User Guide

Version 03 / 01.07.2021

CE

HIT-TRAC 8B
HIT-TRAC 8A

HIT-TRAC 8B

HIT-TRAC 8A

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Prüfzertifikat

Wir bestätigen, dass die genannte Maschine geprüft wurde und den Auftragsanforderungen, Spezifikationen, Zeichnungen sowie gültigen Normen und Vorschriften entspricht.

Motorseilzugmaschine HIT-TRAC 8B mit Benzinmotor
Motorseilzugmaschine HIT-TRAC 8A mit Akkumotor

Certificat d'inspection

Nous déclarons que le produit faisant l'objet du certificat a été contrôlé et est conforme aux exigences de la commande, aux spécifications, aux dessins ainsi qu'aux normes et prescriptions.

Machine motorisée de traction par câble HIT-TRAC 8B avec moteur à essence
Machine motorisée de traction par câble HIT-TRAC 8A avec moteur à batterie

Test certificate

We hereby confirm that the machine described below was tested and satisfies the requirements posed in the order, specifications, drawings as well as the relevant valid standards and regulations.

Motor-driven rope pulling machine HIT-TRAC 8B with petrol motor
Motor-driven rope pulling machine HIT-TRAC 8A with battery motor

Certificato di prova

Confermiamo che la macchina menzionata è stata controllata e che è conforme, sotto ogni aspetto, ai requisiti di incarico, alle specifiche, ai disegni nonché alle norme e alle disposizioni.

Macchina motorizzata con comando a cavo flessibile *HIT-TRAC* 8B con motore a benzina
Macchina motorizzata con comando a cavo flessibile *HIT-TRAC* 8A con motore a batteria

Geräte Nr. /N° de la machine / Machine no.:	.....
HSS ID	.....
Art. Nr./ N° art./ Art. no.:	.....
Motor-Nr. / N° du moteur / Motor no.:	.....
Datum/Date/Date:	.....
Unterschrift/Visa/Visa:	.....

Content

Preface

You made a good choice when you selected the Jakob AG HIT-TRAC motor-driven rope pulling machine. This state of the art rope pulling machine allows you to pull, lift and lower loads. Operation and maintenance are very simple and with correct handling ensure trouble-free and reliable operation.
It may be that you already know how your recently purchased rope pulling machine functions.
Nevertheless, read the following safety instructions safely before first commissioning.
Important information in the operation manual help you:

- To avoid hazards,
- to keep repair costs and downtimes to a minimum and
- to increase the reliability and service life of your rope pulling machine.

Always keep this operation manual at the place where the motor-driven rope pulling machine is used, and make sure that anyone who uses the machine reads and applies the information in the manual. It must be available for all operation personnel, to avoid errors during handling.
As well as the operation manual and the locally applicable accident prevention regulations, the recognized specialist rules for safe and proper working must be complied with.
We wish you every success and enjoyment using your product from Jakob AG.

EG-Konformitätserklärung

Déclaration de conformité CE

EC declaration of conformity

Wir / *Nous* / We

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erklären hiermit, dass die Maschine
déclarons par la présente que la machine
hereby declare that the device

HIT-TRAC 8B
HIT-TRAC 8A

in seiner Konzipierung und Bauart sowie in den von uns in Verkehr gebrachten Ausführungen den grundlegenden Sicherheits- und Gesundheitsanforderungen der EG-Richtlinie Maschinen entsprechen.
Bei nicht bestimmungsgemässer Verwendung, sowie bei nicht von uns freigegebenen Umbauten oder Änderungen, verliert diese Erklärung ihre Gültigkeit. Zudem verliert diese Konformitätserklärung ihre Gültigkeit, wenn die Bestimmungen der Betriebs- und Instandhaltungsanleitung nicht befolgt oder missachtet werden.

satisfait aux exigences fondamentales de la directive machines CE en matière de sécurité et de santé, tant du point de vue de sa conception et de sa construction que pour toutes les versions que nous avons mises sur le marché. En cas d'utilisation non conforme ou de modification ou transformation non approuvées par nous, cette déclaration perd sa validité. Cette déclaration perd également sa validité en cas de non-respect des instructions d'utilisation et de maintenance.

conforms to the health and safety requirements of the EC Machinery Directives in its conception and design, as well as in the version placed on the market by us. In the event of improper use, as well as modifications or changes which are unauthorised by us, this statement loses its validity. This declaration of conformity also loses its validity if the relevant user guide and maintenance manual are not followed or are violated.

