Safety regulations

1 Fundamental safety instructions

1.1 Warnings and symbols

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

NOTE

Extra information about the economical use of the loader.

CAUTION

Special information for regulations and prohibitions for avoiding damage.

DANGER

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

1.2 Proper use of the loader

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

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

1.2.3 The machine is designed exclusively for the purposes described in this operating manual. Any other use beyond these purposes is regarded as being improper use. The manufacturer is not liable for any damage caused in this connection. The risk is solely that of the user.

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

1.3 Organizational measures

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

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

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

1.3.4 The driver must wear a seat belt during operation.

1.3.5 Personnel working with the machine must not wear long flowing hair, loose clothing or jewellery, including rings. Danger of injuries, e.g. by getting caught or being pulled in.

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

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

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

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

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

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

1.4 Selection of personnel and necessary qualifications; basic responsibilities

1.4.1 The machine may be driven and maintained only 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 be carried out only by a qualified electrician or persons supervised by a qualified electrician according to the electrical regulations.

1.4.3 Only qualified specialists may carry out work on the chassis, the brake and steering system.

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

1.5 Safety information for certain operating phases

1.5.1 Normal operation

1.5.1.1 A passenger may only be transported in a dedicated passenger seat!

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

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

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

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

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

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

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

1.5.1.9 Avoid any action which appears to be dangerous!

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

1.5.1.11 The operator may carry out work with the machine only if no persons are in the danger zone.
The danger zone is the area near the machine where persons may be injured
- by work-induced movements of the machine,
- by work attachments and devices,
- by loads swinging out,
- by dropping loads,
- by attachments falling down from the machine.

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

1.5.1.13 In case of functional defects, stop the machine **immediately** and secure it. Eliminate defects immediately!

1.5.1.14 Check the machine at least once every shift for external visible damage and defects. Report any defects (including changes in the operational behavior) immediately to the person in charge. If necessary stop the machine immediately and safeguard it.

1.5.1.15 The driver may slew the attachments in overhead driving, operating and working areas only if these areas are suitably safeguarded by protective roofing. These protection roofs must offer appropriate safety against loads and falling goods. If you are in doubt, assume **no** protection roofs are present.

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

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

1.5.1.18 Make sure to always switch on lights in poor visibility and during darkness.

1.5.1.19 If the 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 Only reliable persons may act as guides. They must be informed of their duties prior to commencing 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 Maintain adequate clearance when working at the edge of quarries, pits, rubbish dumps and embankments to eliminate any danger of the machine plunging down. The contractor or his deputy must stipulate the distance from the edge taking the soil bearing capacity into consideration.

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

1.5.1.27 Avoid such work which could have a detrimental effect on the stability of the machine.

The following may affect the stability:
- overloading,
- ground that is too soft,
- abrupt acceleration or deceleration of driving or working movement,
- reversing out of a high driving speed,
- working on slopes,
- driving too quickly round sharp bends,
- driving the machine on rough terrain.

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

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

1.5.1.30 Always adapt the speed of the machine to the environmental conditions when driving down slopes!
Never change into low gear when driving on slopes, but rather before the slope!

1.5.1.31 Reversing over a longer period must be avoided!

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

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

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

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

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

1.5.2.3 The engine must be switched off before maintenance or repair work is carried out.
1.5.2.4 The stability of the machine or the attachments must be guaranteed at all times during maintenance and repair work.
1.5.2.5 Maintenance and repair work may only be carried out when the attachment is set down on the ground or supported or when equivalent measures against unintentional movement were taken.
During maintenance and repair work under the bucket arm:
- the bucket arm must be mechanically supported: e.g. take the bucket arm support (option) off the left loader front after having unscrewed the fastening screw/nut and insert it in the lifting cylinder (1-1/arrow),
- the pilot valves for working and auxiliary hydraulics (1-2/arrow) must be closed (rear position).

1.5.2.6 Secure the articulated link against buckling when performing maintenance and repair work on it.
Take the bolt out of the rear tow coupling and insert it in the articulation joint (articulation safeguard) (1-3/arrow).

CAUTION
- The steering must be in a straight ahead position when you insert the bolt.
- Do not operate the steering while the articulation safeguard is in place.

1.5.2.7 If necessary, secure the maintenance area on a large scale.
1.5.2.8 The machine must be protected from unintentionally starting after it was switched off for maintenance and repair work:
- remove the ignition key and
- attach at warning sign at the disconnected battery or at the battery main switch.

This applies especially to works to the electrical equipment.

