MANUAL

- INSTALLATION
- OPERATION
- MAINTENANCE

OF THE ELECTRIC ROPE HOIST

"M" SERIES

CE

M 011/03

MISIA

Rev. 11/2003

HOIST IDENTIFICATION DATA

Type: .....

Capacity kg: .....

Serial number: .....

Year of manufacture: .....

Date: .....

CUSTOMER IDENTIFICATION DATA / INSTALLATION LOCATION

Company name and address: .....

.....

.....

Installation location: .....

.....

.....

ENCLOSURES

a) Dimensional table	YES	NO
b) Technical data of ropes and hooks	YES	NO
c) Wiring diagrams	YES	NO
d)	YES	NO
e)	YES	NO
f)	YES	NO

CONTENTS

1. PRELIMINARY INFORMATION

Contents of the manual

This manual contains the description of the trolley/hoist and its "intended purpose", the operation and performance technical data, as well as the installation, operation and maintenance instructions for all supported or suspended versions, with mono- or double rail trolley.

Furthermore, the manual contains following documents:
- CE conformity declaration or manufacturer declaration;
- Final test report of the equipment, where applicable;
- Wiring diagrams.

Recipients of this manual

This manual has been prepared for:
- the works manager, workshop manager or site manager;
- the installation technicians;
- the operator;
- the maintenance technicians.

The manual must be left in the safekeeping of a duly authorised person, in an appropriate place where it is always available in best conditions for reference.
In the event of loss or damage, ask for a copy directly **MISIA PARANCHI srl** indicating the code of this manual.

How to use this manual

The instructions are accompanied by symbols facilitating the reading and specifying the various type of information supplied.

1.1 SAFETY ALERT AND INFORMATION SYMBOLS

Pay utmost attention to the instructions accompanied by this symbol and strictly observe the prescriptions.

Important information:

This symbol calls the attention on useful information and hints for handling, assembly and installation procedures.

This symbol indicates to proceed with the procedure.

Where necessary, references and numbers corresponding to the illustrations appear through-out the text. In the illustrations any part of the trolley/hoist described in the text is indicated with a number.

For example: 1 (fig. 1) means: part or component 1 in figure 1.

1.2 IMPORTANT INFORMATION

Before starting any procedure, the operator must read the relevant section(s) of this instruction manual. The guarantee of problem-free operation and of full correspondence of the performances with the foreseen duty strictly depends on the proper observation of all instructions contained in this manual.

This technical documentation refers to the electric rope hoist "M" Series manufactured by **MISIA PARANCHI srl, Via dei Lavoratori, 9/11 - 20092 Cinisello Balsamo (MI)**, and is identified by the issue code M011/03, June 2003.
The technical documents have been prepared in compliance with the harmonised standards UNI-EN292 part 1, Item 3.20 and Part 2, Item 5.
The electric rope hoists of the "M" Series are manufactured in compliance with the Machinery Directive 98/37/EEC.
The components of the hoist comply with the requirements of the Directive and the CE Mark confirms the conformity of the whole equipment.


CE

Dichiarazione di conformità

ai sensi della Direttiva Macchine 98/37 CEE Allegato IIA

La sottoscritta:

MISIA PARANCHI SRL.

Via Dei Lavoratori, 9/11 - 20092 Cinisello Balsamo (MI)

Dichiara sotto la propria responsabilità che la macchina NUOVA

DENOMINATA: .....

PORTATA KG ..... MATRICOLA N° ..... ANNO COSTR. .....

E' conforme alle seguenti Direttive Comunitarie:

Direttiva Macchine 89/392 CEE

e successivi emendamenti 91/368 CEE - 93/44 CEE - 93/68 CEE

(traposta nell'Ordinamento Legislativo Nazionale Italiano con il D.Lgs. n° 459/96)

Direttiva Bassa Tensione (DBT) 73/23 CEE - 93/68 CEE

(traposta nell'Ordinamento Legislativo Nazionale Italiano con il D.Lgs. n° ...)

Direttiva Compatibilità Elettromagnetica (EMC) - 89/336 CEE - 92/31 ... 93/68 CEE

(traposta nell'Ordinamento Legislativo Nazionale Italiano con il D.Lgs. n° ...)

Compendiate nella Direttiva 98/37 CE (e GU L ... del 23.07.1998)

Norme ... applicate:

UNI - EIN - 292 Parte I ...

UNI - EIN - 292 ... (Principi di qualità Nella produzione)

CEI - ... (Norme degli equipaggiamenti elettrici)

... applicate e regole tecniche:

VISO ... (Regolamento prevenzione infortuni)

DIN ... (Sulla dei ganci)

DIN ... (Protezioni I.P.)

FEM 1001 (Calcolo apparecchi di sollevamento)

FEM 9.511 (Classificazione dei meccanismi)

FEM 9.755 (Parkell di lavoro ricaro S.W.P.)

