GOLDSCHMIDT
Smart Rail Solutions

GP 3600 P4

PROFILE GRINDER

TRANSLATION OF THE ORIGINAL OPERATION MANUAL

Revision history

REVISION	DATE	COMMENTS, AFFECTED SECTIONS/CHAPTERS	Approval
00	01/12/2022	First version	Product management
01	05/04/2023	Revision of content	Engineering, Sales

GOLDSCHMIDT
Smart Rail Solutions

EC Declaration of Conformity

in accordance with EC Machinery Directive 2006/42/EC, Appendix II, No. 1 A.

Manufacturer:

Elektro-Thermit GmbH & Co.KG
A company of the Goldschmidt Group
Chemiestr. 24, 06132 Halle (Saale), Germany

hereby declares that the following product

Trade designation:	Profile grinder
Product name:	GP 3600 P4
Serial number:	GP3600P4-0XXX (XXX serial number)

corresponds to all relevant provisions of EC Machinery Directive 2006/42/EC Appendix I.

Related harmonised standards
EN ISO 12100: 2010 Safety of machinery - General principles for design - Risk assessment and risk reduction
EN 13977:2011: Safety requirements for portable machines and trolleys with rail wheels or rollers designed for construction and maintenance work
EN ISO 15744:2008-11 Hand-held non-electric power tools. Noise measurement code. Engineering method (grade 2)
EN ISO 5349-1:2001-12 Mechanical vibration - Measurement and evaluation of human exposure to hand-transmitted vibration - Part 1: General requirements

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Halle (Saale), 1 Dec 2022

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1. Notes about the operation manual

This operation manual contains all the information relating to the intended use and correct servicing and maintenance of the GP 3600 P4 profile grinder.

Please note the following points:

- The operation manual is part of the GP 3600 P4 profile grinder.
- It must remain available throughout the service life of the machine.
- The operation manual must be available to the user and to the maintenance personnel at all times.

1.1 Using the operation manual

The information in this operation manual is binding in nature. Anyone carrying out work with the machine or handling the machine in any other way must first read and understand the operation manual in full. Follow the instructions, prohibitions and commands in the operation manual at all times, as well as all safety instructions.

1.2 Copyright

1.3 Trademark use

The names of companies and products used in this document may be registered trademarks of their respective owners.

1.4 Product identification of type plate

A type plate is attached to the machine that provides precise identification of the machine. The operating company must ensure that this type plate is replaced in the event of damage or loss. The details on the type plate must always be quoted in any correspondence with the manufacturer or with customer service.

Figure 1: Type plate

The type plate can be found at this location:

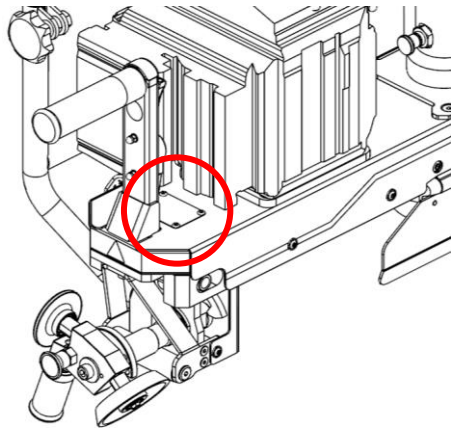

Figure 2: Type plate location

1.5 Signal words and symbols used in this operation manual

When using this operation manual, pay attention to the symbols and abbreviations used. The safety symbols are based on the ISO 3864 standard and are identical to the safety signs attached to the machine.

→ *Chap. 2.6 Safety signage*

SYMBOL	DESCRIPTION
DANGER	The signal word DANGER indicates a hazard with a high level of risk that, if not avoided, may result in death or serious injury.
WARNING	The signal word WARNING indicates a hazard with a medium level of risk that, if not avoided, may result in serious injury.
CAUTION	The signal word CAUTION indicates a hazard with a low level of risk that, if not avoided, may result in minor or moderate injury.
NOTICE	The signal word NOTICE indicates a hazard that, if not avoided, may result in damage to property or the environment.
	The info symbol indicates information (tips, recommendations, remarks, etc.) that may be helpful for handling the product.
	Situations with a risk of injury are additionally marked with a warning sign.

Table 1: Signal words and symbols

2. Information about your safety

This chapter contains all the information relating to safety. Read all safety information thoroughly before using the machine and follow it carefully when operating it. The safety instructions draw attention to hazards of possible personal injury, property damage and environmental damage and contain information on how to avoid and prevent hazards. The presentation and content structure of the safety instructions are based on the ISO 3864 and EN IEC/IEEE 82079 standards.

2.1 Intended use

The machine must always be operated in strict compliance with the specified operating conditions.

→ *Chap. 5 Operating conditions*

The GP 3600 P4 profile grinder is suitable for the accurate profile grinding of butt welds, running surfaces, rail head roundings and the side surface of steel rails with vignole profile as well as groove profile in manual operation without the use of cooling lubricants.

Any other use of the machine or of its components, or any more extensive form of use, constitutes 'non-intended use'. The machine can be used on flat-bottom rails from rail profile 46E1 as well as on grooved rails from rail profile 51Ri1. Please contact the manufacturer to find out whether the machine can be used on smaller rail profiles.

i The manufacturer accepts no liability for damage resulting from improper use.

2.2 Non-intended forms of use

Intended use exists if the machine is used for a different purpose that that described in

→ *Chap. 2.1* Intended use.

Examples of intended use are:

- Grinding of other objects or materials than the defined rail profiles.
- Using the machine to drive other devices.
- Using the machine as a means of transport.
- Using the guidance system on the machine as wheels for transport.

2.3 Further regulations

In addition to the information in this operation manual, due compliance is mandatory with the statutory regulations for accident prevention and environmental and occupational safety as well as the accident prevention regulations of the operating company. Strict compliance is also required with the safety regulations issued by the railway authorities for working on and near the tracks.

2.4 General sources of hazard

The machine is designed to state-of-the-art standards. It is not possible to eliminate residual risks. Pay attention to the following safety instructions when using the machine.

2.5 Danger to life

2.5.1 Danger to life when working on railway tracks

During track construction work, there is always a risk of people being hit by passing trains, causing severe to fatal injuries.

- Before working on the track bed, always ensure that the track has been closed off to permit that work. Never work on a track that is open for rail traffic.
- Always proceed with great caution whenever the construction site is close to railway tracks open to rail traffic.
- Always set down equipment and materials in a place where they cannot collide with other rail vehicles.

2.5.2 Risk to life from electric shock

There is a risk of serious injury from electric shock when working on live parts and cables. This can lead to ventricular fibrillation, cardiac arrest or respiratory paralysis with a fatal outcome.

- Never use the machine if a conductor rail at the work site is live.
- Never use this machine on a conductor rail that is electrically live at the time.
- Always ensure that there is no risk of electric shock.

2.5.3 Risk of injury

Risk of injury from the crushing of body parts

If people's limbs are under the grinding wheel or under the guide system when working with the machine, there is a risk of serious injury from crushing possibly involving broken bones or even the severing of entire limbs.

- When operating this machine, never place hands or feet below the grinding head or under the guide system.
- Always wear protective work shoes of protection class S3.
- Always wear work gloves.
- Everyone except for the operator must maintain a safe distance of at least 5 metres from the machine while it is switched on.

Risk of injury from projectile gravel and dust when cleaning the air filter

Working with compressed air entails the risk of dust particles and splinters getting into the eyes. This can injure them or may even cause blindness. Always wear safety goggles when working with compressed air and in the vicinity of others working with it.

Risk of injury from falling, slipping and sliding

When working on the track bed, there is a risk of slipping and falling on the gravel, causing injuries such as contusions or even broken bones.

- When working with the machine, always maintain a firm stance.
- Do not work with the machine on a gradient of more than 10°.
- Wear work gloves in protection class S3.

Risk of damage to hearing

The A-weighted emission sound pressure level LPA at the workplace can be up to 74 dBA and the A-weighted emission noise level LWA at the workplace can be up to 85 dBA. Exposure to noise can damage hearing and lead to short-term hearing loss and mental overload. Always wear ear defenders when working with this machine.

2.5.4 Risk of burns

Explosive or combustible materials

Explosions or fires can cause serious burn injuries.

- Never perform grinding operations in environments where there is a risk of explosion or fire.
- Always ensure that there are no highly flammable or explosive substances near the machine.
- If necessary, remove combustible substances from the work place and provide sufficient ventilation.

Refuelling the machine

During refuelling, if fuel spills over the machine, there is a risk of explosion or fire when the machine is next started, potentially causing severe burns.

- Never refuel the machine while the engine is hot. Let the engine cool down before refuelling.
- If necessary, clean the machine carefully and remove any fuel that may have escaped. Ensure that the surrounding area is properly ventilated whenever the machine is restarted.

