

Hydraulic Ram Unit HRE 1000 / HRE 3000 / HRE 4000



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1 Basic information

1.1 Notes on the operating instructions

These operating instructions are provided to educate the user concerning the design, function, operation, setup, maintenance and upkeep of hydraulic ram unit HRE 1000/ HRE 3000/ HRE 4000. The hydraulic ram unit HRE 1000/ HRE 3000/ HRE 4000 was developed and built by Gayk Baumaschinen GmbH. Before using hydraulic ram unit HRE 1000/ HRE 3000/ HRE 4000, please carefully read through the operating instructions. They must be available at the machine at all times for operating personnel. The operating instructions will allow you to quickly understand the technical details, and contains necessary information on important technical data and on the expert use of the machine. Hydraulic ram unit HRE 1000/ HRE 3000/ HRE 4000 is only intended to be used for the purposes listed in the operating instructions. The manufacturer cannot be responsible for claims arising from improper use and insufficient maintenance of the equipment. The component documentation located in the appendix, as well as all other documentation provided with the equipment, must be adhered to.

1.2 Explanations in the operating instructions



NOTE

Hydraulic ram unit HRE 1000/ HRE 3000/ HRE 4000 is only called a machine in the following chapters of these operating instructions.

1.3 Proper use

The machine may only be operated in its technically proper state and only for its intended purpose, in accordance with these operating instructions. The machine is operated fully-hydraulically and its exclusive purpose is to precisely ram steel or wooden profiles into earthen soil. The profiles are rammed into the ground through repeated impacts depending on the ramming depth and the soil characteristics.

No other use of the machine beyond this qualifies as proper use. Any other use can be dangerous and is not allowed. The manufacturer is not liable for any consequences arising from improper use of the machine or for any use not in accordance with the instructions in these operating instructions. If the machine is altered without the approval of the manufacturer, the manufacturer is not liable for any damages that may result. Adherence to inspection and maintenance specifications is also part of the proper use of this equipment. Connection data must be adhered to. If changes are made to the system by the operator, the CE certificate of compliance will become invalid.

1.4 Usage conditions

Before beginning work, check the area to make sure it meets the following criteria:

- Make sure there are no cables, lines, sewer lines, etc., in the area that could present a hazard.
- Prepare the work area according to how it is found. If necessary, re-route, disconnect, or secure existing lines.
- The ground must be free of any contaminants and explosive ordinance.
- The ground must be evenly supportive of construction machines being driven on it.
- Establish traffic routes and storage areas and identify them.
- All necessary operating materials such as oils, greases and the like must be made available in sufficient amounts and qualities prior to start-up corresponding to the specifications contained in the operating instructions.

The manufacturer must be timely notified of any environmental and operating conditions that are out of specification at the set-up location of the machine. The deviating environmental and operating conditions must be listed.

1.5 Guarantee and liability

The “General Conditions of Sale and Delivery” submitted by the manufacturer to the operator apply fundamentally. Guarantee and liability claims for personal injury and property damages are not valid if they can be attributed to one or more of the following causes:

- Use of the machine in a manner that is not intended.
- Improper start-up, operating and maintenance of the machine.
- Alterations to the machine without prior consultation with the manufacturer.
- Operation of the machine with defective safety equipment or improperly attached safety and protective equipment.
- Non-adherence to the instructions in these operating instructions with regard to operation and maintenance.
- Insufficient monitoring of machine assemblies that are subject to wear.

2 Safety instructions

2.1 Standards and guidelines

The machine is designed according to the current state of the art according to recognised safety rules. The machine was designed according to basic safety requirements, standards and guidelines. All safety information refers to currently applicable ordinances of the European Union (EU). In countries outside of the EU, the applicable laws and ordinances of those countries must be adhered to. In addition to the safety instructions contained in these operating instructions, the generally applicable regulations concerning accident prevention and environmental protection must be followed and adhered to. All information in the operating instructions must be followed fully. The machine was designed according to the following basic safety requirements, standards and guidelines.

- Machine Guidelines 2006/42/EC dated 17.05.2006

Applied harmonised norms, in particular

- DIN EN-ISO 12100
“Machine Safety - General Structural Guidelines - Risk Assessment and Risk Minimization” (ISO 12100:2010), German Version EN ISO 12100:2010
- DIN EN 60204-1
“Machine Safety – Electrical Equipment in Machines”
- DIN EN 13849
“Machine Safety – Safety-related Parts in Control Systems”
- DIN EN 13850
“Machine Safety – EMERGENCY STOP Structural Guidelines”
- DIN EN 13857
“Machine Safety – Safe distances to prevent reaching into dangerous areas with upper and lower extremities”
- DIN EN 1037
“Machine Safety – Preventing unexpected starting of moving elements”
- DIN EN 13478
“Machine Safety – Fire protection”
- DIN EN 414
“Rules for the drafting and presentation of safety standards”
- DIN EN 4844-1
“Graphical Symbols - Safety colours and safety signs Part 1: Structural fundamentals for safety signs for use in workshops and in public areas”
- DGUV [*German Social Accident Insurance*] Regulation 3 “Portable and fixed operating resources
Accident prevention regulation “Electrical systems and resources”
- BGV A8 / DGUV Regulation 9
“Safety and health protection signage at the workplace”

2.2 Explanation of labels in the operating instructions



DANGER

Type and source of danger!

Immediate danger with high risk of death or serious bodily injuries. Measures to avoid danger.



WARNING

Type and source of danger!

Possible danger with medium risk of death or serious bodily injuries. Measures to avoid danger.



CAUTION

Type and source of danger!

Dangers with low risk of medium bodily injuries or property damage. Measures to avoid danger.



NOTE

User tips and useful information.



NOTE

User tips and useful information on environmental protection.



DANGER

Type and source of danger!

Dangers with risk of environmental damages. Measures to avoid danger.

2.3 Safety labels on the machine

The instructions attached to the machine identify the sources of danger and must be adhered to absolutely. They must be attached in an easily recognizable area and maintained in fully legible condition. If these labels are destroyed, new ones must be attached. The following symbols are attached to the equipment and must be adhered to:



DANGER

Warning of dangerous electrical voltage.

**DANGER**

Warning of crush injuries.

**DANGER**

Warning of rotating parts.

**DANGER**

Warning of crushing at chain drives.

**DANGER**

Warning of hot surfaces.

**DANGER**

Warning of flammable materials.

**DANGER**

Warning of explosive materials.

**DANGER**

Warning of corrosive materials.



2.4 Safety labels at the setup location

The operator of the machine must make sure that the entire work area in which the machine is set up is identified appropriately according to operational conditions, respectively, by means of the following instructions.

**DANGER**

Risk of accidents!

Unauthorised personnel access to the machine is forbidden.

**DANGER**

Fire and explosion danger!

The starting of fires and handling of open flames is strictly forbidden. Areas must be labelled accordingly.

During installation, maintenance and repair work, the entire danger area surrounding the machine must be blocked off with the following identifying tape:



2.5 Basic safety measures

The following must be adhered to:

- The machine may only be used as intended.
- All safety instructions in these operating instructions and in other documents must be followed and adhered to.
- The machine may only be set up, installed, operated and maintained by trained expert personnel. The personnel must have read and understood these operating instructions. This includes in particular the understanding of how risk of injury can be averted for the operator and others.
- Unauthorised personnel may not have any direct access to the machine.
- Downtime and environmental impairments due to incorrect handling must be avoided.
- During transport, installation/removal, operation and care and maintenance, the pertinent work safety regulations and environmental protection regulations must be adhered to.
- All work on the machine must be carried out with care and with a perspective on safety.

2.6 Safety instructions for transport

The following must be adhered to:

- The machine is transported, set up and installed as a complete machine. The danger area must be blocked off with a wide berth and identified as such.
- Safety regulations as to the transport materials used must be adhered to.
- Unauthorised transport work is not permitted. Significant dangers and property damages can result.
- Transport activities may only be carried out by trained personnel.
- Only approved lifting equipment and attachment means with sufficient support capacity may be used.
- Ropes and belts must meet safety requirements. No torn ropes or ropes with abraded areas may be used. Do not let ropes and belts sit against sharp edges and corners, do not knot or twist them. When fastening, be aware of the centre of gravity of the machine.

2.7 Safety instructions for installation

The following must be adhered to:

- The machine may only be installed by trained, instructed expert personnel. Unauthorised assembly is not permitted.
- To avoid dangerous situations, and to ensure optimum performance, no modifications or alterations may be made to the machine.
- The set-up area for the machine must be of such dimensions that sufficient support is guaranteed.
- Before beginning work, sufficient freedom of installation must be ensured. Maintain order and cleanliness at the work place. Any components and tools lying around must be removed.
- Be aware of the dimensions and weight data for the machine. An operational environment suitable for use of the machine must be guaranteed.
- The machine must be checked each time prior to being turned on for damages and proper condition. Any modifications to the machine that affect operational safety must be reported. The causes must be remedied immediately.
- The machine may only be connected to supply lines that are provided and designed specifically for it.

2.8 Safety instructions for operation

The following must be adhered to:

- The operational safety of the machine must be guaranteed at all times.
- The machine must be immediately shut down if changes are detected during operation. Listen for any unusual noise.
- Proper attachment and connection of the control console, safety equipment (EMERGENCY OFF switch, safety switches sensors).
- The machine must be checked each time prior to being turned on for damages and proper condition. Any modifications to the machine must be reported. The causes must be remedied immediately.
- Proper connection of all supply media (electrical energy bonding for safe contact, hydraulics).

2.9 Safety instructions for maintenance and repair

The following must be adhered to:

- All maintenance and repair work on the machine may only be carried out with the machine turned off.
- The machine may only be maintained and repaired by service personnel from the manufacturer or personnel specially trained and instructed in the same.
- Unintentional turning of the machine back on must be prevented (shut of the main switch, attach a warning sign to the main switch, block off the area).
- During maintenance and repair work, sometimes safety equipment needs to be turned off. This equipment must be properly re-installed immediately after the maintenance and repair work and checked for proper functioning.
- After the maintenance work, the following checks must be carried out prior to turning the machine back on, during which time safety regulations are adhered to:
 - Check that all bolted connections are tight.
 - Ensure that all tools, materials and other equipment used have been removed from the work area.
 - Clean the work area and remove any materials, such as liquids, processing materials, etc.



CAUTION

Damage to the machine!

Operational disruptions caused by insufficient or improper maintenance can cause very high repair costs and long downtimes of the machine. The manufacturer assumes no liability for damages caused by improper maintenance and care. Maintenance intervals must be recorded and maintained in a maintenance plan.

2.10 Operator responsibility

The operator of the machine is subject to legal obligations with regard to work safety. In addition to the safety instructions in these instructions, the applicable safety, accident prevention and environmental protection regulations must be adhered to.

- The operator must be aware of the applicable work safety specifications. Any additional dangers that arise from special working conditions at the point of use must be recorded in an overview. The additional dangers determined to exist must be recorded by the operator in its operating instructions and incorporated in the daily handling instructions for the machine.
- During the entire time of use of the machine, the operator must check whether its operating instructions correspond to the current version of the regulatory policies, and if not, modify them as needed.
- The operator must use the machine in good, operationally safe condition. The technical condition must correspond to the legal requirements and regulations.
- The operator must clearly regulate and establish responsibilities for installation operation, maintenance and cleaning.

- The operator must make sure that all employees handling the machine have read and understood these instructions. Also, the operator must train its personnel at regular intervals and make them aware of the risks. Training by the operator must be recorded.



CAUTION

Risk of injury if personnel is insufficiently qualified!

Improper handling can result in serious personal injury and property damage. All activities must be carried out by qualified personnel only.

- The operator must provide its personnel with the required work safety clothing.
- The operator must make sure that the listed maintenance intervals are being adhered to.
- The operator must check all safety equipment regularly for functionality and completeness.

As to requirements to be placed on personnel, the operator must adhere to the following criteria:

Operating personnel	The instruction as to the tasks to be assumed and possible risks from improper behaviour is done by the operator.
Maintenance and repair personnel	Maintenance and repair personnel must be capable, as a result of expert training, experience and knowledge of the pertinent specifications, of autonomously carrying out maintenance and repair work, and of recognising possible risks and avoiding them. Maintenance personnel are to be specially trained for this.
Electrician	The electrician must be capable, as a result of expert training, experience and knowledge of the pertinent specifications, of autonomously working on electrical machines and of recognising possible risks and avoiding them. The electrician is specially trained for this.

2.11 Requirements of personnel

The following must be adhered to:

- Smoking, eating and drinking in the area of the machine are not allowed.
- Working on the machine while tired, under the influence of alcohol and medications is not allowed.
- Personnel may not have any physical limitations that would temporarily or permanently impair their attentiveness and ability to evaluate a situation.
- Operating personnel must have mastered the national language of the operator verbally and in written form enough to allow all tasks pertaining to the machine and the contents of the operating instructions to be understood and internalised.
- Personnel must wear appropriate clothing for the work at hand.
- All safety instructions in these operating instructions and in all other documents must be followed and adhered to in unlimited extent.
- If danger is recognised which could result in personal injury, the machine must be shut off immediately.
- Personnel must have thorough understanding of operational procedures, regulations and processes.
 - Operational processes of the machine
 - Setting up of perimeters, securing and identifying the area of danger
 - Behaviours and actions in case of emergency
- The machine may only be operated and maintained by authorised personnel. If additional qualifications of personnel are necessary to perform certain work, the operator must meet all prerequisites for it.