FEM 9.941 (Simbologia di comando)

Si dichiara inoltre come previsto dall'allegato V della Direttiva Macchine 98/37 CEE:

- La marcatura del simbolo "CE" è apposto sulla macchina
- Il fascicolo tecnico è a disposizione presso la sede del Fabbricante

MISIA PARANCHI SRL

Responsabile di Prodotto

DATA .....

QM 1003

Conformity Declaration

MISIA produces and sells the electric rope hoists under a registered quality control system approved to UNI EN ISO 9002, with issue from the certification company BVQI of following international certificates:
SINCERT - Italy
UKAS – UK

With reference to the content of this instruction manual, MISIA declines any liability in following cases:

- Use in despite of national safety and injury prevention laws and regulations;
- Defective layout of the structures on which the hoist is intended for;
- Failure to read or comply with the instructions supplied in this manual;
- Faults in the main power supply;
- Unauthorised changes to the hoist;
- Use by not instructed operators.

Readability and preservation of plates.

Plates must always be kept in a readable condition of all their details and regularly cleaned.
If only one of the information of a plate deteriorates and/or is no longer readable, we recommend ordering another plate from the manufacturer quoting the data in this manual or on the original plate, especially the Serial number, and to replace the old one.

Plate types:

- Identification plate hoist/trolley
- Rating plate hoist and travel motors
- Rating plate lower blocks

1.3 LIABILITY

The instructions in this manual do not substitute, but only resume the obligations stated by the actual safety and injury prevention laws and regulations.

1.4 MANUAL UPGRADING

This manual illustrates the state-of-the-art of the equipment at the moment of its introduction on the market. The manual is part of the equipment and complies with all laws, directions and regulations actually in force. Therefore, this manual cannot be considered inadequate only because it was actualised in a second time basing on new experiences.

Any changes, adaptations etc. to the equipment sold in future neither compel the manufacturer to interventions on the formerly supplied equipment, nor allow to considerate the equipment and its manual as lacking or inadequate.

Any integration sent by the manufacturer to the users must be saved together with the relevant manual.

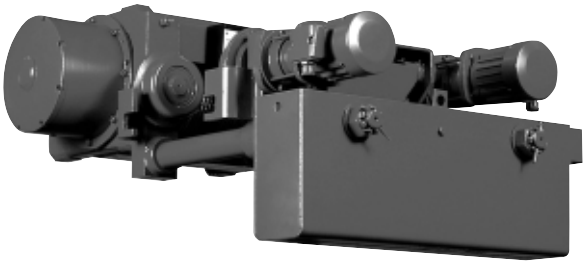
2. DESCRIPTION OF THE HOIST/TROLLEY

2.1 COMPONENTS OF THE HOIST/TROLLEY

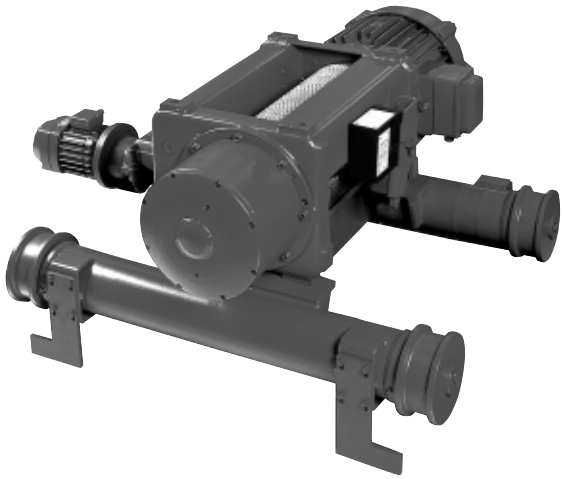
The electric hoists have been designed and tested in conformity with the FEM calculation rules for lifting equipment.
Accordingly to the application, the electric hoists are available in following versions:

a) standard, feet mounted type;

b) low headroom type
This permits to reduce the distance between the suspension point of the load on the hook and the travel surface.

