AHLMANN

OPERATING INSTRUCTIONS
SWING SHOVEL LOADER

1000995A GB

AS 150

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Introduction

Preface

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

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

Scope of documentation supplied by manufacturer:

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

Operating Manual

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

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

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

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

Using the Manual

Terminology

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

Note on Figures

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

Abbreviations used

SW = Safety at work regulations

RS = Road safety regulations

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Table of Contents

Safety regulations

1 Fundamental safety instruction

1.1 Warnings and symbols

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

NOTE

Special information for the economical use of the machine.

CAUTION

Special information for necessities and prohibitions for avoiding damages.

DANGER

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

1.2 Use of the loader as authorized

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

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

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

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

1.3 Organizational measures

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

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

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

1.3.4 The driver must wear a seat belt during operation.

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

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

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

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

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

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

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

1.4 Selection of personnel and necessary qualifications

Fundamental obligations

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

These persons must:

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

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

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

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

1.5 Safety Information for Certain Operating Phases

1.5.1 Normal Operation

1.5.1.1 Other persons must not be transported!

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

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

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

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

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

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

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

1.5.1.9 Avoid any work operation which appears to be dangerous!

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

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

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

- by work-induced movements of the machine,

- by work attachments and devices,

- by loads swiveling out,

- by loads falling down,

- by attachments falling down from the machine.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1.5.1.31 Reversing over a longer period must be avoided!

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

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

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

Figure 1-1

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

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

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

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

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

1.5.2.5 Maintenance and repair work may only be carried out when the attachment is set down on the ground or supported or when equivalent measures against unintentional movement were taken.
During maintenance and repair work under the bucket arm:

- the bucket arm must be mechanically propped up, e.g. by inserting the bucket arm support (option) (1-1/ arrow).
- the hand levers for the hydraulic loader (1-2/1) and auxiliary functions (1-2/2) must be secured.
- the swing mechanism must be blocked. Remove the blocking wedge (1-3/arrow) out of the mounting, switch to swing blocking (1-4/arrow), and secure with spring pin.

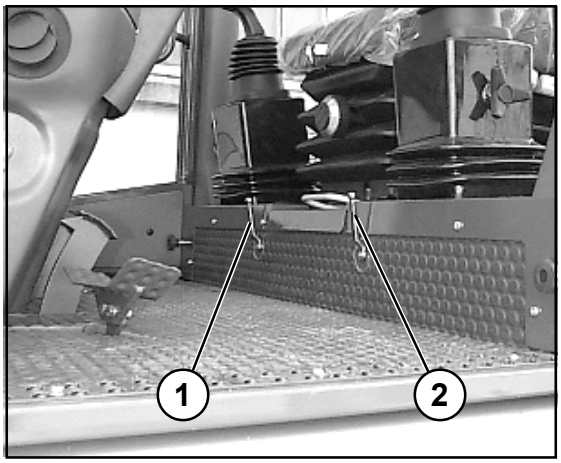


Figure 1-2

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

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

This applies especially to works to the electrical equipment.

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

Figure 1-3

Figure 1-4

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

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

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

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

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

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

1.5.2.15 In the case of erection work having to be carried out above normal human height, suitable safety ascent devices and working platforms must be used. Do not use engine parts as climbing and descending facilities. Use safety harnesses when working at very great heights.
All handles, steps, railings, podests, platforms, ladders must be kept free from dirt and ice.

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

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

1.5.2.18 After cleaning completely remove all protection covering and tape.

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

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

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

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

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

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

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

1.6 Instructions regarding special categories of danger

1.6.1 Electrical energy

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

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

The following safety clearance must be observed, to meet the above mentioned requirement:

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

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

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

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

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

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

1.6.1.6 Always de-energise machine or system parts to be inspected, maintained or repaired by disconnecting the battery main switch.

1.6.1.7 Always disconnect the battery main switch before starting any electrical welding on the machine.

1.6.2 Hydraulic systems

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

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

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

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

1.6.2.5 Never change factory settings for hydraulic components (such as the maximum permissible speed for the axial piston engine). Changing such settings will cause the warranty to become void.

1.6.3 Noise

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

1.6.4 Oil, grease and other chemical substances

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

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

1.6.4.3 Caution when working with brake fluid and battery acid.

TOXIC AND CAUSTIC!

1.6.4.4 Be careful when working with fuel.

FIRE HAZARD!

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

1.6.5 Gas, dust, steam, smoke

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

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

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

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

Explosion hazard!

1.7 Transport and towing, restart

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

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

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

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

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

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

1.8.1 Organizational measures

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

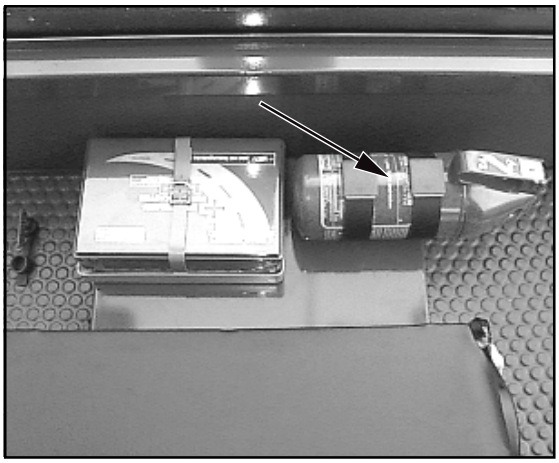


Figure 1-5

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

1.8.2 Selection of personnel, qualifications; additional duties

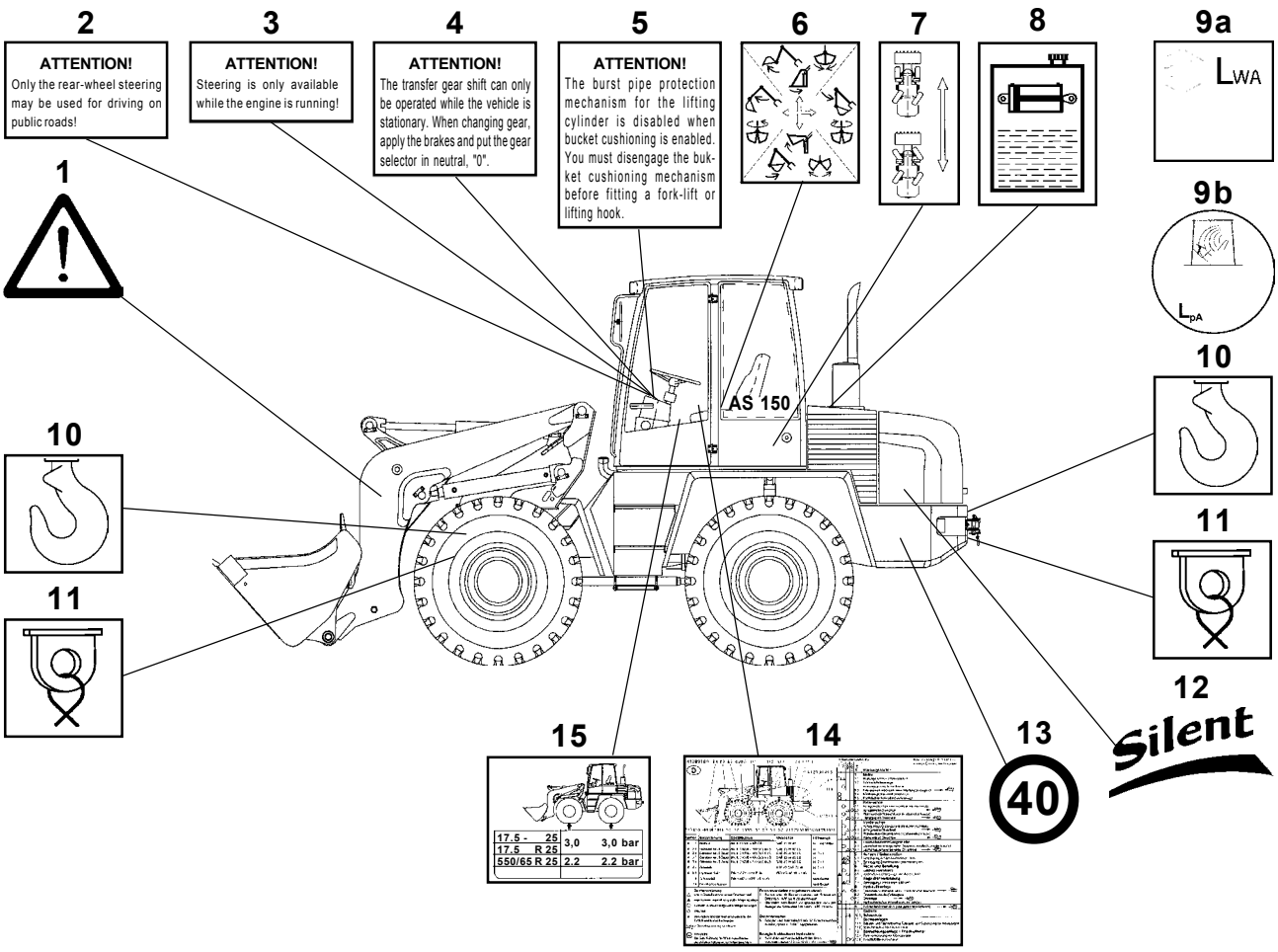
1.8.2.1 Only reliable persons are allowed to work on/with the machine. The minimum legal age must be observed.

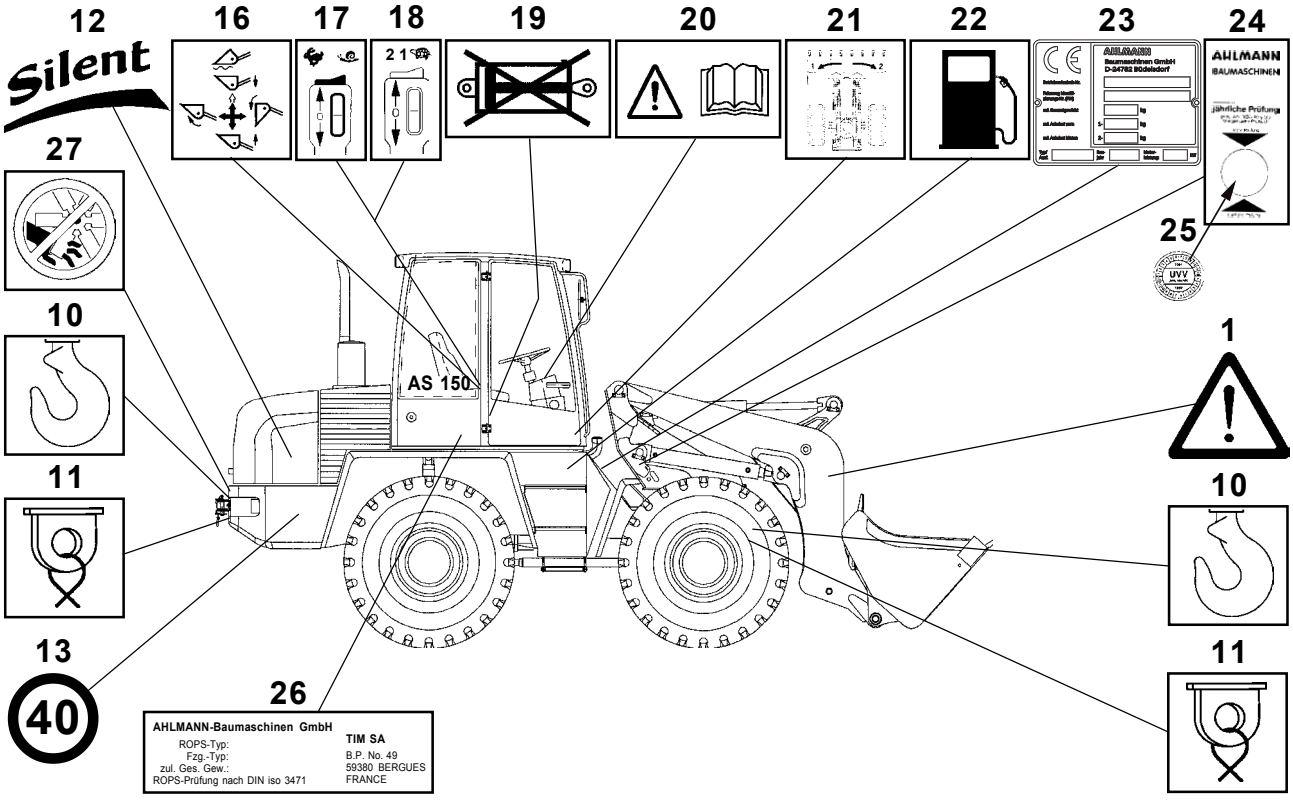
1.8.2.2 Only employ trained or instructed personnel. Clearly define the competencies of the personnel regarding operation, installation, maintenance and repair work. Ensure that only authorized personnel may work on/ with the machine.

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

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

Signs


2
ATTENTION!
Only the rear-wheel steering may be used for driving on public roads!
3
ATTENTION!
Steering is only available while the engine is running!
4
ATTENTION!
The transfer gear shift can only be operated while the vehicle is stationary. When changing gear, apply the brakes and put the gear selector in neutral, "0".
5
ATTENTION!
The burst pipe protection mechanism for the lifting cylinder is disabled when bucket cushioning is enabled. You must disengage the bukket cushioning mechanism before fitting a fork-lift or lifting hook.
6
7
8
9a
LWA
9b
LpA
1
10
11
AS 150
10
11
12
Silent
15
17.5 - 25 3,0 3,0 bar
17.5 R 25
550/65 R 25 2.2 2.2 bar
14
13
40


12
Silent
16
17
18
21
19
20
21
22
23
AHLMANN
Baumaschinen GmbH
D-34782 Bödeledorf
24
AHLMANN
BAUMASCHINEN
jährliche Prüfung
25
UVV
27
10
11
AS 150
1
10
11
13
40
26
AHLMANN-Baumaschinen GmbH
ROPS-Typ:
Fzg.-Typ:
zul. Ges. Gew.:
ROPS-Prüfung nach DIN iso 3471
TIM SA
B.P. No. 49
59380 BERGUES
FRANCE

1	Symbol:	Dangerous area, keep clear
2	Sign:	**ATTENTION!** Only the rear-wheel steering may be used for driving on public roads!!
3	Sign:	**ATTENTION!** - Steering is only available while the engine is running!
4	Sign:	**» for slow-runners only «** **ATTENTION!** The transfergear shift can only be operated while the vehicle is stationary. When changing gear, apply the service brakes and select neutral gear ("0").
5	Sign:	**» only for machines with pipe burst protection «** **ATTENTION!** The burst pipe protection mechanism for the lifting cylinder is disabled when bucket cushioning is enabled. You must disable the bucket cushioning mechanism before fitting a fork-lift or lifting hook.
6	Symbol:	Manual lever for hydraulics (4-6/5) » left of seat «
7	Symbol:	Switch steering type (4-6/4) Rear wheel /Four wheel
8	Symbol:	Hydraulic oil tank
9a	Sign:	Noise level (Chp. 11.17)
9b	Sign:	Accoustic pressure (Chp. 11.17)
10	Symbol:	Lifting hook
11	Symbol:	Lashing points
12	Sign:	Low noise emission equipment
13	Sign:	Max. speed
14	Sign:	Maintenance plan
15	Sign:	Tire pressure
16	Symbol:	Manual lever for main hydraulics (4-7/2)
17	Symbol:	**» for slow-runners** (Type 20 km/h and 25 km/h) **«** Hydraulic gear shift (4-7/1) Hare symbol - road Snail symbol - field Direction - forwards - 0 - reverse
18	Symbol:	**» for quick-runners** (Type 40 km/h) **«** Gear lever - 2nd gear - 1st gear - Alpha max. (Turtle symbol)
19	Symbol:	Stop valve for main/auxilliary hydraulics - closed
20	Symbol:	Read and implement instructions in manual before commissioning. Ensure that all other users are aware of safety precautions!
21	Symbol:	Swivel joint
22	Symbol:	Fuel tank
23	Type plate:	Machine (includes vehicle ID number)
24	Sign:	Annual inspection to TC standards
25	Sign:	TC plaque
26	Type plate:	Operator´s cabin
27	Sign:	Do not open while engine is running

Anti-Theft Protection

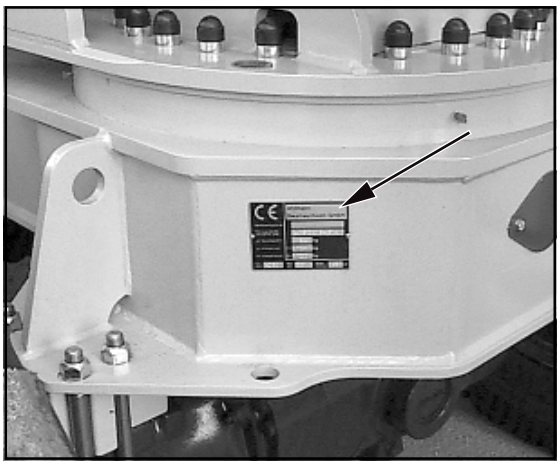


Fig. 3-1

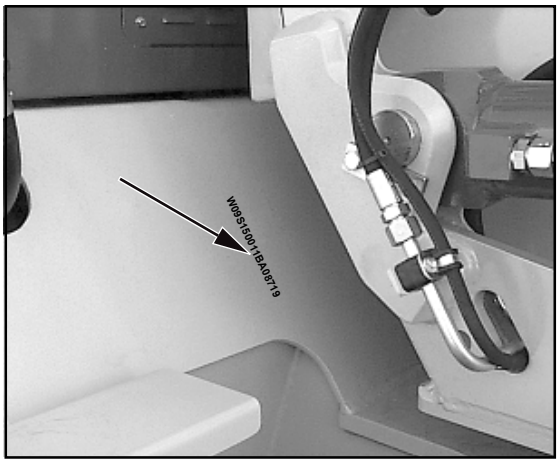


Fig. 3-2

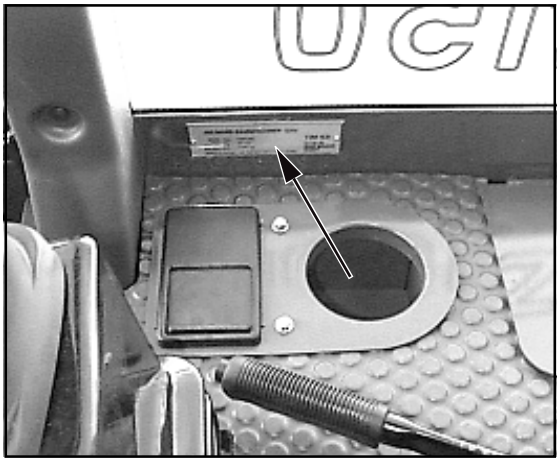


Fig. 3-3

3 Anti-Theft Protection

Recent years have seen a sharp increase in the number of thefts of construction machinery.
To allow the authorities (such as the police, or customs and excise) to discover and identify stolen vehicles more quickly, **Ahlmann** construction machines are fitted with the following identification marks:

3.1 Equipment ID marks

(1) The machine type plaque (3-1/arrow). Amongst other details this includes the 17 digit **FIN** number (vehicle identification number) which starts with W09.

(2) The **FIN** number is also punched into the front of the vehicle (3-2/arrow).

(3) The ROPS plaque (3-3/arrow).
This includes the name of the manufacturer, details of the ROPS type, vehicle type, and max. permitted weight.

3.2 Parking the vehicle

(1) Turn the steering to the left or right till it locks in place.

(2) Put the parking brake on (4-7/4).

(3) Lower the quick change mechanism to allow
- the lip of the bucket,
- the forks of the fork loader,
- the lifting hook boom

to touch the ground.

(4) Close both stop valves (1-2/1 and 1-2/2).

(5) Place gear lever (4-7/3) in "forward" or "reverse".

(6) **- Slow-runners:**
- Use gear selection switch to select gear "I" (4-8/4).
- Select hydraulic drive level "I" (4-7/1).

- Fast-runners:
Use work hydraulics valvecontrol lever (4-7/1) for to select gear "Alpha max. (Turtle symbol)".

(7) Remove ignition key.

(8) Remove main battery key (4-7/5).

(9) Switch on working lights (4-8/24). *

(10) Switch on 360 degree light (SA) (4-8/12). *

(11) Switch on hazard-warning lights (4-8/11). *

(12) Push steering column headlamp switch to select "beam" (4-5/5). *

(13) Lock both doors.

(14) Lock engine hood.

(15) Lock fuel tank filler cap.

* If the vehicle is short-circuited, bystanders will be alerted by the unusual lighting displayed.

3.3 Transponder Immobilizer

(Optional)
The "Transponder Immoblizer" is an electronic immobilizer that disables critical features of the vehicle.
If the transponder (which can be attached to the key-fob for the ignition key) is removed from the vicinity of the receiver (i.e. the vicinity of the ignition lock), these functions are interrupted.

Insurance Benefits:

The transponder immobilizer is in line with the latest stringent requirements imposed by insurance companies. Ask your insurance broker for details!

Description

4 Description

Constructional and design enhancements are important for the technical development of this equipment and may lead to deviations between figures and content in this manual.
These changes are summarized in Chapter 13. Please refer to Chapter 13 for details.

4.1 Overview

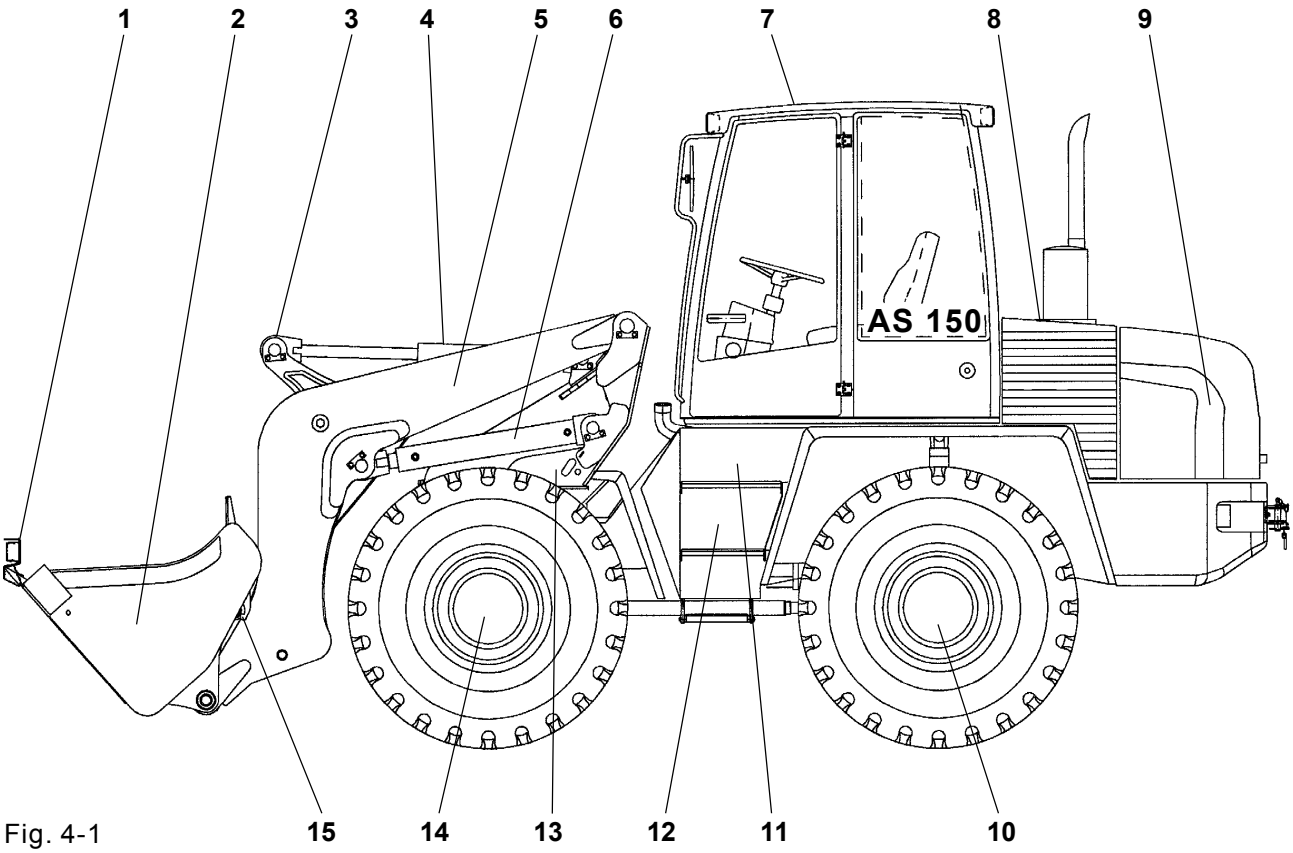


Fig. 4-1

1 - Bucket protector
2 - Bucket/Attachment
3 - Trunnion balls
4 - Push cylinder
5 - Boom
6 - Lift cylinder
7 - Cabin
8 - Hydraulic oil tank/Filler cap
9 - Engine
10 - Rear axle
11 - Battery case
12 - Tool case
13 - Swivel assembly
14 - Front axle
15 - Quick coupling mechanism
16 - Fuel tank, access ladder on right side of vehicle (not shown)

4.2 Swivel assembly and Axle support

The twin rotational cylinders are driven by a separate gear oil pump via a control valve. The swivel assembly is attached to the cylinders via drive chains, and thus totally free of play. Rotation can occur simutaneously while lifting the boom without any interference between the two components.

The loader assembly can be rotated through 90° left or right.

When the loader assembly is rotated through more than approximately 30°, the axle support mechanism automatically engages. Hydraulic pressure is built up in the rear axle support cylinder on the load-bearing side via the support valve and uses the actual load pressure to counteract the effect of the rotated load.

NOTE

Axle support is disengaged when the swivel assembly is centered.

4.3 Float Feature

The assembly is equipped with a float feature that allows the operator to perform tasks such as leveling on uneven terrains. To enable the float feature, push the hydraulics control lever (4-7/2) forwards through its pressure point. The lever will remain in this position until you disengage the float feature by pulling it in the opposite direction.

DANGER

Ensure that the bucket is grounded before engaging the float feature.

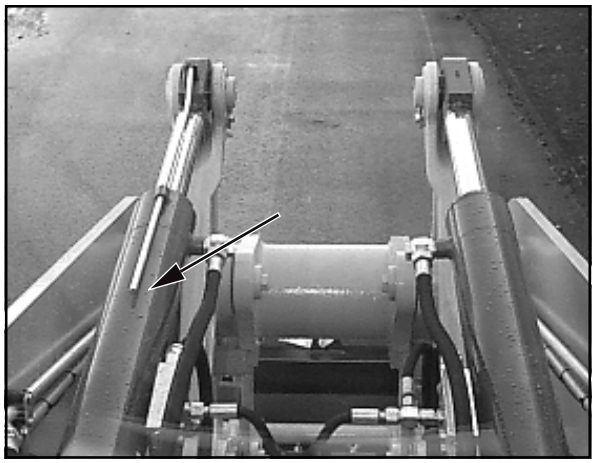


Fig. 4-2

4.4 Bucket Position Display

The driver can determine the bucket position by checking the colored marks on the tilt cylinder. If the mark on the tilt cylinder aligns with the end of the monitoring rod (4-2/ arrow), the bucket heel is parallel to the ground.

4.5 Accoustic Warning System

The machine is fitted with an accoustic warning system that provides three functions:

1. Show gear shift failure.
   » In combination with signal lamp (4-8/10). «
2. Show hydraulic oil temperature over 100°C (+/- 3°C).
   » In combination with signal lamp (4-8/36). «
3. Show indicator use.
   » In combination with signal lamp(4-8/26). «

4.6 Air Conditioning (optional)

The loader is equipped with an air conditioning unit that allows the driver to set the desired temperature, thus guaranteeing improved operator response and considerably enhancing operator concentration. At the same time, the air conditioning unit dehydrates the air entering the cab, preventing condensation and steamed up windows, and allowing for better visibility. Additionally, the air conditioning unit uses dust filters to filter the air, at the same time preventing dust and other unpleasant or harmful substances from entering the cab by permanently generating slightly raised cab pressure.

To ensure perfect working order and full performance, the compressor must be engaged once a week for a short period, in order to lubricate the internal gaskets.

If the ambient temperature is low, the compressor should not be switched on until the engine has reached running temperature. The coolant, which in fluid state tends to collect at the lowest point in the compressor circuit, assumes its gaseous form due to engine heat. Fluid coolant can cause damage to the compressor.

DANGER

- Due not attempt to open the air conditioning circuit, as this will cause coolant loss.
- The coolant circuit contains gas which can be dangerous in certain circumstances.

ATTENTION

- The air conditioning unit should be maintained by trained and authorized staff only.
- The compressor has an oil fill-level gage. Do not remove the gage, as this will empty the unit. The oil fill-level does not need to be checked, except when emptying the air conditioning circuit.

NOTE

If the circuit develops a leak, the air conditioning unit will become ineffective.

4.7 Bucket Cushioning

When driving the loader over a longer distance, particularly if the bucket is loaded, it makes sense to engange the bucket cushioning feature (4-8/15) to prevent the loader from seesawing. This particularly applies on uneven terrain and if the loader is driven at higher speeds.

ATTENTION

- Bucket cushioning can only be activated while moving the loader, but not for normal operations.
- The pipe burst protection system is deactivated when bucket cushioning is engaged.
- Bucket cushioning cannot be activated when a fork-lift attachment or lifting hook is fitted.

NOTE

- Bucket cushioning is activated by pressing a button (4-8/15).
- Returning the starter switch (4-8/19) to the "0" position will automatically disengage the bucket cushioning mechanism. Re-engage the the mechanism, if required.

4.8 Gear Selection Type "20 km/h" and "25 km/h"

ATTENTION

The gears of the transfer gear shift can only be selected when the vehicle is stationary, the service brakes have been applied and the direction selector (4-7/3) is in neutral (position "0").

To select a gear, press the push-button (4-8/4) on the dash board.

- Press the button once to engage first gear (the push-button lights up).
- Press the button again to engage second gear (the push-button is unlit).

NOTE

Second gear is automatically selected when you restart the vehicle, that is after the device has been powered off.

4.9 Changing Wheels

DANGER

Before changing a wheel on a public road, ensure that the danger area has been secured.

(1) Park the vehicle on level ground.
(2) Put the drive selector (4-7/3) in neutral (position "0".
(3) Apply the parking brakes (4-7/4).