DANGER

Risk of accidents!

Unauthorised persons who do not meet the requirements described must be kept away from the work area.

2.12 Personal protective work clothing

The operator will determine which protective work clothing must be worn by personnel.



PROTECTIVE WORK CLOTHING

Wear snugly-fitting protective work clothing to protect against getting caught by moving parts. However, the clothing must not restrict the freedom of movement of personnel.



SAFETY SHOES

To protect from falling parts and slipping on floors that are not non-slip surfaces and when current-carrying components could possibly be touched.



SAFETY GLOVES

To protect the skin from friction, scrapes, punctures or deeper injuries of the hands and to protect against the touching of hot surfaces and substances that are hazardous to a person's health.



HEARING PROTECTION

Hearing protection offers protection against injury to the auditory system due to excess and sustained noise.



SAFETY GLASSES

Safety glasses protects the eyes against flying parts (dust particles, liquid and acid sprays).

2.13 Behaviour in an emergency

In emergencies or accidents, the machine must be shut off immediately!
Since in the event of an accident quick reaction can save lives, the following actions must be introduced:

- Immediately initiate the EMERGENCY SHUT-DOWN system.
- Initiate first aid measures. Operating personnel must know where safety equipment, accident and danger alarms, and first aid and life-saving equipment are located and must be familiar with how to handle them.
- Remove injured persons from the danger zone.
- Notify responsible parties at the location of use.
- Notify first responders.
- Open access routes to allow access to ambulance vehicles.

The operator is responsible for appropriate training of its operations personnel. All first aid equipment (first aid kits, stretchers, etc.) and fire-fighting agents (fire extinguishers) must be maintained in accessible locations and must always be available. All equipment must be in proper condition and regularly checked.



FIRST AID AND FIRE-FIGHTING EFFORTS

The locations for first aid equipment and fire-fighting agents must be identified with information signs. The user must be familiar with these resources. The user must be able to correctly use and operate them in the event of accidents.

2.14 Disposal

Legal fundamentals on disposal:

- Recycling and Waste Management Act (KrW/AbfG)
- State Waste Act for each of the federal states (LAbfG)
- Ordinance for determining wastes that require monitoring (BestbÜAbfV)
- Waste Oil Ordinance (AltöIV)
- Packaging Ordinance (VerpackV)
- Battery Ordinance (BattV)
- Commercial Waste Ordinance (GewAbfV)
- Chemicals Act (ChemG)
- Hazardous Materials Ordinance (GefStoffV)
- Industrial Safety Ordinance (BetrSichV)
- Water Management Act (WHG)
- Technical Rules for Hazardous Materials, TRGS 201 Classification and identification of wastes for disposal while handling
- GUV-SR-2005 Handling hazardous materials in industry



DANGER

Environmental hazard!

If environmentally hazardous materials are handled incorrectly, in particular if they are disposed of incorrectly, serious damages to the environment can occur.

The following must be adhered to:

- The information contained in the operating instructions concerning environmental protection must be followed at all times.
- If environmentally-hazardous materials accidentally come in contact with the environment, suitable measures must be taken immediately. The appropriate authorities must be notified of the damages.



CAUTION

For all auxiliary materials and cleaning agents used, the regulations and EC safety data sheets of the respective manufacturer with regard to storage, handling, use and disposal must be adhered to.



CAUTION

Electrical scrap and electronic assemblies require hazardous waste treatment and may only be disposed of by approved expert operators.

The following must be adhered to:

- No materials may be used if their physical properties are unknown. A consultation with the manufacture is required.
- If there is no take-back or disposal agreement in place, the disassembled components must be sent to a recycling facility after proper disassembly.
 - Metallic material residue is scrapped.
 - Plastic components are sent to a recycling facility.
 - Sort other components according to material properties and dispose of accordingly.
- Cleaning agents and their containers may not be disposed of as domestic waste or allowed to flow to sewer systems and to the soil. Applicable disposal regulations must be adhered to.

3 Technical data

General data	
Name	Hydraulic Ram Unit
Type	HRE 1000 / HRE 3000 / HRE 4000
Serial number	9950216
Model	2016

Dimensions (transport dimensions)	
Length	4000 mm / 5000 mm
Width	2000 mm
Height	2200 mm / 2500 mm
Weight with hydraulic hammer	3100 kg / 3600 kg (depending on the design of the hammer IM 150, IM 304, IM 305)

Operating data	
Operating conditions	Manual and automatic operation
Post height	3200 m / 4200 mm
Transverse grade	20°
Operating hydraulic fluid pressure	200 bar
Oil amount	180 l
Fuel tank volume	60 l
Motor output	22.5 kW (depending on the motor design; 2-, 3-, 4-cylinder motor)
Weight of the hydraulic hammer	76 kg - 136 kg (depending on the hammer design)
Impact rate	670 min ⁻¹ - 1450 min ⁻¹ (depending on the hammer design)
Noise emissions	117 dB

The nameplate is located below the hydraulic aggregate at the air/hydraulic fluid cooler.



Fig. 1: Nameplate

4 Technical description

The hydraulic ram unit is a machine for ramming steel profiles or posts into terrain, even under severe conditions. Areas of use include guardrail supports along streets, frames for solar energy facilities, wood profile palisades, supports for earthen slopes and water bank straighteners. The machine consists of the following main groups:

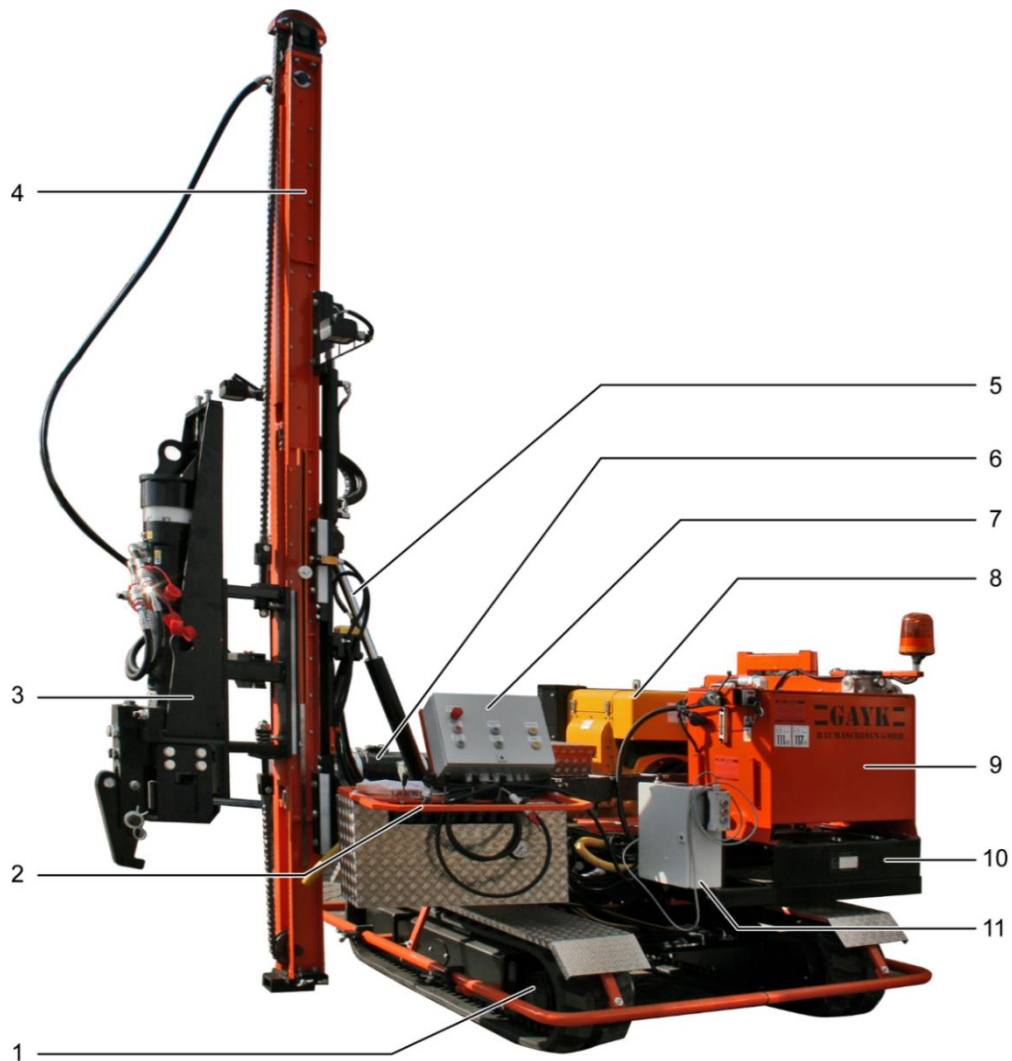


Fig. 2: Main assemblies with optional accessories

- | | |
|----------------------|---|
| 1 Chassis | 7 Electrical cabinet with control elements |
| 2 Control console | 8 Drive motor |
| 3 Hydraulic hammer | 9 Hydraulic aggregate |
| 4 Mast (carriage) | 10 Hydraulic fluid cooler |
| 5 Hydraulic cylinder | 11 Electrical switch box with automatic self-regulation |
| 6 Fuel tank | |

The rugged and stable design of the machine can also facilitate pulling out profiles or posts, or drilling holes with a drill (optional). At a 1.9 m advancement from the forward edge of the chain to the middle of the hydraulic hammer and a working height of 4 m, even large posts can be rammed in effortlessly.

4.1 Chassis

The fully-hydraulic ram unit has a stable crawler chassis with a slewing ring and rubber-coated chain. A Hatz diesel motor is installed as a drive motor. The chassis supports all machine assemblies. A drive gear of the chassis moves the chain links forward in the direction of travel. The rest of the vehicle is pulled along on the runners and guide wheels. The chain drives on both sides move independently of one another. In some designs, the chain drives can move in opposite directions and the chassis can be rotated on the spot.



Fig. 3: Chassis



NOTE

The chassis of the machine is an out-sourced assembly. Construction, function, maintenance and repair are not described in these operating instructions. Detailed instructions can be found in the manufacturer's technical documents.

The machine can be rotated on the chassis by 90°. When it is transported to the work location, the machine is in its transport position (the hydraulic hammer is parallel to the direction of travel lengthwise) and during operation it is in its working position (the hydraulic hammer is perpendicular to the direction of travel).



Fig. 4: Machine in the transport position

When the locking and positioning lever is moved by 90° (lever position is vertical), the lock is released and the machine can be manually rotated on the chassis until it rests against a stop. When it is rotated to another position (such as the working position), the lever must be moved downward and clamped in this position. Rotation back to the transport direction is done in the same sequence.



Fig. 5: Locking and positioning lever



CAUTION

Avoid injuries and machine damage!

When the machine is rotated in a different direction, make sure that the stopping point has been reached. The lever must be returned back to its proper locking position.

4.2 Drive motor

The drive motor is an air-cooled, diesel-operated four-stroke motor with direct injection. The type and size of the drive motor depends on the type of machine. It is a drive assembly for the chassis, the slewing ring drive and the hydraulic pump. To dampen the vibration and noise, the motor is supported on rubber bumpers and fastened to the chassis.



NOTE

When operated over long periods of time without load or very small loads, the running behaviour of the motor can become worse. A motor load of at least 15% is required. Under low-load operation, the motor must be operated under a much higher load for a short period of time before turning it off.



Fig. 6: Drive motor

- | | |
|--|-------------------------------------|
| 1 Drive motor | 4 Tool box for battery and tool kit |
| 2 Oil fill nozzle and oil level dipstick | 5 Exhaust gas muffler |
| 3 Fuel tank | |

The drive motor must be filled with motor oil before initial start-up. The holding capacity is 4 l - 8 l, depending on the type. So pay attention to the different types of motors. The types of motor oils to be used are those with the following specifications:

- ACEA – B2 / E2 and
- API – CD / CE / CF / CF-4 / CG-4

If other motor oils are used, the manufacturer must first be consulted. Unsuitable motor oil reduces the time between oil change intervals and leads to significant shortening of the motor lifespan.