Hot engine

During normal operation and after being switched off, the engine can be very hot, potentially causing burn injuries.

- Avoid contact with the engine shortly after it has been in operation.
- Before maintenance work on the engine, assure sufficient cooling time.
- Always wear protective work clothing, especially work gloves, when working on the machine.

2.5.5 Risk of environmental pollution

The machine contains engine oil and is operated by petrol. Mineral-based oils are a water hazard. If petrol or engine oil leaks into the soil, this can pollute the groundwater causing the infiltration of environmentally hazardous substances into the food chain.

- When refuelling, always ensure that dripping fuel does not enter the ground. If necessary, place collection pans under it.
- Dispose of contaminated cleaning utensils properly.
- Always collect used oil in the containers provided.

2.6 Safety signage

Fit safety signage to the machine that complies with the specifications of ISO 7010 and ISO 3864.

Keep safety signage in good condition If safety signage gets damaged or goes missing during the service life of the machine, the operating company must provide for proper replacement. Check the presence and condition of safety signage at regular intervals.

The following safety pictograms are attached to the machine:

	PIKTOGRAMM	BEDEUTUNG		PIKTOGRAMM	BEDEUTUNG
(1)		Naked flames, fire and ignition sources are prohibited near the machine	(3)		Personal protective equipment
(1)		Smoking is prohibited near the machine			
(2)		Caution - crushing hazard	(4)		Only lift the machine at these points

Table 2: Safety signage

Using the QR code **(5)**, you can access the operating instructions.

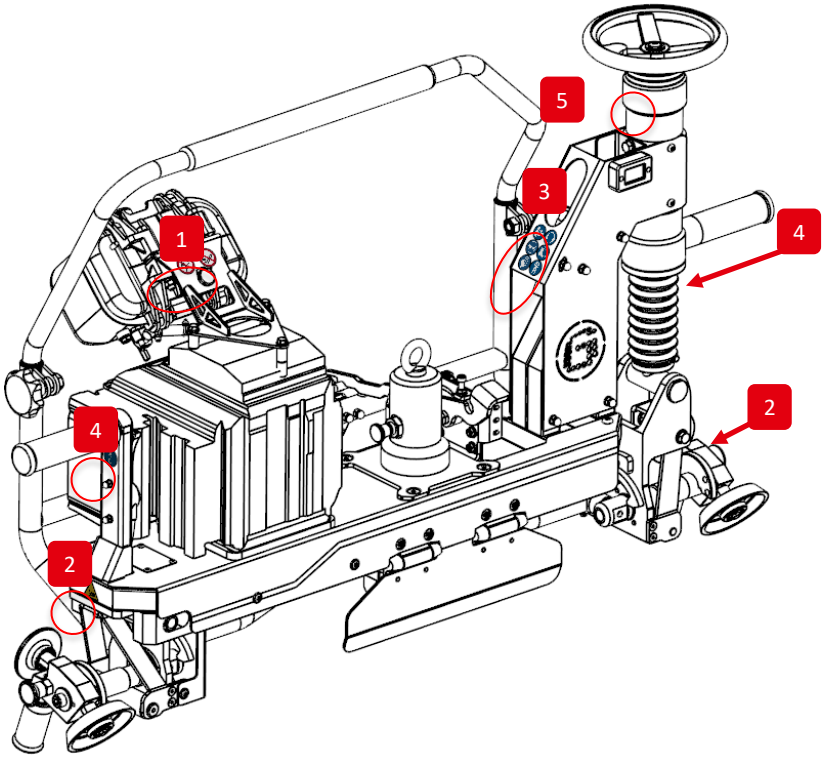

Figure 3: Attachment point for safety signage

2.7 General code of conduct

The personnel must observe this code of conduct at all times when working on the machine:

- The machine should only ever be used in the intended manner.
- When working on the machine, always pay attention to personal safety and to the safety of others, and to cleanliness and tidiness.
- Follow all instructions from the operating company.

2.8 Personnel skills levels

Without exception, all people working on or with the machine must satisfy the following requirements. All other people are prohibited from working on or with the machine.

- Before using the machine, they must have read and fully understood the entire scope of this operation manual.
- You are in perfect health and in full possession of your mental and physical faculties.
- You are rested and not under the influence of drugs, alcohol or medication, which can reduce your ability to react and absorb.
- They are regularly instructed about difficulties, hazards and special rules of conduct as well as about fire protection rules. They always keep the work place tidy.
- To assure work safety, they wear the requisite personal protective equipment.
  → *Chap. 2.9 Personal protective equipment*
- They always observe the employer's safety and accident prevention regulations and all legal provisions relevant to personal safety and to the safety of other persons.

2.8.1 Operating company

The operating company is the entity that operates the machine for commercial or business purposes or permits a third party to use and operate it. The operating company is also legally responsible for the protection of the operator, personnel or third parties.

Obligations of the operating company

- The operating company must know and implement the regulations governing health & safety at work and accident prevention.
- The operating company must clearly regulate and define the responsibilities for proper transport, assembly, operation, troubleshooting, inspection, maintenance, repair, cleaning and disposal.
- The operating company must also ensure that all personnel have read and fully understood the entire scope of this operation manual.
- The operating company must provide training for its personnel at regular intervals and inform them of hazards.
- It must provide its personnel with the requisite personal protective equipment.

2.8.2 Operating personnel

The operating personnel for the machine are defined as follows:

- The personnel is professionally and technically capable of performing all operating activities on the machine as well as troubleshooting and cleaning it.
- Personnel are trained continuously in relation to technical innovations and have the necessary basic understanding of the technology installed.
- Personnel are professionally and technically capable of all the activities that occur on the machine in the areas listed below:
  - operation,
  - fault detection,
  - cleaning.
- The following key points must be taken into account during initial instruction:
  - functional description of the machine,
  - explanation of its components,
  - explanation of the potential hazards,
  - use of the machine,
  - detection of faults and malfunctions,
  - correct cleaning of the machine.

2.8.3 Maintenance personnel

The maintenance personnel is defined as follows.

- Trained specialists in the fields of electrical engineering and mechatronics or trained industrial mechanics, i.e.:
  - Trained in the specific field of application in which they operate and familiar with the relevant standards and regulations.
  - On the basis of their technical training and experience, the personnel can carry out work on machines powered by petrol engines and are independently able to identify and avoid potential hazards.
  - They are capable of fully understanding interrelationships regarding the built-in safety devices.
  - They can read circuit and terminal diagrams and can carry our electrical engineering maintenance work using those circuit and terminal diagrams.
  - They have read and understood the entire scope of the maintenance manual.
- Personnel are professionally and technically capable of all the activities that occur on the machine in the areas listed below:
  - installation,
  - disassembly,
  - operation,
  - troubleshooting and remedial work,
  - inspection,
  - maintenance,
  - repair/replacement,
  - decommissioning,
  - cleaning.
- Personnel receive continuous training on technical innovations and have the necessary expertise to operate the installed technology.
- The following key points must be taken into account during initial instruction:
  - functional description of the machine,
  - explanation of its components,
  - explanation of the potential hazards,
  - use of the machine,
  - detection and remedying of faults,
  - Special points relating to maintenance and servicing.

2.9 Personal protective equipment

Unless the operator specifies otherwise, the protective equipment listed in the following table is mandatory when working with the machine.

The following protective equipment must be worn during the activities listed under 'Work' on the machine:

SYMBOL	PROTECTIVE EQUIPMENT	WORKING
	Protective work clothing (welding protective clothing in accordance with EN 470-1, if necessary warning clothing in accordance with EN 471)	Transport, commissioning, operation, decommissioning, maintenance, cleaning/care
	Work footwear (safety footwear S3 in acc. with EN ISO 20345, ankle-high footwear)	Transport, commissioning, operation, decommissioning, maintenance
	Protective goggles	Operation
	Work gloves (serious mechanical hazard in acc. with EN 388 (4242), EN 402))	Transport, commissioning, operation, decommissioning, maintenance, cleaning/care
	Ear defenders (ear plugs in accordance with EN 352) / EN 458)	Operation

Table 3: Personal protective equipment

2.10 Safety equipment and safety systems

The following safety devices are installed on the machine to prevent personal injury, environmental damage and damage to property. These illustrations show which items of safety equipment are fitted to the machine.

