tirak™

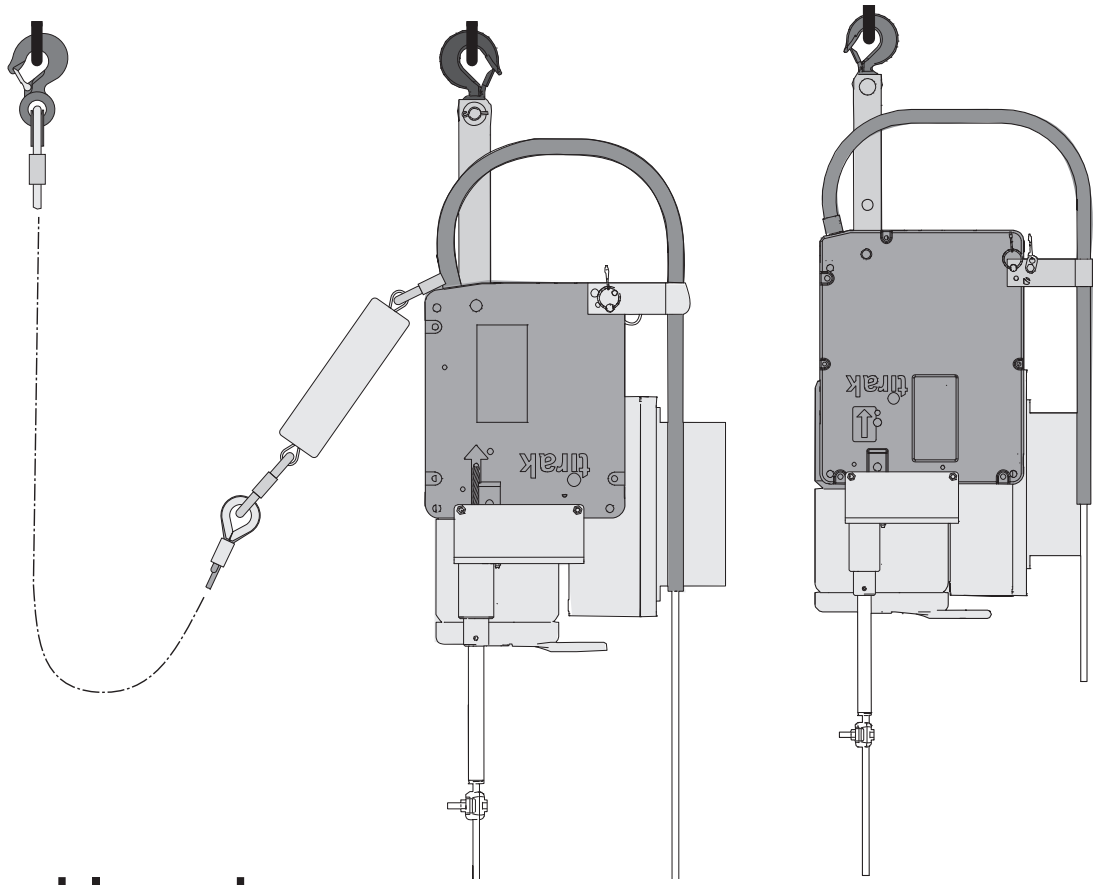
Electrically powered endless hoist for materials handling and man-riding in elevator installations

DIN EN ISO 14001
Zertifikat: 01 104 021411

DIN EN ISO 9001:2000
Zertifikat: 01 100 020037

OHSAS 18001
Zertifikat: 01 113 040078

CE



Assembly and Operating Instruction

tirak™

L 503 P,
X 1030 P, X 1031 P,
X 1032 P, X 1033 P

This instruction manual must be available for the user at all times.
Additional copies may be obtained on request.

Tractel GmbH Greifzug

Contents

Information for this manual

Date of edition

October 2015

Address of the manufacturer:

TRACTEL Greifzug GmbH
Scheidtbachstraße 19-21
D-51469 Bergisch Gladbach
Telefon: +49(0) 22 02 / 10 04-0
Telefax: +49(0) 22 02 / 10 04-50 or -70
internet: www.tractel.com

Explanation of symbols used

Safety advice

Symbol	Code word	Meaning	Possible consequences of noncompliance
	**DANGER**	**IMMEDIATE or possibly imminent danger:**	**Fatal or serious injuries!**
	**DANGER**	**IMMEDIATE or possibly imminent danger through dangerous voltage:**	**Fatal or serious injuries!**
	**CAUTION**	Possibly **dangerous situation:**	**Injuries to persons** or **damage to property.**
Other advice 	**Attention**	Possibly **dangerous situation:**	**Damage to appliance**. or its **surroundings.**
	**Important**	**Useful tips** for optimum working:	None
Directions 	(without code word)	Instruction to **operation/ documentation in writing**.	

1. Exclusion of non-intended use

Use of standard **tirak™** hoists and other equipment for man-riding under the following conditions **is prohibited**:

- at temperatures **below -10 °C** or **above +50 °C** (for advice regarding gearbox oils for lower/higher temperatures contact the manufacturer);
- in potentially explosive atmosphere
- with another wire rope than prescribed and correct **tirak™** wire rope
- with missing or insufficiant lightning of the workplace or respectively the working environment.

Machines for these conditions can be supplied on request.

2. Safety advice

Follow all instructions and safety regulations contained in this manual to avoid injuries.

a) **tirak™** hoists for man-riding are designed for installation in “Suspended access equipment (SAE)”.

b) **tirak™** hoists with standard electric equipment must not be used in a potentially explosive atmosphere[1)].

c) Anchoring, maintenance, and/or the operation of a **tirak™** hoist must only be done by persons, who are familiar with it. Employees must have received the instruction to anchor, maintain, and/or operate the hoist by their employer.

d) They must be familiar with the relevant accident prevention regulations e.g. “Hoists, lifting and pulling devices (BGV D8)”, “safety requirements on suspended access equipment (EN 1808)” etc. and have been instructed accordingly.
They must have read and understood the assembly and operating instructions prepared by the manufacturer of the SAE.

e) If more than one person is entrusted with one of the above mentioned activities, the manufacturer of the SAE must designate a supervisor who is authorised to give instructions.

f) Only **tirak™** hoists, ropes, anchoring devices as well as leads and control cables in good condition must be used.

g) **DANGER!**

Using a tirak™ hoist for man-riding on or inside an elevator cabin **is only allowed, if the fall arrest device of the cabin is functioning**.

Safe access must be provided **on-site** to get to the hoist, which is installed on top of the elevator shaft.

h) Before starting with the assembly, please check that all parts are complete and defect-free.

i) Anchor **tirak™** hoist so that the lifting rope is vertically entering.

k) Only anchor **tirak™** hoist at the points provided for this purpose and according to the “Schindler Installation Manual”.

l) When using self-locking nuts please observe the following:
   – the screw must **protrude from the nut** with at least half of its thread diameter;
   – **do not re-use nuts** if they can be unscrewed by hand!

m) **DO NOT** overload the **tirak™** hoist.

n) Use only the prescribed **tirak™** rope in perfect condition. Use only normally commercially available multi-purpose greases for the required lubrication of the rope. Do not use any lubricants containing disulphide (e.g. Molycote®).

o) When using a rope other than the prescribed **tirak™** rope, the warranty entitlement given by TRACTEL Greifzug GmbH shall not apply.

p) The electrical connection of the **tirak™** hoists as well as of electrical accessories must be carried out in accordance with EN 60204-1.

q) Checks of the electrical system must only be performed by qualified electricians. Repairs only after agreement by the manufacturer.

r) Other checks must only be performed by persons, who have been trained by the manufacturer. Repairs must only be carried out by TRACTEL Greifzug GmbH resp. with written agreement of the manufacturer and by persons, who have been trained by him.

s) TRACTEL Greifzug GmbH shall assume no liability for damage as a result of conversions and alterations to the devices supplied by itself or as a result of the use of non-original parts.

1) **tirak™**-hoists can be supplied for these applications on request.

3. Machine description

3.1 Purpose

tirak™ hoists of the series

L 500 P and X 1030 P

are portable, electric driven hoists for

Lifting and Lowering of "Suspended access equipment (SAE)"

by means of a **tirak™** wire rope prescribed by the manufacturer. This wire rope is mandatory for the safe and troublefree working with **tirak™** hoists.

The hoists and the accessories described here are only intended for the work procedure described in the following section.

3.2 Working principle

tirak™ hoists referred to in 3.1 are installed above the SAE, which they lift/lower by means of a wire rope.

For either lifting or lowering there is one corresponding push button.

The wire rope is driven through the winch with constantly equal safety, and the length of wire rope i. e. the possible pulling length, is practically unlimited.

All **tirak™** hoists referred to in 3.1 have an integrated load limiting device.

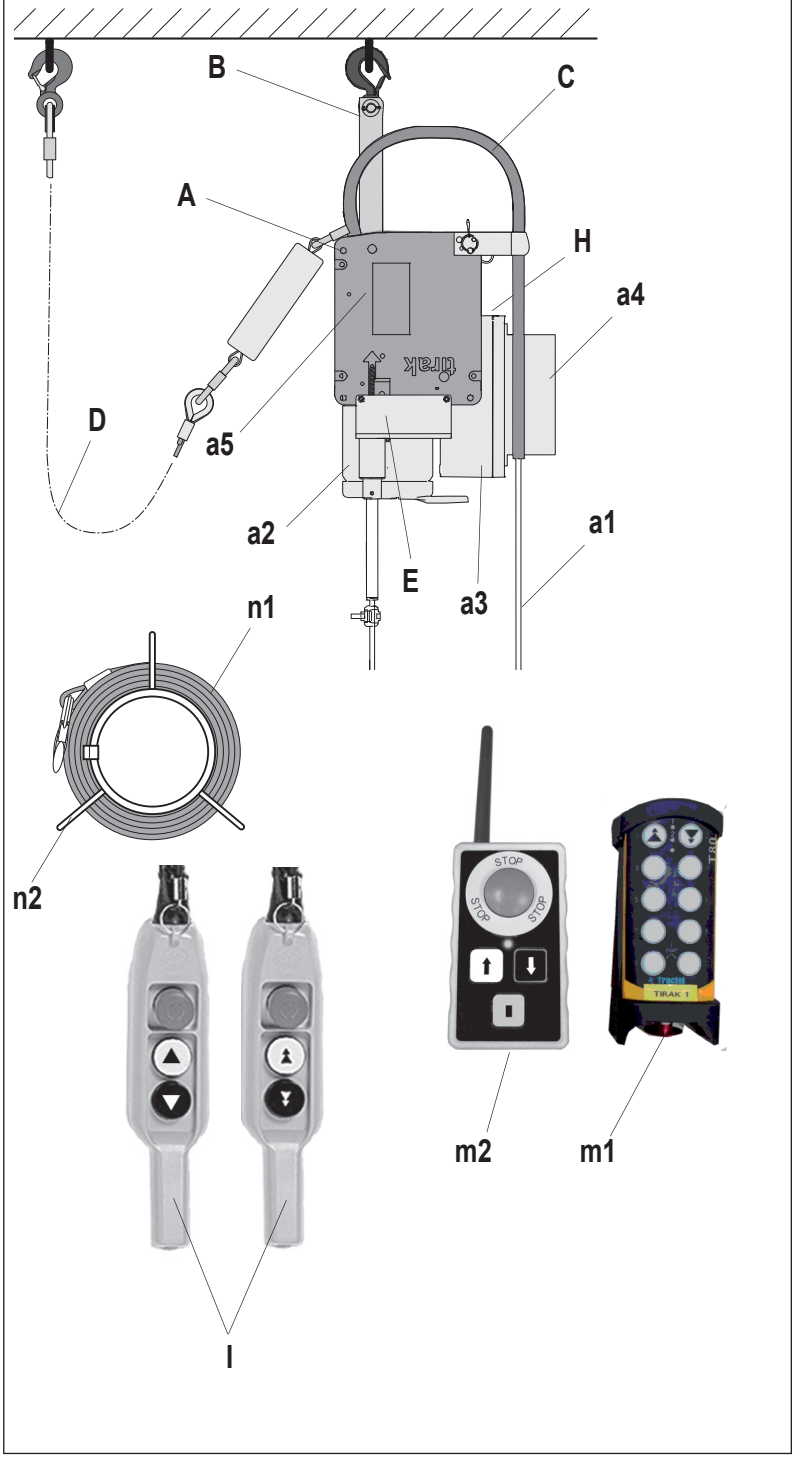
3.3 Allowed tirak™ wire rope for man-riding

for **tirak™** series	**Wire-rope-Ø**
L 500 P	**8 mm**
X 1030 P	**10 mm**

Identification: one **red** strand.

3.4 Main components and operating controls

Fig. 1 (Principle sketches)



Basic package

A tirak™ with
- a1 Suspension rope
- a2 Motor
- a3 Control box
- a4 Remote control
- a5 Rope drive

B Adapter with safety hook

C Rope deflector (rope guide spring)

D Safety rope

E Limit switch UP

F Rope limit switch (limit switch DOWN) (not shown)

G Rope limit switch (limit switch DOWN) (not shown)

H Running hours counter

I Pendant control for one or two speeds including 3 m cable, pluggable

K Mains connection (not shown)

Options

M Control
- m1 Remote control (Teleradio)
- m2 Remote control (Hetronic)

N Wire rope
- n1 Wire rope with tip and hook on a manual reel
- n2 Rope reel up to 650 m (other rope lengths on request)

O Accessories
- o1 Deflection roller with safety hooks and travel limiter
- o2 Extension cable for the button panel: Length on request (not shown)
- o3 blocstop™ BSO fall arrest device

3.5 Noise emission

tirak™ series (Distance 1 m)

L 500 P ..... max. 72 dB(A)

X 1030 P ..... max. 70 dB(A)

3.6 Technical Data

3.6.1 tirak™ Hoist

Design according to DIN 15 020, transmission group 1 B_m or 1 C_m[1].

Technical modifications reserved.