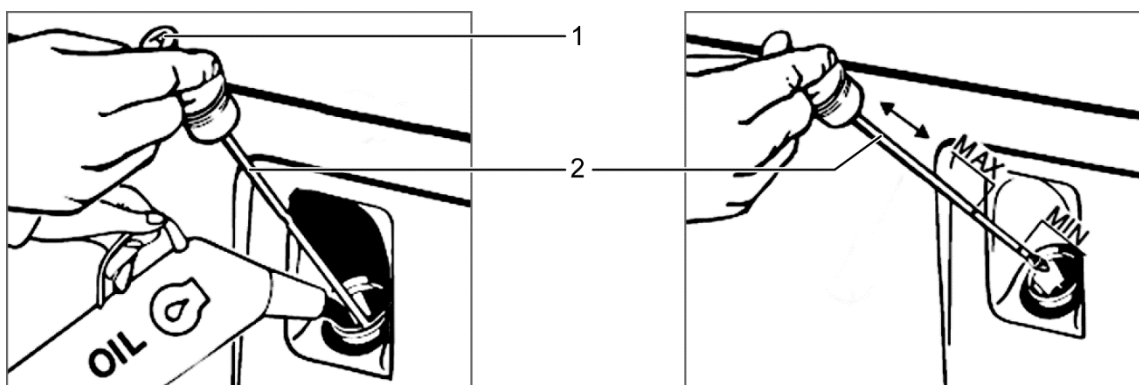


Fig. 7: Motor oil fill opening with oil dipstick

- | | |
|----------|------------------------------------|
| 1 Handle | 2 Oil dipstick (MAX/MIN indicator) |
|----------|------------------------------------|

The oil level is measured using the oil dipstick located in the fill opening. Fill up to the MAX marking when filling.

The drive motor is started using an electric starter. The speed adjustment lever (gas lever) is located right next to the ignition switch.

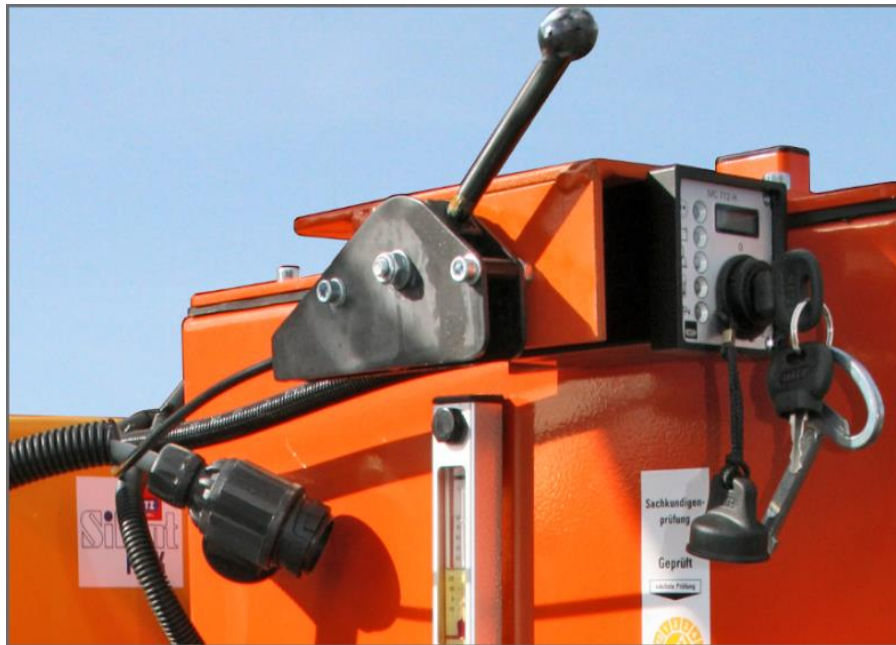


Fig. 8: Electric starter and speed adjustment lever

The ignition switch with key switch for the electric starter has 3 switch positions “0, I, II”. When the key is rotated to the “I” position, the installed “Check Charge 2” and “Oil Pressure Display 3” control lamps light up. To start the motor, the key is turned to the “II” position. When the motor is running, the key is released. The key will turn back to the “I” position by itself and will remain in this position during operation. The charge check and oil pressure display go out immediately after the drive motor starts.



Fig. 9: Ignition switch with message lights

- | | |
|------------------------------------|--|
| 1 Motor “ON” illuminated display | 4 Ignition key |
| 2 Charge Check illuminated display | 5 Motor temperature illuminated display |
| 3 Oil Pressure illuminated display | 6 Air Filter Maintenance illuminated display |

A fuel tank with a holding capacity of 180 l is installed to supply diesel fuel. All diesel fuels are suitable, provided that they meet the minimum requirements of the following specifications.

- EN 590
- BS 2869 A1 / A2
- ASTM D 975 - 1D / 2D

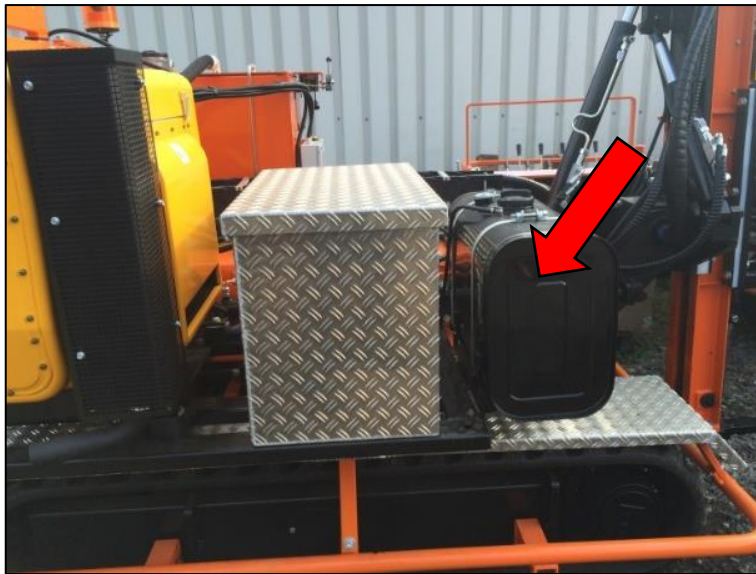


Fig. 10: Fuel tank

When work with the machine is finished, the speed adjustment lever must be moved to the stop position. The motor will run at idle. Close the shut-off valve at the lower end of the diesel fuel tank. Turn the start key to the “0” position and remove it. The start key must be protected against unauthorised access.

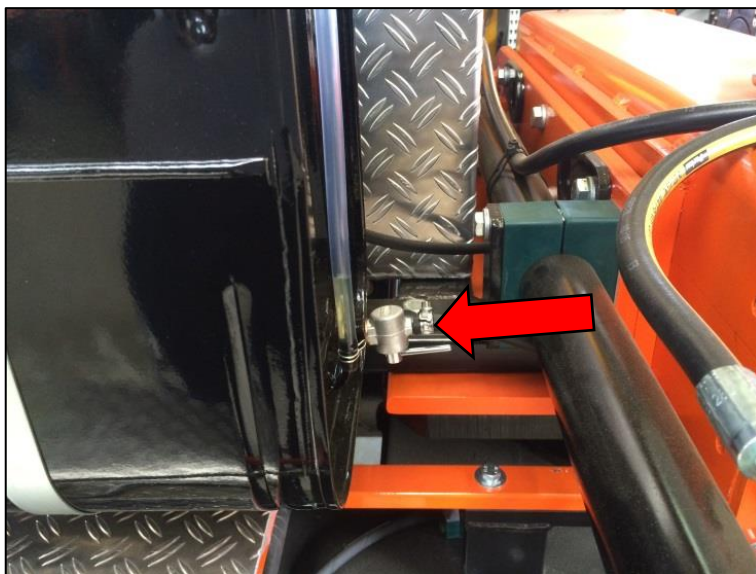


Fig. 11: Fuel tank shut-off valve

**DANGER**

Warning of hot surfaces!

During longer operating durations, various components become very hot, such as the hydraulic tank, hydraulic hoses (sometimes over 80 °C). Direct contact should be avoided until the unit cools down completely.

**DANGER**

Motor damages due to low-quality fuel!

Use of fuel that does not meet the specifications above can lead to motor damage. Use of fuels with deviating specifications may be used only after prior approval by the HATZ motor factory.

**DANGER**

Warning of escaping diesel fuel!

When finished working with the machine and after shutting off the motor, the shut-off valve at the diesel fuel tank must be closed as well. If this is not done, the diesel fuel might spill onto the ground.

**CAUTION**

Machine damage!

Diesel fuel stops flowing at low temperatures. This can cause clogging in the fuel system. When outside temperatures are below 0 °C, winter fuel should be used or petroleum should be added.

**CAUTION**

Danger of poisoning and explosion!

Never run the motor in closed or poorly ventilated rooms. Before starting, make sure that no other people are in the area of danger around the machine. All safety equipment should be installed and functional.

**NOTE**

The drive motor for the chassis is a supplier assembly. Construction, function, maintenance and repair are not described in these operating instructions. Detailed instructions can be found in the manufacturer's technical documents. They are part of the overall documentation.

4.3 Hydraulic aggregate

The purpose of the hydraulic aggregate is to provide the necessary fluid pressure for operating the hydraulic cylinders of the mast (carriage) and the hydraulic hammer. The hydraulic aggregate consists of a gear pump and a hydraulic tank. The gear pump is attached to the drive motor. It draws in hydraulic fluid until it has reached the required operating pressure. The hydraulic tank is a steel container with a holding capacity of 180 l. It may only be filled with hydraulic fluid that meets specification ISO-VG 46 DIN 51 524 / Part 2. Unsuitable fluid can considerably shorten the lifespan of the machine. Feet with struts are welded to the hydraulic tank. They are used to fasten the hydraulic tank to the hydraulic fluid/air cooler. The hydraulic tank consists of a steel container with a cleaning opening, a drain screw at the bottom of the tank, a visual fluid level display, a fill and vent opening with a replaceable filter insert and a visual contamination display.

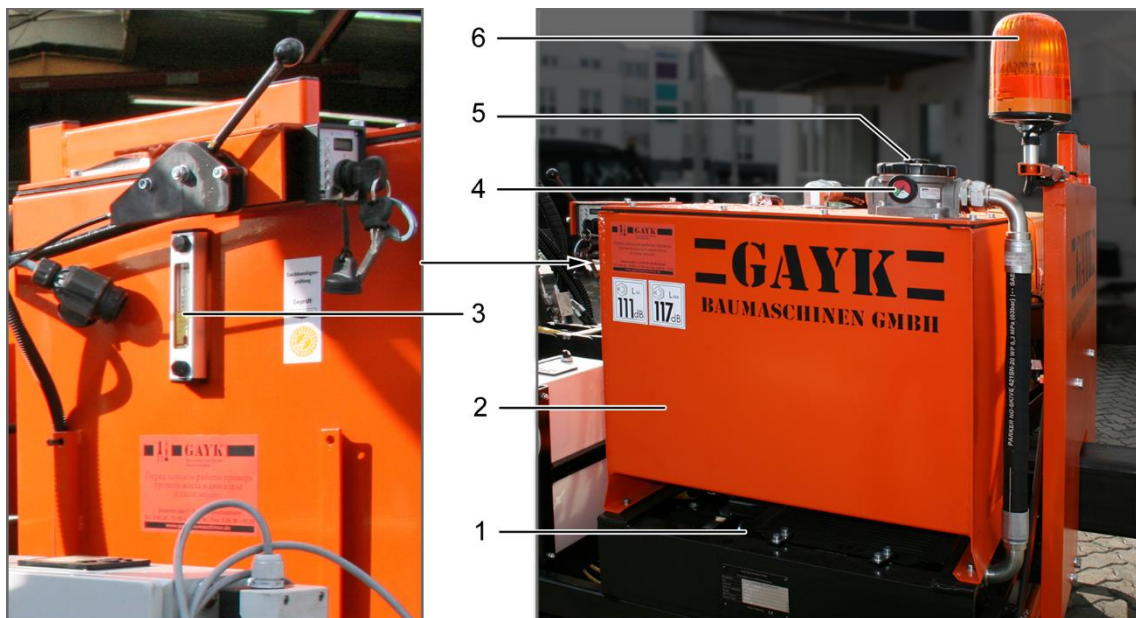


Fig. 12: Hydraulic tank

- | | |
|--------------------------------|--|
| 1 Hydraulic fluid/air cooler | 5 Fill and vent opening with replaceable filter insert |
| 2 Hydraulic tank | 6 Warning light |
| 3 Fluid fill level display | |
| 4 Visual contamination display | |

The vent filter (tank vent filter) of the hydraulic tank has a corrosion-resistant housing with an inlet opening on top. A cover with a protective edge prevents splashing water and allows the filter element to be quickly replaced. The vent filter is used to filter air when the volume changes in the hydraulic fluid tank and prevents contamination from ambient air from penetrating into the fluid. The vent filter is equipped with a filling screen. The filling screen is a support basket that keeps the shape of the filter element stable. When the fluid tank is filled, coarse contaminants are held back. A contamination display attached to the vent filter shows the degree of contamination of the fluid.



Fig. 13: Vent filter with contamination display

The visual fill level display mounted to the side wall of the tank shows the operator of the machine the current hydraulic fluid level in the tank. The two markings on the sight glass indicate the maximum and the minimum fill level.



