opt. = optional equipment

Operation

5 Operation

5.1 Checks before commissioning

- Engine oil level (see the operating instructions for the engine)
- Brake fluid level
- Hydraulic oil level
- Fuel level
- Tire pressure
- Profile depth
- Lighting system
- Seat position
- Ball block valve for the working and auxiliary hydraulics (1-2/arrow); open if necessary
  » only if work is to be commenced «
- Bucket arm prop [(e.g. bucket arm support (option) (1-2/arrow)]; remove if necessary
- Articulation safeguard (1-3/arrow); remove if necessary
- General state of the loader, e.g. check for leaks
- The presence of
  - a fist aid kit
  - a warning triangle
  - a signal lamp

  must be verified.

5.2 Commissioning

5.2.1 Starting the diesel engine

(1) Apply the parking brake (4-12/7).
(2) Set the drive switch (4-12/5) to “0” (starter interlock!).
(3) Insert the battery main switch (8-35/3).
(4) Insert the ignition key into the starter switch (4-10/4) and turn the key clockwise to position “I” (5-1).

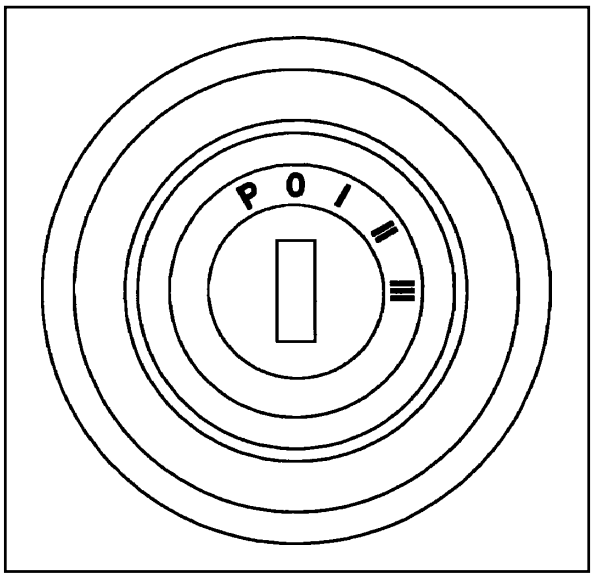


Figure 5-1

NOTE

- The indicator lamps for battery charge, parking brake and engine oil pressure light up. The fuel gauge, the engine oil temperature gauge and the operating hour meter function.
- Start the engine in position “0” of the drive switch (4-12/5).

(5) Turn the ignition key clockwise to position “III” (5-1). 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 operating instructions for the engine.
- For operation at extremely low temperatures, see the operating instructions for the engine.
- The clogging indicator for the hydraulic oil filter (4-9/17) 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 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 and tipping 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.

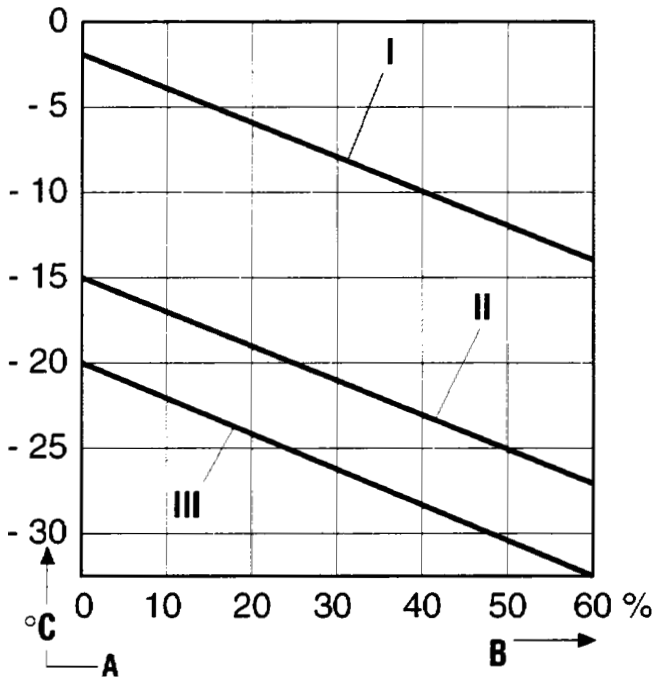


Figure 5-2

5.2.2.2 Engine oil change

See the operating instructions for the engine and the operating instructions for the machine (section 8.2.2).

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 8.2.12 for the hydraulic system oil change.

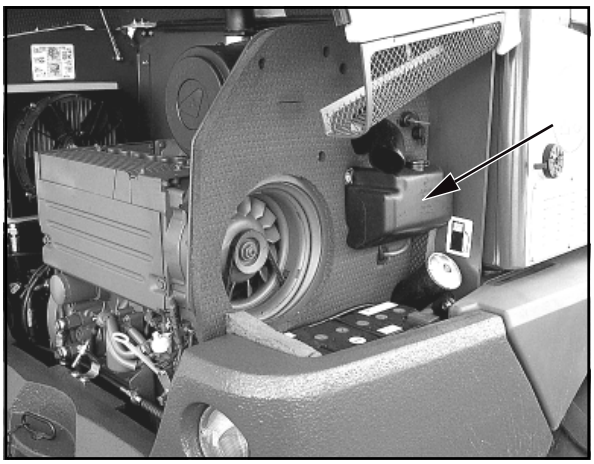


Figure 5-3

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 (5-3/5) 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 an **empty** standard, multi-purpose or light-weight material bucket and **only** with bucket protection.
- A warning triangle and a first-aid kit must be provided in the loader.
- » Only for fast loaders - 30 km/h «
  The distribution gear may only be shifted when the loader is not moving (4-13/11). When shifting gears, set the drive direction lever (4-12/5) to “0” (gear shift released after 5 sec.).

Figure 5-4

NOTE

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

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

Before driving on public roads, the following safety measures must be taken:

(1) Lower the bucket arm until the lowest point of the bucket arm or the bucket is at least 30 cm above the road (5-4).

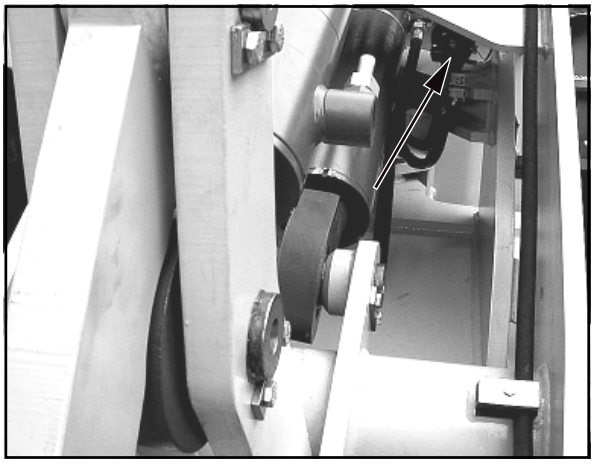


Figure 5-5

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

CAUTION

When closed (horizontal position) the ball block valve is perpendicular to the flow direction. This prevents the bucket arm from being lowered and the bucket from tipping while driving.

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

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

(5) Perform a function check.

(6) Lock both doors.

DANGER
- The differential lock (4-12/2) must not be enabled when driving on public roads.
- Driving on public roads with the bucket filled is forbidden.
- The working searchlights must be switched off (4-13/1).

(7) Release the parking brake (4-12/7).

(8) Preselect hydraulic drive stage II (4-12/1).

(9) Set the gear shift to “II” (4-13/11) » only for fast loaders - 30 km/h «.

(10) Select travel direction (4-12/5).

(11) Press the accelerator pedal (4-10/3).

NOTE
- The loader starts. The travel speed is determined by the position of the accelerator pedal.
- The service brake is activated by depressing the brake pedal (4-8/3).

DANGER
Changing the travel 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 (4-12/1) and a gear stage that matches the working conditions (4-13/11) » only for fast loaders - 30 km/h «.

CAUTION
» Only for fast loaders - 30 kmh «
The distribution gear may only be shifted when the loader is not moving (4-13/11). When shifting gears, set the drive direction lever (4-12/5) to “0” (gear shift released after 5 sec.).

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" (4-12/5) can be selected. The travel speed can thus be reduced to 7 kmh.
To attain full performance, the combined action of propulsion and of the working hydraulics 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 working hydraulics.

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

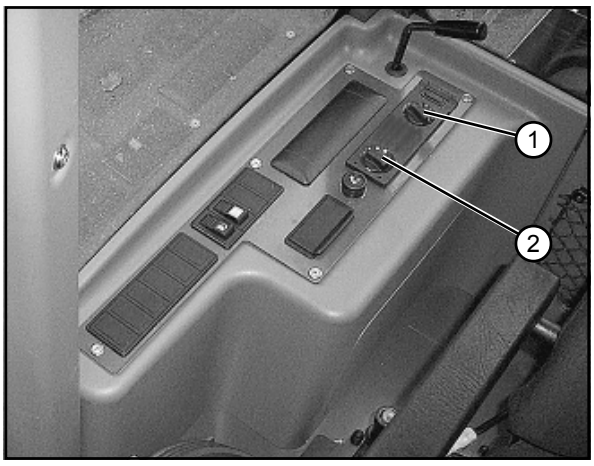


Figure 5-6

(1) Lock both doors.

(2) Release the parking brake (4-12/7).

(3) Preselect the gear stage (4-13/11) » only for fast loaders - 30 km/h «.

(4) Preselect hydraulic drive stage (4-12/1).

(5) Select travel direction (4-12/5).

(6) Press the accelerator pedal (4-10/3).

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.

CAUTION

- The hydraulic quick-change device must only be **locked** if an attachment has been mounted.
- If the hydraulic oil temperature indicator lamp (4-9/12) 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.

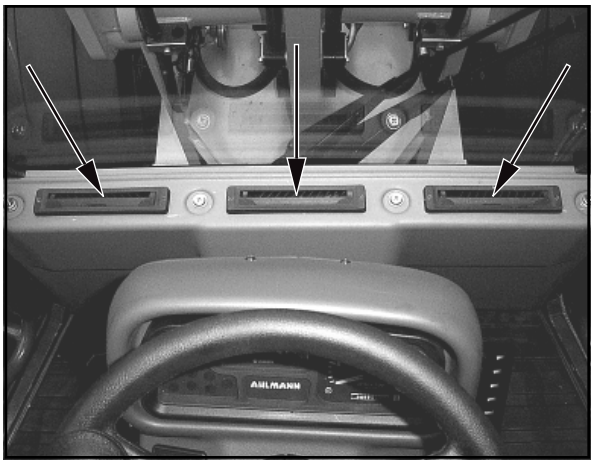


Figure 5-7

5.2.5 Heating and ventilation system

5.2.5.1 Adjusting the air flow

(1) Turn the rotary switch (5-6/2) for the blower to position 0, 1, 2, or 3 depending on the air flow desired.

(2) Adjust the air flow direction with the nozzles at the windshield (5-7/arrows) or in the floor room (5-8/arrows).

Figure 5-8

5.2.5.2 Switching on the heater

(1) Turn the knob (5-6/1) in clockwise direction (warm) or in anti-clockwise direction (cold) to reach the desired temperature.

5.3 Decommissioning the loader

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 attachment on the ground.

(3) Set the drive switch (4-12/5) to “0”.

(4) Apply the parking brake (4-12/7).

DANGER

If parking on a 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, and the articulation safeguard must be inserted. On slopes, the wheel chocks must be placed on the sloping side of the rear axle wheels.

5.3.2 Switching off the diesel engine

CAUTION

If the diesel engine is very hot or has been subjected to heavy loads, let the engine idle for a short time before switching it off.

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

NOTE

In position “P”, 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 (5-6/1).

(2) Turn the rotary switch (5-6/2) for the blower to position “0”.

5.3.4 Leaving the loader

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

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

(3) Remove the battery main switch (8-35/3).

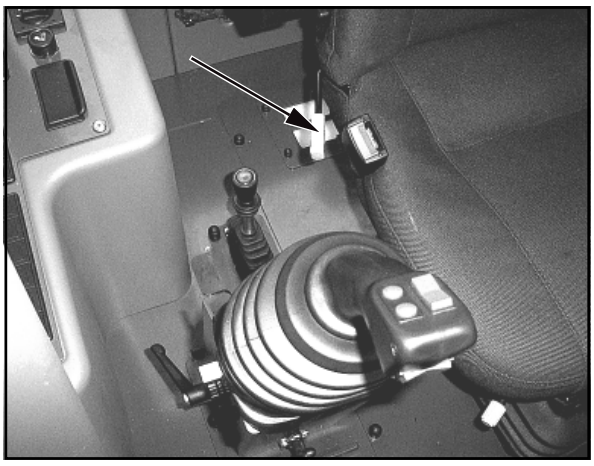


Figure 5-9

5.4 Adjusting the driver's seat

5.4.1 Klepp seat

(1) Adjust or swing forward the backrest using the hand lever (5-9/arrow).

(2) The operator's seat can be adjusted in the horizontal direction to suit the driver's requirements by pulling the handle (5-10/1) upwards and moving the seat forward or backward.

(3) Turn the rotary knob (5-10/2) while exerting a force on the seat to adjust the seat height.

(4) The seat suspension can be adjusted to the driver's weight with the hand wheel (5-10/3).

(5) Adjust the height of the arm rest by turning the knob (5-10/4).

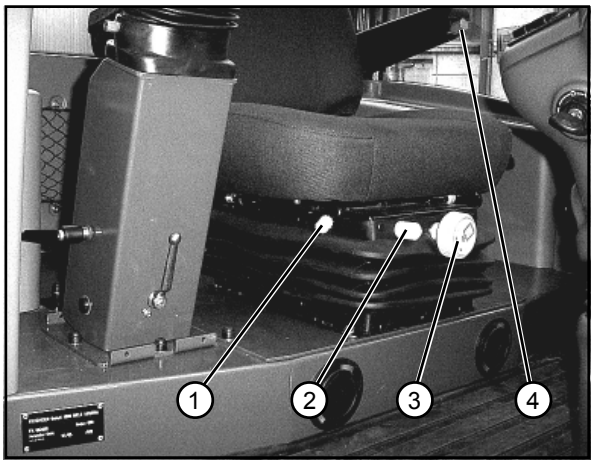


Figure 5-10

5.4.2 Isri seat

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

(2) Adjust or swing forward the backrest using the hand lever (5-11/2).

(3) Adjust the seat height and rear inclination by pulling the hand lever (5-11/3) upwards.

(4) Adjust the seat height and front inclination by pulling the hand lever (5-11/4) upwards.

Figure 5-11

(5) The seat suspension can be adjusted to the driver's weight (40 ... 130 kg) with the handwheel (5-12/1).

(6) Readjust the position of the pilot valves for the working and auxiliary hydraulics (4-12/4) if necessary.

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

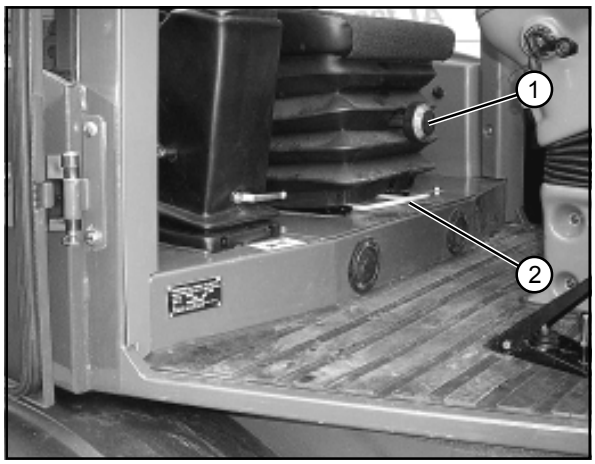


Figure 5-12

5.4.3 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).

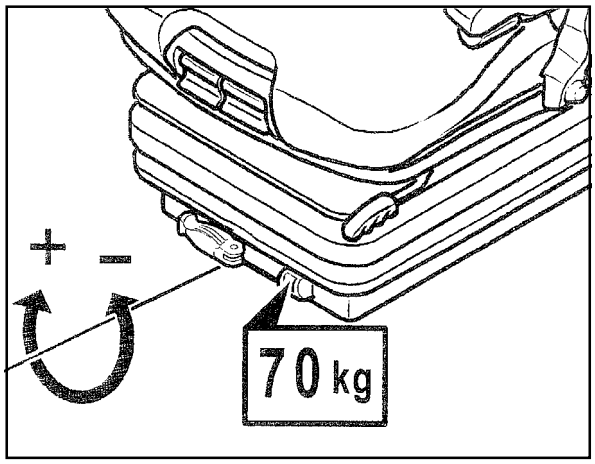


Figure 5-13

(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).

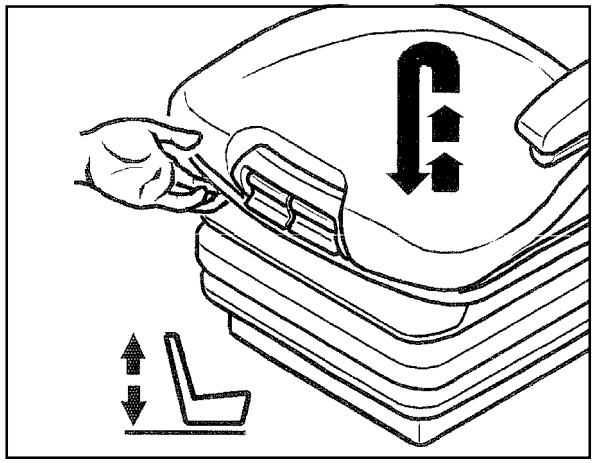


Figure 5-14

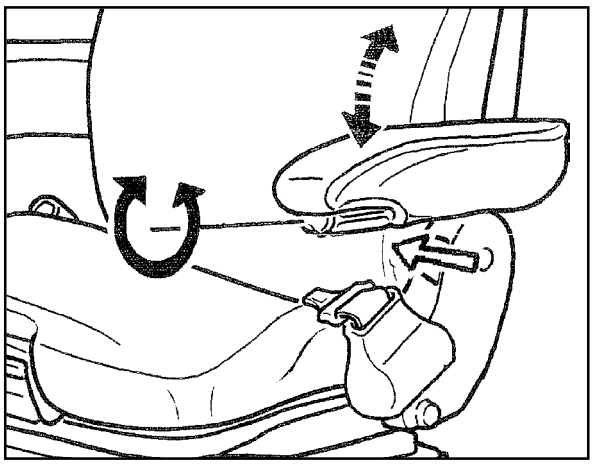


Figure 5-15

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

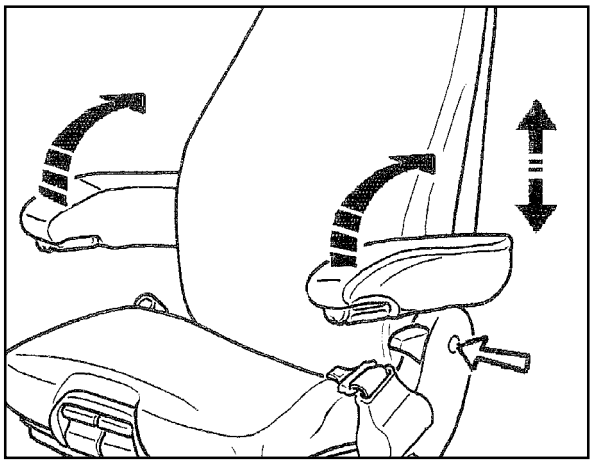


Figure 5-16

(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.

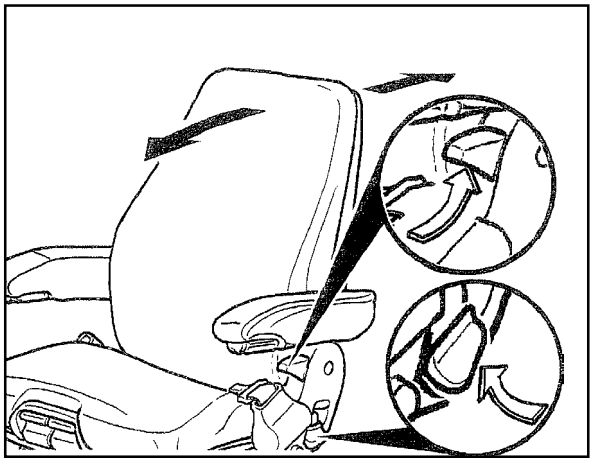


Figure 5-17

(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.

(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.

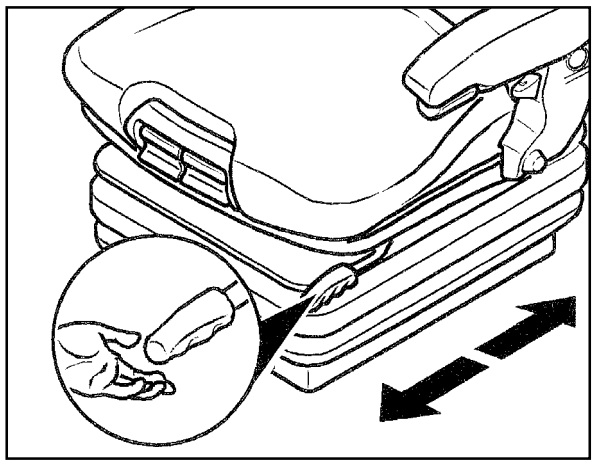


Figure 5-18

Attachments

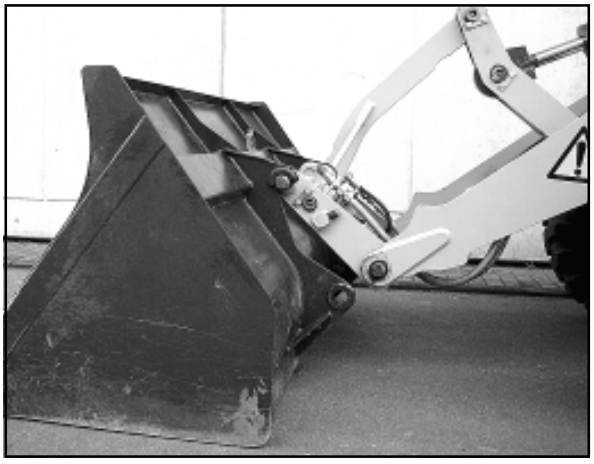


Figure 6-1

Figure 6-2

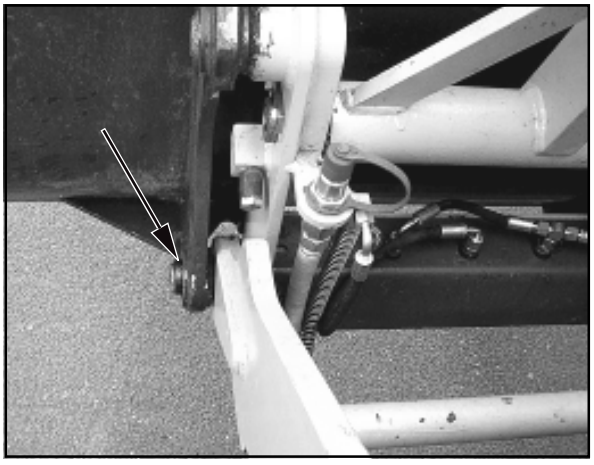


Figure 6-3

6 Attachments

6.1 Mounting and dismounting 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 (4-12/3).

NOTE

- The ball block valve (6-4/arrow) must be in the vertical position.
- The ball block valve is located at the left bucket arm inside near the windshield.