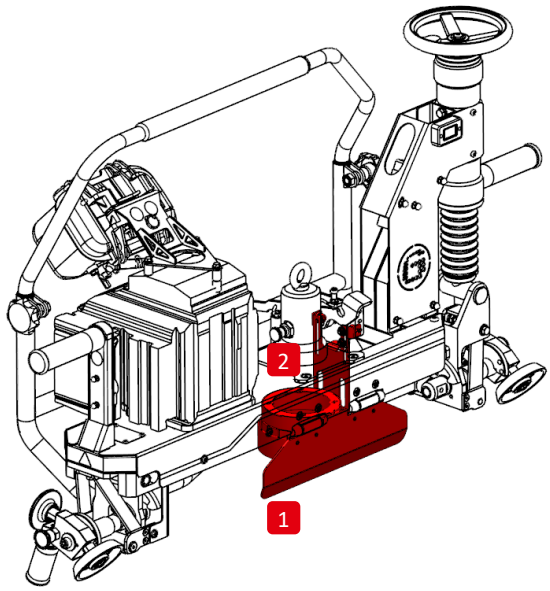

Figure 4: Safety equipment

	COMPONENT
(1)	Spark protection
(2)	Rupture protection

Table 4: Safety equipment

Spark protection

The spark protection helps to prevent sparks from flying when grinding the rail head. Instead, sparks are deflected by the operator and only fly downwards towards the ground to minimise the risk of fire and explosion posed by flying sparks.

Rupture protection

The rupture protection shields the grinding head. If the grinding cup gets damaged during the grinding process, the rupture protection prevents grinding cup components from getting ejected centrifugally.

2.11 Fire extinguisher

The operating company must ensure that an operational CO_2 fire extinguisher is available at all times right beside the workplace.

2.12 Behaviour in case of an emergency

If an emergency occurs, shut down the machine immediately and vacate the danger area as quickly as possible. Immediately initiate first aid measures in the event of personal injury. In the event of a fire, immediately initiate the required steps for fire-fighting.

3. Description of device

This chapter illustrates the most important components of the and explains their functions.

This machine is made to state-of-the-art standards. At the design stage, all applicable legislation, regulations, statutory requirements and directives were observed. All of the required safety precautions were taken, assuring the highest possible level of personal safety. The materials used, the equipment parts as well as the production, quality assurance and testing procedures meet the highest safety and reliability requirements.

3.1 Description of function

This machine is used to grind rail heads.

- To satisfy this function, the machine uses a rotary grinding head that is in contact with the rail head.
- The grinding cup is driven by an engine.
- This engine transmits power to the grinding cup via a belt drive.
- The machine is mounted on rollers and is held on the rail by a guide system. The rail guide is suitable for flat-bottom rails and for grooved rails.
- The guide system can be adjusted to suit different rail profiles. The operator can move the machine along the rail.
- A tipping fixture helps to tilt the grinding cup and the functional components of the machine on the rail head, and to grind the sides of the rail head.
- A stand allows the machine to be safely parked at the work site without having to lift it off the rail.

3.2 Overall design

The machine comprises the following components:

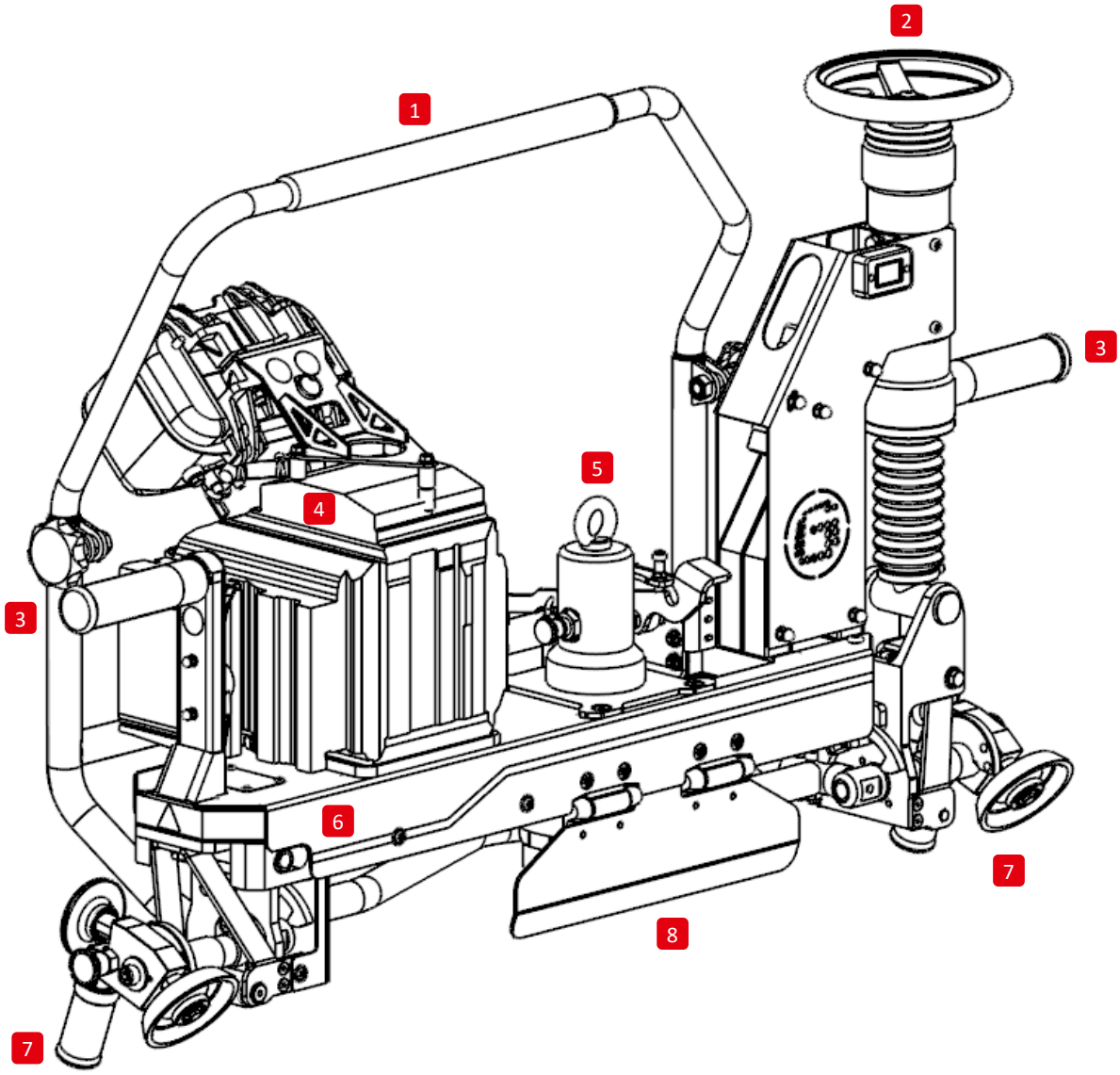

Figure 5: Complete layout of the GP3600 P4

	COMPONENT
(1)	Control arm
(2)	Adjustment
(3)	Carrying handle
(4)	Motor with fuel tank
(5)	Grinding spindle
(6)	Machine frame
(7)	Rail guide
(8)	Spark and rupture protection

Table 5: Technical data

3.3 Scope of delivery

DESIGNATION	AMOUNT
GP 3600 P4	1
Cup grinder 125x65-M20	1
Quick start guide	1

Table 6: Scope of delivery

4. Technical data

This chapter contains all of the important technical data for the machine.

PARAMETERS	PARAMETER VALUE
Length	1,220 mm
Width	375 mm
Height	810 mm
Weight (operational readiness)	50 kg
Roller spacing	850 mm
Motor type	4-stroke petrol motor
Motor manufacturer	Honda
Model	GXR120 Rammer
Fuel	Petrol
Rating	2.3 kW
Motor speed (under load)	3,600 min^{-1}
Tank contents	2.4 l
Noise level	85 dB(A)
Sounds pressure level	74 dB(A)
Hand-arm vibration	10.1 m/s^2

Table 7: Technical data

5. Operating conditions

This chapter describes the operating conditions needed for the machine to operate properly. Do not operate the machine if real conditions differ from these operating conditions. Before commissioning the machine, always check that all operating conditions are met.

CONDITION	VALUE
Ambient temperature	-20 °C to +40 °C

Table 8: Operating conditions

Also, the following conditions need to be satisfied when operating the machine:

- No protective equipment or other components can be shut down.
- The machine must always be operated in technically perfect condition.
- All inspection and maintenance intervals must be complied with.
- The machine must not be operated in an environment where there is a risk of fire or explosion nor in the vicinity of flammable or explosive liquids or gases.
- The workplace must be illuminated sufficiently to enable potential danger areas to be detected in good time.
- The workplace must be ventilated sufficiently.
- The machine can only be operated in a dry location.
- The machine must not be operated on a gradient of 10° or more.

6. Transport

This chapter contains all information necessary for the safe transport of the machine. Read all instructions for transport thoroughly and comply with them to ensure a long service life of the machine.

6.1 Lifting fixtures on the machine

The following figure shows the fixtures on which the machine is supported and/or can be lifted.

