

User Guide

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HIT-TRAC 16E
HIT-TRAC 16E vario
HIT-TRAC 16E neo



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Preface

You made a good choice when you selected the HABEGGER 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 16E

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:

DIN EN 14492-1: 2010-06

EN 60204-1: 2006

EN ISO 12100: 2011-01

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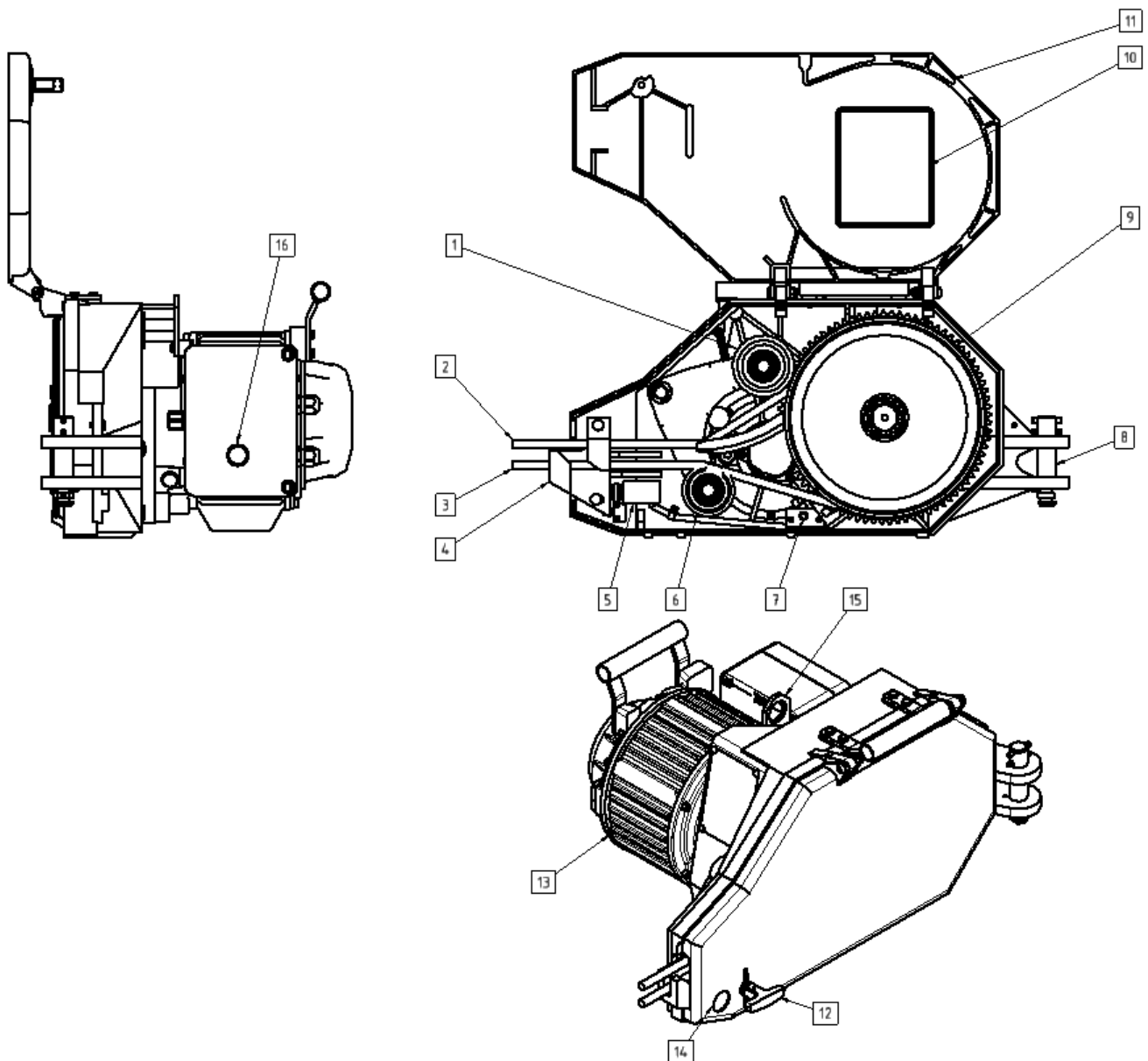
1 General description

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 | 9 Drive wheel |
| 2 loose rope end | 10 Information sign |
| 3 Traction rope | 11 Housing cover |
| 4 Rope guide | 12 Cover closure |
| 5 Limit switch lift/lower | 13 Electric motor |
| 6 Guide roller | 14 HSS NFC Chip |
| 7 Cover monitoring | 15 Tab for transport |
| 8 Anchor bolt | 16 Key motor protection switch |



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 hazardous electrical voltage.