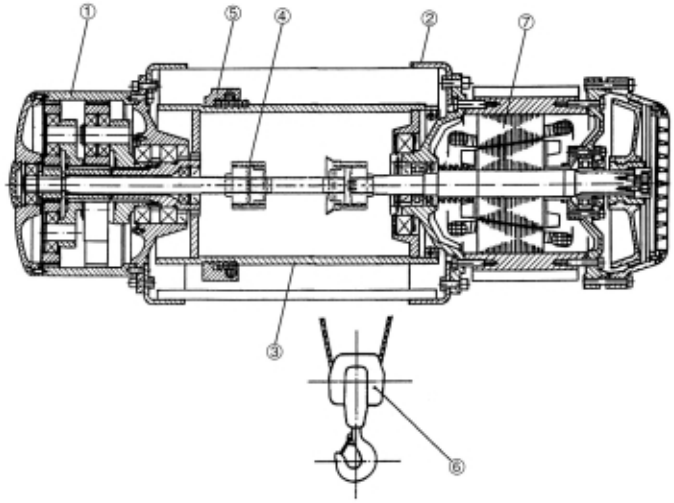


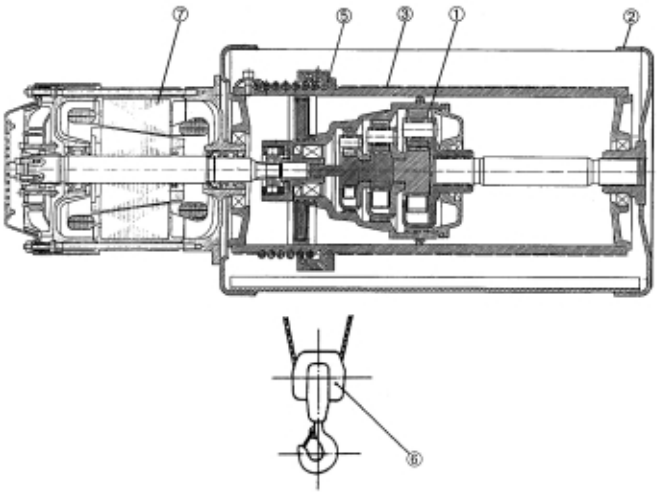
c) with double rail trolley and supported hoist or suspended.



Hoisting gear

The hoisting gear consists of following assemblies:
1. planetary gear;
2. hoist body;
3. rope drum;
4. coupling;
5. rope guide;
6. lower block;
7. electric brake motor.





Electric brake motor
Three-phase asynchronous 1 or 2 speed motor with cone rotor and integrated cone brake driven by a coil spring. The brake release is due to the sliding of the rotor after switching-on of the power supply.

Coupling
The torque of the motor is transmitted to the shaft of the gearbox by a toothed coupling connected to the gearbox shaft

Planetary gear
The 2 or 3-stage planetary gear reduces the speed of the electric motor to the rpm necessary for the drum.
All gears of the planetary gearbox are made of heat-treated high quality steel.

Drum
The drum is driven centrally by the hollow output shaft of the gearbox. The shaft of the gearbox and the guide plate of the second stage are supported on rolling bearings on which is installed the drum. Only on the hoists type “E” and “F” the gearbox is located inside the drum. The profile of rope grooves on the drum is machined in compliance with the DIN standards DIN.

Rope guide
The rope guide basically consists of two parts: a guide ring and a pressure spring that properly guide the rope on the drum grooves.
The guide ring maintains the rope in position during the uncoiling, preventing it to come-off the groove and, when the load swings, is guided by a fixed bar and runs on rolling bearing.

Hoist body
The supporting framework is a compact welded structure made of two steel flanges jointed by profiled plates.

Lower block with hook
The structure of the lower block with hook and 2 or 4 rope falls allows the distribution of the tensile force generated from the load on the ropes. The side covers of the lower block protecting the pulleys are strong and shock resistant.

Load limiter
All the hoists of the "M" Series with 2 or 4 falls are systematically equipped with a load limiter with two reaction thresholds. The load limiter consists of an electromechanical system with pre-calibrated springs acting on two microswitches which operate the auxiliary circuit, stopping all movements, exception made for the load lowering. The 1st is a WARNING threshold, the 2nd is a STOP threshold.

Electric equipment
Upon request, the trolley/hoist is available with an own electric equipment consisting of:
electromagnetic switches for the control of all the movements of the hoist and fuses for protection against shorts. The control circuits are in low voltage (48V). A terminal box with numbered terminals ensures simplicity and safety in the wiring for all external functions.