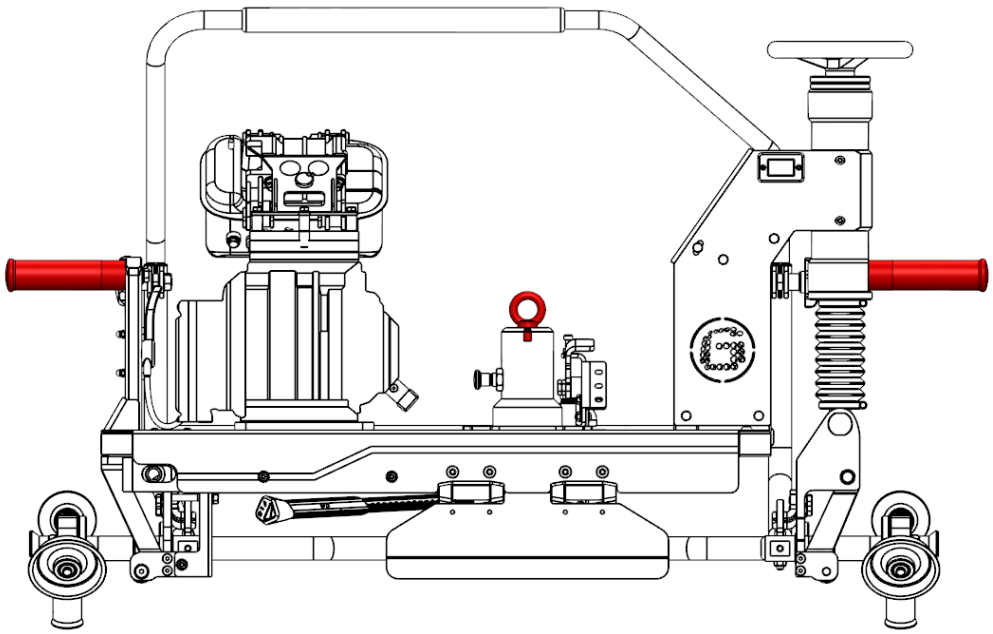

Figure 6: Carrying devices

6.2 Transport operation

WARNING

The engine may be very hot after operation. If the hot engine comes into contact with highly flammable materials, e.g. on a loading area, there is a risk of fire, which can result in extremely serious burn injuries.

- Allow the engine to cool down sufficiently before loading or storing the machine.
- Do not bring flammable materials near the machine.

WARNING

If the machine is moved by means of transport, serious injuries may result if the machine falls.

- Always secure the machine adequately before transporting it.
- Never stand underneath suspended loads.

WARNING

The machine could topple over. Bruises or broken bones may result if the machine falls on the hands or feet.

- Always set down the machine so that it cannot topple over.
- Always wear work gloves, safety footwear and protective work clothing when transporting the machine.
- Always use the transport rollers or appropriate lifting gear when lifting and moving heavy loads.
- Ensure that loads are secured properly for transport.
- Always secure transport routes when bringing in and moving heavy loads.

WARNING

The engine may be very hot after operation. Skin contact with the engine can cause burn injuries.

- Avoid contact with the engine shortly after it has been in operation.
- Always wear work gloves and protective work clothing when transporting the machine.

Pay attention to the following points for correct transport of the machine:

- Carrying the machine is a two-person job.
- Only transport the machine by hand as far as absolutely necessary.
- Only use the carrying fixtures on the machine.
- To prevent operating fluids from leaking from the engine, only ever transport and park the machine in an upright position.
- When lowering the machine, always proceed with caution to avoid damage to the guidance system.

Observe the following points for correct transport of the machine with suitable means of transport:

- Secure machine sufficiently to prevent it from dropping.
- Clear the transport route and ensure that no persons can be injured.
- Only use the carrying devices on the machine as slings.
- To prevent operating fluids from leaking from the engine, only ever transport and park the machine in an upright position.
- When lowering the machine, always proceed with caution to avoid damage to the guidance system.

Observe the following points when transporting the machine on a load surface:

- To ensure that the machine cannot topple over or be damaged, and that it stands upright, secure it to the lifting fixtures with transport straps.

Make sure that the engine and the controls are not damaged by their transport straps, nor by any other objects needing to be transported.

7. Operation

All the information needed for correct operation is contained in this chapter. Read all operating instructions thoroughly and comply with them to assure a long service life for the machine.

7.1 Control and setting elements

The following control and setting elements are installed on the machine:

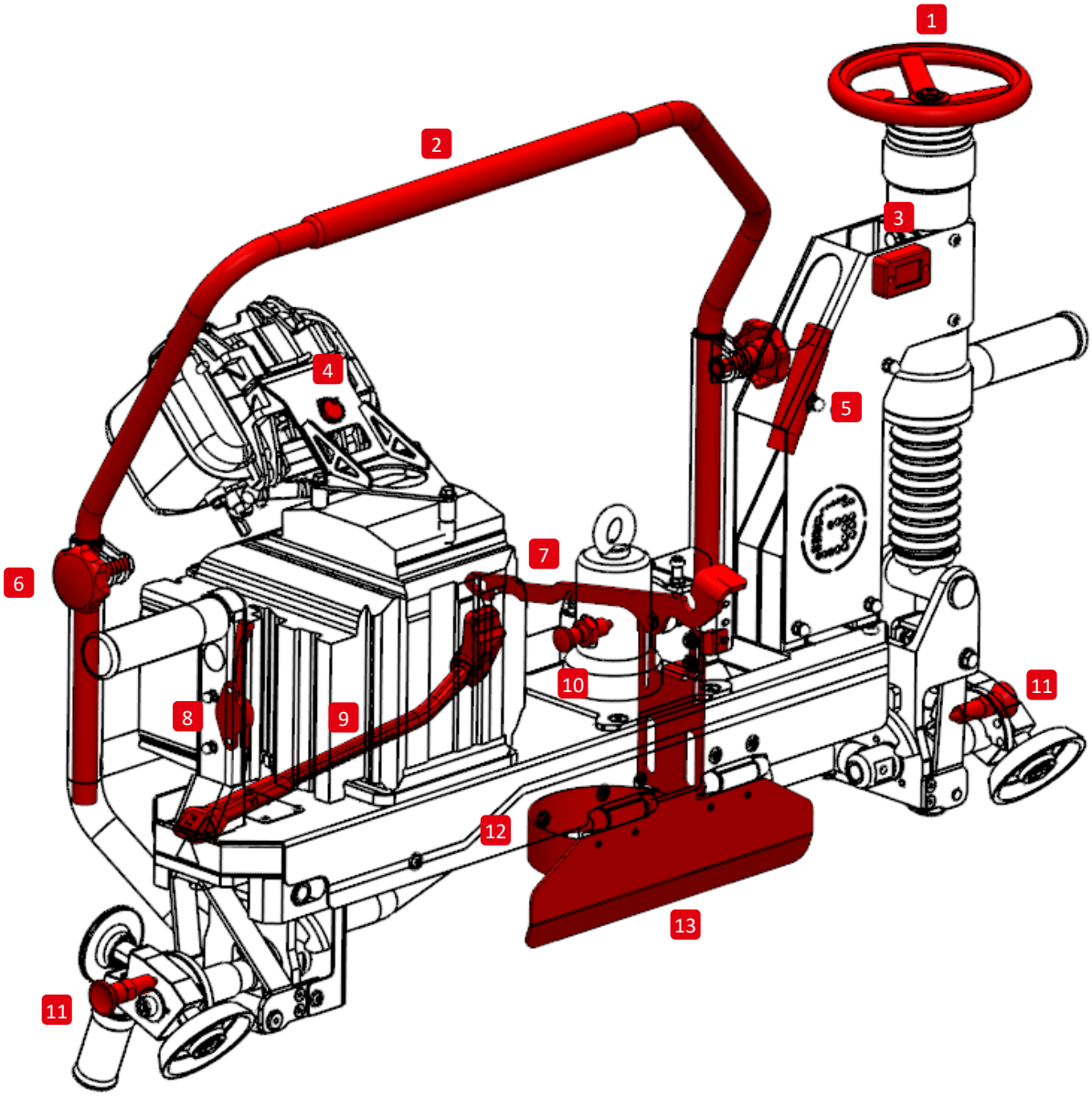

Figure 7: Control and setting elements

	CONTROL ELEMENT	FUNCTION
(1)	Handwheel	Setting of cup grinder
(2)	Control arm	Running the machine
(3)	Operating hours counter	Monitoring the operating time to enable maintenance work to be carried out at the right time
(4)	Motor switch	Switch off engine
(5)	LED light	Lighting of grinding area
(6)	Setting the control arm height	Height adjustment of control arm tube
(7)	Foot pedal	Folding the machine to grind the running edge
(8)	Bowden cable lever	Setting the engine speed
(9)	Stand	Positioning the machine
(10)	Blocking of sliding shaft	Cup grinder replacement
(11)	Changing over the guide rollers	Changing the guidance system between flat-bottom rail and grooved rail
(12)	Rupture protection	Height-adjustable to compensate for cup grinder wear
(13)	Spark protection	Can be folded for grinding the driving edge