- Warning of hot surfaces.

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 provisions

The liability and warranty provisions of the general T&C of Jakob Rope Systems apply. Especially T&C points 10 and 11.

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 Electrical connection



- Before the components are connected, the details on the relevant type plate must be checked and complied with.



- Hazardous electrical voltage!
- Touching electrical components can cause severe injuries or lead to death.
- Before all maintenance and repair work, the device must be isolated from sources of energy (electrical power).
- The machine must not be operated without a residual current device (RCD). (Personal protection)

2.7.2 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)

2.7.3 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!

2.7.4 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.

2.7.5 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 rope 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!

2.7.6 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** press emergency stop button (19). Machine stops immediately.
- 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.
- Ensure that the Traction rope (3) is slightly tensioned before lifting the load to prevent load peaks from occurring.



- 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.



- 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 Lowering



- Release the lowering button (18). Machine stops.
- **In an emergency** press emergency stop button (19). Machine stops immediately.
- 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

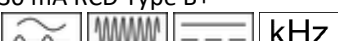


- The device must be transported on pallets, secured against sliding and tilting.

3 Design and function

3.1 Technical specifications

HIT-TRAC	16E	16E vario	16E neo
Rated force (pulling, lifting, lowering)	16 kN		
Overload protection at	env. 20 kN		
Rope speed	approx. 10 m/min	approx. 2-10 m/min	approx. 0-10 m/min
Control pendant	fixed	plug-in 10-pin	
Radio remote control	-	plug-in 10-pin	
Load display	-	-	X
Pulling force regulation	-	-	X
Switch-on period lifting at rated force	30% (3 min work, 7 min break, etc. ...)		
Switch-on period lowering at rated force	30% (3 min work, 7 min break, etc. ...)		See chapter 3.5.3
Rope movement: lifting/lowering	unlimited/unlimited		
Dimensions			
Length	700 mm	860 mm	700 mm
Width	450 mm	492 mm	480 mm
Height	355 mm	480 mm	350 mm
Effective diameter of drive wheel:	250 mm		
Rope pulling machine own weight	57 kg	93 kg	43 kg
Transmission oil	0.2 l / 80 W 90		
Pulling rope type	HABEGGER HIT-TRAC rope		
Diameter	11.2 mm		
Construction	4 x 25 FW+FC galvanized		
Length	any		
Breaking strain	88 kN		
Drive group (DIN 15 020)	1 C _m		
Sound power level L _{WA}	max. 85 dB		
Permissible temperature range for use and storage	-20°C bis +50°C		

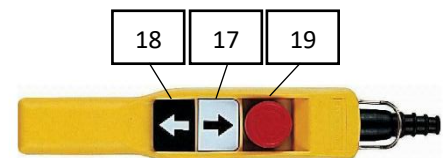
HIT-TRAC	16E	16E vario	16E neo
Drive motor	Asynchronous motor	Asynchronous motor	Synchronous motor
Power S3 30%	3 kW	3 kW	3 kW
Type	S 132-2-10	S 132-2-10	910-0028
Speed	2820 U/min	2820 U/min	2820 U/min
Motor current S3 30%	6.8 A	6.8 A	6.0 A
Current S3 30%	6.8 A	9.0 A	9.8 A
Power cable	5m (3xL+PE)	5m (3xL+N+PE)	5m (3xL+N+PE)
plug	CEE 16 16A	CEE 16 16A	CEE 16 16A
Type	S 132-2-10-1097		
from engine no.:	2103060		
Speed	2750 U/min		
Motor current S3 30%	6.3 A		
Current S3 30%	6.3 A		
Power cable	5m (3xL+N+PE)		
plug	CEE 16 16A		
Voltage	3 x 400 V		
Mains frequency	50 Hz		50 / 60 Hz
Standard / protection type	VDE 530 / IP 65		
Fault current protection switch	According to DIN VDE 0100-410:2018-10, DIN VDE 0100-530:2018-6 and VDE 0664-10/-2		
- 30 mA RCD Type AC 	-	-	-
- 30 mA RCD Type A 	X	-	X
- 30 mA RCD Type F 	X	X	X
- 30 mA RCD Type B 	X	X	X
- 30 mA RCD Type B+  kHz	X	X	X
Brake	Spring pressure brake Lenze BFK 458-10 - 205 V		Perm. magnet brake Binder 86 611-09-H05-0
Rated braking torque	16 Nm		19 Nm
Anchor tension	205 V		24 VDC ±10% smoothed
Emergency mode control	-	-	-