Zutreffende EG-Richtlinie: *Directive CE concernée:* Applicable EC directives:	**EC Machinery Directive 2006/42/EC**
Angewandte harmonisierte Normen: *Normes harmonisées appliquées:* Applied harmonised standards:	**EN ISO 12100: 2011-01**

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Suppléant du chef technique / deputy Head of Technology
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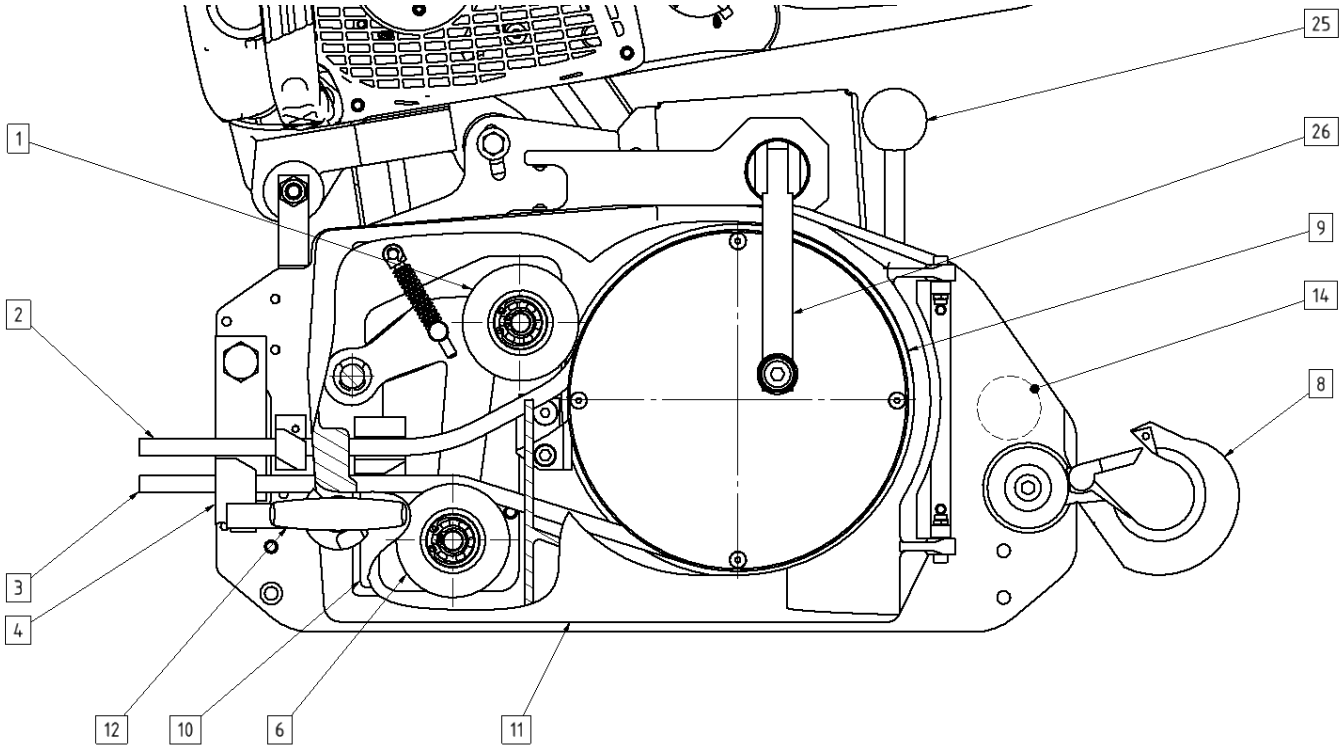
Urs Schneider

1 General description

The HIT-TRAC motor-driven rope pulling machine is designed to pull, lift and lower loads.
The traction element used is a special HABEGGER HIT-TRAC rope of any length, which is steered around the drive wheel via a series of guide elements, and then exits once more in the unloaded condition.