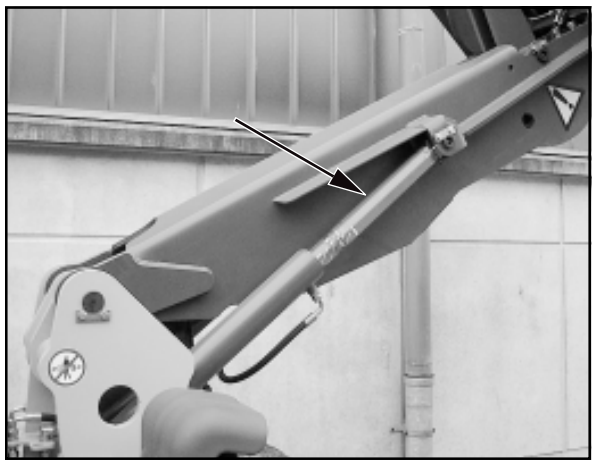
Figure 1-1


Figure 1-2

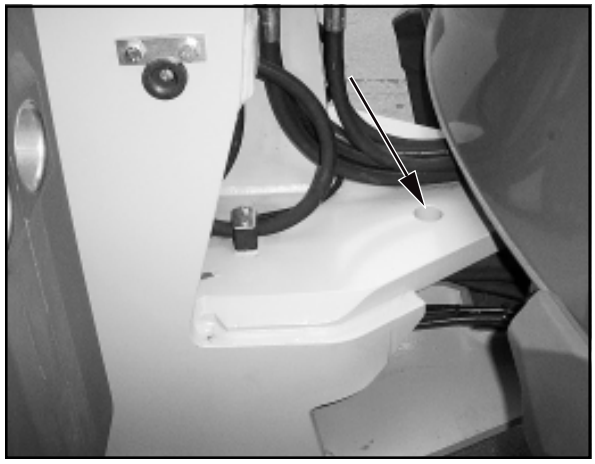
Figure 1-3

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

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

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

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

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

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

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

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

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

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

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

1.5.2.19 After cleaning completely remove all protection covering and tape.

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

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

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

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

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

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

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

1.6 Notes on special categories of danger

1.6.1 Electrical energy

1.6.1.1 Only use original fuses with stipulated ratings. Immediately switch off the machine if the electrical supply fails.

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 (kilovolts)			Safety clearance (metres)
	up to	1 kV	1.0 m
from 1 kV	to	110 kV	3.0 m
from 110 kV	to	220 kV	4.0 m
over 220 kV	to	380 kV	5.0 m
unknown voltage			5.0 m

When approaching overhead lines, all working movements of the machine must be taken into consideration, e.g. the position of jibs, the swinging of ropes and the dimensions of attached loads.
In addition, attention must be paid to any roughness of soil which could cause an inclined position of the machine, thus getting it closer to the overhead line.
The fact that overhead lines may swing out during windy weather and may reduce the distance must also be taken into consideration.

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

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

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

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

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

1.6.2 Hydraulics

1.6.2.1 Only experts with special expertise and experience may carry out work on the hydraulic system!

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

1.6.2.3 Those hydraulic system segments which are to be opened must be depressurised 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 mix up the connections. Spare parts must meet the technical requirements of the manufacturer. Original spare parts ensure the fulfilment of these requirements.

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

1.6.3 Noise

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

1.6.4 Oil, grease and other chemical substances

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

1.6.4.2 Caution when working with hot fuel and other accessory materials (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 refuelling, switch off the engine and remove the ignition key.
- Do not refuel in an enclosed area.
- Never refuel near open fire or sparks.
- Do not smoke during refuelling.
- Immediately wipe up spilled fuel.
- Keep the machine free of fuel, oil and grease.

1.6.5 Gas, dust, steam, smoke

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

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

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

Explosion hazard!

1.7 Transport and towing; recommissioning

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

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

1.7.3 Start towing at a low speed. Persons must not be 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 tyres must be kept clean of mud, snow and ice so that the machine can drive on ramps without danger of sliding.

1.7.5 Strictly observe the operating manual during recommissioning.

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

1.8.1 Organizational measures

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

Figure 1-4

1.8.1.2 Inform yourself of the location/use of fire extinguishers (1-4/arrow) and first-aid kit!

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

1.8.2 Selection of personnel and necessary qualifications; basic responsibilities

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

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

1.8.2.3 Authorize the drive to refuse instructions given by third parties when these instructions are detrimental to the safety of the driver and the machine.

1.8.2.4 Personnel who are to be trained, instructed or working on/ with the machine in the scope of professional training must not work on/ with the machine, unless they are supervised by an experienced person.