3.2 Operating éléments

3.2.1 HIT-TRAC 16E

Control pendant

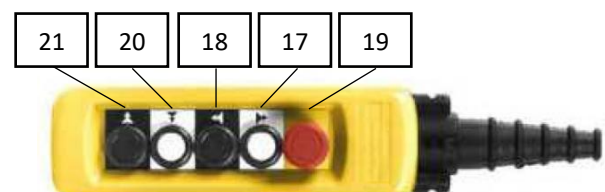
- 17 Lift button
- 18 Lower button
- 19 Emergency stop



3.2.2 HIT-TRAC 16E vario / neo

Pendant button

- 17 Lift button
- 18 Lower button
- 19 Emergency stop
- 20 Faster
- 21 Slower



Radio remote control

As an option a radio remote control can be fitted on the 10-pin plug (24)

- Radio control Quadrix / FSE308
Control for 1 machine
- Radio control Micron 5 / FSE51
Control for 2 to 5 machines



3.3 General functions

3.3.1 Cover monitoring

The housing cover (11) over the drive wheel prevents the entry of foreign objects and protects against accidents due to improper access. The rope derailment protection for the pulling rope is also integrated in the housing cover (11).

The cover monitoring (7) makes sure that the housing cover (11) is closed. The machine cannot be started with the cover open.

3.3.2 Limit switch lift/lower

The limit switch for lifting/lowering is only for an emergency. If the hook on the pulling rope (3) or the loose rope and (2) is pulled against the housing, the machine stops immediately.



- Danger! After activation of the limit switch lifting/lowering (5) the machine must be secured and unloaded. It must be checked whether any damage has occurred.

3.4 Functions HIT-TRAC 16E / 16E vario

3.4.1 Motor and control

Since the special design of the motor (13) does not stipulate forced ventilation, it is designed for intermittent operation. (See Switch-on period in chapter 3.1)

3.4.2 Brake

The brake is fixed on the free motor shaft end. It is protected by a protective cap with a rubber seal against moisture and foreign objects.

3.4.3 Monitoring of pulling rope (3):

1. Hook was pulled against the rope guide (4)
2. Check whether it is possible to drive free
3. Key motor protection switch (16).
4. Press lower button (18) until the limit switch (5) is no longer activated.
5. Key motor protection switch (16)