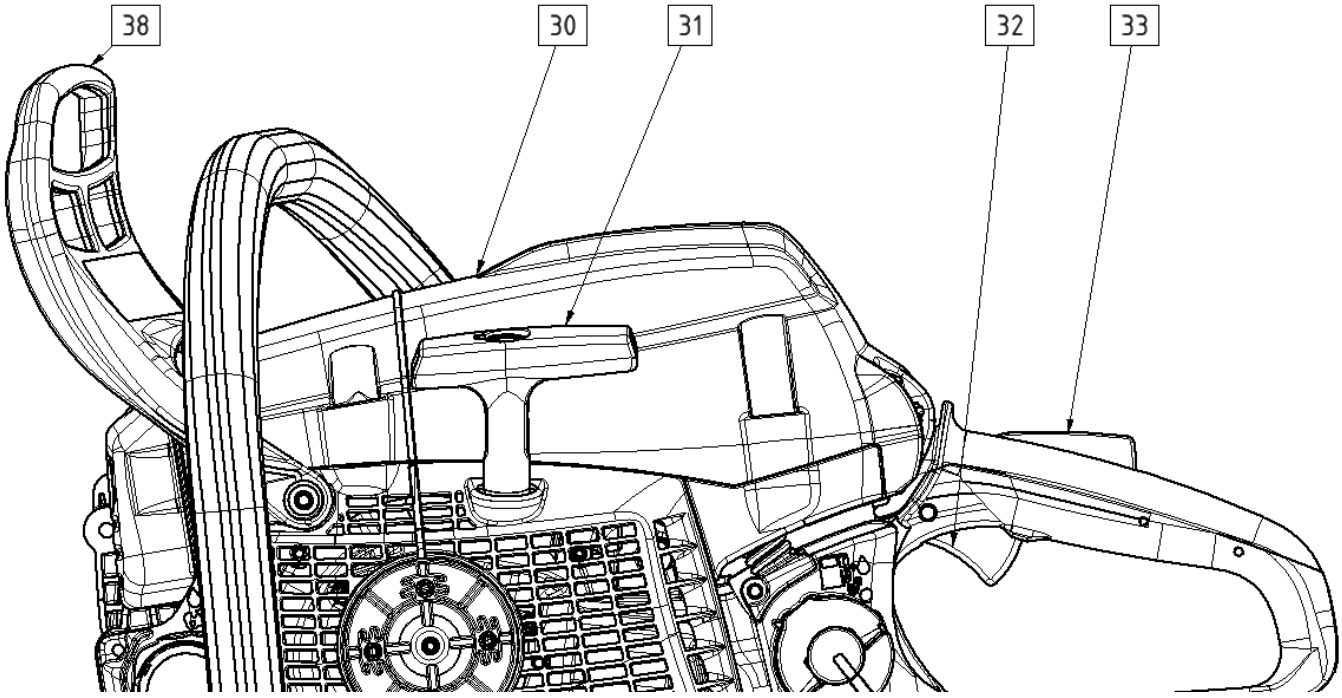
1.1 Components

1 Pressure roller
2 loose rope end
3 Traction rope
4 Rope guide
6 Guide roller
8 Anchor hook
9 Drive wheel
10 Information sign
11 Housing cover
12 Cover closure
14 HSS NFC Chip
25 Brake release lever
26 Rope loosening crank



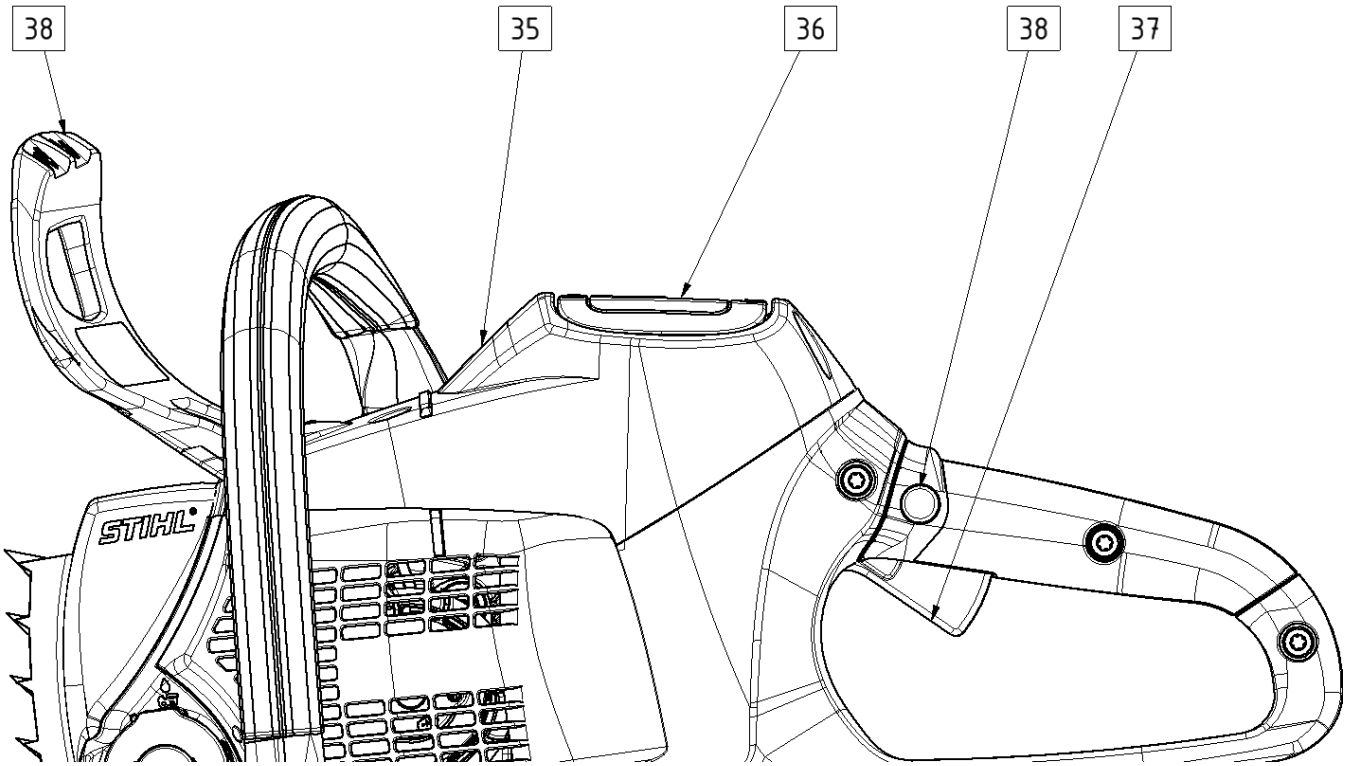
1.2 Components HIT-TRAC 8B

30 Petrol motor
31 Starter motor
32 Throttle lever
33 Throttle lock
38 Chain brake



1.1 Components HIT-TRAC 8A

35 Battery motor
36 Battery
37 Trigger
38 Lockout Button
38 Chain brake



2 General safety rules

The HABEGGER motor-driven rope pulling machine HIT-TRAC confirms to the current state of the art. To protect against accidents, it is equipped with effective safety devices according to the recognized technical safety standards, guidelines and laws.
However: Laws, regulations and safety devices do not offer protection against carelessness and negligence!
Only use the motor-driven rope pulling machine in perfect condition, complying with the operation manual.
Before you work with the motor-driven rope pulling machine, you must carefully read and comply with the safety information below.
This is for your safety!