Hoist tirak™-Typ	Capacity kg[2]	Rope speed m/min	Type of drive –[3]	Output kW	Rated current A	tirak™ rope Ø mm	Dead weight approx. kg[4]
L 503 P	**500**	9/18	D	0.9/1.8	3.0/5.4	8	40
X 1030 P	**1000**	9	D	2,2	5,3	10	47
X 1031 P	**1000**	7	W	2	10	10	59
X 1032 P	**1000**	18	D	3,6	10,6	10	58
X 1033 P	**1000**	9/18	D	1.8/3.6	5.5/9.0	10	58

Table 1

1) Hoist to 9 m/min = Driving group 1B_m, Hoists over 9 m/min = Driving group 1C_m
2) If the capacity is not sufficient in direct pull, multiply it by reeving the rope according to the block and tackle principle.
3) D = 400 V three phase current; W =230 V single phase current.
4) Weight without wire rope

Fig. 2a Dimensions of L 503 P

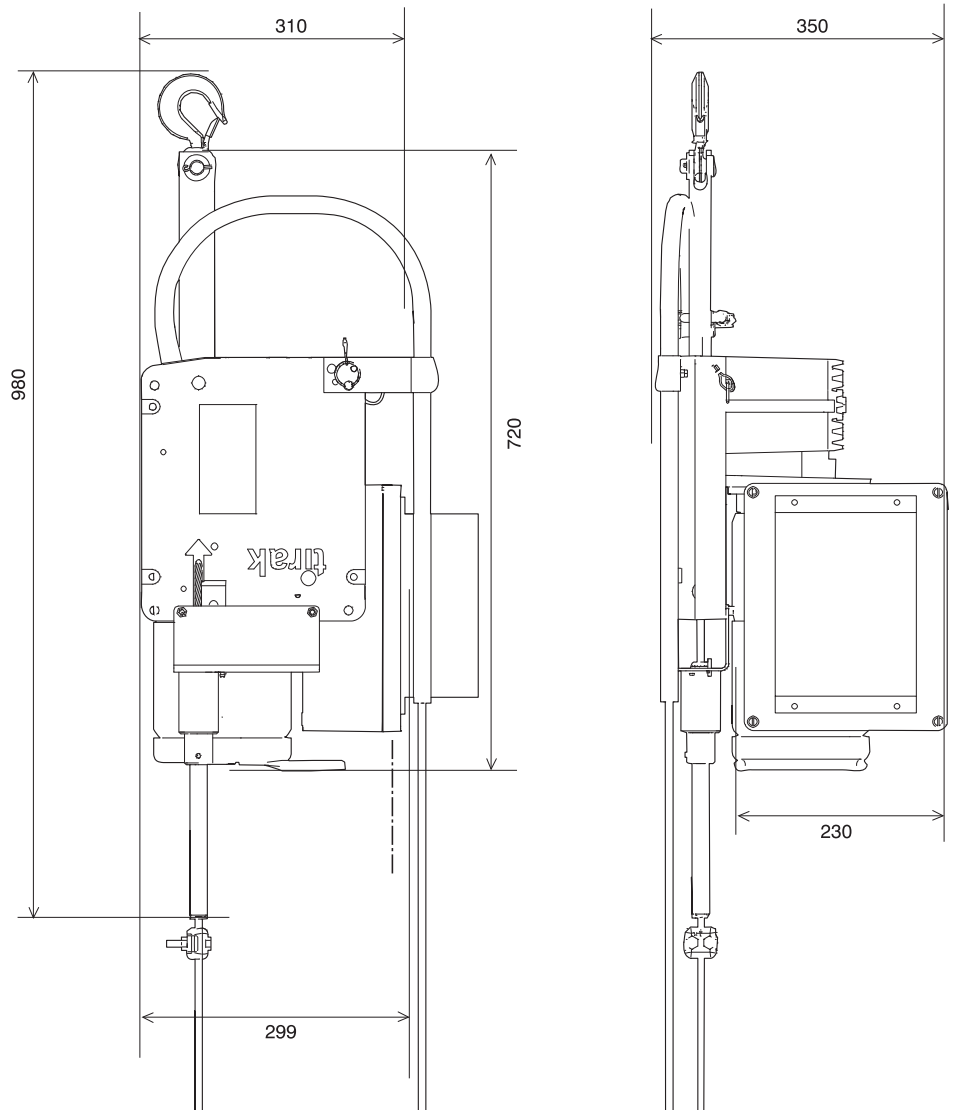
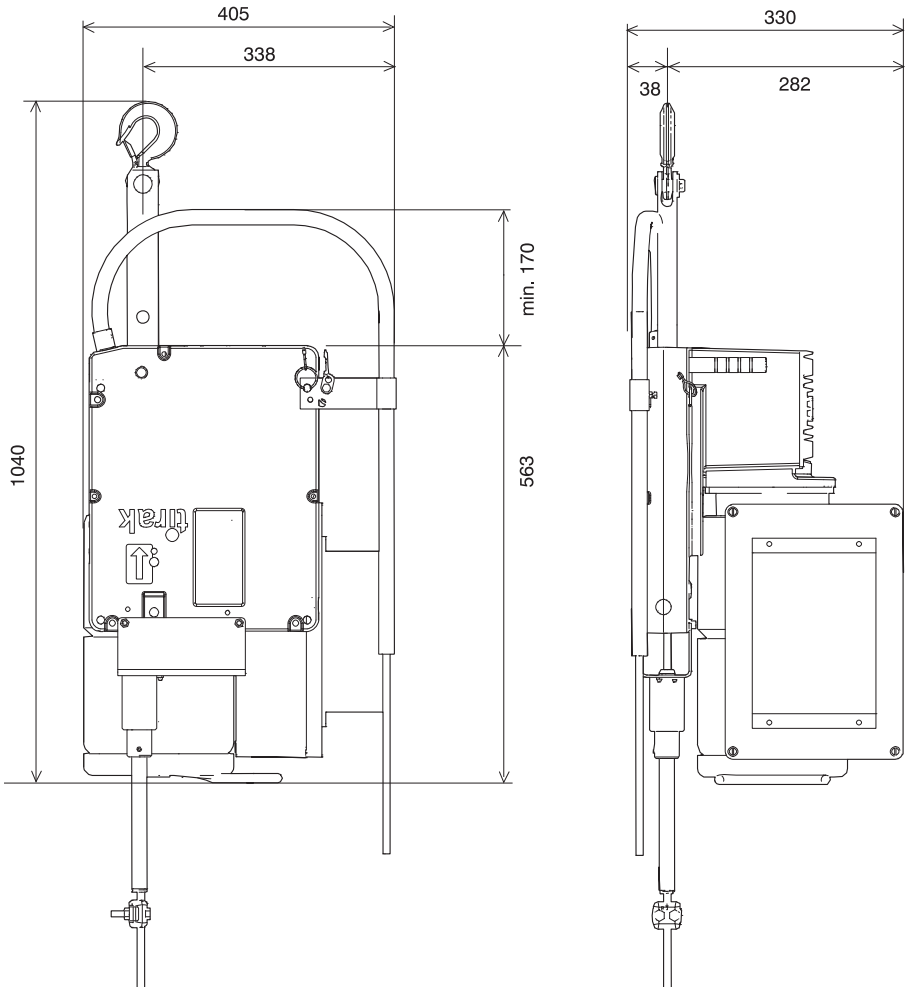


Fig. 2b Dimensions of X 1030 P series



3.6.2 Fall arrest device

DANGER!

Using a tirak™ hoist for man-riding on or inside an elevator cabin **is only allowed, if the FALL ARREST DEVICE OF THE CABIN is functioning**.

3.7 Typical application

Fig. 3a Typical application on an elevator cabin with **single capacity of the tirak™ hoist** (Principle sketch)

DANGER!

NO MAN-RIDING WITHOUT FUNCTIONING FALL ARREST DEVICE!

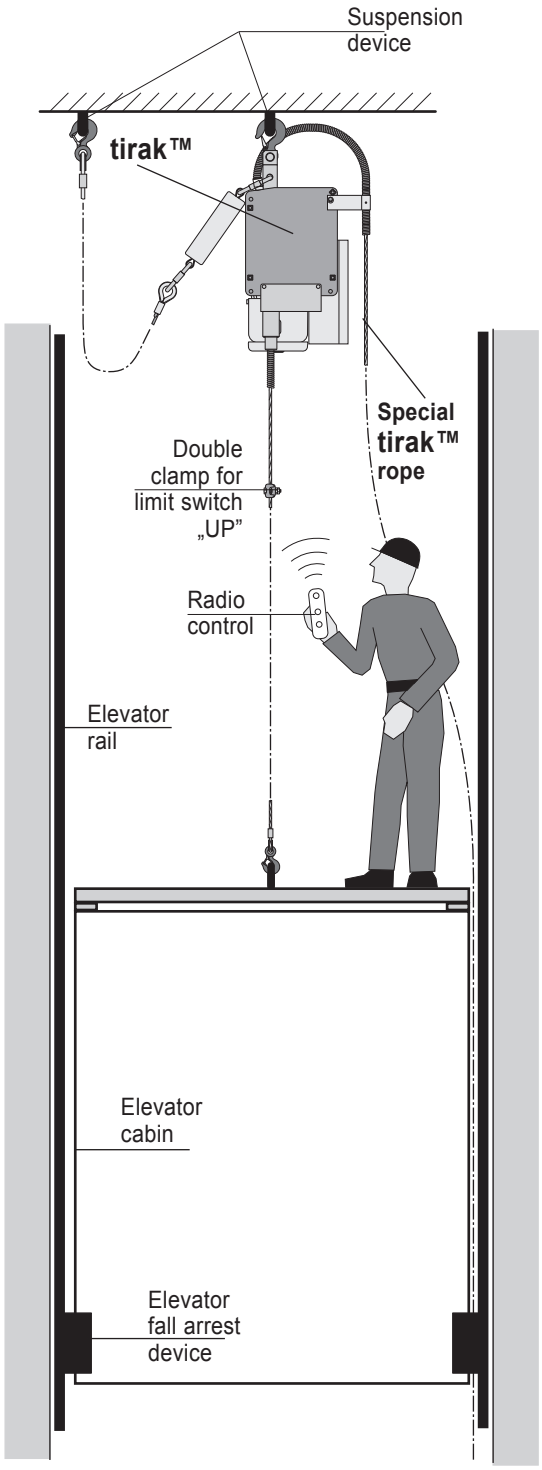


Fig. 3b Typical application on an elevator cabin with **double capacity of the tirak™ hoist** (Principle sketch)

DANGER!

NO MAN-RIDING WITHOUT FUNCTIONING FALL ARREST DEVICE!

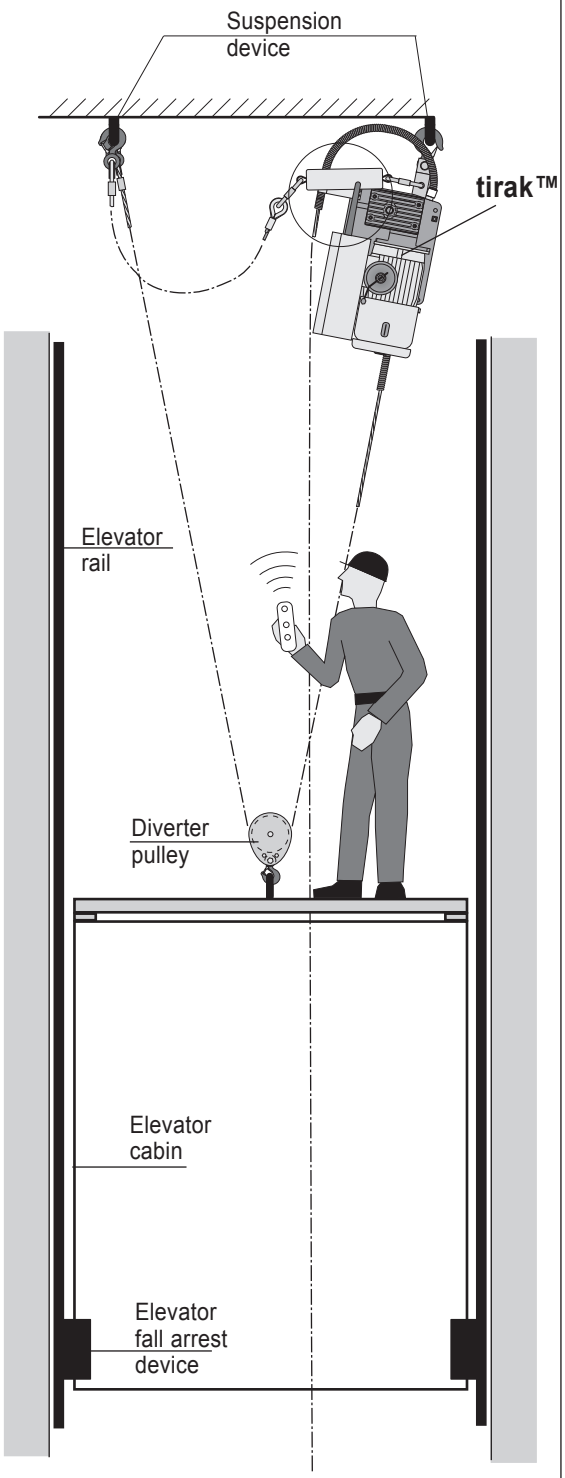
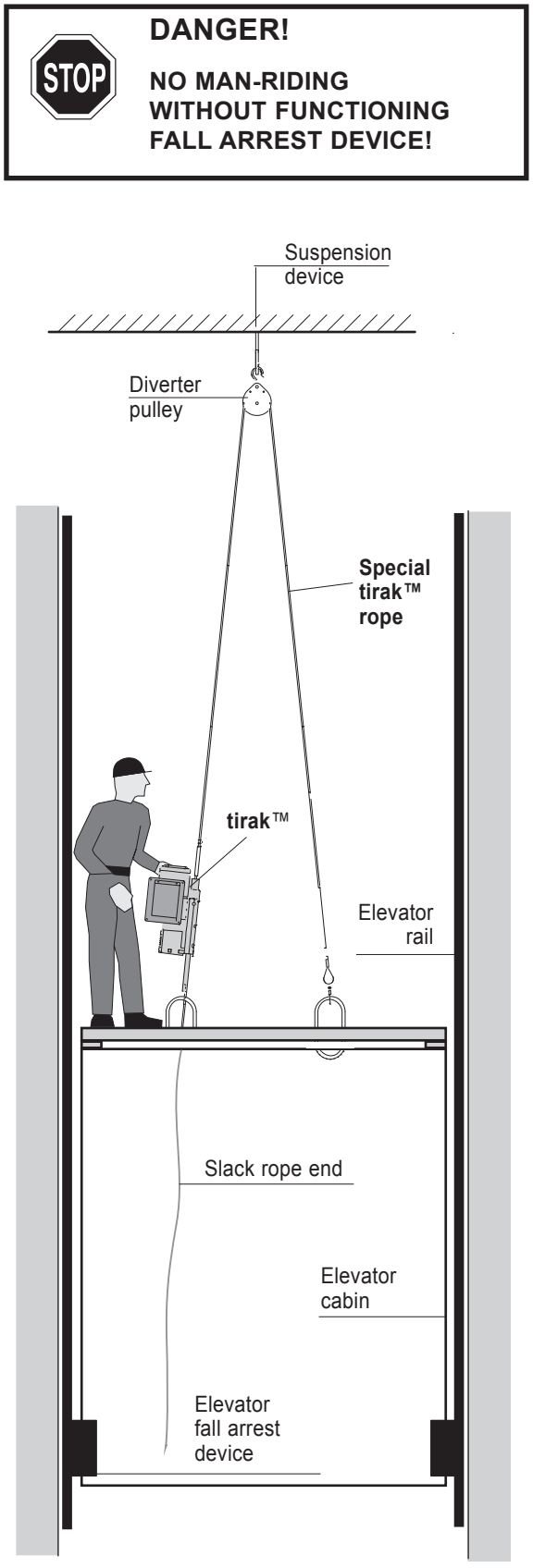


Fig. 3c Application on an elevator cabin with **double capacity of the tirak™ hoist** (Principle sketch)



3.8 Safety devices

3.8.1 Primary brake

Electromagnetic brake which closes automatically

– if the UP/DOWN-button is released (Fig. 4),
– when pushing the EMERGENCY-STOP button, and
– in case of power supply failure.