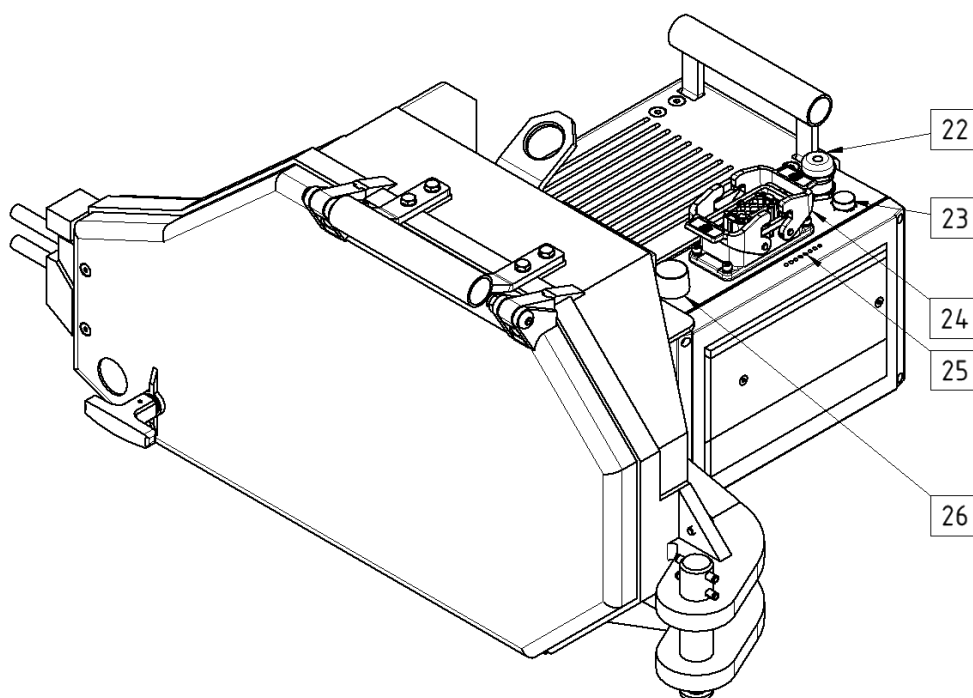


- The limit switch will only be activated with the correct motor direction of rotation (rotation direction of the power connection).

3.5 Functions HIT-TRAC 16E neo

22 Power connection
23 Gore-Tex valve
24 Control plug

25 LED load display
26 Pulling force regulation



3.5.1 Motor and control

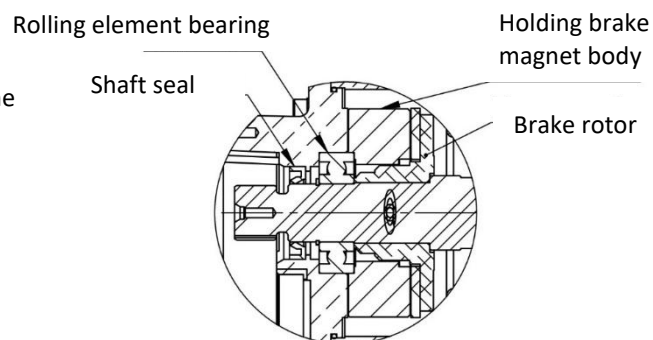
Since the special design of the motor (13) does not stipulate forced ventilation, it is designed for intermittent operation.



- The control must only be opened by authorized personnel.

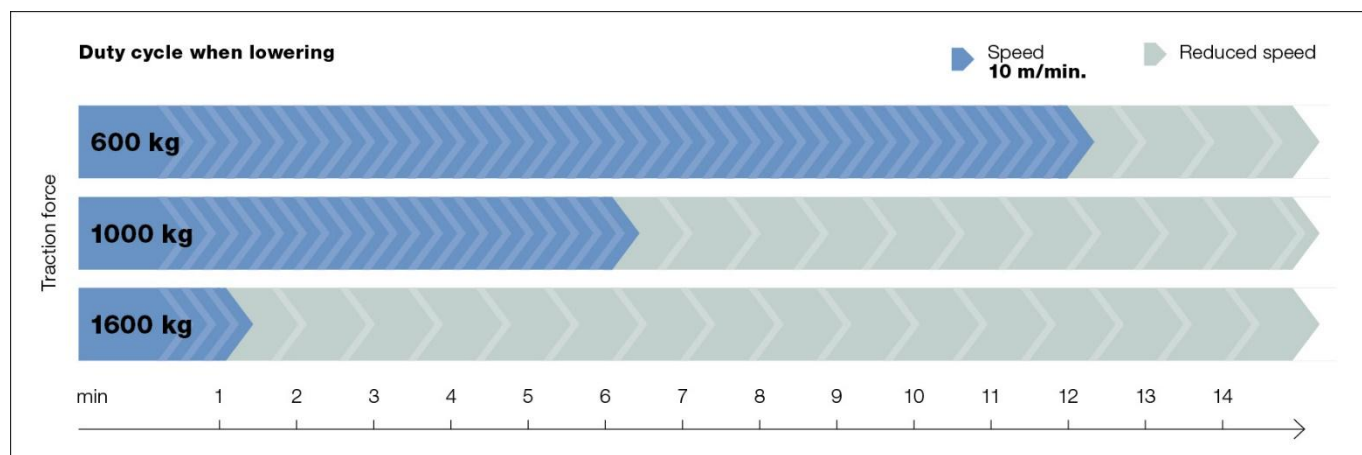
3.5.2 Brake

The holding brake creates the fixed support on the A-side and the air gap adjusts automatically.



3.5.3 Duty cycle when lowering

As the braking resistors heat up during the lowering of the load, the rope speed decreases. The rope tension directly affects the duty cycle.



3.5.4 Variable rope speed

The rope speed can be adjusted with the buttons faster (20) and slow (21). The setting can also be made without moving the rope.