2.2 PERFORMANCES AND TECHNICAL DATA

Technical data

Capacity (Kg)	FEM / ISO groups	Hoist type	Rope falls N°	Lifting speed (m/min.) 1 speed N	1 speed V	2 speed NA	2 speed VA	Hook travel (m) P	S	T	Q	R
800	3 m M6	MA 08 S2	2/1	8	12	8/2	12/2	-	8,5	12	19	26
1000	2 m M5	MA 10 S2	2/1	8	12	8/2	12/2	-	8,5	12	19	26
1600	3 m M6	MA 16 S4	4/1	4	6	4/1	6/1	-	-	6	9,5	13
	3 m M6	MB 16 S2	2/1	8	12	8/2	12/2	-	9	12,5	19,5	26
2000	2 m M5	MA 20 S4	4/1	4	6	4/1	6/1	-	-	6	9,5	13
	2 m M5	MB 20 S2	2/1	8	12	8/2	12/2	-	9	12,5	19,5	26
2500	3 m M6	MB 25 S4	4/1	4	6	4/1	6/1	-	-	6	9,5	13
	3 m M6	MC 25 S2	2/1	8	12	8/2	12/2	-	10,5	14,5	22,5	30
3200	3 m M6	MB 32 S4	4/1	4	6	4/1	6/1	-	-	6	9,5	13
	2 m M5	MC 32 S2	2/1	8	12	8/2	12/2	-	10,5	14,5	22,5	30
4000	2 m M5	MB 40 S4	4/1	4	6	4/1	6/1	-	-	6	9,5	13
	3 m M6	MD 40 S2	2/1	8	12	8/2	12/2	-	8,5	12	19	26
5000	3 m M6	MC 50 S4	4/1	4	6	4/1	6/1	-	-	7	11	15
	2 m M5	MD 50 S2	2/1	8	12	8/2	12/2	-	8,5	12	19	26
6300	2 m M5	MC 63 S4	4/1	4	6	4/1	6/1	-	-	7	11	15
	3 m M6	ME 63 S2	2/1	8	-	8/2	-	-	14,5	19,5	26,5	33,5
8000	3 m M6	MD 80 S4	4/1	4	6	4/1	6/1	-	-	6	9,5	13
	2 m M5	ME 80 S2	2/1	8	-	8/2	-	-	14,5	19,5	26,5	33,5
	3 m M6	MF 80 S2	2/1	6	-	6/1,5	-	20	32	48	-	-
10000	2 m M5	MD 100 S4	4/1	4	6	4/1	6/1	-	-	6	9,5	13
	2 m M5	MF 100 S2	2/1	6	-	6/1,5	-	20	32	48	-	-
12500	3 m M6	ME 125 S4	4/1	4	-	4/1	-	-	7	9,5	13	16,5
16000	2 m M5	ME 160 S4	4/1	4	-	4/1	-	-	7	9,5	13	16,5
	3 m M6	MF 160 S4	4/1	3	-	3/0,75	-	10	16	24	-	-
20000	2 m M5	MF 200 S4	4/1	3	-	3/0,75	-	10	16	24	-	-
	2 m M5	MG 200 S4	4/1	2,5	-	2,5/0,6	-	10	16	24	-	-
25000	1A m M4	MG 250 S4	4/1	2,5	-	2,5/0,6	-	10	16	24	-	-
	2 m M5	MH 250 S4	4/1	2	-	2/0,5	-	10	12	15	22	-
32000	1A m M4	MH 320 S4	4/1	2	-	2/0,5	-	10	12	15	22	-
	2 m M5	ML 320 S4	4/1	1,5	-	1,5/0,37	-	10	12	15	22	-
40000	1A m M4	ML 400 S4	4/1	1,5	-	1,5/0,37	-	10	12	15	22	-

NB: The lifting and travel speed are referred to a frequency of 50Hz

Technical data of the motors

Normal voltages:

- 230 V - 400 V a 50 Hz THREE-PHASE;
- For single pole motors, the voltage changeover Δ/Y or Y/Δ is always possible;
- For bipolar motors specify the exact main voltage;
- The current consumption values indicated in the tables are for voltage 400 V-50 Hz.

Special voltages:

Upon request, special voltages are available

NB: Auxiliary speeds must be used only for short time, in compliance with their ED (e.g.: for spotting) and not as normal operating speed.

Technical data of the hoist motors (No. of starts=240 - I.D. 40% - aux. speed. I.D. 15%)

Hoist	1 speed				2 speed			
	N-Standard		V-Fast		NA-Standard/Aux		VA-Fast/Aux. speed	
	kw	A	kw	A	kw	A	kw	A
MA	1,5	6,5	2,2	6,5	1,5/0,33	6/5,5	2,2/0,33	6,5/7
MB	3,0	12,0	4,5	13,0	3/0,75	8,5/7,5	4,5/0,75	10/6,5
MC	4,5	16,5	7,5	18,0	4,8/1	12/11	7,5/1	15/11
MD	8,0	26,0	12	30,0	8/1,7	18/15	12,5/1,7	25/16
ME	12,5	38,5	-	-	13/3	32/40	-	-
MF	12,5	38,5	-	-	13/3	32/40	-	-

NB: 2 speed motors for hoists ME-MF are equipped with thermal sensor.

Technical data

Capacity (Kg)	FEM group Section IX°	Hoist type	No. of rope falls	Hoisting speed (m/min.) 1 speed N	1 speed V	2 speed NA	2 speed VA	Hook travel (m) Z	Hook travel (m) X
800	2 m	M 10 S2	2/1	8	12	8/2	12/2	37,0	41,0
1000	2 m	M 10 S2	2/1	8	12	8/2	12/2	37,0	41,0
1600	2 m	M 20 S2	2/1	8	12	8/2	12/2	33,0	37,5
2000	2 m	M 20 S2	2/1	8	12	8/2	12/2	33,0	37,5
2500	2 m	M 32 S2	2/1	8	12	8/2	12/2	37,5	45,5
3200	2 m	M 32 S2	2/1	8	12	8/2	12/2	37,5	45,5
4000	2 m	M 50 S2	2/1	8	12	8/2	12/2	32,5	40,0
5000	2 m	M 50 S2	2/1	8	12*	8/2	12/2*	32,5	40,0
6300	2 m	M 80 S2	2/1	8	-	8/2	-	39,5	45,5
8000	1A m	M 80 S2	2/1	8	-	8/2	-	39,5	45,5

**Speed not available for the size "X".*

NB: the lifting and travel speed are referred to a frequency of 50Hz.