3.8.2 EMERGENCY STOP

Pushing the red EMERGENCY STOP button in case of emergency completely switches off the hoist control.

To start after clearing the problem, push the ON-button.

3.8.3 Phase control relay

On hoists with 3-phase motors, the integrated phase control relay stops the operation, if the phases are reversed. This prevents wrong coordination of the UP/DOWN-buttons, which would prevent operation of the load limiting device as well as the upper limit switch. **Correction**: turn the **phase inverter** of the plug by 180° (Fig. 5).

3.8.4 Load limiting device

The load limiting device is installed in the rope drive and switches off the UPWARD travel in the event of overload.

A warning signal (buzzer) is triggered inside the **tirak™** control box, which does not go off until the cause of the overload has been removed.

Possible **causes for the switching off**:

– overload of the suspended access equipment
– or the suspended access equipment being blocked by an obstacle during upward travel.

Action following switching off:

– reduce load to such an extent that, or redistribute it until there is no longer any overload, or
– move downwards until the suspended access equipment is free from the obstacle which must be removed before travel is continued.

3.8.5 Limit switch UP

Limit switch UP (Fig. 6) stops lifting, as soon as it is reached by the double clamp mounted on the rope.

CAUTION!
When using the diverter pulley for reeving the rope, on-time switching off must be guaranteed by an on-site installed limiting device!

Fig. 4

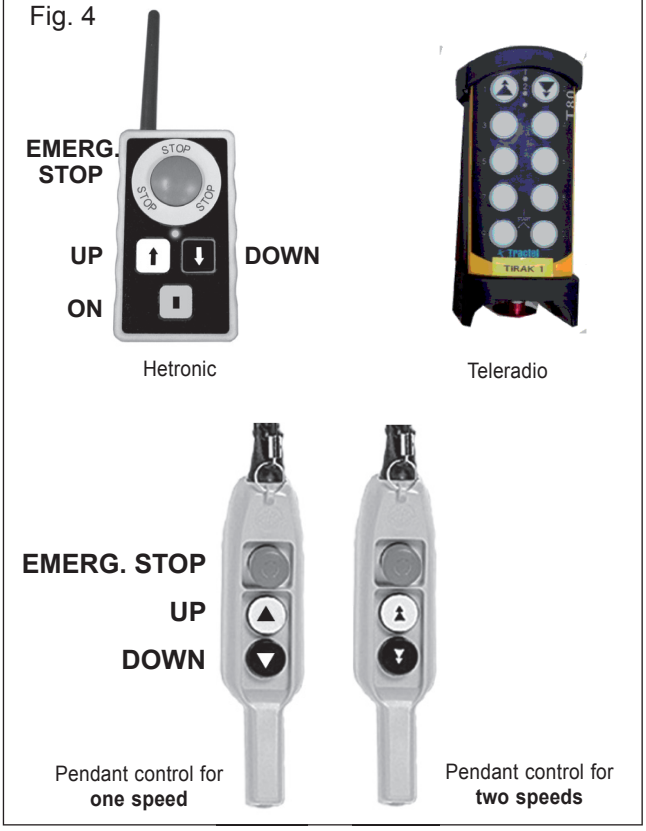


Fig. 5

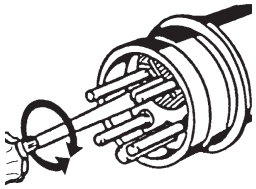
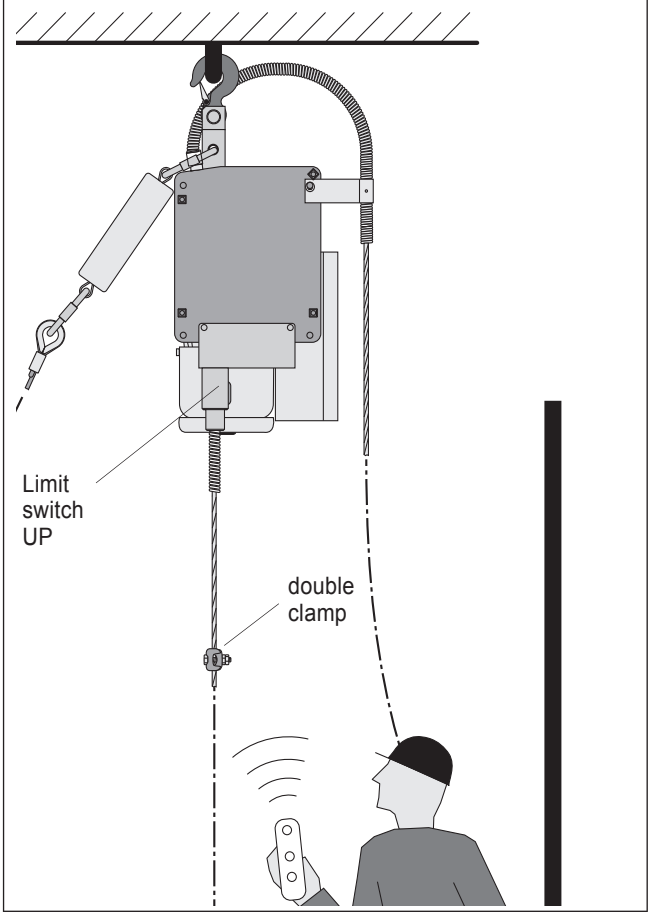


Fig. 6



3.8.7 Manual Operation

3.8.7.1 **Emergency Descent**

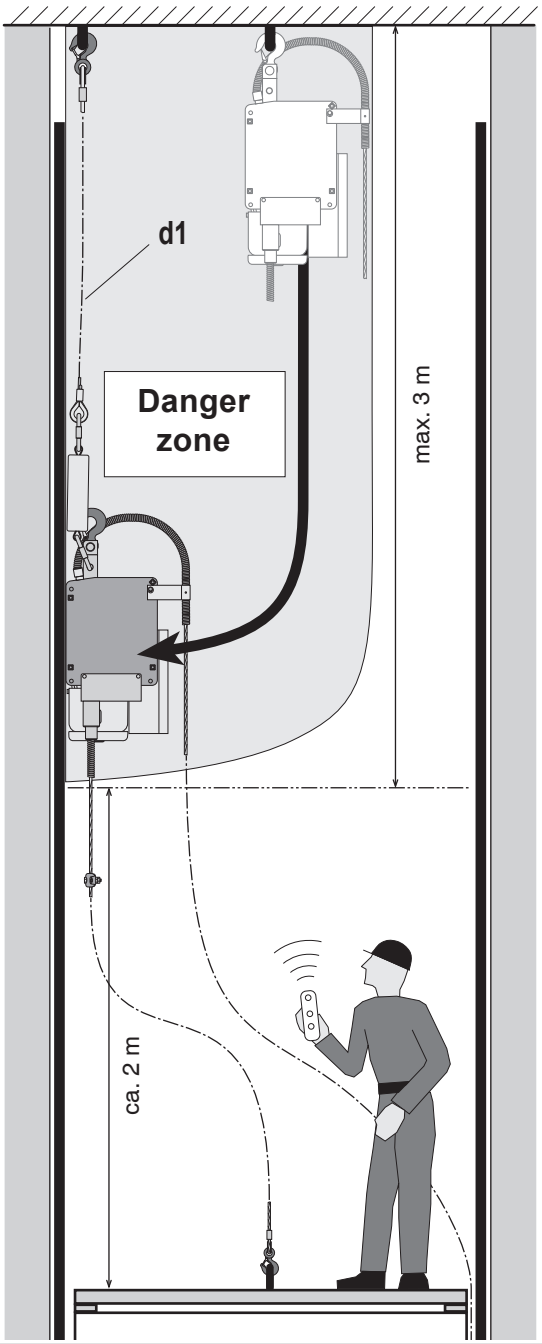
In case of power failure you can **manually open the brake** with lever (1) (Fig. 7).

3.8.7.2 **Manual lifting**

With the **brake opened** the suspended access equipment can be lifted with the hand wheel (2). (Fig. 7).

Details in chapter 5.5 on page 22.

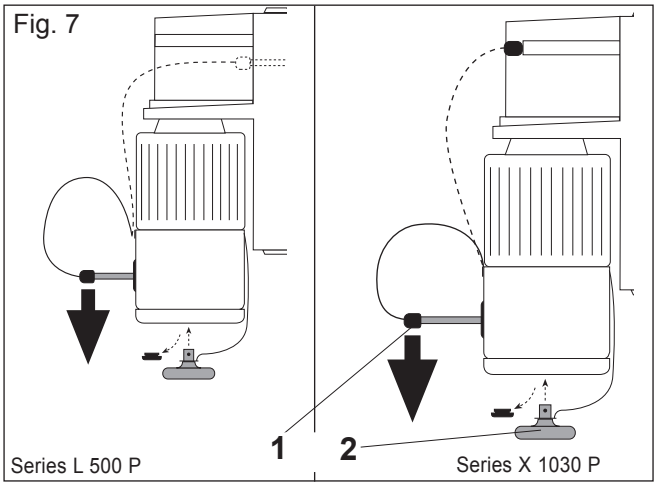
Fig. 8



3.8.8 Fall arrest device for the hoist

A **safety rope c/w energy absorber** (d1) arrests the **tirak**™ hoist in case of its anchoring failing (Fig. 8) – the cabin itself is secured against fall by its own fall arrest device.

Fig. 7



DANGER!

To prevent from injuries, special measures of precaution are required for working in the danger zone (= the hoist's falling area)!

For details see chapter 5.6 on page 23.

3.9 Residual risks

CAUTION!

The following risks are not constructively covered for the tirak™ hoist:

a) The **load limiting device** is set to the maximum rated capacity of the respective hoist;
the manufacturer of the suspended access equipment must check whether the admissible overall weight of his installation (own weight + working load) corresponds to this value.

Adjusting the only by the manufacturer resp. by persons, who have been trained by him.

b) **Limit switch UP:**

With reeved rope by using the diverter pulley, the **double clamp cannot be mounted on the rope**.

Therefore an **on-site installed device must assure that the hoist stops, as soon as the highest allowed position of the SAE** (resp. of the load to lift) **is reached!**

c) **Residual risks related to the radio control**: see chapter 10.4 on page 32.

d) **Limit switch DOWN:**

DANGER!

In event of a malfunction, the rope can run out of the hoist and fall down.

The inductive limit switch DOWN stops the downwards travel as soon as no more rope is detected. In event of heavy soiling, safe operation cannot be guaranteed which is the reason why this limit switch is not a safety component.

The rope must be long enough so that the personnel lifting equipment can stand safely on the ground before the rope runs out in event of the switch failing.

4. Setting up

4.1 General

The manufacturer of the suspended access equipment is responsible for ensuring that the device, including the suspension construction, conforms to the applicable standards.

4.2 Required equipment

a) **tirak™** hoist(s) of correct capacity with load limiting device and safety rope c/w energy absorber.

b) Radio control ready for use.

c) **For man-riding on or inside the elevator cabin**: **Functioning fall arrest device** of the cabin.

d) Prescribed **tirak™** wire rope with correct diameter and of sufficient length. Also multi-purpose grease to lubricate the rope.

e) Electric supply cable of correct type and required length, with correct number of wires and cross sectional area.

f) For diverting or reeving the wire rope:
The diverter pulley delivered with the hoist.

Check condition of all components.

4.3 Anchoring the tirak™ hoist

important!

If not described hereafter, follow the instructions of the „Schindler-Installation Manual" referring to this procedure.

4.3.1 Verification of the carrying capacity

The **carrying capacity of the suspension construction** and the **anchor points** for the rope resp. the diverter pulley **of the cabin** must have been certified:

Load x Safety factor 4!

For details regarding the **Load** see Figs. 9a to 9c on the following pages.

DANGER!

STOP

Slings, shackles or other anchoring devices must have the sufficient capacity!