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

DANGER

- The two bolts of the quick-change device must be in the bore holes of the bucket suspension and must be clearly visible (6-3/arrow).
- Set the ball block valve (6-4/arrow) to the horizontal position. This prevents the bucket from unlocking inadvertently.

Dismounting

(1) Place the bucket firmly on the ground.
(2) Unlocking the bucket:
- Turn ball block valve (6-4/arrow) to the vertical position and press the bottom pushbutton for the auxiliary hydraulics (4-12/3).
- **(option):** Press the release button for the quick-change device (4-10/1) and, while keeping the button depressed, unlock the bucket by pressing the bottom pushbuttons for the auxiliary hydraulics (4-12/3).

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

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-hand side beneath the cross arm.

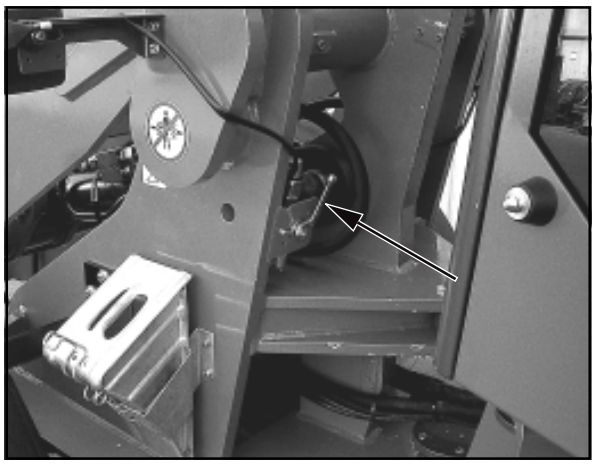


Figure 6-4

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

- The two bolts of the quick-change device must be in the bore holes of the fork-lift attachment suspension and must be clearly visible (6-5/arrow).
- Set the ball block valve (6-4/arrow) to the horizontal position. This prevents the fork-lift attachment from unlocking inadvertently.
- Distribute the load equally on both fork tines and secure it against moving and falling off.
- Let the load rest against the rear of the fork and tilt the fork-lift attachment.
- Position both fork tines at an equal distance from the centre (6-6/arrows) and lock them.
- Moving loads with the fork-lift attachment is only permitted close to the ground!
- Protect the fork-lift attachment against tipping over when it has been dismounted; danger of injuries!

CAUTION

- The hydraulic quick-change device must only be **locked** when an attachment has been mounted.
- The fork tines are locked correctly when the two tiltable locking levers fully rest on the fork carrier.

NOTE

The type plate is on the rear of the upper fork carrier, on the right-hand side.

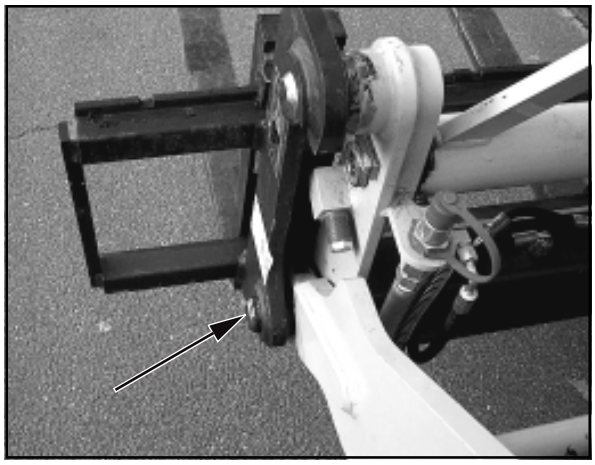


Figure 6-5

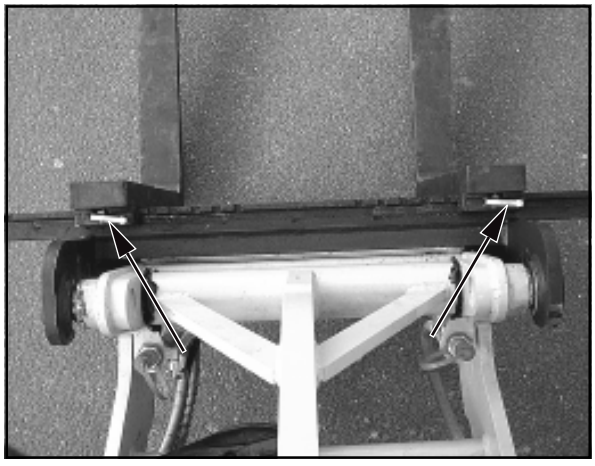


Figure 6-6

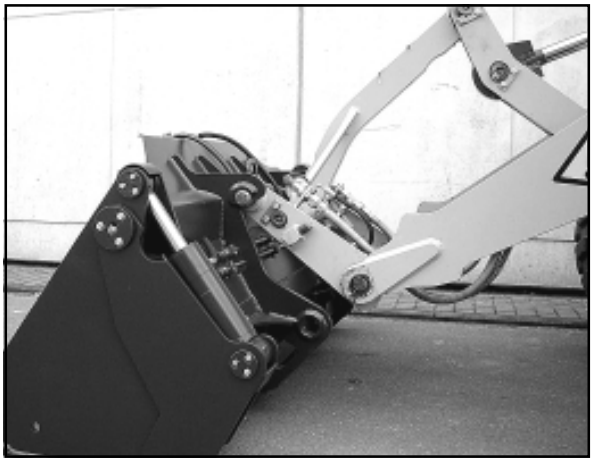


Figure 6-7

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 (6-7).

(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 (6-8).

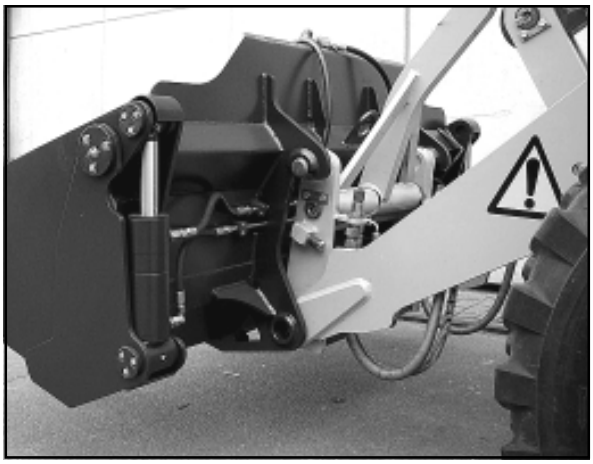


Figure 6-8

(4) Lock the bucket with the upper pushbutton for the auxiliary hydraulics (4-12/3).

NOTE

- The ball block valve (6-4/arrow) must be in the vertical position.
- The ball block valve is located at the left bucket arm inside near the windshield.

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

DANGER

- The two bolts of the quick-change device must be in the bore holes of the bucket suspension and must be clearly visible (6-9/arrow).
- Set the ball block valve (6-4/arrow) to the horizontal position.

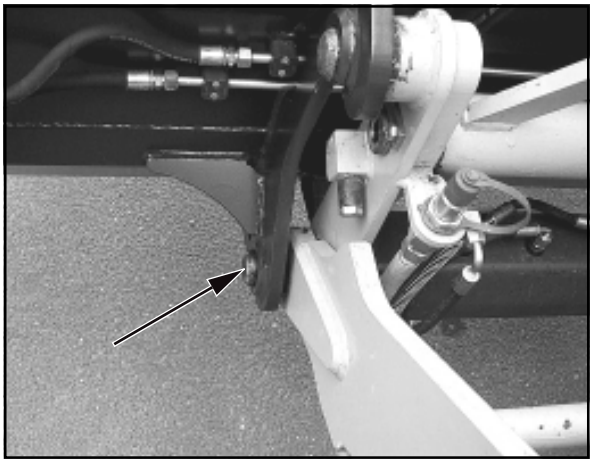


Figure 6-9

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

(7) Remove the pressure from the hydraulic lines. For this purpose, press both pushbuttons for the auxiliary hydraulics (4-12/3) alternately several times.

(8) Pull off the protective caps from the hoses of the quick-change device (6-10/1).
(9) Swing up the protective flaps of the quick-change couplings on the multipurpose bucket (6-10/2) and connect them with the hoses of the quick-change device (6-10) by tightly pushing them in.

CAUTION

When making connections, make sure that the hydraulic connections are clean and completely connected.

Dismounting

(1) Place the multi-purpose bucket firmly on the ground.
(2) Shut down the engine and turn the ignition key to "I".
(3) Remove the pressure from the hydraulic lines. For this purpose, press both pushbuttons for the auxiliary hydraulics (4-12/3) alternately several times.
(4) Disconnect the quick-change couplings on the multi-purpose bucket from the hoses of the quick-change device by pulling firmly.
(5) Fit the protective caps on the hoses of the quick-change device (6-10/1).
(6) Start the engine and unlock the bucket:
- Turn ball block valve (6-4/arrow) to the vertical position and press the bottom pushbutton for the auxiliary hydraulics (4-12/3).
- **(option):** Press the release button for the quick-change device (4-10/1) and, while keeping the button depressed, unlock the bucket by pressing the bottom pushbuttons for the auxiliary hydraulics (4-12/3).

(7) Further dismounting is in the reverse order of steps for mounting.

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-hand side beneath the cross arm.

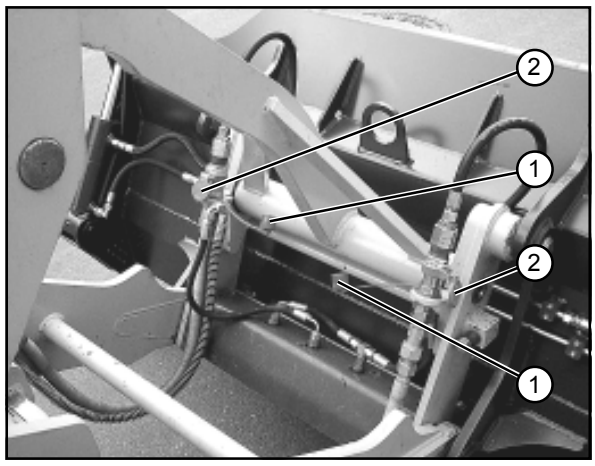


Figure 6-10


Figure 6-11

Notes on the application of the multi-purpose bucket

The multi-purpose bucket can be used for:

- peeling (6-11)

- scraping (6-12)


Figure 6-12

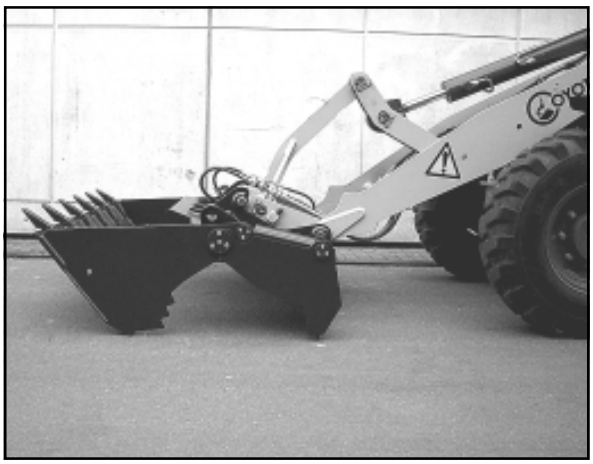


Figure 6-13

- grabbing (6-13) and
- in bucket operation.

6.3 Using other attachments

DANGER

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

2. We emphasize that attachments that are not supplied by us are also not tested and approved by us. Use of such products can under certain conditions adversely affect the present constructional qualities of your loader and thus limit the active and passive driving safety. The manufacturer cannot be held responsible for damage that occurs through the use of such products.

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 articulated loader if the engine or drive has failed

CAUTION

The articulated 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 site 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 articulated loader if the engine has failed

(1) Actuate the toggle switch for the hazard flasher (4-8/7).

(2) Set the drive switch (4-12/5) to “0”.

(3) Apply the parking brake (4-12/7).

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.

NOTE

The preparations described in steps (4) and (5) are only to be carried out if the rescue location is **not** on a public road:

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

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

(6) Push the valve lever for the working hydraulics (4-12/6) beyond its pressure point into the forward position.

(7) 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 mechanical bucket arm support can be inserted at the loader to be towed (7-1).

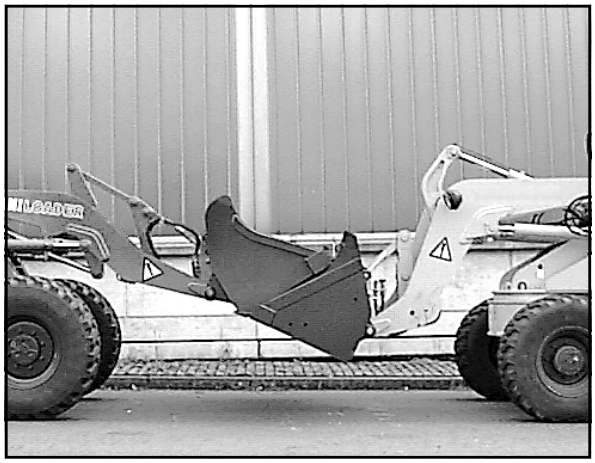


Figure 7-1

(8) Mechanically prop up bucket arm [e.g. by inserting the bucket arm support (option) (1-2/arrow)] and lower bucket arm until it rests on the bucket arm support.

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

(10) Connect the tow rod to the loader to be towed (7-2/2) and to the towing vehicle.

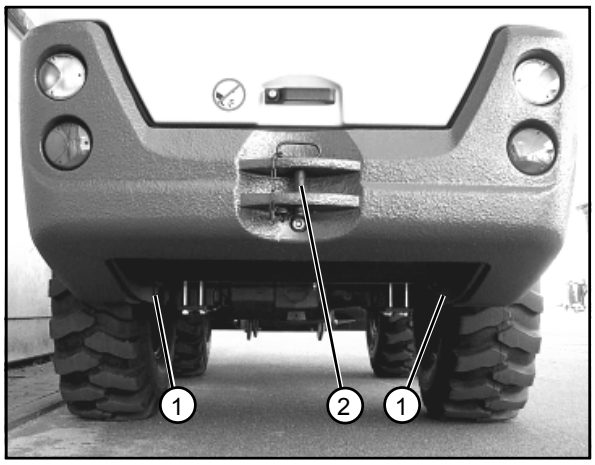


Figure 7-2

(11) Release the parking brake lever (4-12/7).

(12) Loosen the adjusting screws (7-3/1 and 7-4/1) of the spring-loaded brake.

(13) Remove the spacers (7-3/2 and 7-4/2) and completely tighten the adjusting screws again.

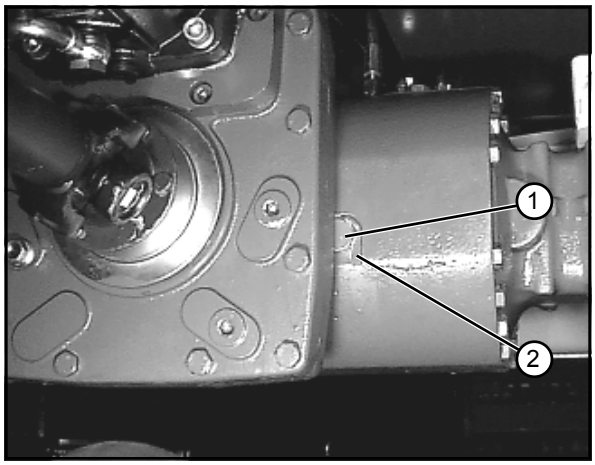


Figure 7-3

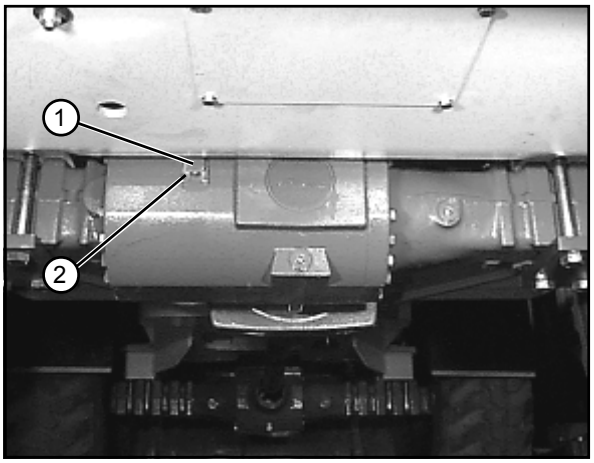


Figure 7-4

CAUTION

- After towing has been completed, restore the operating state of the brake.
  To do so, loosen the adjusting screws (7-3/1 and 7-4/1), insert the spacers (7-3/2 and 7-4/2) between adjusting screws and axle arch and tighten the adjusting screws again.

- Tighten the adjusting screws (7-3/1 and 7-4/1) to a torque of 95 to 115 Nm.

(14) Switch the hydrostatic drive motor to free oil flow before towing. For this purpose, screw in the setscrews at both high pressure relief valves (7-5/arrows) of the drive pump until they are level with the hexagon nuts (size 13) loosened beforehand. Then tighten the hexagon nuts.

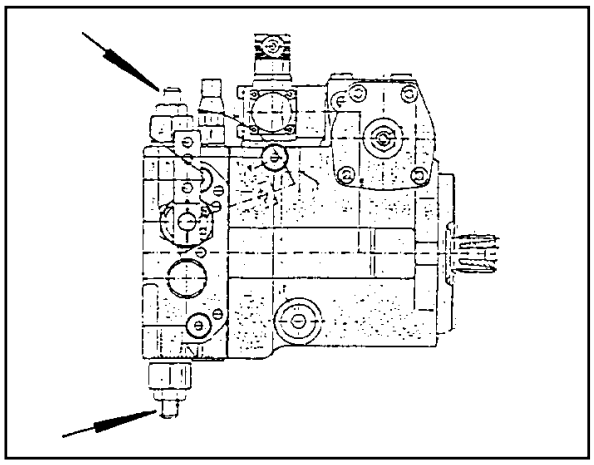


Figure 7-5

NOTE

After towing has been completed, loosen the hexagon nuts again. Screw the setscrews out of both high pressure relief valves until they stop. Tighten the lock nuts.

(15) Remove the chocks (if applicable).

DANGER

- More power is required to steer if the engine has failed.

- Tow the loader at walking speed (2 kmh).

- 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, 7-2/2 and 7-6/arrows).

  - The max. permissible load of the shunting and towing coupling (7-2/2) is 4.5 t horizontally in the longitudinal direction.

  - The max. permissible load of the lashing points/load-bearing points (7-2/1 and 7-6/arrows) is 2.0 t.

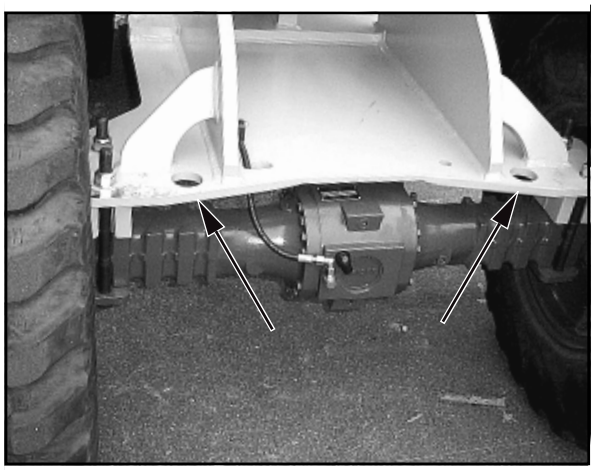


Figure 7-6

NOTE

- If the loader has been out of operation for a longer period of time, the hydraulic hoses (7-7/arrows) must be disconnected from the lifting cylinders before attaching the lifting gear. Collect the escaping hydraulic oil in a sufficiently large oil pan.
- After towing has been completed, fill the lifting cylinders with hydraulic oil and bleed them by raising and lowering the bucket arm several times.

Figure 7-7

7.1.1.2 Towing the articulated loader if the drive has failed

(1) Actuate the toggle switch for the hazard flasher (4-8/7).
(2) Set the drive switch (4-12/5) to “0”.
(3) Apply the parking brake (4-12/7).

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.

NOTE

The preparations described in steps (4) and (5) are only to be carried out if the rescue location is **not** on a public road:

(4) Cover the bucket cutting edge and teeth with the bucket protector (5-4/arrow).
(5) Insert the plug of the bucket protector into the socket (5-5/arrow, option).
(6) Lift and mechanically prop up bucket arm [e.g. by inserting the bucket arm support (option) (1-2/arrow)] and lower bucket arm until it rests on the bucket arm support.
(7) Close the ball block valve (1-2/arrow) for the working and auxiliary hydraulics.
(8) Connect the tow rod to the loader to be towed (7-2/2) and to the towing vehicle.
(9) Switch the hydrostatic drive motor to free oil flow before towing. For this purpose, screw in the setscrews at both high pressure relief valves (7-5/arrows) of the drive pump until they are level with the hexagon nuts (size 13) loosened beforehand. Then tighten the hexagon nuts.

NOTE

After towing has been completed, loosen the hexagon nuts again. Screw the setscrews out of both high pressure relief valves until they stop. Tighten the lock nuts.

(10) Remove the chocks (if applicable).
(11) Release the parking brake (4-12/7).