Fig. 14: Visual fill level display

The air/hydraulic fluid cooler contains a compact cooling package. It consists of rectangular aluminium profiles in series. Aluminium sheet lamella are inserted between the individual layers. They enlarge the surface to be cooled. A fan motor with a fan impeller is located below the air/hydraulic fluid cooler. The fan motor is protected by a fuse and a protective relay. A thermostat is installed in the air/hydraulic fluid cooler. It turns on the fan motor with fan impeller at 60 °C. It cools the hydraulic fluid down to 40° and is then turned off again.



Fig. 15: Cooling package

The medium to be cooled (hydraulic fluid) flows through the profiles of the cooling package. The cooling air flows through the lamella perpendicular to the cooling package. The medium dissipates heat to the cooler environment and is blown away.

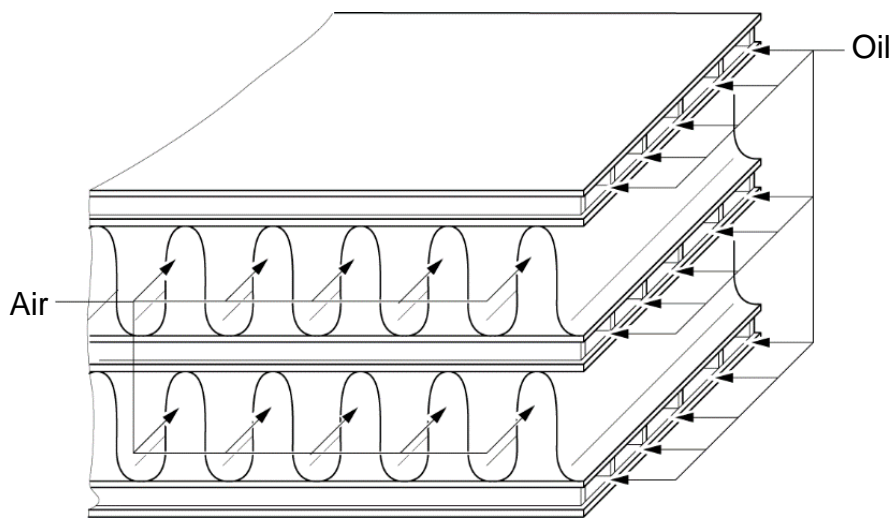


Fig. 16: Functioning principle of the cooling package



WARNING

Machine damage!

The hydraulic fluid cooler must always be free of particulates and other contaminants. Hydraulic assemblies can be damaged by an impaired cooling effect.

4.4 Mast (carriage)

The mast (carriage) is a stable steel structure. Pulleys are mounted at both ends. The drive chains (upper and lower) are guided on the pulleys. At one end, the drive chains are fastened to the hydraulic hammer sled and at the other end to a chain holder. The chain attachments at the sled are spring-loaded. The chain tension can be adjusted by tightening or loosening the nut. Various hydraulic cylinders are attached to the mast. They are controlled from the control console. With these hydraulic cylinders, the mast and hydraulic hammer can be moved to the following positions:

- Hydraulic hammer up and down
- Mast upright and store
- Mast set and place
- Mast left and right

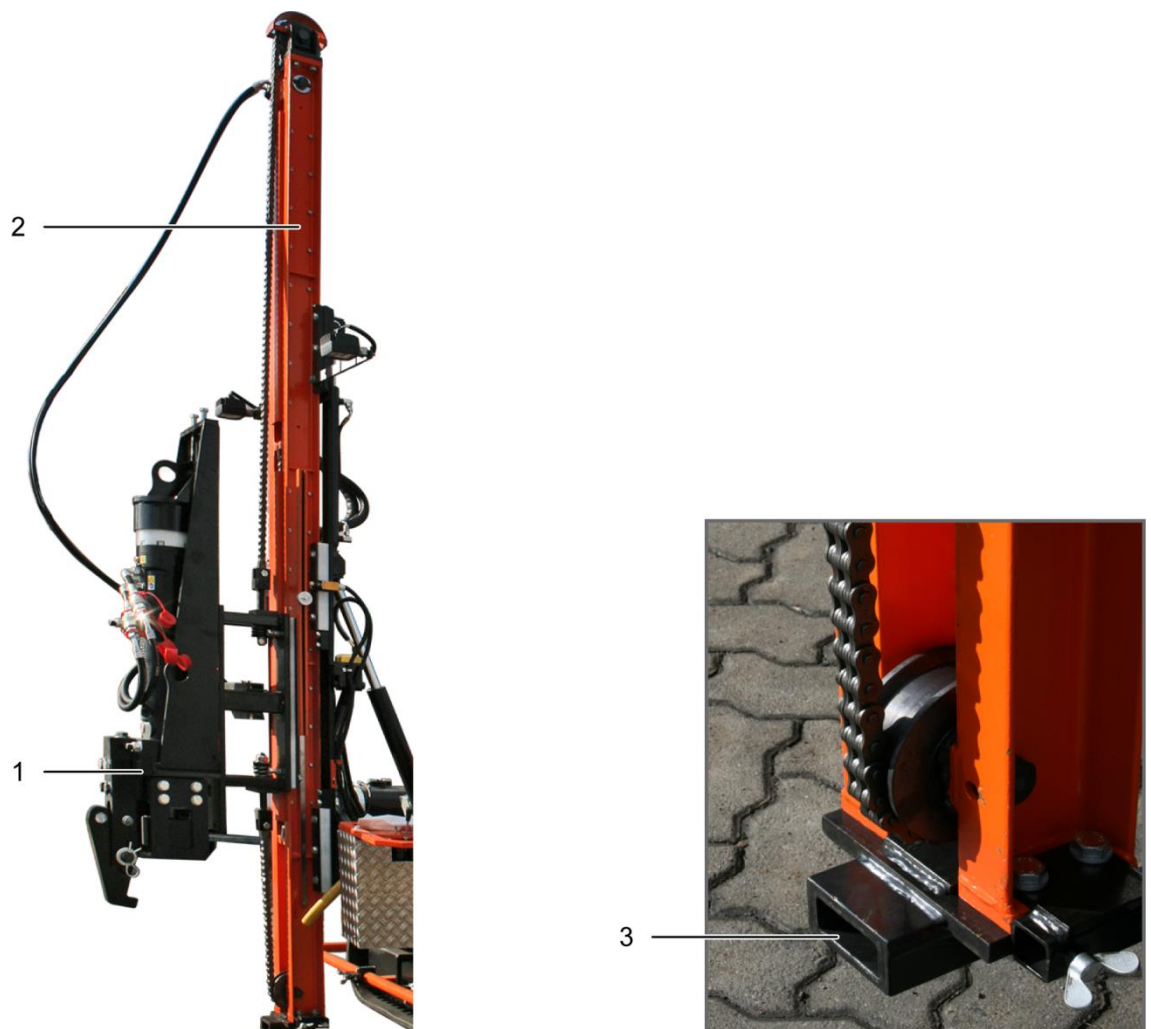


Fig. 17: Mast (carriage) with hydraulic hammer

- 1 Hydraulic hammer
2 Mast (carriage)

- 3 Post guide

4.5 Hydraulic hammer

The hydraulic hammer has a sled to which it is attached. The rolls of the sled run frictionlessly in a guide of the mast. The drive chains are fastened at both ends of the sled. They move the entire hydraulic hammer up and down depending on the motion of the hydraulic cylinder. The hydraulic hammer converts the work output from the machine into kinetic energy and transfers it to the upper ram head of the hydraulic hammer. Hydraulic fluid pressure is built up and is released suddenly to the impact piston located below it, causing the piston to move. The energy transmitted with each impact is called impact energy and the number of individual impacts per unit time is called the impact rate. The impact rate is 670 min^{-1} - 1450 min^{-1} . It is adjustable. When the impact piston hits the upper ram head, it conveys the energy to the profile material to be rammed. The lower ram head guides the rammed material. The shape of the ram heads depend on the geometry of the rammed material or is specified by the operator off the machine.

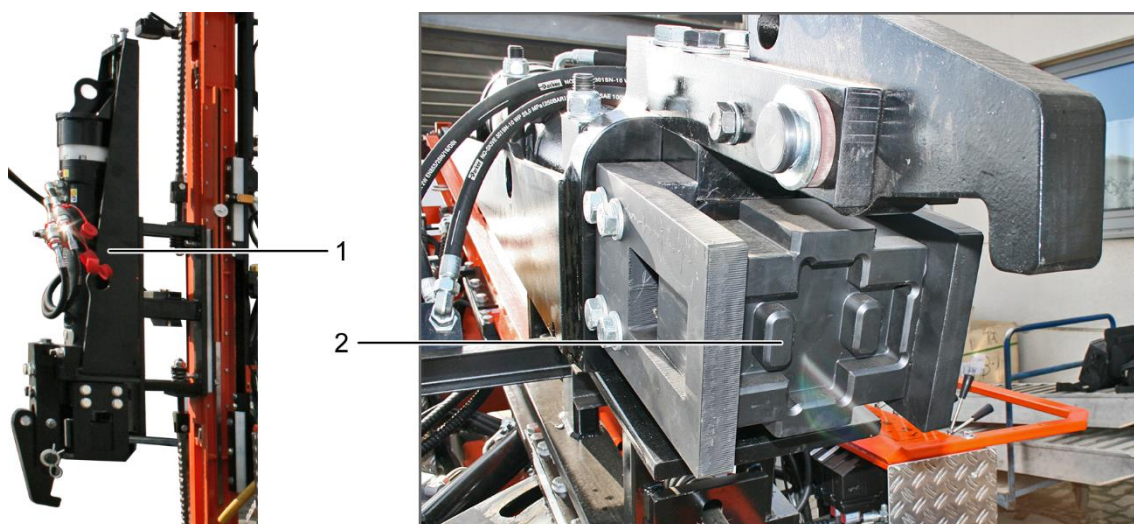


Fig. 18: Hydraulic hammer

1 Hydraulic hammer

2 Ram head



NOTE

The hydraulic hammer is a supplier assembly. Construction, function, maintenance and repair are not described in these operating instructions. Detailed instructions can be found in the manufacturer's technical documents. They are part of the overall documentation.

4.6 Control console

The control console is the workplace for the operator of the machine. All movements of the entire machine can be controlled from here. By actuating the individual shift levers, the following functions can be executed:

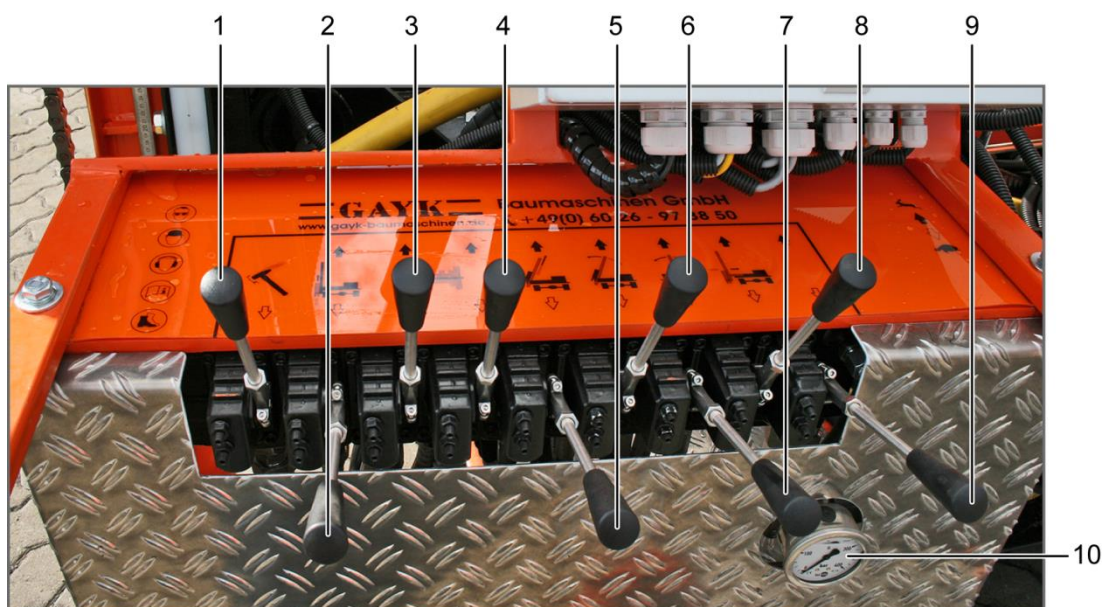
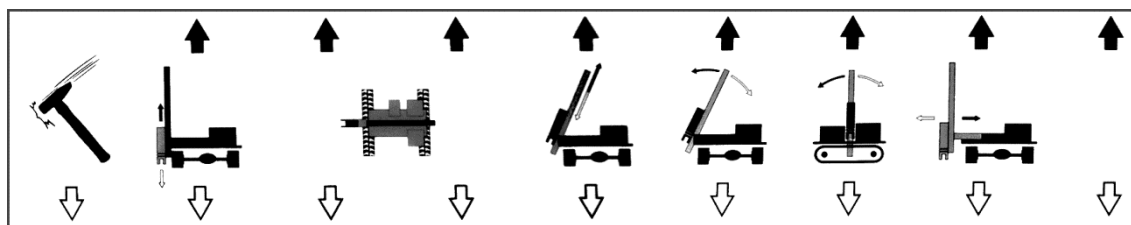