Table 9: Control and setting elements

The 4-stroke petrol engine has the following control and setting elements:

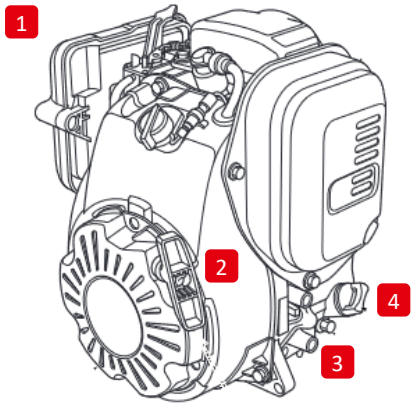

Figure 8: Control and setting elements Engine

	CONTROL ELEMENT	FUNCTION
(1)	Air filter	Filtration of the intake air
(2)	Cable starter	Starting the engine
(3)	Oil drain plug	Draining the engine oil
(4)	Oil filler cap	Topping up the engine oil

Table 9: Control and setting elements, motor

i You will find details of the control and setting elements in the operation manual for the engine manufacturer.

7.2 Commissioning

Prior to commissioning, check the general condition of the machine:

1. Engine for signs of oil or fuel leaks,
2. excessive dirt or foreign bodies, especially around the silencer and the start on the engine,
3. signs of damage (cracks, breaks, distortion etc.),
4. covers and safety precautions,
5. screw connections,
6. cup grinder for signs of wear and replace, if necessary,
7. engine oil level,
8. fuel tank level.

7.3 Setting the rail guide

Before this machine can be used on a rail track, the rail guide must be adjusted to the appropriate rail type. Proceed as follows:

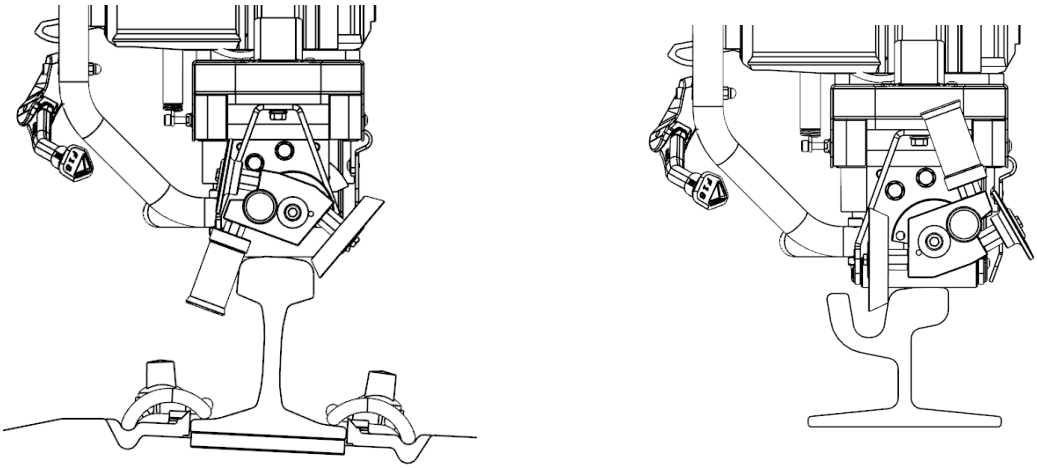

Figure 9: Setting of guide rollers on Vignol and grooved rails

1. Raise machine slightly using the handle.
2. Pull the arrester pin until the rail guide can turn freely.
3. Set the rail guide to match the type of rail.
4. Reinstall the arrester pins.

WARNING

If an operator reaches between the drive rollers and the rail while the machine is being placed on the track, there is a risk of injury (crushing).

- Never reach between drive roller and rail.

7.4 Starting the machine

WARNING

The cup grinder begins to rotate as soon as the engine starts. The rotating cup grinder can cause severe skin abrasions, bruising, broken bones or separation of body parts.

- Always handle the machine in such a way that it cannot fall over and ensure that it is standing firmly.
- Before starting, adjust the rail guide system to match the rail profile.
- Before starting, position the machine securely on the rail and raise the cup grinder completely.
- During operational work, always wear protective work gloves, safety footwear and protective work clothing.

WARNING

The exhaust system heats up during operation. Contact with the exhaust can cause burn injuries to the operator.

- Wear your safety clothing.

1. Open the fuel cock.
2. Set motor switch to "ON".
3. Move bowden cable lever to the centre position.
4. In low temperatures, set choke lever to "CLOSED" if necessary.
5. Make sure that the spring pin for locking the grinding spindle is not latched in.
6. Gently pull the start handle until you feel resistance. First, pull the handle vigorously, then return it steadily.
7. Set choke lever to "OPEN" again if necessary.
8. Set motor speed using the bowden cable lever.

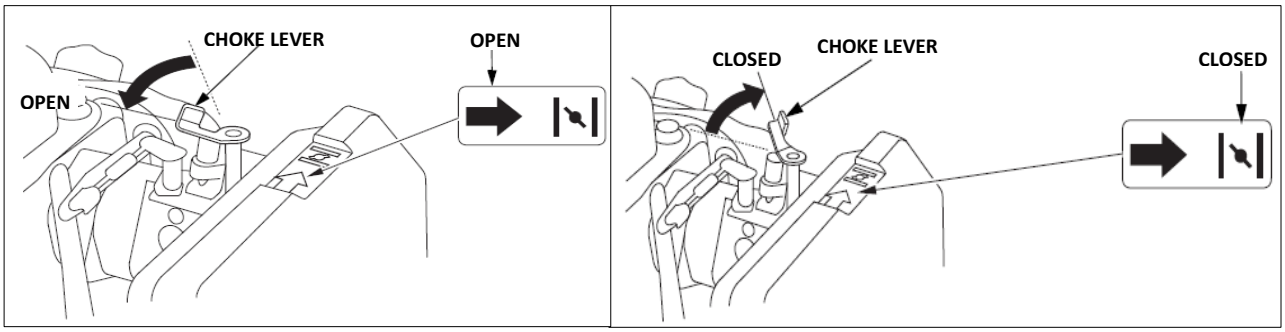

Figure 10: Setting the choke lever

You will find details about starting the engine in the relevant operation manual of the engine manufacturer.

7.5 Operating the machine correctly

DANGER

In thunderstorms, employees may get badly or even fatally injured by lightning strike.

- Stop work during thunderstorms!

WARNING

A defect on the machine can lead to unanticipated operating statuses. Persons may get injured.

- Only operate the machine in technically perfect condition, paying due attention to all chapters in the operation manual!

DANGER

The inhalation of exhaust gases can lead to irreversible health problems.

- Pay attention to specific safety provisions when working in tunnels.
- Shut down the machine if there are any defects in the exhaust system.

WARNING

Incorrect operation of the machine or failure to observe the safety instructions may result in danger to persons or damage to the machine.

- Familiarise yourself with the entire operation manual before working on the machine.
  Pay particular attention to → *Chap.* **Fehler! Verweisquelle konnte nicht gefunden werden.** *Information about your safety*!

i Incorrect operation of the machine, e.g. due to instruction errors, can result in injury to persons or damage to the machine. The operating and maintenance personnel must have assured access to the operation manual at all times!

WARNING

The rotating cup grinder can cause severe skin abrasions, bruising, broken bones or separation of body parts.

- Always handle the machine in such a way that it cannot fall over and ensure that it is standing firmly.
- During operational work, always wear protective work gloves, safety footwear and protective work clothing.

WARNING

While in operation, the engine and the cup grinders get very hot. The operator can sustain injuries by touching them. Petrol can combust if it comes into contact with hot components on the system. Skin contact with the engine can cause burn injuries.

- When working, wear non-flammable protective work clothing.
- Before any maintenance work, give the machine time to cool down.

WARNING

If the machine is not used in the intended way, unforeseeable operating statuses can occur. Severe injuries to personnel may occur.

- Repairs must not cause any change in function. Do not tamper with or modify the system.

WARNING

In the event of bad weather conditions (rain, snow etc.) poor visibility or slippery surfaces can present a risk of injury.

- Stop work if horizontal surfaces are slippery.
- Stop work in the event of poor visibility.

7.5.1 Grinding the running surface

WARNING

Flying sparks may injure the operator or people in the vicinity. Readily flammable objects can combust spontaneously.