2.1 Safety information in this operation manual

For hazards, notes and important information, the following symbols and descriptions are used:

- Notices are particularly important information which you must comply with when operating the equipment for its intended use.

- Caution! Note indicates hazard for the machine, machine parts and the environment.

- Danger! Note referring to hazards to health and the life of the operator and other persons in the working area of the motor-driven rope pulling machine.

- Warning of hot surfaces.

- Wear ear defenders

2.2 Intended use

The HIT-TRAC motor-driven rope pulling machine is designed to pull, lift and lower loads.

- The HIT-TRAC must not be used to transport persons.

2.3 Authorized operators

The motor-driven rope pulling machine must only be used by a specialist person who is authorized. As the operating company for the motor-driven rope pulling machine, make sure that the operation manual is made accessible to the operator and ensure that they have read and understood it.

2.4 Warranty and liability

Jakob AG warrants the replacement as well as installation and removal of parts which have become demonstrably unusable as a result of material or manufacturing defects.
The warranty period (guarantee term) is 12 months.
Warranty and liability claims for injury to persons or damage property are excluded is they are due to one or more of the following:

- use of the rope pulling machine other than intended use
- improper operation and maintenance of the rope pulling machine
- Failure to comply with the information in the operation manual regarding operation and maintenance of the rope pulling machine
- independent modifications on the rope pulling machine
- poor monitoring of machine parts which are subject to wear
- repairs carried out improperly
- Catastrophic failures due to foreign objects and force majeure
- The use of third party spare parts, if these are not designed and manufactured according to the loading or safety requirements.
- We recommend that you only use HABEGGER spare parts.

2.5 Behavior in an emergency situation

Before starting work, always inform yourself whether and where there is a mobile phone network or where a traditional telephone is available. Check the availability of a first-aid box.

2.6 Product specific hazards

2.6.1 Hot surfaces

During operation the components of the device warm up to differing degrees.

- CAUTION! Skin burns!
- If touched, hot surfaces can cause skin burns.
- After shutting down operation, wait until the components in the working area have cooled down sufficiently so that their surfaces can be touched safely. Some surfaces can be hotter than others!
- If required wear protective gloves/protective clothing.

2.7 Preparation

2.7.1 Location

- Personnel must not be located on a structure hanging on the HIT-TRAC.
- When working always make sure you have a firm and safe location to stand in.
- Always stand outside the hazard area of the load to be moved, and never in the way of the exiting rope.
- You need sufficient room to move. Therefore make sure you have a sufficiently large area to stand in.
- Do not use ladders as a standing area.
- If your location is unsuitable: Install deflection roller and select a better location.
- When installing the machine take care that no external hazards can act on the rope pulling machine, the traction rope, the load and the operator personnel. (e.g. falling objects, passing vehicles, electrical overhead lines, and so on)

- During operation, ensure that the machine is not standing directly in water (or snow).

Following contact with water, you should have your HIT-TRAC checked by Jakob AG so that the brakes can be dried and greased. If the brakes are wet, the load can either not be lowered or can only be lowered jerkily.

2.7.2 Anchoring

- Attach the machine with sufficiently strong strops or slings to the anchor bolts.
- Do not use damaged strops or lifting slings.
- In the unloaded condition, rope couplings and fixings must not come undone of their own accord.
- The machine must be able to adjust freely in the pulling direction of the rope. Otherwise there is a risk of the housing breaking!
- When remaining in the same location for longer periods: Regularly check attachments!

2.7.3 Load

- The pulling force must not be greater than the rated pulling force of the machine.
- Secure free hanging loads against turning!
- The inherent stability of the load must be guaranteed, to prevent sliding off or tipping during the work.
- Pay attention to obstacles, which could cause the load to tip or become stuck.
- Uncontrolled loading (e.g. buckets, containers) during the lift or at interim positions is prohibited.
- When tensioning and anchoring, take into account possible stress spikes (in static condition) due to external influences.
- Excessive impacts and loading on the pulling machine (e.g. anchoring of moving machinery, wind and so on) must be prevented by the use of a strain relief rope.

- The efficiency of deflection devices must be considered when designing the system.

2.7.4 Traction rope

The condition of the rope is decisive for the reliability of the drive system.
Rope structure and inherent strength (transverse compressive strength, impact resistance) must resist the loads which occur.