Technical data of the hoist motors (No. of starts=240 - I.D. 40% - aux. speed. I.D. 15%)

Hoist	1 speed				2 speed			
	N-Standard		V-Fast		NA-Standard/Aux		VA-Fast/Aux. speed	
	kw	A	kw	A	kw	A	kw	A
M 10	3	12,0	4,5	13,0	3/0,75	8,5/7,5	4,5/0,75	10/6,5
M 20	8	26,0	12	30,0	8/1,7	18/15	12,5/1,7	25/16
M 32	8	26,0	12	30,0	8/1,7	18/15	12,5/1,7	25/16
M 50 Z	8	26,0	12	30,0	8/1,7	18/15	12,5/1,7	25/16
M 50 X	12,5	38,5	-	-	13/3	32/40	-	-
M 80	12,5	38,5	-	-	13/3	32/40	-	-

NB: 2 speed motors for hoists M50-X and M80 are equipped with thermal sensor.

Technical data

Capacity (Kg)	FEM groups Section IX	Hoist type	No. of rope falls	Hoisting speed (m/min.) 1 speed N	1 speed V	2 speed NA	2 speed VA	Hook travel (m) P	S	T	Q	R
Version D1 double rope output only from 1 side - Version DC1 - Opposite double rope output												
250+250	2 m	MA 10 D1	2/1	16	24	16/4	24/4	-	-	14	23,5	32,5
	2 m	MA 10 DC1	2/R1	16	24	16/4	24/4	-	-	14	23,5	32,5
500+500	2 m	MB 20 D1	2/1	16	24	16/4	24/4	-	-	10,5	19	27,5
	2 m	MB 20 DC1	2/R1	16	24	16/4	24/4	-	-	10,5	19	27,5
800+800	2 m	MC 32 D1	2/1	16	24	16/4	24/4	-	-	10,5	18,5	26
	2 m	MC 32 DC1	2/R1	16	24	16/4	24/4	-	-	10,5	18,5	26
1250+1250	2 m	MD 50 D1	2/1	16	24	16/4	24/4	-	-	10	19,5	28,5
	2 m	MD 50 DC1	2/R1	16	24	16/4	24/4	-	-	10	19,5	28,5
2000+2000	2 m	ME 80 D1	2/1	16	-	16/4	-	-	-	16,5	24,5	32,5
	2 m	ME 80 DC1	2/R1	16	-	16/4	-	-	-	16,5	24,5	32,5
2500+2500	2 m	MF 100 D1	2/1	12	-	12/3	-	17,5	33	52	-	-
	2 m	MF 100 DC1	2/R1	12	-	12/3	-	17,5	33	52	-	-
Version D2 double rope output only from 1 side												
1000	2 m	MA 10 D2	2/2	8	12	8/2	12/2	-	-	6	11	15,5
2000	2 m	MB 20 D2	2/2	8	12	8/2	12/2	-	-	4,5	9	13
3200	2 m	MC 32 D2	2/2	8	12	8/2	12/2	-	-	4,5	8,5	12,5
5000	2 m	MD 50 D2	2/2	8	12	8/2	12/2	-	-	4	9	13,5
8000	2 m	ME 80 D2	2/2	8	-	8/2	-	-	-	7,5	11	15,5
10000	2 m	MF 100 D2	2/2	6	-	6/1,5	-	8,5	16,5	26	-	-
Version DC2 opposite double rope output												
500+500	2 m	MA 10 DC2	2/R2	8	12	8/2	12/2	-	-	7	11,5	16
1000+1000	2 m	MB 20 DC2	2/R2	8	12	8/2	12/2	-	-	5	9,5	13,5
1600+1600	2 m	MC 32 DC2	2/R2	8	12	8/2	12/2	-	-	5	9	13
2500+2500	2 m	MD 50 DC2	2/R2	8	12	8/2	12/2	-	-	5	9,5	14
4000+4000	2 m	ME 80 DC2	2/R2	8	-	8/2	-	-	-	8	12	16
5000+5000	2 m	MF 100 DC2	2/R2	6	-	6/1,5	-	8,5	16,5	26	-	-

NB: the lifting and travel speed are referred to a frequency of 50Hz.

Technical data of the hoist motors (No. of starts=240 - I.D. 40% - aux. speed. I.D. 15%)

Hoist	1 speed N-Standard kw	1 speed N-Standard A	1 speed V-Fast kw	1 speed V-Fast A	2 speed NA-Standard/Aux kw	2 speed NA-Standard/Aux A	2 speed VA-Fast/Aux. kw	2 speed VA-Fast/Aux. A
MA	1,5	6,5	2,2	6,5	1,5/0,33	6/5,5	2,2/0,33	6,5/7
MB	3,0	12	4,5	13	3,0/0,75	8,5/7,5	4,5/0,75	10/6,5
MC	4,5	16,5	7,5	18	4,8/1	12/11	7,5/1	15/11
MD	8,0	26	12,0	30	8,0/1,7	18/15	12,5/1,7	25/16
ME	12,5	38,5	-	-	13/3	32/40	-	-
MF	12,5	38,5	-	-	13/3	32/40	-	-

NB: 2 speed motors for hoists ME-MF are equipped with thermal sensor.