Fig. 4-3

(4) Changing a front wheel:
- Lift and mechanically prop up bucket arm [e.g. by inserting the bucket arm support (option) (1-1/arrow)] and lower bucket arm until it rests on the bucket arm support.
- Block the swivel assembly. To do so remove the wedge (1-3/arrow) from the holder, insert it in the swivel retainer (1-4/arrow) and use a spring-pin to lock it in this position .

(4) Changing a rear wheel:
Drop and uncouple attachment.

(5) Turn the ignition key (4-8/19) left to position "0".
(6) Lock the levers for main and auxiliary hydraulics (1-2/1 and 1-2/2).
(7) Chock one wheel on the rear axle in both directions to prevent the vehicle from rolling. Choose the wheel that **does not** need to be changed.
(8) Loosen the wheel nuts on the wheel you are changing to a point where they can be removed without needing to apply force.
(9) Place a suitable jack (minimum load 6 tons) at the jacking point under the rear axle as indicated in (4-3) ensuring that the jack is centered under the axle and cannot slip. Then raise the jack until the wheel is clear of the road.

DANGER
- Ensure that the jack does not sink into soft ground by using an appropriate base.
- Ensure that the jack is properly seated.

(10) Completely loosen and remove the wheel nuts.
(11) Lower the vehicle by lowering the jack slightly to a point where the wheel bolts are freely accessible.
(12) Rotate the wheel clockwise and anticlockwise while pulling the wheel off the wheel hub, and then roll the wheel to one side.
(13) Fit the new wheel on the hub.

NOTE
- Use only tires specified in Chapter 11.7.
- Pay attention to the profile direction.
- If the profile direction of your spare tire is inappropriate, the spare wheel must be replaced by a wheel with the appropriate tire profile as soon as possible.
- All four wheels must be of the same size and have the same PR (ply rating) number. Refer to Fig. 4-4 for the running direction.

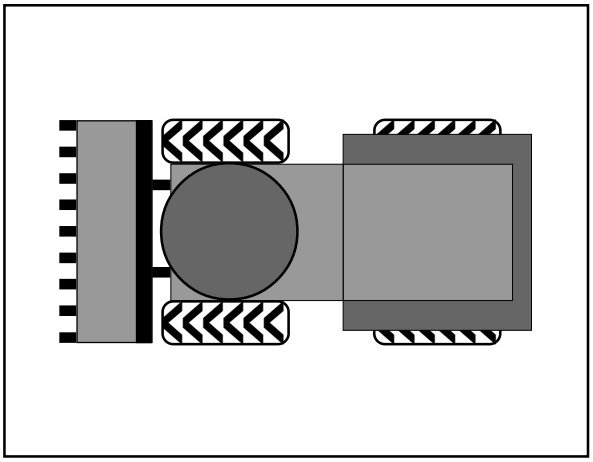


Fig. 4-4

(14) Replace wheel nuts manually.

(15) Lower the jack to lower the front/rear axle.

(16) Use a torque wrench (600 Nm) to tighten the wheel nuts.

ATTENTION
Re-tighten the wheel nuts after 8 - 10 operating hours.

4.10 Operating elements

1 - Locking device for steering column adjustment
  - forwards/backwards
  - axially parallel to steering column
2 - Throttle
3 - Double pedal for service brakes/inching
4 - Foot pedal for swivel
5 - Steering column switch
  - forwards: right indicator
  - backwards: left indicator
  - up - driving lights
  - down - driving lights beam
  - push-button - signal-horn
6 - Heating and ventilation unit /air conditioning (opt.)

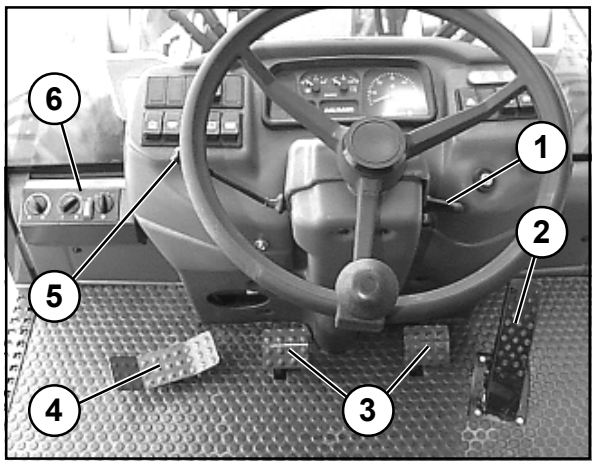


Fig. 4-5

Left of driver´s seat:

1 - Door handle
2 - not used
3 - Inspection flap
4 - Steering selection lever
  - outwards : four-wheel-drive
  - inwards: rear-wheel-drive
5 - Control lever auxiliary hydraulics front boom
6 - Switch for auxiliary hydraulics front boom (opt.)
7 - Push-button dump lock (opt.)
8 - Manual console adjustment wheel (valve control for auxiliary hydraulics)

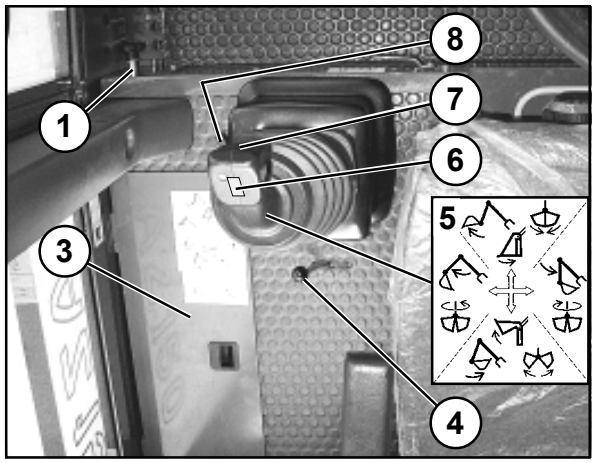


Fig. 4-6

Right of driver´s seat:

1 - **Fast-runners**
  - Gears:
    - left: 2nd gear
    - center: 1st gear
    - right: Alpha max. (Turtle symbol)
  - **Slow-runners**
  - Hydraulic drive levels:
    - right - speed I: slow
    - left - speed II: fast
2 - Valve control for main hydraulics
3 - Drive selector: forward/0/reverse
4 - Lever for parking brake
5 - Main battery switch
6 - Inspection flap
7 - Holder
8 - Manual console adjustment wheel (valve control for main hydraulics)
9 - Door handle

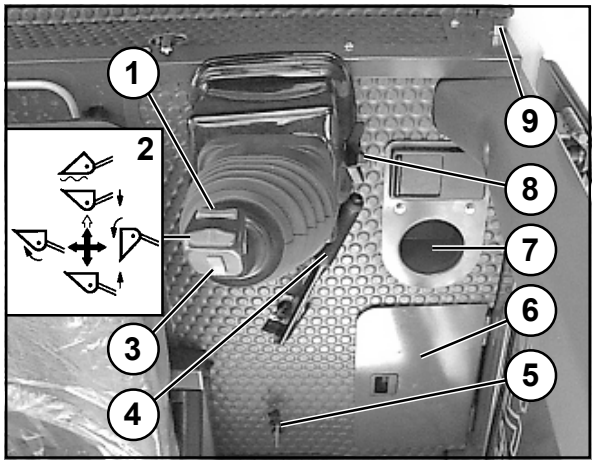


Fig. 4-7

4.11 Dashboard

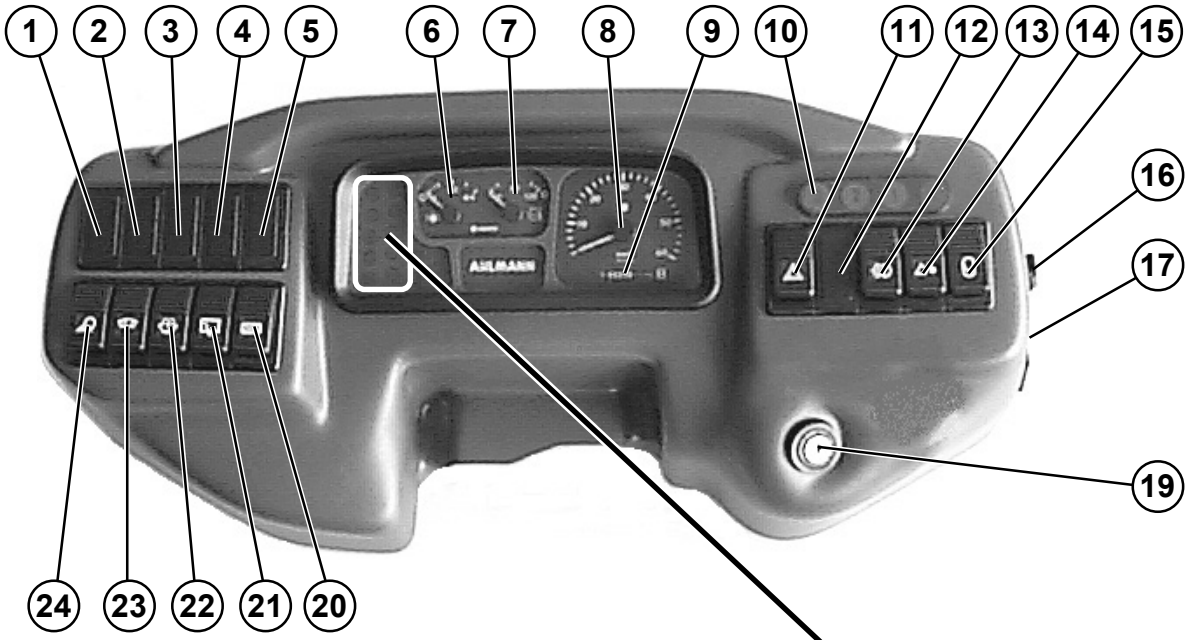
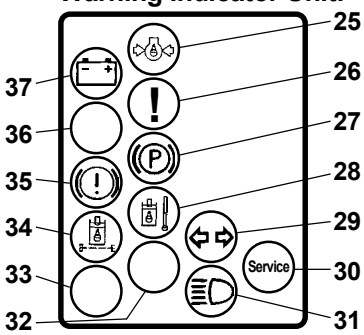


Fig. 4-8

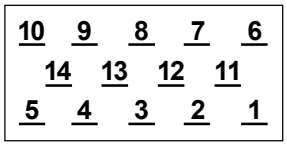
Warning Indicator Unit:



1 - Rocker switch for permanently engaging auxiliary hydraulics (opt.)
2 - not used
3 - not used
4 - Push-button for speed select (nur für Langsamläufer)
5 - Rocker switch for differential lock (opt.)
6 - Fuel indicator
7 - Cooling water temperature display/
Warning light cooling water temperature
8 - Tachometer
9 - Operating hour counter
10 - Indicators for gear select
from left to right:
2nd gear,
1st gear,
Alpha max. (Turtle symbol),
malfunction (red) with accoustic warning (see section 4.5)
11 - Rocker switch for hazard warning lights
12 - Rocker switch for 360° light (opt.)
13 - Rocker switch for road lights
- Position I: Rear lights, side lights
- Stellung II: Driving lights
14 - Push-button Release quick coupling mechanism
15 - Push-button for bucket cushioning
16 - Socket
17 - Fusebox
18 - not used
19 - Starter switch
20 - Rocker switch for heated rear screen, rear view mirror (opt.)
21 - Rocker switch for screen wash / rear screen wash
22 - Rocker switch for windscreen wipers front (continuous)
23 - Rocker switch for windscreen wipers front (interval)
24 - Rocker switch for working floodlights
25 - Warning indicator engine oil pressure
26 - Warning indicator cooling water low
27 - Warning indicator parking brake
28 - Warning indicator hydraulic oil temperature
29 - Indicator travel direction
30 - Indicator service interval (opt)
31 - Warning indicator driving lights beam
32 - not used
33 - not used
34 - Warning indicator hydraulic oil filter blocked
35 - Warning indicator service brake malfunction
36 - not used
37 - Indicator loading

opt. = optional feature

Fuse box (Item 17):



1	Driving operations	7,5 A
2	Indicators	7,5 A
3	Hydraulics	10,0 A
4	Heating/Air cond.	10,0 A
5	Heated rear screen	15,0 A
6	Headlight beam	7,5 A
7	Headlight dip	7,5 A
8	Tail light left, Sidelight left	5,0 A
9	Tail light right, Sidelight right	5,0 A
10	Hazard warning	7,5 A
11	Wipers/Washer	15,0 A
12	Engine cut-off	5,0 A
13	Working floodlights, Panel display lighting, Brake lights	25,0 A
14	360° light (opt.), Signal-horn, Socket, Interior light	20,0 A

opt. = optional feature

Operations

5 Operations

The manufacturer reserves the right to alter construction details, which may lead to some deviations between your actual equipment and the figures shown in this manual, but will not affect the accuracy of the contents.
Changes have been collated and documented in Chapter 13.

5.1 Checks before you start

- Engine oil fill-level (refer to engine manual)
- Hydraulic oil fill-level
- Fuel reserves
- Tire pressure
- Tire tread
- Battery fluid fill-level
- Lighting unit
- Mirrors
- Seat position
- Swivel assembly lock (1-4/arrow) may need to be removed » prior to commencing work only«
- Remove bucket arm prop [(e.g. bucket arm support (option) (1-1/arrow)] if necessary
- Stop valves for main and auxiliary hydraulics (1-2/1 and 1-2/2) may need to be removed » prior to commencing work only «
- General condition of equipment, check for leakages, for example
- Check whether
  - a first aid kit
  - a warning triangle
  - a hazard warning light

  are available.

5.2 Getting started

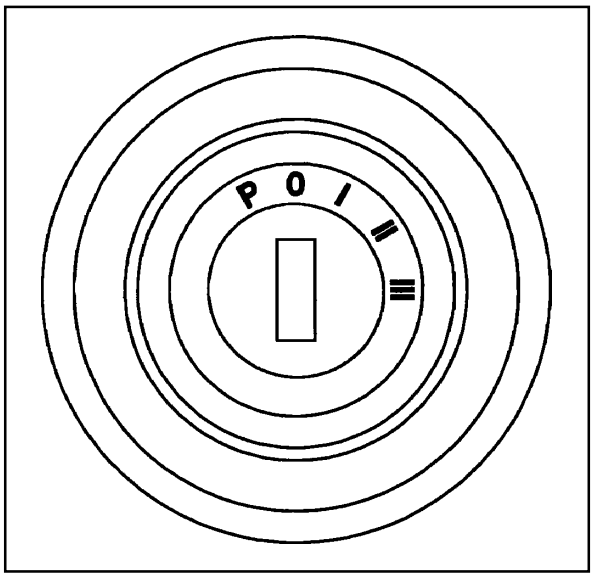


Fig. 5-1

5.2.1 Starting the diesel engine

(1) Apply the parking brakes(4-7/4).

(2) Insert the main battery key (4-7/5).

(3) Put the gear selector (4-7/3) in neutral (position "0") (immobilizer!).

(4) Insert the ignition key in the ignition (4-8/19) and turn right to the "I" (5-1) position.

NOTE
The charge indicator, and the indicators for the parking brake and engine oil pressure will light up. The fuel and cooling water temperature displays will show readings.

(5) Now turn the ignition key to the right to position "III". Let go of the key as soon as the engine fires.

NOTE

- If the engine fails to fire after two attempts, follow the troubleshooting procedures outlined in the engine manual.
- In case of extremely low ambient temperature, follow the procedures outlined in the engine manual.
- After cold starting the blockwage warning indicator may light up, however, the indicator will be switched off as the hydraulic oil reaches normal temperature. Run the equipment at **low** revs, and never at full power until the indicator is switched off (4-8/36).

5.2.2 Winter operations

ATTENTION

If the ambient temperature is below 0° C, the equipment must be "warmed up" to avoid damage to specific components. While the engine is idling, accentuate all the cylinders (lifting, tipping and swivel cylinder) for some time (depending on the ambient temperature).

The following tasks must be fulfilled to ensure trouble free operations at low temperatures:

5.2.2.1 Fuel

At low temperatures paraffin precipitation can cause blockages of the fuel system. Use winter diesel fuel (suitable down to -15° C) at temperatures below 0°C.

NOTE

Winter diesel fuel is normally available from refuelling stations in time for the cold season. Often diesel fuels with additives are available for use in ambient temperatures down to -20°C (super-grade diesel fuel).
Add paraffin additives for temperatures below -15°C or -20°C. Diagram (5-2) shows the required quantities.

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

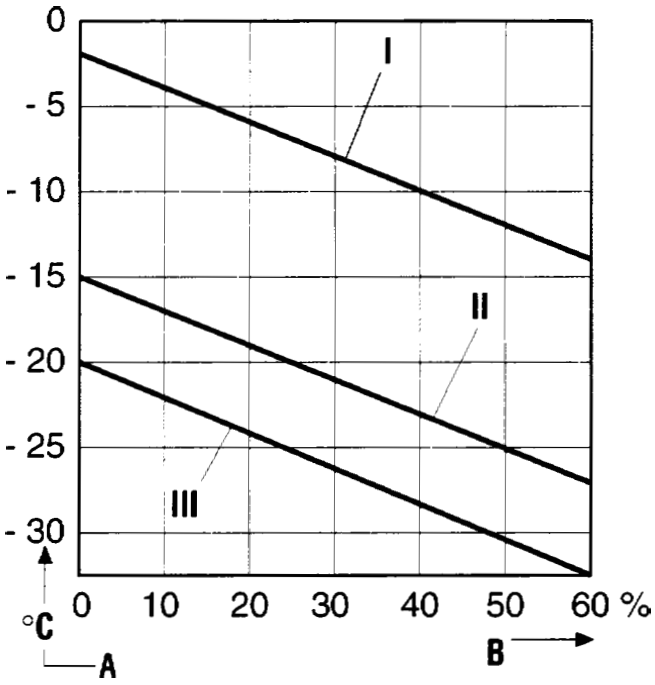


Fig. 5-2

ATTENTION

Use only the fuel tank for mixing fuel! First fill in the required amount of paraffin oil and then add diesel.

5.2.2.2 Oil Change Engine

Refer to the operating manual for the engine and the operating manual for the equipment (section 8.2.6).

5.2.2.3 Oil Change Hydraulic System

ATTENTION

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 8.2.10 for the oil change procedure required for the hydraulic system.

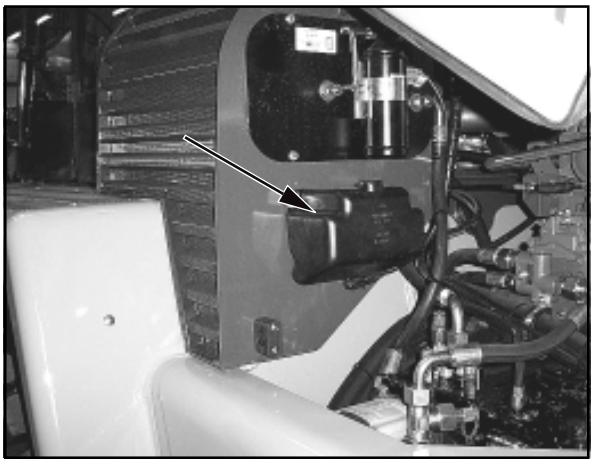


Fig. 5-3

5.2.2.4 Anti-Freeze for the Screen Washer

ATTENTION

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/ arrow) to prevent it from icing up.
Follow the manufacturer´s instructions for the mixing ratio.

5.2.3 Driving the loader on public roads

ATTENTION

- Driving on public roads is allowed **only when an empty** standard or multi-purpose is attached and **only then if** a bucket protector has been fitted.
- The maximum permissible speed is 30 km/h with the driving light switched on. The driving light only serves to illuminate the road.
- The 360° light (optional feature) may not be permitted by local traffic codes unless the vehicle is marked with red and white hazard markings.
- Ensure that a warning triangle and first aid kit are available at all times.

The driver must possess an appropriate driver´s license - European class **"C"**.

The driver must carry a driving license (original) and operating permit at all times.

Before entering a public road ensure that the following safety checks have been performed:

5.2.3.1 Transporting a bucket

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

(2) Close both stop valves (1-2/1 and 1-2/2).

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

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

(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).

(6) Check the lights.

(7) Close both doors.

(8) Put on your seat belt.

(9) Switch the steering system selection lever to “rear axle steering” (4-9/4).

DANGER
The working lights must be switched off (4-8/24).

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

(11) - **Applies to slow-runners only**
» Type 20 km/h and 25 km/h «
Select speed II (4-8/4).
- **Applies to fast-runners only**
» Type 40 km/h «
Select "2" (4-7/1).

(12) Pre-select hydraulic drive speed II (4-7/1) - applies to slow-runners only » Type 20 km/h and 25 km/h «.

(13) Select the travel direction (4-7/3).

(14) Depress the drive pedal (4-5/2).

DANGER
Do **not** change the travel direction while the vehicle is in motion to avoid endangering other road users.

Fig. 5-4

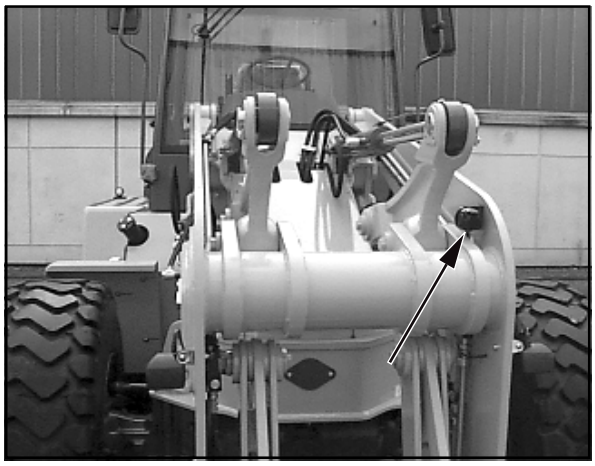


Fig. 5-5

5.2.4 Working with the loader

5.2.4.1 Slow-runner type "20 km/h" and "25 km/h"

DANGER
Always fasten your seat belt while working with a swivel loader.

Normally, all work is executed in hydraulic drive stage **"II"** (4-7/1) and a transmission step (4-8/4) that matches the working conditions.

ATTENTION
Ensure that the vehicle is stationary, the parking brake is on and the travel direction selector (4-7/3) is in neutral (position "0") before selecting a gear via the transfer gearbox.

In special cases where more granular speed control, or higher revs at lower speeds are required, you can select hydraulic drive step "I" (4-7/1) and thus reduce the speed to 6 km/h (for slow-runners rated "20 km/h") or 7 km/h (for slow-runners rated "25 km/h").

NOTE
You can switch from hydraulic drive step I to II, or vice-versa, while traveling. However, shifting from hydraulic drive level II down to I is not recommended at higher speeds as it will cause the vehicle to brake suddenly.

5.2.4.2 Fast-runners Type "40 km/h"

DANGER
Always fasten your seat belt while working with a swivel loader.

Normally, all work is executed in hydraulic drive stage **"II"** (4-7/1).
In special cases where more granular speed control, or higher revs at lower speeds are required, you can select hydraulic drive step "I" and thus reduce the speed to 5 km/h.

Speed ranges per gear

Alpha max. (Turtle symbol)	from	0	to	5 km/h
1st	from	0	to	11.5 km/h
2nd	from	0	to	40 km/h

NOTE
When you switch from 3rd to 2nd gear
- the display for the selected gear (4-8/10) starts to flash (the gear you selected will not be available until the display stops flashing).
- if the permissible speed range has been reached the gear will not be selected until you press the drive pedal (4-5/2) down hard for a short while.

(1) Close both doors.

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

(3) Pre-select a gear [(4-8/4) » applies to slow-runners type "20 km/h" and "25 km/h" «] or [(4-7/1) » applies to fast-runners type "40 km/h" «].

(4) Pre-select a hydraulic drive step [(4-7/1) » applies to slow-runners type "20 km/h" and "25 km/h" «].

(5) Select a travel direction (4-7/3).

(6) Depress the drive pedal (4-5/2).

NOTE

- To achieve maximum performance the combined action of propulsion unit and main hydraulics is required. It is up to the operator to to control the available power using the drive pedal, inching and the manual hydraulic controls to assign power as required for the job in hand.
- Travel speed and power are controlled by depressing the drive pedal only.
- While the vehicle is traveling up a slope, travel speed is reduced to provide more power, even if the drive pedal is fully depressed.
- Power and travel speed are equal both in forward and reverse directions.

ATTENTION

- If the warning indicator for hydraulic oil temperature (4-8/31) lights up, or an accoustic signal is given, stop the vehicle immediately and call in an expert to troubleshoot the hydraulics and remedy the issue.

- Do not attempt to lock the hydraulic quick coupling assembly unless an attachment is fitted.

- Ensure that the engine is idling while coupling or decoupling an attachment. This ensures that the insertion or retraction speed of the locking bolts stays reasonably low thus preventing leaks.

DANGER

If special tasks necessitate driving with the bucket arm swiveled, the bucket or the attachment must be kept close above the wheel and the travel distance must be kept as short as possible. If because of rough terrain a wheel is raised off the ground by the stabilizer equipment, the bucket arm must be briefly swiveled in the direction of travel in order to disengage the axle lock.

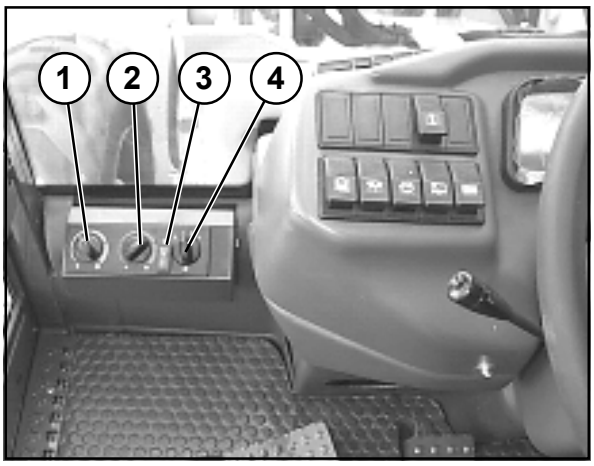


Fig. 5-6

5.2.5 Heating and Ventilation Unit / Air-Conditioning (opt.)

5.2.5.1 Adjusting the airflow

(1) Turn the rotary switch (5-6/4) for the fan to position 0, 1 or 2, depending on the amount of air desired.

(2) Adjust the direction of the air flow by means of the lateral nozzles on the left and right sides (5-7/1 and 5-8/1).

5.2.5.2 Switching on the heater

(1) Depending on the heating requirement, turn the dial (5-6/2) clockwise (hot) or anticlockwise (cold).

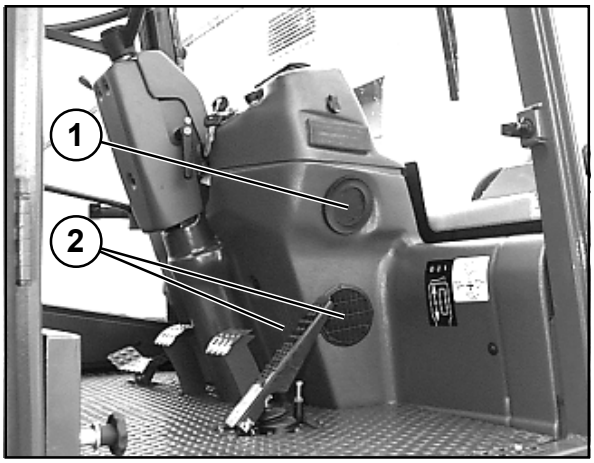


Fig. 5-7

5.2.5.3 Switching on the air-conditioning unit (opt.)

(1) Use the "ON/OFF" switch (5-6/3) to switch the air-conditioning unit on or off, as required.

Press top of switch - Air-conditioning "ON"
Press bottom of switch - Air-conditioning "OFF"

5.2.5.4 Selecting a temperature

(1) Use the dial (5-6/1) to set the cab temperature.

Turn dial clockwise - colder
Turn dial anticlockwise - wärmer

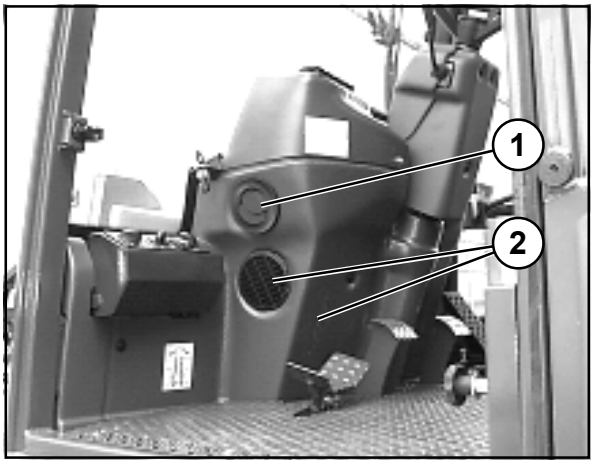


Fig. 5-8

NOTE

The air-conditioning unit draws air in through four vents (5-7/2 and 5-8/2).

ATTENTION

For safety recommendations, disposal notes, and maintenance tasks, plese refer to the manual supplied with the air-conditioning unit.

5.3 Stopping loader operations

5.3.1 Parking the loader

(1) Stop the vehicle on firm and preferably level ground.
(2) Apply the parking brake (4-7/4).
(3) Lower the bucket or front-loaded attachment to the ground.
(4) Set the drive switch (4-7/3) to “0”.

DANGER

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

5.3.2 Switching off the diesel engine

ATTENTION

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

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

NOTE

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

5.3.3 Switching off the heating and ventilation unit / air-conditioning (opt.)

(1) Shut off the warm air supply (5-6/2).
(2) Turn the dial for the fan (5-6/4) to the "0" position.
(3) Switch off the air-conditioning unit (opt.) (5-6/3).

5.3.4 Leaving the loader

(1) Lock the hand levers for the working and auxiliary hydraulics (1-2/1 and 1-2/2).

(2) Remove the main battery switch (4-7/5).

NOTE

If you will not be using the vehicle for a while, follow the steps outlined in Chapter 3 (Anti-Theft Protection).