- Only suitable **original HABEGGER ropes** must be used.
- The pulling rope must not be lubricated, and must be kept clean.
- The rope diameter must match that on the type plate.
- Damage of the rope: crushed, unwound, non-circular, kinked ropes or ropes with strand breaks or tangles must not be used. **(ISO 4309)**
- Ropes with broken wires: remove carefully and correctly.
- Rope connections, sleeves, compression heads, short splices and so on must not run through the drive system.
- When deflecting the rope over sharp edges, obstacles and so on protect the rope using suitable floor rollers or supports made of wood or plastic.
- Due to unloading of the rocker, the loose robe end (2) must not hang freely for more than **50 m**.
- For lengths greater than **20 m** the loose rope end (2) must be rolled up properly (rollers, reels). Rope twists, tangles, kinks etc. must be avoided!

2.7.5 Inserting rope

- Before all work, close and lock housing cover (11) above the drive system.
- When handling wire ropes wear gloves.

2.8 Working

2.8.1 Pulling and lifting

- **In an emergency** Release throttle lever (32/37). The driving wheel will immediately stop moving and the built-in backstop will stop the driving wheel from turning backwards.
- The loose rope end (2) must be able to exit the pulling machine unhindered.
- Never pull hooks against the housing.
- In situations where the work cannot easily be seen: Observations by assistants, if necessary with radio contact.

- Before starting work, check the correct direction of rotation for lifting and lowering.
- Observe the rope during the movement.
- Observe the movement of the load.
- Risk of slipping with low load!
- When pulling make sure that neither the housing nor the rope are deflected or tilted by objects or obstacles.
- When pulling diagonally upwards the rope pulling machine can tilt. Place wood underneath, or avoid diagonal pull with rope roller.
- If the brake release lever (25) is not swivelled upwards, the load will fall at lowering speed after the throttle lever (32/37) is released.
  Pivot brake release lever (25) upwards immediately

- Wear ear defenders when working with the machine!

- During operation, the pressure roller (1), in connection with the rope geometry, can lead to elongation slippage and accumulation of the rope so that it briefly lifts out of the V-groove of the drive sheave. The subsequent compensation of this rope protrusion usually results in a regular, characteristic cracking or banging noise. This phenomenon is therefore operational. The machine operation can be continued without hesitation.

2.8.2 Restart under load HIT-TRAC 8B

- Allowing the coupling to slide through for too long leads to overheating and early wear and tear.

2.8.3 Lowering

- **In an emergency** Release throttle lever (32/37). The driving wheel will immediately stop moving and the built-in backstop will stop the driving wheel from turning backwards.
- Risk of falling! Pay attention to loose rope end (2)! Stop lowering movement **2 m** before the end of the rope end at the latest.
- The loose rope end (2) must be able to run freely and without deformations and tangles into the machine.

2.9 Decommissioning

- The pulling rope (3) must be unloaded during decommissioning.
- Loads must be secured.

2.10 Storage and transport

- The device must be transported on pallets, secured against sliding and tilting.

3 Design and function

3.1 Technical specifications

HIT-TRAC	8B	8A
Rated force (pulling, lifting, lowering)	8 kN	
Overload protection at	ca. 10 kN	
Rope speed	ca. 10 m/min	ca. 8 m/min
Switch-on period lifting at rated force	100%	
Switch-on period lowering at rated force	Limited by brake temperature For rated force approx. 30 m without cooling	
Operating time / tankful	tankful approx. 15 min (150 m rope movement)	Battery charge AP 300S approx. 9 min (70 m rope movement)
Rope movement: lifting/lowering	unlimited/unlimited	
Dimensions Length Width Height	 541 mm 260 mm 530 mm	 541 mm 260 mm 505 mm
Effective diameter of drive wheel:	160 mm	
Rope pulling machine own weight	30 kg	28.5 kg
Gear grease	Liquid grease Microlube GB 0	
Pulling rope type Diameter Construction Length Breaking strain	HABEGGER HIT-TRAC rope 8.2 mm 4 x 25 FW+FC galvanized any 50 kN	
Drive group (DIN 15 020)	1 C_m	
Sound power level L_{WA}	max. 114 dB	max. 100 dB
Permissible temperature range for use and storage	-20°C to +40°C	-10°C to +40°C
Driving motor: Model Emission standards MS260 Emission standards MS261 Output Fuel Fuel capacity	2 stroke Petrol motor STIHL MS260 / STIHL MS261 RI 97/68/EG (EU I) VER (EU) 2016/1628 (EU V) 2,6 kW 2 stroke petrol oil mixture according to Stihl's require-ments 0.50 l	Battery motor STIHL MSA 220 C - - 1.8 kW - -
Battery Weight Energy content Battery cell technology End of charge voltage Charging time 80% Charging time 100%	-	AP 300 S 1.8 kg 281 Wh LITHIUM-ION 42 V 30 min 45 min
Quick charger Rated voltage Charging current Weight	-	AL 500 220-240 V 12 A 1.3 kg

3.2 Operation HIT-TRAC 8B

The machine is operated by a petrol engine using a friction clutch. If the machine is overloaded, the coupling slips through and the load cannot be hoisted or pulled.

3.3 Operation HIT-TRAC 8A

The machine is operated by a battery motor. If the machine is overloaded, the motor stops and the load cannot be hoisted or pulled.

3.4 Braking

The motor does not allow braking. The load is stopped using a brake which is built into the machine which needs to be released by hand for lowering.

4 Operation

4.1 Preparation

4.1.1 Petrol motor

The STIHL petrol motor should be operated according to the STIHL operating instructions.