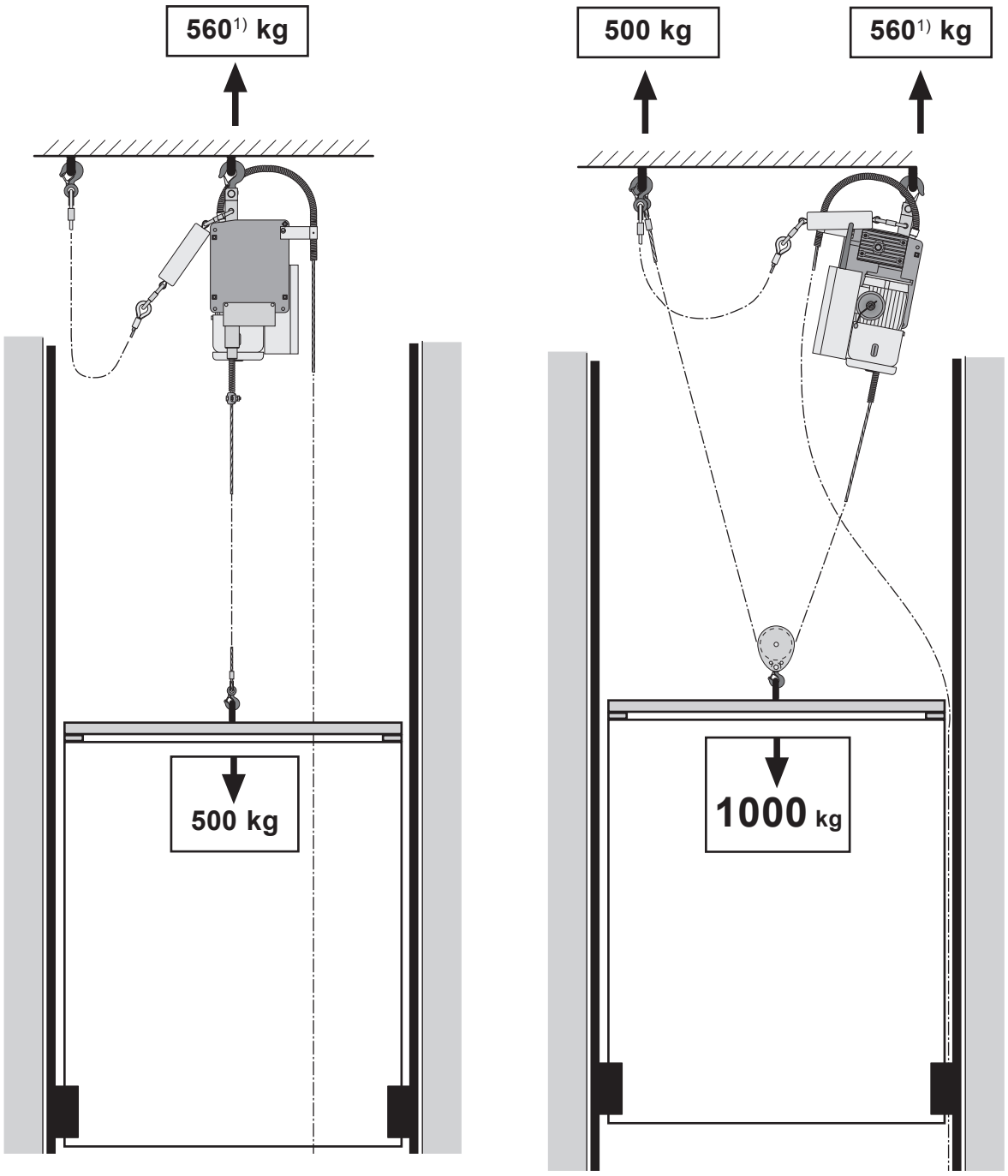
A) tirak™ L 503 P

Required statical certification:

Load x Safety factor 4!

Fig. 9a

Loads
at the anchor points



1) 500 kg capacity **+ 60 kg max. weight of the hoist**

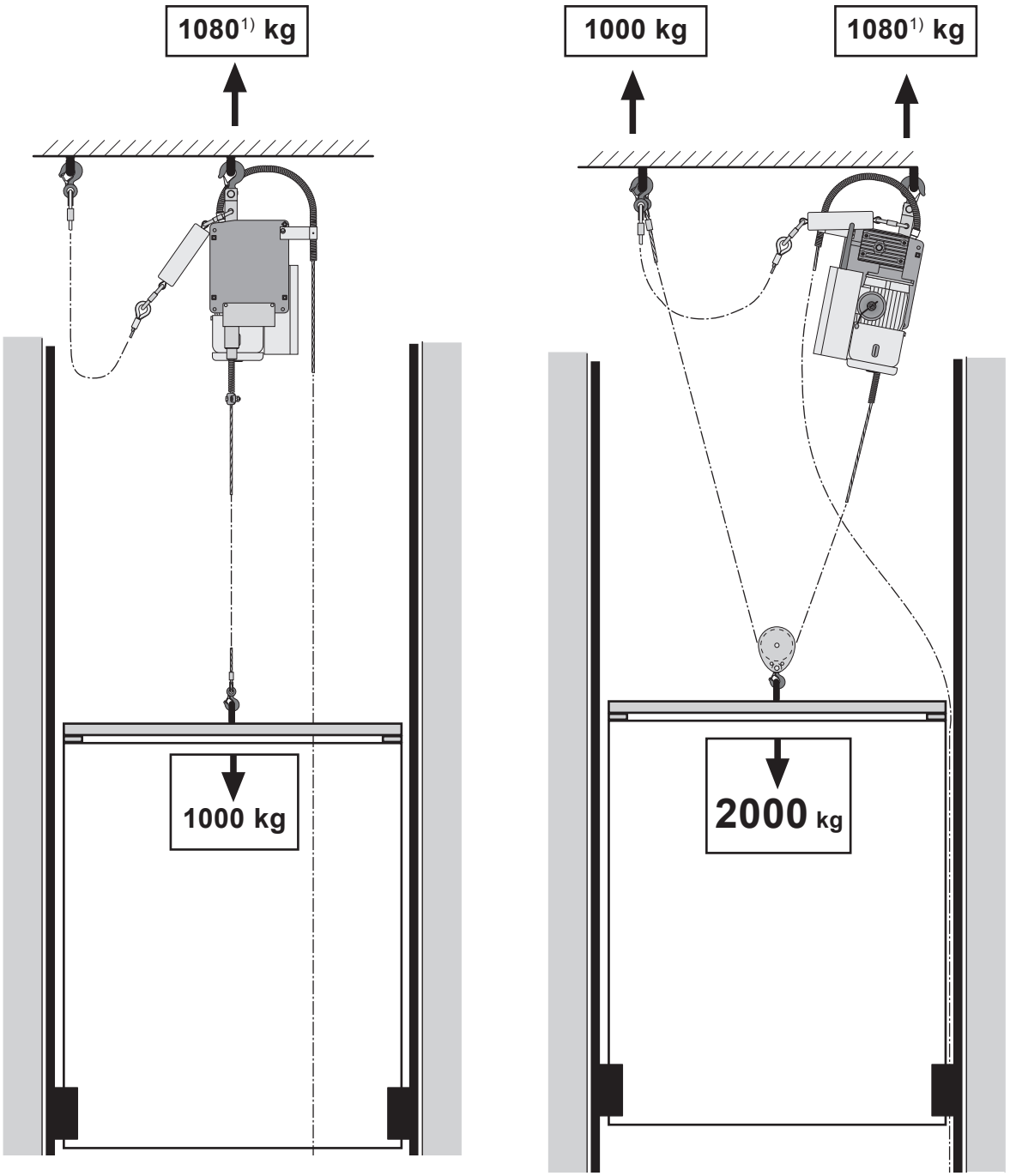
B) tirak™ X 1032 P

Required statical certification:

Load x Safety factor 4!

Fig. 9b

Loads
at the anchor points



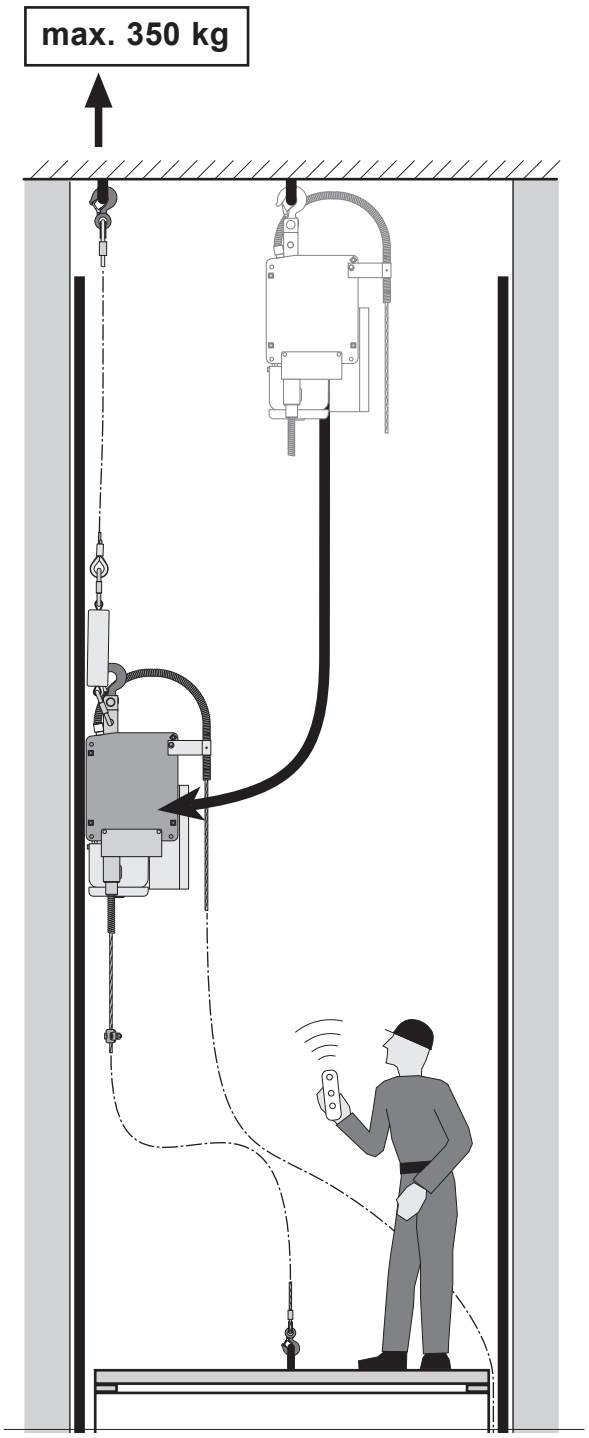
1) 1000 kg capacity **+ 80 kg max. weight of the hoist**

4.3.1 Verification of the carrying capacity (Continued)

C) Safety rope

Fig. 9c

Load
on the anchor point
in the arrest case



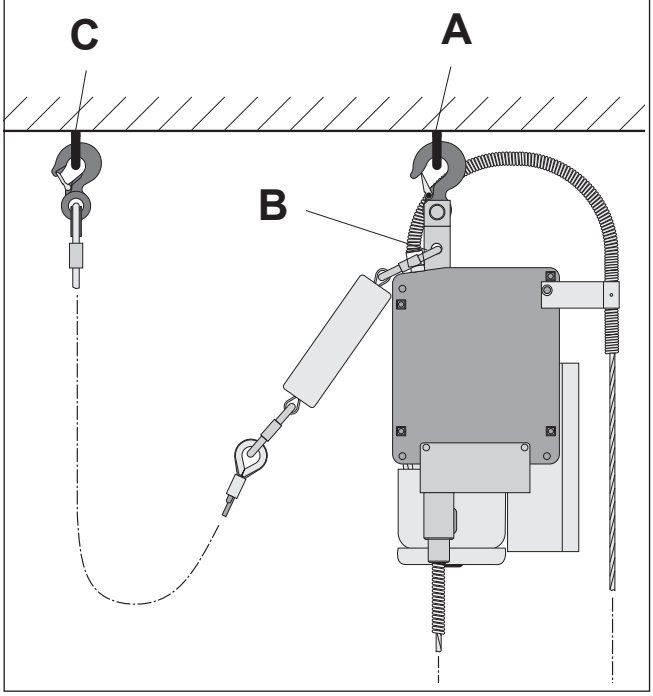
Required statical certification:

Load x Safety factor 4!

4.3.2 Anchoring the hoist

The hoist is equipped with a mounted adapter for anchoring by hook (Fig. 10).

Fig. 10 (Principle sketch)



a) Anchor the hoist to the fixing point (**A)** so that it can **align itself in pulling direction**.

b) Connect the **safety rope** with its **energy absorber** by means of the snap-hook at point (**B**) to the hoist, and anchor it to suspension point (**C**).

4.3.3 Anchoring the radio control

DANGER!

STOP

To avoid danger for persons on the elevator cabin by non-authorized use from outside the elevator shaft, the radio control must be anchored to the cabin.

On site, **anchor the radio control to the cabin** by means of the anchor rope (Fig. 11), so that it **cannot be removed** by means of **normally available tools**!

Fig. 11

4.4 Electrical Connections

The manufacturer of the suspended access equipment is responsible for the connection of the **tirak™** hoists taking into consideration the wiring diagrams provided.

DANGER!

The electrical connection for **tirak™** winches must conform to EN 60204-1.

The lead must be on-site protected by fuse.

Always pull the plug out before opening a central control!

a) Does **mains voltage** complies with the **motor?**

- **3 phase**: 400 V (3P + N + PE), 50 Hz, 16 amp rated plug and socket
- **Single phase**: 230 V (P + N + PE), 50 Hz, 16 amp rated plug and socket

If in doubt ask the manufacturer.

b) **Minimum cross sections of supply cable. Important** for longer distances between supply net resp. generator and **tirak™**:

Table 2a
indicates the reference letter of the **tirak™** model and the mains supply voltage.

Maximum speed must be used for **tirak™** with two speeds.

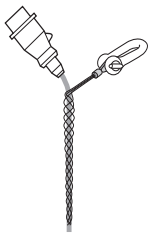
Table 2b
gives the **minimum cable cross section** based on the reference letter.

c) Use only **heavy duty cables with incorporated strain relief**.

d) **Hanging cables** longer than 30 m should be fixed by means of a cable sleeve or cable clamp. (Fig. 12).

e) When using a **generator,** its output must be at least **3 times greater** than the **tirak™ power consumption**.