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

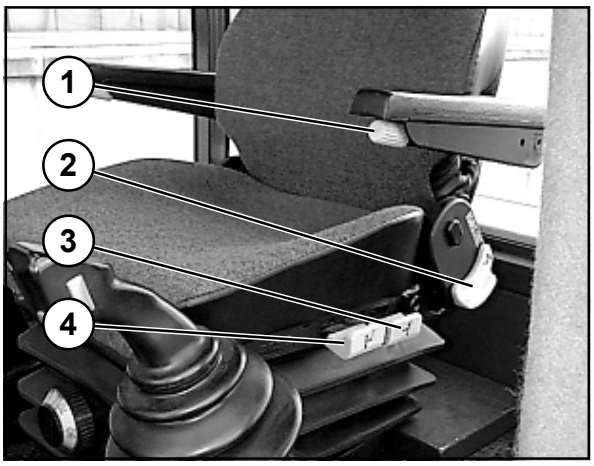


Fig. 5-9

5.4 Adjusting the driver´s seat

5.4.1 Isri seat

(1) Use the lever (5-9/2) to adjust the inclination of the backrest or fold the backrest.

(2) Pull the lever (5-9/3) up to adjust the height and tilt for the rear of the seat.

(3) Pull (5-9/4) up adjust the height and tilt for the front of the seat.

(4) You can use the wheel (5-10/1) to adjust the seat cushioning to the weight of the driver (40 ... 130 kg).

(5) You can use the wheel (5-9/1) to adjust the height of the armrests.

(6) If required, adjust the positions of the valve controls for the main (4-7/8) and auxiliary hydraulics (4-6/8).

(7) Pull up the bar (5-10/2) and at the same time move the seat forwards or back to adjust the horizontal position to the driver´s requirements.

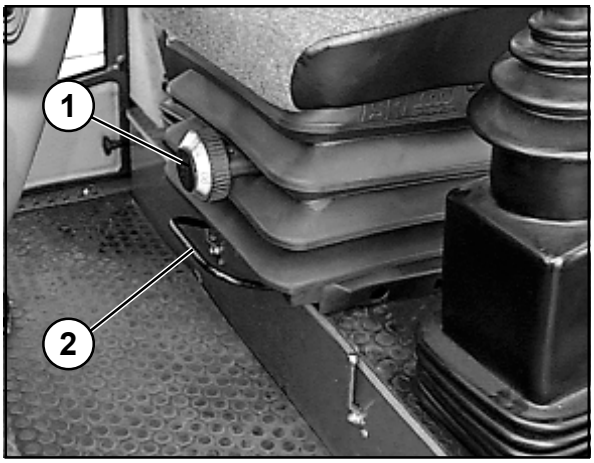


Fig. 5-10

5.4.2 Grammer seat

(1) **Weight adjustment:**
Adjust the seat to the driver's weight by actuating the weight adjustment lever. The set driver's weight is visible in the ispection window (5-11).

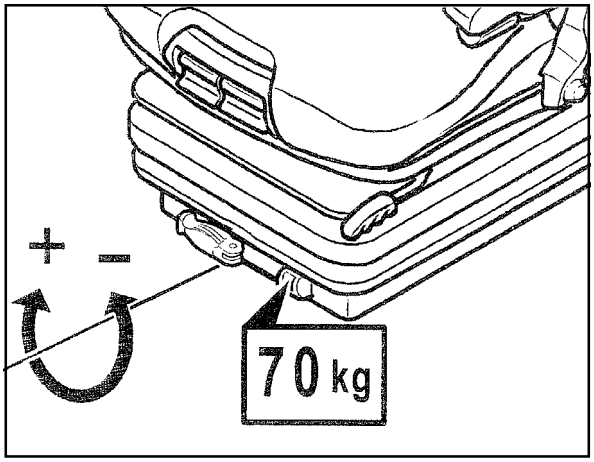


Fig. 5-11

(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) (5-12).

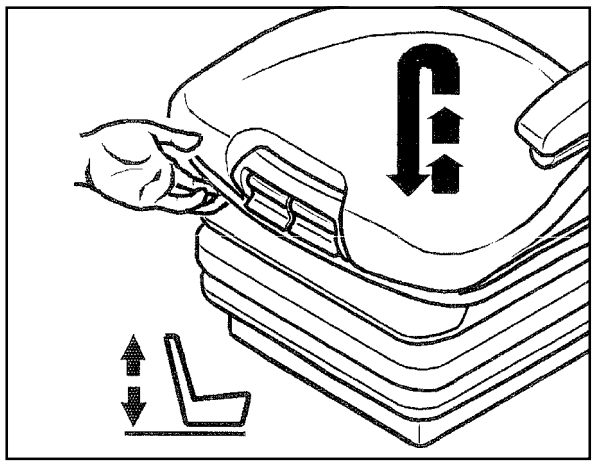


Fig. 5-12

(3) **Armrest inclination:**
Turn the handwheel (5-13/arrow) to adjust the armrest in longitudinal direction.

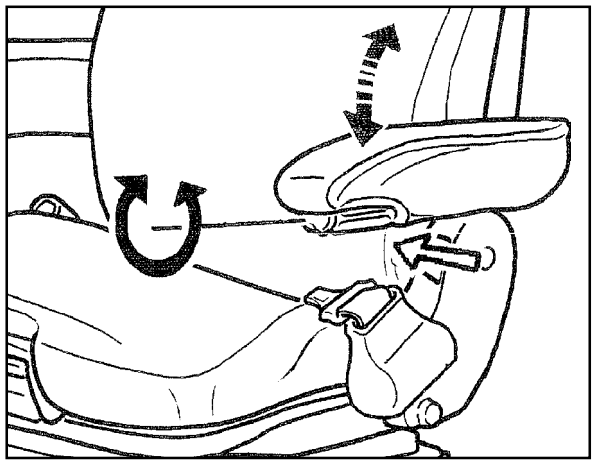


Fig. 5-13

(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 (5-14/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.

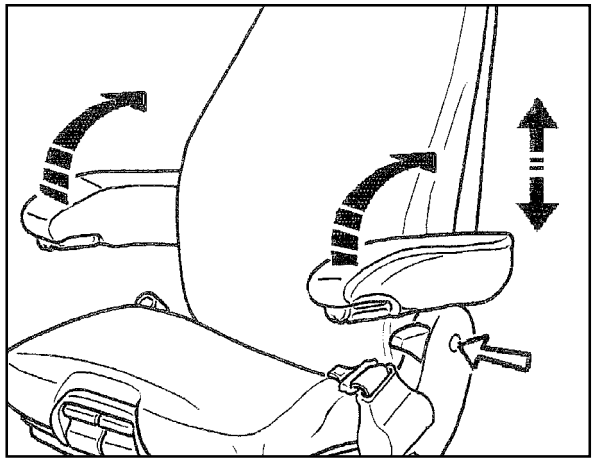


Fig. 5-14

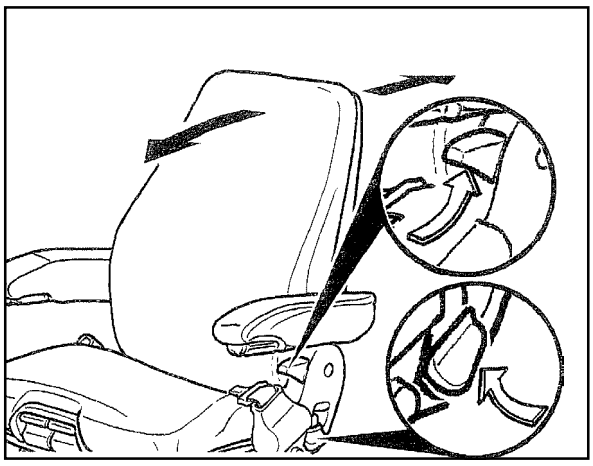


Fig. 5-15

(5) **Adjusting the backrest:**
Use the locking lever (5-15/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.

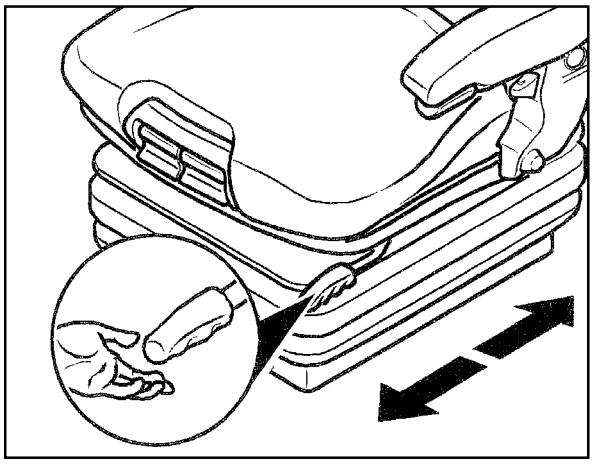


Fig. 5-16

(6) **Longitudinal adjustment:**
You can adjust the seat in longitudinal direction when you pull the lever (5-16) 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.

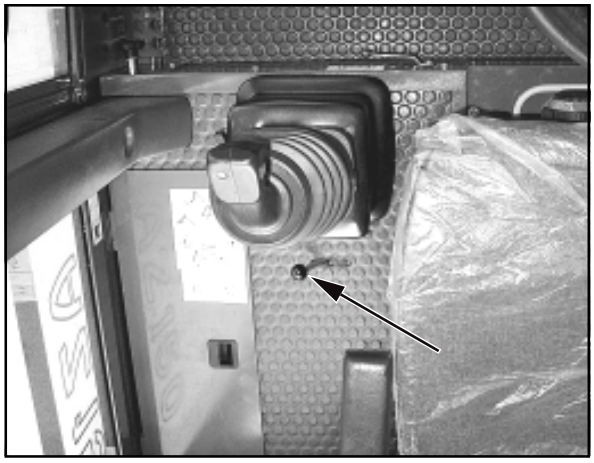


Fig. 5-17

5.5 Switching the steering

ATTENTION
- The wheels of the rear axle must be straight before operating the steering toggle switch (5-17/arrow).
- The steering mode may only be changed when the **machine** is **stationary**. To toggle the steering mode, move the lever forward (rear-wheel steering) or backward (four-wheel steering).

Attachments

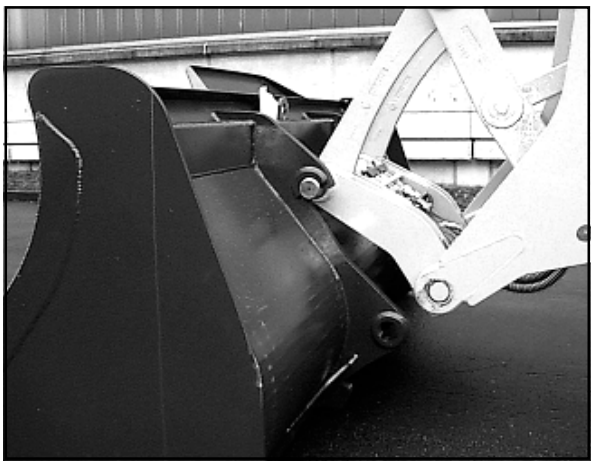


Fig. 6-1

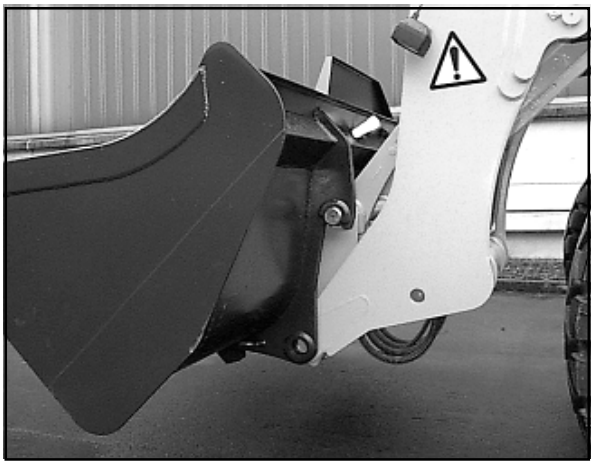


Fig. 6-2

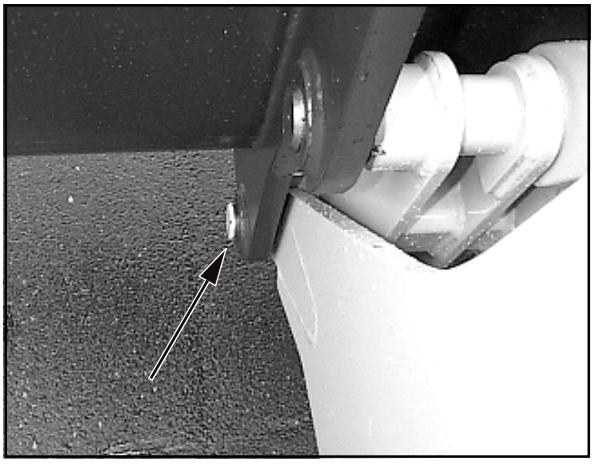


Fig. 6-3

6 Attachments

6.1 Coupling and uncoupling attachments without hydraulics

6.1.1 Standard/Light Material Bucket

Coupling

(1) Lower the loader arms as far and possible and tilt the quick coupler.

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

(3) Pick up the bucket using the quick coupler frame and, by simultaneously tilting the quick coupler, raise the bucket until the quick coupler is in line with it (6-2).

(4) Use the auxiliary hydraulic system lever (4-6/5) to lock the bucket (6-3).

ATTENTION

Ensure that the engine is idling while locking the bucket in order to reduce the insertion speed of the lock pins and thus prevent leakages.

(5) Check seating and ensure that the pins are locked left and right.

DANGER

The lock pins of the quick coupler must be inserted in the lifting holes on both sides of bucket and must protude visibly when viewed from the side (6-3/arrow).

Uncoupling

(1) Place the bucket firmly on the ground.

(2) Hold down the quick coupler release button (4-8/14) and at the same time unlock the bucket using the auxiliary hydraulics lever (4-6/5).

ATTENTION

- Ensure that the engine is idling while locking the bucket in order to reduce the retraction speed of the lock pins and thus prevent leakages.
- Ensure that an attachment is fitted before engaging the hydraulic quick coupler.

(3) Roll the quick coupler off and reverse away from it.

NOTE

The type plate is on the back of the bucket on the right-hand side of the box beam.

6.1.2 Fork-lift attachment

NOTE

- Fig. 6-4 shows the vehicle with with the fork-lift attachment at full stretch.
- For coupling and uncoupling procedures please refer to the description of the standard/ light material bucket in section 6.1.1.

Fig. 6-4

DANGER

- The lock pins of the quick coupler must be inserted in the lifting holes on both sides of fork-lift attachment and must protude visibly when viewed from the side (6-5/arrow).
- Spread the load evenly across both fork tines and ensure that the load cannot slide or fall off.
- Align the load with the heel of the fork and tilt the fork-lift attachment slightly up.
- Ensure that the fork tines must be equidistant from the center (6-6/arrows) and lock them in place.
- When moving loads ensure that the fork-lift is raised only slightly above the ground!
- When moving loads, avoid quick acceleration, braking, and steering maneovres.

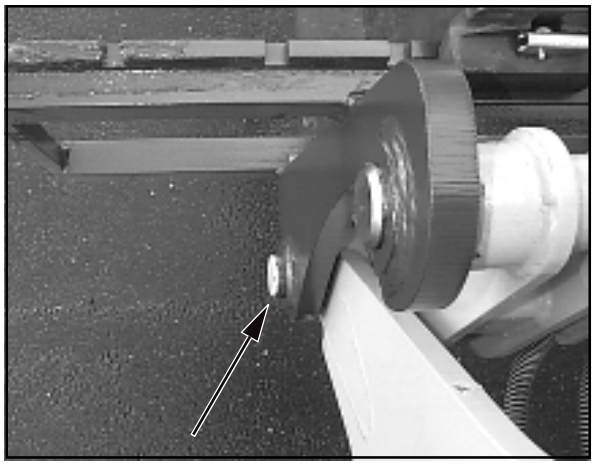


Fig. 6-5

ATTENTION

- In case of equipment with pipe burst protection (opt.), engaging the fork-lift cushioning (4-8/15) will deactivate the pipe burst protection mechanism.
- The driver may not leave the vehicle while the fork-lift is attached.
- Ensure that the engine is idling while locking or unlocking the fork-lift attachment in order to reduce the insertion/retraction speed of the lock pins and thus prevent leakages.
- Ensure that an attachment is fitted before engaging the hydraulic quick coupler.

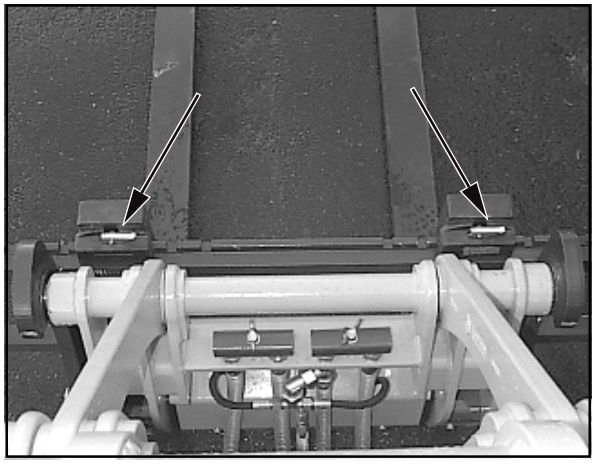


Fig. 6-6

NOTE

- To ensure that the fork tines are properly locked, both locking levers must be flush with the fork-lift coupler frame.
- The type plate is on the back of the top fork-lift coupler frame.

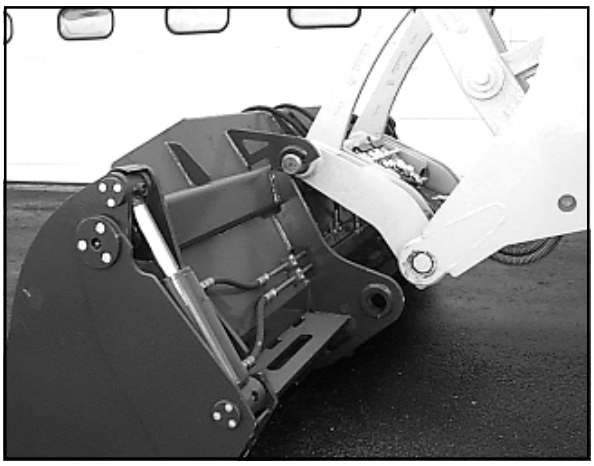


Fig. 6-7

Fig. 6-8

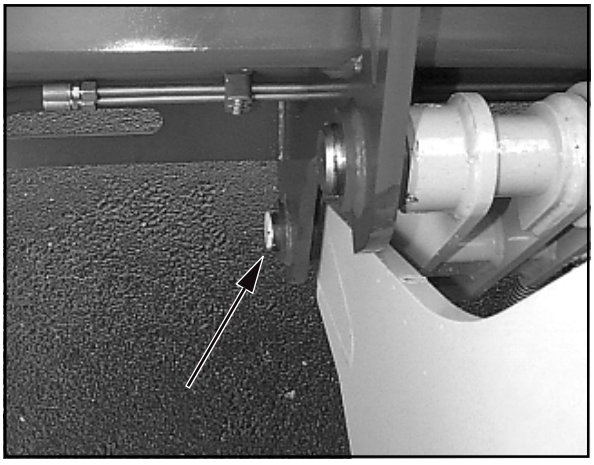


Fig. 6-9

6.1.3 Lifting Hook

NOTE

- For coupling and uncoupling procedures please refer to the description of the standard/ light material bucket in section 6.1.1.
- The type plate is on the top right of the lifting hook coupler frame.

DANGER

- The lock pins of the quick coupler must be inserted in the lifting holes on both sides of fork-lift attachment and must protude visibly when viewed from the side .
- Ensure that the safety lock on the lifting hook is working.

ATTENTION

- In case of equipment with pipe burst protection (opt.), engaging lifting hook cushioning (4-8/15) will deactivate the pipe burst protection mechanism.
- Ensure that the engine is idling while locking or unlocking the lifting hook in order to reduce the insertion/retraction speed of the lock pins and thus prevent leakages.
- Ensure that an attachment is fitted before engaging the hydraulic quick coupler.

6.2 Coupling and uncoupling attachments with hydraulics

6.2.1 Multi-purpose bucket

Coupling

(1) Lower the loader arms as far and possible and tilt the quick coupler.

(2) Drive the loader up to the bucket (6-7).

(3) Pick up the bucket using the quick coupler frame and, by simultaneously tilting the quick coupler, raise the bucket until the quick coupler is in line with i (6-8).

(4) Use the auxiliary hydraulic system lever (4-6/5) to lock the bucket (6-9).

ATTENTION

Ensure that the engine is idling while locking the bucket in order to reduce the insertion speed of the lock pins and thus prevent leakages.

(5) Check seating and ensure that the pins are locked left and right.

DANGER

The lock pins of the quick coupler must be inserted in the lifting holes on both sides of bucket and must protude visibly when viewed from the side (6-9/arrow).

(6) Stop the engine.

(7) Release the pressure on the hydraulic hoses by moving the auxiliary hydraulics lever (4-6/5) back and forth.

(8) Unscrew and remove the protective shield on the right-hand connector of the quick coupler (6-10/arrow).

(9) Attach the protective shield to the box beam of the quick coupler (6-11/2).

(10) Flip up the protective lids on the quick fit coupling sleeves of the multi-purpose bucket (6-11/1) and firmly press onto the quick coupler hose (6-11).

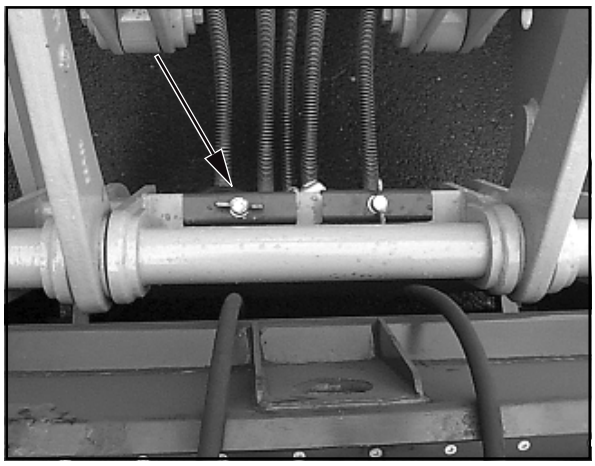


Fig. 6-10

ATTENTION

When attaching hydraulic hoses pay attention to cleanliness of the joint and ensure that connectors are seated properly.

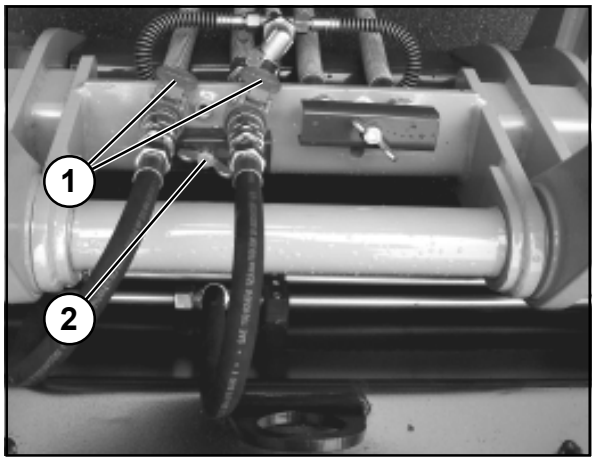


Fig. 6-11

Uncoupling

(1) Place the bucket firmly on the ground.

(2) Stop the engine.

(3) Release the pressure on the hydraulic hoses by moving the auxiliary hydraulics lever (4-6/5) back and forth.

(4) Follow the coupling procedure in reverse order, the exception being that you need to press the quick coupler release button (4-8/14) to release the multi-purpose bucket.

ATTENTION

- Ensure that the engine is idling while unlocking the multi-purpose bucket in order to reduce the insertion/retraction speed of the lock pins and thus prevent leakages.
- To release a connector from the corresponding coupler line up the grooves in the grip ring (6-12/arrows) with the cams on the coupling sleeve (you will feel it snap into place), and then pull firmly upward.
- Ensure that an attachment is fitted before engaging the hydraulic quick coupler.

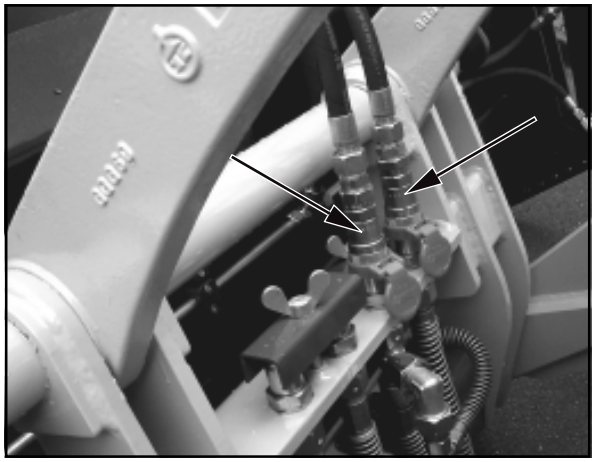


Fig. 6-12

NOTE

The type plate is on the back right of the bucket underneath the box beam.

Fig. 6-13

Notes on using the multi-purpose bucket

The multi-purpose bucket can be used for:

- blading (6-13)

Fig. 6-14

- clamming (6-14)

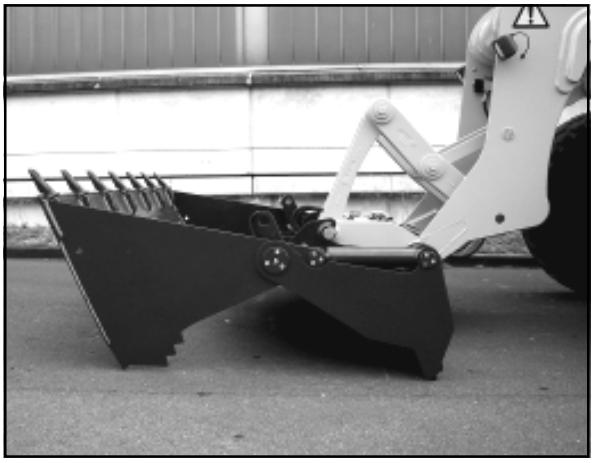


Fig. 6-15

- grappling (6-15) and for

- digging like a normal bucket.

6.2.2 Front-end excavator

Coupling

For coupling and uncoupling procedures please refer to the description of the multi-purpose bucket in section 6.2.1 (1) ...(10), except that **all four** hydraulic hose sleeves on the front-end excavator need to be attached to the connectors on the quick coupler assembly.
Ensure that the hoses on the right of the front-end excavator are attached to the connectors on the right of the quick coupler assembly and that that both hoses on the left of the front-end excavator are attached to the connectors on the left of the quick coupler assembly. Make sure that the hoses do not cross.

NOTE

If you cross attach the hydraulic hoses, the motion of the front-end excavator boom and bucket will not correspond to the description on plate (2-1/5).

DANGER

The lock pins of the quick coupler must be inserted in the lifting holes on both sides of the front-end excavator attachment and must protude visibly when viewed from the side.

ATTENTION

- Ensure that the engine is idling while locking the front-end excavator in order to reduce the insertion speed of the lock pins and thus prevent leakages.
- When attaching hydraulic hoses pay attention to cleanliness of the joint and ensure that connectors are seated properly.

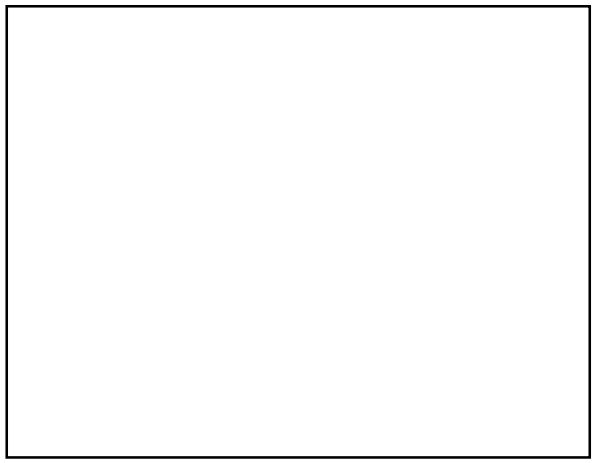


Fig. 6-16

Uncoupling

For uncoupling procedures see the description of the multi-purpose bucket (section 6.2.1), however, ensure that all four hydraulic hoses of the front-end excavator are disconnected from the four connectors on the quick coupler.

ACHTUNG

- Ensure that the engine is idling while unlocking the front-end excavator in order to reduce the retraction speed of the lock pins and thus prevent leakages.
- Ensure that an attachment is fitted before engaging the hydraulic quick coupler.

NOTE

The type plate is on the right of the arm near the coupler frame.

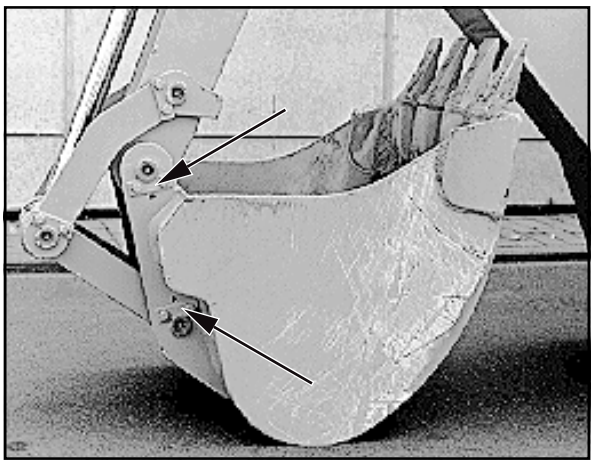


Fig. 6-17

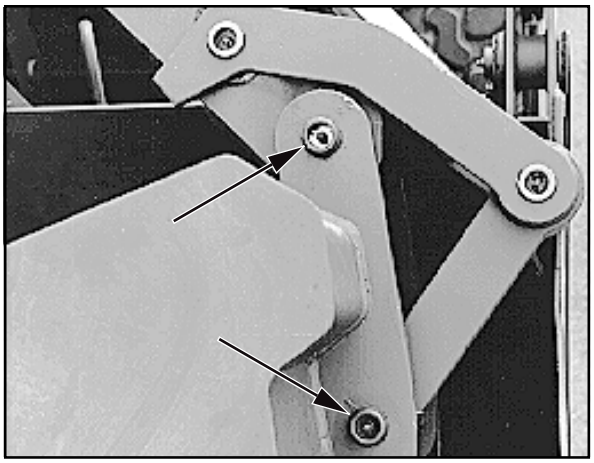


Fig. 6-18

6.2.2.1 Changing a bucket

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

(2) Move the front-end loader into a position where the bucket heel is flush with the ground.

(3) Switch off the engine.

(4) Release the pressure on the hydraulic hoses by moving the auxiliary hydraulics lever (4-6/5) back and forth.