Rope speeds of less than 3% are more sensitive and can therefore be set more precisely.

Rope speed at shutdown	Rope speed at restart
$\geq 30\%$	Always 30 %
$< 30\%$	Same speed as at shutdown

3.5.5 Monitoring of pulling rope (3)

1. Hook was pulled against the rope guide (4)
2. Check whether it is possible to drive free
3. Press lower button (18) until the limit switch (5) is no longer activated.

3.5.6 Monitoring of loose rope end (2)

1. Fit loose rope end (2) with bolted rope clamp
2. Rope clamp on loose rope end (2) was pulled against the cable guide (4)
3. Check whether it is possible to drive free
4. Press lift button (17) until the limit switch (5) is no longer activated.

3.5.7 Monitoring of loose rope end (2) or pulling rope (3) on power loss



In the event of power loss or an emergency stop (19) the control system cannot determine the direction of rotation to drive free.

Procedure

1. Close housing cover (11)
2. Start machine
3. Open housing cover (11) with cover handle (12)
4. Check whether the load rope (3) or the loose pulling rope (2) has operated the limit switch (5).
5. Check whether it is possible to drive free
6. Drive free with the buttons lift (17) or lower (18) (direction of rotation correct)
7. Drive free until the limit switch (5) is no longer activated.

3.5.8 LED load display

The load can be read off via the LED load display (25) in percent. Exact values are measured when the load is held steady.
(Press the Lift key (17) or the Lower key (18) halfway)

Pulling force:

⑧	⑦	⑥	⑤	④	③	②	①	< 12½ %
⑧	⑦	⑥	⑤	④	③	②	①	≥ 12½ % < 25 %
⑧	⑦	⑥	⑤	④	③	②	①	≥ 25 % < 37½ %
⑧	⑦	⑥	⑤	④	③	②	①	≥ 37½ % < 50 %
⑧	⑦	⑥	⑤	④	③	②	①	≥ 50 % < 62½ %
⑧	⑦	⑥	⑤	④	③	②	①	≥ 62½ % < 75 %
⑧	⑦	⑥	⑤	④	③	②	①	≥ 75 % < 87½ %
⑧	⑦	⑥	⑤	④	③	②	①	≥ 87½ % < 100 %
⑧	⑦	⑥	⑤	④	③	②	①	≥ 100 % < 112½ %
⑧	⑦	⑥	⑤	④	③	②	①	≥ 112½ %

Fault display:

Input Error <i>Eingangs-Fehler</i>	⑧	⑦	⑥	⑤	④	③	②	①
					MOP MOP	Cover Deckel	End – End –	End + End +

Device Error <i>Gerät-Fehler</i>	⑧	⑦	⑥	⑤	④	③	②	①
					Binary Coded Binärkodiert		see right siehe rechts	

Device Warning <i>Gerät-Warnung</i>	⑧	⑦	⑥	⑤	④	③	②	①
					Binary Coded Binärkodiert		see right siehe rechts	

Device Error <i>Gerät-Fehler</i>				Device Warning <i>Gerät-Warnung</i>			
0	④	③	②	①	BADPARAS	EEPROM Parameter falsch	PARAS ID-Default/Begrenzung/CRC
1	④	③	②	①	POWERFAULT	Hardware-Fehler	ILLEGAL STATUS Contact supplier
2	④	③	②	①	RFE offen	Sicherheitsschalter offen	RFE Sicherheitsschalter offen
3	④	③	②	①	BUS TIMEOUT	Zeitüberschritten	Warn. 3
4	④	③	②	①	FEEDBACK	Schlechtes oder falsches Geber Signal	FEEDBACK Glitching (?)
5	④	③	②	①	POWERVOLTAGE	Leistungsspannung fehlt	POWERVOLTAGE Quelle(n) < Min
6	④	③	②	①	MOTORETEMP	Motortemperatur zu hoch	MOTORETEMP Motortemperatur >87%
7	④	③	②	①	DEVICETEMP	Gerätetemperatur zu hoch	DEVICETEMP Gerätetemperatur >87%
8	④	③	②	①	OVERVOLTAGE	Überspannung erreicht	Vout_Sat Spannungsausgabe-Grenze erreicht
9	④	③	②	①	I_PEAK	Überstrom >Kritisch	I_PEAK Ausgangstreiber
10	④	③	②	①	Drehzahl	unkontrolliert (Motoranschluss überprüfen)	RACEAWAY Max. Drehzahlauflösung überschritten
11	④	③	②	①	Fehler B		Warn. B
12	④	③	②	①	Fehler C		Warn. C I2t über programmiertem Wert
13	④	③	②	①	PRE_CHARGE	Vor-Lade Ausfall	Warn. D
14	④	③	②	①	HW_ERR	Hardware-Bauteil Ausfall	HW-WARNUNG
15	④	③	②	①	BALLAST	Ballastschaltung überlastet	BALLAST >87%