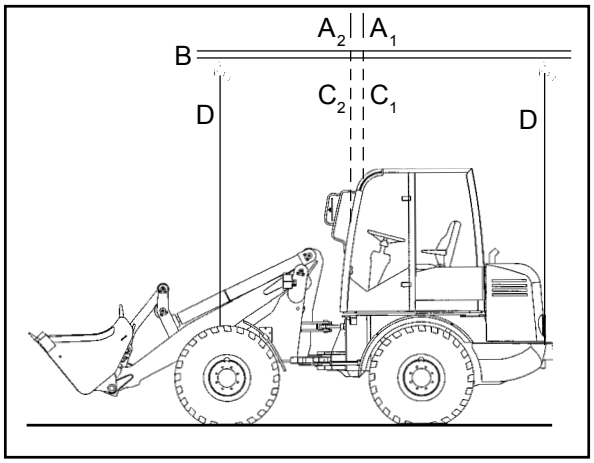


Figure 7-8

DANGER

- With the engine running, 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, 7-2/2 and 7-6/arrows).
  - The max. permissible load of the shunting and towing coupling (7-2/2) is 4.5 t horizontally in the longitudinal direction.
  - The max. permissible load of the lashing points/load-bearing points (7-2/1 and 7-6/arrows) is 2.0 t.

7.2 Lifting by crane

The loader to be lifted must be prepared as follows:
(1) Set the drive switch (4-12/5) to "0".
(2) Set hydraulic drive stage „I" (4-12/1).
(3) Apply the parking brake (4-12/7).
(4) Lift or lower the bucket arm until the lowest point of the bucket arm or of the bucket is at least 30 cm above the road (5-4).
(5) Close the ball block valve for the working and auxiliary hydraulics (1-2/arrow).
(6) Remove the articulation safeguard after loosing of the fixing screw, insert the bend in protection into the articulated link and fasten it (1-3/arrow).

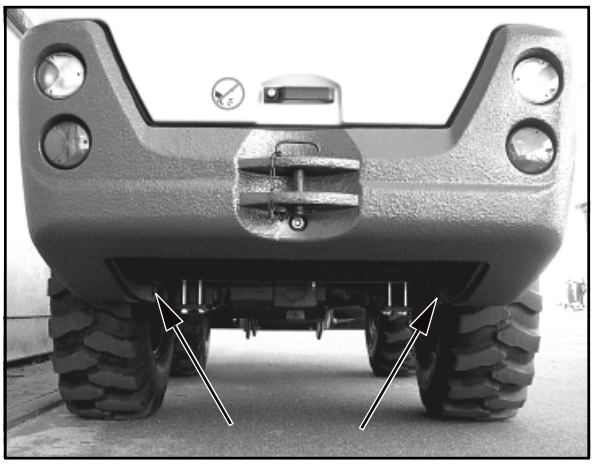


Figure 7-9

CAUTION

Make sure prior to tightening the screws that the articulation safeguard makes contact with the loader rear.

(7) Lock both doors.
(8) Fold the outside mirror inwards.

CAUTION

The following items must be observed when lifting the loader by crane (Figure 7-8):

- 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 center axis of the loader.
- The lifting gear (D) must lead vertically upwards from the lifting points of the loader (7-9/arrows and 7-10/arrows).

DANGER

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

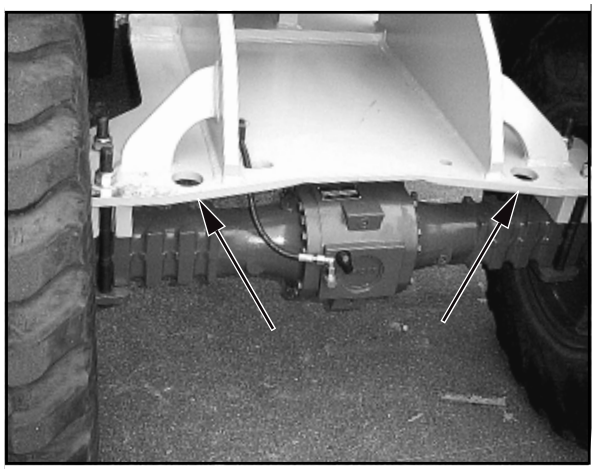


Figure 7-10

Maintenance

8 Maintenance Plan

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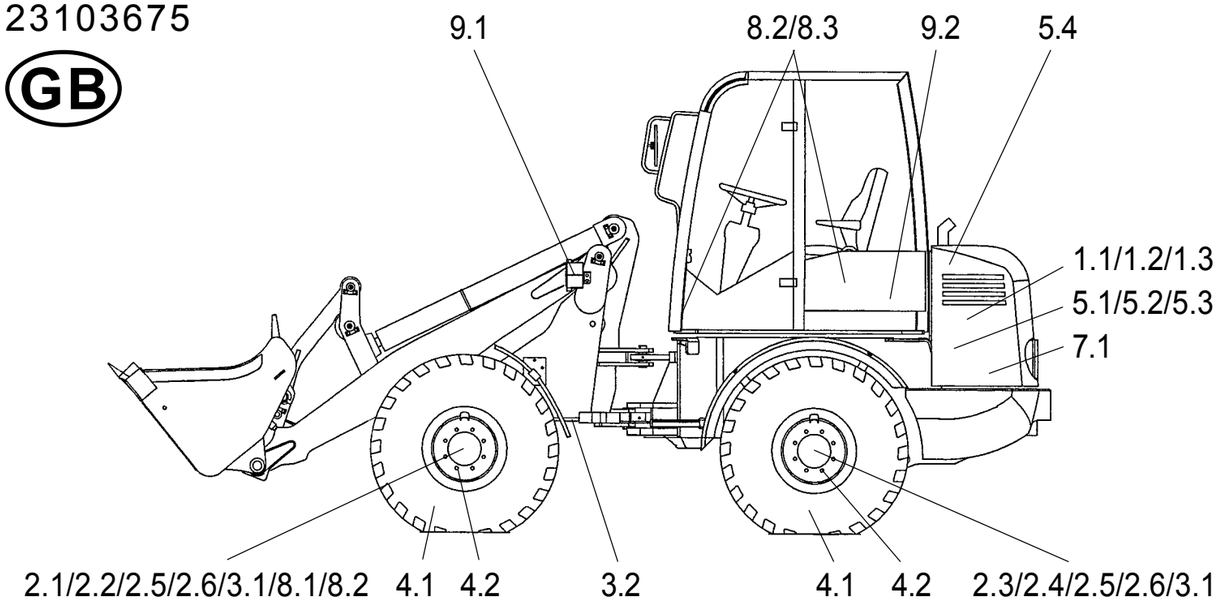


	Item	Designation	Specification	Viscosity	Filling amount
*	1	Motor oil	MIL-L-2104 C = API-CD	acc. to manufacturer	ca. 10 l with oil filter
*	2.2	Transmission oil with LS additive	MIL-L-2105 D = API-GL5-6-LS	SAE 85 W 90-LS	ca. 4.2 l (20 km/h) ca. 3.8 l (30 km/h)
*	2.4	Transmission oil with LS additive	MIL-L-2105 D = API-GL5-6-LS	SAE 85 W 90-LS	ca. 5.1 l (20 km/h) ca. 5.5 l (30 km/h)
*	2.6	Transmission oil	MIL-L-2105 D = API-GL5-6	SAE 85 W 90	ca. 2 x 0.9 l each
*	5.2	Hydraulic oil	DIN 51524 - HVLP 46	ISO VG 46, VI > 180	ca. 100 l
	6	Grease	DIN 51825 - KPF 1/2 N-20		as required
	7	Distilled water			as required
*	8	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
STOP **Caution**
When carrying out maintenance work, heed accident prevention regulations!

Grease points (indicated in red)

1. Grease bolts every 10 opreating 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. Use MIL-L-2104 C engine oil to lubricate the joints and deflection levers every 50 operating hours.

Optional equipment: Biodegradable hydraulic oil

4. Ester-based synthetic hydraulic oil viscosity class ISO VG 46 VI > 180

⚠ **CAUTION !** Operate service brake with mineral oil only!

Every x operating hours 10	50	500	1500	Item	Maintenance points (Max. permissible intervals or shorter (depending on use))
				1	**Engine**
○	△			1.1	Maintenance acc. to manufacturer
				1.2	Dry air filter system
	○				Activate dust removal valve
	○				Check maintenance display
				1.3	Replace filter element if maintenance display is red →
				2	**Axles / distribution gear**
	○			2.1	Front axle oil level check →
		△	◇	2.2	Front axle oil change →
	○			2.3	Rear axle with distribution gear
					Oil level check →
		△	◇	2.4	Rear axle with distribution gear
					Oil change →
	○			2.5	Planetary gear oil level check →
		△	◇	2.6	Planetary gear oil change →
				3	**Axles / cardan shaft / articulated pendulum joint**
	▲	○		3.1	Check fastening of axles (385 Nm)
	▲	○		3.2	Check fastening of cardan shaft (33 Nm)
				4	**Wheels and tires**
	○			4.1	Check air pressure
▲		○		4.2	Check fastening of wheel nuts (440 Nm)
				5	**Hydraulic system**
○				5.1	Oil level check (view glass)
			◇	5.2	Oil change →
	△		◇	5.3	Replace filter inserts, observe electr. control lamp →
○				5.4	Check and clean hydraulic oil cooler
				6	**Grease points (indicated in red)** →
				7	**Battery**
		○		7.1	Visual inspection
				8	**Brake systems**
				8.1	Service/parking brake: Function and visual check before starting work
○				8.2	Service/parking brake: Visually check compensation tank
		○		8.3	Service/parking brake: Check brake lining, adjust if necessary
				9	**Lighting system / fresh air filter**
				9.1	Function test before starting work
		○	◇	9.2	Check fresh air filter →

8 Maintenance

8.1 Notes regarding maintenance

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 must be mechanically propped up [e.g. by inserting the bucket arm support (option) (1-2/arrow)],
  - the ball block valve for the working and auxiliary hydraulics (1-2/arrow) must be closed.
- For work to be carried out in the area of the articulation joint, the articulation safeguard must be inserted (1-3/arrow).
- The loader must be secured against rolling by applying the parking brake (4-12/7) and by setting the drive direction switch (4-12/5) to position “0”. In addition, wheel chocks 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.
- Check the oil level when the loader is on level ground and when the bucket arm is in its lowest position.
- Replace damaged filter inserts and gaskets immediately.
- Clean force-feed lubrication nipples before lubricating.

NOTE

- For the maintenance work required, refer to the maintenance plan (page 8-1).
- Damage which is traceable to non-observance of the maintenance plan is not covered by the warranty.
- The lubricants listed in the maintenance plan can be used at ambient temperatures ranging from **-15° C** to **+40° C.**

CAUTION

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

8.2 Maintenance work

8.2.1 Engine oil level check

See the operating instructions for the engine.

NOTE

The engine can be accessed via the engine hood.

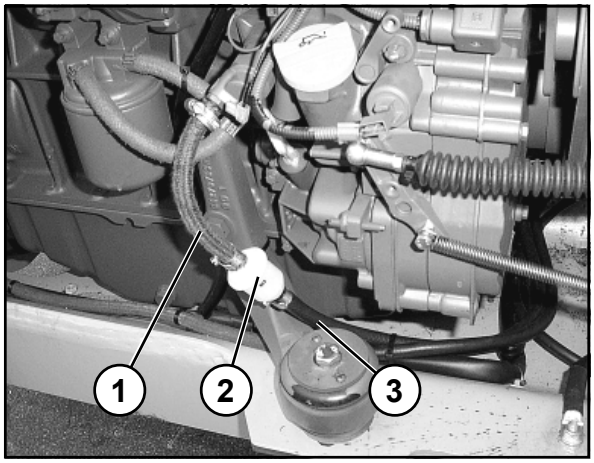


Figure 8-1

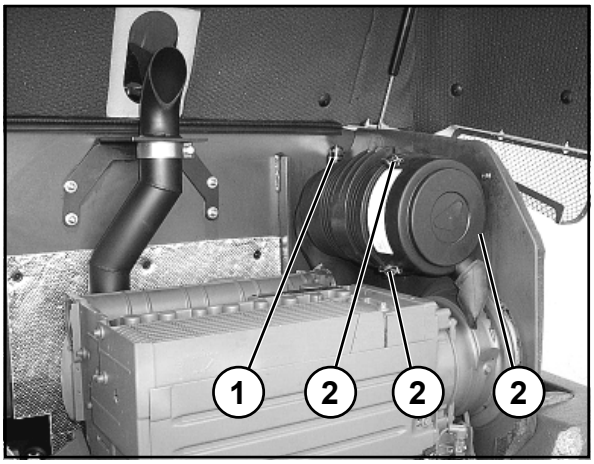


Figure 8-2

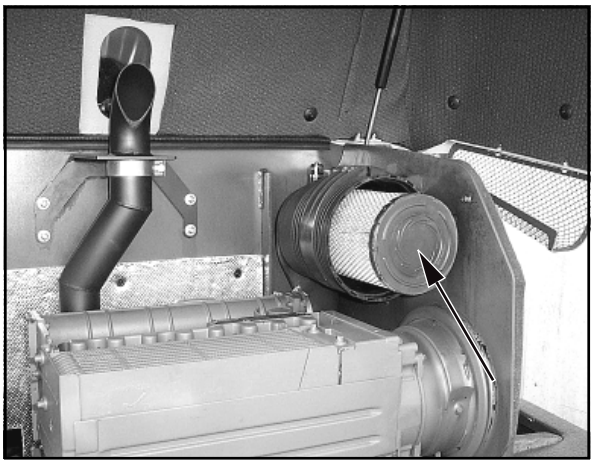


Figure 8-3

8.2.2 Engine oil change

See the operating instructions for the engine.

NOTE

The engine can be accessed via the engine hood.

8.2.3 Fuel prefilter replacement

NOTE

Maintenance (visual inspection) of the fuel prefilter must be carried out every **500 operating hours**. The fuel prefilter must be replaced when soiled, but at least once a year.

(1) Open the motor hood.
(2) Loosen the two clamps upstream and downstream of the prefilter (8-1/2).
(3) Bend the fuel line (8-1/1) on one side of the prefilter to prevent the fuel from escaping, pull the line off the old prefilter and immediately push it onto the new prefilter. Then bend and pull off the fuel line (8-1/3) on the other side of the prefilter and push it onto the new prefilter.

NOTE

- Collect any fuel that escapes.
- When installing the new prefilter, heed the flow direction.

(4) Fasten both clamps.
(5) Check for leaks.

8.2.4 Maintaining/replacing the air filter

NOTE

Maintenance of the filter cartridge is necessary when the red range is visible in the maintenance indicator (8-2/1) or after 12 months have elapsed, whichever is sooner.

(1) Open the motor hood.
(2) Loosen the three retaining clamps of the air filter lid (8-2/2) and remove the air filter lid.
(3) Pull out the filter cartridge (8-3/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 bottom of the cartridge. 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 liquids for cleaning.

(5) Use a hand-held lamp to check the cartridge paper and the rubber gasket of the filter cartridge for damage.
If the cartridge or the gasket is 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 upwards. This ensures that the dust removal valve faces downwards.

NOTE

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

(8) When the indicator field becomes red (8-2/1), 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.

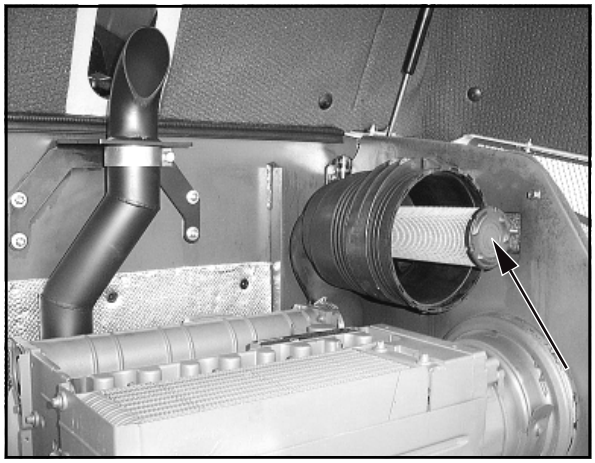


Figure 8-4

8.2.5 Replacing 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, but at the latest after two years.
- Make sure that no dirt or dust can enter the filter housing during replacement of the safety cartridge.

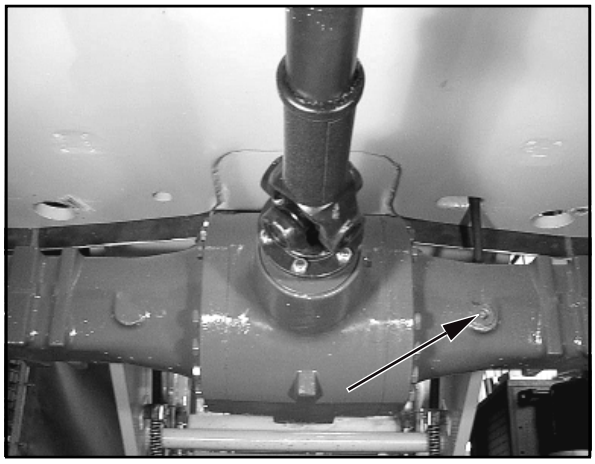


Figure 8-5

(1) Remove the filter cartridge (section 8.2.4).

(2) Pull out the safety cartridge (8-4/arrow) by carefully turning it back and forth and replace the safety cartridge and the filter cartridge with new cartridges.

(3) The remaining installation is performed as described in section 8.2.4 (6) - (8).

8.2.6 Front axle oil change

(1) Unscrew the plugs from the axle arch (8-5/arrow or 8-6/arrow).

NOTE

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

(2) Screw in the plug again.

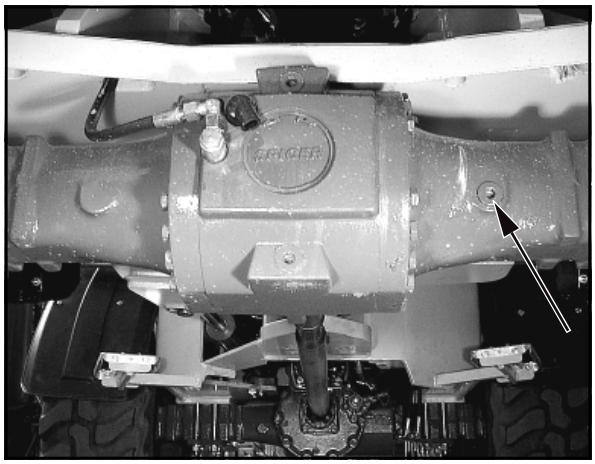


Figure 8-6

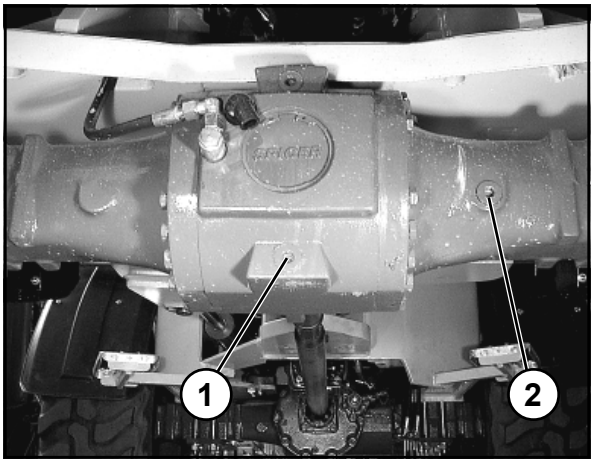


Figure 8-7

8.2.7 Front axle oil change

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

(2) Unscrew the plugs from the axle arch (8-7/1, 8-7/2 and 8-8/arrow) and drain the oil.

CAUTION

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

(3) Screw in the plug (8-7/1) again.

(4) Fill in oil via the plug bore (8-7/2 or 8-8/arrow) until the oil level reaches the opening.

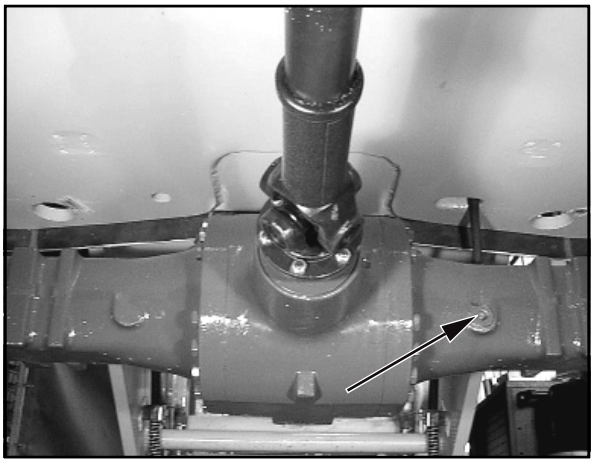


Figure 8-8

NOTE

- The vent valve of the axle (8-9/arrow) must be free from dirt.
- Details regarding the amount of oil required are given in the maintenance plan (page 8-1).
- 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) Screw the plugs (8-7/2 and 8-8/arrow) back in.

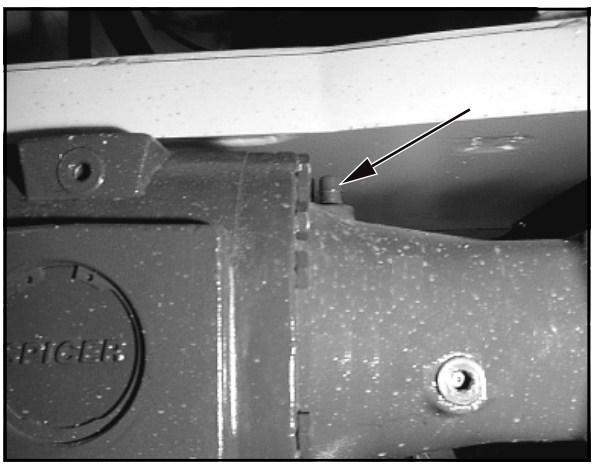


Figure 8-9

8.2.8 Rear axle oil level check

8.2.8.1 Slow loader » 20 km/h «

(1) Unscrew the plug from the axle arch (8-10/arrow).

NOTE

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

(2) Screw in the plug again.

(3) Unscrew the plug from the intermediate gear (8-11/arrow).

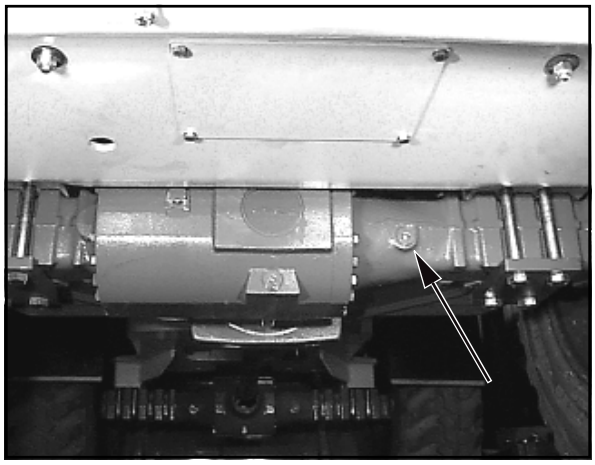


Figure 8-10

NOTE

- The axle arch and the intermediate gear do not have a common oil filling.
- The oil level must reach the plug bore.
- Collect any oil that escapes.