Fig. 19: Control console (optional)



Pos. No.	Process	Figure
1	Turning the hydraulic hammer on and off	
2	Moving the hydraulic hammer up and down	
3 4	Chassis left back and forth Chassis right back and forth	




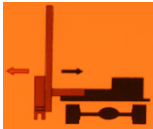

Pos. No.	Process	Figure
5	Mast up and down	
6	Mast upright and store	
7	Mast left and right	
8	Advance in and out	
9	Not assigned	
10	Operating pressure manometer	



Fig. 20: Gear lever

- | | | | |
|---|------------|---|-----------|
| 1 | Gear lever | 3 | Slow rate |
| 2 | Fast rate | | |

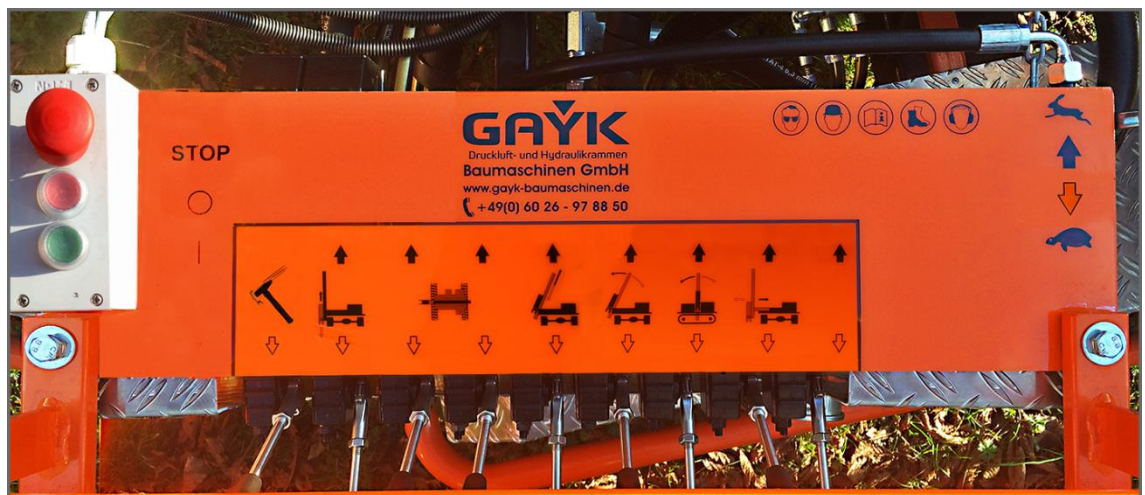


Fig. 21: Control console (standard)

4.7 Electrical system

The electrical system for the machine is a 12 V system. It consists of the following assemblies:

- 12 V battery
- Automatic self-regulation
- Electrical switch box with control elements
- Sensors, safety switches and electrical connection elements



DANGER

If the electrical insulation becomes damaged, immediately shut off the power supply and have the problem repaired!

- In all work on the electrical system, the system must be de-energised and checked to make sure of it.
- Do not bypass any fuses or take them out of service. When replacing fuses, make sure the correct current rating in amperage is used.
- Avoid moisture on live parts. Short-circuiting can occur.



DANGER

Danger of non-functioning safety equipment!
Safety is only ensured when safety equipment is functioning.

- Before beginning work, check to make sure that the safety equipment is functionally and correctly installed.
- Never shut down or bypass safety equipment.
- Ensure that safety equipment such as EMERGENCY STOP switches, limit switches, sensors, etc. are always accessible.



DANGER

Danger due to uncontrolled turn-on!

Uncontrolled turn-on can lead to serious personal injury. The following must be adhered to:

- Prior to turning the machine back on, all faults must be remedied, all safety equipment must be installed and functional.
- An EMERGENCY STOP is initiated by pressing the EMERGENCY STOP button. After an EMERGENCY STOP button has been pressed, it must be pulled back again to turn the machine back on.

4.7.1

Battery

The electrical energy for starting the drive motor is provided by a 12 V, 90 Ah battery. It is located under a cover in the tool box.

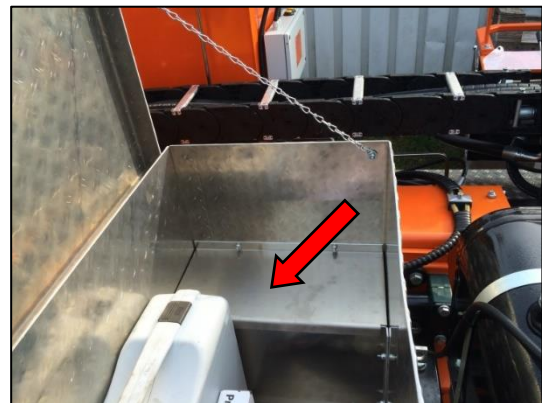


Fig. 22: Tool box for battery and tool kit



DANGER

Danger of explosion due to flammable materials!

There is a danger of explosion due to flammable gases. Keep batteries away from open flames and ignition sparks. Do not smoke when handling batteries.



CAUTION

Danger of corrosion!

When installing and removing batteries for electrical operation, and when filling them with battery acid, corrosive burning can occur. Protect eyes, skin and clothing from corrosive battery acid. In the event of acid spray, immediately rinse with clear water thoroughly and, if necessary, seek medical attention.





DANGER

Environmental hazard!

If batteries and battery acids are handled incorrectly, serious damages to the environment can occur. The following must be adhered to:

- Proper disposal of unusable batteries must be done according to the battery ordinance.
- Prevent battery acid from leaking.
- Store and transport battery acid in containers designed for them.

4.7.2 Automatic self-regulation

Automatic self-regulation is an option and can be installed at customer request. It allows the self driving distance to be adjusted. In other words, the machine will travel a pre-set distance by itself. This distance is input in the associated control system.

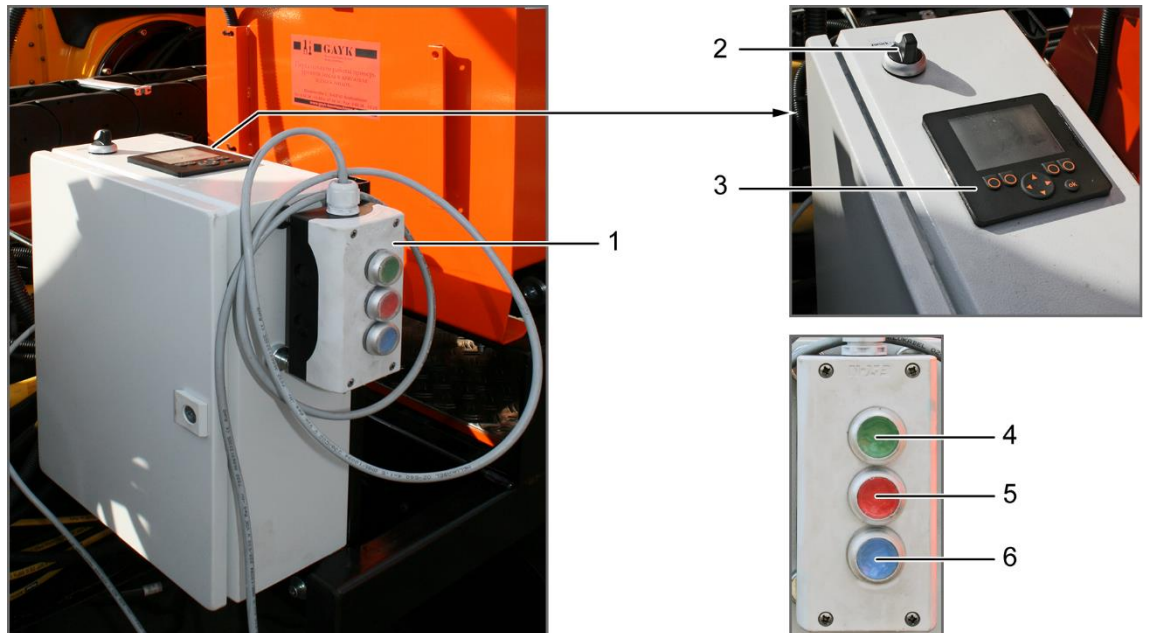


Fig. 23: Electrical switch box with automatic self-regulation (option)

- | | | | |
|---|--|---|-------------------------------|
| 1 | Manual controller | 4 | Automatic self-regulation ON |
| 2 | Self-regulation On | 5 | Automatic self-regulation OFF |
| 3 | Automatic self-regulation (controller) | 6 | Set zero |

The manual controller for automatic self-regulation is equipped with a longer connection cable. This makes it possible to control the machine from a different location. If the controller is no longer needed, it can be attached to a flat wall using the attached magnetic feet.

4.7.3 Electrical switch box

The machine has an electrical cabinet (optional). It is mounted above the control console of the hydraulic machine controls. All the control elements, machine protections and main machine assemblies are installed in the electrical cabinet. All terminal and connecting elements are also kept there. Every load is separately fused. Connecting the power and control voltage for the machine is done through terminal elements directly in the electrical cabinet.

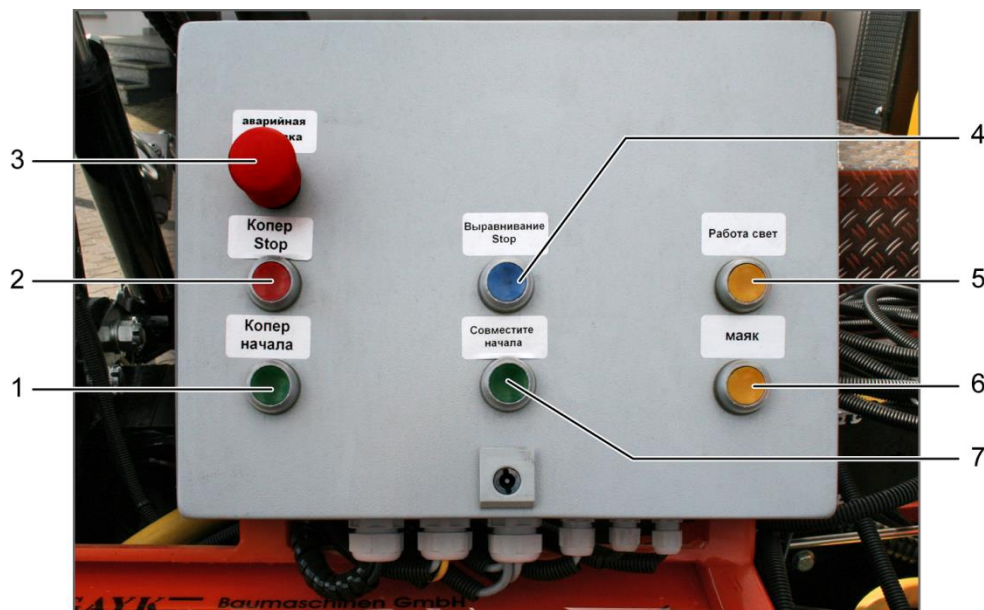


Fig. 24: Exterior of the electrical cabinet (optional)

- | | |
|---------------------------|-----------------------------|
| 1 Hydraulic hammer ON | 5 Working headlights ON/OFF |
| 2 Hydraulic hammer OFF | 6 Warning light ON/OFF |
| 3 EMERGENCY OFF button | 7 Automatic alignment ON |
| 4 Automatic alignment OFF | |

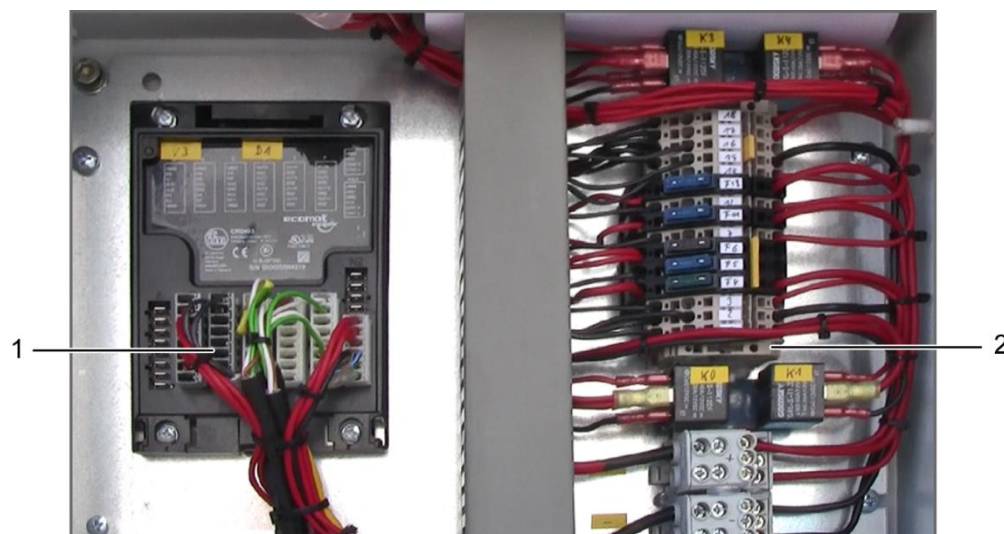


Fig. 25: Interior of the electrical cabinet (optional)

- | | |
|------------------------------------|---|
| 1 Controls for automatic alignment | 2 Fuses, plug connectors, connection elements |
|------------------------------------|---|



Fig. 26: Electrical cabinet (standard)

5 Transport

5.1 General transport instructions

For transport to the set-up location, VDI 2700 "Process Instructions for Securing Loads for Road Traffic" must be followed. A vehicle must be prepared. Lashing straps must also be provided. The loader and the driver of the vehicle are responsible for properly loading and securing the machine for transport on a vehicle.