3.5.9 Pulling force regulation

The pulling force can be adjusted in percent via the potentiometer (26) on the control unit. Exact values are achieved during slow speed. With a sudden load increase, the drive reacts immediately and stops the pulling motion.

Potentiometer setting (26)	Traction force (approx.)	Potentiometer setting (26)	Traction force (approx.)
10%	1.6 kN	75%	12 kN
25%	4 kN	100%	16 kN
50%	8 kN	120%	19 kN



- The load measuring system is technically inert, so that it requires a certain reaction time. If the load increases immediately, the set tensile force may be exceeded for a short time.

3.6 Options

3.6.1 Protective bar

For rugged use, a protective bar can be mounted above the control cabinet.

3.6.2 Pipe frame

For easier handling and protection during transport the HIT-TRAC can be installed within a pipe frame. The pipe frame cannot accept any rope pulling forces.

- To insert the rope: drive a loop of rope from the left into the pipe frame and lay the rope in the drive wheel.
- Guide the pulling rope (3) behind the vertical and under the horizontal rope roller.
- Guide the loose rope and (2) over the horizontal rope roller.



- Caution! The reel turns during operation.
- Only anchor rope pulling device on anchor bolt (8). Never attach to the frame!

3.6.3 Reel drive with pipe frame

With an additional item of equipment on the rope pulling device, up to 120 m of rope exiting loose from the rope pulling device can be automatically wound onto a reel. When lowering, the rope is unwound from the reel. The rope can be easily pulled out by hand and laid in the drive wheel. To transport the rope pulling device undo star handle, pull off reel and pivot in reel carrier.

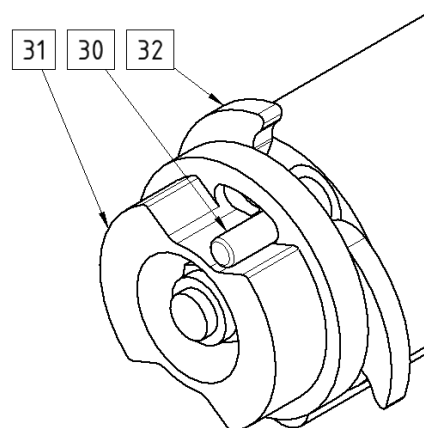


1. Grasp reel carrier by axle, pull-out locking bolt downwards and pivot reel carrier outwards until locking bolt engages.
2. Push on reel I, II or III with rope onto the axle on the main carrier (rope must lead away from the rope pulling device on the reel at the top) and firmly tighten star handle with pliers.
3. The rope can now be pulled out and as with the pipe frame, laid into the drive wheel.

Reel carrier fastener without star handle

Reel mounting:

1. Push the pressure bolt (30)
2. Turn the rotary handle (31) until the pawls (32) are folded in
3. Release the pressure bolt (30)
4. Push on the reel
5. Press the pressure bolt (30)
6. Turn the rotary handle (31) until the pawls (32) are folded out
7. Release the pressure bolt (30)



3.6.4 Control cable extension

The control cable can be extended by the manufacturer.

3.6.5 Extension cable

The power cable can be extended.



- Any kinds of extension cables up to 30 m in length must have a minimum cross-section of $5 \times 2.5 \text{ mm}^2$.
- For longer cables at least $5 \times 4 \text{ mm}^2$

3.6.6 Power generator

The HIT-TRAC machines can be operated with a mobile generator. Jakob AG will be happy to support you with the valuation. Important, the supply must be provided via 5 conductor L1, L2, L3, N and PE.

4 Operation

4.1 Preparation

4.1.1 Electrical connection

All electrical components must be connected and tested in accordance with applicable standards and regulations.