(4) Screw in the plug again.

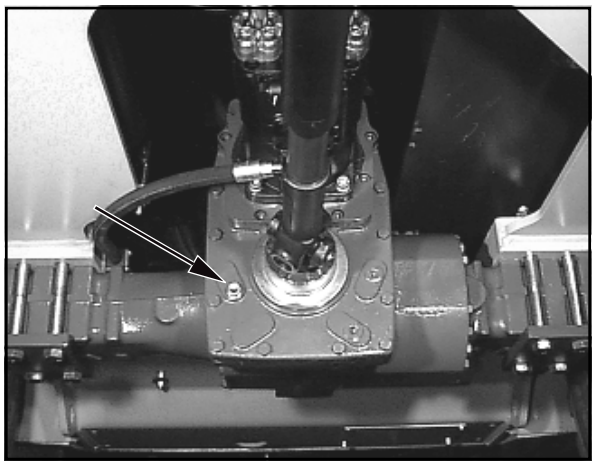


Figure 8-11

8.2.8.2 Fast loader » 30 km/h «

(1) Unscrew the plug from the axle arch (8-12/arrow).

NOTE

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

(2) Screw in the plug again.

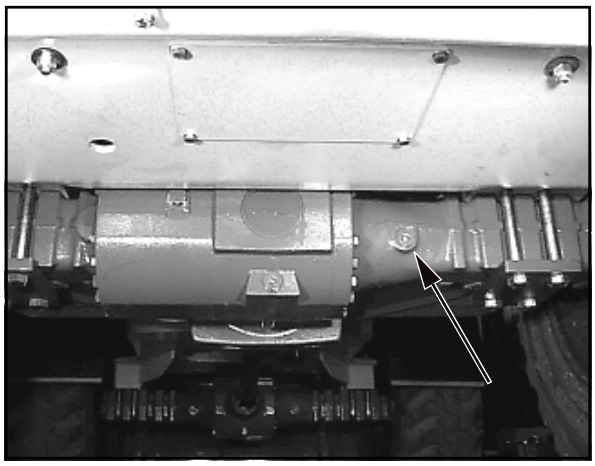


Figure 8-12

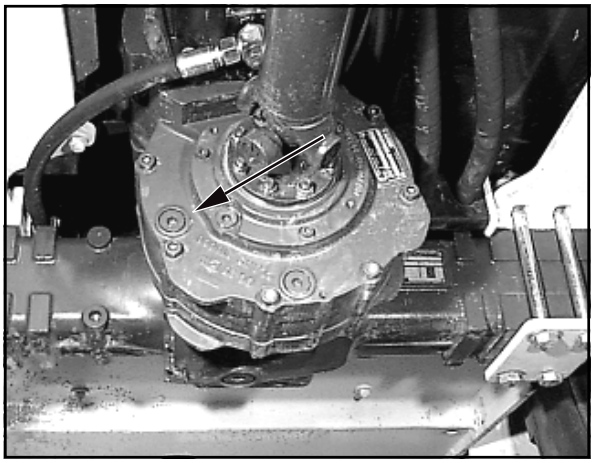


Figure 8-13

(3) Unscrew the plug from the distribution gear (8-13/ arrow).

NOTE

- The axle arch and the intermediate gear do not have a common oil filling.
- The oil level must reach the plug bore.
- Collect any oil that escapes.

(4) Screw in the plug again.

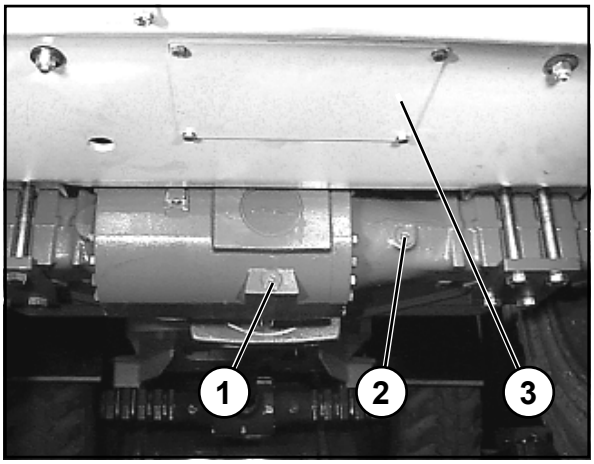


Figure 8-14

8.2.9 Rear axle oil change

8.2.9.1 Slow loader » 20 km/h «

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

(2) Unscrew the plugs from the axle arch (8-14/1 and 8-14/2) and the intermediate gear (8-15/1 and 8-15/2) and let the oil drain out.

CAUTION

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

(3) Screw in the plugs for the axle arch (8-14/1) and the intermediate gear (8-15/2) again.

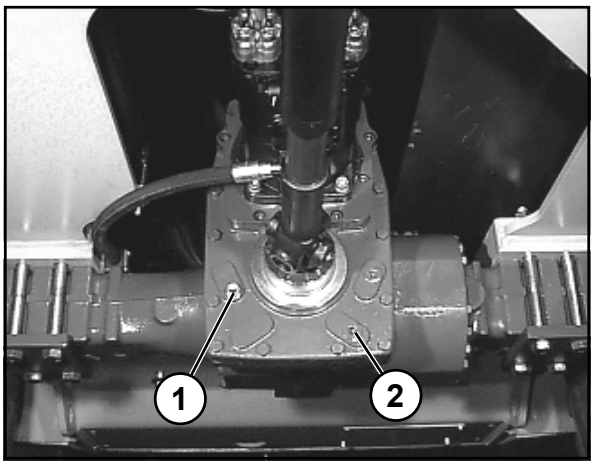


Figure 8-15

(4) Fill oil into the plug bore of the intermediate gear (8-15/1) until the oil level reaches the opening.

NOTE

- The axle arch and the intermediate gear do not have a common oil filling.
- Details regarding the amount of oil required are given in the maintenance plan (page 8-1).
- 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) Screw in the plug of the intermediate gear (8-15/1) again.
(6) Fill oil into the plug bore of the axle arch (8-14/2) until the oil level reaches the opening.

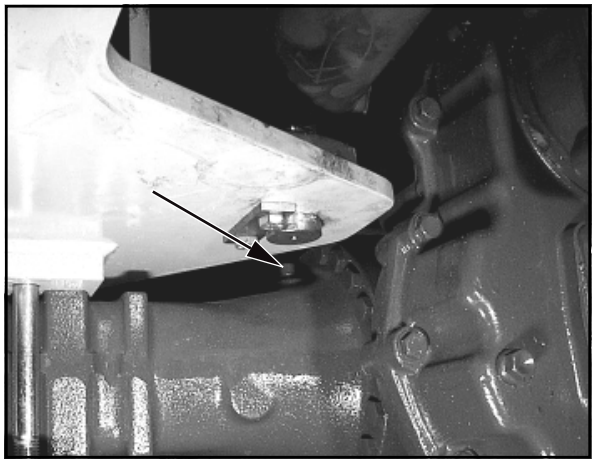


Figure 8-16

NOTE

- Details regarding the amount of oil required are given in the maintenance plan (page 8-1).
- 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.
- The vent valve of the axle (8-16/arrow) must be free from dirt.

(7) Screw in the plug of the axle arch (8-14/2) again.

8.2.9.2 Fast loader » 30 km/h «

(1) Place a sufficiently large oil drain pan underneath the axle.
(2) Unscrew the plugs from the axle arch (8-17/1 and 8-17/2) and the distribution gear (8-18/1 and 8-18/2) and let the oil drain out.

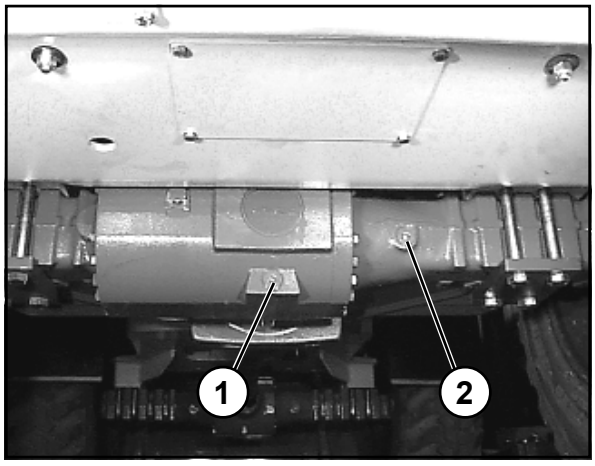


Figure 8-17

CAUTION

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

(3) Screw in the plugs for the axle arch (8-17/1) and the distribution gear (8-18/2) again.
(4) Fill oil into the plug bore of the distribution gear (8-18/1) until the oil level reaches the opening.

NOTE

- The axle arch and the distribution gear do not have a common oil filling.
- Details regarding the amount of oil required are given in the maintenance plan (page 8-1).
- 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) Screw in the plug of the distribution gear (8-18/1) again.
(6) Fill oil into the plug bore of the axle arch (8-17/2) until the oil level reaches the opening.

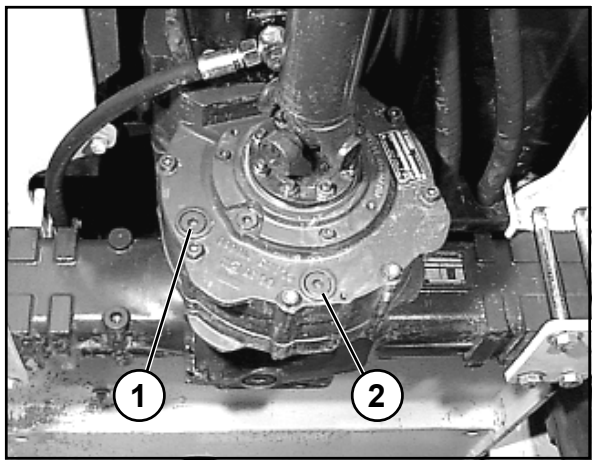


Figure 8-18

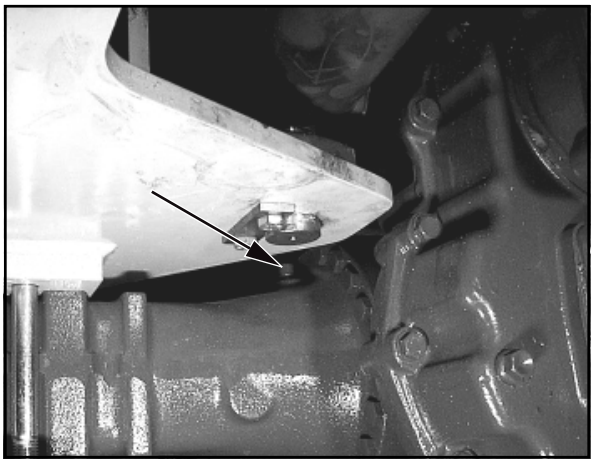


Figure 8-19

NOTE

- Details regarding the amount of oil required are given in the maintenance plan (page 8-1).
- 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.
- The vent valve of the axle (8-19/arrow) must be free from dirt.

(7) Screw in the plug of the axle arch (8-17/2) again.

8.2.10 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 (8-20/arrow).

(2) Unscrew the plug.

Figure 8-20

NOTE

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

(3) Fit a new gasket and screw the plug back in.

8.2.11 Planetary gear oil change

(1) Move the loader so that the plug (8-21/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 8-21

(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 (8-20/arrow).

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

(6) Use a new gasket when screwing the plug back in.

8.2.12 Hydraulic system oil change

(1) Dismount the maintenance flap (8-14/3).

(2) Place an oil drain pan (min. capacity: 110 l) underneath the drain point.

(3) Unscrew the oil drain plug (8-22/arrow).

(4) Drain the oil into the drain pan.

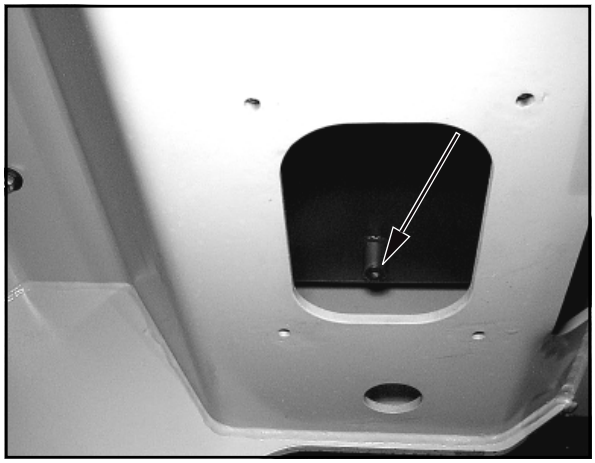


Figure 8-22

CAUTION

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

(5) Screw in the oil drain plug again.

(6) Change the hydraulic oil filter cartridge (section 8.2.13).

(7) Fill in oil into the filler neck (8-23/arrow).

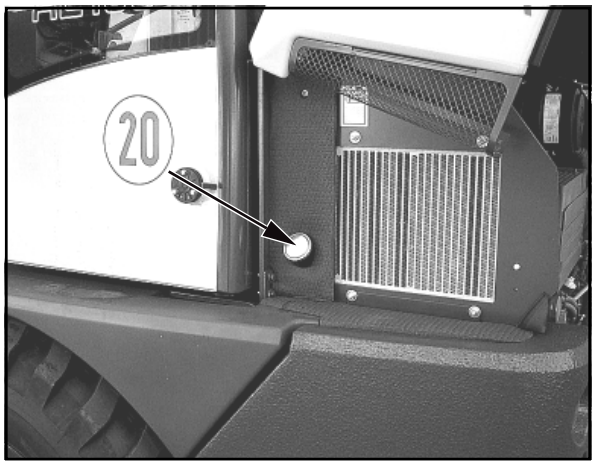


Figure 8-23

CAUTION

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

Mineral and biodegradable hydraulic 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!

CAUTION

Use only mineral oil for the service/parking brake!

(8) Check the oil level at the sight glass (8-24/arrow).

(9) Close the filler neck.

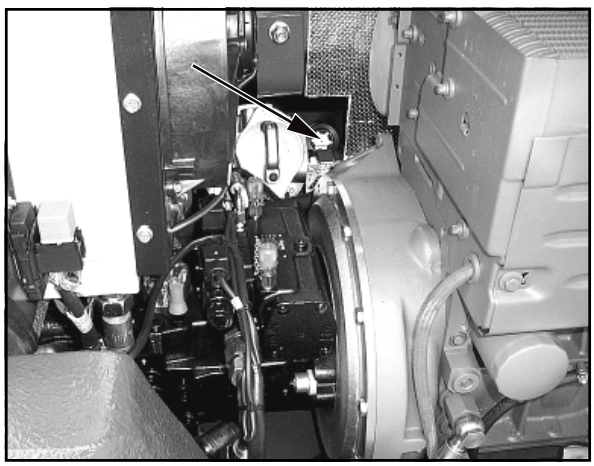


Figure 8-24

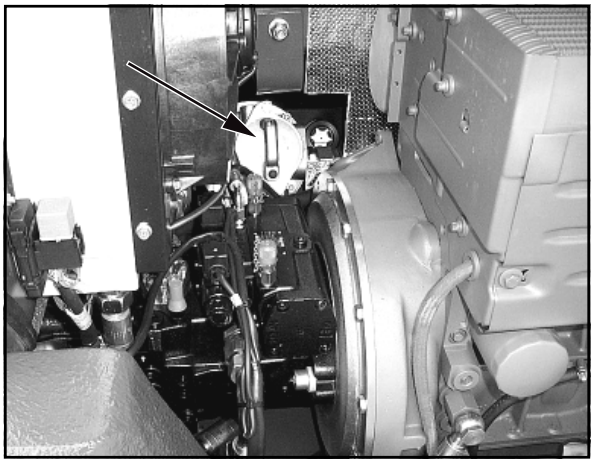


Figure 8-25

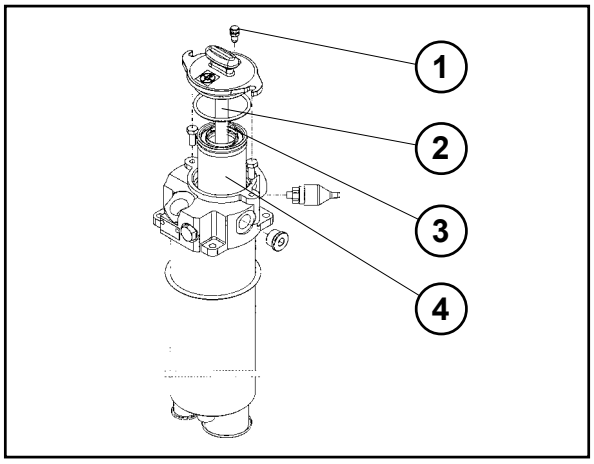


Figure 8-26

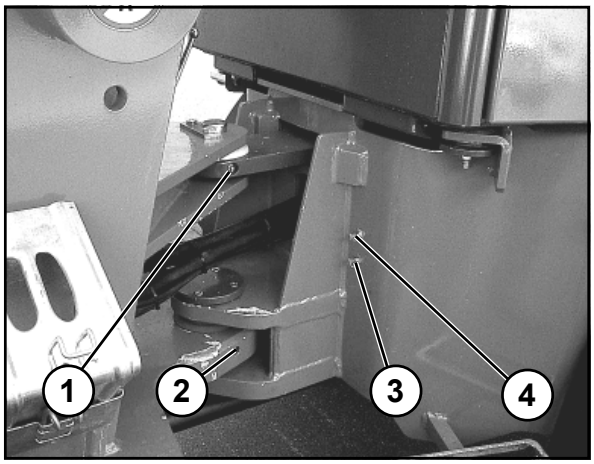


Figure 8-27

8.2.13 Hydraulic oil filter cartridge replacement

CAUTION

Replace the filter cartridge according to the maintenance plan or when the clogging indicator lamp (4-9/17) lights up.

NOTE

The clogging indicator may light up prematurely after a cold start. It will go out when the hydraulic oil warms up.

(1) Open the motor hood.
(2) Loosen but do not unscrew both screws of the hydraulic oil filter lid (8-25/arrow).
(3) Turn hydraulic oil filter lid with the magnetic tube (8-26/2) to the left and lift it out. Collect hydraulic oil dripping off.
(4) Swing up handle (8-26/3), slowly pull out the filter cartridge (8-26/4) and replace it with a new one.

CAUTION

- Collect any hydraulic oil dripping off when you pull out the filter cartridge.
- The used hydraulic oil filter cartridge must be disposed of in such a way that it does not cause pollution.

(5) Use a clean cloth to wipe the magnet tube (8-26/2) before fitting it back in.
(6) Refit the hydraulic oil filter lid with magnet tube and fasten it again.
(7) Connect ventilation hose to ventilation valve (8-26/1).
(8) Start the engine.
(9) Have an oil drain pan ready and open the ventilation valve.

NOTE

Keep the ventilation valve open until there are no more bubbles in the escaping oil.

(10) Close the ventilation valve.

8.2.14 Grease points

NOTE

The grease points are marked in red on the loader.

8.2.14.1 Articulated pendulum joint/ steering cylinder

CAUTION

Grease the bearings of pendulum support, articulated pendulum joint and steering cylinder every 50 operating hours.

Item 1 Pendulum support, front
Item 2 Articulated pendulum joint
Item 3 Pendulum support, rear:
Item 4 Steering cylinder, rear

CAUTION

The steering cylinder bearing (8-28/arrow) must be greased **every 50 operating hours**.

Figure 8-28

8.2.14.2 Bucket assembly AL 80, AL 100 and AL 100turbo

CAUTION

The bearing bolts/grease nipples of the bucket assembly (8-29 and 8-30) must be greased **every 10 operating hours.**

Item 1 + 2	Bucket assembly/quick-change device
Item 3 + 4	Quick-change device/tip lever
Item 5	Bucket assembly/pivot arm
Item 6	Bucket assembly/lift cylinder
Item 7	Pivot arm/tip cylinder
Item 8	Tip lever/pivot arm
Item 9 + 10	Bucket assembly/front end
Item 11	Front end/tip cylinder

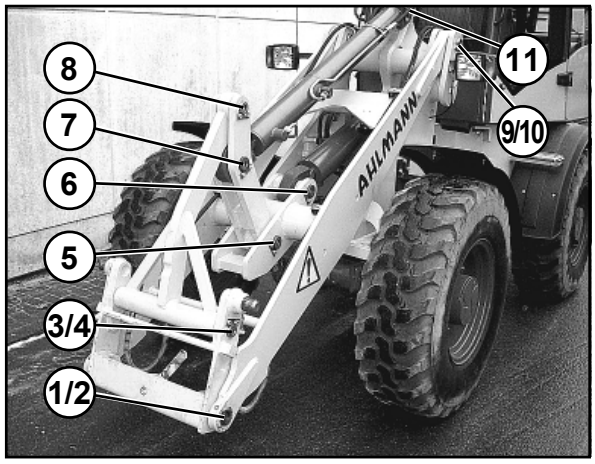


Figure 8-29

8-30/arrow Front end/lift cylinder

Figure 8-30

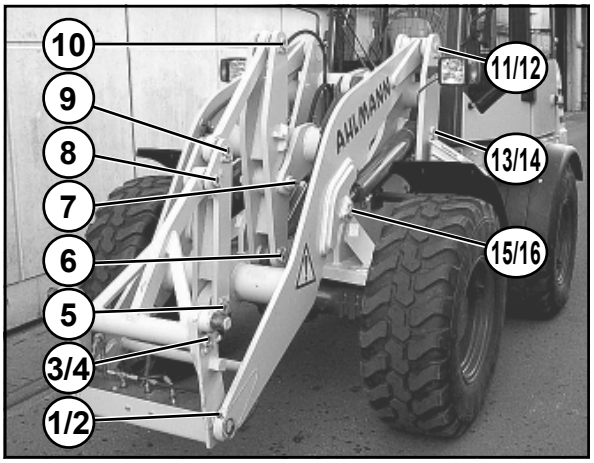


Figure 8-29a

8.2.14.3 Bucket assembly AL 120

CAUTION

The bearing bolts/grease nipples of the bucket assembly (8-29a and 8-30a) must be greased **every 10 operating hours.**

Item 1 + 2	Bucket assembly/quick-change device
Item 3 + 4	Quick-change device/tilt rod
Item 5	Bucket assembly/tip lever
Item 6	Pivot arm/tip cylinder
Item 7	Bucket assembly/pivot arm
Item 8	Tip lever/tilt rod
Item 9	Tip lever/reversing rod
Item 10	Reversing rod/pivot arm
Item 11 + 12	Bucket assembly/front end
Item 13 + 14	Front end/lift cylinder
Item 15 + 16	Bucket assembly/lift cylinder

Figure 8-30a

8-30a/arrow Front end/tip cylinder

Figure 8-31

8.2.14.4 Driver's cab door

CAUTION

The door hinges of the driver's cabin (8-31/arrows) must be lubricated **every 50 operating hours**.