(5) Close both stop valves (1-2/1 and 1-2/2).

(6) Unscrew the safeguards for the bolts (size 19) (6-17/ arrows).

(7) Knock out the bearing pin (6-18/arrows) and remove the bucket.

(8) Follow these steps in reverse order to attach a bucket.

NOTE

The type plate for the bucket is on the outside left.

6.3 Using other attachments

DANGER

1. Use only those attachments described in this manul.
2. Be aware that we cannot approve attachments we have not supplied ourselves. Using non-approved products may adversely affect the constructional and active or passive safety features of your equipment . We accept no responsibility for damage caused by using non-approved products.

Rescue, Towing, Lashing, Crane-Lifting

7 Rescue, Towing, Lashing, Crane-Lifting

7.1 Rescue, Towing, Lashing

7.1.1 Rescue/Towing of the swing loader in case of engine or transmission failure

DANGER
On public roads, first secure the rescue area.

ATTENTION
- Do not attempt to tow-start the swivel loader. Any attempt to do so will cause damage.
- Towing is permitted to remove the loader from hazardous areas only, and when loading onto a low-loader.

NOTE
Preparatory steps before towing depend on whether the engine has failed, and thus the hydraulic system is inoperable, or only the transmission has failed and the engine can still power the hydraulic subsystem.

7.1.1.1 Towing the swing loader in case of engine failure

ATTENTION
- When the engine has failed, towing is only permitted to rescue the machine out of the danger area.
- Remove both cardan shafts prior to towing if the machine must be towed over a longer distance and cannot be loaded.

(1) Press the rocker switch for the hazard warning lights (4-8/11).

(2) Chock both front wheels in both directions to prevent the vehicle from to ensure that the vehicle does not roll.

(3) Put the gear selector (4-7/3) in neutral (position "0").

NOTE
The preparation in points (4), (6), (7) and (13) is only to be carried out if the rescue location is **not** on a public road.

(4) Align the wheels on the front axle and then use the steering selector lever (4-6/4) to set the steering mode to "rear-wheel-steering".

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

(6) Apply the bucket protector to protect the lip and teeth of the bucket (5-4/arrow).

(7) Insert the bucket protector plug in the socket (5-5/arrow).

(8) Push the valve control lever for main hydraulics (4-7/2) forwards through its pressure point to the front position.

(9) 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).


Fig. 7-1

NOTE

- If the vehicle breakdown occurred some time ago, ensure that the hydraulic hoses are disconnected from the lift cylinder before attaching the lifting equipment. Use an oil tray with appropriate dimensions to catch any hydraulic oil that seeps out.
- After completing towing, remember to fill the lift cylinder with hydraulic oil and vent the cylinder by repeatedly raising and dropping the loader arm.

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

(11) Close both stop valves (1-2/1 and 1-2/2).

(12) Return the valve control for main hydraulics (4-7/2) to its original position.

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

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

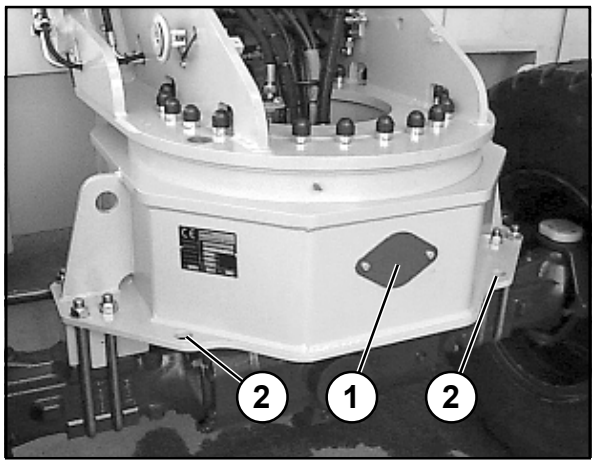


Fig. 7-2

ATTENTION

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

Fig. 7-3

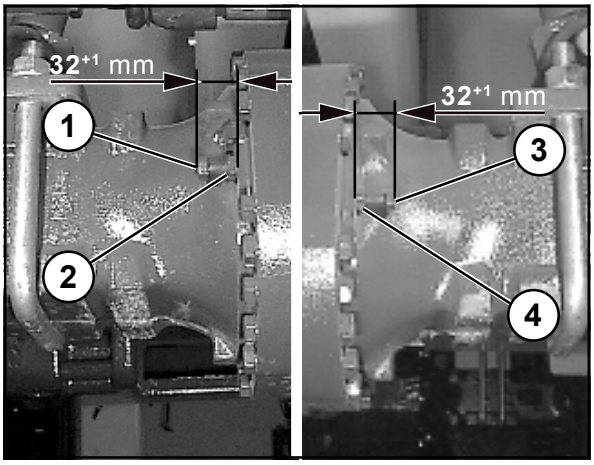


Fig. 7-4

(15) Detach the spring brake. To do so, loosen the counter nuts (7-4/2 and 7-4/4) and set screws (7-4/1 and 7-4/3) a quarter turn in sequence.
One turn is required to slacken the spring brake.

ATTENTION

- Do not exceed one turn!
- Tighten the set screws in sequence. That is, when you tighten the screws, you must tighten each screw a quarter turn in sequence to prevent jamming or canting.
- Detach the spring brakes to the left and right of the axle assembly separately.

Adjustment after manual slackening

- Remove the set screws (7-4/1 and 7-4/3), counter nuts (7-4/2 and 7-4/4) and gaskets.
- Lubricate the set screws with silicon grease TECNO LUBE 101.
- Refit the set screws, counter nuts and gaskets.

(16) Tighten the set screws to a point where the measurement between the screw head and the axle assembly is 32^{+1} mm.

(17) Use counter nuts to fix the set screws in position.

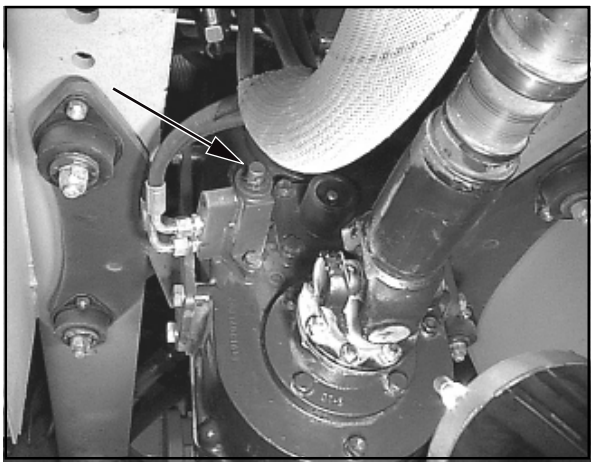


Fig. 7-5

ATTENTION

The screws must protrude by exactly 32^{+1} mm (7-4).

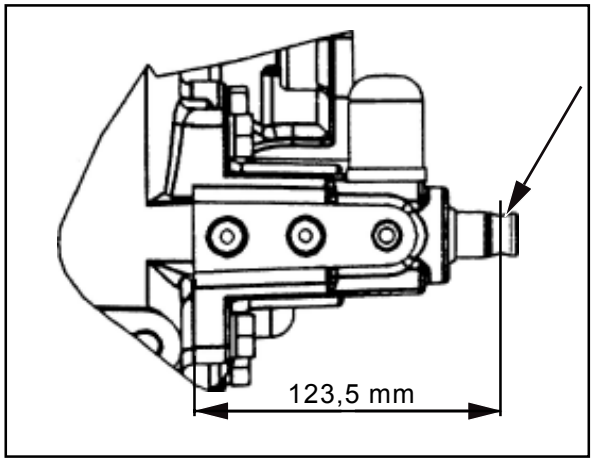


Fig. 7-6

Applies to slow-runners
» Type "20 km/h" and "25 km/h" «

(18) Put the gear lever (7-5/arrow and 7-6/arrow) into neutral.

NOTE

- The gear lever will snap noticably into place. The correct position is between first gear (pressed in) and second gear (pulled out).
- The measurement will be 123,5 mm (7-6).

(19) Remove chocks.

DANGER

- In case of engine failure considerably more force is required to steer the vehicle.
- Tow the vehicle at slow speed (2 km/h).
- For longer towing distances, the defective vehicle should be loaded (see 7-2/1 and 7-2/2, 7-3/1 and 7-3/2) for lashing points.
  - The max. permissible load of the front towing and shunting coupling (7-2/1) is 8.0 t horizontally and axially.
  - The max. permissible load of the rear towing and shunting coupling (7-3/1) is 8.0 t horizontally and axially.
  - The max. permissible load of the lashing points/ loading points (7-2/2, and 7-3/2) is x t assuming an angle of 45°.
  - Note maximum height restrictions!

7.1.1.2 Towing the swing loader in case of transmission failure

(1) Press the rocker switch for the hazard warning lights (4-8/11).
(2) Chock both front wheels in both directions to prevent the vehicle from to ensure that the vehicle does not roll.
(3) Put the gear selector (4-7/3) in neutral (position "0").

NOTES

Preparatory tasks (4), (6), (7), and (10) are only required if the rescue area is **not** in a publicly accessible area:

(4) Align the wheels on the front axle and then use the steering selector lever (4-6/4) to set the steering mode to "rear-wheel-steering".
(5) Apply the bucket protector to protect the lip and teeth of the bucket (5-4/arrow).
(6) Insert the bucket protector plug in the socket (5-5/ arrow).
(7) Lift and mechanically prop up bucket arm [e.g. by inserting the bucket arm support (option) (1-1/arrow)] and lower bucket arm until it rests on the bucket arm support.
(8) Close both stop valves (1-2/1 and 1-2/2).
(9) Block the swivel mechanism by inserting the blocking wedge (1-3/arrow) in the swivel blocking mechanism (1-4/arrow).
(10) Attach the towing rod to the loader to be towed [(7-2/1 - for towing forwards) or (7-4/1 - for towing backwards)] and to the towing vehicle.

ATTENTION

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

(11) Switch off the engine.
(12) Release the parking brake (4-7/4).

(13) Detach the spring brake. To do so, loosen the counter nuts (7-4/2 and 7-4/4) and set screws (7-4/1 and 7-4/3) a quarter turn in sequence.
One turn is required to slacken the spring brake.

ATTENTION

- Do not exceed one turn!
- Tighten the set screws in sequence. That is, when you tighten the screws, you must tighten each screw a quarter turn in sequence to prevent jamming or canting.
- Detach the spring brakes to the left and right of the axle assembly separately.

Adjustment after manual slackening

- Remove the set screws (7-4/1 and 7-4/3), counter nuts (7-4/2 and 7-4/4) and gaskets.
- Lubricate the set screws with silicon grease TECNO LUBE 101.
- Refit the set screws, counter nuts and gaskets.

(14) Tighten the set screws to a point where the measurement between the screw head and the axle assembly is 32^{+1} mm.

(15) Use counter nuts to fix the set screws in position.

ATTENTION

The screws must protrude by exactly 32^{+1} mm (7-4).

Applies to slow-runners
» Type "20 km/h" and "25 km/h" «

(16) Put the gear lever (7-5/arrow and 7-6/arrow) into neutral.

NOTE

- The gear lever will snap noticably into place. The correct position is between first gear (pressed in) and second gear (pulled out).
- The measurement will be 123,5 mm (7-6).

(17) Remove chocks.

DANGER

- In case of engine failure considerably more force is required to steer the vehicle.
- Tow the vehicle at slow speed (2 km/h).

- For longer towing distances, the defective vehicle should be loaded (see 7-2/1 and 7-2/2, 7-3/1 and 7-3/2) for lashing points.
  - The max. permissible load of the front towing and shunting coupling (7-2/1) is 8.0 t horizontally and axially.
  - The max. permissible load of the rear towing and shunting coupling (7-3/1) is 8.0 t horizontally and axially.
  - The max. permissible load of the lashing points/ loading points (7-2/2, and 7-3/2) is ? t assuming an angle of 45°.
  - Note maximum height restrictions!

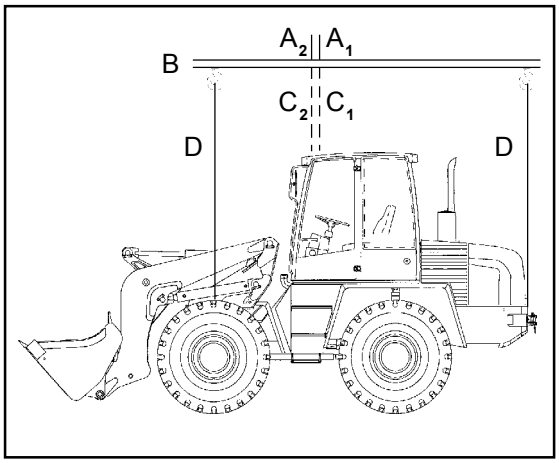


Fig. 7-7

7.2 Crane Lifting

The following steps are required to prepare the vehicle for crane lifting:

(1) Apply the parking brake (4-7/4).
(2) Put the gear selector (4-7/3) in neutral (position "0").
(3) **- Applies to slow-runners only**
» Type 20 km/h and 25 km/h «
- Select first gear (4-8/4).
- Select hydraulic gear I (4-7/1).

- Applies to fast-runners only
» Type 40 km/h «
Select "Alpha max. (Turtle symbol)" (4-7/1).

(4) Raise or lower the loader arm to a position where the bucket heel is at least 30 cm above the ground (5-2).
(5) Close stop valves for main and auxiliary hydraulics (1-2/1 and 1-2/2).
(6) Block the swivel mechanism by inserting the blocking wedge (1-3/arrow) in the swivel blocking mechanism (1-4/arrow).
(7) Lock the doors.
(8) Fold the outside mirrors in.

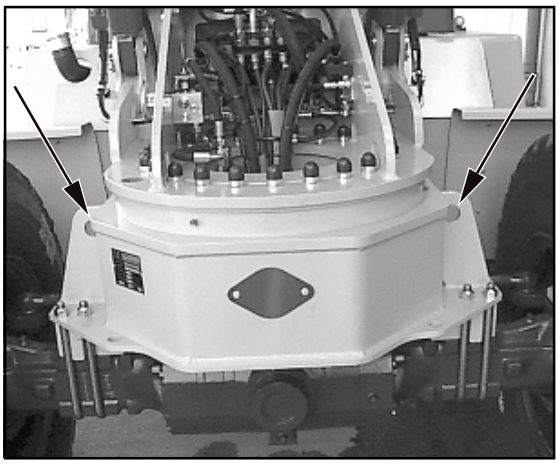


Fig. 7-8

ATTENTION

Pay particular attention to the following points when crane lifting a loader, see figure 7-7:

- The lifting point (A_1 - vehicles without standard bucket or A_2 - vehicles with standards bucket) of the lifting equipment (B) must be exactly vertically above the center of gravity (C_1 bzw. C_2) of the vehicle, to allow the lifting device to be placed **horizontally** above the longitudinal axis of the loader.
- The lifting gear (D) must lead vertically upwards from the lifting points of the loader (7-8/ arrows and 7-9/arrows).

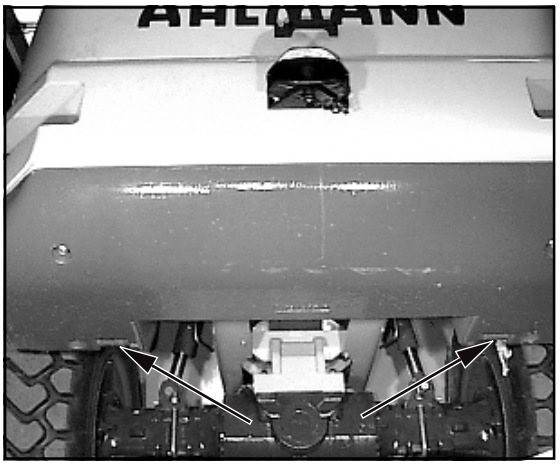


Fig. 7-9

DANGER

The lifting gear must have a lifting capacity of at least 6.5 t.

Maintenance

8 Maintenance (Maintenance Plan AS 150 Type 40 km/h)

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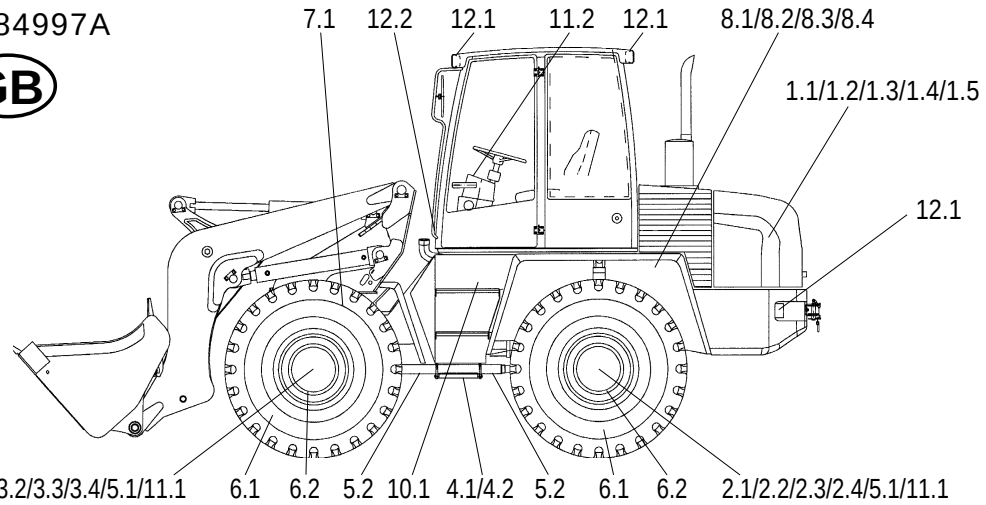

	Item	Name	Specification	Viscosity	Quantity
*	1	Engine Oil	MIL-L-2104C = API-CD	SAE 15 W 40	= 10 l with Oil filter
*	2.2	Transm. Oil with LS Add.	MIL-L-2105B = API-GL5-6-LS	SAE 85 W 90-LS	= 12,8 l
*	2.4	Transm. Oil with LS Add.	MIL-L-2105B = API-GL5-6-LS	SAE 85 W 90-LS	= 2 x 1,9 l
*	3.2	Transm. Oil with LS Add.	MIL-L-2105B = API-GL5-6-LS	SAE 85 W 90-LS	= 15,0 l
*	3.4	Transm. Oil with LS Add.	MIL-L-2105B = API-GL5-6-LS	SAE 85 W 90-LS	= 2 x 1,9 l
*	4.2	Transmission Oil	General Motors ATF Typ DEXRON II	ATF 22 SAE 75 W	= 6,0 l
*	8.3	Hydraulic Oil (4.)	DIN 51524 - HVLP 46	ISO VG 46, VI > 180	= 160 l
	9	Grease	DIN 51825 - KPF 1/2 N-20		as required
	10	Distilled water			as required
	12	Coolant	R 134 a		850 g ± 50 g

Legend

△ First oil or filter change

▲ First service interval, repair any failures noted

○ Service, repair any failures noted

◇ Change

* these marks, filling or service points are mandatory:

Refer to manual

STOP **Attention**
Observe accident prevention measures when performing servicing tasks!

Lubrication Points (marked in red)

1. Grease bolts with DIN 51825 - KPF 1/2 N-20 every 10 hours.
2. Grease friction points as required and after cleaning with DIN 51825 - KPF 1/2 N-20.

Oil Lubrication Points

3. Oil joints and bell cranks every 50 working hours with engine oil MIL-L-2104 C

Biodegradable Hydraulic Oil

4. Synthetic ester based hydraulic oil viscosity class ISO VG 46 VI > 180

Intervals in working hours — max. permissible intervals, can be shorter dep. on use

10	100	500	750	1500	Pos.	Maintenance Points
					1	**Engine**
○	△	◇			1.1	Maintenance according to manufacturers specs
	○				1.2	Dry air filter unit: Check service display Change filter element if display shows red
		○			1.3	Check and clean fuel filter →
○					1.4	Check coolant fill-level
○					1.5	Check and clean combined cooling unit
					2	**Rear axle**
	○				2.1	Check oil fill-level of transmission unit (inspection screw)
	△		◇		2.2	Oil change transmission unit →
	○				2.3	Check oil fill-level of helical planetary gearing (inspection screw)
	△		◇		2.4	Oil change helical planetary gearing →
					3	**Front axle**
	○				3.1	Check oil fill-level of transmission unit (inspection screw)
	△		◇		3.2	Oil change transmission unit →
	○				3.3	Check oil fill-level of helical planetary gearing (inspection screw)
	△		◇		3.4	Oil change helical planetary gearing →
					4	**Transfer Case**
	○				4.1	Check oil fill-level of transfer case (inspection screw)
	△			◇	4.2	Oil change transfer case →
				◇	4.3	Change transfer case oil filter insert (fine filter) →
	△			◇	4.4	Clean transfer case suction filter (pre-filter) →
					5	**Axles / Articulated Shafts**
▲		○			5.1	Check tightness of axles (500 Nm)
	▲	○			5.2	Check tightness of articulated shafts (65 Nm)
					6	**Wheels and Tyres**
	○				6.1	Check air pressure
▲		○			6.2	Check tightness of wheel bolts (600 Nm)
					7	**Swivel Joint**
	▲	○			7.1	Check tightness (610 Nm)
					8	**Hydraulic Unit**
	△		◇		8.1	Change suction return line filter insert, check electr. display →
○					8.2	Check oil fill-level (inspection glass)
				◇	8.3	Oil change →
○					8.4	Check and clean hydraulic oil cooler
					9	**Greasing points (marked in red)** →
					10	**Battery**
		○			10.1	Visual check
					11	**Brakes**
					11.1	Perform visual and functional check of brakes and parking brakes before starting work
○					11.2	Check accumulator valve
					12	**Lighting unit / Air filter / Air conditioning unit**
					12.1	Perform functional check before starting work
		○		◇	12.2	Check air filter
	○				12.3	Check condensator for contamination
	○				12.4	Check tension of compressor drive belt

8 Maintenance (Maintenance Plan AS 150 Type 20 km/h und 25 km/h)

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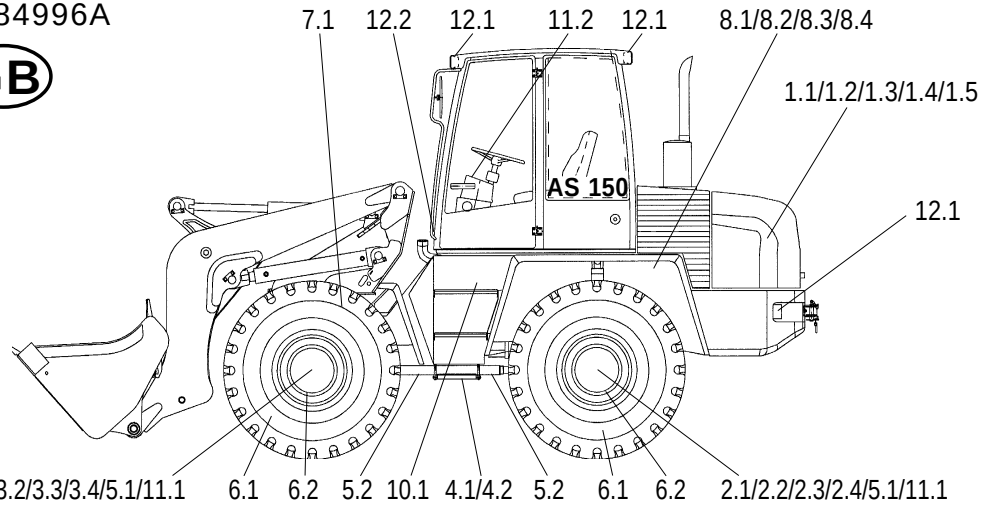


	Item	Name	Specification	Viscosity	Quantity
*	1	Motor Oil	MIL-L-2104 C = API-CD	SAE 15 W 40	= 10 l with Oil filter
*	22	Transm. Oil with LS Add.	MIL-L-2105 B = API-GL5-6-LS	SAE 85 W 90-LS	= 12,8 l
*	24	Transm. Oil with LS Add.	MIL-L-2105 B = API-GL5-6-LS	SAE 85 W 90-LS	= 2 x 1,9 l
*	32	Transm. Oil with LS Add.	MIL-L-2105 B = API-GL5-6-LS	SAE 85 W 90-LS	= 15,0 l
*	34	Transm. Oil with LS Add.	MIL-L-2105 B = API-GL5-6-LS	SAE 85 W 90-LS	= 2 x 1,9 l
*	42	Transm. Oil	MIL-L-2105 D = API-GL5-6	SAE 85 W 90	= 3,2 l
*	83	Hydraulic Oil (4.)	DIN 51524 - HVLP 46	ISO VG 46, VI > 180	= 160 l
	9	Lubricant	DIN 51825 - KPF 1/2 N-20		as required
	10	Distilled Water			as required
	12	Coolant	R 134 a		850 g ± 50 g

Legend

△ First oil or filter change

▲ First service interval, repair any failures noted

○ Service, repair any failures noted

◇ Change

* these marks, filling or service points are mandatory:

Refer to manual

Attention
Observe accident prevention measures when performing servicing tasks!

Lubrication Points (marked in red)

1. Grease bolts with DIN 51825 - KPF 1/2 N-20 every 10 hours.
2. Grease firction points as required and after cleaning with DIN 51825 - KPF 1/2 N-20.

Oil Lubrication Points

3. Oil joints and bell cranks every 50 working hours with engine oil MIL-L-2104 C .

Biodegradable Hydraulic Oil

4. Synthetic ester based hydraulic oil viscosity class ISO VG 46 VI > 180

Intervals in working hours — max. permissible intervals, can be shorter dep. on use

10	100	500	750	1500	Pos.	Maintenance Points
					1	**Motor**
○	△	◇			1.1	Maintenance according to manufacturers specs
	○				1.2	Dry air filter unit: Check service display
						Change filter element if display shows red →
		○			1.3	Check and clean fuel filter
○					1.4	Check coolant fill-level
○					1.5	Check and clean combined cooling unit
					2	**Rear axle**
	○				2.1	Check oil fill-level of transmission unit (inspection screw)
	△		◇		2.2	Oil change transmission unit →
	○				2.3	Check oil fill-level of helical planetary gearing (inspection screw)
	△		◇		2.4	Oil change helical planetary gearing →
					3	**Front axle**
	○				3.1	Check oil fill-level of transmission unit (inspection screw)
	△		◇		3.2	Oil change transmission unit →
	○				3.3	Check oil fill-level of helical planetary gearing (inspection screw)
	△		◇		3.4	Oil change helical planetary gearing →
					4	**Transfer Case**
	○				4.1	Check oil fill-level of transfer case (inspection screw)
	△			◇	4.2	Oil change transfer case →
					5	**Axles / Articulated Shafts**
▲		○			5.1	Check tightness of axles (500 Nm)
	▲	○			5.2	Check tightness of articulated shafts (65 Nm)
					6	**Wheels and Tyres**
	○				6.1	Check air pressure
▲		○			6.2	Check tightness of wheel bolts (600 Nm)
					7	**Swivel Joint**
	▲	○			7.1	Check tightness (610 Nm)
					8	**Hydraulic Unit**
	△		◇		8.1	Change suction return line filter media, check electr. display →
○					8.2	Check oil fill-level (inspection glass)
				◇	8.3	Oil change →
○					8.4	Check and clean hydraulic oil cooler
					9	**Greasing points (marked in red)** →
					10	**Battery**
		○			10.1	Visual check
					11	**Brakes**
					11.1	Perform visual and functional check of brakes and parking brakes before starting work
○					11.2	Check accumulator valve
					12	**Lighting unit / Air filter / Air conditioning unit**
		○			12.1	Perform functional check before starting work
		○		◇	12.2	Check air filter
	○				12.3	Check condensator for contamination
	○				12.4	Check tension of compressor drive belt

8 Maintenance

Constructional and design enhancements are important for the technical development of this equipment and may lead to deviations between figures and content in this manual. These changes are summarized in Chapter 13. Please refer to Chapter 13 for details.n.

8.1 Maintenance Notes

DANGER

- Ensure that the engine has stopped.
- When working under the loader arm,
  - unload the bucket and/or support the attachment,
  - the bucket arm must be mechanically propped up [e.g. by inserting the bucket arm support (option) (1-1/arrow)],
  - close the stop valves for main (1-2/1) and auxiliary hydraulics (1-2/2),
  - block the swivel assembly(1-4/arrow).
- Ensure that the vehicle cannot roll away by applying the parking brake (4-7/4) and placing the travel direction selector (4-7/3) in neutral (position "0"). Additionally chock both wheels on the front axle.

ATTENTION

- Ensure that units are warm, but not hot, before carry out oil changes.
- Perform maintenance work when the vehicle is on level ground and the loader arm has been grounded.
- Immediately replace damaged filter media and gaskets.
- Clean pressure lubrication fittings before lubri cating.

NOTE

- Refer to the maintenance schedule (on pages 8-1 and 8-2) for a list of maintenance tasks.
- Damage that occurs due to failure to comply with the maintenance plan is not covered by warranty.
- The materials mentioned in the maintenance plan are designed for use in ambient temperatures between **-15°C** and **+40°C**.

ATTENTION

In case of ambient temperatures below -15° C refer to the description of winter operations in section 5.2.2.

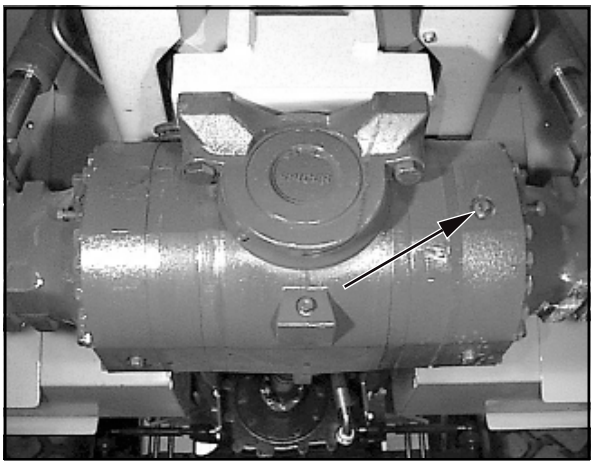


Fig. 8-1

8.2 Maintenance Tasks

8.2.1 Check engine oil fill-level

See the operating manual for the engine.