- Wear flame-retardant protective work clothing when working.
- Remove easily flammable objects from the operating environment.

DANGER

If an employee is hit by a train, very serious or even fatal injuries can result.

- Pay attention to your own safety.
- Wear work clothing with protectors or a hi-visibility jacket.
- Always switch on the signal lamp on the machine.
- The leading hand must make sure that the track on which work is being done is shut down.
- Provide a track marshal with a signal horn on the opposite track.

WARNING

The cup grinders and the rails to be machined are all very hot. Burn injuries can be caused by physical contact.

- Wear work gloves when working.

WARNING

The grinding process can cause the cup grinders to eject projectile particles.

- Wear the specified personal protective equipment.
- Never use the machine without cup grinder protection.
- People who are not working on the machine must stay outside the danger zone.

WARNING

The loudness of the grinding process can cause permanent hearing damage.

- When working, always wear ear defenders.
- Agree unique hand signals for communication.

WARNING

Physically heavy work can cause damage to the body in the medium and long term.

- Never work alone and, if possible, swap places at regular intervals.

The following illustration shows the rail head areas that can be machined by this machine:

Figure 11: Grinding areas

Before starting the grinding process, always ensure that:

- there are no signs of damage on the cup grinder and that the expiry date has not yet passed,
- the spark protection is folded down,
- the rupture protection is set at the right height,
- the tank is sealed tightly,
- the cup grinder is not touching the rail before the engine is started,
- the rail guide is set to the correct rail profile,
  the machine stand is folded in,
- the control arm handle is engaged,
- the spring pin on the grinding shaft housing is **not** engaged.

7.5.2 Grinding the running edge

The control arm can be folded down to machine the running and outer edges. In this way, the machine can tilt around the rail head.

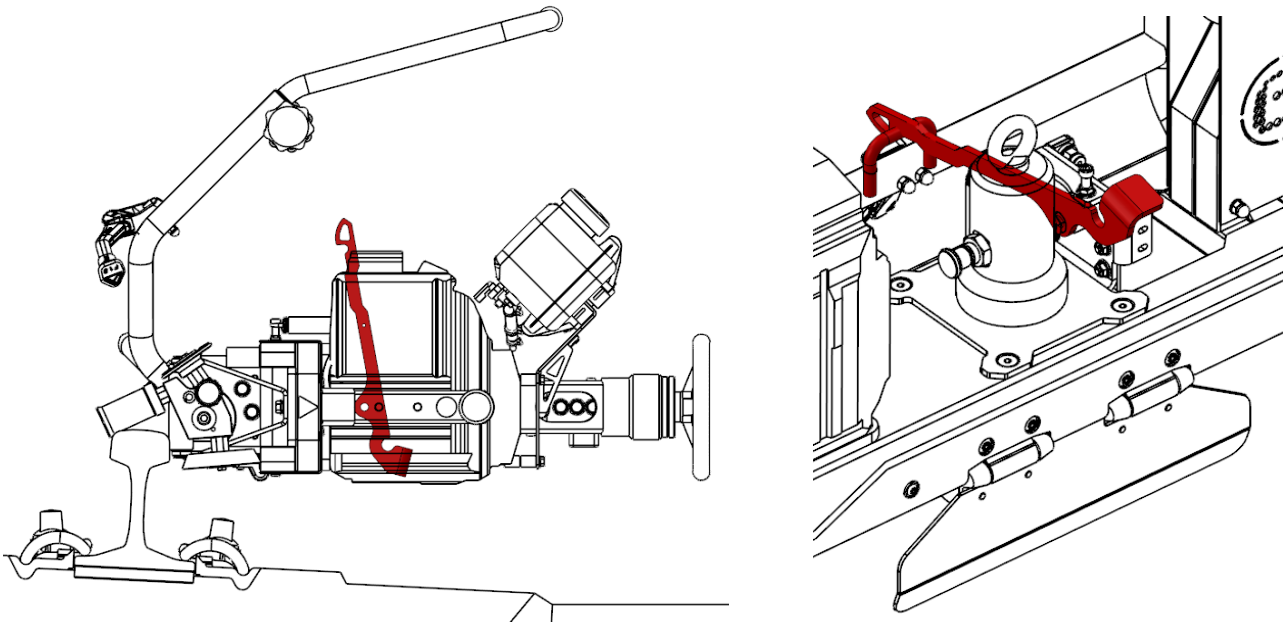

Figure 12: Tilting the machine

Proceed as follows to change the angle of inclination:

1. Grip machine on the control arm handle.
2. Step on the arrester hook by pressing foot down on pedal.
3. Tilt the machine towards the operator.

To return the machine to its original position, it is gripped by the handwheel and swivelled upwards until the catch hook engages in the catch pipe again.

7.5.3 Replacing the cup grinder

	**WARNING**
	Contact with the rotating cup grinders can cause permanent injuries. • Never use the machine without cup grinder protection. • Before maintenance and set-up work, make sure that the cup grinder is at a standstill and that the machine cannot be switched on again unintentionally. • People who are not working on the machine must stay outside the danger zone.

	**WARNING**
	After operation, the cup grinder can get very hot. Skin contact with the cup grinder can cause burn injuries. • Avoid contact with the cup grinder shortly after it is has been in operation. • Always wear work gloves and protective work clothing when operating this equipment.

Proceed as follows to replace the cup grinder:

1. Switch off machine and let it cool down.
2. Move machine into a safe horizontal position and set it down.
3. Press spring pin **(2)** against cup grinder housing and turn the cup grinder **(3)** until the spring pin engages in the grinding shaft **(1)**.
4. Keep spring pin pressed in and use a suitable tool (e.g. ratchet with socket, waf 30) **(4)** to release the cup grinder from the grinding spindle and unscrew it completely.
5. Screw new cup grinder on as far as its limit stop.
6. Release the spring pin and make sure that the grinding spindle can rotate freely.

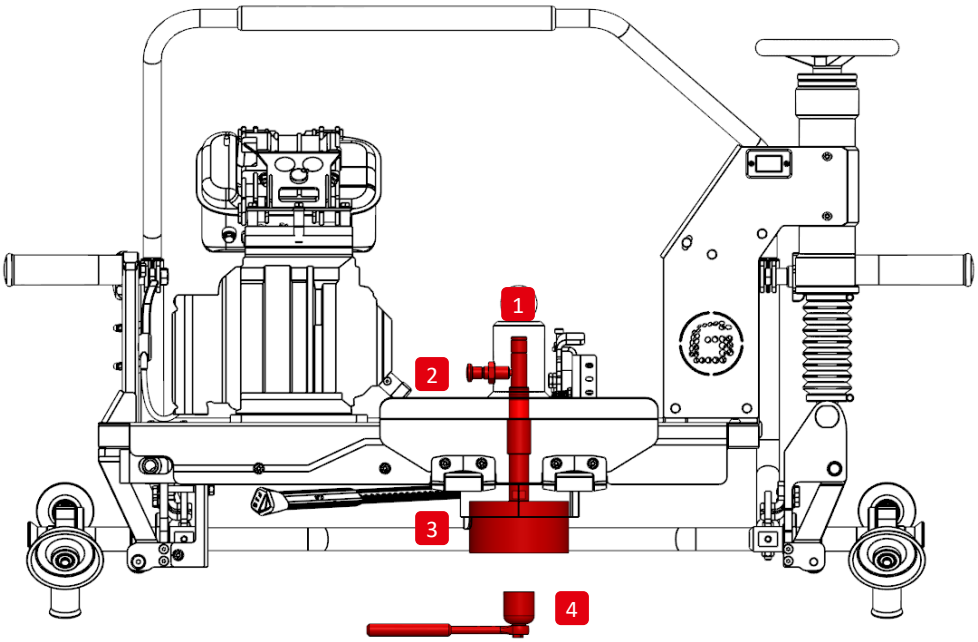

Figure 13: Replacing the cup grinder

7.5.4 Setting the rupture protection

The height of the rupture protection can be adjusted to reflect the extent of wear on the cup grinder.

For this, the tab **(1)** for holding the rupture protection must be pulled upwards or pressed downwards. The rupture protection then engages automatically in one of three predefined positions.

For safety reasons, the rupture protection always needs to be adjusted in its lowest position manually to permit the current height of the cup grinder. When adjusting the rupture protection, the machine needs to be switched off and protected to prevent it from being switched back on accidentally.

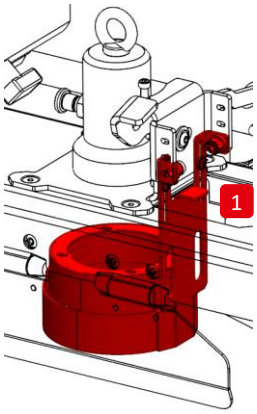

Figure 14: Adjusting the rupture protection

7.5.5 Adjusting the control arm height

The upper control arm **(1)** is height-adjustable to facilitate ergonomic working for the machine operator.