NOTE

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

8.2.14.5 Engine hood

CAUTION

The hinges of the engine hood (8-32/arrow) must be lubricated **every 50 operating hours**.

Figure 8-32

8.2.14.6 Multi-purpose bucket

CAUTION

The bottom bearing bolts of the multi-purpose bucket (8-33/arrow) must be greased **every 10 operating hours**.

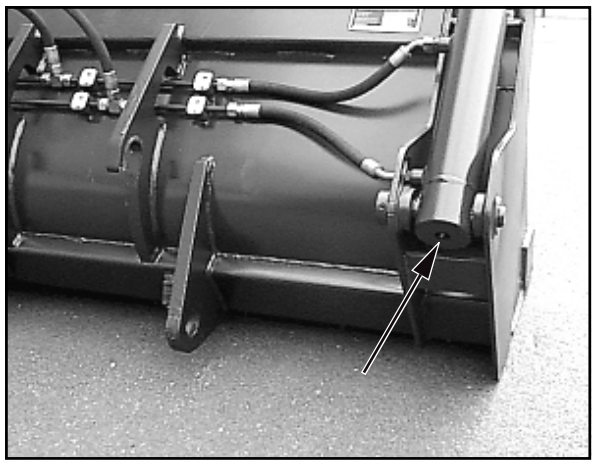


Figure 8-33

CAUTION

The bearing bolts of the multi-purpose bucket (8-34/arrows) must be greased **every 10 operating hours.**

NOTE

The bolts must be greased on both sides of the multi-purpose bucket.

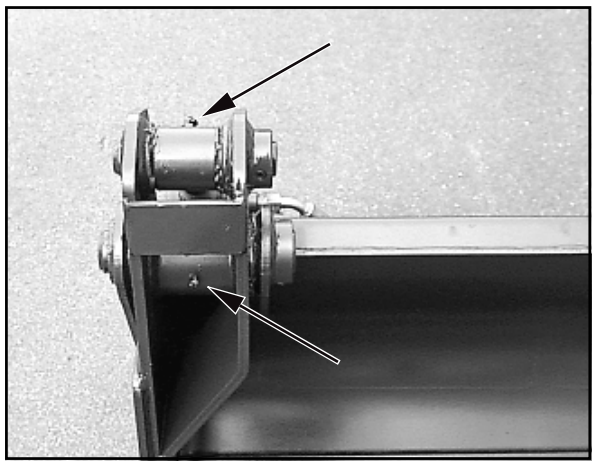


Figure 8-34

8.2.15 Oil lubrication points

Lubricate the following items with oil every 50 operating hours:
- The door locks,
- The hinges of the roof window,
- The Bowden cable and leverage of the accelerator pedal.

8.2.16 Replacing 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) Open the motor hood.
(2) Remove the battery main switch (8-35/3).
(3) Loosen and remove the fastening screw (8-35/1) (size 17) of the battery holder.
(4) Fold up the cover caps (8-35/2) and disconnect and remove the terminals from the battery (size 13).

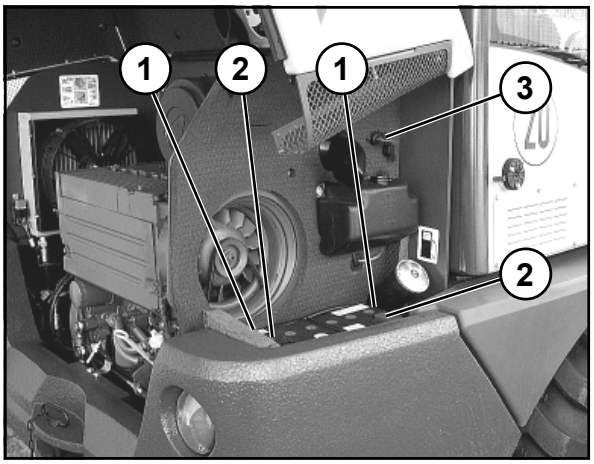


Figure 8-35

DANGER

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

(5) Remove the battery and replace it.
(6) Apply grease to the terminals before fastening them.
(7) Installation is in the reverse order.

DANGER

Make sure the fastenings are secure.

8.2.17 Checking/adjusting the service/ parking brake

DANGER

- The combined service/parking brake must be checked and, if necessary, adjusted every **500 operating hours**.
- 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.
- Operation of the loader must be stopped immediately if the pedal can be pressed down too far or the braking effect decreases noticeably.


Figure 8-36

(1) Check the brake's hydraulic oil level (8-36/arrow) and top up if necessary.
(2) Check the pedal travel.
(3) Check the entire system for proper functioning and absence of leaks (visual test).

NOTE

The service brake/parking brake is maintenance-free and therefore does not require any further check.

8.2.18 Maintaining/replacing the fresh air filter

NOTE

The fresh air filter is located at the right loader side in the vicinity of the rear side window.

(1) Loosen the six fastening screws (8-37/arrows) of the filter cover and remove the cover.

(2) Remove the filter cartridge (8-38/arrow) and clean it using “mild” compressed air.

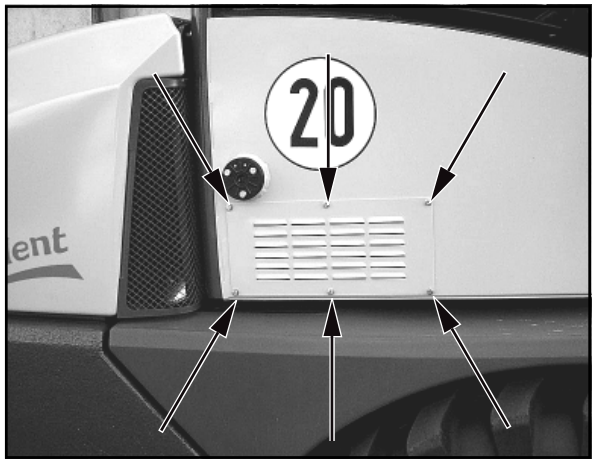


Figure 8-37

CAUTION

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

(3) Check the filter element for damage.

NOTE

The filter element must be replaced when it is damaged, but at least every **1500 operating hours.**

(4) Insert the filter element and install the filter cover.

Figure 8-38

Malfunctions, causes and remedies

9 Malfunctions, causes and remedies

NOTE

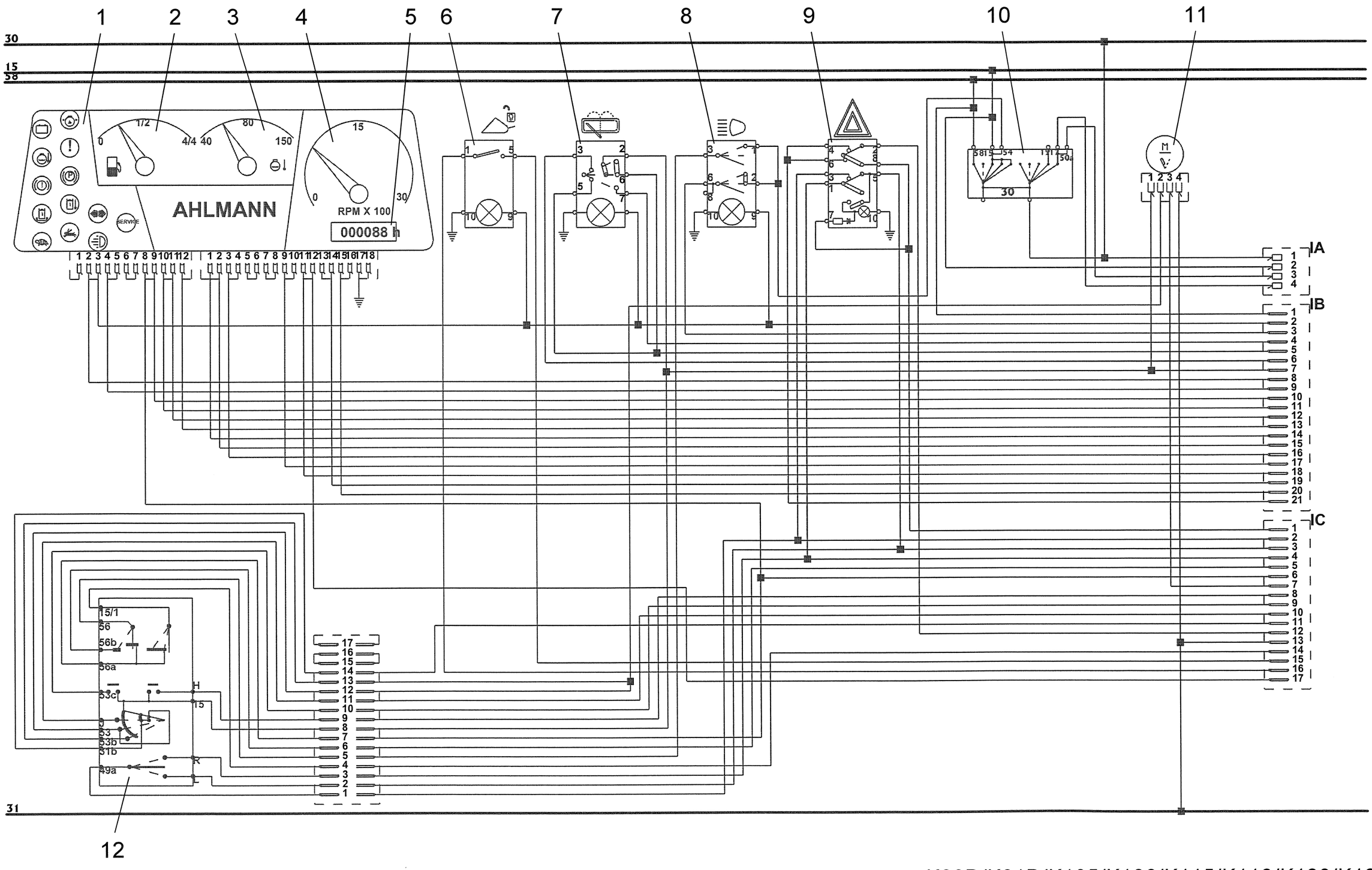
*) Malfunctions may only be remedied by authorised personnel.

Malfunction	Possible cause	Remedy
Engine		See the operating instructions for the engine
Engine does not start	Drive switch (4-12/5) is not in the neutral position	Set the drive switch to the neutral position
Generator does not charge	Plug connection is loose	Push in and secure the plug connection
	V-belt is torn	Replace the V-belt
	Generator speed is too low	Check V-belt tension; if necessary, tighten
Bucket arm cannot be raised or lowered	Pressure relief valve in the control valve is open	Completely dismantle and clean the pressure relief valve; readjust *
	Pilot valve for the working and auxiliary hydraulics (4-12/6) is locked	Unlock the pilot valve (1-2/arrow)
	Pilot pressure is not available or is too low	Open the pressure relief valve in the control line, clean it and readjust it *
	Diesel engine has failed	Using storage pressure, it is possible to bring the bucket arm to its lowermost position directly after the engine has failed
		»Not with built-in pipe break safety device«
Steering requires increased effort	Pressure relief valve in the steering unit is open	Completely dismantle and clean the pressure relief valve; readjust *
	Pusher in the priority valve is stuck	Replace the priority valve *
Defect in the drive and working hydraulics	Filter is clogged	Replace the filter insert (section 8.2.13)
	Lack of oil in the hydraulic oil reservoir	Top up the oil
	Electrical connections to the axial piston pump are loose, disconnected or oxidised	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 the setting; if necessary, readjust *
		Check whether the electr. drive cut-off is connected to the brake lever

Malfunction	Possible cause	Remedy
Heating/ventilation has failed	Fuse in the fuse box is defective	Replace the fuse
Hose couplings of the 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-exchange coupling: oil sprays off; the excess pressure drops. Tighten the coupling. **NOTE** Make sure that the collected oil cannot cause any pollution
	Increased pressure in the basic loader	Stop the engine. Remove the pressure in the lines by moving the valve lever for the auxiliary hydraulics (4-12/3) back and forth several times

Diagrams

10.1 - 06.2006 Elektrik-Schaltplan/Schéma électrique/Wiring diagramm/Elektrisch schakelschema/El-kopplingsschema/ Sähkökytkentäkaavio/Diagrama de conexiones eléctricas/Elektrisk koblingsskjema/El-oversigt/ Esquema de circuitos eléctricos/Schéma elektrického zapojení



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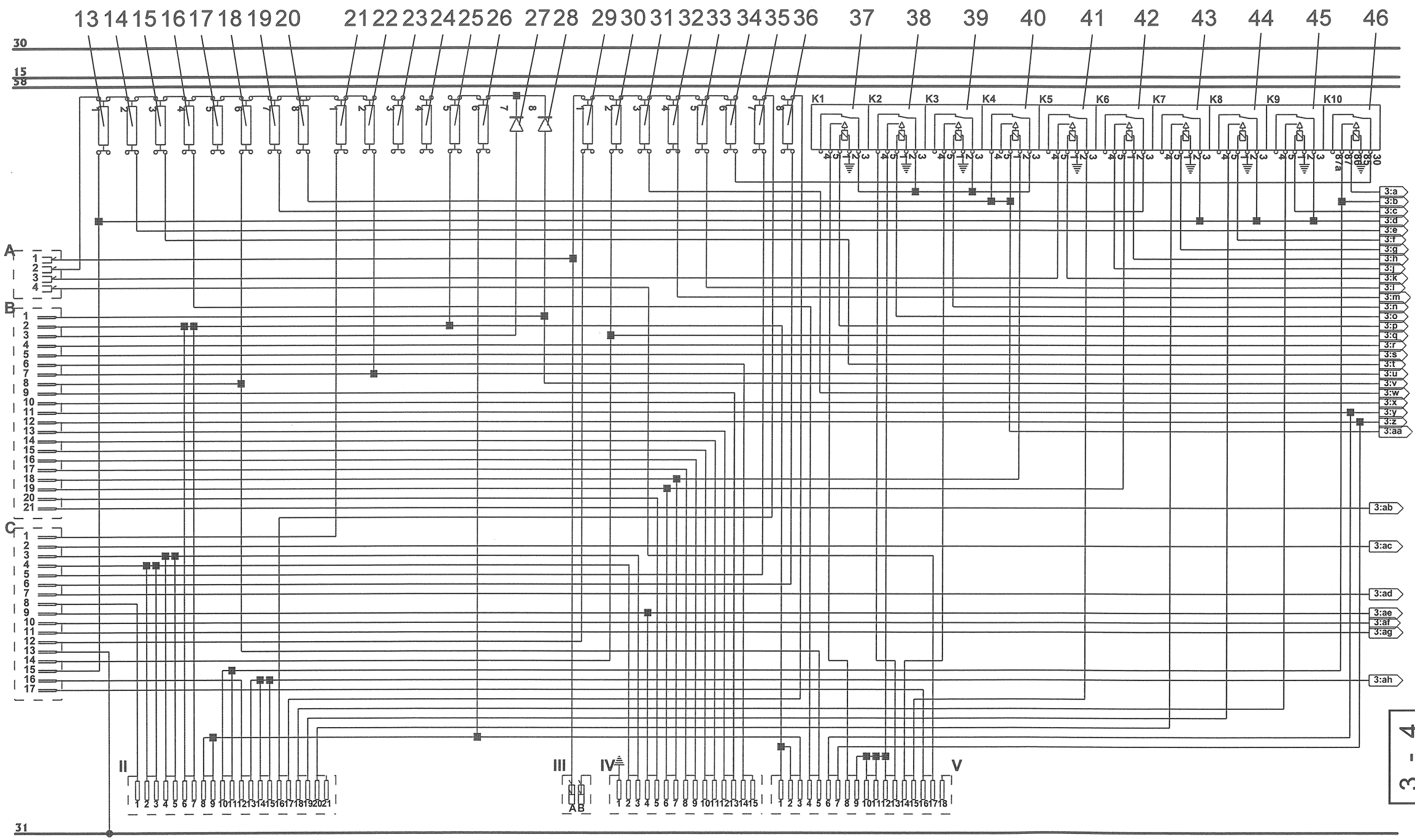

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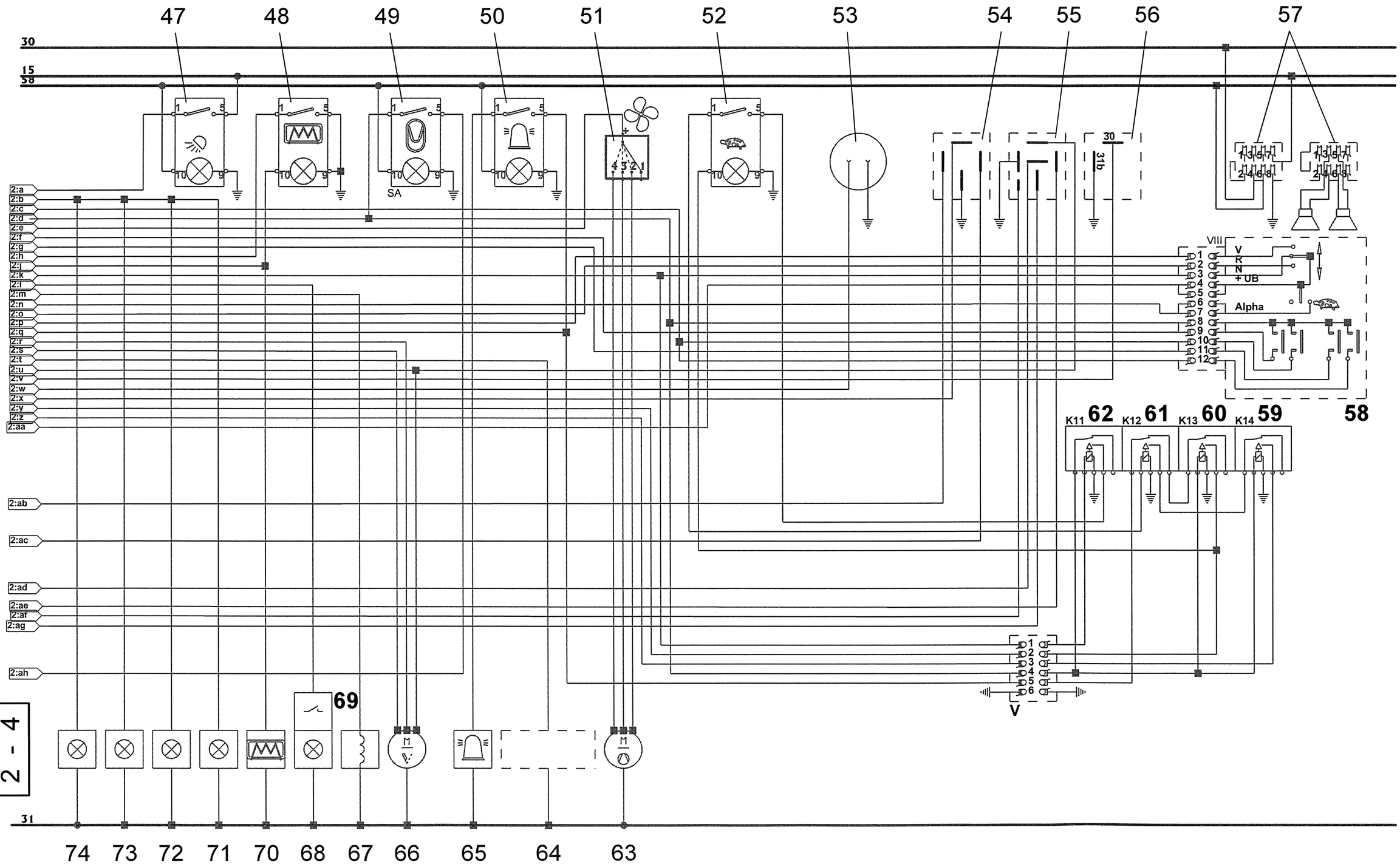

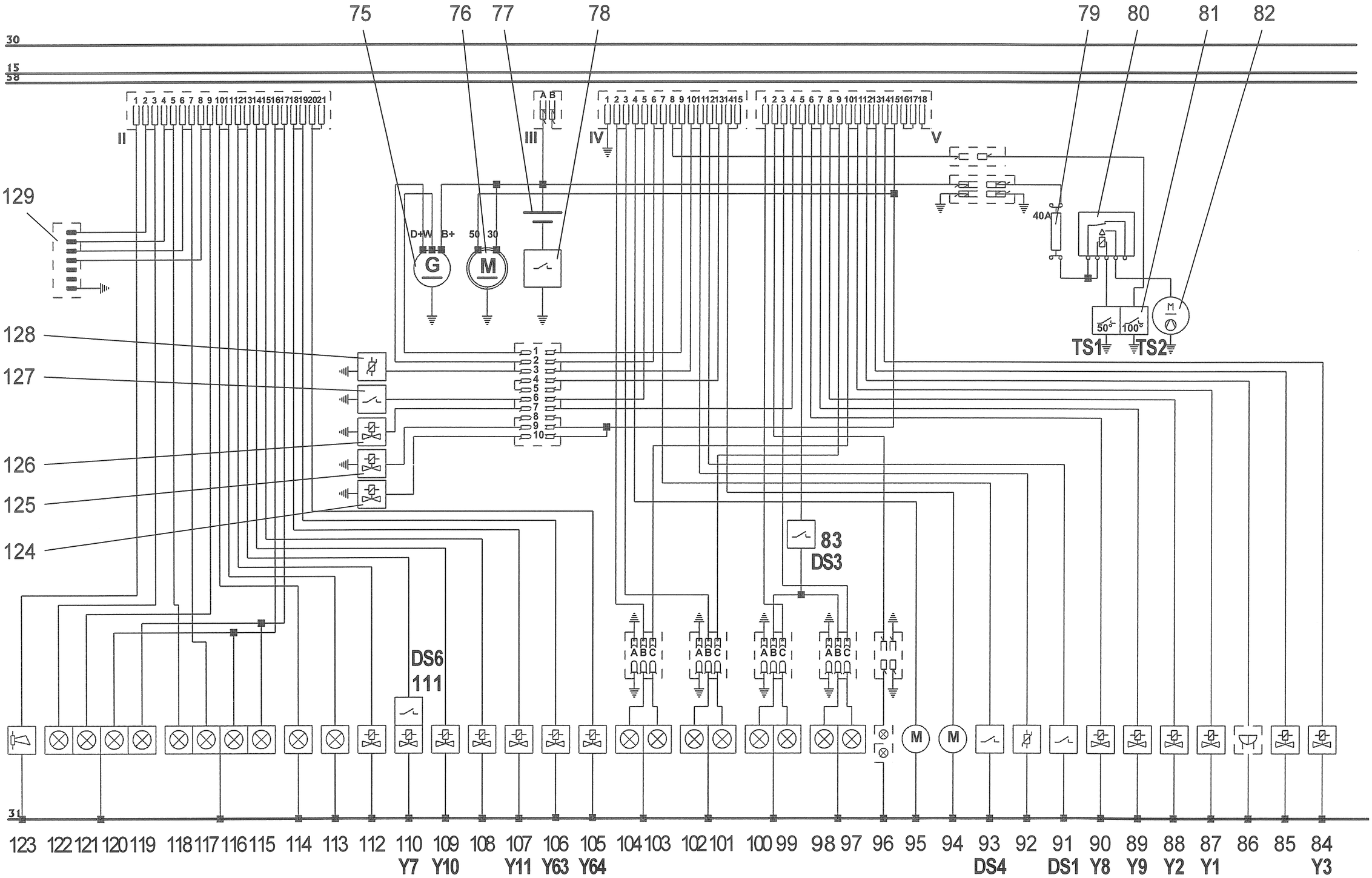
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D+W
B+
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30
G
M
40A
TS1
TS2
83
DS3
DS6
111
31
123 122 121 120 119 118 117 116 115 114 113 112 110 109 108 107 106 105 104 103 102 101 100 99 98 97 96 95 94 93 92 91 90 89 88 87 86 85 84
Y7 Y10 Y11 Y63 Y64 DS4 DS1 Y8 Y9 Y2 Y1 Y3