- Do not fill with chain lubricant
- Use the blend of fuel recommended in the STIHL operating instructions.
- Shake the fuel mixture thoroughly before refuelling. The fuel should not be older than 2 years old.

When working at **high altitudes** or in **unfavourable climate conditions**:

- Optimise carburettor settings or Reduce load accordingly.
- If being used regularly in mountainous areas, a special carburettor can partially compensate for the reduction in power.

4.1.2 Battery Motor

The STIHL Battery Motor should be operated according to the STIHL operating instructions.

- With full battery capacity must not be lowered! It has to be raised briefly before.

- Do not fill with chain lubricant.

4.1.3 Location

Suitable location for the rope puller.

4.1.4 Anchoring

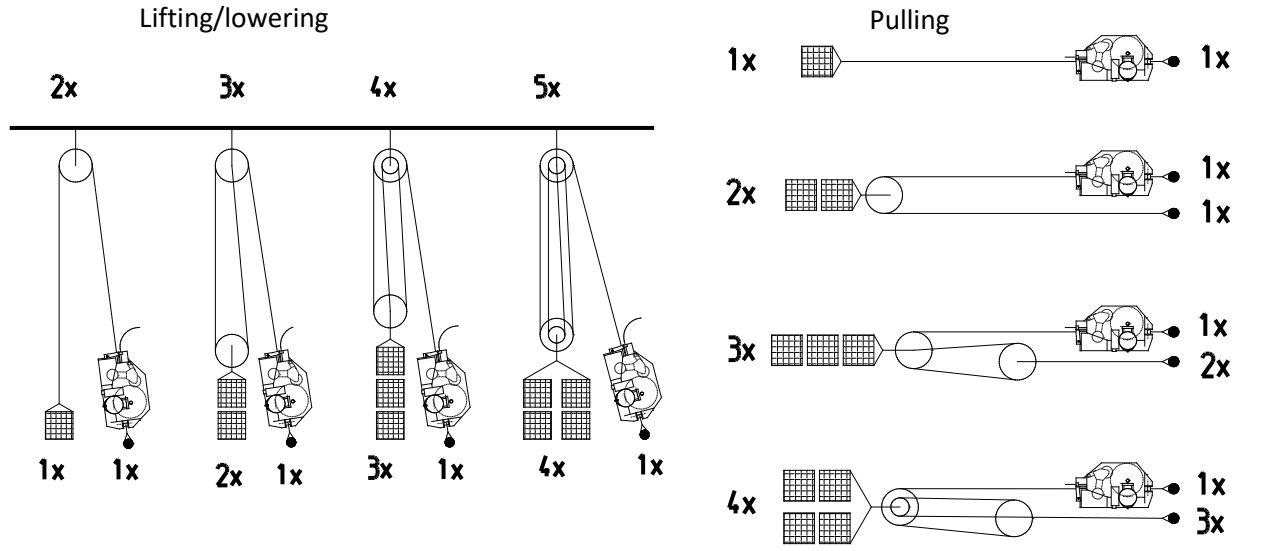
The rope puller is anchored using the anchor bolt (8) with a suitable attachment on the attachment point.

The best anchor points are:	- Solid objects and constructions - Concreted rings - Eyelets or rods
Natural anchoring points:	- Heavy/strong boulders - Trees - Other suitable objects
Technical anchor points:	- Habegger field anchor with posts - Rock anchor, concrete anchor - Round wood anchor in ground - These anchors depend very much on the ground conditions.

4.1.5 Load

The load must be determined before pulling. A suitable load dynamometer can be used for this.
Suitable means of attachment are used to fix the load on the pulling hook. These prevent the load slipping or tilting during work. Suitable attachment equipment includes for example eyes, slings, strops, straps.

For larger rated loads:
Reduce the pulling force by using pulleys.



- The efficiency of the rope block must be included in the design of the rope system. As a rule, an efficiency of 98% per deflection can be expected.

- Icy pulleys or stiff bearings can lead to an extreme deterioration of efficiency in the pulley block. The pulleys must be checked for smooth running before pulling in the rope.
- The choice of reeving can have an influence on the alignment of the rope blocks under tensile force. If they are misaligned during operation, this can lead to an extreme deterioration of the efficiency. The reeving must be changed in this case. The original operating instructions for the rope blocks must be considered.

Calculation example:

Load Transmission	Number of rollers	Efficiency (guideline value)	Traction force at 8 kN
1x	0	100%	8 kN
2x	1	98%	15.68 kN
3x	2	96% (0.98 x 0.98)	23.04 kN
4x	3	94% (0.98 x 0.98 x 0.98)	30.08 kN
5x	4	92% (0.98 x 0.98 x 0.98 x 0.98)	36.8 kN
...	...	...	...
8x	7	87 % (0,98 ^ 7)	55.68 kN
...	...	...	...
20x	19	68 % (0,98 ^ 19)	108.8 kN