To adjust the height of the control arm, first loosen the star grip screws **(2)**. Then adjust the control arm to left and right **uniformly**. Failing this, the adjustment facility may be subjected to torsional stress and blocking.

After setting the desired height of control arm, the star grip screws can be tightened back down. For this height adjustment operation, shut down the machine and protect it to prevent it from starting up again accidentally.

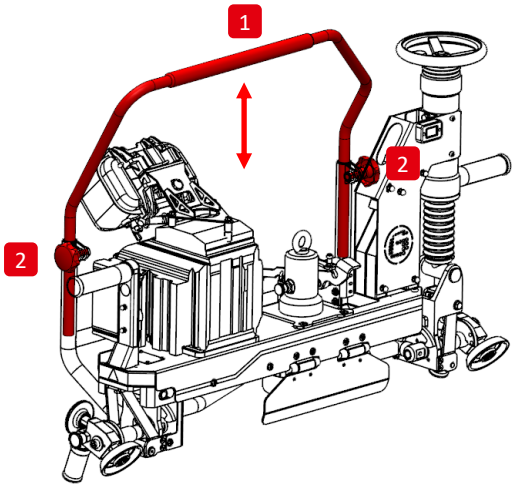

Figure 15: Setting the control arm height

7.6 Switching off the machine

1. Set bowden cable lever to ’MIN’.
2. Set motor switch to ’OFF’.
3. Close fuel tap.
4. Unfold stand and set machine down securely.

8. Maintenance and inspection

WARNING

Incorrect or untimely maintenance work may result in damage to the machine or injury to persons.

- Maintenance intervals are to be determined by the operator during the risk assessment process.
- Pay attention to the maintenance intervals and maintenance specifications of the manufacturers and to applicable directives.
- Components must only be replaced using identical spare parts. For installation purposes, compliance with the stipulations of the component manufacturers is mandatory.

i All servicing and maintenance work must be carried out by trained maintenance personnel.
→ *Chap. 2.8 Personnel skills levels*

8.1 Cleaning

8.1.1 Fundamental

WARNING

If soiling is removed with compressed air, there is a risk of injury to the eyes caused by metal splinters.

- Wear protective goggles and protective work wear for cleaning activities.

Clean the machine after each time in use. To keep the machine free of grinding dust, it is usually sufficient to clean the machine with a thorough blast of compressed air. Pay attention to the following points when cleaning the machine:

- Never allow water to get onto or into the engine.
- Never use combustible or highly flammable cleaning agents.
- Ensure that no paper residue or cleaning cloths remain on the engine.

8.1.2 Air filter

Check and clean the air filter as described below:

1. Ensure that the machine is shut down. If necessary, give the engine long enough to cool down.
2. Remove the two screws from the air filter cover and remove the cover.
3. Remove paper filter cartridge from the air filter housing.
4. Check both air filter inserts and replace if damaged. The paper air filter insert must be replaced at the scheduled intervals.
5. Clean the air filter inserts before using them again.
   - Tap out the paper air filter insert a few times on a hard surface or blow it out using compressed air [not above 207 kPa (2.1 kg/cm^2)] from the air filter housing end through the filter insert. Replace the paper air filter insert whenever it gets too dirty.
6. Wipe dirt off the inside of the air filter housing and cover with a damp cloth. Ensure that no dirt enters the air duct leading to the carburetor.
7. Reinstall the paper air filter insert and the cover in the air filter housing and tighten down both screws.

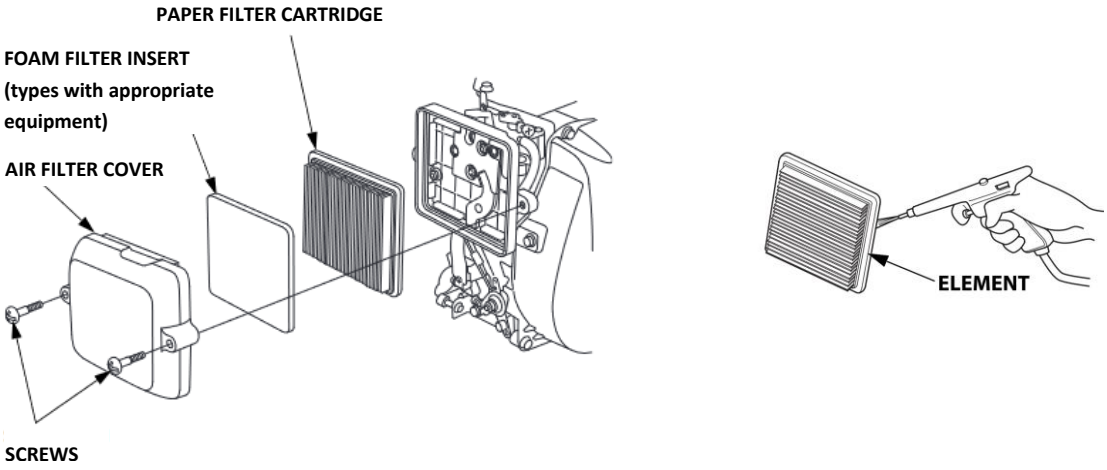

Figure 16: Cleaning the air filter

8.2 Topping up operating fluids and consumables

This chapter contains all the information on the correct way to top up operating fluids and consumables.

NOTICE
Topping up a machine with the wrong operating fluids and consumables can cause it to malfunction.

8.2.1 Checking and topping up fuel

	DANGER
	Mineral oil-based fuel is combustible and highly flammable. If this fuel comes into contact with ignition sources, hot surfaces or open flames, there is a risk of spontaneous combustion and fire, potentially causing extremely serious burn injuries and even death. • Always let the engine cool down sufficiently before refuelling the machine. • Never refuel near sources of ignition or open flames and always ensure adequate ventilation. • Remove fuel from the machine surfaces.

NOTICE

Mineral oil-based fuel is a water hazard. If this gets into the soil, it can result in groundwater pollution and the permeation of environmentally hazardous substances into the food chain.

- When refuelling, always take care to ensure that fuel does not get spilled causing it to enter the ground.
- Use appropriate means to absorb any spilled fuel and dispose of it properly.

The machine must only be fuelled with **unleaded petrol, grade 98, 95 or 95 E-10** (in accordance with RON + MON/2 = 86 octane or higher). Do not use any grade of petrol with an ethanol content of more than 10%. This can cause corrosion damage to the fuel system.

For checking and topping up, proceed as follows:

1. Switch off the engine and let it cool down sufficiently.
2. Position machine so that the tank is in an upright position and secure the machine to prevent it from falling over.
3. Remove tank cover from the tank.
4. Perform a visual check of the fuel level.
5. Ensure that the recessed petrol filter is in the tank aperture.
6. Fill with petrol using a suitable funnel up to a maximum of the red mark on the level indicator on the petrol filter.
7. Seal tank firmly with the tank cap.
8. Check seal integrity before starting the engine again.

8.2.2 Checking engine oil, topping up and changing it

CAUTION

In the event of a leak, there is a risk of slipping on the film of oil.

- Immediately mop up spilled liquids with absorbent materials provided for this purpose.

NOTICE

Mineral-based engine oil is a water hazard. If this gets into the soil, it can result in groundwater pollution and permeation of environmentally hazardous substances into the food chain.

- Do not top up engine oil in places where it may get spilled into the ground.
- Mop up every last trace of spilled engine oil and dispose of it properly.

Only fill the engine with oil that matches API Service Class SJ or above. The recommended grade for general use is **SAE 10W-30**.

For checking and topping up, proceed as follows:

1. Ensure that the machine is shut down. If necessary, give the engine long enough to cool down.
2. Position the machine so that the engine is in an upright position and secure the machine to prevent it from toppling over.
3. Open the oil filler cap by turning it anti-clockwise.
4. Remove oil from the dipstick and plug in the oil filler cap (without screwing it in).
5. Pull out the oil filler cap and read off the oil level on the dipstick. The fill level must be between the top and bottom line. If the level drops below the minimum mark, top up the oil level.
6. Use a funnel to top up the engine oil, filling until the level is between the top and bottom line on the dipstick. Before checking the level again, wait until the engine oil has settled.
7. Then close the oil filler cap hand-tight.