10.1 Electric wiring diagram

Item Designation

01 Indicator lamp assembly
02 Fuel gauge
03 Engine oil temperature gauge
04 RPM meter
05 Operating hours meter
06 Actuator: Release of quick-change device (option)
07 Actuator: Rear window wiper/washer
08 Actuator: Road lights
09 Actuator: Hazard flasher
10 Start switch
11 Windshield wiper motor, front
12 Steering column switch

Item	Designation
13	Fuse (chapter 4.5/A1)
14	Fuse (chapter 4.5/A2)
15	Fuse (chapter 4.5/A3) (SA)
16	Fuse (chapter 4.5/A4)
17	Sicherung (nicht belegt)
18	Fuse (chapter 4.5/A6)
19	Fuse (chapter 4.5/A7)
20	Fuse (chapter 4.5/A8)
21	Fuse (chapter 4.5/B1)
22	Fuse (chapter 4.5/B2)
23	Fuse (free)
24	Fuse (free)
25	Fuse (chapter 4.5/B5)
26	Fuse (chapter 4.5/B6)
27	Light indicator diode (chapter 4.5/B7)
28	Light indicator diode (chapter 4.5/B8)
29	Fuse (chapter 4.5/C1)
30	Fuse (chapter 4.5/C2)
31	Fuse (chapter 4.5/C3)
32	Fuse (chapter 4.5/C4)
33	Fuse (chapter 4.5/C5)
34	Fuse (chapter 4.5/C6)
35	Fuse (chapter 4.5/C7)
36	Fuse (chapter 4.5/C8)
37	Relay for power adaptation: forward
38	Relay for power adaptation: reverse
39	Relay Alpha max.
40	Traction drive cut-out relay
41	Starter interlock relay
42	Rear window heater relay
43	Relay for auxiliary hydraulics: Close bucket
44	Relay for auxiliary hydraulics: Open bucket
45	Relay for differential lock
46	Relay for working lights

Item Designation

47 Actuator: Working lights
48 Actuator: Rear window heater
49 Actuator: Lifting device suspension (option):
50 Actuator: Warning beacon (opt.)
51 Actuator: Fan/blower
52 Gear switch (only for fast loaders)
53 2-pole socket
54 Turn signal relay
55 Interval timer
56 Buzzer
57 Radio (option)
58 Multifunction lever
59 Gear switch micro relay
60 Gear switch micro relay
61 Gear shift impulse relay
62 Gear shift timer relay
63 Heater fan motor
64 Air conditioning system (option)
65 Warning beacon (opt.)
66 Wiper motor, rear
67 Cigarette lighter
68 Interior lighting
69 Interior lighting switch
70 Rear window heater
71 Working lights
72 Working lights
73 Working lights
74 Working lights

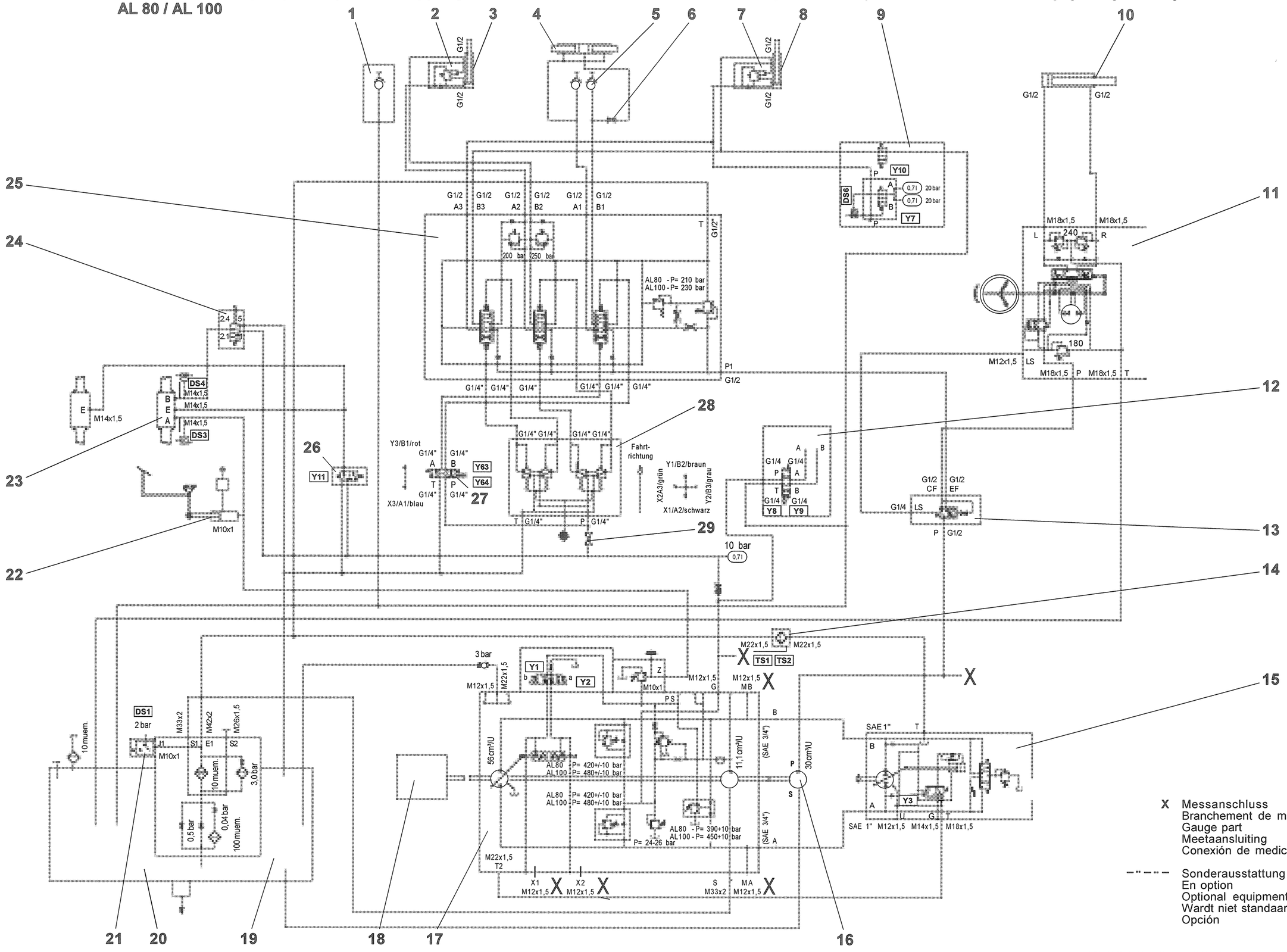
Item	Designation
75	Alternator
76	Starter
77	Battery
78	Battery main switch
79	Fuse (oil cooler)
80	Relay (oil cooler)
81	Oil cooler thermostat 50°/100°
82	Oil cooler fan motor
83	Brake light switch
84	Valve Alpha max.
85	Direction detection valve
86	Reversing buzzer valve
87	Valve, reverse drive direction
88	Valve, forward drive direction
89	Valve for 2nd gear (only for fast loaders)
90	Valve for 1st gear (only for fast loaders)
91	Hydraulic oil filter switch
92	Dip pipe sensor
93	Parking brake switch
94	Window washer motor, rear
95	Windshield washer motor, front
96	License plate illumination (option)
97	Reversing light, left
98	Brake light, left
99	Tail light, left
100	Turn signal, rear left
101	Reversing light, right
102	Brake light, right
103	Tail light, right
104	Turn signal, rear right
105	Valve for auxiliary hydraulics: close bucket
106	Valve for auxiliary hydraulics: open bucket
107	Differential lock valve
108	Combination valve: pipe break protection/lifting device suspension (option)
109	Reservoir valve, lifting device suspension (option)
110	Memory valve, lifting device suspension (option):
111	Pressure switch, lifting device suspension (option):
112	Quick-change device release valve
113	Working lights (option)
114	Working lights (option)
115	High beam, left
116	Low beam, left
117	Parking light, left
118	Turn signal, front left
119	High beam, right
120	Low beam, right
121	Parking light, right
122	Turn signal, front right
123	Signal horn
124	Torque minus adaptation valve
125	Start fuel allowance valve
126	Engine shut-off valve
127	Oil pressure switch
128	Motor oil temperature sensor
129	7-pole socket (option)

NOTE

The bold numbers next to the item numbers in the electric wiring diagram are cross references to the respective part in the hydraulic diagram.

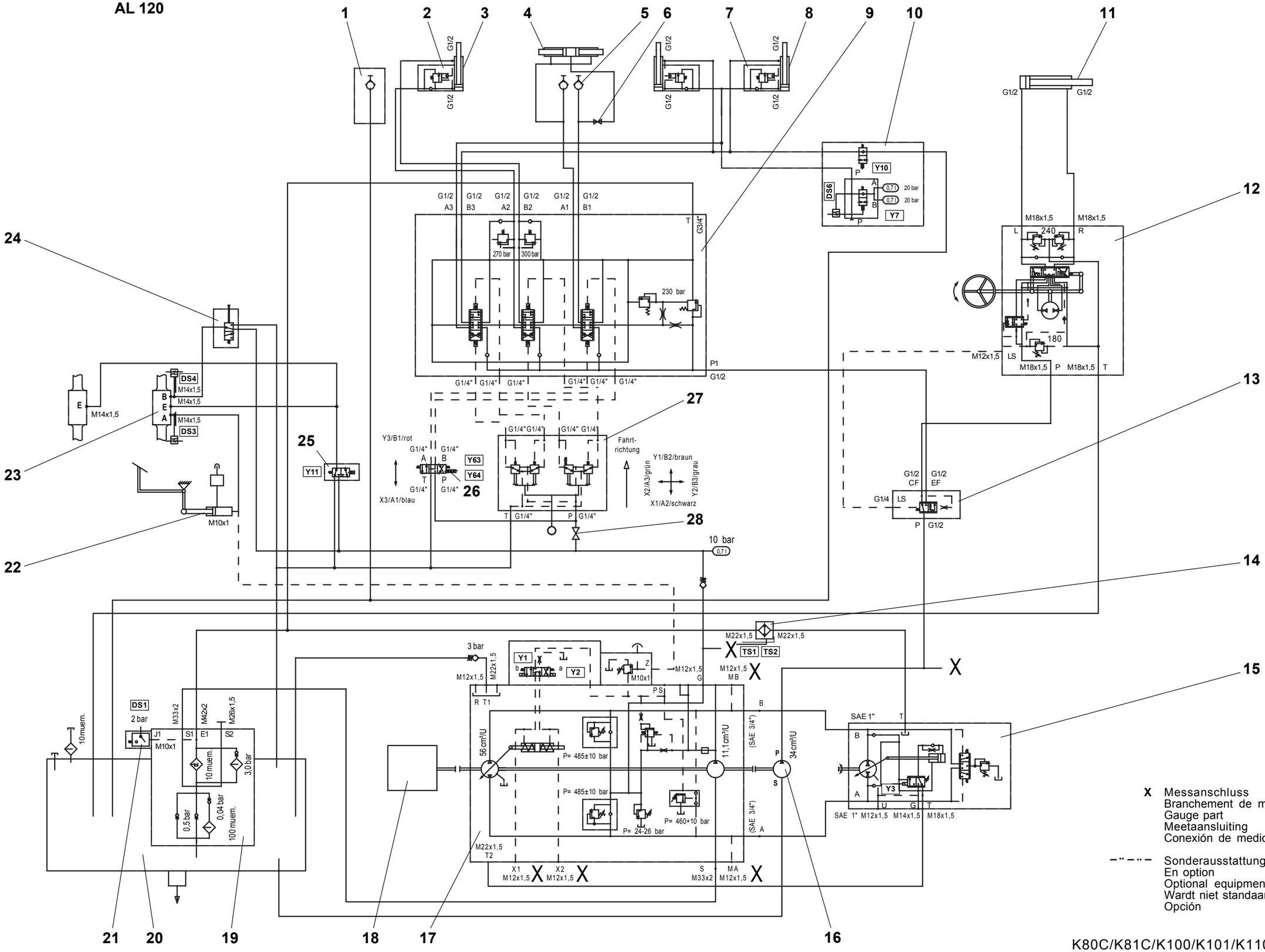
Hydraulikschaltplan/Schéma hydraulique/Hydraulisch schakelschema/Hydraulic circuit diagram/Hydraulikoversigt/Plano de conexiones hidráulicas/ Hydraulisk koblingsskjema/Hydraulik kopplingsschema/Plano de circuitos hidráulicos/Hydrauliikkakytkentäkaavio/Schéma zapojení hydrauliky

AL 80 / AL 100



10.2.2 - 10.2004 **Hydraulikschaltplan/Schéma hydraulique/Hydraulisch schakelschema/Hydraulic circuit diagram/Hydraulikoversigt/Plano de conexiones hidráulicas/ Hydraulisk koblingsskjema/Hydraulik kopplingsschema/Plano de circuitos hidráulicos**

AL 120



X Messanschluss
Branchement de mesure
Gauge part
Meetaansluiting
Conexión de medición

Sonderausstattung
En option
Optional equipment
Wardt niet standaard geleverd
Opción

10.2.1 Hydraulic diagram (AL 80 und AL 100)

Item Designation

01 Unpressurized return line (option)
02 Pipe break protection, tilt cylinder (option)
03 Tip cylinder DW 110/50/377/693
04 Locking cylinder DW 40/25/347
05 Auxiliary hydraulics
06 Shut-off valve, quick-change device
07 Pipe break protection, lift cylinder (option)
08 Lift cylinder DW 130/80/526/944
09 Lifting device suspension (option)
10 Steering cylinder DW 80/40/395/712
11 Steering unit, 320/160 cm³/rev.
12 Hydraulic gear switch (only for fast loaders)
13 Priority valve
14 Hydraulic oil cooler
15 Drive motor A6VM 80 HA
16 Gear-type pump 30 cm³/rev.
17 Drive pump A4VG 56 DA
18 Drive engine:
AL 80 - KHD F4L 2011 / 40 kW / 2300 rpm
AL 100 - KHD F4L 2011 / 43.5 kW / 2300 rpm
19 Combined suction and return flow filter
20 Hydraulic oil tank
21 Electric contamination indicator
22 Main brake cylinder
23 Lamella brake
24 Parking brake valve
25 3-way valve
26 Differential lock
27 Control pressure transmitter, auxiliary hydraulics
28 Control pressure transmitter, working hydraulics
29 Shut-off valve, working hydraulics

option = Optional equipment

10.2.2 Hydraulic diagram AL 120

Item Designation

01 Unpressurized return line (option)
02 Pipe break protection, tilt cylinder (option)
03 Tip cylinder DW 110/70/448/833
04 Locking cylinder DW 40/25/347
05 Auxiliary hydraulics
06 Shut-off valve, quick-change device
07 Pipe break protection, lift cylinder (option)
08 Lift cylinder DW 90/50/598/1013
09 3-way valve
10 Lifting device suspension (option)
11 Steering cylinder DW 80/40/395/712
12 Steering unit, 320/160 cm³/rev.
13 Priority valve
14 Hydraulic oil cooler
15 Drive motor A6VM 80 HA
16 Gear-type pump 34 cm³/rev.
17 Drive pump A4VG 56 DA
18 Drive engine: KHD BF4L 2011 / 53,5 kW / 2500 rpm
19 Combined suction and return flow filter
20 Hydraulic oil tank
21 Electric contamination indicator
22 Main brake cylinder
23 Lamella brake
24 Parking brake valve
25 Differential lock
26 Control pressure transmitter, auxiliary hydraulics
27 Control pressure transmitter, working hydraulics
28 Shut-off valve, working hydraulics

option = Optional equipment

Technical data (loader)

11 Technical data

11.1 AL 80

NOTE

The technical data refer to 12.5 - 18 10PR tires.

11.1.1 Loader

- Height		2670 mm
- Width (across tires)		1785 mm
- Wheelbase		2030 mm
- Track width at floor		1450 mm
- Operating weight w/o attachment		4437 kg
- Ground clearance	- Vehicle center	345 mm
	- Rear axle gear	mm
- Turning radius (across the rear)		3775 mm
- Articulation angle	- left	40 °
	- right	40 °
- Embankment angle		°
- Climbing ability with payload		60 %
- Max. lifting capacity		35 kN
- Thrust force		36 kN

11.1.2 Engine

- Type	F4L 2011
- Oil/air cooled diesel engine	
- 4 cylinders, 4-stroke, direct injection	
- Type: F 4L 2011	
- Displacement	3108 cm³
- Power according to ECE 24/03, Appendix 10	40 kW at 2300 rpm

11.1.3 Starter

-	2.2 kW, 12 V

11.1.4 Alternator

-	80 A, 14 V

11.1.5 Hydrostatic drive

“20 km/h” variant

- Drive stage I	0.....7 km/h
- Drive stage II	0.....20 km/h

“30 km/h” variant

1st gear

- Drive stage I	0..... km/h
- Drive stage II	0..... km/h

2nd gear

- Drive stage I	0..... km/h
- Drive stage II	0.....30 km/h

11.1.6 Axle loads

- Perm. axle loads acc. to StVZO	- front	3500 kg
	- rear	4300 kg
- Perm. total weight acc. to StVZO		6500 kg

11.1.7 Tires

The following tires are permitted:

- Size		12.5 - 18
- Tire pressure	- front	3,0 bar
	- rear	2,5 - 3,0 bar
- Size		14.5 - 20
- Tire pressure	- front	3,0 bar
	- rear	2,5 - 3,0 bar
- Size		405/70 R 18
- Tire pressure	- front	3,0 bar
	- rear	2,5 - 3,0 bar
- Size		405/70 R 20
- Tire pressure	- front	3,0 bar
	- rear	2,5 - 3,0 bar
- Size		16/70 - 20
- Tire pressure	- front	3,0 bar
	- rear	2,5 - 3,0 bar

11.1.8 Steering system

- Hydrostatically via priority valve
- Pressure max. bar

11.1.9 Brake system

Service brake:
1. Hydraulic wet lamella brake in the rear axle, acting on all four wheels.
2. Hydrostatic inching brake, acting on all four wheels.

Parking brake:
Spring-loaded wet lamella brake acting on the rear axle.

11.1.10 Electrical system

- Battery 88 Ah

11.1.11 Hydraulic system

- Contents	100 l
- Hydraulic oil reservoir	l
- Flow rate	70 l/min
- Max. operating pressure	210 bar
- 1 lift cylinder	Ø 130/60 mm
- 1 tip cylinder	Ø 110/70 mm
- 1 steering cylinder	Ø 70/35 mm
- Times acc. to DIN ISO 7131	
- Lift (with payload)	6,4 s
- Lower (without load)	4,5 s
- Dump 90°	2,0 s
- Tilt 45°	2,5 s

11.1.12 Fuel supply system

- Contents
  Fuel tank 70 l

11.1.13 Heating and ventilation system

- Oil heater	COBO
- Type	2/9008/COMB-10/A45
- Heating capacity	
3-stage	Q_{80}max. 10.5 kW at $\mathring{V}_{oil}$ 30 l/min
- Fan performance	
3-stage	max. 785 m³/h

11.1.14 Return suction filter

- Filter mesh	µm abs.
- Bypass response pressure	p = bar
- Pilot pressure	Δ bar

11.1.15 Electric contamination indicator

- Switch-on pressure	p = 2 bar

11.1.16 Oil cooler with temperature-controlled fan

- Performance	max. kW
- Flow rate	l/min

11.1.17 Noise emission

Sound power level (LWA) »Noise outside: «	103 dB(A)
Acoustic power level (LpA) » Noise in the driver's cabin: «	73 dB(A)

11.2 AL 100

NOTE

The technical data refer to 14.5 -20 12PR tires.