DANGER

Risk of accidents!

Before performing transport work, check to see that the machine is stable enough. To securely load the machine, a loading ramp is always required. It must not be damaged and must have sufficient support capacity.



DANGER

Risk of accidents!

Falling parts must be removed prior to transport. Standing below a suspended load is strictly forbidden.



Crush injuries can occur between moving parts. No unauthorised persons are allowed in the work area of the machine.



5.2 Incoming inspections by the operator

The machine must be checked immediately after transport.

The following must be checked:

- any transport damages
- proper scope of delivery
- loose bolted connections
- other defects

A delivery record is required, with the signature of the driver of the transport vehicle. Complaints must be submitted to the manufacturer or supplier immediately within 24 hours.

If the machine is not set up and installed immediately after delivery at the customers location, it must be stored in a protected location. For longer periods of storage (>3 months), the general condition of the machine and its packing should be checked regularly. If required, renew or replace preservative.

6 Assembly and start-up

6.1 General assembly instructions



DANGER

Unauthorised set-up, assembly and initial start-up is not permitted. Set-up, assembly and initial start-up of the machine should be done by service personnel or other authorised personnel of Gayk Baumaschinen GmbH, and all safety regulations must be observed.

The following must be adhered to:

- Before beginning work, sufficient freedom of installation must be ensured.
- Be aware of the dimensions and weight data for the machine.
- Proper assembly procedure. Improperly fastened components can fall off or topple.
- Install assemblies and components properly. Maintain prescribed bolt torques.

In the assembly of the machine, the following protective clothing must be worn:

- Protective work clothing
- Protective safety helmet
- Protective work gloves
- Safety shoes

6.2 Aligning the machine

Before setting up the mast, the machine must always be placed in its work position. The lock is released and the entire upper structure of the machine is rotated to its working position and locked. The lock may only move slightly against the stop. The mast is raised by about 50 cm by actuating the corresponding control lever. When the vertical position is reached, the mast may not be pressed into the soil. The machine can be aligned automatically and manually. Automatic operation is turned on by pressing the “Automatic Alignment ON” button. To check alignment, check the attached bubble level to see whether the mast of the machine is exactly vertical. Automatic operation is turned on by pressing the “Automatic Alignment ON” button.

When aligning by hand, the “Mast up and down” shift lever is actuated until the exact alignment is indicated at the bubble level.



Fig. 27: Circular level



CAUTION

Aligning the machine!

Improper alignment of the machine and thus all assemblies can lead to damage of the rammed material and wear of the respective machine parts.

7 Operating the machine

7.1.1 General instructions



DANGER

Risk of accidents when turning on the machine!

Any damages found must be reported before turning on the machine. The machine is only ready to operate after all defects are remedied.



DANGER

Risk of accidents when turning on the machine!

Actuating control devices causes a mechanical movement at the machine. The following must be adhered to:

- The control device should be actuated slowly. No uncontrolled movements are allowed.
- No unauthorised personnel are allowed in the work area of the machine.
- Obstructions or other objects near the machine must be removed.

7.1.2 Operating procedure

1. The following checks must be done before beginning work:
 - check and, if necessary, top up the motor oil level.
 - check and, if necessary, top up the fuel.
 - check and, if necessary, top up the hydraulic fluid level.
 - degree of contamination of the fill and vent filter and, if necessary, change filter.
 - check and, if necessary, replace hydraulic fluid hoses and connectors.
 - check chain tension and tighten if necessary.
2. Rotate and lock the upper structure of the machine in the working position.
3. Set ignition key to the "I" position, the check charge and fluid pressure control lamps will light.
4. Rotate the ignition key to "II". The motor will start. The charge check and oil pressure control lamps will go out.
5. Lightly actuate the speed adjustment lever.
6. Bring the machine to the position at which the profile is to be rammed.
7. To move, actuate the two corresponding control levers.
 Move straight forward → both control lever are moved in the same direction. To go around a curve → move the control lever in opposite directions.
 When driving the machine, the hydraulic hammer may never be higher than one meter above the ground.
8. Drive until the correct position is reached.
9. Erect the mast. Move the hydraulic hammer to its centre position.
10. Align the mast automatically or manually (optional).

11. Optionally, the corresponding distance can be established in the automatic self-regulation system.
12. Ramming position has been reached.
13. Move the hydraulic hammer upward using the control lever until the profile can be inserted into the ram head.
14. Place the profile into the post guide and then align it, then move the hydraulic hammer downward until the profile is pressed into the ground.
15. Before beginning the ramming process, check to see whether the profile is standing vertically in the machine

7.1.3 Ramming the profiles

1. The ramming process can be done manually with the control levers or using the automatic ramming function.
2. In the manual ramming process, the “Hammer down” control lever is always actuated first before the ramming process is begun. The control levers are held until the desired depth of the profile is reached. To end the ramming process, the control lever “Hammer in” is released first and then the control lever “Hammer down”.
3. If the correct depth is not yet reached, the process is repeated until the desired depth is reached.
4. The hydraulic hammer is lifted far enough that it does not get caught in the profile.
5. In the ramming process using the automatic ramming function, the height of the automatic shut-down is adjusted on the mast.



Fig. 28: Limit switch for shutting off the automatic ramming function

1 Limit switch

2 Switch roll

6. The profile is placed under the hydraulic hammer. To start the ramming process, the green button on the control panel of the electrical cabinet (optional) is pressed. The machine automatically turns off the ramming process when the height setting is reached.
7. If the automatic ramming process is stopped, the red button on the control panel of the electrical cabinet is pressed. Only the ramming process is interrupted, but the machine continues to run. If a dangerous situation arises during ramming, the emergency stop button must be pressed immediately. The machine is shut down completely.
8. At the end of the work, the machine must be placed in the transport position. The lock is opened and the chassis structure is rotated. The lock is re-set.
9. Move the hydraulic hammer all the way downward.
10. The mast must be brought to the transport position. It is folded backward onto its storage position. Before the mast is fully stored, it must be moved all the way downward. Otherwise it might damage the hydraulic cylinder.

8 Maintenance and repair

8.1 General instructions



DANGER

Risk of accidents!

In all work involving operation, installation and maintenance, the shut-off procedures described in these operating instructions must be followed, as well as any required safety measures. After all work on the machine, check whether all safety equipment has been installed and is functioning properly. Safety equipment may not be bypassed or shut down.



CAUTION

Maintenance and testing of machine functions may only be performed by qualified personnel according to the instructions in the operating instructions. The maintenance intervals established by the manufacturer of the machine must be adhered to. The operation of the machine must not be affected by a power loss.



CAUTION

Only perform maintenance work with the machine shut off and after it has been secured against being turned back on. Statutory disposal regulations for waste oil, lubricants, cleaning agents and filters must be followed. To protect against unauthorised access, the ignition key must be removed and the negative terminal of the battery disconnected. At the end of the maintenance work, all tools and miscellaneous objects must be removed from the machine.



DANGER

Risk of accidents!

After the maintenance work, the following checks must be carried out prior to turning the machine back on, during which time safety regulations must be adhered to.

- Check that all loose bolted connections are tightened.
- Properly re-install all removed safety equipment. Ensure that all safety equipment for the machine is properly functioning again.
- Clean the work area and remove any escaped process materials.



CAUTION

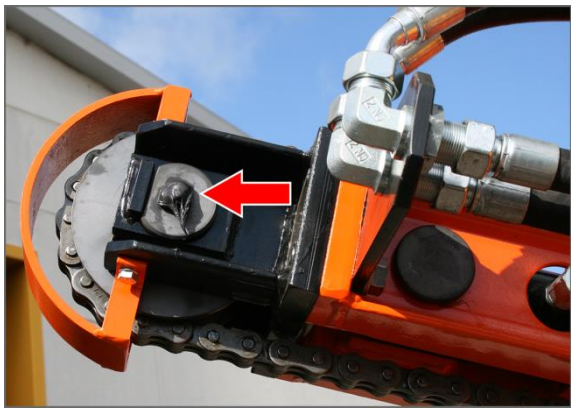
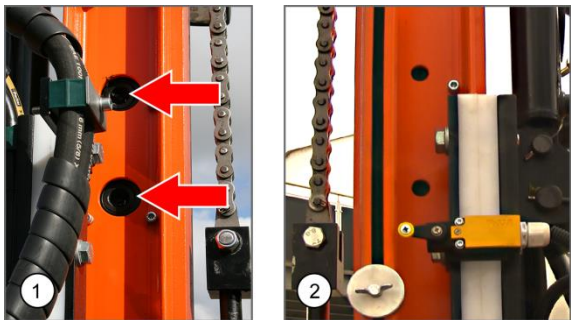
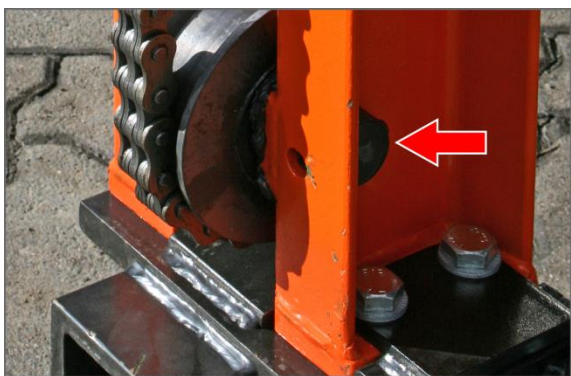
Do not use aggressive cleaning agents!

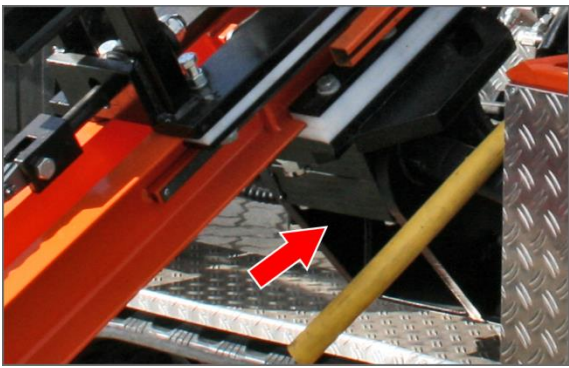
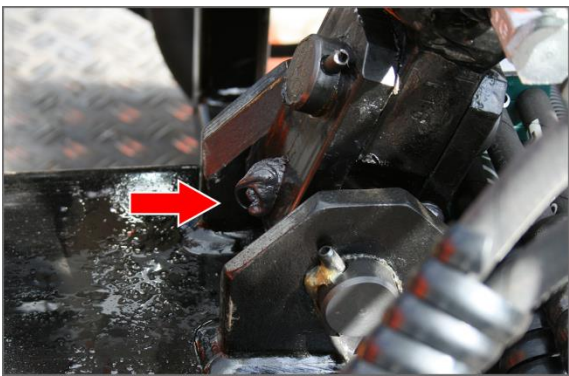

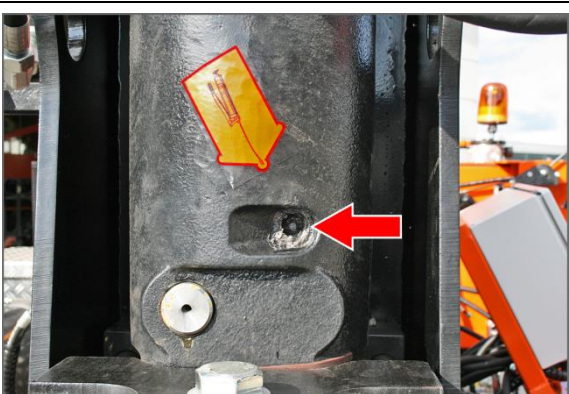
Cleaning agents must not damage the paint and the components of the machine. Use a lint-free cleaning cloth. Only work with dry, filtered compressed air up to max. 2 bar. After cleaning work on the machine, perform a visual and functional inspection.