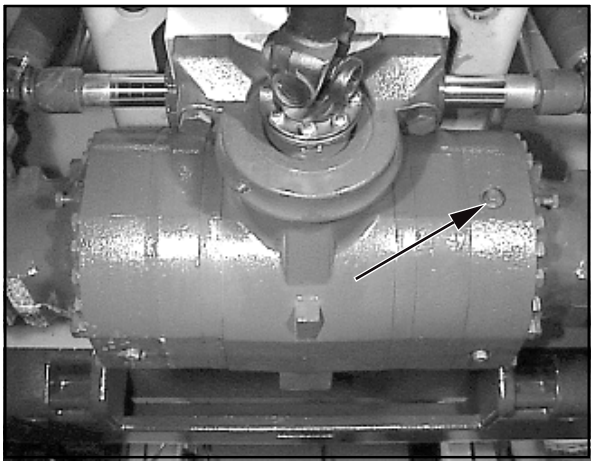


Fig. 8-2

8.2.2 Check axle oil fill-level

8.2.2.1 Rear axle

(1) Remove the plugs from the axle arches (8-1/arrow) and/or (8-2/arrow).

NOTE

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

(2) Replace the plugs.

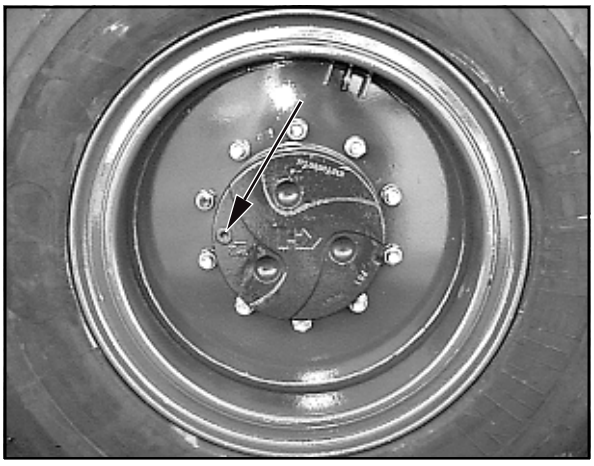


Fig. 8-3

8.2.2.2 Planetary Gear

(1) Move the loader until the "OIL LEVEL" mark is horizontal and the plug is located at the top right of the mark (8-3/arrow).

(2) Remove the plug.

NOTE

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

(3) Fit a new gasket and re-insert the plug.

8.2.2.3 Front axle

(1) Remove the plugs from the axle arches (8-4/arrow) and/or (8-5/arrow).

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

(2) Re-insert the plug.

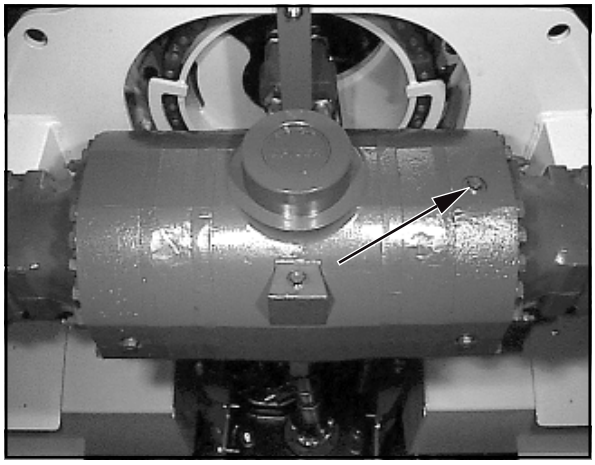


Fig. 8-4

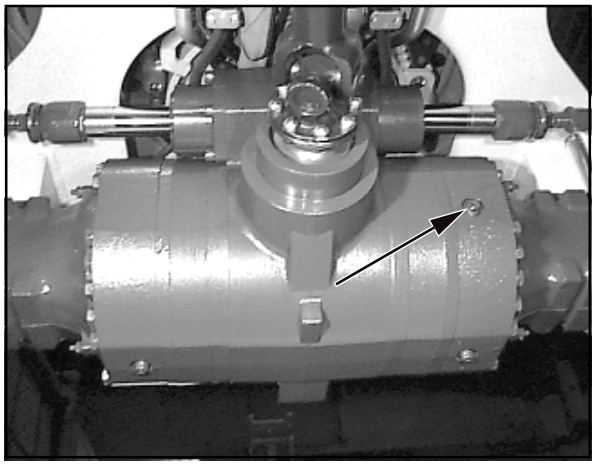


Fig. 8-5

8.2.3 Check oil fill-level transfer gearbox » Slow-runner 20 km/h and 25 km/h «

(1) Remove plug (8-6/arrow).

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

(2) Re-insert plug.

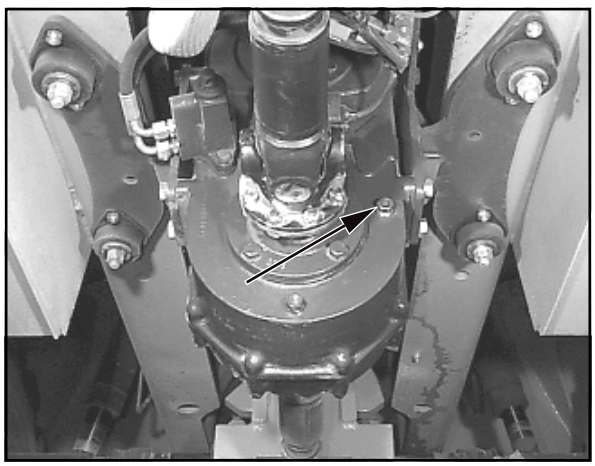


Fig. 8-6

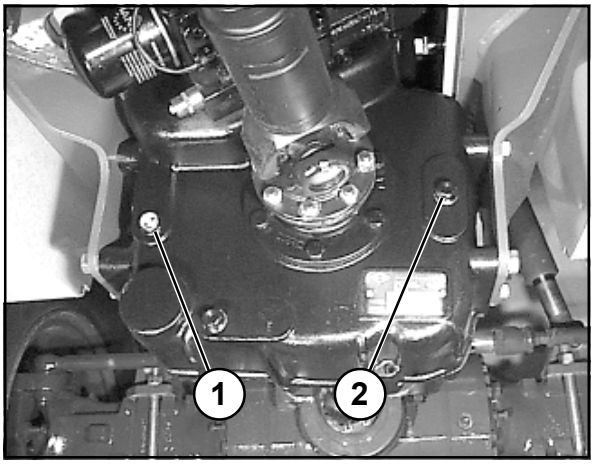


Fig. 8-7

8.2.4 Check oil fill-level transfer gearbox » Fast-runner 40 km/h «

(1) Check oil-level in inspection glass (8-7/1).

NOTE

- The oil level must be visible in the upper quarter of the inspection glass. If required use the plug bore to top up with transmission oil (8-7/2).
- Collect any escaping oil.

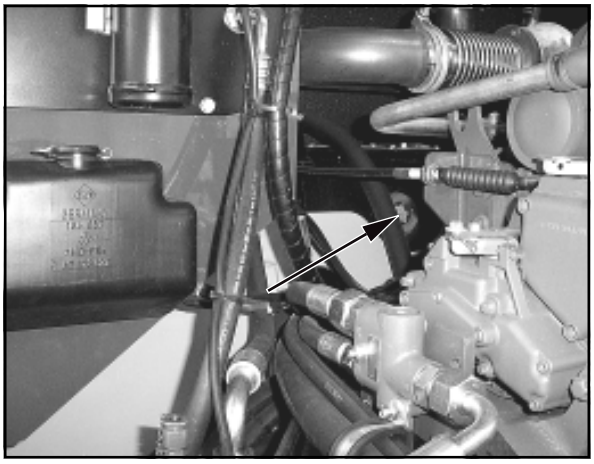


Fig. 8-8

8.2.5 Check oil fill-level in hydraulic oil reservoir

(1) Park the vehicle on level ground.

(2) Lower the loader arm to the ground.

(3) Tilt the quick coupler assembly and use the auxiliary hydraulics lever (4-6/5) to retract the locking bolts.

(4) Open the engine hood.

(5) Check the oil level in the inspection glass (8-8/arrow).

NOTE

- The oil level must be visible in the upper quarter of the inspection glass. If required use the plug bore to top up with transmission oil (8-7/2).
- Collect any escaping oil.

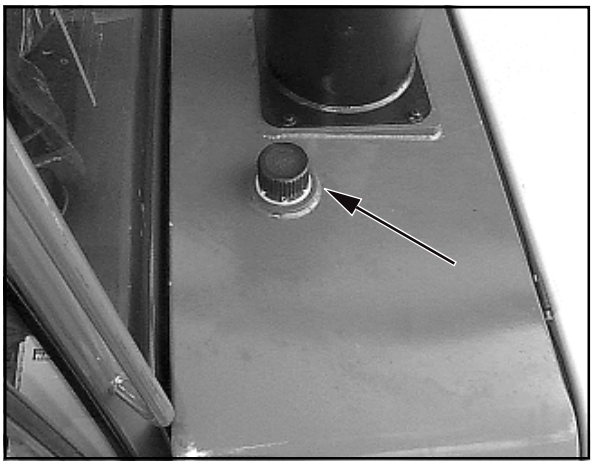


Fig. 8-9

8.2.6 Change the engine oil

(1) Remove the inspection plate from the engine trough (8-10/Pfeil).

(2) Place a sufficiently large oil spill tray under the motor oil sump.

(3) Open the engine hood.

(4) Remove the inspection plate for the engine oil drain plug.

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

(6) Remove the cover cap from the hose.

(7) For further instructions see the engine operating manual.

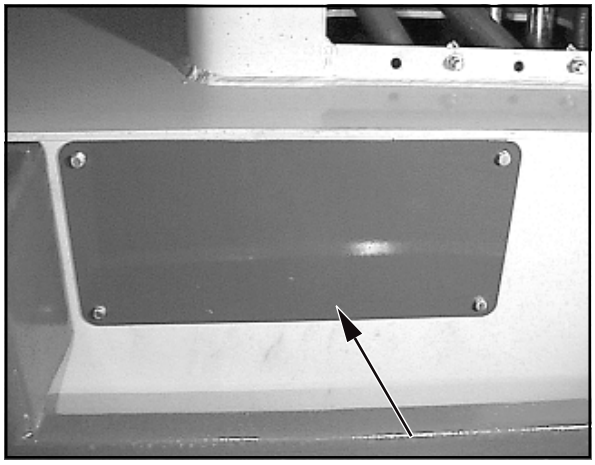


Fig. 8-10

8.2.7 Oil change axles

8.2.7.1 Rear axle

(1) Place a sufficiently large oil spill tray under the vehicle.

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

ATTENTION
Dispose of waste oil in an environmentally friendly way!

(3) Re-insert axle arch plugs (8-11/1, 8-11/2, and 8-11/3).

(4) Top up with oil via axle arch plug bore (8-11/4 or 8-12/arrow) until the oil fill-level reaches the bore opening.

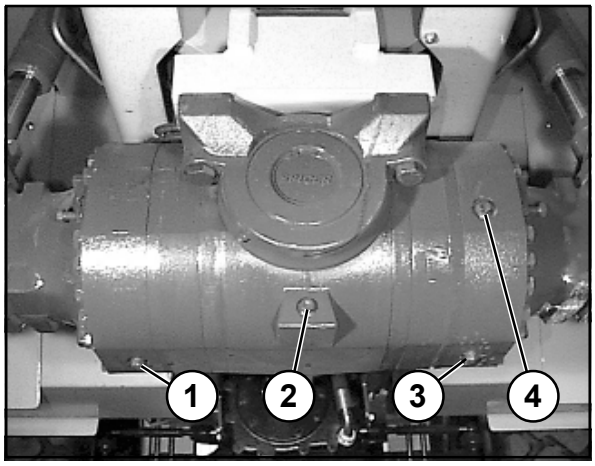


Fig. 8-11

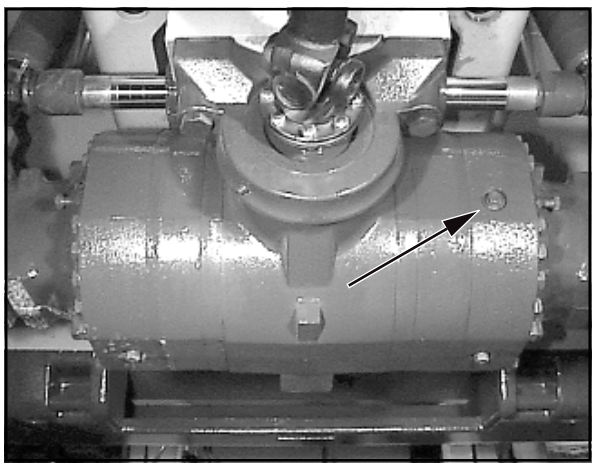


Fig. 8-12

Fig. 8-13

NOTE

- Refer to the maintenance plan (pages 8-1and 8-2) for details on required amounts.
- The oil fill-level will drop after a few minutes. Top up with oil, until the required level has been reached and remains constant.
- The axle vent valve (8-13/arrow) must be free of contamination.

(5) Re-insert the axle arch bore plugs (8-11/4 and 8-12/ arrow).

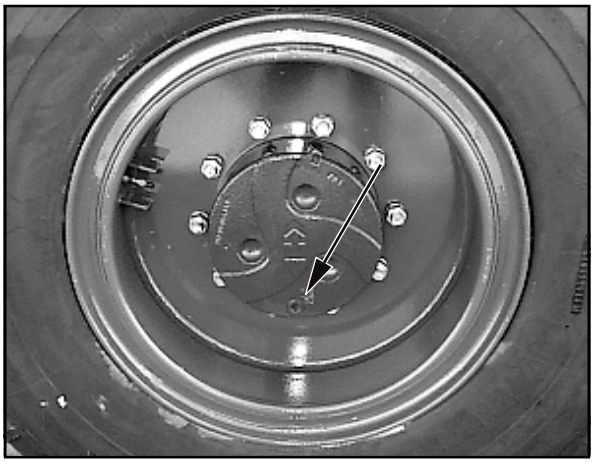


Fig. 8-14

8.2.7.2 Planetary gear

(1) Position the vehicle so that the plug (8-14/arrow) is at 6 o´clock.

(2) Place a sufficiently large oil spill tray with a drainage chute underneach.

(3) Remove the plug and drain the oil.

ATTENTION

Dispose of waste oil in an environmentally friendly way!

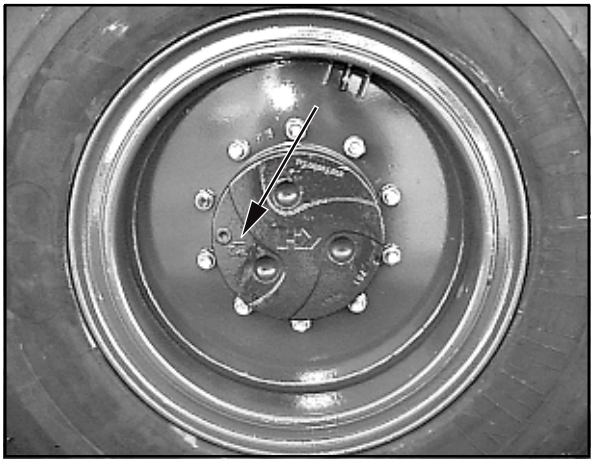


Fig. 8-15

(4) Position the vehicle to allow the "OIL LEVEL" to be horizontal so that the plug is to the top left of the mark (8-15/arrow).

(5) Add oil via the plug bore until the oil fill level reaches the bore opening.

(6) Re-insert the plug with a new gasket.

8.2.7.3 Front axle

(1) Place a sufficiently large oil spill tray underneath the vehicle.

(2) Remove plugs from axle arches (8-16/1, 8-16/2, 8-16/3, 8-16/4, and 8-17/Pfeil) and drain oil.

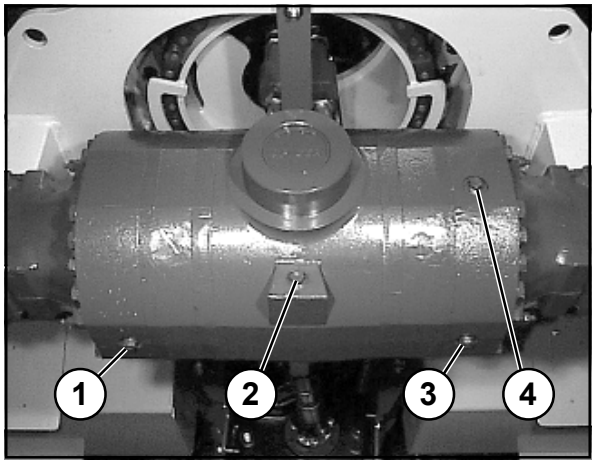


Fig. 8-16

ATTENTION
Dispose of waste oil in an environmentally friendly way!

(3) Re-insert plugs (8-16/1, 8-16/2, and 8-16/3).

(4) Top up with oil via axle arch plug bore (8-16/4 or 8-17/arrow) until oil fill-level reaches plug bore.

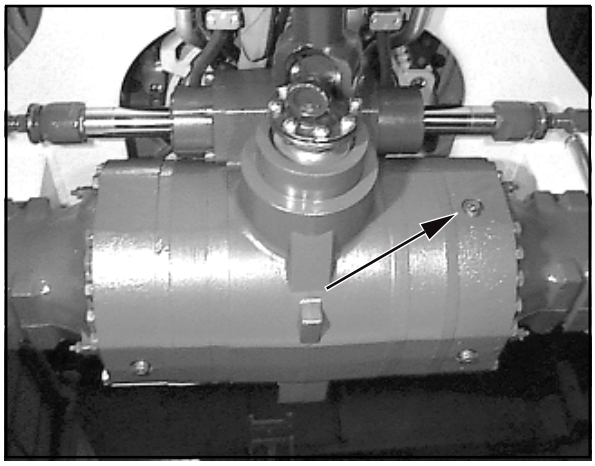


Fig. 8-17

NOTE
- Refer to the maintenance plan (pages 8-1and 8-2) for details on required amounts.
- The oil fill-level will drop after a few minutes. Top up with oil, until the required level has been reached and remains constant.
- The axle vent valve (8-18/arrow) must be free of contamination.

(5) Re-insert plugs (8-16/4 and 8-17/arrow).

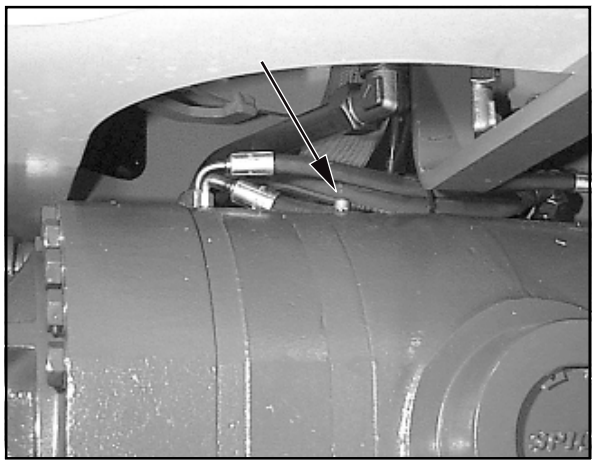


Fig. 8-18

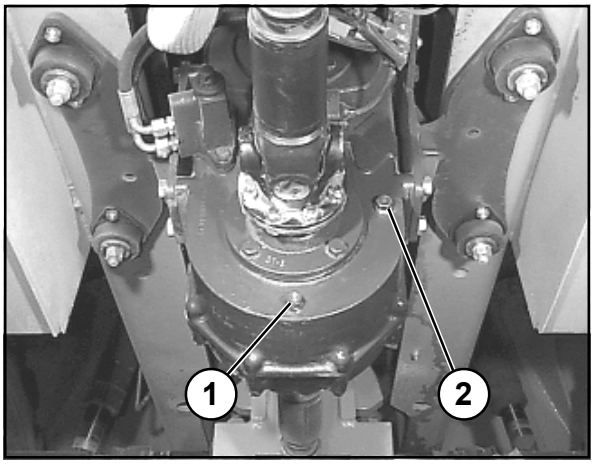


Fig. 8-19

8.2.8 Oil change transfer gear gox » slow-runners 20 km/h and 25 km/h «

(1) Place a sufficiently large oil spill tray under the transfer case.
(2) Remove plugs (8-19/1 and 8-19/2) and allow oil to drain.

ATTENTION
Dispose of waste oil in an environmentally friendly way!

(3) Re-insert plugs (8-19/1).
(4) Top up with oil via plug bore (8-19/2) until the oil fill-level reaches the bore opening.

NOTE
- Refer to the maintenance plan (pages 8-1and 8-2) for details on required amounts.
- The oil fill-level will drop after a few minutes. Top up with oil, until the required level has been reached and remains constant.

(5) Re-insert the plugs (8-19/2).

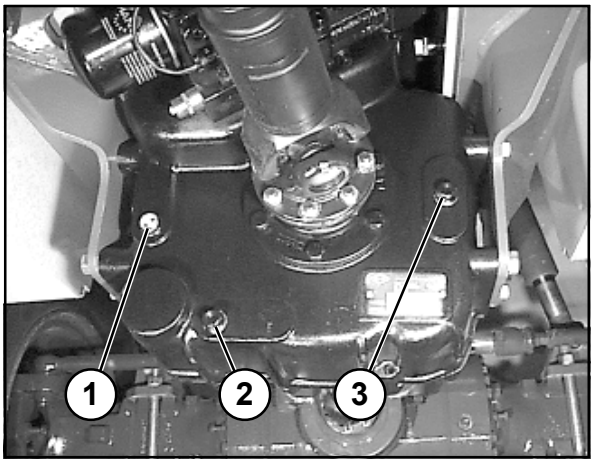


Fig. 8-20

8.2.9 Oil change transfer gear gox » fast-runners 40 km/h «

(1) Place a sufficiently large oil spill tray under the transfer case.
(2) Remove plugs (8-20/2 and 8-20/3)and allow oil to drain.
(3) Change the filter cartridge (microfilter) (8-21/1).
(4) Clean the suction filter (macrofilter) (8-21/2).

ATTENTION
Dispose of waste oil in an environmentally friendly way!

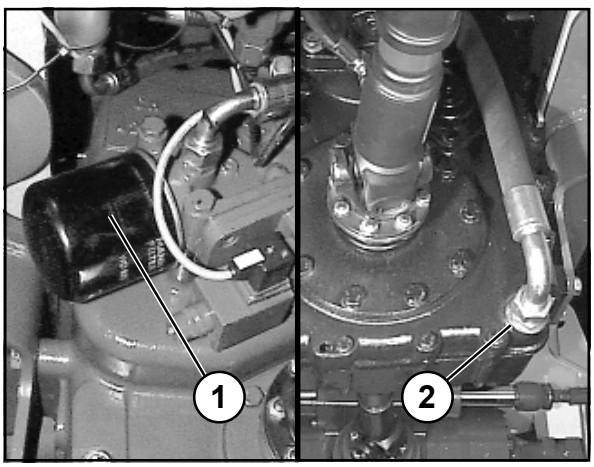


Fig. 8-21

(5) Re-insert plugs (8-20/2).
(6) Top up with oil via plug bore (8-20/3).

NOTE
- Refer to the maintenance plan (pages 8-1and 8-2) for details on required amounts.
- The oil level must be visible in the upper quarter of the inspection glass (8-20/1).
- The oil fill-level will drop after a few minutes. Top up with oil, until the required level has been reached and remains constant.

(7) Re-insert plug (8-20/3).

8.2.10 Oil change hydraulics

(1) Open the engine hood.

(2) Ensure that an oil spill tray is available (for size refer to section Kapitel 11.11).

(3) Remove the inspection plate for the oil drain plug (8-22/arrow).

(4) Attach the drainage nozzle with hose from the tool case (4-1/13) to the oil drain plug.

(5) Remove the cover cap from the hose.

(6) Allow the oil to drain into the spill tray.

ATTENTION
Dispose of waste oil in an environmentally friendly way!

(7) Screw the cap back on the hose and remove the drainage nozzle with hose.

(8) Replace the inspection plate and tighten the oil drain plug.

(9) Change the hydraulic oil filter media (section 8.2.11).

(10) Top with oil via plug bore (8-23/arrow).

ATTENTION
Equipment using biodegradable hydraulic oil (ester based synthetic hydraulic oil - viscosity class ISO VG 46 VI > 180) - (refer to the label on the hydraulic oil reservoir and on the dashboard) need to use the same replacement oil type.
Do not mix mineral and biodegradable hydraulic oils!
Biodegradable hydraulic oil must be change every **1000 operating hours**.
Follow the migration guidelines VDMA 24 569 when moving from mineral based to biodegradable hydraulic oil grade!

(11) Check the oil fill-level in the oil fill-level inspection glass (8-24/Pfeil).

NOTE
- Ensure that the loader arm has been lowered to the ground.
- Ensure that the quick coupler assembly has been tipped, and that the locking bolts have been moved to lock position using the auxiliary hydraulics lever (4-6/5).
- The oil fill-level must be in the top quarter of the inspection glass.

(12) Use specialized tool (hook wrench) to move the filling nozzle.

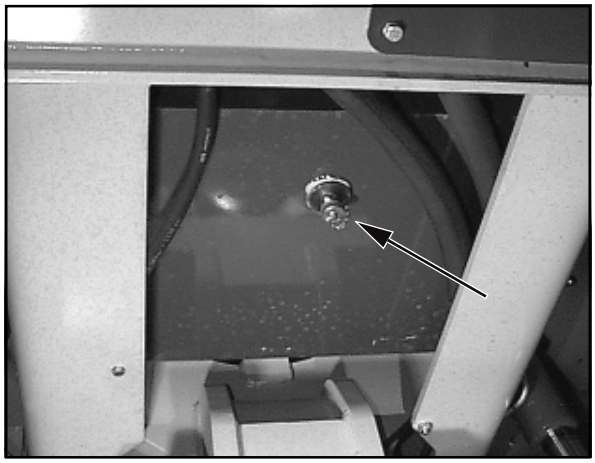


Fig. 8-22

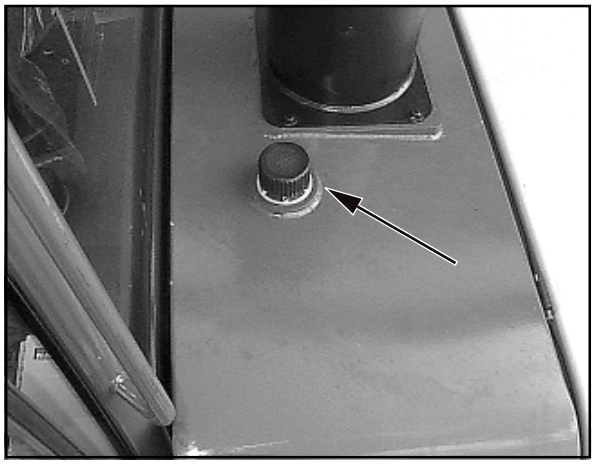


Fig. 8-23

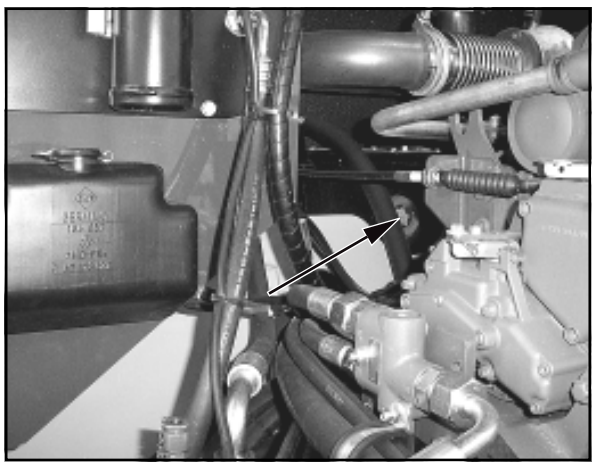


Fig. 8-24

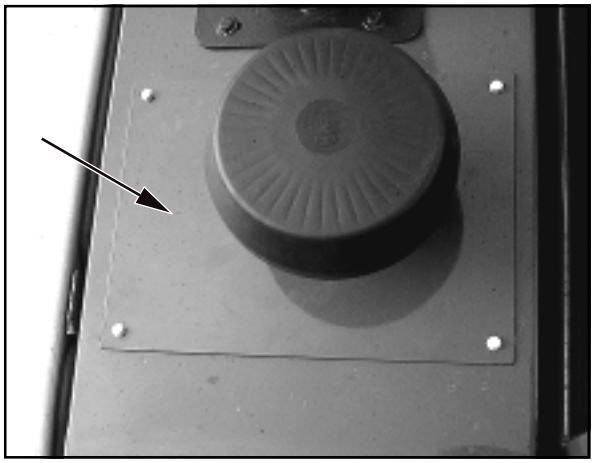


Fig. 8-25

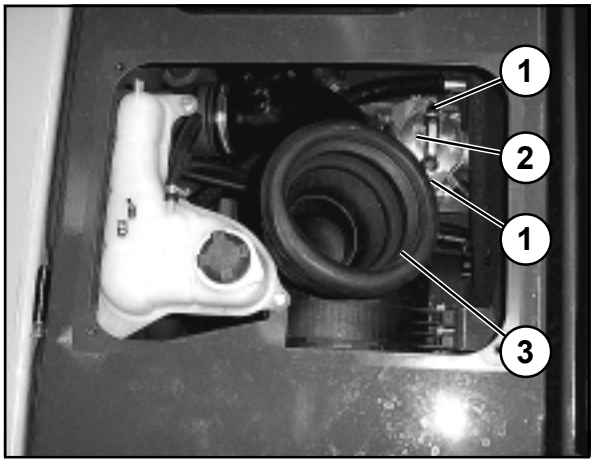


Fig. 8-26

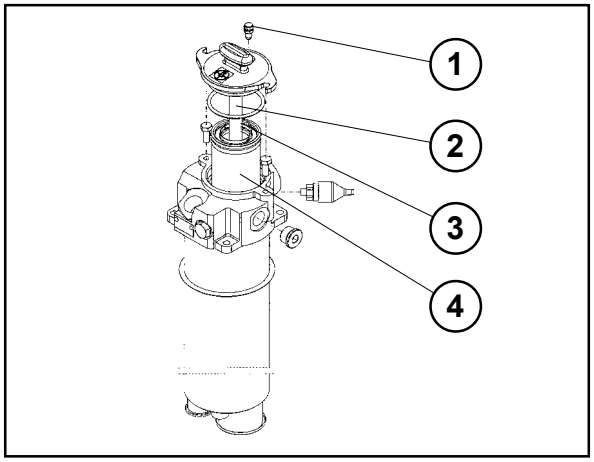


Fig. 8-27

8.2.11 Changing the suction return filter insert

ATTENTION

Change the filter insert at the intervals indicated in the maintenance plan or when clogging is indicated (4-8/34).