Trolley travel speeds (m/min.)

Hoist	1 speed					2 speed						
3 - standard headroom mono-rail	20	16	12	10	8	20/6,5	-	16/5,3	-	12/4	-	-
83 - low headroom mono-rail	20	16	12	-	-	-	20/5	-	16/4	-	12/3	-
53 - double rail	20	16	12	10	-	20/6,5	-	16/5,3	-	12/4	-	10/3,3

2.3 TECHNICAL DATA OF THE MOTORS

Technical data of the motors for mono-rail trolleys (type 3) (No. of starts=120 - I.D. 40% - aux. speed. I.D. 15%)

Max capacity	1 speed		2 speed	
(kg)	*kw*	*A*	*kw*	*A*
Up to 2000	0,12	0,85	0,18/0,06	1,1/0,7
Up to 6300	0,37	1,80	0,37/0,10	1,5/1,0
Up to 16000	2x 0,37	2x 1,80	2x 0,37/0,10	2x 1,5/1,0

Technical data of the motors of the mono-rail trolleys (type 83) (No. of starts=120 - I.D. 40% - aux. speed. I.D. 15%)

Max capacity	1 speed		2 speed	
(kg)	*kw*	*A*	*kw*	*A*
Up to 4000	2x 0,18	2x 0,75	2x 0,18/0,045	2x 0,75/0,75
Up to 6300	2x 0,24	2x 0,85	2x 0,24/0,060	2x 0,85/1,10
Up to 10000	2x 0,30	2x 1,20	2x 0,30/0,060	2x 1,20/1,20
Up to 16000	2x 0,60	2x 1,8	2x 0,50/0,13	2x 1,8/1,0

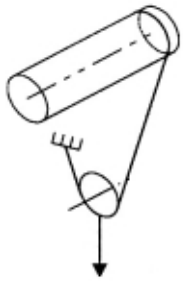
Technical data of the motors for double rail trolleys (type 53) (No. of starts=120 - I.D. 40% - aux. speed. I.D. 15%)

Max capacity	1 speed		2 speed	
(kg)	*kw*	*A*	*kw*	*A*
Up to 4000	0,25	0,85	0,25/0,08	0,90/0,95
Up to 6300	0,37	1,30	0,37/0,12	1,40/1,40
Up to 10000	0,55	1,70	0,55/0,18	1,80/1,90
Up to 16000	0,75	2,00	0,75/0,25	2,10/2,50
Up to 20000	1,10	3,40	1,10/0,37	3,50/3,50

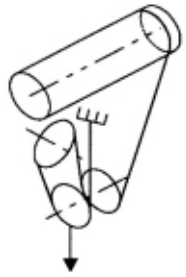
2.4 STANDARD VERSIONS AND EXECUTIONS

Rope fall arrangements

Standard versions
S2 - 2 rope falls

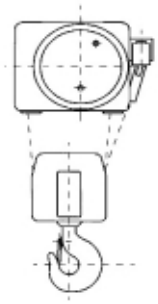


Standard versions
S4 - 4 rope falls

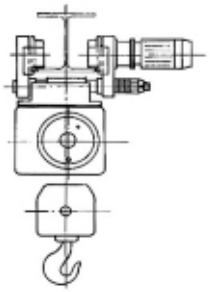


Standard executions

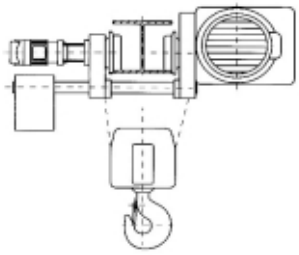
Type 5 supported
Type 5C1 suspended



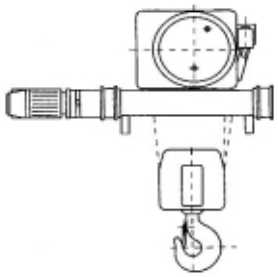
Type 3
monorail trolley,
standard headroom



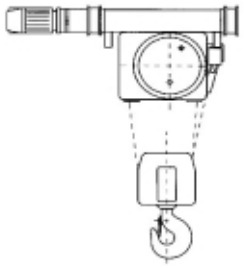
Type 83
monorail trolley,
low headroom



Type 53
double rail trolley,
supported hoist



Type 53C1
double rail trolley,
suspended hoist



EXAMPLE OF ELECTRIC HOIST IDENTIFICATION CODE

M C 63 S4 T N / 5 (a) — with two travel speeds

- Serial number
- Hoist type
- Max capacity
- Version: **S2** - 2 rope falls; **S4** - 4 rope falls
- Hook travel **P-S-T-Q-R**
- Type: **5** supported; **5C1** suspended; **3** monorail trolley, standard headroom; **83** monorail trolley, low headroom; **53** double rail trolley, supported hoist; **53C1** double rail trolley, suspended hoist
- **N** 1 standard hoisting speed
- **V** 1 fast hoisting speed
- **NA** 2 standard hoisting speeds/Aux. speed
- **VA** 2 fast hoisting speeds/Aux. speed

2.5 TECHNICAL INFORMATION

Reference standards

The MISIA standard hoists are manufactured in compliance with following standards and regulations:

Machinery Directive 89/392/EEC with successive amendments 91/368/EEC, 93/44/EEC and 93/68/EEC.