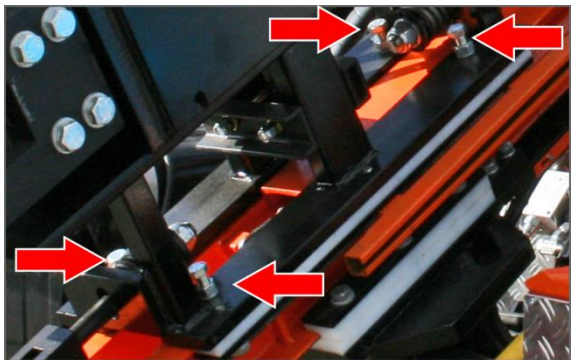
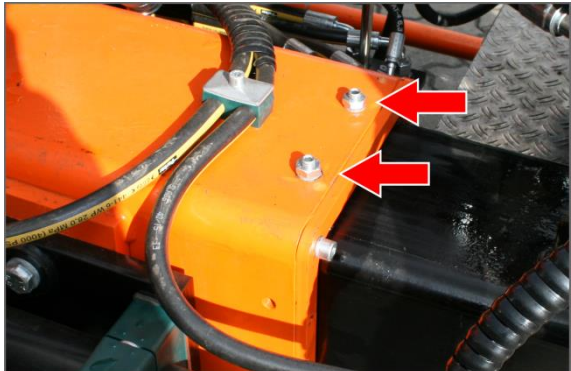
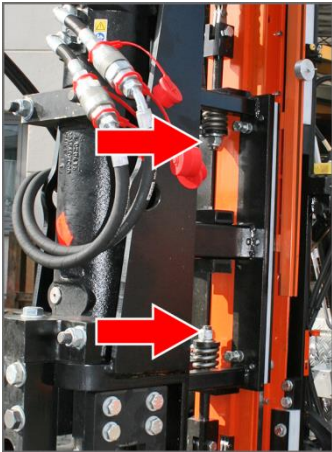
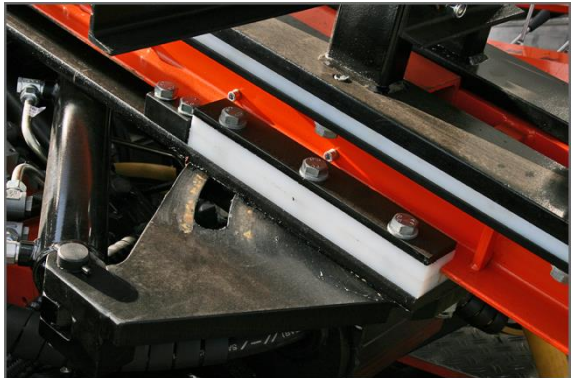
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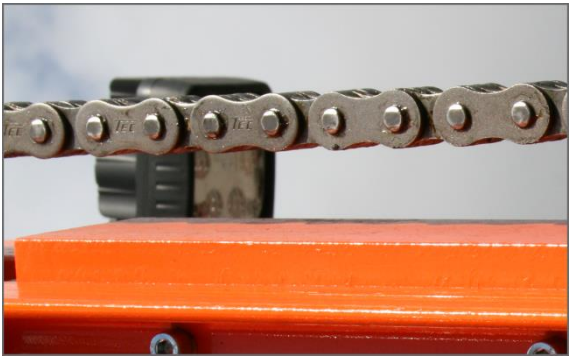
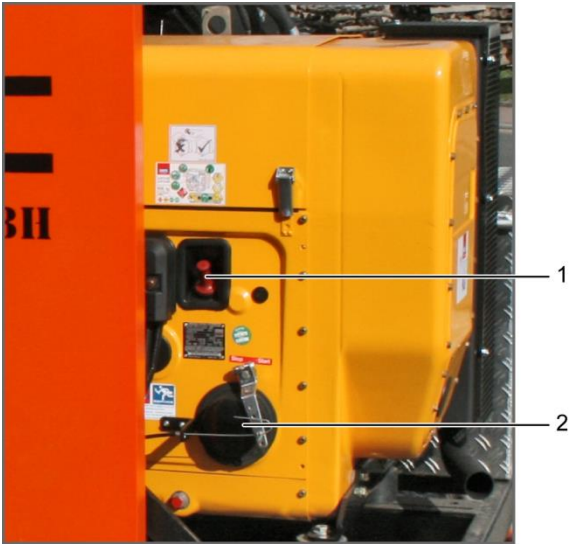
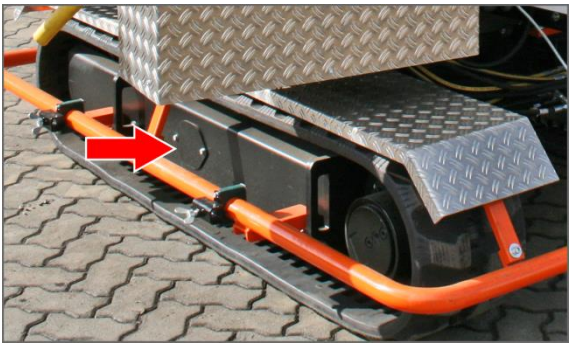
The life of the machine depends to a large degree on the quality of the maintenance measures being performed.


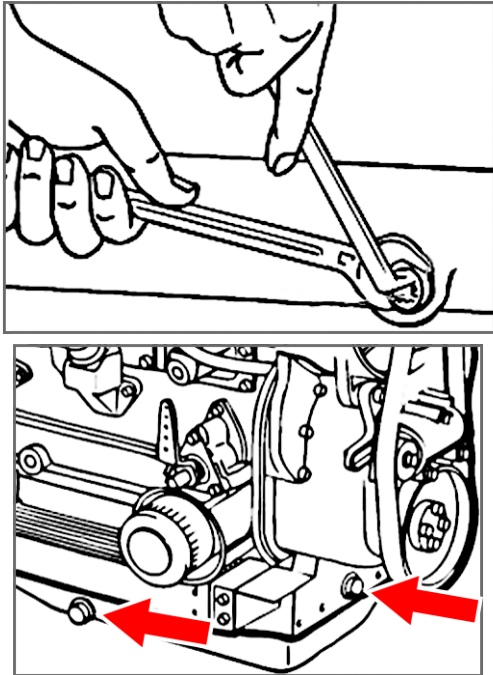

8.2 Maintenance and repair measures

Maintenance and repair measures		
Work to be performed	Interval	Figure
Upper mast lubrication (carriage) 2 to 3 pumps of high-pressure grease	30-50 operating hours	
Mast lubrication (carriage) 2 to 3 pumps of high-pressure grease 1. Lubricant nipple at the centre of the mast (carriage) 2. Sight holes for positioning the return pulleys	30-50 operating hours	
Lower mast lubrication (carriage) 2 to 3 pumps of high-pressure grease	30-50 operating hours	

Maintenance and repair measures		
Work to be performed	Interval	Figure
Mast lubrication (carriage) at hinge 2 to 3 pumps of high-pressure grease	30-50 operating hours	
Lubrication at lower hydraulic cylinder 2 to 3 pumps of high-pressure grease	30-50 operating hours	
Lubrication at upper hydraulic cylinder 2 to 3 pumps of high-pressure grease	30-50 operating hours	
Lubrication at the hydraulic hammer Lay the hydraulic hammer on a post and push the chisel completely into the hydraulic hammer.	2 – 3 times per day 1 – 2 pumps	

Maintenance and repair measures		
Work to be performed	Interval	Figure
Adjusting bolts at sled (4x) Check the bolted connections	250 operating hours	
Adjusting bolts at the advance (8x) Check the bolted connections	250 operating hours	
Tensioning bolts at the sled Check the bolted connections	250 operating hours	
Slide rails Adjust play		

Maintenance and repair measures		
Work to be performed	Interval	Figure
Check tubing for leaks	Ongoing checks. Replace as necessary.	
Chains Check tension and oil		
Gear oil replacement at vehicle motor 1. Oil dipstick 2. Oil fill nozzle	500 operating hours	
Tensioning the vehicle tracks	500 operating hours	

Maintenance and repair measures		
Work to be performed	Interval	Figure
Hydraulic hoses Visual check for damages, abrasions, cracks.	Every 6 years under normal loads. Under increased demands, after 2 years.	
Blow out cooling fins with compressed air. Do not set the compressed air gun onto the cooling fins.	250 operating hours	
Change motor oil During motor oil change, place a collection vessel for the waste oil underneath. It should not be allowed to drain to the environment, or the ground. Danger of slipping.  The drained waste oil must be disposed of according to the waste oil ordinance (AltöIV).	Manufacturer's operating instructions	
Replace hydraulic fluid During a hydraulic fluid change, place a collection vessel for the waste fluid underneath. It should not be allowed to drain to the environment, or the ground. Danger of slipping.  The drained waste oil must be disposed of according to the waste oil ordinance (AltöIV).	500 operating hours	

Maintenance and repair measures	
Checking the chain tension	
<ol style="list-style-type: none"> 1. Check on a flat surface. 2. Rotate the chassis to the working position and lift using the mast until the chain is free. 3. Lift the opposite side using a suitable forklift below the bracket until the chain is free (make sure that the machine is secured against slippage). 4. Never lift both sides at the same time. 5. Sag of the chain between the pulley and the chain (the distance should be 15-20 mm). 	
Tensioning the chains	
<ol style="list-style-type: none"> 1. Remove bolts on the cover to the right and left at the drive support and place the manual grease pump over the lubrication nipple. 2. Re-tension the chain. 3. Do not use any chisel paste to tension the chain. 4. Move the chain and check the chain tension again. 5. For new rubber tracks, check the sag of the rubber tracks 2-3 times. Tension the rubber tracks if necessary. 	
De-tensioning the chains	
<ol style="list-style-type: none"> 1. Slowly loosen the valve with the lubrication nipple and allow grease to flow out until the correct chain tension is reached. 2. Re-tighten the valve with the lubrication nipple. 3. Remove grease and dispose of it properly. 	
Removing the rubber track	
<ol style="list-style-type: none"> 1. Remove the fenders and raise the chassis. 2. Loosen the valve until the rubber chain is entirely de-tensioned. 3. Use a long pry bar to remove the chain. 4. The lower end at the sagging chain must reach in front of the rear pulley. A lateral force will be exerted on the chain. 5. Now slowly move the chain forward using the drive motor and exert more pressure on the chain. The chain will now move downward from the guide bracket of the guide pulley and can be pulled backward and removed from the drive pulley. 	
Installing the rubber track	
<p>The rubber track is installed in the same sequence as its removal, but in reverse.</p> <ol style="list-style-type: none"> 1. Place the chain completely against the cogging of the drive pulley. 2. Lay the lower end of the chain onto the guide pulley. 3. Push on the chain using the pry bar. 4. Slowly move the chain forward until it is seated on the guide pulley and drive pulley completely. 5. Tension the chain according to the description. 	
Adjusting the slide rails	
<p>The slide rails are seated using adjusting bolts at the sled and the base tube. There are 4 adjusting bolts at the sled with lock nuts, and 8 adjusting bolts at the base tube with lock nuts.</p>	
1. Adjusting the slide rails at the sled	
<p>Set the mast in the vertical position. Loosen the lock nut. Tighten the adjusting bolt hand tight against the lock nut. Check the play in the sled by moving it up and down. The sled should have a constant speed in each direction. If not, the adjusting bolt must be readjusted. Check whether the sled is sitting firmly against the mast by shaking it.</p>	

2. Adjusting the slide rails at the base tube

Set the mast in the vertical position. Lock nuts are loose. Tighten the bolts until resistance is felt. Tighten the lock nuts and check the play by slowly moving the advancement and the left-right cylinder of the mast one after the other. If there is still play in the slide rails, the adjustment must be repeated at the adjusting bolts.

9 Disruptions

Type of disruption	Possible causes	Remedy
Motor does not start	Emergency Stop button activated	Unlock the Emergency Stop button. Follow the Hatz operating instructions.
Hydraulic hammer is not making impact	Loose quick coupling	Tighten the quick coupling Follow the Atlas Copco operating instructions.