11.2.1 Loader

- Height		2720 mm
- Width (across tires)		1785 mm
- Wheelbase		2030 mm
- Track width		1450 mm
- Operating weight w/o attachment		4890 kg
- Ground clearance	- Vehicle center	345 mm
	- Rear axle gear	mm
- Turning radius (across the rear)		3775 mm
- Articulation angle	- left	40 °
	- right	40 °
- Embankment angle		°
- Climbing ability with payload		60 %
- Max. lifting capacity		37 kN
- Thrust force		39 kN

11.2.2 Engine

- Type	F4L 2011
- Oil/air cooled diesel engine	
- 4 cylinders, 4-stroke, direct injection	
- Type: F 4L 2011	
- Displacement	3108 cm³
- Performance acc. to ISO 9249	43.5 kW at 2300 rpm
- Exhaust gas emission acc. 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

“20 km/h” variant

- Drive stage I	0.....7 km/h
- Drive stage II	0.....20 km/h

“30 km/h” variant

1st gear

- Drive stage I	0..... km/h
- Drive stage II	0..... km/h

2nd gear

- Drive stage I	0..... km/h
- Drive stage II	0.....30 km/h

11.2.6 Axle loads

- Perm. axle loads acc. to StVZO	- front	3500 kg
	- rear	4300 kg
- Perm. total weight acc. to StVZO		6500 kg

11.2.7 Tires

The following tires are permitted:

- Size		12.5 - 18
- Tire pressure	- front	3,0 bar
	- rear	2,5 - 3,0 bar
- Size		14.5 - 20
- Tire pressure	- front	3,0 bar
	- rear	2,5 - 3,0 bar
- Size		405/70 R 18
- Tire pressure	- front	3,0 bar
	- rear	2,5 - 3,0 bar
- Size		405/70 R 20
- Tire pressure	- front	3,0 bar
	- rear	2,5 - 3,0 bar
- Size		16/70 - 20
- Tire pressure	- front	3,0 bar
	- rear	2,5 - 3,0 bar

11.2.8 Steering system

- Hydrostatically via priority valve
- Pressure max. bar

11.2.9 Brake system

Service brake:
1. Hydraulic wet lamella brake in the rear axle, acting on all four wheels.
2. Hydrostatic inching brake, acting on all four wheels.

Parking brake:
Spring-loaded wet lamella brake acting on the rear axle.

11.2.10 Electrical system

- Battery 88 Ah

11.2.11 Hydraulic system

- Contents	100 l
- Hydraulic oil reservoir	l
- Flow rate	70 l/min
- Max. operating pressure	230 bar
- 1 lift cylinder	Ø 130/60 mm
- 1 tip cylinder	Ø 110/70 mm
- 1 steering cylinder	Ø 70/35 mm
- Times acc. to DIN ISO 7131	
- Lift (with payload)	6,2 s
- Lower (without load)	4,5 s
- Dump 90°	2,0 s
- Tilt 45°	2,5 s

11.2.12 Fuel supply system

- Contents
  Fuel tank 70 l

11.2.13 Heating and ventilation system

- Oil heater	COBO
- Type	2/9008/COMB-10/A45
- Heating capacity	
3-stage	Q_{80} max. 10.5 kW at $\mathring{V}_{oil}$ 30 l/min
- Fan performance	
3-stage	max. 785 m³/h

11.2.14 Return suction filter

- Filter mesh		µm abs.
- Bypass response pressure	Δ	p = bar
- Pilot pressure		bar

11.2.15 Electric contamination indicator

- Switch-on pressure	p = 2 bar

11.2.16 Oil cooler with temperature-controlled fan

- Performance	max. kW
- Flow rate	l/min

11.2.17 Noise emission

Sound power level (LWA) »Noise outside: «	103 dB(A)
Acoustic power level (LpA) » Noise in the driver's cabin: «	73 dB(A)

11.3 AL 100 turbo

NOTE

The technical data refer to 14.5 -20 12PR tires.

11.3.1 Loader

- Height		2720 mm
- Width (across tires)		1785 mm
- Wheelbase		2030 mm
- Track width		1450 mm
- Operating weight w/o attachment		4890 kg
- Ground clearance	- Vehicle center	345 mm
	- Rear axle gear	mm
- Turning radius (across the rear)		3775 mm
- Articulation angle	- left	40 °
	- right	40 °
- Embankment angle		°
- Climbing ability with payload		60 %
- Max. lifting capacity		37 kN
- Thrust force		39 kN

11.3.2 Engine

- Type	BF4L 2011
- Oil/air cooled diesel engine	
- 4 cylinders, 4-stroke, direct injection	
- Type: BF 4L 2011	
- Displacement	3108 cm³
- Performance acc. to ISO 9249	50 kW at 2300 rpm
- Exhaust gas emission acc. to RL 97/68 EC level 1 + EPA	

11.3.3 Starter

-	2.2 kW, 12 V

11.3.4 Alternator

-	80 A, 14 V

11.3.5 Hydrostatic drive

“20 km/h” variant

- Drive stage I	0.....7 km/h
- Drive stage II	0.....20 km/h

“30 km/h” variant

1st gear

- Drive stage I	0..... km/h
- Drive stage II	0..... km/h

2nd gear

- Drive stage I	0..... km/h
- Drive stage II	0.....30 km/h

11.3.6 Axle loads

- Perm. axle loads acc. to StVZO	- front	3500 kg
	- rear	4300 kg
- Perm. total weight acc. to StVZO		6500 kg

11.3.7 Tires

The following tires are permitted:

- Size		12.5 - 18
- Tire pressure	- front	3,0 bar
	- rear	2,5 - 3,0 bar
- Size		14.5 - 20
- Tire pressure	- front	3,0 bar
	- rear	2,5 - 3,0 bar
- Size		405/70 R 18
- Tire pressure	- front	3,0 bar
	- rear	2,5 - 3,0 bar
- Size		405/70 R 20
- Tire pressure	- front	3,0 bar
	- rear	2,5 - 3,0 bar
- Size		16/70 - 20
- Tire pressure	- front	3,0 bar
	- rear	2,5 - 3,0 bar

11.3.8 Steering system

- Hydrostatically via priority valve
- Pressure max. bar

11.3.9 Brake system

Service brake:
1. Hydraulic wet lamella brake in the rear axle, acting on all four wheels.
2. Hydrostatic inching brake, acting on all four wheels.

Parking brake:
Spring-loaded wet lamella brake acting on the rear axle.

11.3.10 Electrical system

- Battery 88 Ah

11.3.11 Hydraulic system

- Contents	100 l
- Hydraulic oil reservoir	l
- Flow rate	75 l/min
- Max. operating pressure	230 bar
- 1 lift cylinder	Ø 130/60 mm
- 1 tip cylinder	Ø 110/70 mm
- 1 steering cylinder	Ø 70/35 mm
- Times acc. to DIN ISO 7131	
- Lift (with payload)	5,8 s
- Lower (without load)	3,9 s
- Dump 90°	2,0 s
- Tilt 45°	2,5 s

11.3.12 Fuel supply system

- Contents
  Fuel tank 70 l

11.3.13 Heating and ventilation system

- Oil heater COBO
- Type 2/9008/COMB-10/A45
- Heating capacity
  3-stage Q_{80}max. 10.5 kW at $\mathring{V}_{oil}$ 30 l/min
- Fan performance
  3-stage max. 785 m³/h

11.3.14 Return suction filter

- Filter mesh µm abs.
- Bypass response pressure Δ p = bar
- Pilot pressure bar

11.3.15 Electric contamination indicator

- Switch-on pressure p = bar

11.3.16 Oil cooler with temperature-controlled fan

- Performance max. kW
- Flow rate l/min

11.3.17 Noise emission

Sound power level (LWA) »Noise outside: « 103 dB(A)
Acoustic power level (LpA) » noise in the driver's cabin: « 73 dB(A)

11.4 AL 120

NOTE

The technical data refer to 16/70 - 20 14PR tires.

11.4.1 Loader

- Height		2720 mm
- Width (across tires)		2000 mm
- Wheelbase		2130 mm
- Track width		1525 mm
- Operating weight w/o attachment		5380 kg
- Ground clearance	- Vehicle center	345 mm
	- Rear axle gear	mm
- Turning radius across the rear (outside)		3780 mm
- Articulation angle	- left	40 °
	- right	40 °
- Embankment angle		°
- Climbing ability with payload		60 %
- Max. lifting capacity		40 kN
- Thrust force		39 kN

11.4.2 Engine

- Type	BF4L 2011
- Oil/air cooled diesel engine	
- 4 cylinders, 4-stroke, direct injection	
- Type: BF 4L 2011	
- Displacement	3108 cm³
- Performance acc. to ISO 9249	53.5 kW at 2500 rpm
- Exhaust gas emission acc. to RL 97/68 EC level 1 + EPA	

11.4.3 Starter

-	2.2 kW, 12 V

11.4.4 Alternator

-	80 A, 14 V

11.4.5 Hydrostatic drive

- Drive stage I	0.....7 km/h
- Drive stage II	0..... 20 km/h

11.4.6 Axle loads

- Perm. axle loads acc. to StVZO	- front	3500 kg
	- rear	4300 kg
- Perm. total weight acc. to StVZO		6500 kg

11.4.7 Tires

The following tires are permitted:

- Size		12.5 - 18
- Tire pressure	- front	3,0 bar
	- rear	2,5 - 3,0 bar
- Size		14.5 - 20
- Tire pressure	- front	3,0 bar
	- rear	2,5 - 3,0 bar

- Size		405/70 R 18
- Tire pressure	- front	3,0 bar
	- rear	2,5 - 3,0 bar
- Size		405/70 R 20
- Tire pressure	- front	3,0 bar
	- rear	2,5 - 3,0 bar
- Size		16/70 - 20
- Tire pressure	- front	3,0 bar
	- rear	2,5 - 3,0 bar

11.4.8 Steering system

- Hydrostatically via priority valve
- Pressure max. bar

11.4.9 Brake system

Service brake:
1. Hydraulic wet lamella brake in the rear axle, acting on all four wheels.
2. Hydrostatic inching brake, acting on all four wheels.

Parking brake:
Spring-loaded wet lamella brake acting on the rear axle.

11.4.10 Electrical system

- Battery 88 Ah

11.4.11 Hydraulic system

- Contents	100 l
- Hydraulic oil reservoir	l
- Flow rate	80 l/min
- Max. operating pressure	230 bar
- 2 lift cylinder	Ø 90/50 mm
- 1 tip cylinder	Ø 110/70 mm
- 1 steering cylinder	Ø 80/40 mm
- Times acc. to DIN ISO 7131	
- Lift (with payload)	5.7 s
- Lower (without load)	4.9 s
- Dump 90°	1.1 s
- Tilt 45°	1.3 s

11.4.12 Fuel supply system

- Contents
  Fuel tank 70 l

11.4.13 Heating and ventilation system

- Oil heater	COBO
- Type	2/9008/COMB-10/A45
- Heating capacity	
3-stage	Q_{80}max. 10.5 kW at $\mathring{V}_{oil}$ 30 l/min
- Fan performance	
3-stage	max. 785 m³/h

11.4.14 Return suction filter

- Filter mesh µm abs.
- Bypass response pressure Δ p = bar
- Pilot pressure bar

11.4.15 Electric contamination indicator

- Switch-on pressure p = bar

11.4.16 Oil cooler with temperature-controlled fan

- Performance max. kW
- Flow rate l/min

11.4.17 Noise emission

Sound power level (LWA) »Noise outside: « 103 dB(A)
Acoustic power level (LpA) » noise in the driver's cabin: « 73 dB(A)

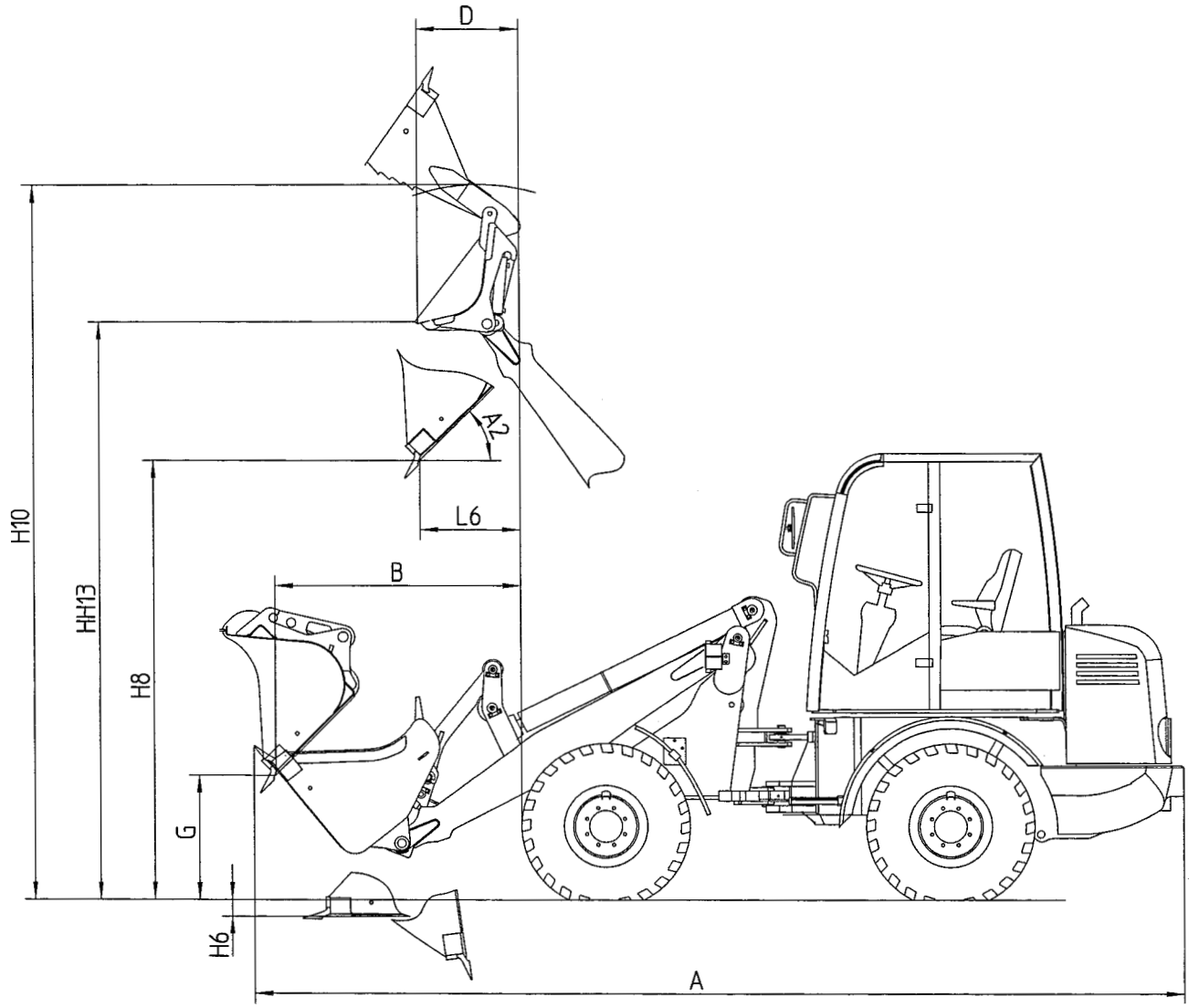
Technical data (attachments)

12.1 AL 80 attachments

NOTE

- The technical data refer to 12.5 - 18 10PR tires.

12.1.1 Buckets



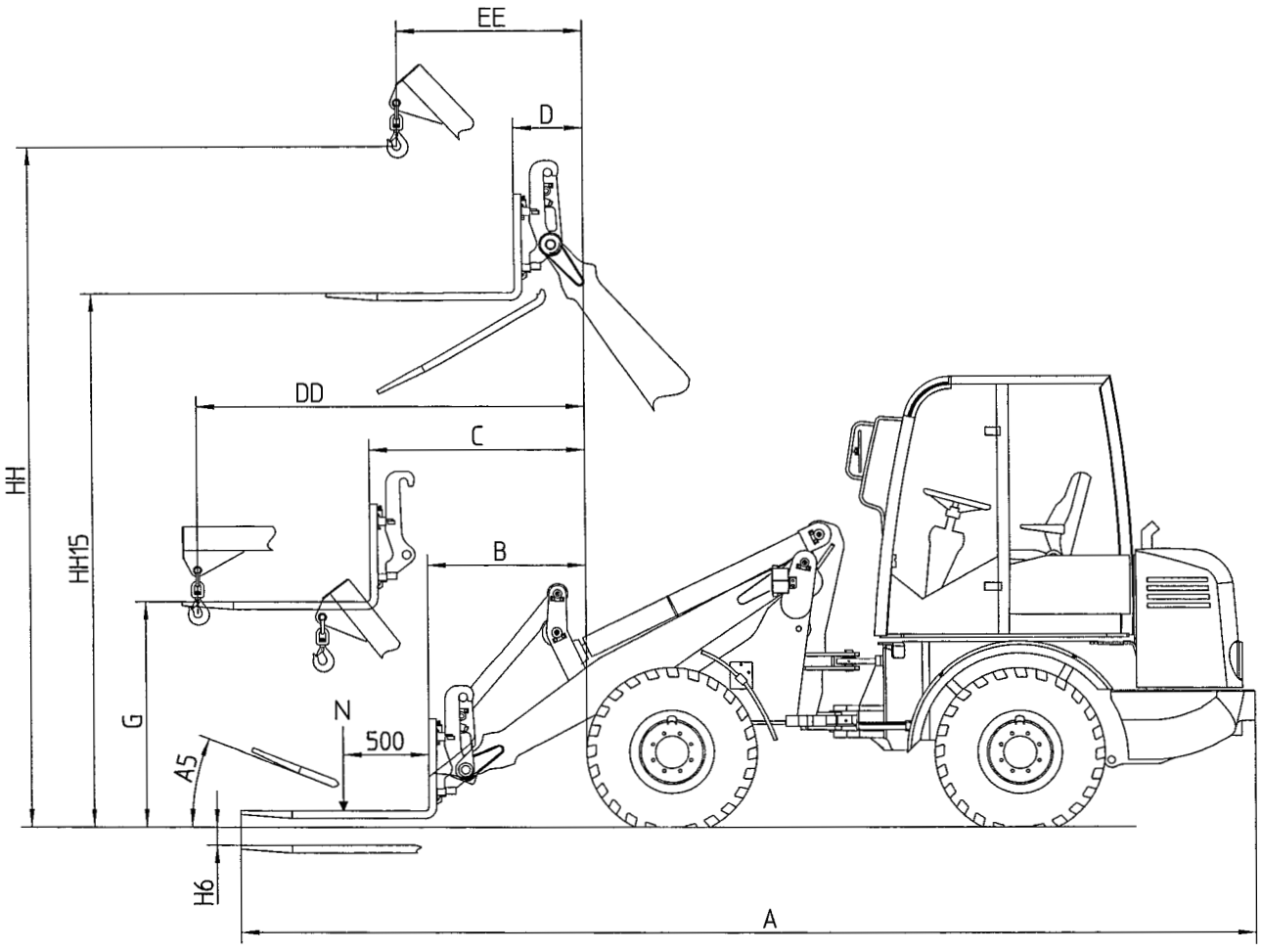
12.1.1 Buckets

Bucket type		Standard bucket	Lightweight bucket	Multi-purpose bucket
Bucket volume	m³	**0.8**	**1.2**	**0.7**
Bucket width	mm	1950	2000	1950
Dead weight	kg	258	283	493
Loads acc. to ISO 14397 *1				
Bulk density	t/m³	1,8	1,3	2
Dump load				
- frontally	kg	3660	3080	2880
- articulated	kg	3230	2550	2345
Payload				
- frontally	kg	1830	1540	1440
- articulated	kg	1615	1275	1175
Loads acc. to ISO 8313 *2				
Bulk density	t/m³	1.8	1.3	2
Dump load				
- frontally	kg	3410	2925	2735
- articulated	kg	2860	2500	2300
Payload				
- frontally	kg	1705	1465	1370
- articulated	kg	1430	1250	1150
Tear-out force acc. to ISO 8313	daN	42	35	44
A Total length (bucket in the transport position)	mm	5550	5490	5550
A2 Max. dump angle (top)	°	45	45	45
Max. dump angle (bottom)	°	125	125	125
B Max. dumping distance at dumping angle 50°	mm	1420	1520	1430
G Dumping height at max. dumping distance and dumping angle 50°	mm	810	650	780
H6 Depth of feed-in	mm	100	160	150
H8 Dumping height at max. lifting height and dumping angle 50°	mm	2585	2500	2515
H10 Max. working height	mm	4170	4300	4030
L6 Dumping distance at max. lifting height and dumping angle 50°	mm	700	650	675
Multipurpose bucket opened:				
D Max. dumping distance at max. lifting height and tilted bucket	mm	-	-	695
HH13 Max. dumping height with tilted bucket	mm	-	-	3290

NOTE

*1 - ISO 14397: “Calculation of permissible payload“
*2 - ISO 8313: “Measurement of dump load”

12.1.2 Fork-lift attachment
12.1.3 Lifting hook



12.1.2 Fork-lift attachment

Tine length	1100 mm
Tine height	45 mm
Tine spacing (center)	
- min.	216 mm
- max.	1054 mm
Dead weight	192 kg

Perm. payload N acc. to ISO 14397	
frontally	
- level ground (stability factor 1.25)	2260 kg
- uneven ground (stability factor 1.67)	1690 kg
articulated	
- level ground (stability factor 1.25)	1990 kg
- uneven ground (stability factor 1.67)	1495 kg
Perm. payload N acc. to DIN 8313	
frontally	
- level ground (stability factor 1.25)	2135 kg
- uneven ground (stability factor 1.67)	1600 kg
articulated	
- level ground (stability factor 1.25)	1785 kg
- uneven ground (stability factor 1.67)	1340 kg
Perm. payload N acc. to DIN 8313, **fork-lift attachment 300 mm above ground**	
frontally	
- level ground (stability factor 1.25)	2440 kg
- uneven ground (stability factor 1.67)	1825 kg
articulated	
- level ground (stability factor 1.25)	2040 kg
- uneven ground (stability factor 1.67)	1530 kg

A	Total length	5970 mm
A5	Tilt angle	19 °
B	Min. reach	960 mm
C	Max. reach	1360 mm
D	Reach at max. lifting height	580 mm
G	Free lift height at max. reach	1355 mm
H6	Depth of feed-in	100 mm
HH15	Free lift height at max. reach (upper tine edge)	3100 mm

12.1.3 Lifting hook

Perm. payload acc. to DIN EN 474-3	
- Max. outreach (stability factor 2)	750 kg
Dead weight	145 kg