Machinery Directive 98/37/CE, ex 89/392/EEC with successive amendments 91/368/EEC, 93/44/EEC and 93/68/EEC.

The construction of the MISIA standard hoists is performed in compliance with following rules:

- Machine Directive 98/37/CE (ex 89/392 EEC with successive amendments: 91/368 EEC, 93/44 EEC, 93/68 EEC);
- Directive 73/23 EEC "Low voltage electric equipment";
- Directive Electromagnetic compatibility 89/336/EEC;
- EN 292 Part 1 and 2 Safety of machines;
- EN 60529 IP Protection classes;
- EN 12077-2 Limiting and indicating devices;
- ISO 4301 Cranes and lifting appliances - Classification;
- ISO 4308-1 Rope selection;
- UNI 7670 Mechanisms for lifting appliances - Instructions for design;
- FEM 1001 Rules for the design of hoisting appliances;
- FEM 9.511 Rules for the design of serial lifting equipment; Classification o mechanisms;
- FEM 9.661 Rules for the design of serial lifting equipment; Dimensions and design of rope reeving components;
- FEM 9.683 Selection of lifting and travel motors;
- FEM 9.755 Measures for achieving safe working periods for motorised serial hoist units (S.W.P.);
- FEM 9.761 Lifting force limiters for controlling the loading on motorised series hoist mechanisms;
- FEM 9.761 Test specifications for electric hoists.

Operating conditions

MISIA standard hoists are designed to operate under following conditions:

- Temperature range: min. -10°C ... max +40°C
- Relevant humidity: < 80%
- Elevation max 1000 M.S.L.

For operation in other environmental conditions, as specified above, contact the manufacturer for special executions.

Standard protections and insulation

MISIA hoists are designed to operate in an environment protected from atmospheric influences. Electric components are supplied with the protections and insulation as shown in Table 1 and 2.

Motors Table 1

Operation	Protection		Insulation
	Motor	Brake	class
Hoist	IP54	IP23	F
Travel	IP54	IP23	F

Electric equipment Table 2

Item	Protection	Max. voltage Insulation
Electric box	IP55	1500 V
Cables	CE 120/22	450/750 V
Connectors	IP55	600 V
Pendant	IP55	500 V
Limit switches	IP54	500 V

Executions for operation in the open air, not standard protections and isolations can be supplied upon request.

Noise level

The sound pressure level during the operation of all components of the hoist is clearly under 85 dB(A) measured at 1 m distance and 1,60 m from the floor.

Power supply

Serial MISIA hoists are designed for three-phase AC power supply 230/400Volt / 50Hz ± 10% in case of 1 speed motor, or 400Volt / 50Hz ± 10% for 2 speed motors.

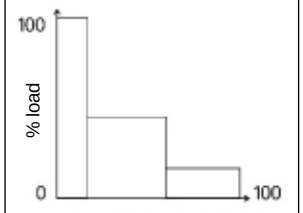
The design of the power supply line must be adequate for the rated current ranges and consumption motors foreseen in the offered equipment configuration.

Motors for special voltages and frequencies are available upon request.

2.6 SELECTION OF THE HOIST IN COMPLIANCE WITH THE FEM GROUPS

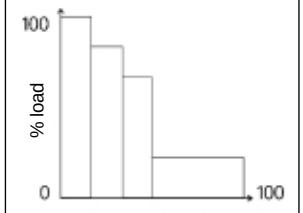
Two parameters determine the duty class of the hoist:
a) running time;
b) duty class.

L1 Light duty



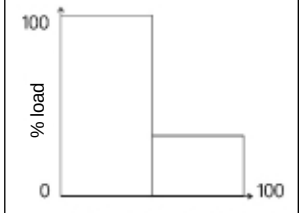
Hoists seldom lifting the maximum load and mostly reduced loads.

L2 Middle duty



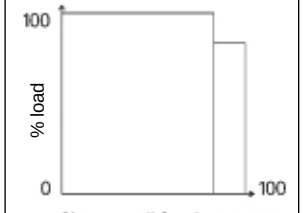
Hoists lifting approx. with the same ratio maximum, middle and reduced loads.

L3 Heavy duty



Hoists frequently lifting the maximum load and normally middle loads.

L4 Very heavy duty



Hoists regularly lifting loads near the maximum value.

Duty class	Running time "T"	
L1 - Light duty	6300	12500
L2 - Middle duty	3200	6300
L3 - Heavy duty	1600	3200
L4 - Very heavy duty	800	1600
FEM group	**1A m**	**2 m**

Temporary service

As foreseen in the **FEM standards 9.681** and **9.682**, electric brake motors for travel and lifting are designed and manufactured for intermittent duty in relation with the selected duty class. However, for example in case of long travel strokes or hook travel, it is possible that these intermittent duty rates cannot be observed. In these cases the hoist may be operated in **temporary service**, with the possibility to establish the running time taking into account the limit temperatures permissible for the motors. In these cases, make sure that the motors are not started for more than 10 times and for a maximum running time in compliance with the duty class selected basing on a.m. FEM standards (see table).