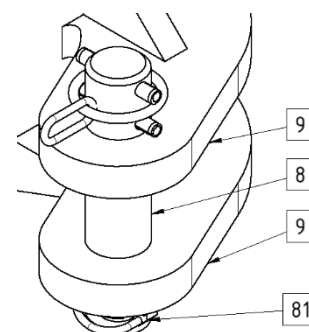
4.1.2 Location

Suitable location for the rope puller.

4.1.3 Anchoring

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

1. Insert the anchor bolt (8) correctly into the anchor lugs of the housing (9)
2. Secure the anchor bolt (8) correctly by turning it through 180° twice
3. Secure the anchor bolt (8) with a linch pin (81)



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.

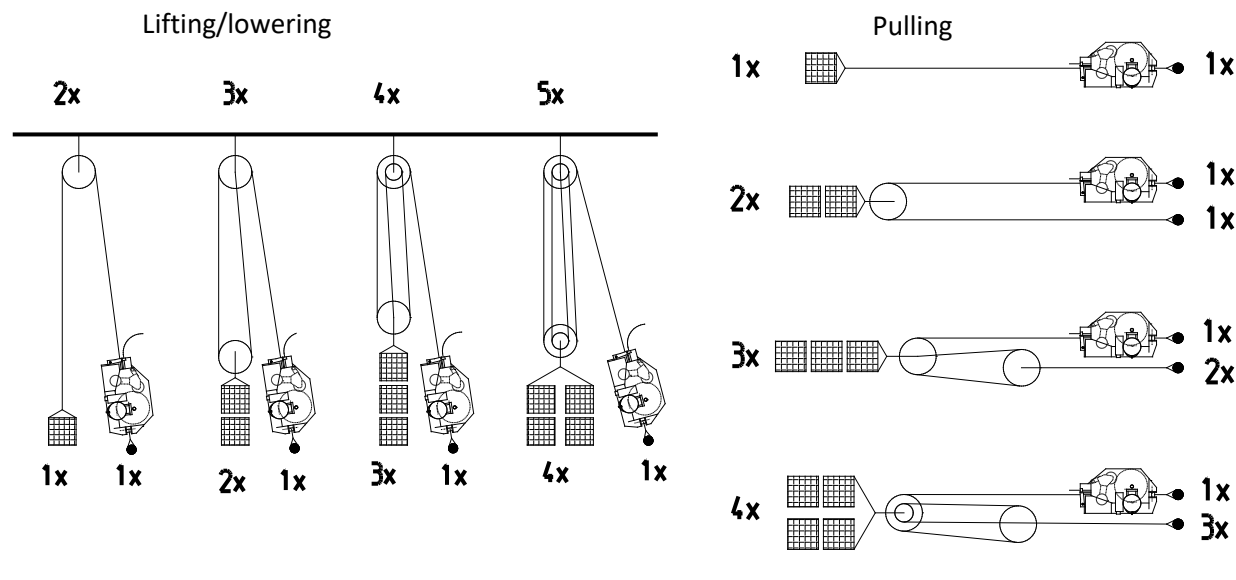
4.1.4 Load

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, straps, 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.



- Caution: 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.
- Caution: 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 16 kN
1x	0	100%	16 kN
2x	1	98%	31.4 kN
3x	2	96% (0.98 x 0.98)	46.1 kN
4x	3	94% (0.98 x 0.98 x 0.98)	61.5 kN
5x	4	92% (0.98 x 0.98 x 0.98 x 0.98)	73.6 kN
...	...	...	...
8x	7	87 % (0,98 ^ 7)	111.4 kN
...	...	...	...
20x	19	68 % (0,98 ^ 19)	217.6 kN