NOTE

When cold starting the vehicle the clogging indicator may light up prematurely. The indicator will go off as soon as the hydraulic oil warms up.

(1) Remove the access cover (8-25/cover)

(2) Loose the hose band clip of the rubber collar (8-26/3) and pull off the collar.

(3) Remove both screws on the hydraulic oil filter cover (8-26/1).

(4) Remove the hydraulic oil filter cover and the magnetic tube attached to it (8-27/2).

(5) Lift up the handle (8-27/3), remove the filter insert (8-27/4) and replace it with a new insert.

ATTENTION

Dispose of used hydraulic oil filter inserts in an environ-mentally friendly way!

(6) Wipe the magnetic tube (8-27/2) clean before re-fitting.

(7) Re-fit and tighten the hydraulic oil filter cover and magnetic tube.

(8) Attach the vent tube to the vent outlet (8-26/2 or 8-27/1).

(9) Start the engine.

(10) Make sure you have an oil spill tray available and open the vent valve.

NOTE

Keep the vent valve open until the oil that emerges is bubble free.

(11) Close the vent valve.

(12) Slip the rubber collar (8-26/3) on the air filter tube and fasten it with the hose band clip.

(13) Re-fit the access cover (8-25/arrow).

8.2.12 Servicing/Changing the airfilter

NOTE

The filter insert requires attention when the maintenance indicator (8-28/1) shows red, or after 12 months, which ever is sooner.

(1) Open the engine hood.
(2) Unscrew both wing screws on the top of the maintenance grid (8-28/2). Push the grid outside in the upper part and lift it.
(3) Loosen the two fastening clamps on the air filter lid (8-29/1) and remove the air filter lid.
(4) Pull out the filter cartridge (8-29/2) by carefully turning it back and forth.
(5) Clean the filter cartridge.

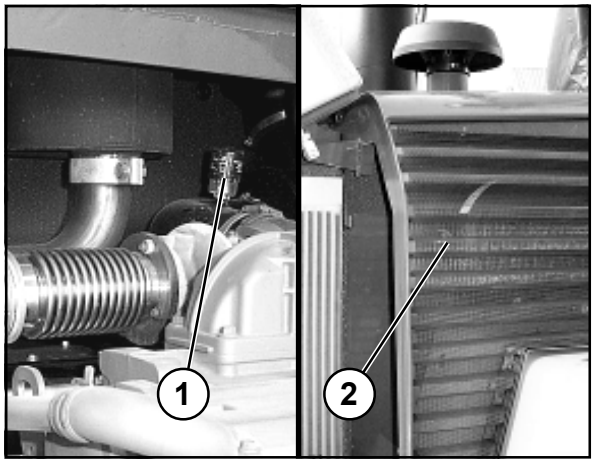


Fig. 8-28

ATTENTION

- For cleaning, use a compressed air gun to which a pipe (angled at 90°) has been attached. The pipe must be sufficiently long to reach the cartridge bottom. Use dry compressed air of no more than 5 bar to blow out the cartridge by moving the pipe back and forth in the interior of the cartridge. Cleaning may be stopped when dust formation ceases.
- Do not use petrol or hot liquid for cleaning.

(6) Use a hand-held inspection lamp to check the filter cartridge for damage to the cartridge paper or the rubber gasket. If the cartridge or seals are damaged, replace the cartridge.
(7) Re-insert the filter cartridge carefully.
(8) Install the air filter lid on the filter housing in such a way that the direction arrow in the **"OBEN-TOP"** mark points upward. This ensures that the dust removal valve is pointing down.
(9) If the service indicator (8-28/1) previously showed red, press the reset button. The indicator should now be clear.
(10) Re-install the maintenance grid (8-28/2).

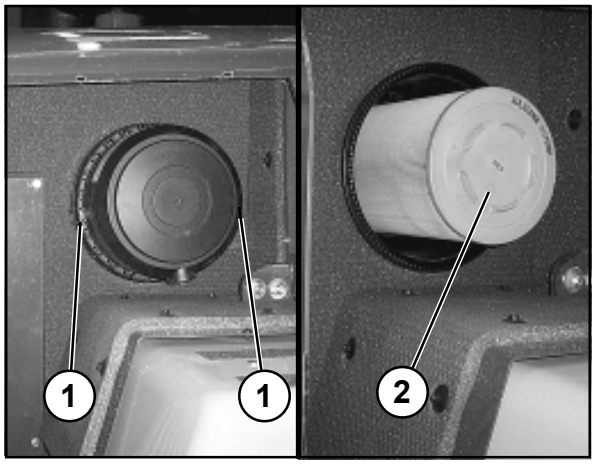


Fig. 8-29

ATTENTION

Before starting the engine, check the connecting pipes and hose on the airfilter unit for signs of damage.

8.2.13 Changing the safety cartridge

ATTENTION

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

Fig. 8-30

(1) Remove the filter cartridge (section 8.2.12).

(2) Pierce the seal of the safety cartridge (8-30/arrow) from the inside by using a screwdriver or similar tool and pull up both strips.

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

(4) The remaining installation is performed as described in section 8.2.12 (7)...(10).

8.2.14 Changing the fuel filter

See the engine operating manual.

8.2.15 Changing the starter batteries

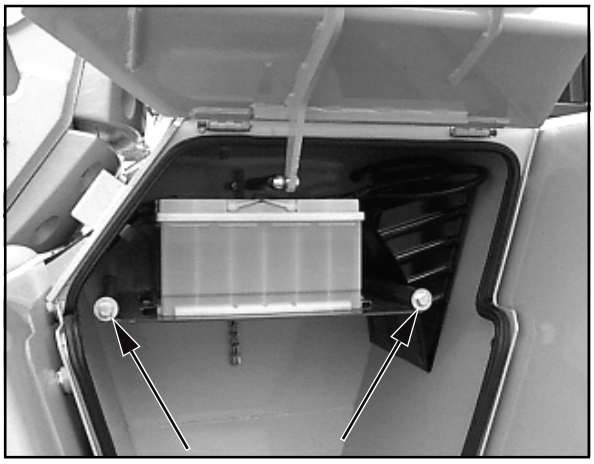


Fig. 8-31

NOTE

- The starter battery is a low maintenance part according to DIN 72311, section 7. It is located in the engine compartment, on the right-hand side of the machine.
- Always store batteries in a clean and dry place.

(1) Disconnect the battery master switch (4-7/5).

(2) Use a square wrench to open the access panel.

(3) Remove both securing bolts SW 19) (8-31/arrows) for the battery holder.

(4) Pull out the battery holder and the batteries to the extent the retainer allows.

(5) Loosen and remove the securing bolts (SW 17) (8-32/1) for the battery holder.

(6) Loosen and disconnect the battery cable clamps (8-32/2) from the battery terminals (SW 13).

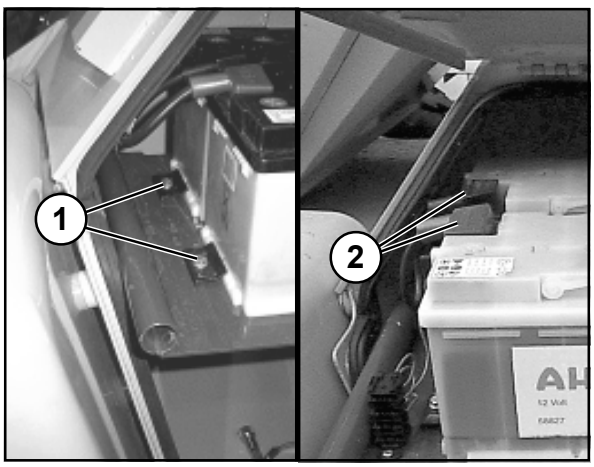


Fig. 8-32

DANGER

Always remove the negative cable clamp first, before removing the positive clamp. When re-attaching, use the reverse order.

(7) Remove and replace the batteries.

(8) Lightly lubricate the terminals and clamps before re-attaching them with acid-free and acid-resistant grease.

(9) To fit a new battery perform these steps in reverse order.

DANGER

Make sure the fastenings are secure.

(10) Close the access cover again.

8.2.16 Servicing/Changing the fresh air filter

(1) Lift and mechanically prop up bucket arm [e.g. by inserting the bucket arm support (option) (1-1/arrow)], Lower bucket arm until it rests on the bucket arm support and swivel all the way to the right or left.

(2) Loosen and remove the four holding screws (8-33/arrows) of the heating unit cover, and then remove the cover.

(3) Remove the filter elements (8-34/arrows) and blow them clean with air.

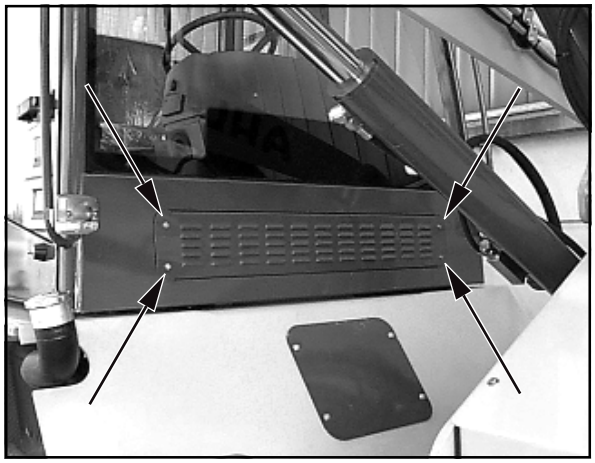


Fig. 8-33

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

(4) Check the filter elements for signs of damage.

NOTE
Change the filter elements in case of damage or every **1500 operating hours**.

(5) Re-fit the filter elements and the heating unit cover.

Fig. 8-34

8.2.17 Checking brake play

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

(2) Remove the axle arch plugs (8-12/arrow and 8-17/arrow).

(3) Use a special feeler gage to measure the gap between the center brake disks.

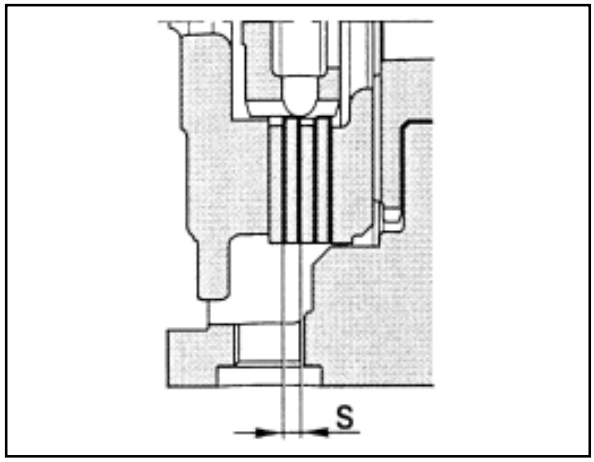


Fig. 8-35

ATTENTION
- "S" minimum: 5 mm.
- If necessary, change the center brake disks on both sides.

(4) Re-fit the plugs (8-12/arrow and 8-17/arrow) wieder.

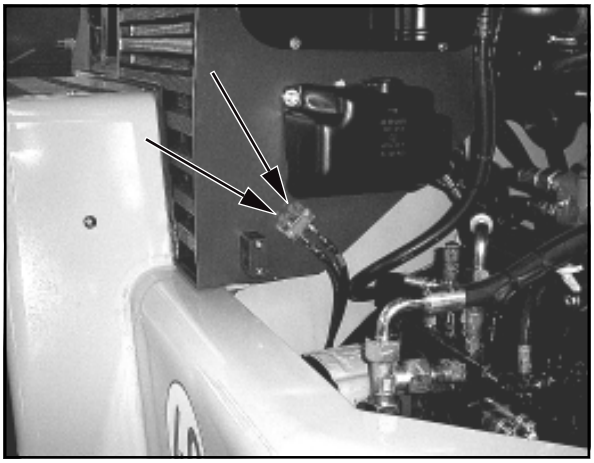


Fig. 8-36

8.3 Greasing points

NOTE
Greasing points are painted red on the vehicle.

8.3.1 Rear axle pivot bolt (8-36/arrows)

ATTENTION
The rear axle pivot bolt must be greased **every 10 operating hours**.

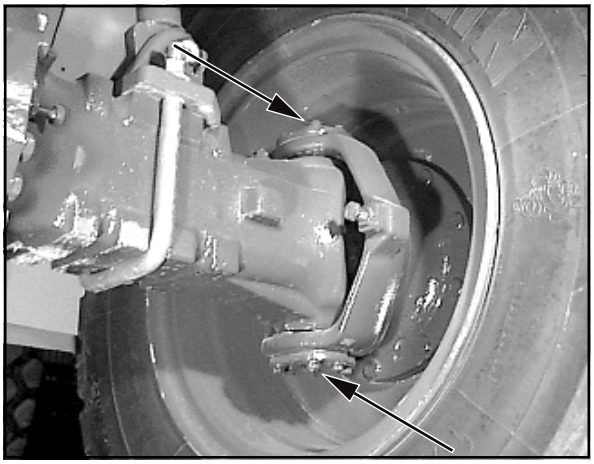


Fig. 8-37

8.3.2 Rear axle (8-37/arrows)

ATTENTION
The rear axle spindle bolts must be greased every **50 operating hours**.

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

Fig. 8-38

8.3.3 Front axle (8-38/arrows)

ATTENTION
The front axle spindle bolts must be greased every **50 operating hours**.

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

8.3.4 Swivel assembly (8-39/arrows)

The grease pack is designed to avoid friction, to seal the unit and protect it from corrosion. For this reason, the bearings should be greased liberally **every 10 operating hours** until grease emerges. When greasing the swivel assembly rotate the loader arm in 20° steps. Ensure that all four grease points are greased at every step. Additionally grease the assembly before and after longer periods of inactivity.

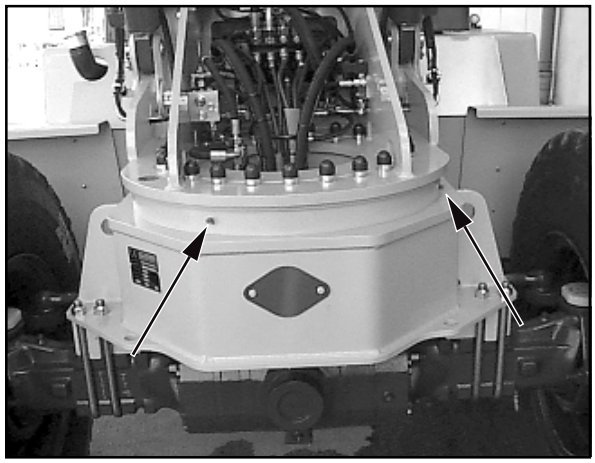


Fig. 8-39

DANGER

- Before greasing, mechanically prop up the bucket arm [e.g. by inserting the bucket arm support (option) (1-1/arrow)], apply the parking brake (4-7/4) and set the drive direction switch (4-7/3) to "0".
- Makes sure that nobody is in the working area of the loader arm **while** rotating the arm.

8.3.5 Loader assembly

ATTENTION

The bolts/greasing points (8-40/arrows of the loader/quick coupler assembly) must be greased **every 10 operating hours**.

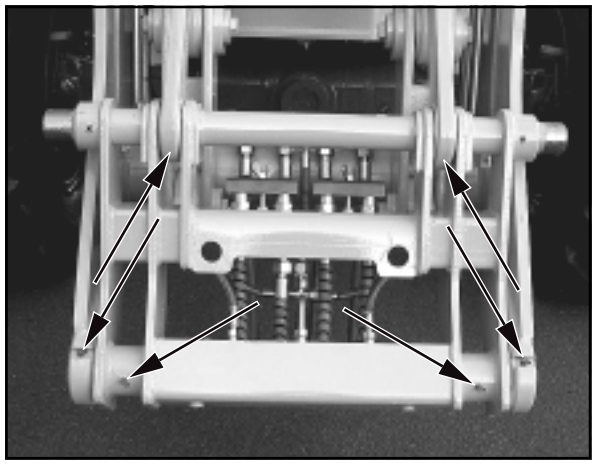


Fig. 8-40

8.3.6 Driver cab doors (8-41/arrows)

ATTENTION

Ensure that the hinges of the driver cab doors are greased **every 50 operating hours**.

NOTE

Ensure that the hinges on both driver cab doors are greased.

Fig. 8-41

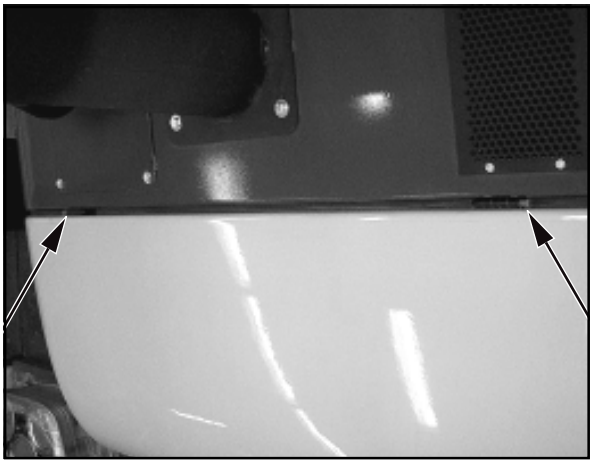


Fig. 8-42

8.3.7 Engine hood

ATTENTION

The hinges of the engine hood (8-42/arrows) must be lubricated **every 50 operating hours.**

Fig. 8-43

8.4 Oiling points

8.4.1 Support valve control mechanism

ATTENTION

The support valve control mechanism must be oiled with engine oil **every 50 operating hours**.

(1) Raise the loader arm, insert the loader arm support and swivel the arm out fully to the left or right.

(2) Loosen and remove the four holding screws on the access panel (8-43/arrows).

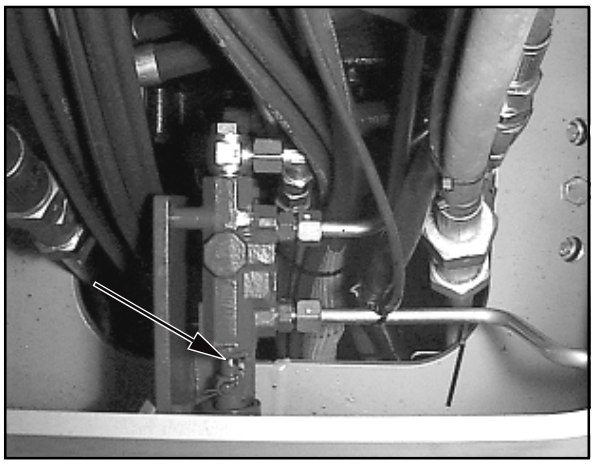


Fig. 8-44

NOTE

Oil only the visible area of the piston rod on the suspension casing (8-44/arrow).

Troubleshooting

9 Troubleshooting

NOTE

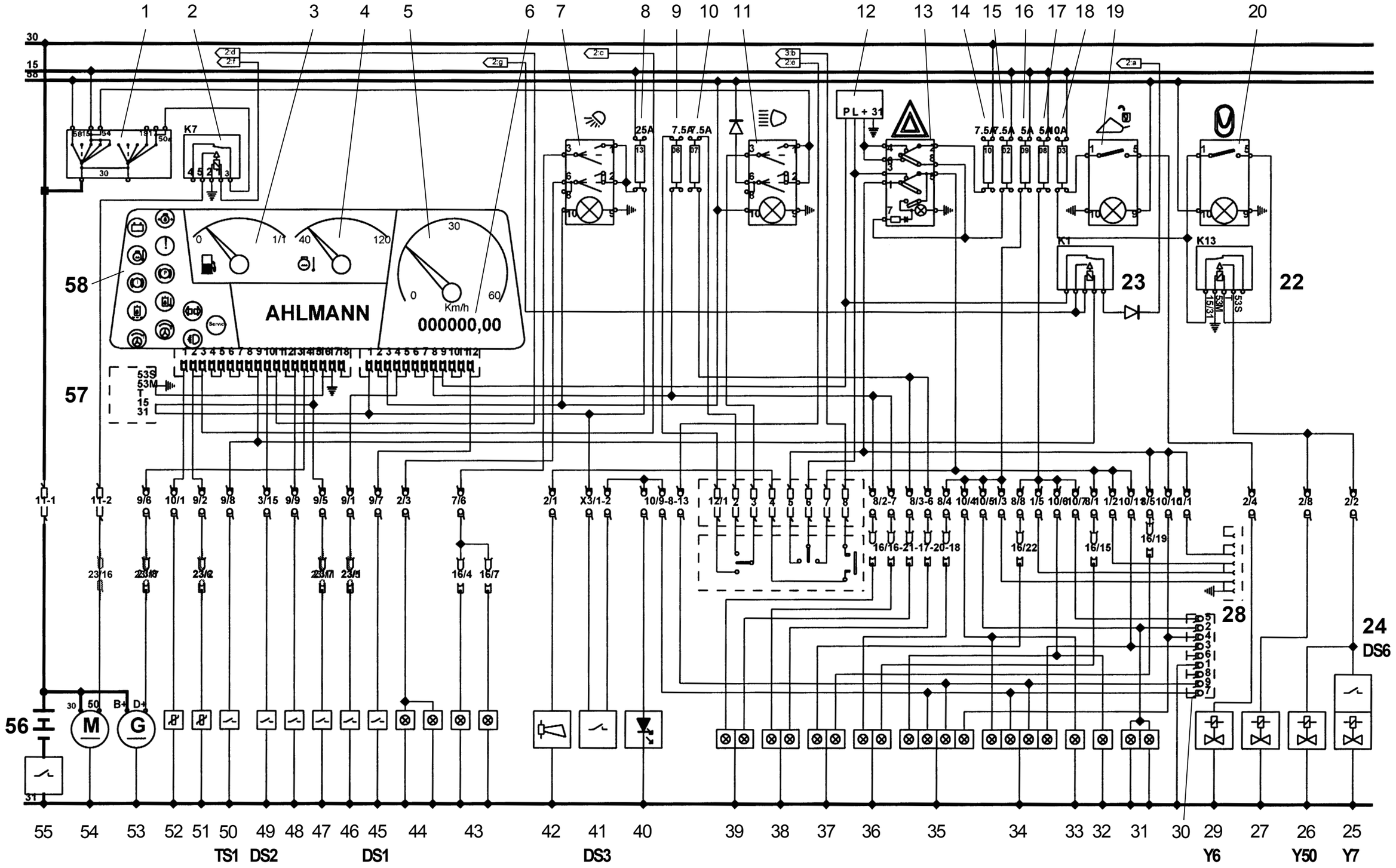
*) These tasks to be performed by authorized staff only

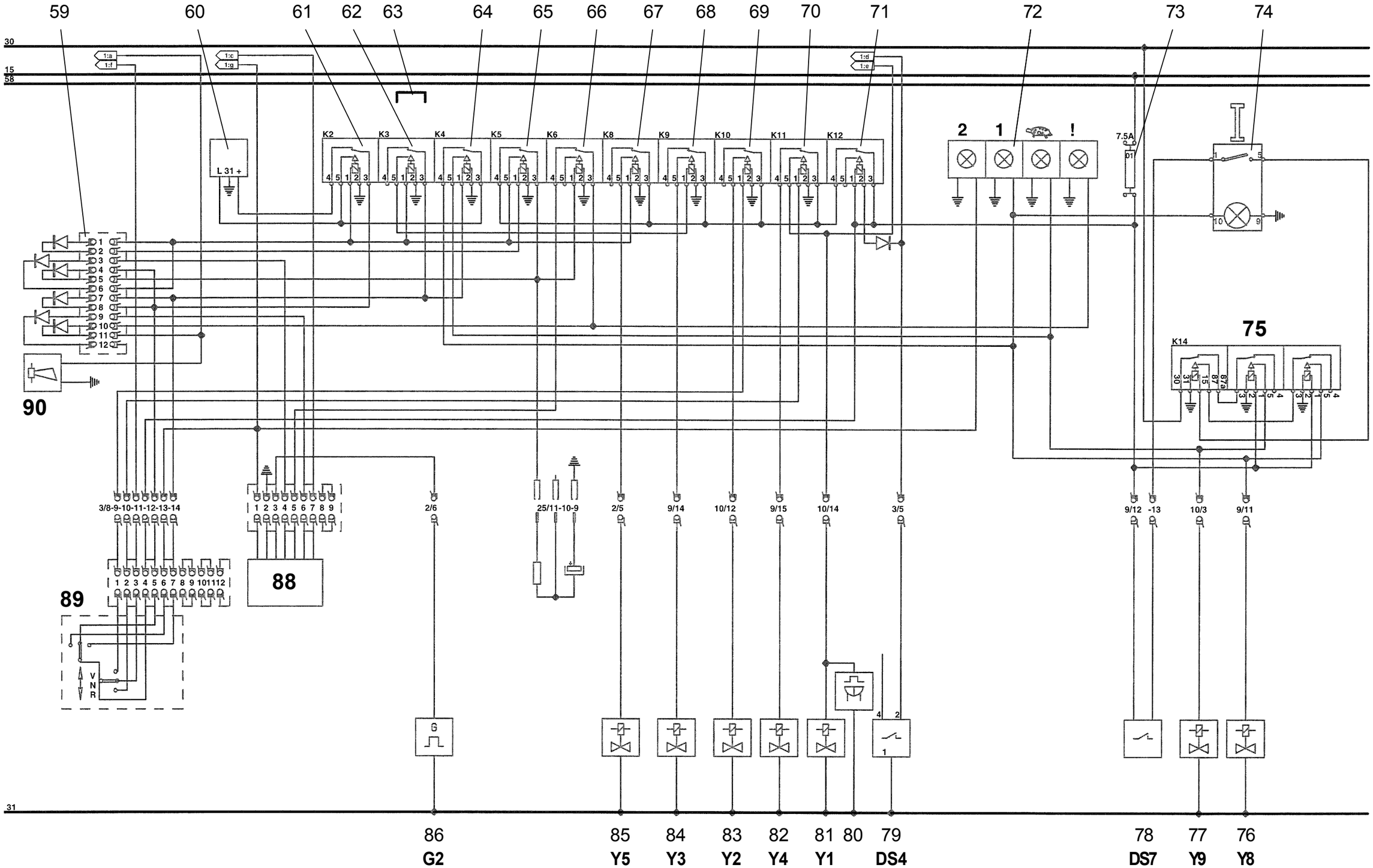
Malfunction	Probable Cause	Remedy
Engine		Refer to engine manual
Engine will not start	Drive selector (4-7/3) not in neutral	Put drive selector in neutral
Loader arm cannot be lifted or dropped	Pressure valve in in control valve may be open	Remove pressure valve, clean and re-calibrate*
	Control valve for main hydraulics (4-7/2) locked	Unlock control valve (1-2/1)
	No pilot pressure or pressure too low	Open pressure valve in control circuit, clean and re-calibrate*
	Diesel engine failure	Use residual pressure to lower the loader arm to the ground immediately after engine failure
More force required for steering	Pressure valve in steering unit may be open	Remove pressure valve, clean and re-calibrate*
	Slide valve in priority valve blocked	Replace priority valve
Swivel assembly (1-4/arrow) fails to rotate	Swivel mechanism may be blocked	Remove swivel assembly block and store in holder
	Pressure valve in control valve may be open	Remove pressure valve, clean and re-calibrate*
Support failure	Cut-off valve switch in frame under swivel assembly jammed	Rotate loader arm in direction of travel; free arm
Support failure when loader arm is lowered in swivelled state	Non-return valve in pressure hose open	Rotate loader arm in direction of travel, remove non-return valve clean and refit or replace*

Malfunction	Probable Cause	Remedy
Malfunction in travel and main hydraulics	Filter clogged	Change filter inserts
	Low oil fill-level in hydraulic oil reservoir	Top up with oil
	Electrical connection of axial piston pump not tight, separated or corroded	Connect according to wiring diagram or clean
	High pressure valves contaminated	Clean
Brake malfunction	Parking brake cannot hold vehicle	Check adjustment and possibly readjust*
		Check whether breaker circuit is attached to brake lever
Alternator not charging	Loose connector	Replace and fasten connector
	Alternator belt snapped	Relace belt
	Alternator revs too low	Check tension of alternator belt. and re-tension, if needed
Heating/Ventilation unit failure	Fuse blown	Replace fuse
Hose connectors for attachments will not attach	Increased pressure due to effect of heat on attachment	**Carefully** remove screw joint above the quick coupling, to bleed oil and reduce the increased pressure. Re-tighten the screw joint **NOTE** Dispose of waste oil in an environmentally friendly way!
	Increased pressure in unit	Switch engine off, release pressure in pilot valve (4-9/5) through circular motion of lever

Wiring and Hydraulics

10.1 - 02.2003 Elektrik-Schaltplan/Schéma électrique/Wiring diagramm/Elektrisch schakelschema/Elektrisk kopplingsschema