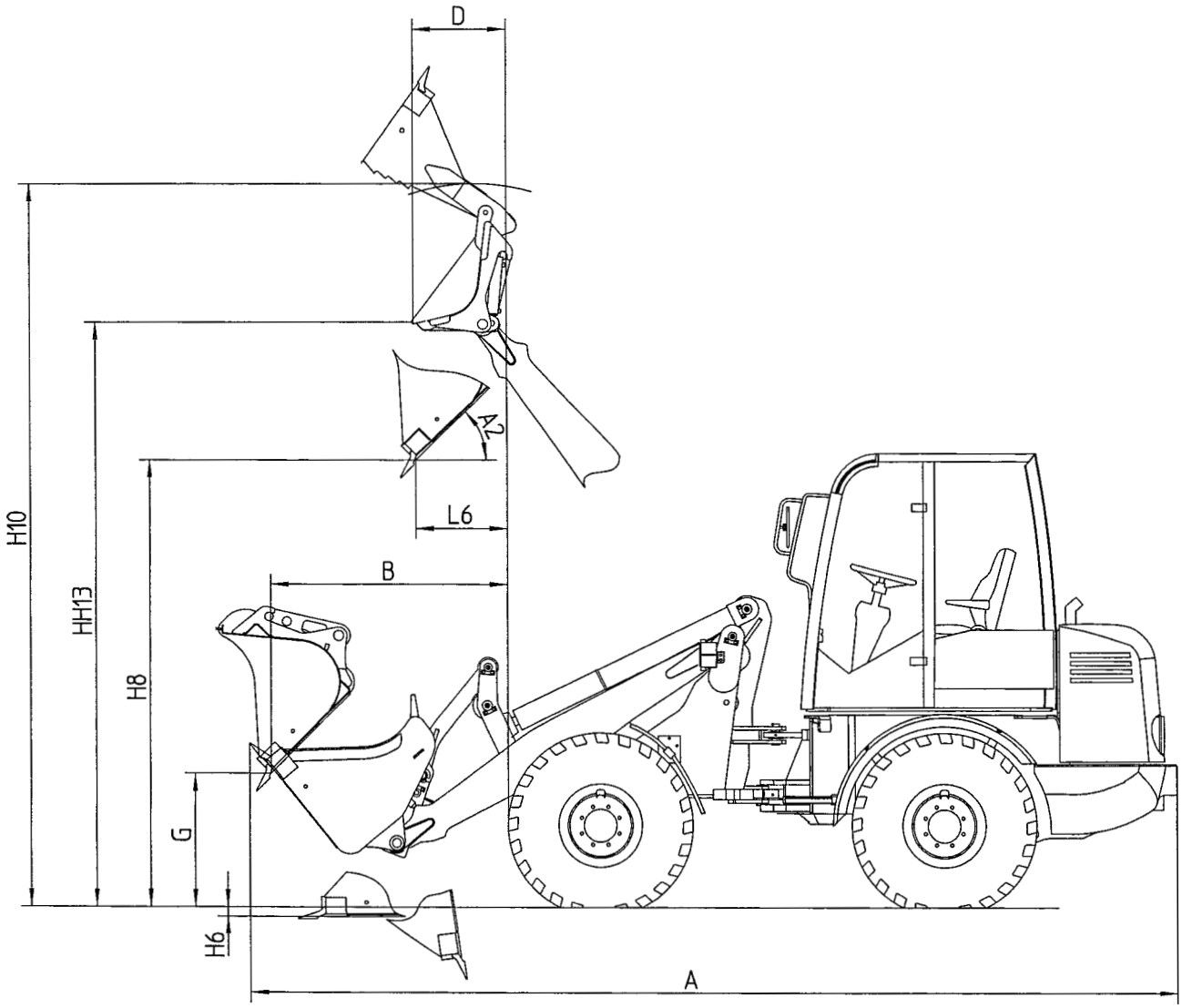
A	Total length	5380 mm
DD	Max. outreach	2290 mm
EE	Reach with bucket arm in uppermost position	1100 mm
HH	Max. lifting height	3970 mm

12.2 AL 100 / AL 100 turbo attachments

NOTE

- The technical data refer to 14.5 -20 12PR tires.

12.2.1 Buckets



12.2.1 Buckets

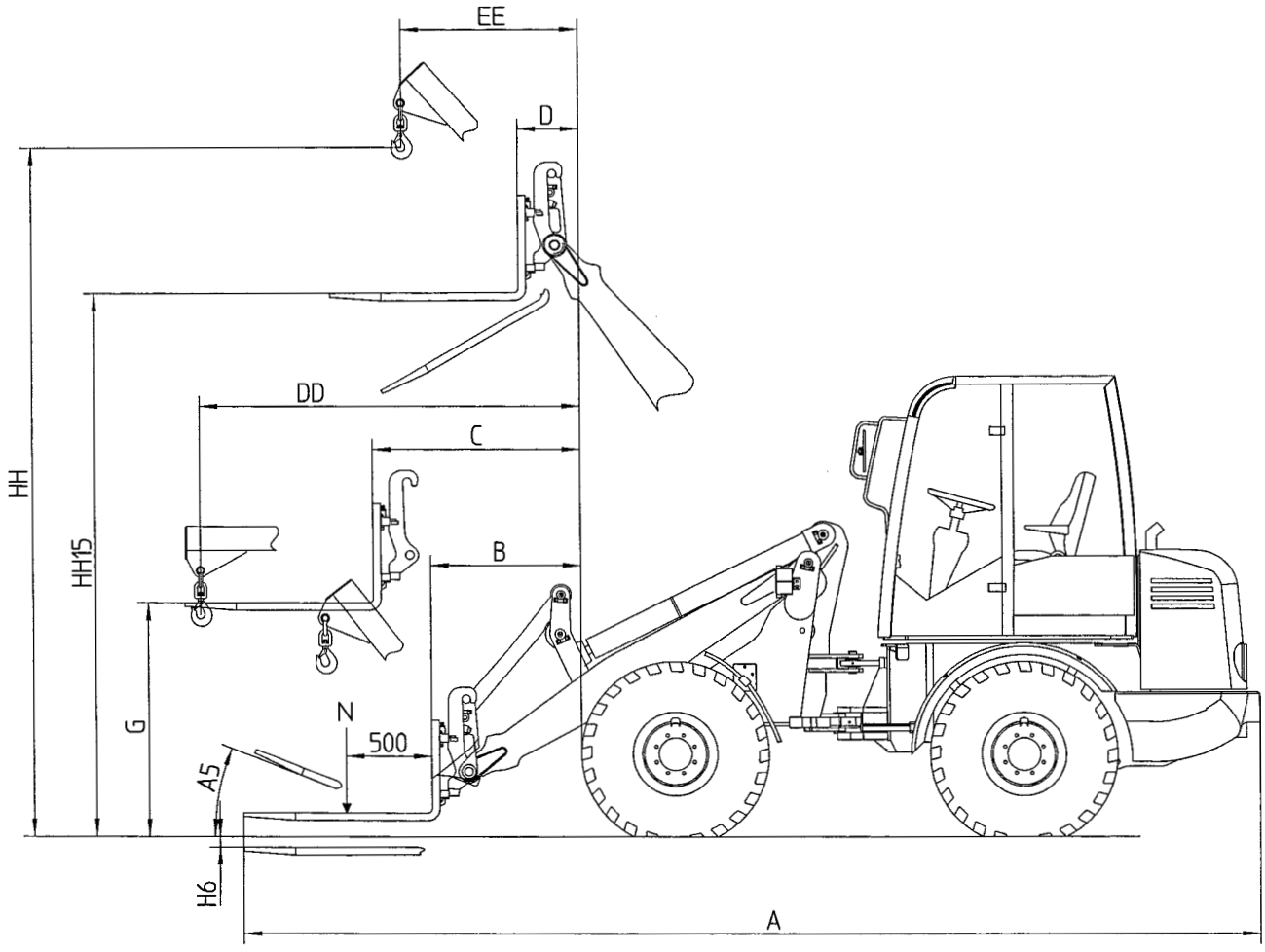
Bucket type		Standard bucket	Lightweight bucket	Multi-purpose bucket
Bucket volume	m³	**1,0**	**1,2**	**0,8**
Bucket width	mm	2000	2000	1950
Dead weight	kg	280	283	551
Loads acc. to ISO 14397 *1				
Bulk density	t/m³	1,8	1,3	2
Dump load				
- frontally	kg	4350	3595	3350
- articulated	kg	3840	2965	2705
Payload				
- frontally	kg	2175	1800	1675
- articulated	kg	1920	1485	1355
Loads acc. to ISO 8313 *2				
Bulk density	t/m³	1,8	1,3	2
Dump load				
- frontally	kg	4000	3415	3180
- articulated	kg	3210	2905	2650
Payload				
- frontally	kg	2000	1710	1590
- articulated	kg	1605	1455	1325
Tear-out force acc. to ISO 8313	daN	45	37	44
A Total length (bucket in the transport position)	mm	5580	5490	5580
A2 Max. dump angle (top)	°	45	45	45
Max. dump angle (bottom)	°	125	125	125
B Max. dumping distance at dumping angle 50°	mm	1420	1520	1430
G Dumping height at max. dumping distance and dumping angle 50°	mm	850	690	820
H6 Depth of feed-in	mm	60	130	110
H8 Dumping height at max. lifting height and dumping angle 50°	mm	2625	2500	2555
H10 Max. working height	mm	4210	4300	4070
L6 Dumping distance at max. lifting height and dumping angle 50°	mm	700	650	675
Multipurpose bucket opened:				
D Max. dumping distance at max. lifting height and tilted bucket	mm	-	-	695
HH13 Max. dumping height with tilted bucket	mm	-	-	3330

NOTE

*1 - ISO 14397: “Calculation of permissible payload“
*2 - ISO 8313: “Measurement of dump load”

12.2.2 Fork-lift attachment

12.2.3 Lifting hook



12.2.2 Fork-lift attachment

Tine length	1100 mm
Tine height	45 mm
Tine spacing (center)	
- min.	216 mm
- max.	1054 mm
Dead weight	192 kg
Perm. payload N acc. to ISO 14397	
frontally	
- level ground (stability factor 1.25)	2720 kg
- uneven ground (stability factor 1.67)	2040 kg
articulated	
- level ground (stability factor 1.25)	2400 kg
- uneven ground (stability factor 1.67)	1800 kg
Perm. payload N acc. to DIN 8313	
frontally	
- level ground (stability factor 1.25)	2580 kg
- uneven ground (stability factor 1.67)	1935 kg
articulated	
- level ground (stability factor 1.25)	2145 kg
- uneven ground (stability factor 1.67)	1610 kg
Perm. payload N acc. to DIN 8313, **fork-lift attachment 300 mm above ground**	
frontally	
- level ground (stability factor 1.25)	2950 kg
- uneven ground (stability factor 1.67)	2215 kg
articulated	
- level ground (stability factor 1.25)	2430 kg
- uneven ground (stability factor 1.67)	1825 kg

A	Total length	5970 mm
A5	Tilt angle	19 °
B	Min. reach	960 mm
C	Max. reach	1360 mm
D	Reach at max. lifting height	580 mm
G	Free lift height at max. reach	1355 mm
H6	Depth of feed-in	60 mm
HH15	Free lift height at max. reach (upper tine edge)	3140 mm

CAUTION

- The maximum permissible capacity of the fork-lift attachment is indicated on the attachment's type plate.
- The load to be picked up must not exceed the maximum permissible capacity of the loader.

12.2.3 Lifting hook

Perm. payload acc. to DIN EN 474-3	
- Max. outreach (stability factor 2)	850 kg
Dead weight	145 kg

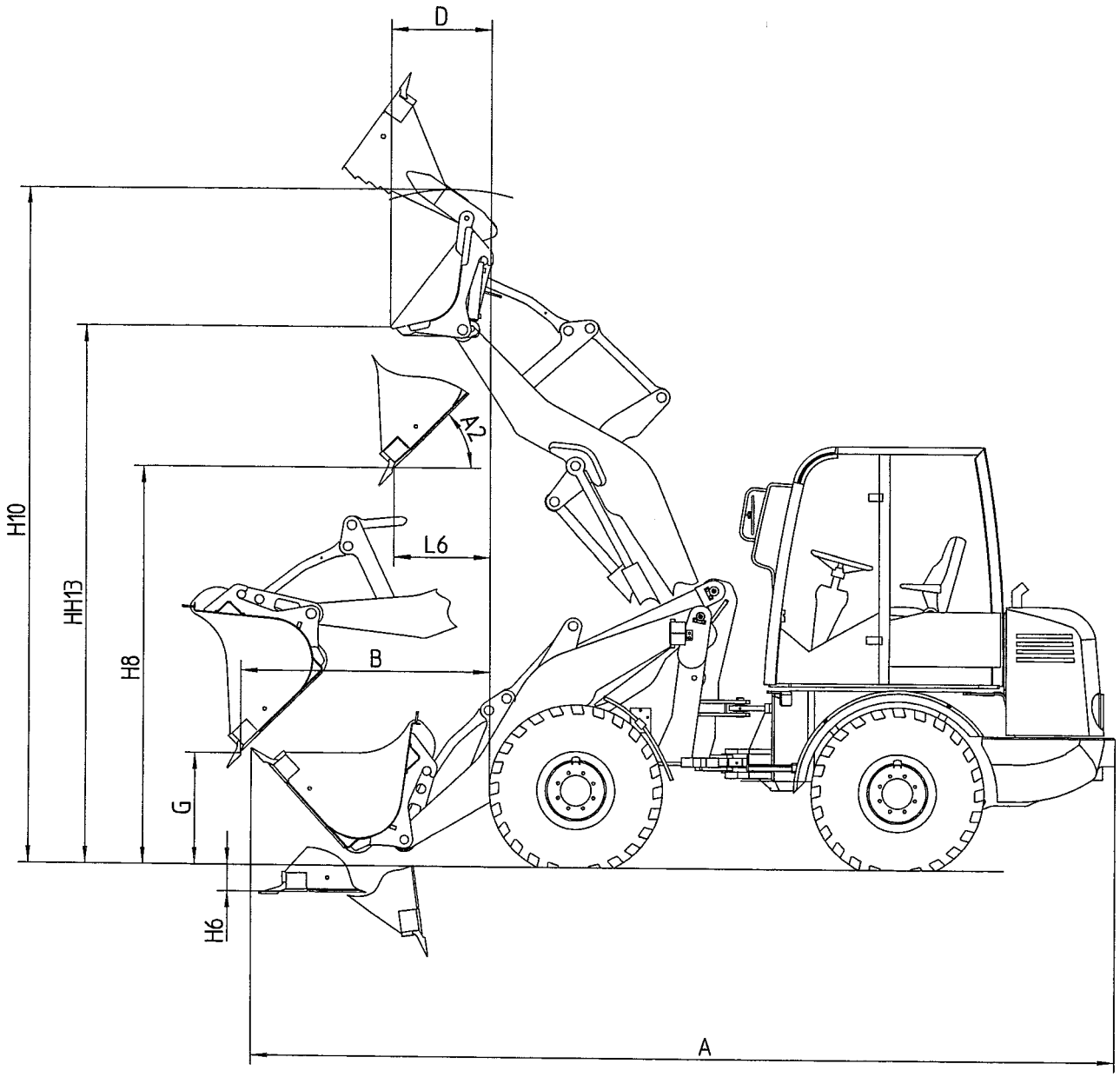
A	Total length	5380 mm
DD	Max. outreach	2290 mm
EE	Reach with bucket arm in uppermost position	1100 mm
HH	Max. lifting height	4010 mm

12.3 AL 120 attachments

NOTE

- The technical data refer to 16/70 - 20 14PR tires.

12.3.1 Buckets



12.3.1 Buckets

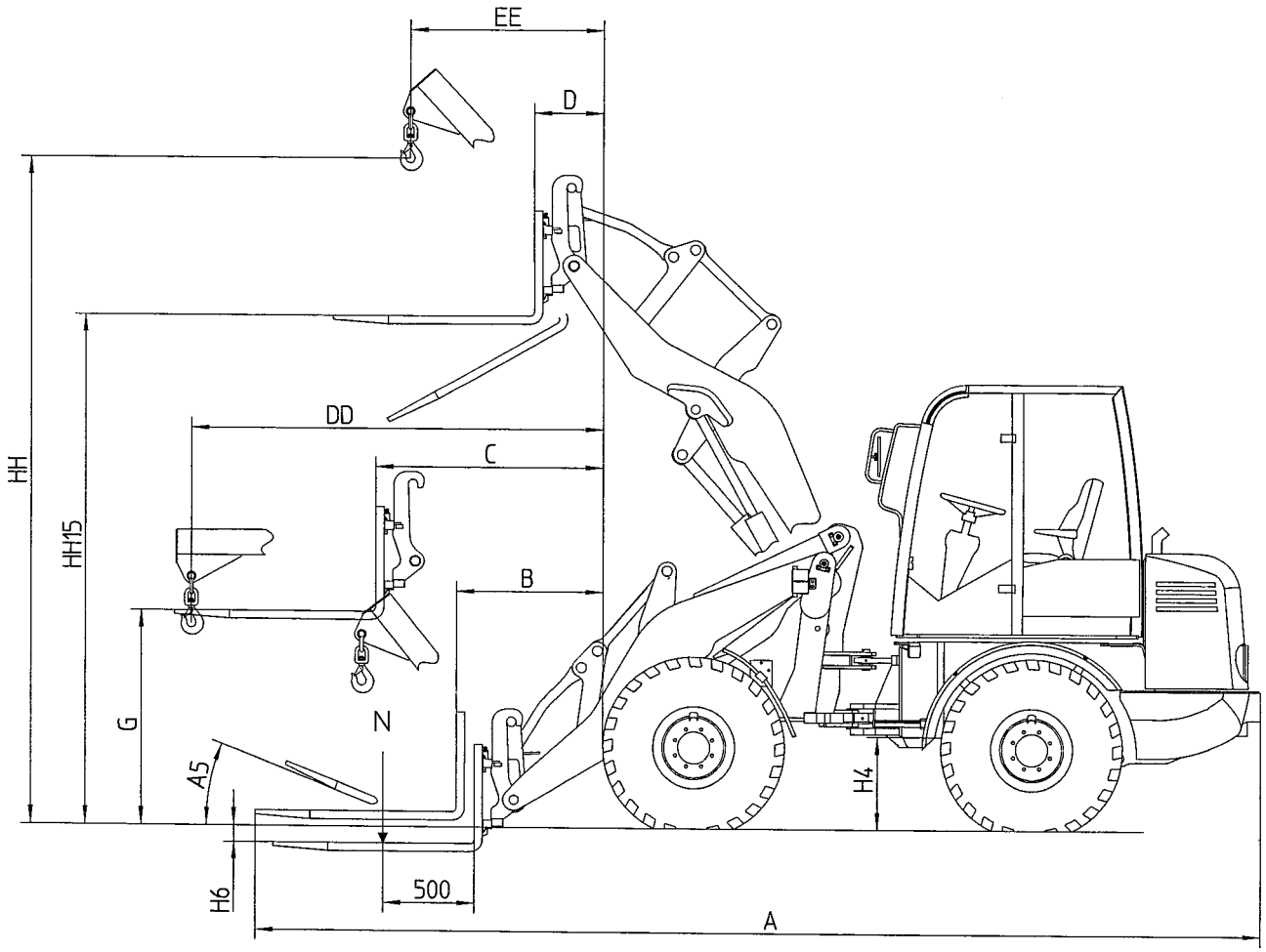
Bucket type		Standard bucket	Lightweight bucket	Multi-purpose bucket
Bucket volume	m³	**1.2**		**1.0**
Bucket width	mm	2000		
Dead weight	kg	310		
Loads acc. to ISO 14397 *1				
Bulk density	t/m³	1,8		
Dump load				
- frontally	kg	4840		
- articulated	kg	4300		
Payload				
- frontally	kg	2420		
- articulated	kg	2150		
Loads acc. to ISO 8313 *2				
Bulk density	t/m³	1,8		
Dump load				
- frontally	kg	4430		
- articulated	kg	3620		
Payload				
- frontally	kg	2215		
- articulated	kg	1810		
Tear-out force acc. to ISO 8313	kN	50		
Thrust force	kN	39		
A Total length (bucket in the transport position)	mm	5775		5735
A2 Max. dump angle (top)	°	45		45
Max. dump angle (bottom)	°	125		125
B Max. dumping distance at dumping angle 50°	mm	1435		1495
G Dumping height at max. dumping distance and dumping angle 50°	mm	830		815
H6 Depth of feed-in	mm	135		100
H8 Dumping height at max. lifting height and dumping angle 50°	mm	2800		2760
H10 Max. working height	mm	4520		4385
L6 Dumping distance at max. lifting height and dumping angle 50°	mm	575		580
Multipurpose bucket opened:				
D Max. dumping distance at max. lifting height and tilted bucket	mm	-	-	530
HH13 Max. dumping height with tilted bucket	mm	-	-	3620

NOTE

*1 - ISO 14397: “Calculation of permissible payload“
*2 - ISO 8313: “Measurement of dump load”

12.3.2 Fork-lift attachment

12.3.3 Lifting hook



12.3.2 Fork-lift attachment

Tine length	mm
Tine height	mm
Tine spacing (center)	
- min.	mm
- max.	mm
Dead weight	kg

Perm. payload N acc. to ISO 14397	
frontally	
- level ground (stability factor 1.25)	3120 kg
- uneven ground (stability factor 1.67)	2340 kg
articulated	
- level ground (stability factor 1.25)	2770 kg
- uneven ground (stability factor 1.67)	2080 kg
Perm. payload N acc. to DIN 8313	
frontally	
- level ground (stability factor 1.25)	2945 kg
- uneven ground (stability factor 1.67)	2210 kg
articulated	
- level ground (stability factor 1.25)	2480 kg
- uneven ground (stability factor 1.67)	1860 kg
Perm. payload N acc. to DIN 8313, **fork-lift attachment 300 mm above ground**	
frontally	
- level ground (stability factor 1.25)	3400 kg
- uneven ground (stability factor 1.67)	2550 kg
articulated	
- level ground (stability factor 1.25)	2850 kg
- uneven ground (stability factor 1.67)	2140 kg

A	Total length	6040 mm
A5	Tilt angle	20 °
B	Min. reach	795 mm
C	Max. reach	1265 mm
D	Reach at max. lifting height	260 mm
G	Free lift height at max. reach	1480 mm
H6	Depth of feed-in	50 mm
HH15	Free lift height at max. reach (upper tine edge)	3400 mm

CAUTION

- The maximum permissible capacity of the fork-lift attachment is indicated on the attachment's type plate.
- The load to be picked up must not exceed the maximum permissible capacity of the loader.

12.3.3 Lifting hook

Perm. payload acc. to DIN EN 474-3	
- Max. outreach (stability factor 2)	kg
Dead weight	kg

A	Total length	5465 mm
DD	Max. outreach	2285 mm
EE	Reach with bucket arm in uppermost position	970 mm
HH	Max. lifting height	4245 mm

Additional options, modifications, notes on inspection for loaders

13 Additional options, modifications, notes on inspection for loaders

13.1 Additional options

none

13.2 Modifications

none