Fig. 12



Cable sleeve

tirak™ Series	Max. rope speed m/min	1 **tirak™**			2 **tirak™**		
		3 phase 400V	230V	1 ph. 230V~	3 phase 400V	1 ph. 230V	230V~
L 500 P	9	A	C	E	B	E	F
	18	B	E	-	D	G	-
X 1030 P	9	B	E	-	D	-	-
	18	C	F	-	F	-	-

Table **2a**

Reference letter of table 2a	For cable lengths up to ... 20 m	50 m	100 m	200 m
A	1,5	1,5	1,5	1,5
B	1,5	1,5	1,5	2,5
C	1,5	1,5	2,5	**4**
D	1,5	2,5	**4**	**6**
E	1,5	2,5	**4**	**10**
F	1,5	**4**	**10**	**16**
G	2,5	**6**	**10**	**16**
	Cross section (mm^2)			

Table **2b**

Fig. 13a

4.5 Radio control

Function / Switching on

To start push the „ON" button, the function control lamp starts blinking green (Fig. 13a).

Buttons for **UP** and **DOWN**.

For hoists with **2 speeds**:

half depressed	=	low speed
fully depressed	=	high speed

EMERGENCY-STOP-button:

push the button	=	mains supply interrupted

The lamp shortly blinks red and extinguishes.

To re-start push **„ON" button**, until the function control lamp starts blinking green.

4.6 Pendant control

Buttons for **UP** and **DOWN**.

For hoists with **2 speeds**:

half depressed	=	low speed
fully depressed	=	high speed

EMERGENCY-STOP-button:

push the button	=	mains supply interrupted

Important: If the hoist doesn't start, two phases of the power supply may be reversed – the integrated phase control relay stops the operation.
Correction:
Turn the **phase inverter** of the plug by 180°.

4.7 Wire rope installation

The hoist is usually supplied with **max. 60 m wire rope Ø 10 mm resp. 100 m wire rope Ø 8 mm wire rope** stored on a hasp (Fig. 14).

4.7.1 Preparing the rope

CAUTION!

Use gloves, when handling wire ropes.

a) **Use only prescribed tirak™ wire ropes**.

b) Check **correct diameter** and **sufficient length (max. 60 m wire rope Ø 10 mm resp. 100 m wire rope Ø 8 mm)** of the wire rope.

c) Always **unreel** the wire rope **in a straight line** (Fig. 15), to prevent it from becoming unusable because of loops.

d) Check the **wire rope condition** for damage:
- Hook is not bent; proper safety catch is in place, proper connection between the wire rope and the hook (rope eye, ferrule) (Fig. 16a);
- the wire rope has no visible damage along its total length; the fused and tapered end is according to Fig. 16b.

Fig. 15

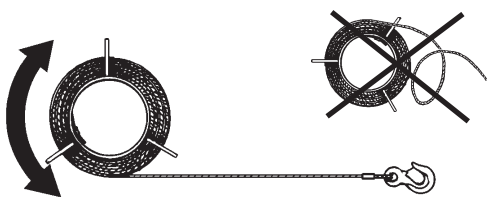


Fig. 13b

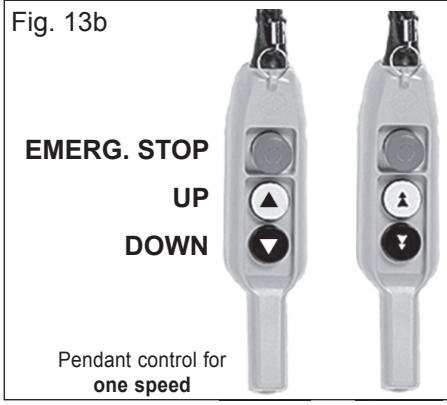
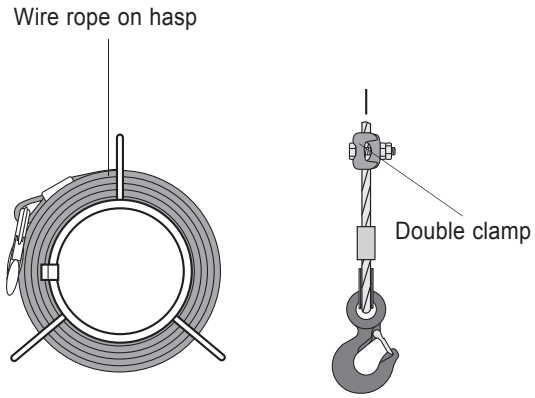


Fig. 14 (Principle sketch)



e) **Attention!**

Never use the tirak™ wire rope for fixing a load!

Never let it rub over sharp edges!

Always ensure a **clear rope exit**!

Always keep it **lightly lubricated**!
Use normal commercially available multi-purpose grease; **do not use** lubricants containing disulphide (e.g. Molycote®).

Fig. 16a

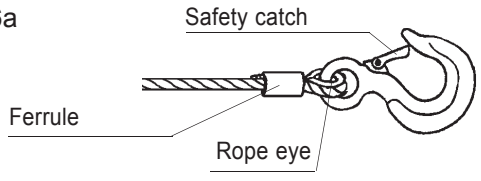
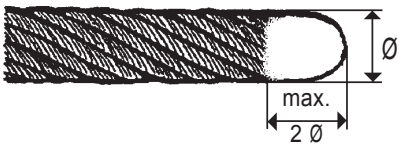


Fig. 16b



4.7.2 Rope installation

DANGER!

For the wire rope installation, the cabin has to be at its lowest possible position, to make sure, that the wire rope is sufficiently long.

4.7.2.1 Installation for **direct pull**

a) Feed the wire rope as far as possible into the wire rope guide spring (**A**) (Fig. 17).

b) Start the control, push “UP” button, and push the wire rope, until it starts to reeve itself automatically, enters the rope guide spring (**B**), and exits at (**C**).

c) Anchor hook (D) to the cabin (Fig. 19) and push UP button, until the rope is slightly tensiond.

d) Take appropriate precautions to let the free wire rope end pass at the side of the cabin (Fig. 18), when cabin and wire rope meet in the middle of the elevator shaft. If needed, install a roller or another adequate wire rope guiding so that the wire rope will not get damaged while running over edges. Take measures under the cabin so that the wire rope hangs freely and is able to untwist or that it is stored properly.

e) **CAUTION!**

Fix fist grip clamp (E) to the wire rope **so far above the hook** (Fig. 19), **that Upwards-travel** of the cabin **is stopped** by the limit switch UP (F) **in the highest allowable position.**

Fig. 17

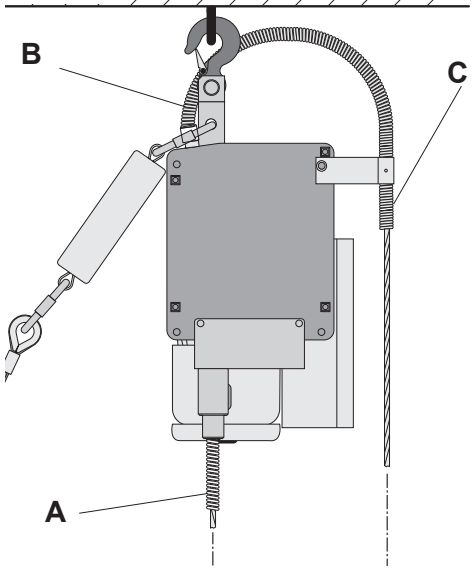


Fig. 19

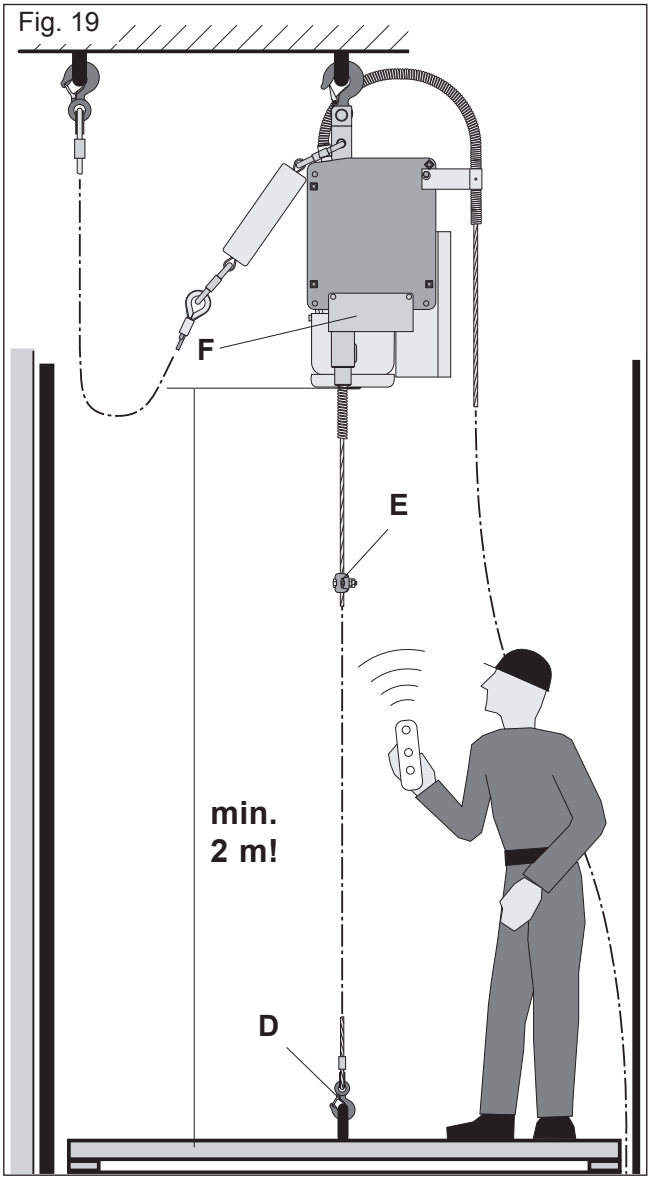
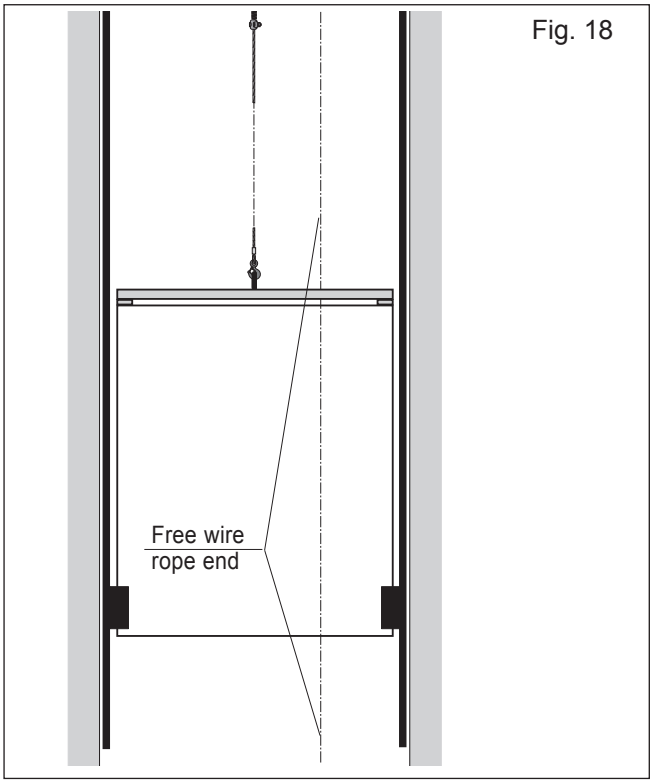


Fig. 18



“Highest allowable position” means:
Minimum 2 m distance between the cabin roof and an obstacle in the shaft or 5 m between cabin roof and tirak™, e. g. the podest/catwalk, which is used for anchoring/servicing the hoist.

“Lowest allowable position” means:
Let **run out 1 meter of wire rope** after **touch down of the cabin on the lowest position** (e.g. ground level) to discharge wire rope.

4.7.2.2 When using the diverter pulley

a) Anchor the hook (D) to the suspension construction and let the loose wire rope hang down the shaft (Fig. 20).

Attention!

The wire rope must be able to completely untwist!

b) Insert the wire rope tip through the diverter pulley (R).

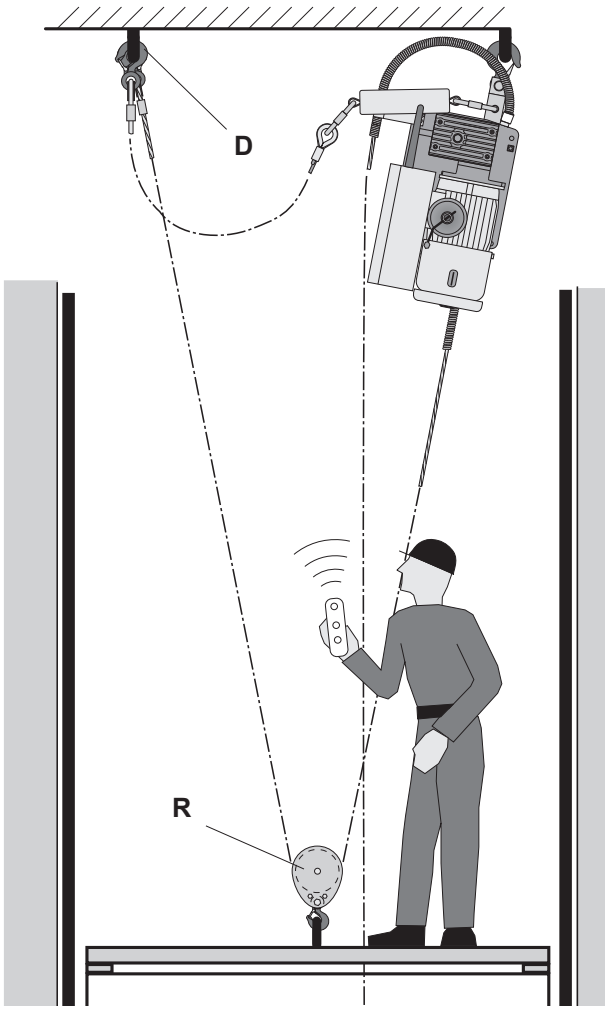
c) Pull the wire rope tip up to the hoist, and install it according to chapter 4.6.2.1.