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1:a
1:f
1:c
1:g
1:d
1:e
L 31 +
K2
K3
K4
K5
K6
K8
K9
K10
K11
K12
2
1
!
7.5A
D1
75
K14
90
89
88
3/8-9-10-11-12-13-14
1 2 3 4 5 6 7 8 9
1 2 3 4 5 6 7 8 9 101112
V
N
R
2/6
25/11-10-9
2/5
9/14
10/12
9/15
10/14
3/5
9/12
-13
10/3
9/11
G
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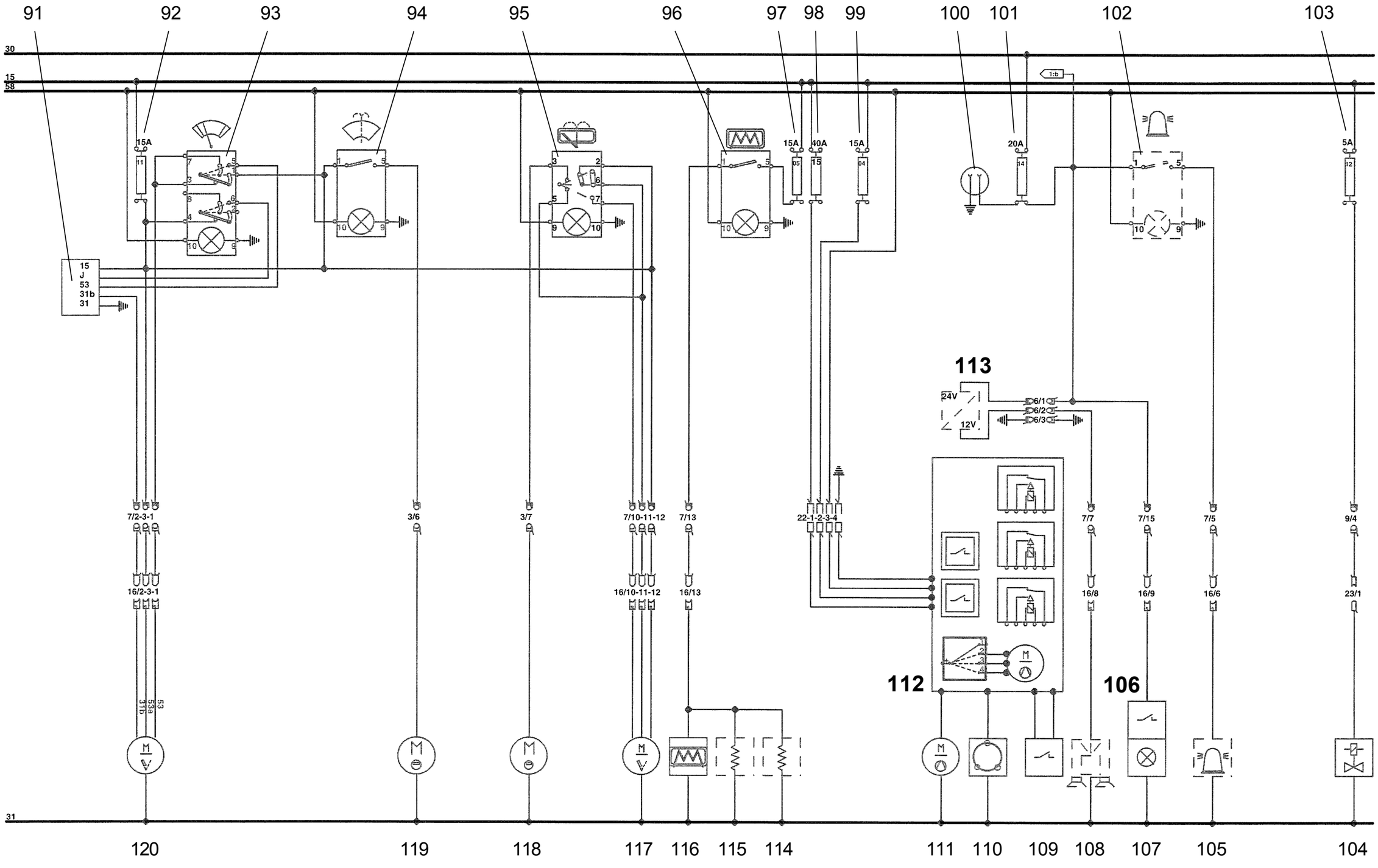
2
1
31
86
G2
85
Y5
84
Y3
83
Y2
82
Y4
81
Y1
80
79
DS4
78
DS7
77
Y9
76
Y8

10.1 - 02.2003 Elektrik-Schaltplan/Schéma électrique/Wiring diagramm/Elektrisch schakelschema/Elektrisk kopplingsschema



10.1 Wiring Diagram

Pos.	Name
01	Starter button
02	Relay: Starter cut-out
03	Fuel fill-level display
04	Cooling water temperature display
05	Tachometer
06	Operating hour counter
07	Actuator: Working floodlights
08	Fuse (Chapter 4.9 Pos. 17/13)
09	Fuse (Chapter 4.9 Pos. 17/6)
10	Fuse (Chapter 4.9 Pos. 17/7)
11	Actuator: StVZO-Beleuchtung
12	Indicator pick-up
13	Actuator: Hazard Warning Lights
14	Fuse (Chapter 4.9 Pos. 17/10)
15	Fuse (Chapter 4.9 Pos. 17/2)
16	Fuse (Chapter 4.9 Pos. 17/9)
17	Fuse (Chapter 4.9 Pos. 17/8)
18	Fuse (Chapter 4.9 Pos. 17/3)
19	Actuator: Quick coupler release
20	Actuator: Loader arm cushioning
21	not used
22	Relay: Loader arm cushioning
23	Relay: Accoustic warning
24	Pressure switch: Overload loader arm cushioning
25	Accumulator valve: Loader arm cushioning
26	Valve: Pipe burst protection/Loader arm cushioning (opt.)
27	Combi-valve
28	Socket 7-pin front
29	Valve: Quick coupler release
30	Adapter for socket 7-pin rear
31	Number plate lighting
32	Marker lamp right
33	Marker lamp left
34	Tail light unit right
35	Tail light unit left
36	Indicator/marker light right
37	Indicator/marker light left
38	Driving light left
39	Driving light right
40	Additional brake light
41	Brake light switch
42	Signal horn
43	Working floodlight back
44	Working floodlight front
45	Switch: Hydraulic oil filter
46	Switch: Cooling water temperature
47	Switch: Oil pressure
48	Switch: Cooling water fill-level
49	Switch: Service brake malfunction
50	Switch: Hydraulic oil temperature
51	Cooling water temperature pick-up
52	Plunge tube pick-up
53	Alternator
54	Starter motor
55	Battery main switch
56	Batteries
57	Service interval pick-up (opt.)
58	Warning indicators

Pos.	Name
59	Diode combination (only fast-runners)
60	Pulse generator indicator light unit gear selector
61	Relay gear selector (only fast-runners)
62	Relay gear selector (only fast-runners)
63	Brücke gear selector (only Langsamläufer)
64	Relay gear selector (only fast-runners)
65	Relay gear selector (only fast-runners)
66	Relay gear selector (only fast-runners)
67	Relay gear shift switch
68	Relay 1st gear
69	Relay power control forwards
70	Relay power control reverse
71	Relay drive breaker
72	Indicator light unit gear selector
73	Fuse (Chapter 4.9 Pos. 17/1)
74	Push-button gear shift selector slow/fast (only slow-runners)
75	SchrittschaltRelay (only slow-runners)
76	Valve 1st gear (only slow-runners)
77	Valve 2nd gear (only slow-runners)
78	Switch: Relase gear selector (only slow-runners)
79	Switch: Parking brake
80	Reverse warning pick-up
81	Valve reverse travel direction
82	Valve travel direction recognition
83	Valve forward travel direction
84	Valve 1st gear
85	Valve gear shift switch
86	Rev pick-up
87	not used
88	Rev evaluator
89	Multi-purpose lever right (Valve pick-up for main hydraulics)
90	Accoustic warning

Pos.	Name
91	Interval pick-up
92	Fuse (Chapter 4.9 Pos. 17/11)
93	Acuator interval wipers front
94	Acuator screen washer front
95	Acuator wiper/washer back
96	Acuator rear screen heating
97	Fuse (Chapter 4.9 Pos. 17/5)
98	MaxiFuse (40 A)
99	Fuse (Chapter 4.9 Pos. 17/4)
100	Socket dashboard 2 pin
101	Fuse (Chapter 4.9 Pos. 17/14)
102	Acuator 360° lamp (opt.)
103	Fuse (Chapter 4.9 Pos. 17/12)
104	Valve engine cut-out
105	360° lamp (opt.)
106	Switch interior lighting
107	Interior lighting
108	Radio (opt.)
109	Pressure switch (filter air-conditioning)
110	compressor (air-conditioning)
111	Fan motor (air-conditioning)
112	Air-conditioning (opt.)
113	Transformer radio
114	Heated mirror right (opt.)
115	Heated mirror left (opt.)
116	Rear screen heating
117	Motor wiper back
118	Motor washer back
119	Motor washer front
120	Motor wiper front

Opt. = Optional equipment

NOTE

The item nos. printed in bold type in the wiring diagram are cross-references to the interface in the hydraulics plan.

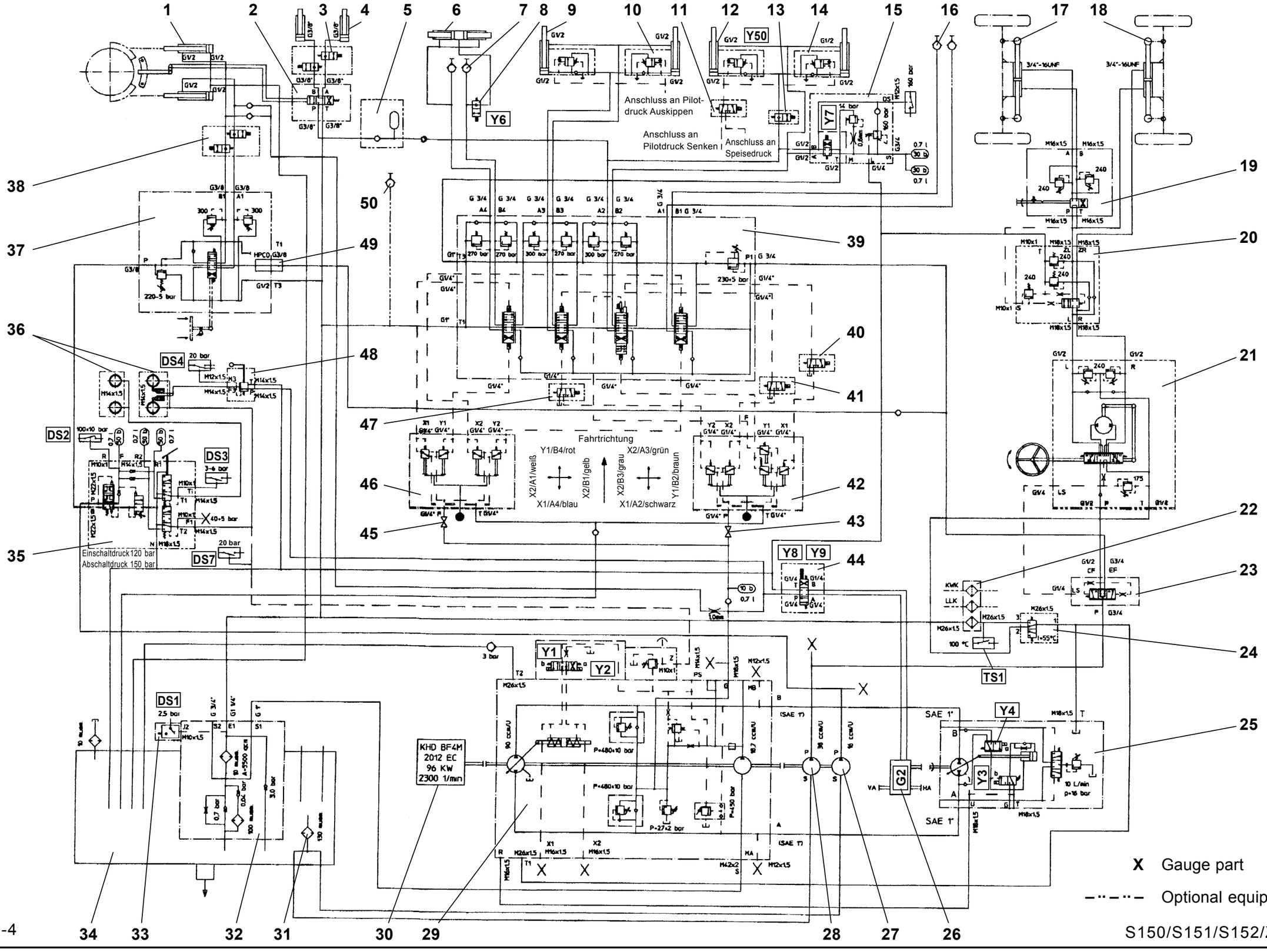
MaxiFuse wechseln (Pos. 98):

Should it be necessary to change the fuse for the air-conditioning system, the dash board cover must be removed first.

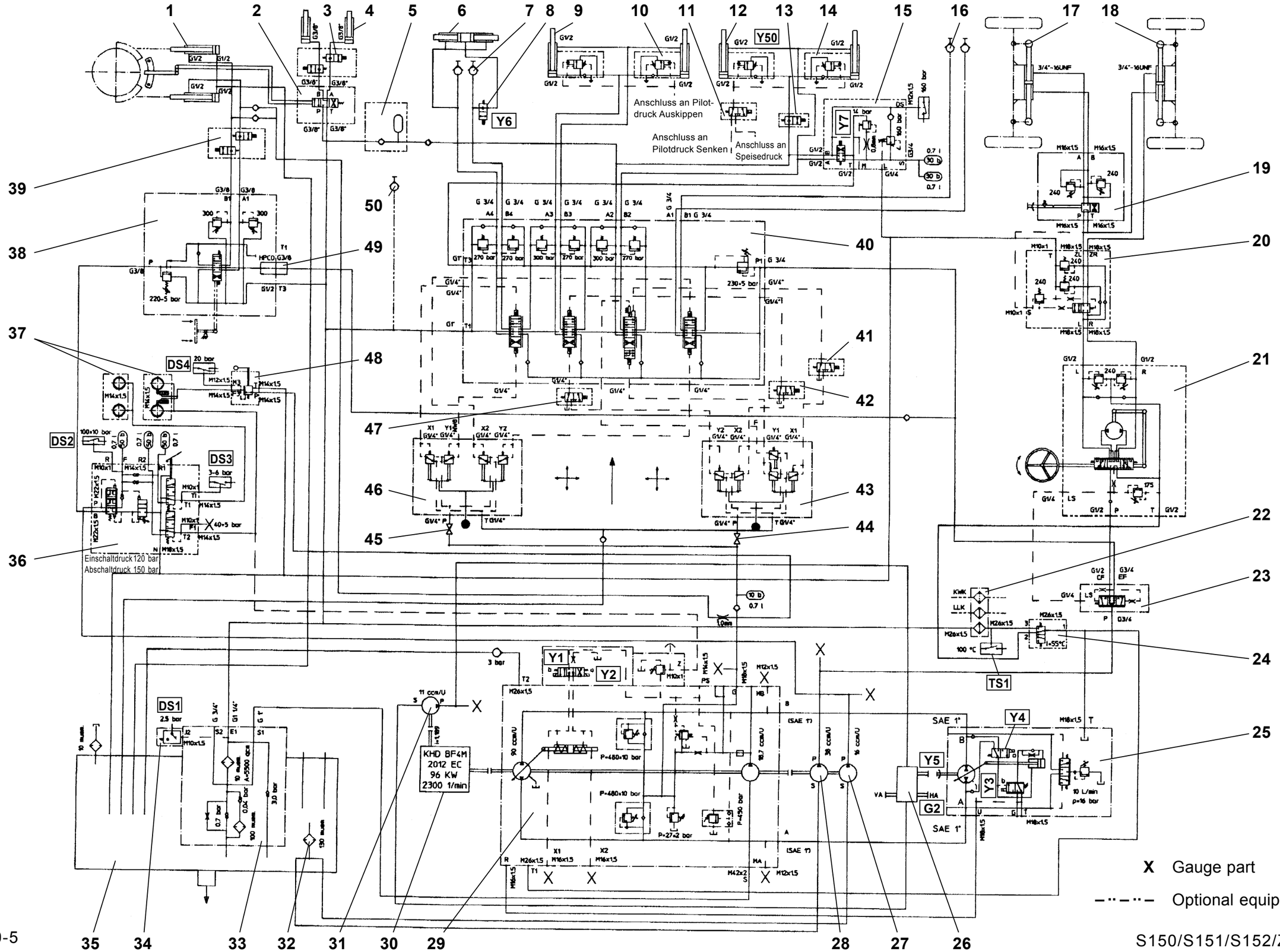
NOTE

After removing the dash board cover, the fuse is accessible in the front area near the front screen.

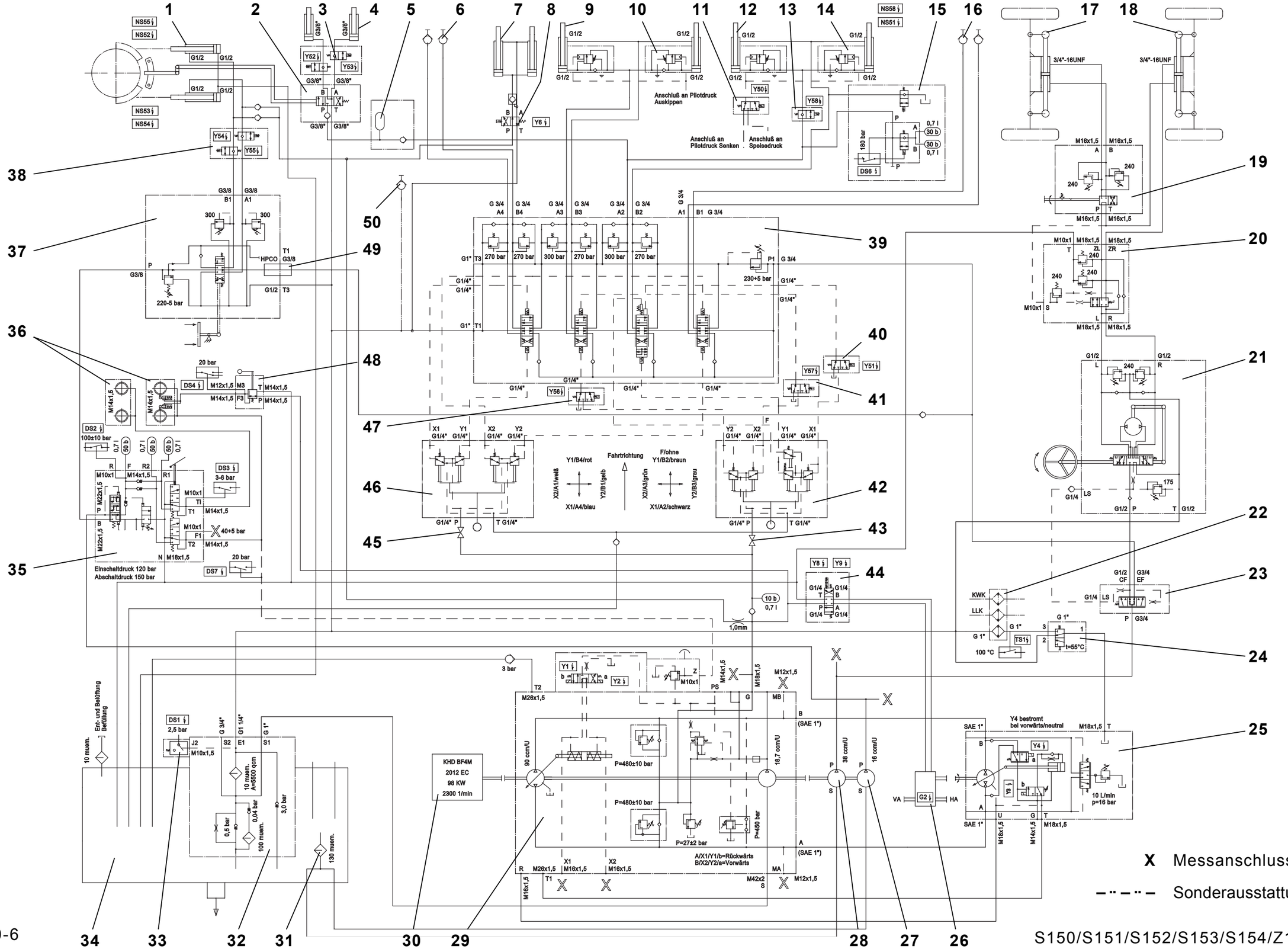
10.2.1 - 04.2001 Hydraulics Diagram AS 150 (bolt lock) Type "20 km/h" and "25 km/h"



10.2.2 - 04.2001 Hydraulics Diagram AS 150 (bolt lock) Type "40 km/h"



10.2.3 - 01.2006 Hydraulics Diagram AS 150 (claw lock) Type "20 km/h"



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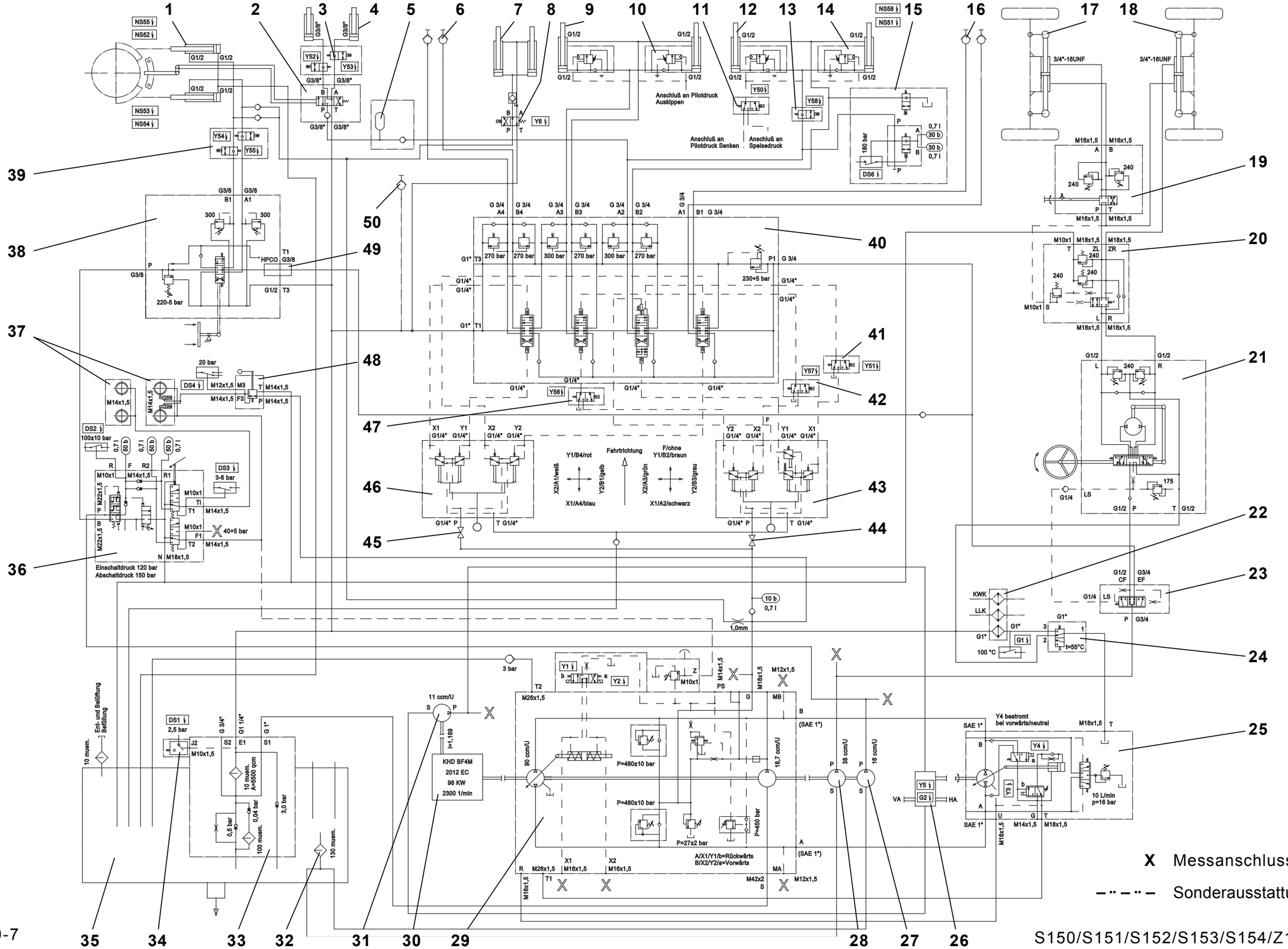
10.2.4 - 01.2006 Hydraulics Diagram AS 150 (claw lock) Type "40 km/h"



10.2 Hydraulics Diagram

10.2.1 Hydraulics Diagram AS 150 (bolt lock) Type "20 km/h" and "25 km/h"

Pos.	Name
01	Swivel cylinder DW 100/45/785/1095
02	Actuator support
03	Leak free lock
04	Support cylinder EW 60/210/518
05	Storage facility pipe burst protection (opt.)
06	Locking cylinder DW 80/60/377
07	Auxiliary hydraulics right circuit
08	Electro-hydraulic lock quick coupler
09	Tilt cylinder DW 90/55/540/964
10	Pipe burst protection tilt cylinder (opt.)
11	Combination valve RBS/HWF (SA)
12	Lift cylinder DW 100/60/704/1146
13	Drop limiter valve (AKE) (opt.)
14	Pipe burst protection lift cylinder (SA)
15	Loader arm cushioning (SA)
16	Auxiliary hydraulics left circuit
17	Steering cylinder back GDW100/50/180
18	Steering cylinder front GDW100/50/180
19	Steering mode switch valve
20	Blocking valve (opt.)
21	Steering unit 240/100 cm^3/U
22	Combi-cooler/oil side
23	Priority valve
24	Temperature control (55°C) (opt.)
25	Drive motor A6VM 107 HA1R2
26	Idle gear
27	Cam pump 16 cm^3/U
28	Cam pump 38 cm^3/U
29	Drive pump A4VG 90 DA2D8
30	Drive motor
31	Suction filter
32	Combined suction return filter
33	Electrical contamination display
34	Hydraulic oil reservoir
35	Central braking unit (opt.)
36	Multiple disk brake
37	Directional control valve 1-way
38	Hydraulic swivel limiter (opt.)
39	Directional control valve 4-way
40	Lift height limiter (opt.)
41	Hydraulic tilt inhibitor (opt.)
42	Pilot pressure initiator main hydraulics
43	Stop valve main hydraulics
44	Hydraulic gear change
45	Stop valve auxiliary hydraulics
46	Pilot pressure initiator auxiliary hydraulics
47	Hydraulic tilt inhibitor (opt.)
48	Parking brake valve
49	Pressure cross over
50	Pressureless return circuit (opt.)

10.2.2 Hydraulics Diagram AS 150 (bolt lock) Type "40 km/h"

Pos.	Name
01	Swivel cylinder DW 100/45/785/1095
02	Actuator support
03	Leak free lock
04	Support cylinder EW 60/210/518
05	Storage facility pipe burst protection (opt.)
06	Locking cylinder DW 80/60/377
07	Auxiliary hydraulics right circuit
08	Electro-hydraulic lock quick coupler
09	Tilt cylinder DW 90/55/540/964
10	Pipe burst protection tilt cylinder (SA)
11	Combination valve RBS/HWF (SA)
12	Lift cylinder DW 100/60/704/1146
13	Drop limiter valve (AKE) (SA)
14	Pipe burst protection lift cylinder (SA)
15	Loader arm cushioning (SA)
16	Auxiliary hydraulics left circuit
17	Steering cylinder back GDW100/50/180
18	Steering cylinder front GDW100/50/180
19	Steering mode switch valve
20	Blocking valve (opt.)
21	Steering unit 240/100 cm³/U
22	Combi-cooler/oil side
23	Priority valve
24	Temperature control (55°C) (opt.)
25	Drive motor A6VM 107 HA1R2
26	Load switchgear
27	Cam pump 16 cm³/U
28	Cam pump 38 cm³/U
29	Drive pump A4VG 90 DA2D8
30	Drive motor
31	Cam pump11 cm³/U
32	Suction filter
33	Combined suction return filter
34	Elektrical contamination display
35	Hydraulic oil reservoir
36	Central braking unit (opt.)
37	Multiple disk brake
38	Directional control valve 1-way
39	Hydraulic swivel limiter (opt.)
40	Directional control valve 4-way
41	Lift height limiter (opt.)
42	Hydraulic tilt limiter (opt.)
43	Pilot pressure initiator main hydraulics
44	Stop valve main hydraulics
45	Stop valve auxiliary hydraulics
46	Pilot pressure initiator auxiliary hydraulics
47	Hydraulic tilt limiter (SA)
48	Parking brake valve
49	High pressure crossover circuit
50	Pressureless return circuit (opt.)

10.2.3 Hydraulics Diagram AS 150 (claw lock) Type "20 km/h"

Pos.	Name
01	Swivel cylinder DW 100/45/785/1095
02	Actuator support
03	Leak free lock
04	Support cylinder EW 60/210/518
05	Storage facility pipe burst protection (opt.)
06	Auxiliary hydraulics right circuit
07	Locking cylinder GDW 63/40/70/382
08	Electro-hydraulic lock quick coupler
09	Tilt cylinder DW 90/55/540/964
10	Pipe burst protection tilt cylinder (SA)
11	Combination valve RBS/HWF (SA)
12	Lift cylinder DW 100/60/704/1146
13	Drop limiter valve (AKE) (SA)
14	Pipe burst protection lift cylinder (SA)
15	Loader arm cushioning (SA)
16	Auxiliary hydraulics left circuit
17	Steering cylinder back GDW100/50/180
18	Steering cylinder front GDW100/50/180
19	Steering mode switch valve
20	Blocking valve (opt.)
21	Steering unit 240/100 cm³/U
22	Combi-cooler/oil side
23	Priority valve
24	Temperature control (55°C) (opt.)
25	Drive motor A6VM 107 HA1R2
26	Idle gear
27	Cam pump 16 cm³/U
28	Cam pump 38 cm³/U
29	Drive pump A4VG 90 DA2D8
30	Drive motor
31	Suction filter
32	Combined suction return filter
33	Elektrical contamination display
34	Hydraulic oil reservoir
35	Central braking unit (opt.)
36	Multiple disk brake
37	Directional control valve 1-way
38	Hydraulic swivel limiter (opt.)
39	Directional control valve 4-way
40	Lift height limiter (opt.)
41	Hydraulic tilt limiter (opt.)
42	Pilot pressure initiator main hydraulics
43	Stop valve main hydraulics
44	Hydraulic gear shift
45	Stop valve auxiliary hydraulics
46	Pilot pressure initiator auxiliary hydraulics
47	Hydraulic tilt limiter (SA)
48	Parking brake valve
49	High pressure crossover circuit
50	Pressureless return circuit (opt.)