Ersatzteilliste HRE / Spare Parts List HRE

A=Aufbau, E=Elektrik, HY=Hydraulik, M= Motor, B=Bohrereinheit

A=Assembly, E=Electric, HY=Hydraulic, M=Motor, B=Drilling Unit

	Bezeichnung (d)	Name (engl)	Art-Nr/ArtNo
	Große Inspektion	Large service	09575274
	Kleine Inspektion	Minor service	09575174
A	Beschriftungstafel zum HRE	Identification plate for the HRE	09570499
A	Meißelstummel PB 160	chisel stub PB 160	09576374
A	Haltebolzen zum PB 160	Retainer pin PB 160	09576474
A	Vulconplattensatz PB 160	Vulcon plate kit PB 160	09570978
A	Schlitten z Schlagwerk PB 160	Carriage for pile driver PB 160	09571274
A	Spannhalbschale Schlitten PB 160	Clamping half-shell carriage PB 160	09571277
A	Hammerkasten/Hammeraufnahme PB 305	Carriage for pile driver PB 305	09571974
A	Haltebolzen zum PB 305	Retainer pin PB 305	09570872-1
A	Meißelstummel PB 305	chisel stub PB 305	09570881
A	Spionrohrhalter	Spy pipe clamp	09574479
A	Schwingungsdämpfer/Gummi Puffer	Vibration damper/rubber buffer	09574475
A	Gleitplatte Kst kpl Satz Vorschub	Sliding plate plastic cpl. kit feed	09575774
A	Gleitplatte Kst Vorschub 150x150x15	Sliding plate plastic feed 150x150x15	09575874
A	Gleitplatte Kst Vorschub 150x50x12	Sliding plate plastic feed 150x50x12	09575974
A	Gleitplatte z Schlitten (Kunststoff)	Sliding plate for carriage (plastic)	09576075
A	Halbschale m Schmier Tasche z Gelenk	Half-shell with lubrication bore relief for joint	09576774
A	Axial Nadelkranz Lager Gelenk	Axial needle roller bearings joint	09576874
A	Kreuzgelenk HRE Stellen/Legen	Universal joint HRE erect/lower	09745274-4.3
A	Distanzhülse HRE Stellen/Legen	Spacer sleeve HRE erect/lower	09745274-4.2
A	Geweihtmastaufgabe	Mast support	09745474-20
A	Mastgrundplatte m Gelenk+Gleitbuchse	Mast base plate with joint + slide bush	09752174
A	Flyer Kette unten	Flyer chain bottom	09752374-10
A	Flyer Kette oben	Flyer chain top	09752374-9
A	Kettenspanner für Flyerkette	Chain adjuster for flyer chain	09752378
A	Mastgleitplatte m Kstpl+Gewindestift	Mast slide plate w pla.plate+grub screw	09752474-1
A	Distanzplatte zur Lafette	Spacer plate for mount	09752474-2.1
A	Gleitleiste Lafette (Metall)	Guide rail mount (metal)	09752474.6.8
A	Gleitleiste Lafette (Kunststoff)	Guide rail mount (plastic)	09752474.6.9
A	Verstärkungsleiste z Kstleiste z Lafette	Reinforcement rail for plastic rail of mount	09752574-10
A	Gleitleiste z Kettenschlitten	Guide rail for chain carriage	09752674-7.1
A	Gelenklager z HyZyl. Stellen/Legen	Swing bearings for hydr.cyl. erect/lower	HY1093
A	Feder Schlitten	Spring carriage	01268174
A	Flügelschraube M 12 x 30	Thumbscrew M 12 x 30	93071600
A	Spionrohr Länge 1500mm	Spy pipe, length 1500mm	09574574
A	Schiene für autom.Abschaltung C-Profil	Rail for autom. stop C-profile	09574976
A	Gewichtsplatte zum HRE 1000x1000x50	Weight plate HRE 1000x1000x50	09500774
A	Stoßfeder zum Kettenschlitten	Shock spring for chain carriage	012681.74
A	Federteller, Federscheibe Hammerschlitten	Spring plate, spring disc, hammer carriage	09752674-10
A	Zwischenteil Verb.platte Lafette U-Form	Connection plate, mount, U-form	09576574
A	Zwischenteil Verb.platte Lafette GeradeForm	Connection plate, mount, straight form	09576674
A	Stehbolzen / Gelenkbolzen M 24x90	Stud bolts / pivot bolts M 24x90	09752174-26
A	Gleitplatte zur Mastschwenkplatte groß	Sliding plate for mast swivel plate, large	09575374
A	Gleitplatte zur Mastschwenkplatte klein	Sliding plate for mast swivel plate, small	09575474
A	Halteeisen HRE (VR120/150)	Holding iron HRE (VR 120/150)	09753574-10
A			
A			
A			

Ersatzteilliste HRE / Spare Parts List HRE

	Bezeichnung (d)	Name (engl)	Art-Nr/ArtNo
E	Beleuchtung Arbeitsscheinwerfer LED kpl	Light, working light, complete	09500274
E	Birne Arbeitsscheinwerfer H1	Bulb, working light H1	000064150
E	Birne Arbeitsscheinwerfer H3	Bulb, working light H3	000064151
E	Schalter Arbeitsscheinwerfer	Switch, working light	09574776.1
E	Schalter Not / Aus	Emergency stop switch	09570482
E	Schalter Rundumleuchte	Switch beacon light	09574776
E	Rundumleuchte 12 V	Beacon light	09574777
E	Rundumleuchte 24 V	Beacon light	09574780
E	Birne zur Rundumleuchte	Bulb for beacon light	09577274
E	Winkel zum Haltemagnet	Angle for holding magnet	09574972
E	Haltemagnet 40 mm	Holding magnet 40mm	09574973
E	Haltemagnet Teller z Bucher Block	Holding magnet plate for Bucher block	09574975
E	Rollenendschalter z autom.Abschaltung	Roller limit switch for automatic cut-off	09574977
E	Alurolle für automatische Abschaltung	Alu roller for automatic cut-off	09574978
E	Sicherung 15 A	Fuse 15A	09577174
E	Schraubenfeder CB 17, Feder Magnet	Coil spring CB17, spring magnet	510.3321
E	Schiene für automatische Abschaltung	Rail for automatic cut-off	09574976
E			
E			
HY	Öl-Filter Hatz	Oil filter Hatz	09574374
HY	Öl-Filter kpl. mit Gehäuse	Oil filter cpl. with housing	09513176
HY	Öl-Filter	Oil filter	09513175
HY	Öl-Filter kpl. Tank Topper	Oil filter cpl. Tank Topper	09513178
HY	Lecköl-Rücklaufleitung	Oil leakage return line	HY0903
HY	Runddicht O-Ring z CH 80 (Dichtungssatz)	O-Ring to CH 80 (Seal kit)	Hy1062
HY	Runddicht O-Ring z CH 50 (Dichtungssatz)	O-Ring to CH 50 (Seal kit)	Hy1063
HY	Runddichtring	O-Ring	391321936205
HY	Führungskette (Lasche)	Guide chain (flap)	HY0974-1
HY	Führungskette (Steg)	Guide chain (gutter)	HY0974-2
HY	Gummi Balg Bucher Block	Rubber bellows Bucher Block	HY1043
HY	Staubkappe Hammerkupplung Gr. 6	Dust cap hammer coupling size 6	HY0978-1
HY	Staubkappe Hammerkupplung Gr. 6	Dust cap hammer coupling size 6	HY0979-1
HY	Schnellkupplung Staubstecker Gr. 3	Quick connector dust plug size 3	HY0980-1
HY	Staubmuffe Gr. 3	Dust bush size 3	HY0981-1
HY	Hydraulik Öl, HLP 46	Hydraulic oil, HLP 46	09510174
HY	Öl Filter Umbau kpl.	Oil filter modification cpl.	09512974
HY	Deckel Öl Filter	Cap oil filter	09513179
HY	Belüfterelement für Tanktopper	Aeration element Tanktopper	09513181
HY	Runddichtring 15,22x2,62	O-Ring 15.22x2.62	9023485
HY	Runddichtring 20,63x2,62	O-Ring 20.63x2.62	903435
HY	Runddichtring 4,2x1,9	O-Ring 4.2x1.9	904003
HY	Runddichtring 14x2	O-Ring 14x2	904063
HY	Runddichtring O-Ring 20,22x3,53 z.80ltr Block	O-Ring 20.22x3.53 to 80ltr block	Hy1060
HY	Deckel für 80ltr.Block	Cap for 80ltr block	Hy09614
HY	Kunststoffkappe HRE G 1/2" CH 80	Plastic cap HRE G 1/2" CH 80	HY09616
HY	Kunststoffkappe HRE G 3/8" CH 50	Plastic cap HRE G 3/8" CH 50	HY09665
HY	Stromregelventil	Flow control valve	HY0969
HY	Gelenklager zum Hydr.Zyl.,stellen-legen	Swing bearing for hyd.cyl. erect/lower	HY1093
HY	Gelenkkopf zum Hydr.Zyl.,stellen-legen	Joint head for hyd.cyl. erect/lower	HY1095
HY	Schlauchschutz	Hose protection	HYS0001

Ersatzteilliste HRE / Spare Parts List HRE	
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Ersatzteilliste HRE / Spare Parts List HRE

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Ersatzteilliste HRE / Spare Parts List HRE

[illegible]



Series No.

Service hours

Mechanic:

Spare part list with pictures and numbers

3363491004
Service box / Nitrogen bag PB 160/310/420
with 2l bottle



09570878
Nitrogen bottle
1329518
Manometer for testing
the nitrogen pressure in
the hydraulic hammer

1329516
Filling valve to fill nitrogen
in the hydraulic hammer
incl. manometer

09574977
roller limit for automatic shutdown



09574977.2
Pivoting lever for roller limit

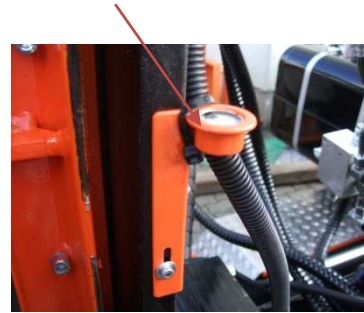
3363087286
Filling valve tot he PB 160 – 420



09511074
Grease press for chisel paste



09029274
box level



09513074
grease

09512074
hammer/chisel paste

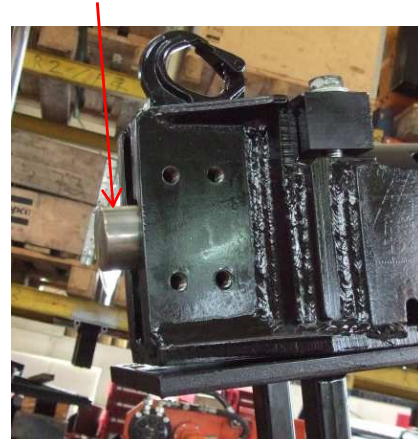


93280074
Grease nipple R ¼"



chisel

PB 160 - 09576374
PB 310 - 09570881
PB 420 - 09903774-40



Spare part list with pictures and numbers

09513179

black plastic cover Oil filter



HY 10125
dust indication Hydraulic filter

09513183

supporting cage

937894Q

Hydraulic filter



HY 1025
Glycerin - Manometer



09513181
Breather item Tank topper



09500274
Working lights LED



09500474
working lights H3



HY 0955
Hydraulic cylinder mast up-down



Hydraulic pipe
HY 0805

bar block
HY 0972



HY 0986
traight screw-in fitting



Spare part list with pictures and numbers

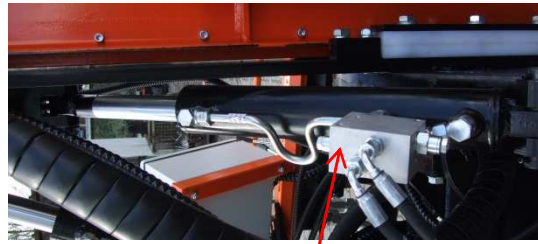
Hydraulic pipe hammer up-down
HY 0803 for 3,7m erector
HY 0804 for 4,7m erector



HY 0951-2
Cylinder put-lay



Hydraulic cylinder left-rights
HY 0939



HY0987.1 locking block sagging compensate

09574977
Revolving limit switch



09574977.2
Lever to the revolving limit switch

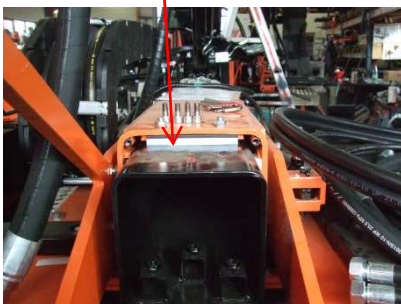
HY 0973
three-way shift ball valve



09752474-2.2
guide rail-Set - erector



09575774
guide rail-Set - Slide



09752674-7.2guide plate - Set feed



Spare part list with pictures and numbers

09753574-10

Holding iron PB 160-420
8x hexagon Screws M20x50 - 93011890
8x NL-disc 20 - 93149591



rubber chain
Let us know the serial number)



09570880 - PB 310
09576474 - PB 160
09570887 - PB 420
retaining bolt Hydraulic hammer



HY 0976
Coupling muff

HY 0977
coupling plug



HY09585.1
Gear pump 2 cylinder



HY09585.2
gear pump 3 cylinder



01663600
Flange to the elastic-coupler



01413801
clutch hub



Spare part list with pictures and numbers

09574475

Vibration damper Hatz-engine



Poly-V-belt/ V-belt

09574474 - 2-Cyl-engine

09574474-1 - 3 Cyl-engine



50404900

50600800

Key until year of manufac. 08/2013

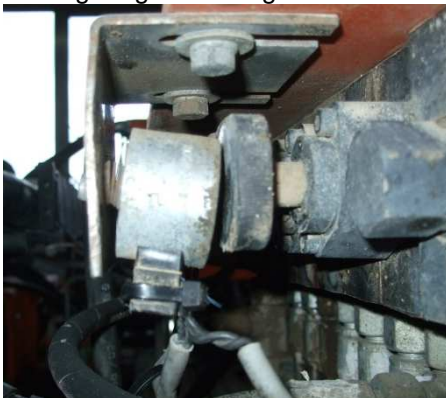


key from 08/2013



09574973

holding magnet locking block



09570482

emergency stopp with case



Half-shell brass

09576774