CAUTION!

ON-SITE[1] **take appropriate precautions**, **that Upwards-travel** of the cabin **is stopped** by the limit switch UP **in the highest allowable position.**

1) Using the diverter pulley, the **double clamp can not be mounted** on the rope to activate the limit switch „UP” of the hoist.

Fig. 20



4.7.3 Removing installed wire rope

CAUTION!

Wear protective gloves when handling when handling wire ropes.

a) Press the DOWN button and allow the rope to unreel until the rope end arrives at the infeed of the limit switch DOWN (Fig. 20a).

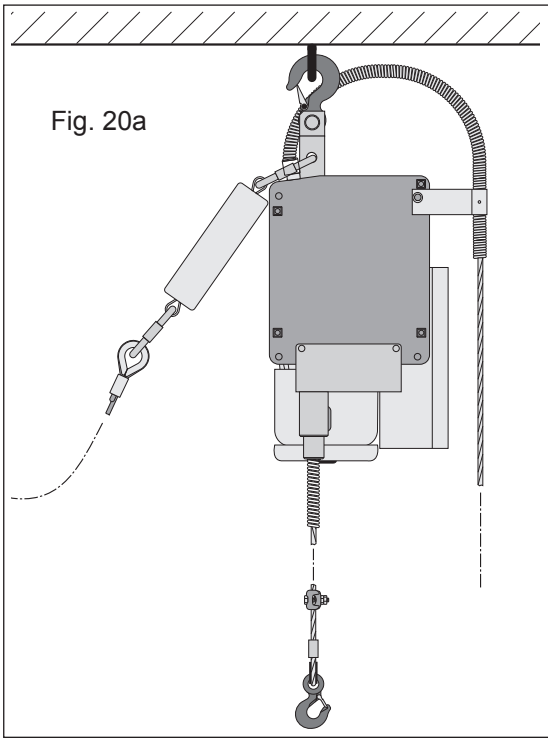
b) **CAUTION!**
Hold the rope tight to prevent it from falling down in an uncontrolled manner thus causing injury and / or damage.

Press the “Bridge” button on the terminal box in order to bypass the DOWN limit switch. Then the complete rope can be moved out of the hoist.

c) Press **DOWN**-button to let the wire rope completely run out, and let it down to ground level by using an auxiliary rope or similar.

d) Store the rope on the hasp.

Fig. 20a



5. Operation

DANGER!

For man-riding with the elevator cabin:

Before starting and afterwards daily: Check the proper function of the fall arrest device of the cabin!

5.1 Checks before the first use

A **qualified person must**

a) **carry out the checks as per sections 5.2 and 5.3**,

b) make a **trial journey with the working load limit** of the suspended access equipment and when so doing

c) **press the EMERGENCY STOP button (Fig. 21)**, the suspended access equipment must come to a standstill.

To re-start radio control push **„ON" button**, the function control lamp starts blinking green. **To re-start pendant control** pull out EMERGENCY STOP button.

d) check the **limit switch UP**: when travelling **upwards push up the switch bushing** (Fig. 22), the hoist must stop immediately.

e) drive out the wire rope: hoist must stop as soon as the end of the rope passes the inductive limit switch.

Make a **written noteof the result** of this check and keep the report.

5.2 Daily checks
by the supervisor

a) Check correct anchoring of **tirak™** hoist and its **safety rope** with the energy absorber to the suspension construction.

b) Check function of **UP** and **DOWN** button as well as of **EMERGENCY STOP** button (Fig. 22).

c) Check battery charge condition.
(Details in separate instruction.)

d) Take care, that no person is under the elevator cabin or under a suspended load.

Fig. 21

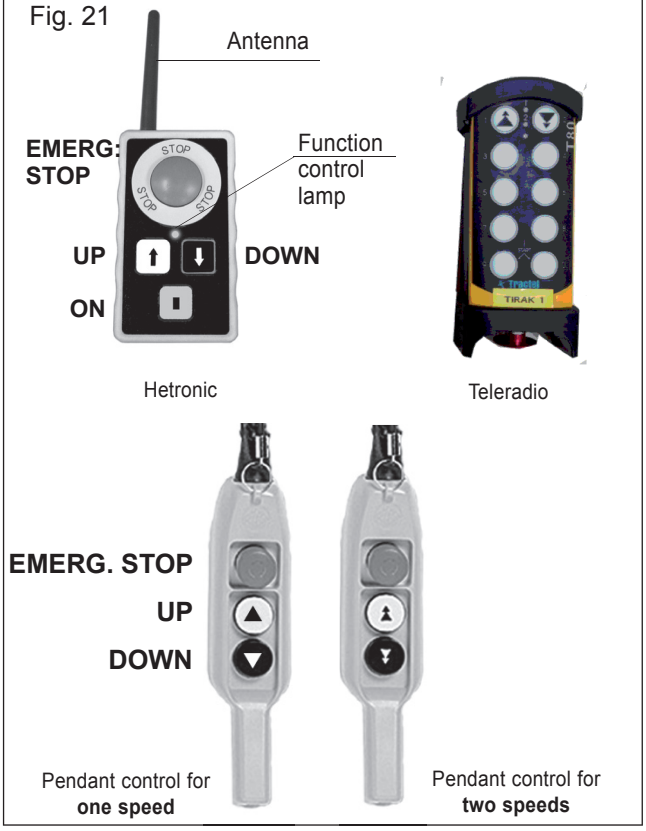
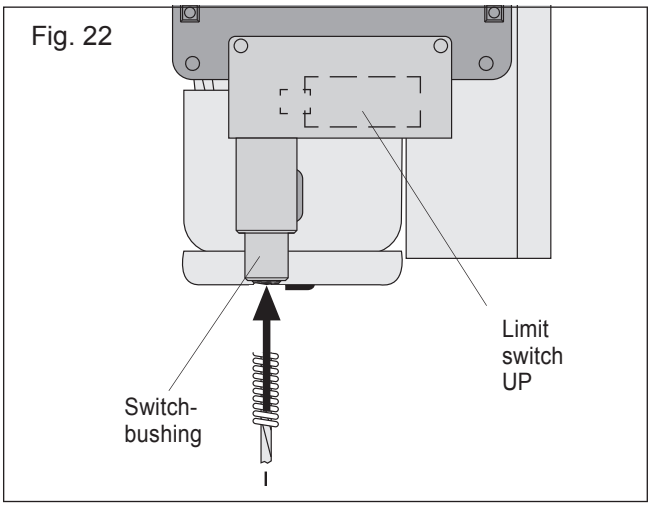


Fig. 22



5.3 Weekly checks of wire rope and cable

DANGER!

Damaged wire ropes endanger operational safety!

Therefore examine **tirak™ rope** in accordance with section 8.2.1 on page 27 for damage which requires replacement.

Attention!

Keep the **wire rope lightly lubricated**. This **prolongs its life** to a maximum.

Check all **power supply and control cables** and if necessary replace.

5.4 Operation

5.4.1 Stop / Emergency Stop (Fig. 23)

a) **To STOP movement release UP** or **DOWN** button – the suspended access equipment stops.

If not:

b) **Press EMERGENCY STOP-Button**, the control must stop completely.

if that does not function:

c) **Pull out the plug!**

CAUTION! in cases **b)** and **c)**:

STOP working!
Have the TIRAK **checked/repaired by a qualified electrician**.

5.4.2 Service operation (Fig. 23)

a) To **START** push **"ON" button**, the function control lamp starts blinking green.

b) **To lift**: Push "**UP**" button.
To lower: Push "**DOWN**" button.

For hoists with **2 speeds**:

half depressed	=	low speed
fully depressed	=	high speed

To STOP, release button (see also chapter 5.4.1).

c) When stopping the hoist the load is securely held at any position by the primary brake.

5.5 Manual operation

5.5.1 Emergency descent

In case of power failure you can **manually open the brake**:

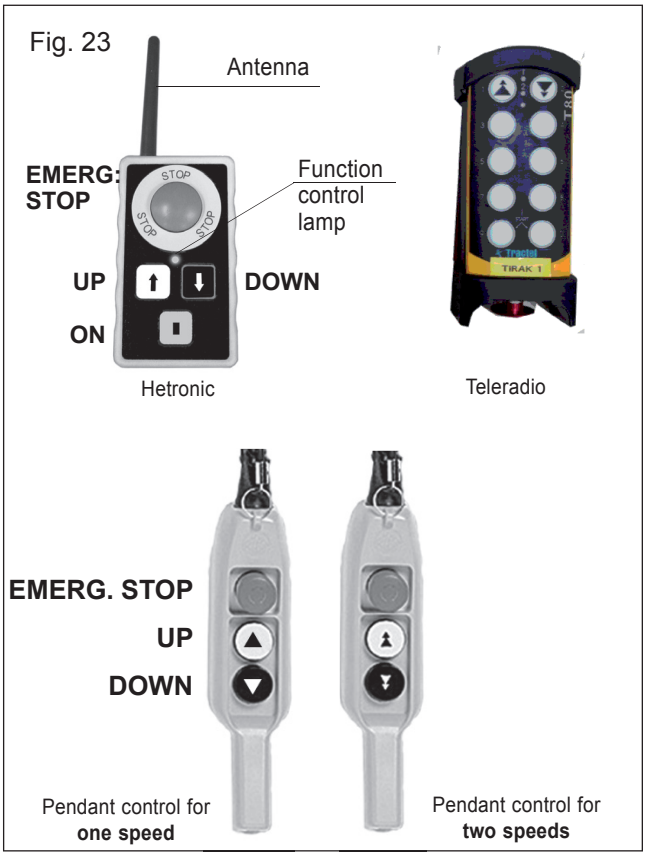
– Take the control lever (1) from its rest position, insert it through the motor cover into the brake release point, and pull down (Fig. 26).
The **tirak™** starts running.

– Go down. The **centrifugal brake** ensures a limited descent speed.
To STOP: release the control lever (1).

After use: put back the control lever (1) in its rest position.

CAUTION!

Emergency descent in case of overload is prohibited!



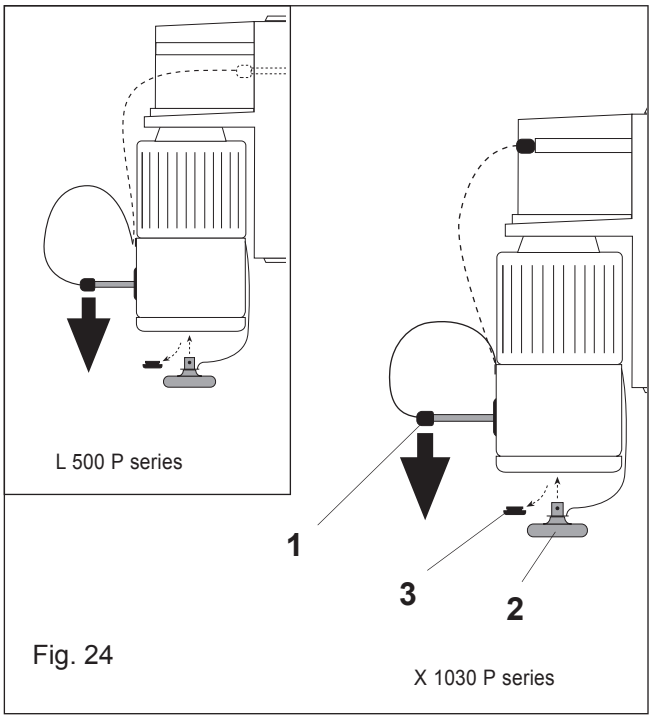


Fig. 24

5.5.2 Manual lifting

– Take off rubber cap (3).

– Put the hand wheel (2) on the motor shaft and with the **brake opened** (see above) turn to the left to lift the cabin resp. the load.

– **After use**: Put brake release lever (1), hand wheel (2) and rubber cap (3) back to their original positions.

5.6 Measures of precaution in the highest operation area

A **safety rope c/w energy absorber** (d1) arrests the **tirak™** hoist in case of its anchoring failing (Fig. 25) – the cabin itself is secured against fall by its own fall arrest device.

DANGER!

To prevent from injuries during works in the possibly dangerous zone (= the hoist's falling area) provide for the following measures of precaution!