4.1.6 Traction rope

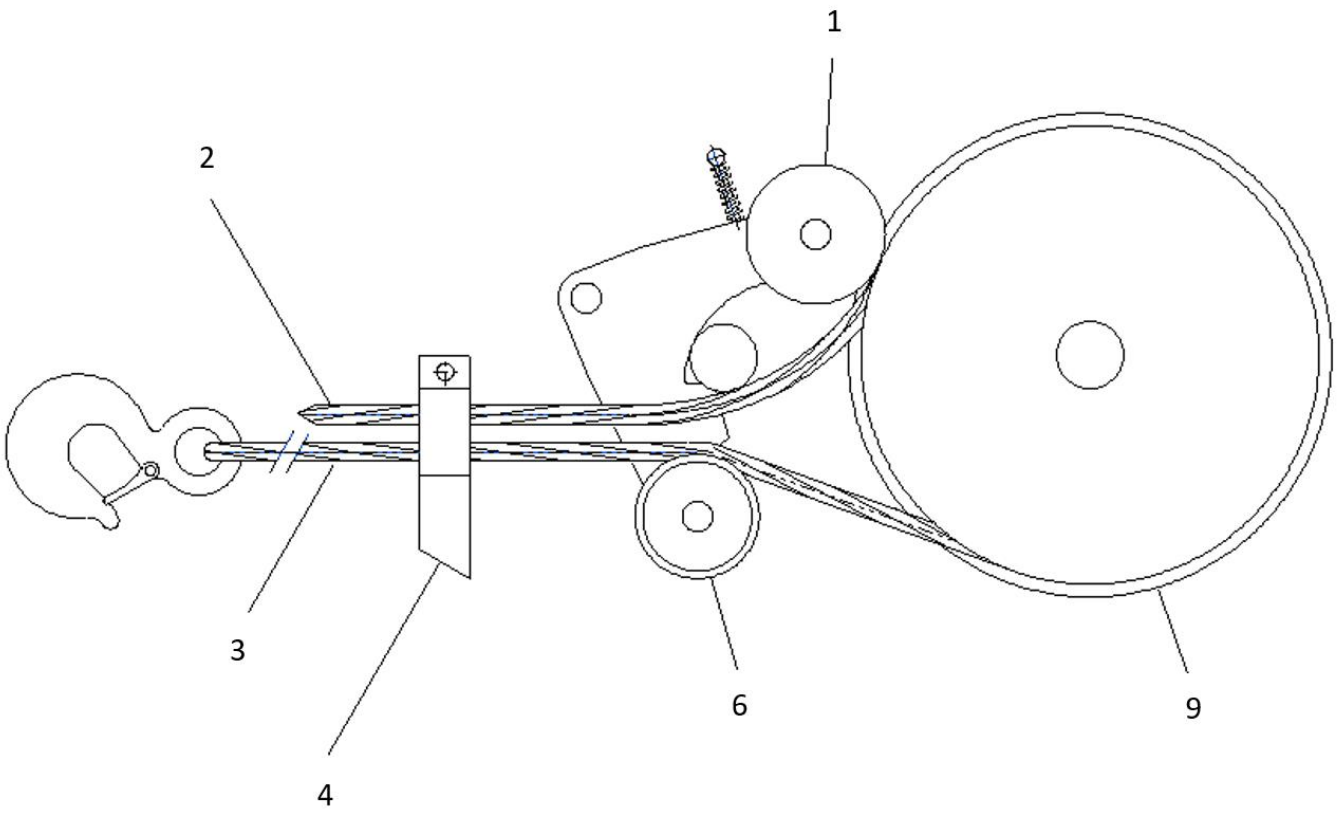
Unwinding and winding up the rope must be done properly according to ISO 4309.
Matching accessories:

- HABEGGER rope reel and carrying tube
- Reel drive 4 (Art.: 00395)
- Reel drive 6 (Art. 01651)

4.1.7 Inserting rope

Only insert the rope at the end of the preparation work. This allows the rope to be pre-tensioned by hand and laid around the drive wheel at a suitable point without an idle stroke. The rope is laid into the drive wheel according to the following sketch or information sign (10).

1. Unlock housing cover (11) with cover handle (12) and fold up.
2. Create a loop of rope, pulling rope (3) at the bottom.
3. Swivel in pulling rope (3) at the bottom in the cable guide (4).
4. Lay loose rope end (2) at the top in the cable guide (4) and under pressure roller (1) (lift rocker).
5. Lay rope loop in rope groove of drive wheel (9).
6. Pulling rope (3) over guide roller (6) (press rocker downwards).
7. On loose rope and (2) pull the rope into the rope groove of the drive wheel (9).
8. Check correct location of rope one more time.
9. Close housing cover (11) and lock with cover handle (12).



4.2 Working

4.2.1 Pulling and lifting

1. Start the motor (30/35)
2. Check that the chain brake (38) is disengaged. (see arrow) To protect the coupling, the chain brake should not be engaged for too long.
3. Set the driving wheel into motion using the throttle lever (32/37). Open the thrttle enough that the motor runs smoothly and the centrifugal clutch grips properly.
4. Release throttle lever. The driving wheel will immediately stop moving and the built-in brake will stop the driving wheel from turning backwards.

4.2.2 Restart under load

1. Release chain brake (38)
2. Quickly pull the throttle lever (32/37) so that the motor can reach the required speed and the centrifugal clutch can instantly deliver the required torque.