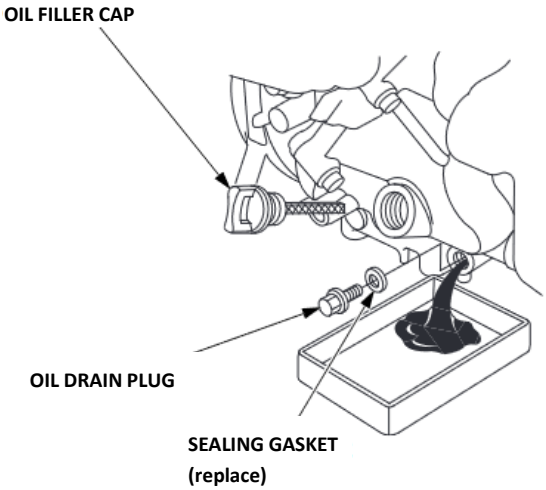

Figure 17: Topping up oil

8.3 Replacing the V-belt

Proceed as follows to replace the V-belt:

1. Remove the cup grinder, the lower rupture protection **(7)** and the V-belt cover **(6)**.
2. Remove the V-belt pulley **(5)** on the sliding shaft.
    a. Block the sliding shaft by pressing in the spring pin on the sliding shaft bell.
    b. Unfasten both threaded dowels in the tapered bush **(2)** and turn them to remove them.
    c. Screw one threaded down into the extractor bore **(4)** in the tapered bush.
    d. Tighten and screw in the threaded dowel until the V-belt pulley **(1)** slides completely out of the tapered bush.

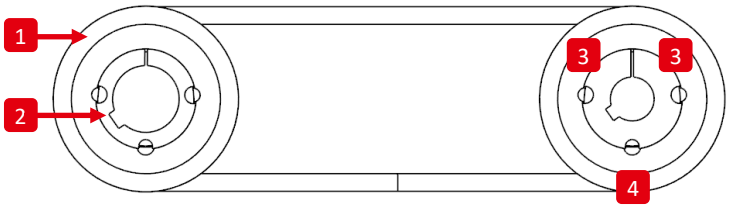

Figure 18: V-belt drive

3. Remove the V-belt that is to be replaced.
4. Fit the V-belt pulley back onto the sliding shaft.
    a. Plug in tapered bush and V-belt pulley, aligning them so that all three bores are aligned vertically.
    b. Screw in both threaded dowels to the two opposing bores **(3)**.
    c. Slide tapered bush and V-belt pulley firmly home on the sliding shaft.
    d. Block the sliding shaft by pressing in the spring pin on the sliding shaft bell.
    e. Using a torque wrench, uniformly tighten both threaded dowels to their maximum torque of 20 Nm.
    f. Release the sliding shaft by pulling out the spring pin.
5. Insert the whole of the new V-belt into the pulley at the engine end and as far as possible into the pulley wheel at the sliding shaft end.
6. Using a waf19 open-ended spanner, turn the sliding shaft clockwise until the V-belt moves into position.
7. Reinstall the V-belt cover, the lower rupture protection and the cup grinder.

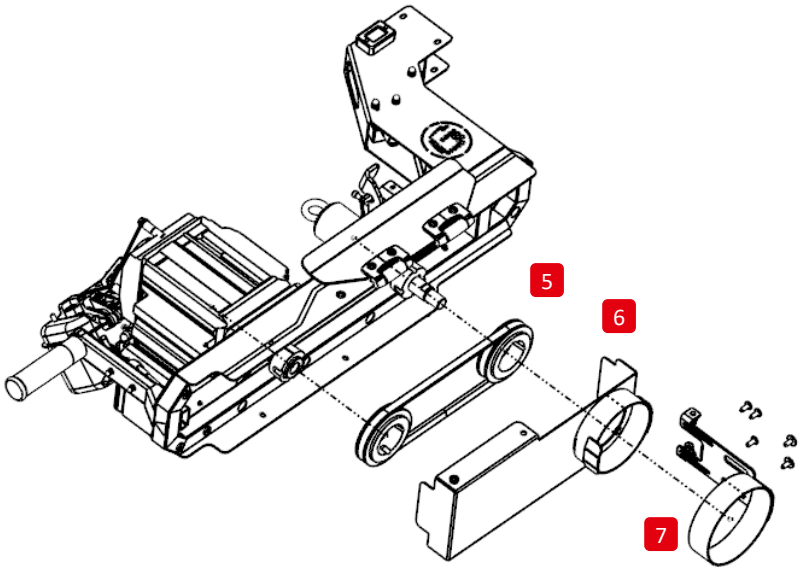

Figure 19: Replace V-belt

Spare part, V-belt: art. no. 363736

8.4 Inspection

At every inspection, check the general condition of the machine:

1. Check outside and underside of the engine for signs of oil or fuel leaks.
2. Remove excessive dirt or foreign bodies, especially around the silencer and the pull starter of the engine.
3. Check for damage such as cracks and breaks.
4. Check that all covers are fitted and that all nuts and bolts are tightened down.

If the engine is not in perfect condition, do not start it. Instead, carry out maintenance or notify the maintenance personnel.

Inspection intervals

INSPECTION ACTIVITY	INTERVAL
Check the general condition of the machine	before every entry into service
Clean the air filter	every 8 operating hours
Replace the filter element on the air filter	every 150 operating hours
Check the drive belt tension	every 40 operating hours
Check that the engine is firmly attached and mounted	after its first 16 operating hours, thereafter every 80 operating hours
Check the screw connections are tightened down firmly	after its first 16 operating hours, thereafter every 80 operating hours

Table 10: Inspection intervals

Spare parts

The machine must only be operated with genuine spare parts. These spare parts can be sourced from Elektro-Thermit GmbH & Co. KG.

9. Remedying problems

This chapter describes potential problems and ways of remedying them.

PROBLEM	POSSIBLE CAUSE	REMEDIAL ACTION
Engine fails to start	Petrol cock/choke/engine switch in the wrong position	Switch over the position
	Shortage of fuel	Topping up with fuel
	Spark plug defective, contaminated or wet (engine flooded)	Replace the spark plug and/or dry it and reinstall it. Start engine with throttle lever set to MAX. and choke lever set to 'OPEN'.
Insufficient engine power	Filter cartridges clogged	Clean filter cartridge or replace it
	Inferior fuel: engine stored without pre-treatment or draining of fuel, or fuelled with inferior fuel.	Drain fuel tank and carburetor (see engine handbook) and top up with fresh petrol.
Handwheel with impaired movement	Delivery contamination	Unfasten gaiter, clean parts below it and relubricate/grease the sliding seat
Height of control arm handle cannot be adjusted	Control arm handle is now at an angle in the lower link and has become wedged	Straighten the control arm handle (parallel to the lower link), then adjust the left and right ends of the tube
Machine vibrates too much	Imbalance on the cup grinder	Replace the cup grinder
	Tipping device catch hook has too much play on the arrester tube	Retension the catch hook using the setting screw

Table 11: Remedying problems

10. Storage

This chapter describes how the machine, its components and its spare parts are mounted.

Comply with the following storage conditions:

- Storage temperature: 0 °C – 40 °C
- Relative humidity: 40 – 60 %
- Store machine upright or horizontally on the side of the spark plate
- UV light-protected environment
- Ozone-free environment (no fluorescent light sources, mercury vapour lamps, photocopiers etc.)
- Store on pallets or shelves (never store directly on the ground or directly on walls to prevent the ingress of damp)
- Do not store directly beside heaters or other heat sources to prevent the material from getting distorted
- Store in a dust-free place (use dust covers)
- Do not remove corrosion inhibitor (e.g. oil film on untreated steel components)

11. Disposal

This chapter contains all the information needed to dispose of machine components as well as lubricants and consumables.

NOTICE

Disposal of the machine components may only be carried out by trained specialist personnel or by duly appointed specialist companies. Always ensure that disposal takes place in an environmentally responsible manner.

11.1 Disposal of used oil

Used engine oil must be disposed of in accordance with national, regional and local legislation and regulations. The operating company is responsible for the classification of waste. This process depends upon the substances with which the used oil is contaminated. If the company has no in-house system for the disposal of used oil, a professional waste disposal company must be appointed. Always ensure that no oil can enter the environment.

11.2 Disposal of parts containing oil and equipment contaminated with oil

NOTICE

Mineral-based engine oil is a water hazard. If engine oil gets into the soil, this can contaminate the ground water and can introduce environmentally hazardous substances into the food chain.

- Engine oil must therefore always be collected in appropriate containers.
- Always dispose of old oil properly.

1. After disassembly, always allow oil-bearing parts to drip out thoroughly and clean them.
2. Collect any escaping engine oil in a container provided for this purpose and dispose of it separately.
3. Dispose of used cleaning materials separately as oil-contaminated operating materials.
4. Dispose of any metal extracted from the oil as scrap metal.
5. Dispose of all non-metallic machine parts and waste contaminated with oil and grease separately, in the oil-contaminated category.

11.3 Disposal of scrap metal

Disposal of the machine creates scrap metal. Suitable disposal points are available from the respective municipal authorities. Contact them for details.