5.6.1 Mark the danger zone

On-site, approx. five meters below the anchoring of the hoist **Fix a WARNING LABEL** on the wall of the elevator shaft (Fig. 25), **which only allows a further lifting of the cabin, if the special safety instructions are followed.**

5.6.2 Instruction for working in the danger zone

The employer has to edit a **written safety instruction**, which only **allows driving upwards into the danger zone**, if the **operator stays at the side opposite to the suspension of the safety rope AND in one corner of the elevator shaft** ! (Fig. 25a)

Fig. 25a (Top view / Principle sketch)

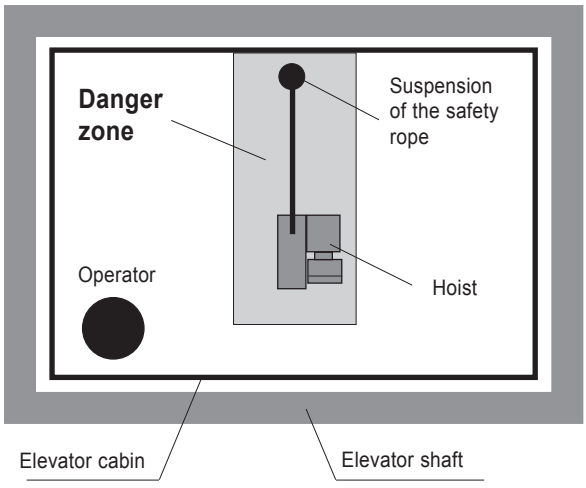
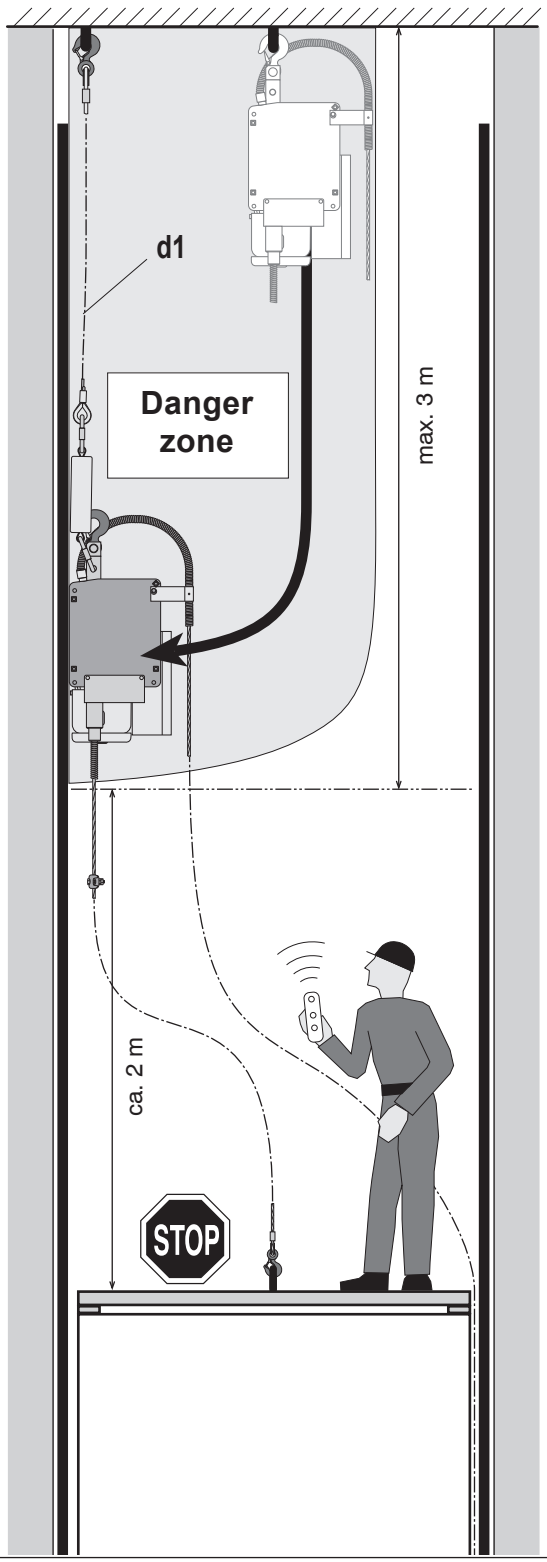


Fig. 25



5.6.3 Lifting limitation by means of the Limit switch "Up"

a) **When using the hoist in direct pull**:
Fix fist grip clamp at approx. 2 m above the wire rope hook, so that the cabin automatically stops under the danger zone.

b) **When using the diverter pulley**:
By means of **on-site measures, ensure the timely stopping of the hoist!**

5.7 Action in the event of operation of the fall arrest device

CAUTION!

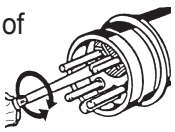
The instruction must be provided by the manufacturer of the Fall Arrest Device of the cabin!

6. Troubleshooting

WARNING!

AVOID INJURIES:

1. Checks of the electrical equipment of the **tirak™** must only be carried out by **qualified electricians!** Repairs only after agreement by the TRACTEL Greifzug GmbH.
   Wiring diagrams are shown in the control box of the **tirak™** hoist.
2. Repairs must only be carried out by TRACTEL Greifzug GmbH resp. with written agreement of the manufacturer and by persons, who have been trained by him.

Breakdown	Cause	Remedy
The cabin moves neither up nor down although the motor starts when the UP/ DOWN buttons are pressed. 	**DANGER! IMMEDIATELY STOP WORKING! Any attempt to continue operating the tirak™ hoist jeopardizes the operational safety!**	
	A1 Rope jam in the **tirak™** hoist. Defective or incorrect wire rope or obstructed rope exit.	**Stop working immediately!** Request assistance from the manufacturer.
	A2 The cabin has become caught on an obstacle or **the cabin is held tight**.	Release cabin **carefully** from the obstacle or untie cabin. Check affected cabin parts for their **operational safety.** **Inform supervisor.**
	A3 The fall arrest device holds the cabin	
	a) Lifting rope rupture	a) + b) Evacuate cabin and follow the instructions in section 5.7, page 22.
	b) Failure of the hoist	
	c) **Fall arrest device of the** cabin is defect.	c) An expert of the manufacturer- must check/repair the device.
	DANGER! Defective fall arrest devices endanger the operational safety of the installation! They must be replaced as a matter of urgency!	
The hoist **doesn't move at all**. 	**B1 Power failure**	
	a) Control switched off.	a) Push ON button
	b) Interrupted power supply.	b) Check reason and wait, until power returns.
	c) On 3-phase motors: two phases changed in the supply, the built-in phase control relay blocks the hoist control.	c) Turn phase inverter of the central control plug by 180°. 
	d) Defect connection between power supply and hoist control.	d) Check lead and control cable, fuses and connections or wiring of central control and terminal boxes and repair if necessary.
	B2 Battery of the radio control is discharged.[1)]	Replace by charged battery and charge the battery.
	B3 Defect radio receiver[1)]	Call the manufacturer for support

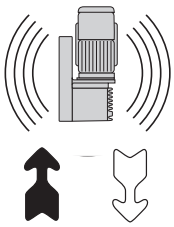
DANGER!
Always pull the plug out before opening a terminal box or a pendant or central control!

1) Further information on radio controls on pages 32-34

Breakdown	Cause	Remedy
The hoist **doesn't move at all**. 	**B4 Wrong connection**, e. g. no neutral conductor	Compare connection with wiring diagram. If necessary conversion **by the manufacturer**.
	B5 Protective switching off due to overheating:	
	a) One phase is missing	a) Check/repair fuses, leads and connections.
	b) Insufficient cooling	b) Clean air inlet at the motor cover.
	c) Voltage too high/too low	c) Check voltage and current consumption on the motor **under load**. If necessary increase lead cross section.
	B6 Brake does not open (no "click" noise, when switching on/off)	
	a) Defective supply conductor, brake coil, or rectifier.	a) Have supply conductor, brake coil and rectifier checked by an electrician and repaired/replaced.
	b) Worn brake rotor.	b) Send the **tirak™** for repairs.
Cabin moves down **but not up**. 	 **DANGER! Thoughtless behaviour endangers the safety of the installation!**	
	C1 The cabin has become caught on an obstacle.	Move the cabin **carefully** downwards and remove the obstacle. Check cabin parts affected for their **operational safety**. **Inform the supervisor**.
	C2 Overload, the load limiting device has switched off the hoist.	Check load and if necessary reduce it.
	C3 upper limit switch:	
	a) Limit switch defective or not connected.	a) Check switch connection/function; if necessary replace.
	b) Limit switch activated.	b) Move down until the limit switch is free.
	C4 One phase is missing.	Check fuses and leads.
	C5 Error in the UP control circuit of the control of the **tirak™** hoist.	Check connections, wiring, contactors and replace if necessary.

DANGER!

Always pull the plug out be-fore opening a terminal box or a pendant or central control!

Breakdown	Cause	Remedy
Excessive motor noise or **hoist is crunching,**  although UP and DOWN travel are possible.	**D1 Overheating**	Individual causes as well as their correction see page 25 point **B5**.
	D2 Dirt in the rope drive **Attention!** Continuing travel can lead to damage on the rope and the rope drive.	**Replace** the **tirak™** **as urgently as possible** and have **checked/repaired** by the manufacturer.
The cabin moves up **but not down** 	**DANGER!** **Thoughtless behaviour endangers the safety of the installation!** **E1 The cabin has hit an obstacle** or **has become caught on an obstacle**.	Move cabin **carefully** upwards, and remove the obstacle. Check cabin parts affected for their **operational safety**. **Inform the supervisor**.
DANGER! Always pull the plug out be-fore opening a terminal box or a pendant or central control!	**E2 Error in DOWN control circuit** of the control system or the **tirak™** hoist.	If necessary **Emergency descent** (details in section **5**.**5**) Check connections, wiring, contactors etc. and replace if necessary.
	E3 The fall arrest device has not been released.	Release fall arrest device of the cabin following the relevant instructions of the device's manual.
	E4 Limit switch DOWN: a) Limit switch is defective or not connected.	a) Check the limit switch connection/ function. Replace if necessary.
The hoist has fallen down and is kept by the safety wire rope. The cabin has been caught by its fall arrest device.	**F** Suspension failure	a) Rescue persons from the cabin and, if needed, start with first aid activities. b) Remove the hoist together with the wire rope and send it to a safety inspection. c) Check failure cause, install new suspension and provide new verification of carrying capacity. d) Check fall arrest device of the cabin for properly functioning. e) Install faultless hoist with a **new energy absorber**. f) By means of the hoist, lift the cabin to open the fall arrest device and continue working.

Should these steps not explain the cause and provide a remedy please contact TRACTEL Greifzug GmbH.

7. Out of operation

7.1 Pause

a) **Anchoring the cabin**:

- **Lower the cabin to the ground** with slightly tensiond ropes
  or
- Stop the cabin **at the level of an access possibility**, and secure it by means of its fall arrest device.

b) Switch off the radio control, take off and safely store the battery pack .

c) **Disconnect the power supply** to prevent any unauthorised operation:

- Disconnect power supply cable from site distributor

  or, if available
- turn and lock the main switch to “0“.

7.2 End of the job

a) **Safely put the cabin on the ground**.

b) **Remove wire rope** (see chapter 4.6.3), clean it, and check it according to chapter 8.2, **whilst coiling it on the hasp**.

d) Switch off the radio control.

e) Disconnect from mains supply.

f) Remove the **tirak™** hoist.

g) Maintain the hoist according to chapter 8.1, and store it together with the radio control and the wire rope at a dry place.

8. Maintenance

Deadline (Performer)	Test item	Regulations	Details on page
Each working day: (Supervisor)	**Anchoring parts tirak™ hoists**	Safety requirements on suspended access equipment EN 1808	21
Each working week: (Supervisor)	**Wire ropes Electrical cables**	DIN 15 020, sh. 2/ISO 4309 Manufacturer's advice	28 – 29
Annually: (qualified person)	**Entire installation**	EN 1808 (see above)	–
Annually, at the latest however after 200 operating hours (TRACTEL Greifzug GmbH)	**tirak™ hoist**	UVV „Winden" BGV D8 EN 1808 (see above)	30
Annually: (qualified person)	**Energy absorber** and **snap-hook**	EN 355 EN 362	30

8.1 Maintenance

8.1.1 Hoist

The mechanism does not require any special maintenance.

Lubrication:

Keep the wire rope lightly lubricated (see 8.2.1).

This will not affect the gripping power but will prolong the life of wire rope to a maximum.

8.1.2 Motor, brake, and gear box

a) The **motor** does not require any special maintenance. If it is **very dirty**, it should be cleaned to ensure an effective air flow.

b) The **brake** does not require any special maintenance. If it is **very dirty**, it should be cleaned. **Keep it free of oil or grease!**

c) The **gear box** is maintenance-free.

8.1.3 Radio control

a) Treat batteries with care: Remove the batteries, when the installation is not used.

b) Regularly charge the batteries.

8.1.4 Wire ropes

a) Always unreel and reel the wire rope.

b) Do not use the wire rope for fixing a load, and do not pull it over sharp edges.

c) Always keep the wire rope **clean** and **lightly lubricated**. Use normally commercially available multi-purpose grease; **do not use** lubricants containing disulphide (e.g. Molycote®).

8.1.5 Safety wire rope c/w energy absorber

a) Keep it clean, and protect it from heat and aggressive media.

b) Regularly check the hook to be in perfect condition.

8.2 Checks

8.2.1 Essential checks

a) General

Prior to every operation
and
during operation make sure, that

- the **tirak™** hoist,
- the fall arrest device of the cabin
- and all other used equipment (anchoring devices, pulleys etc.)

are properly installed
and
without visible damage

Attention!

If **during operation** damage appears:

- **STOP operating**,
- if necessary: **cordon off the danger zone**, and
- have the **damage removed** by a qualified person!

b) Nameplates and labels

Make sure that all nameplates and labels are in place and not obscured (see section 9, pages 31/32).

Replace missing labels and those which are not legible!

c) Wire ropes

Attention!

Replace wire ropes, if one of the following defects is determined **during** the prescribed **weekly check**:

- **8 or more wire breaks** (fig. 26) on a length which corresponds to 30 times the rope diameter.

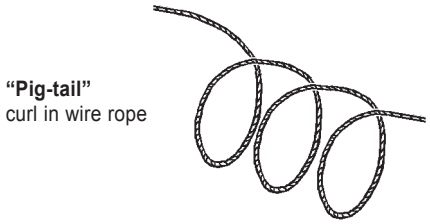
Fig. 26

broken wires

- Heavy **rust formation** on the surface or inside.
- **Heat damage**, recognisable through discoloured wires.
- **Reduction of the diameter** by 5% or more compared with the nominal diameter (fig. 28).
- **External damage** to the rope – fig. 27 shows the most frequent forms of damage.

  These **examples** do not however replace the **DIN 15 020 sheet 2** or ISO 4309 reference for wire rope checks!

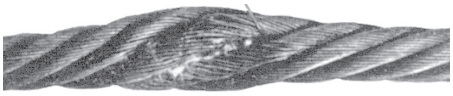
Fig. 27



"Pig-tail"
curl in wire rope

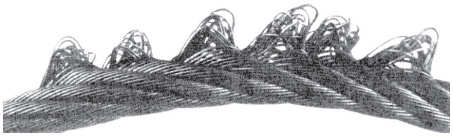
Kinked wire rope

Damage
caused by improper use,
(e.g. by fixing a load with the rope)



Crushed wire rope

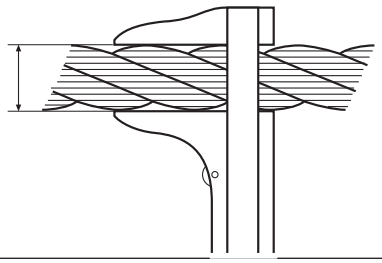
Birdcaged wire rope



Loop formation
on wire rope

Fig. 28

Wire rope diameter



d) **Electric cables**

Replace lead and control cables if damage to the insulation or to cable connections is determined during the prescribed weekly check.