10.2.4 Hydraulics Diagram AS 150 (claw lock) Type "40 km/h"

Pos.	Name
01	Swivel cylinder DW 100/45/785/1095
02	Actuator support
03	Leak free lock
04	Support cylinder EW 60/210/518
05	Storage facility pipe burst protection (opt.)
06	Auxiliary hydraulics right circuit
07	Locking cylinder GDW 63/40/70/382
08	Electro-hydraulic lock quick coupler
09	Tilt cylinder DW 90/55/540/964
10	Pipe burst protection tilt cylinder (SA)
11	Combination valve RBS/HWF (SA)
12	Lift cylinder DW 100/60/704/1146
13	Drop limiter valve (AKE) (SA)
14	Pipe burst protection lift cylinder (SA)
15	Loader arm cushioning (SA)
16	Auxiliary hydraulics left circuit
17	Steering cylinder back GDW100/50/180
18	Steering cylinder front GDW100/50/180
19	Steering mode switch valve
20	Blocking valve (opt.)
21	Steering unit 240/100 cm³/U
22	Combi-cooler/oil side
23	Priority valve
24	Temperature control (55°C) (opt.)
25	Drive motor A6VM 107 HA1R2
26	Load switchgear
27	Cam pump 16 cm³/U
28	Cam pump 38 cm³/U
29	Drive pump A4VG 90 DA2D8
30	Drive motor
31	Cam pump11 cm³/U
32	Suction filter
33	Combined suction return filter
34	Elektrical contamination display
35	Hydraulic oil reservoir
36	Central braking unit (opt.)
37	Multiple disk brake
38	Directional control valve 1-way
39	Hydraulic swivel limiter (opt.)
40	Directional control valve 4-way
41	Lift height limiter (opt.)
42	Hydraulic tilt limiter (opt.)
43	Pilot pressure initiator main hydraulics
44	Stop valve main hydraulics
45	Stop valve auxiliary hydraulics
46	Pilot pressure initiator auxiliary hydraulics
47	Hydraulic tilt limiter (SA)
48	Parking brake valve
49	High pressure crossover circuit
50	Pressureless return circuit (opt.)

Technical Data (Equipment)

11 Technical Data (Equipment)

NOTE
The technical data assume 17.5-25 12 PR tire specs.

11.1 Equipment

- Height	3100 mm
- Width	2460 mm
- Wheelbase	2200 mm
- Track	1980 mm
- Operating weight without attachments	10455 kg
- Clearance	
- Differential	440 mm
- Turning circle (via rear with four-wheel-drive)	4300 mm
- Turning angle	35 +/- °
- Swing angle	10 +/- °
- Gradient	33 °
- Climbing capacity with working load restricted to due to maximum permissible tilt of engine	60 %
- Max. trailer load with max. vertical load on coupling point 250 kg	
- braked	3500 kg
- unbraked	750 kg
- Max. lifting force	69 kN
- Max. thrust	81 kN

11.2 Engine

- Liquid cooled diesel engine	
- 4 cylinder, 4 stroke, direct fuel injection	
- Capacity	4038 cm^3
- Power corresponding to ISO 1585	98 kW bei 2300 min^{-1}
- Exhaust gas emission corresponding to RL 97/68 EC Step 1 + EPA	

11.3 Starter

-	4,0 kW, 24 V

11.4 Alternator

-	55 A, 28 V

11.5 Hydrostatic transmission

Type "20 km/h"

1st gear	
- Step I	0.....5 km/h
- Step II	0.....8,5 km/h
2nd gear	
- Step I	0....11,5 km/h
- Step II	0.....20 km/h

Type " 25 km/h"

1st gear
- Step I 0.....5 km/h
- Step II 0...10,5 km/h

2nd gear
- Step I 0....11,5 km/h
- Step II 0.....25 km/h

Type " 40 km/h"

Alpha max. (Turtle symbol) 0.....5 km/h
1st gear 0....11,5 km/h
2nd gear 0.....40 km/h

11.6 Axle loads

- max road legal axle load	- front	7000 kg
	- back	7500 kg
- max. road legal gross weight		11500 kg

11.7 Tires

The following tires are permitted:

- Size		17.5 - 25
- Pressure	- front	3,0 bar
	- back	3,0 bar
- Size		17.5 R 25
- Pressure	- front	3,0 bar
	- back	3,0 bar
- Size		455/70 R 24
- Pressure	- front	4,5 bar
	- back	3,0 bar
- Size		550/65 R 25
- Pressure	- front	2,2 bar
	- back	2,2 bar

11.8 Steering

- Four-wheel (switchable to rear-wheel mode)
- hydrostatic via priority valve
- Max. pressure 175 bar

11.9 Brakes

- Service brakes: Hydraulic pump servo brake system (wet multiple disk brake on front and rear axle). Inching available on initial pedal depress.
- Parking brake: wet spring loaded multiple disk brake on rear axle.

11.10 Electrical subsystem

- Battery 2 x 88 Ah

11.11 Hydraulic subsystem

- Volume	160 l
- Hydraulic oil reservoir	115 l

11.11.1 Main hydraulics

- Output flow pump I (priority valve controlled)	87 l/min
- Output flow pump II (via swivel assembly and accumulator valve)	38 l/min
- Total flow output	125 l/min
- Operating pressure	max. 230 bar
- 2 lift cylinders	Ø 100/70 mm
- 2 tilt cylinders	Ø 90/55 mm
- Timing corresponding to DIN ISO 7131	
Lifting (with load)	5,6 s
Lowering (without load)	3,0 s
Tipping 90°	1,5 s
Tilting 45°	1,0 s

11.11.2 Swivel assembly hydraulics

- Output flow pump II (via accumulator valve)	38 l/min
- Operating pressure	max. 210 bar
- 2 swivel cylinders	Ø 100/45 mm
- Swivel time 180°	7,0 s

11.11.3 Support assembly

- Operating pressure	lastabhängig
- 2 support cylinders	
Plunger diamter	60 mm

11.12 Fuel supply system

- Volume	
Fuel tank	170 l

11.13 Heating and Ventilation System (Driver Cab)

- Water heater
- Type
- Heating capacity
  3 levels
- Fan capacity
  3 levels

11.14 Suction-Return Filter (Hydraulics)

- Filter granularity corresponding to ISO 4572	10 µm abs.
- By-pass-Ansprechdruck	p = 3,0 bar

11.15 Electrical Contamination Display

- Acuating pressure	p = 2,5 bar

11.16 Oil Cooler (Combi-Cooler) with Thermostatically Controlled Valve

- Capacity	max. 30 kW
- Throughflow	43 l/min

11.17 Noise Emission

Type "20 km/h"

Noise level (L_{WA})	
Noise external:	106 dB(A)
In-band accoustic level (L_{pA})	
Noise level in cab:	81 dB(A)

Type "25 km/h"

Noise level (L_{WA})	
Noise external:	dB(A)
In-band accoustic level (L_{pA})	
Noise level in cab:	dB(A)

Type "40 km/h"

Noise level (L_{WA})	
Noise external:	106 dB(A)
In-band accoustic level (L_{pA})	
Noise level in cab:	83 dB(A)

11.18 Options

11.18.1 Air-Conditioning Unit (Driver Cab)

Technical Data (Attachments)

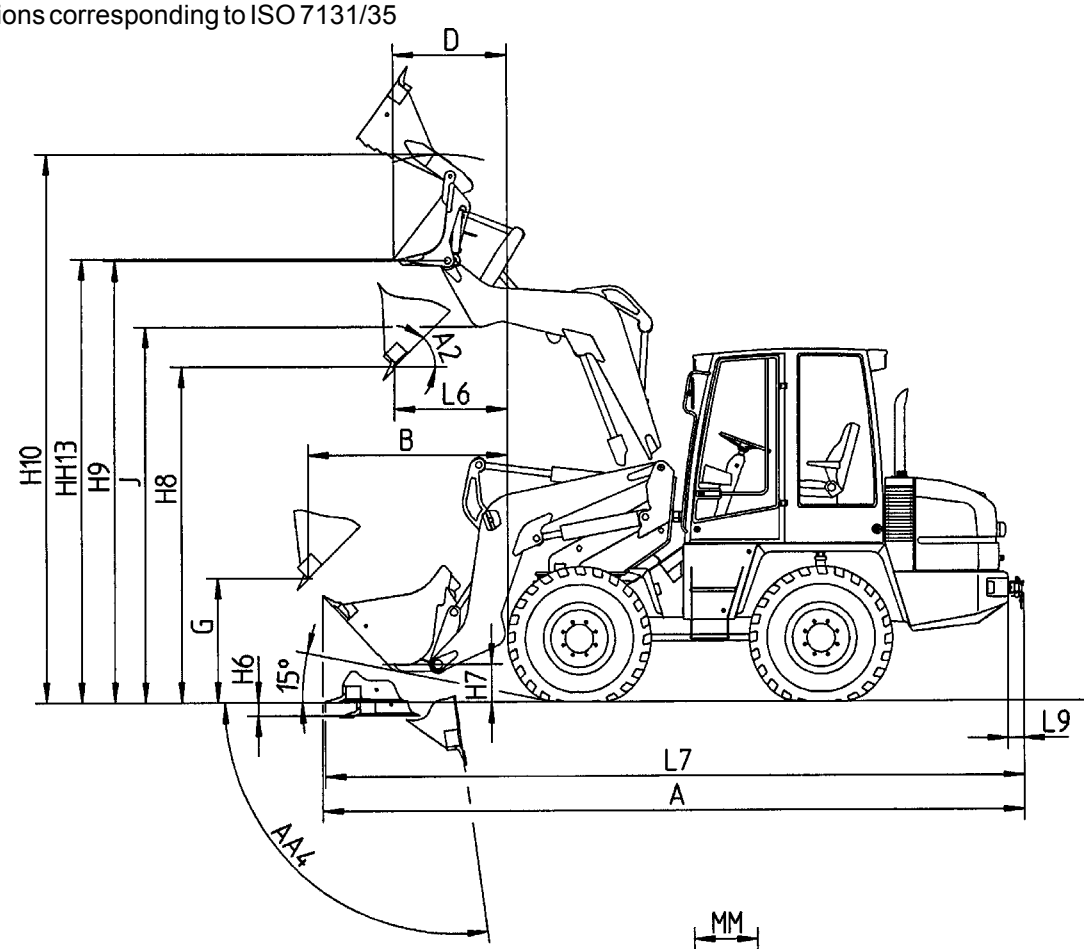
12 Attachments

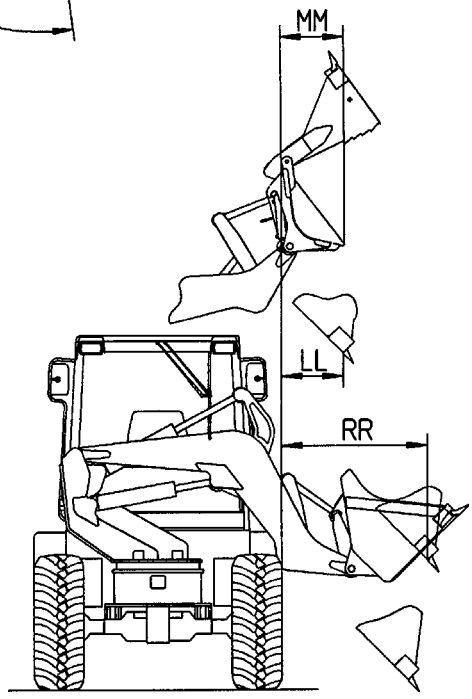
Notes

The technical data assume 17.5-25 12 PR tires

12.1 Buckets

Dimensions corresponding to ISO 7131/35





12.1 Buckets

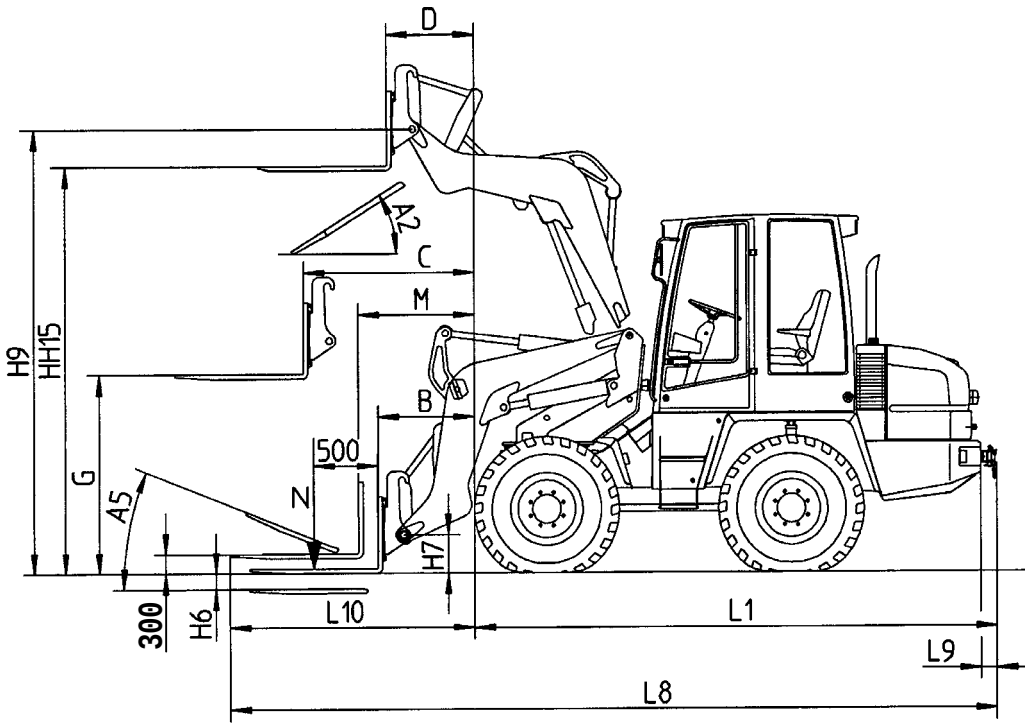
Bucket type		Bucket I with teeth	Bucket II no teeth	Bucket III no teeth	Muliti-purpose bucket
Bucket volume to DIN/ISO 7546	m³	1,45	2,00	2,40	1,30
- heaped	m³	1,60	2,20	2,65	1,45
Bucket width	mm	2480	2480	2480	2480
Net weight	kg	465	525	575	690
Loads to DIN 24094					
Aggregate density	t/m³	1,9	1,4	1,1	2,0
Dumping load					
- in-line	kg	5630	5480	5390	5300
- swiveled	kg	6010	5820	5670	5600
Lifting load					
- in-line	kg	2815	2740	2695	2650
- lateral	kg	3005	2910	2835	2800
Loads according to ISO 8313					
Aggregate density	t/m³	1,7	1,12	1,0	1,75
Dumping load					
- in-line	kg	5090	4960	4860	4790
- swiveled	kg	4810	4660	4540	4490
Workload					
- in-line	kg	2545	2480	2430	2395
- swiveled	kg	2405	2330	2270	2245
Breakout force according to ISO 8313	kN	80	66	55	73
A Total length	mm	6580	6630	6715	6570
AA4 max. dump in angle	°	100	100	100	100
A2 max. dump in angle	°	53	53	53	53
B max. dump out range at dump out angle 45°	mm	1920	2055	2145	1990
G Dump out height at max. dump out range. and dump out angle 45°	mm	1100	960	870	1035
H6 Penetration	mm	110	110	110	110
H7 Clearance to center lug (Quick coupler)	mm	565	565	565	565
H8 Dump out height at max lifting height and dump out angle 45°	mm	3075	2935	2845	3010
H9 Clearance to center lug (Quick coupler)	mm	3985	3985	3985	3985
H10 max. working height	mm	4975	5165	5290	4950
J Heaped height	mm	3390	3390	3390	3390
LL Dump out range at max. lifting height and dump out angle 45°	mm	465	605	690	535
L6 Dump out range at max. lifting height and dump out angle 45°	mm	1075	1215	1300	1145
L7 Overall length	mm	6505	6575	6690	6600
L9 Shunting and towing coupling	mm	125	125	125	125
RR Max. dump out range . at dump out angle 45°	mm	1410	1545	1635	1480
Multi-purpose bucket open:					
D Dump out range at max. lifting height and tilted bucket	mm	-	-	-	870
HH13 max. dump out height with tilted bucket	mm	-	-	-	3910
MM Dump out range at max. lifting height and tilted bucket	mm	-	-	-	370

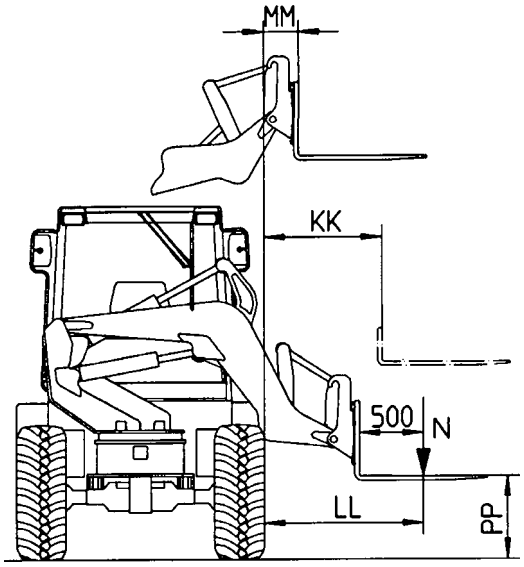
NOTE

- Permissible loads corresponding to **DIN 24094** are included for **purpose of comparison only.**
- Permissible loads corresponding to **ISO 8313** are the **actual loads.**

12.2 Fork-lift attachment

Measurements corresponding to ISO 7131/35





12.2 Fork-lift Attachment

Tine lenght	1200 mm
Tine height	50 mm
Distance between tines (from center)	
- min.	340 mm
- max.	1340 mm
Weight	310 kg

Max. permissible load N according to DIN 24094

frontal	
- even ground (stability factor 1,25)	4025 kg
- uneven groung (stability factor 1,67)	3020 kg
swiveled	
- even ground (stability factor 1,25)	3945 kg
- uneven ground (stability factor 1,67)	2960 kg

Max. permissible load N according to ISO 8313

frontal	
- even ground (stability factor 1,25)	3750 kg
- uneven ground (stability factor 1,67)	2810 kg
swiveled	
- even ground (stability factor 1,25)	3460 kg
- uneven ground (stability factor 1,67)	2595 kg

Max. permissible load N according to ISO 8313, **with fork-lift 300 mm over ground**

frontal	
- even ground (stability factor 1,25)	4460 kg
- uneven ground (stability factor 1,67)	3345 kg

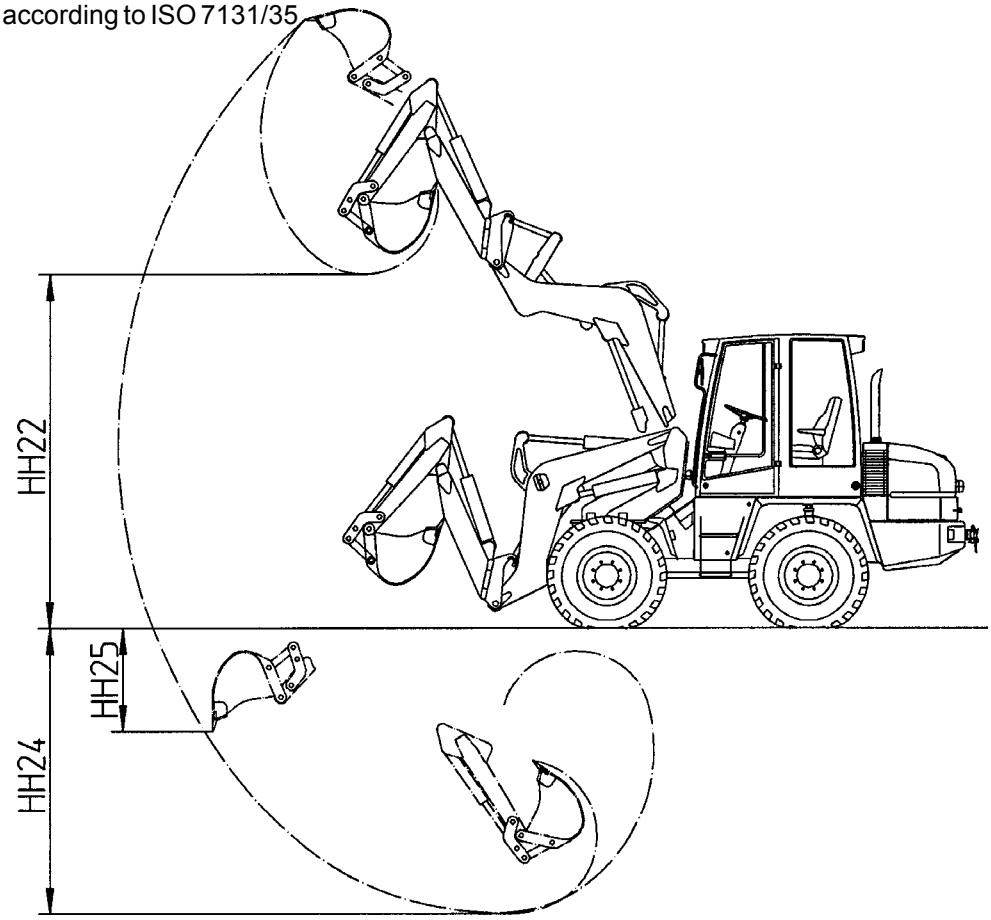
A2	Dump out angle	50 °
A5	Tilt in angle	25 °
B	Min. range	1020 mm
C	Max. range	1615 mm
D	Range at max. lifting height	760 mm
G	Heaped height at max. range	1750 mm
H6	Cutting depth	60 mm
H7	Clearance to center lug (quick coupler)	765 mm
H9	Clearance to center lug (quick coupler	3995 mm
HH15	Heaped height at max. range (top of fork tines)	3735 mm
KK	Max. range	1110 mm
LL	Clearance between tires and load	1415 mm
L1	Length	4615 mm
L8	Overall length	7015 mm
L9	Shunting and towing coupling	125 mm
L10	Clearance from tires to top of fork tines (height at top of fork tines 300 mm)	2400 mm
M	Range (height at top of fork tines 300 mm)	1195 mm
MM	Range at max. lifting height	305 mm
PP	Heaped height min.	780 mm

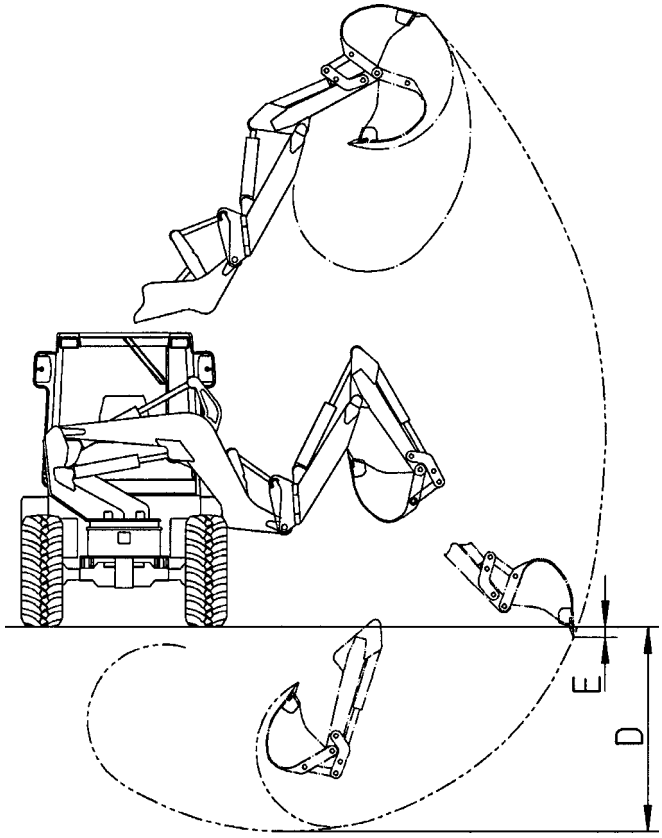
NOTE

- Permissible loads corresponding to **DIN 24094** are included for **purpose of comparison only.**
- Permissible loads corresponding to **ISO 8313** are the **actual loads.**

12.3 Front-end Loader

Measurements according to ISO 7131/35





12.3 Front-end loader

Breakout force at cutting edge of bucket max. 3720 daN

Curling force at cutting edge of bucket max. 2830 daN

Bucket volume to DIN ISO 7451	Bucket width to DIN ISO 7451	Net weight
0,06 m³	300 mm	65 kg
0,09 m³	400 mm	75 kg
0,12 m³	500 mm	90 kg
0,14 m³	600 mm	95 kg
0,17 m³	700 mm	105 kg

Net weight
- Front-end loader without bucket 435 kg

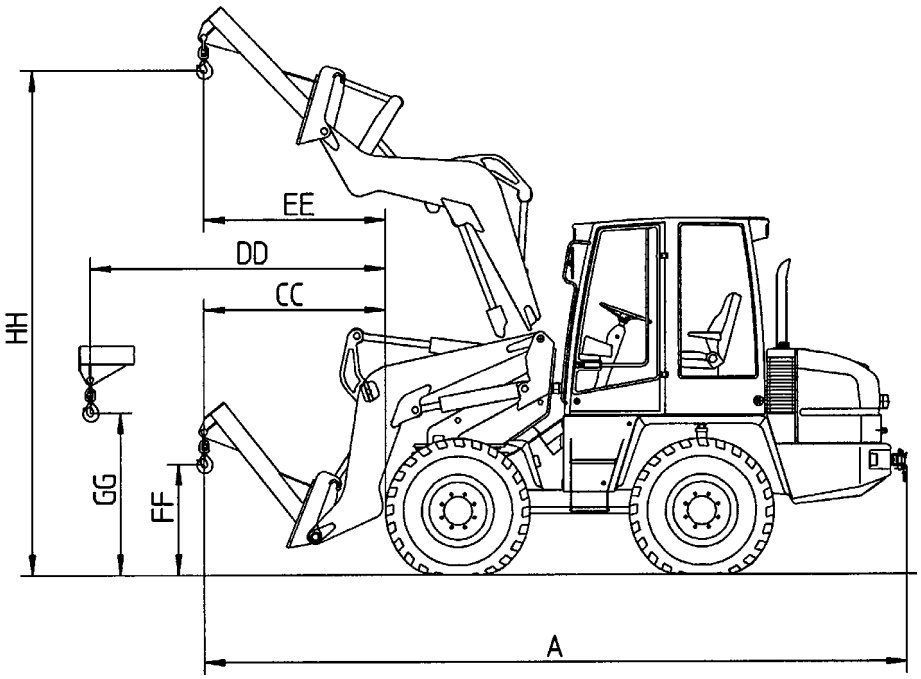
D	Max. digging depth above cutting edge according to DIN ISO 7135	2090 mm
E	Penetration	./. mm
HH22	Max. dump out height according to DIN ISO 7135	2920 mm
HH24	Max. digging depth above cutting edge according to DIN ISO 7135	2890 mm
HH25	Penetration	1170 mm

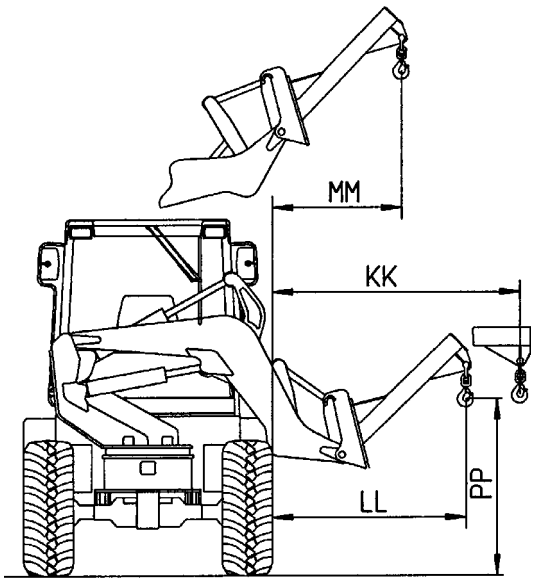
Timing values $n_{engine\ max.}$:

- Extend boom 0,9 s
- Retract boom 1,8 s
- Open bucket 0,9 s
- Close bucket 1,8 s

12.4 Lifting Hook

Dimensions according to ISO 7131/35





12.4 Lifting Hook

Max. permissible load according to DIN EN 474-3 (measurement analgous to ISO 8313)

at maximum reach (stability factor 2)	
- frontal	1660 kg
- swiveled	1320 kg
Net weight	230 kg

A	Total length	6515 mm
CC	Min. reach	1895 mm
DD	Max. reach	3335 mm
EE	Max. reach at maximum lifting height	1785 mm
FF	Min. lifting height with tilted quick coupler	1380 mm
GG	Lifting height at max. reach	1670 mm
HH	Max. lifting height	5145 mm
KK	Max. reach	2845 mm
LL	Min. reach	2010 mm
MM	Max. reach at maximum lifting	1260 mm
PP	Lifting height at min. reach	2515 mm

Optional Extras, Changes

13 Optional extras, changes, certifications for wheel loader

13.1 Optional extras

13.1.1 Description (Chapter 4)

13.1.1.1 Pipe Burst Protection

A pipe burst protection valve is fitted at the ground side of lifting and tilting cylinders. In case of rod or pipe burst in the lifting or lifting/tilting subsystem, any movement of the loader arm or tilting mechanism is interrupted until the problem is solved.

ATTENTION

Activating loader arm cushioning disables the pipe burst protection mechanism.

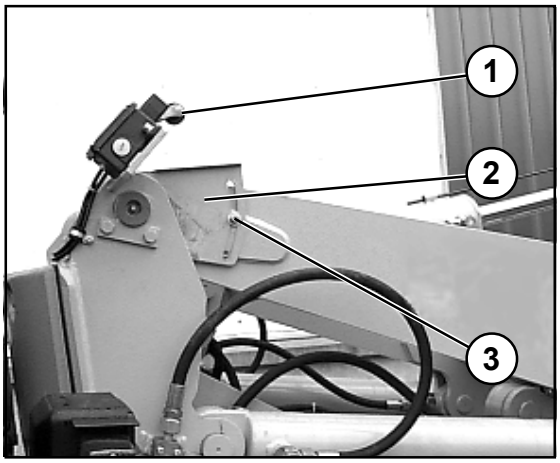


Fig. 13-1

13.1.1.2 Lift Limiter

A device mounted at the joint between the bucket assembly and the swivel assembly allows you to limit the maximum lifting height.

Setup:

(1) Lift the loader arm to the required height.

(2) Switch off the engine and close the stop valves for main and auxiliary hydraulics (1-2/arrows).

(3) Loosen the hexagonal bolts (SW 10) (13-1/3) on the gear gate assembly and rotate the gate (13-1/2) against the roller gage (13-1/1) until you hear the gate shift.

(4) Re-tighten the hexagonal bolts on the gear gate assembly.

DANGER

Perform a functional check before starting a job that requires the lift limiter, and while working perform a visual check while seated in the driver´s seat.

13.1.1.3 Service Interval Display (4-8/30)

The service interval display lights up :

initially after	50 hours
then every	500 hours

13.2 Changes