4.2.3 Lowering

1. Power off motor.
2. To lower the load or relieve tension in the rope, release the brake by pulling the brake release lever (25) on the back of the machine. The chain brake (38) needs to be released for this.
3. For large enough loads (larger than approx. 100 kg), the load will move of its own accord when the brake release lever is pulled away from the housing. In this case, the centrifugal brake limits the load's lowering speed. The load stands still as soon as the brake lever is released.
4. If the brake release lever (25) is pivoted right down, it locks and the brake stays open!
5. For smaller loads and to release tension in the rope, i.e. when the load does not move of its own accord when the brake is released, the crank (26) at the front of the housing must be switched to the other side, when the brake is released, and pressed against the housing until the claw coupling clicks into place, possibly after being rotated. By turning the crank (26) in an anticlockwise direction the load will be lowered or, respectively, the rope tension will be relieved.
   The rope speed is dependent on the speed of the hand crank.
6. After the rope tension has been relieved, pivot the brake release lever upwards again to engage the brake.

As energy produced during lowering is converted into frictional heat, the distance the load can be lowered by is restricted to protect the lowering brake against overheating. The table provides the maximum values:

Lowering force	Lowering distance
8 kN	20 m
6 kN	25 m
4 kN	40 m
2 kN	80 m

If the load is to be lowered over longer distances, the brake should be allowed to cool (air) and then lowered the rest of the distance.

4.3 Decommissioning

4.3.1 Taking rope out of the machine

1. Pulling rope (3) must be loose
2. Unlock housing cover (11) with cover handle (12) and fold up.
3. Remove loose rope and (2) at the top in the cable guide (4) and under pressure roller (1)
4. Remove pulling rope (3) at the bottom in the cable guide (4)
5. Remove complete rope from the machine and wind up properly
6. Close housing cover (11) and lock with cover handle (12).

4.3.2 Dismantling machine

- Release machine from the anchor point

4.4 Storage and transport

The device must be stored in a dry place. During transport and storage, the device must be covered against dust.

5 Faults

Faults	Possible cause	Measures
Petrol motor cannot be started	Too little petrol	Refuel
	Single lever operation on motor set to stop	Switch lever to start
	other causes	see STIHL operating instructions.
Petrol motor “dies” when starting up	Altitude too great over approx. 2200 m above sea level	Adjust carburettor
	Poor carburettor settings	see STIHL operating instructions.
	Load is greater than permitted tensile force	Reduce load or employ pulley block
Battery motor turns off	Battery empty	Charge the battery
Rope does not move, even though drive wheel turns	Rope incorrectly inserted	Install rope according to sketch
	Too small or too thin rope installed	Install correct rope
	Severe wear on rope	Install new rope
	Drive wheel or rope excessively greased	Clean
	Rope groove in drive wheel strongly contaminated	Clean
	No load on rope	Load rope
The driving system is not moving despite the throttle on the running motor being open	Chain brake (38) released (blocked)	Release chain brake (38)
	Broken V-belt	Replace V-belt
	Centrifugal clutch on Petrol motor worn out	Replace centrifugal clutch
	Sliding clutch 8B worn out	Readjust sliding clutch
	Sliding clutch 8B misaligned	Adjust sliding clutch
	Brake (spindle) stuck in open position	Hold brake housing steady and turn hand crank in hoisting direction
The tension in the rope cannot be relieved	Brake not released	Release brake by pivoting brake release lever (25) backwards
	Brake wet	Have machine repaired
	Chain brake (38) engaged	Release chain brake (38)

6 Maintenance

The following items of inspection and maintenance work must be carried out:

Working	At the start of work	As required	Comments
General visual inspection: - Drive system - Housing - Anchor bolts, pulling tab	X	X	
Bolt check		X	after first use or overhaul
Cleaning of drive wheel		X	
Petrol motor: Refuel	X	X	see STIHL operating instructions
Battery motor: Charge battery	X	X	see STIHL operating instructions
Relubrication of the pinion		X	Gear wheel grease
Rope: - Visual inspection - Compression sleeve - Eye hook with securing device - Diameter check	X	X	According to ISO 4309 Inspection for deformations, damage, cracks or wire breaks Max **10%** smaller than rated diameter
Rope: Cleaning		X	
Oil level in sight glass		X	

Units, rope and accessories must be checked at least **every 2 years** (see sticker on the unit) by an expert certified by Jakob AG.
When doing so all parts are checked for deformation, wear and cracks. The test results must be entered in the inspection log.
The tests must be arranged by the operating company.
In addition to this additional tests must be arranged by an expert according to the local regulations as well as after harsh use conditions, at a shortened interval.

7 Spare parts

The spare parts are provided on a separate list. This can be requested from Jakob AG.

8 Disposal

Please comply with the local regulations on disposal.
Fully drain your HIT-TRAC of oil.
Please dispose of even the smallest quantities of oil properly or bring them to a responsible location.
When dismantling, separate material types as far as possible, to allow recycling: Keep metal and plastic parts separate and send for recycling.
Please bear in mind that protecting the environment and re-use of materials benefits everybody.