8.2.2 Safety inspection

8.2.2.1 Checking the tirak™ hoists by the TRACTEL Greifzug GmbH:

At the minimum **every twelve months or more regularly** depending on the working practice, **and at the latest after 200 running hours**[1]. ("German safety requirements on Hoists (BGV D8)" and "European safety requirements on suspended access equipment (EN 1808)").

1) Hour meter inside the control box..

8.2.2.2 Inspection of the energy absorber and the snap-hook of the safety rope

At the minimum **every twelve months or more regularly** depending on the working practice **by a qualified person.**

8.2.2.3 Extraordinary inspection

In case of a fall arrest (failure of the hoist anchoring) the following **safety inspection/activities** have to be done:

a) **Exchange the energy absorber**;

b) **check snap-hook and safety rope**;

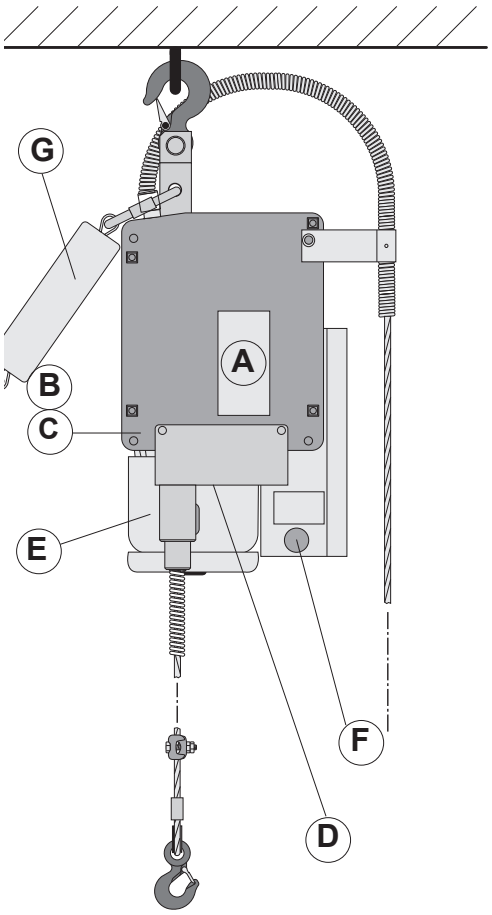
c) **inspect tirak™ hoist**;

d) **certify the carrying capacity** of the **anchor points** of the hoist and the safety rope;

e) **Inspect the fall arrest device of the levator cabin**.

It is the responsibility of the employer that a **written register is kept** showing the **dates, period of use, and inspection record**.

Fig. 29



A) **tirak™** nameplate
B) Motor nameplate
C) Brake nameplate
D) Adhesive "Wire rope diameter"
E) Adhesive "EMERGENCY STOP"
F) Test badge
G) Energy absorber nameplate

8.3 Repair

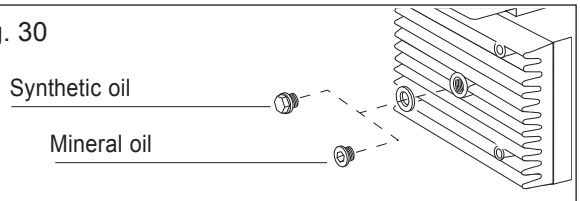
Repair of **tirak™** hoists must only be carried out **by the TRACTEL Greifzug GmbH** resp. with **written agreement** of it and by **persons trained by it**.
And **only original spare parts** shall be used.

If a **gearbox oil change** is necessary, take one of the oils specified below according to the temperature range that the hoist will be usually used in.

Quantities required:

Series **L 502/503/ P** & **X 1032 P**:	**2,0 l**

Fig. 30



Oil drain screw for indentification of the applied gearbox oil.

Temp.-range	**–10** to **+50 °C**	**–35** to **+40°C**	**–15** to **+80°C**
API-Specifications	**Mineral oils**[2]	**Synthetic oils**[2]	
	SAE85W-140 GL5[1]	**CLPPG or PGLP ISO VG 100**	**CLPPG or PGLP ISO VG 460**
Sample oils (other oils on request)	**BP Hypogear EP 90** **Shell Spirax HD 90** **TEXACO Multigear EP6 S80 W90**	**Klübersynth GH6-100**	**Klübersynth GH6-460**
		Utilisation of other synthetic oils only with explicit authorisation of the manufacturer!	

1) Standard charge; see also footnote 2)!
2) IMPORTANT: If changing between mineral and synthetic oil the gearbox must get cleaned

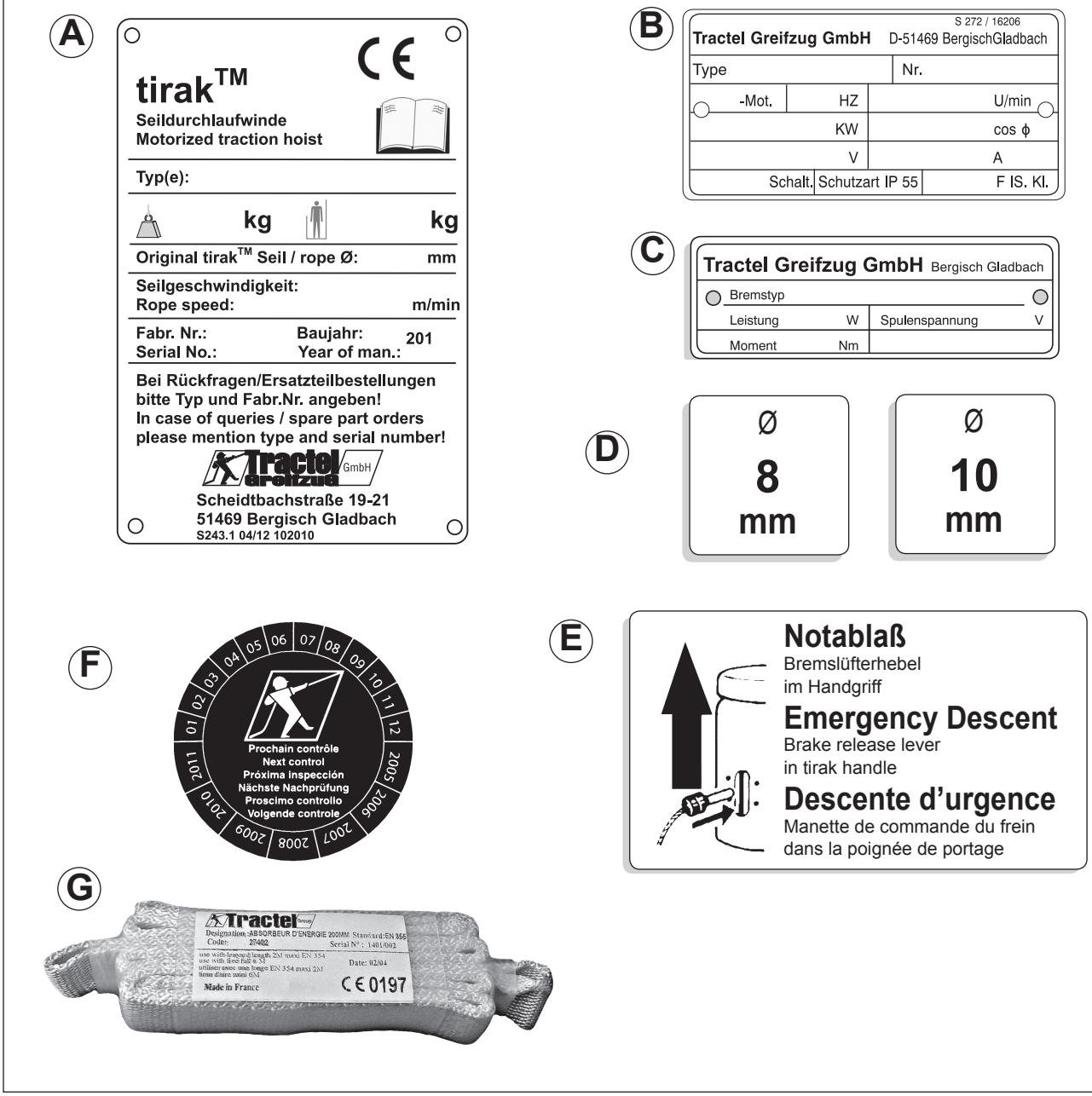
9. Nameplates and labels

Make sure that all nameplates and labels are in place and not obscured (see figs. 29 and 31).

Replace missing labels and those which are not legible!

Spares are available from the manufacturer.

Fig. 31



10. Radio control

10.1 General

10.1.1 Intended use and Warranty

a) The radio control serves for controlling the **tirak™** hoist.

b) Any modification not authorized by the manufacturer leads to the loss of any warranty.

10.2 Technical data

See the documentation for the remote control.

10.3 Safety devices

The radio control is equipped with electronic and mechanical safety devices.

The reaction on signals from other senders is excluded, since the coding of the sender is unique.

10.3.1 Switching off

a) By depressing the EMERGENCY STOP.

b) Sender is out of range.

c) Failure of he receiver.

d) By taking off the battery pack (Akku) from the sender.

10.3.2 Protection against non-intended operation

The embedded function buttons prevent from non-intendedly operating the sender.

10.4 Residual risks

Wireless transmission of control signals may even work through obstacles, or if the installation to be controlled is out of sight of the operator.

DANGER!

Non-intended motions of the installation are an IMMEDIATE or possibly imminent danger with the possible consequence of fatal or serious injuries!

Therefore: **The operator must depress the EMERGENCY STOP button, as soon as the installation is out of sight**.

10.4 Troubleshooting for the Hetronic radio control

DANGER!

AVOID INJURIES:

1. Checks of the electrical equipment of the **ti-rak**™ must only be carried out by **qualified electricians!** Repairs only after agreement by the TRACTEL Greifzug GmbH.
   Wiring diagrams are shown in the control box of the motor.
2. **Setting** and/or **repairs of the radio control** must only be carried out by TRACTEL Greifzug GmbH resp. with written agreement of the manufacturer and by persons, who have been trained by him.

Breakdown	Cause	Remedy
The sender cannot be switched ON.	**A** Discharged batteries.	Insert new batteries.
No reaction of the installation when depressing the buttons.	**B1** Failure in the power supply of the receiver.	a) Turn main switch on. b) If needed, replace fuses. c) Check plug connections. d) Check supply voltage of the receiver; if needed, have it repaired by a qualified electrician.
	B2 Address resp. frequency of sender and receiver do not correspond to each other.	Have address resp. frequency set by a qualified **and trained person**.
	B3 No radio contact.	Check by a **trained person**: On the receiver board, a yellow and a green LED must flash. If not, call for manufacturer's support.
Signal transmission towards the installation malfunctioning.	**C1** Out of range.	With the sender, go nearer to the installation.
	C2 In the neighbourhood, there is an other radio control working with the same frequency.	a) **A trained person** may try to set an other frequency on sender and receiver. b) If the other radio control within a range of 75 m, the two systems must have a difference of at least 2 frequency channels, within a range of 20 m of at least 3 frequen cy channels. Checks and settings **only** by a **trained person**.
Some functions of the installation cannot be controlled.	**D1** Interruption of control line between receiver and installation.	Checks and, if needed, repairs by a qualified electrician.
	D2 Defect output module of the receiver.	Check by a **trained person**: On the receiver board, when activating a certain function, the LED on the corresponding module should light. If not, call for manufacturer's support.
Too short operating time of the sender.	**E** Discharged or wrong batteries.	Insert new batteries. **Only use alkaline-batteries!**

DANGER!

Always pull the plug out be-fore opening a terminal box or a pendant or central control!

10.5 Troubleshooting for the Teleradio radio control

DANGER!

AVOID INJURIES:

1. Checks of the electrical equipment of the **tirak**™ must only be carried out by **qualified electricians!** Repairs only after agreement by the TRACTEL Greifzug GmbH.
   Wiring diagrams are shown in the control box of the motor.
2. **Setting** and/or **repairs of the radio control** must only be carried out by TRACTEL Greifzug GmbH resp. with written agreement of the manufacturer and by persons, who have been trained by him.

Breakdown	Cause	Remedy
The yellow LED of the receiver does not illuminate for correct operating voltage.	Incorrect operating voltage of the receiver.	Check the power supply.
	The fuse in the receiver has tripped.	Replace the fuse.
	Power supply of the receiver interrupted.	a) Switch on the main switch of the system. b) If necessary, replace the fuse. c) Check the plug connection. d) Measure the supply voltage of the receiver; if necessary, have it repaired by a qualified electrician.
The yellow LED of the receiver for the number of programmed transmitters does not flash.	There are no transmitters programmed in the receiver.	Programme the desired transmitter.
The transmitter does not function when the start buttons are pressed at the same time (at least 1 second) and then let go. The LED on the transmitter illuminates red.	The battery is empty.	Charge the rechargeable battery in the transmitter.
	One button in the transmitter is defective.	For more information, please contact TRACTEL Greifzug GmbH.
If the transmitter is switched on and the start buttons are pressed at the same time, the red LED 3 flashes.	The stop button is pressed.	Pull out the stop button.
If the transmitter is switched on and the start buttons are pressed at the same time, the red LED and yellow LED 1 flash.	The processor indicates that it has found an error on the stop button.	Press the stop button without releasing the start buttons. If the stop button is intact, LED 2 must start to flash. Pull out the stop button and let go of the start button. If the transmitter does not start then, the stop button must be changed. For more information, please contact TRACTEL Greifzug GmbH.
The range is too short.	Range exceeded.	Move closer to the transmitter.
	Aerial or aerial cable are damaged, or incorrectly installed.	Position the aerial at another location. Change the aerial cable.

Post address
P.O.Box 20 04 40
D-51434 Bergisch Gladbach

Residential address
Scheidtbachstr. 19-21
D-51469 Bergisch Gladbach

Phone & Fax
Tel.: +49(0) 22 02/10 04-0
Fax: +49(0) 22 02/10 04-70

Internet
www.tractel.com