4.1.5 Traction rope

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

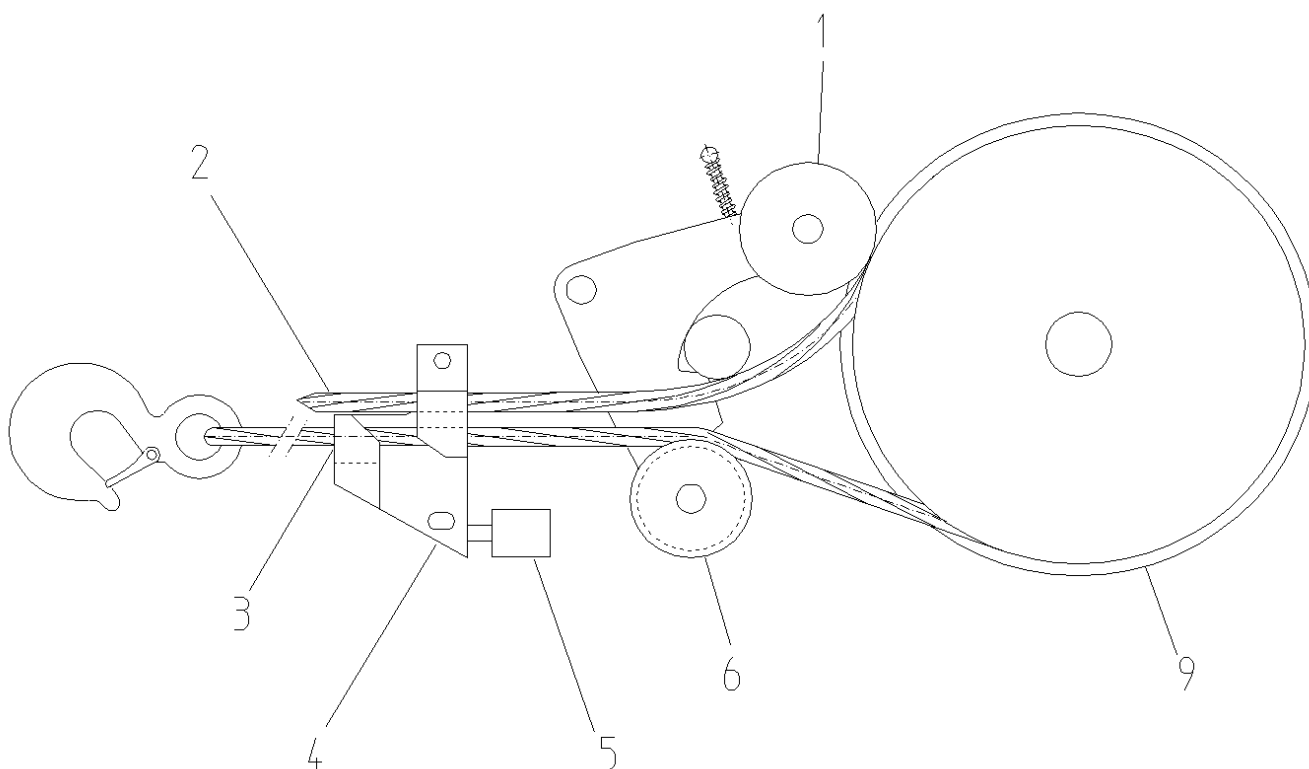
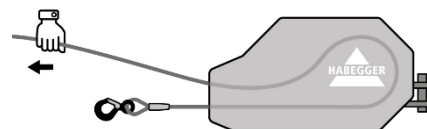
Matching accessories:

- XXX rope reel and carrying tube
- Reel drive in pipe frame
- Reel drive 4 (Art.: 00395)
- Reel drive 6 (Art. 01651)

4.1.6 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. Press lift push button (17).
2. Pulling rope (3) is pulled. Check the rope stretching and lifting of the machine during pulling.
3. Release push button lift (17). Machine stops.

4.2.2 Lowering

1. Press push button lower (18).
2. Load is lowered
3. Release push button lower (18). Machine stops.

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
- Disconnect machine from the power supply

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
Motor does not start when push button is pushed	Housing cover (11) is not closed Power cable not connected Power cable defective Defective fuse in the power supply RCD tripped Emergency stop button (19) on pendant button pressed Limit switch lift/lower (5) activated Other cause	Close housing cover (11) Connect power cable Replace power cable Clarify cause, fuse Replace If necessary replace RCD according to chapter 3.1. Release emergency stop button (19) by turning Drive free Call an electrician, schematic is in the control cabinet cover or on the HSS chip (14)
Despite the motor making a noise the drive equipment does not move	Rectifier defective holding brake does not open Rope tension is greater than permissible pulling force	Replace rectifier Reduce load or use pulley system
Rope does not move, even though drive wheel turns	Rope incorrectly inserted Too small or too thin rope installed Severe wear on rope Drive wheel or rope excessively greased Rope groove in drive wheel strongly contaminated No load on rope	Install rope according to sketch Install correct rope Install new rope Clean Clean Load rope

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	
Direction of rotation of electric motor	X	X	Lift button (17) Turning of the drive wheel in counterclockwise direction
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.