Comparison between duty classes FEM section IX (standard hoists) E FEM section the and ISO (special hoists)	
FEM 9.511	**FEM Section I-ISO**
1C m	M2
1B m	M3
1A m	M4
2 m	M5
3 m	M6
4 m	M7

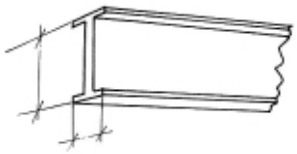
Temporary service (high hook travel and long travels)			
FEM group	**ISO**	**Continuous running time min.**	**Max. number of subsequent starts during the running time**
1B m	M3	15	10
1A m	M4		
2 m	M5	30	10
3 m	M6		

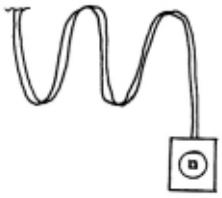
3. INSTALLATION INSTRUCTIONS

3.1 INSTALLATION PREPARATIONS

Before starting the installation, make sure that the technical data of the hoist and of the parts to be prepared by the user comply with the content of the order confirmation, in order to ensure a proper installation, especially:

Verify the suitability of the beam or of the fixed support prepared to hold the hoist, as well as of the feeding line.

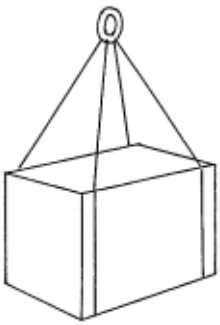




Inspect the working area where the hoist will be operating;

- Check that are no obstacles in the way of the hook during the lifting.
- In case of hoist with trolley, make sure that the travel and lifting movements are free from obstacles and are not dangerous to people, things and workplace.
- Make sure that no permanent working activities are performed under the operating area of the trolley.

Provide suitable test weights for dynamic and static load tests, with suitable sling and lifting equipment, as follows:



DYNAMIC TEST
mass =
rated capacity x 1,1

STATIC TEST
mass =

- **rated capacity x 1,25** besides the rated capacity of 1000 kg.
- **rated capacity x 1,5** up to the rated capacity of 1000 kg.

Check the suitability of the power supply line and the current / voltage values accordingly to the content of the order confirmation.

Verify the this documentation corresponds to the hoist to be installed.

3.2 PACKAGE

Check in the packing-list, or in the delivery note the list of the documents supplied with the equipment (including the instruction, operation and maintenance manual, the various certificates and the conformity declaration). The hoist can be delivered on: pallets, crate, open case, closed case, according to the requirements of the customer at the order. In case of "closed case" respect the handling instructions as well as the indications and symbols marked thereon.

Handle with care

Do not overturn

Protect from rain

Do not stack

Indication of lifting means and holding points

Before handling the packaging, take knowledge of the weight of the load unit signed on the package and use proper tools.

If the hoist should not be installed immediately, notice following points:

The standard packaging is not "rainproof" and is intended for transport by land, and not by sea, inside covered rooms, without humidity.

The packed and suitable preserved equipment can be stored indoors for a period of about 5 years, at temperatures between - 20°C and + 70°C and 80% humidity. Different environmental conditions require a special package.

Identify the hold points, if any, marked on each package unit with the corresponding symbol. Before handling the load unit, visually check the package, and consequently the goods, for breaks or damages.

NEVER USE SLING CHAINS TO LIFT OR MOVE THE PACKAGE UNIT

LIFT THE PACKAGED HOIST WITH THE FORKS OF A LIFT TRUCK OR BY MEANS OF A TRANS-PALLET

Dispose of the package accordingly to the law prescriptions.

3.3 TRANSPORT AND HANDLING

In order to ensure a careful and proper handling of the equipment, we recommend to entrust qualified carries with the transport. No other goods can be laid on the equipment or its package. During transport the goods must be properly covered to provide waterproof protection against the rain.
In case of shipping, the package units must be kept in the hold protected against sprinkling water or humid winds.

Perform the handling with suitable means, lifting the equipment without dragging it.

3.3.1. STORAGE

The goods, whether designed for indoor or outdoor installation, can be stored up to a maximum period of 5 years in an environment with the following characteristics:
- protected against atmospheric agents;
- humidity not higher than 80%
- minimum temperature -20°C
- maximum temperature +70°C

For storage periods over 5 years, ask the manufacturer for special protection procedures.

Should these values change during the storage, preliminary checks must be performed before putting the hoist into service. (refer to section 4.13 “Restoration after storage” on page 58).

If in the storage place the temperature rises above or falls below the given values and the humidity exceeds 80%, provide protections for the parcels with barrier bags and hygroscopic salts.

In case of storage outdoors:
- provide for supports to keep all packages without pallets clear of the floor;
- protect all packages with barrier bags and hygroscopic salts.

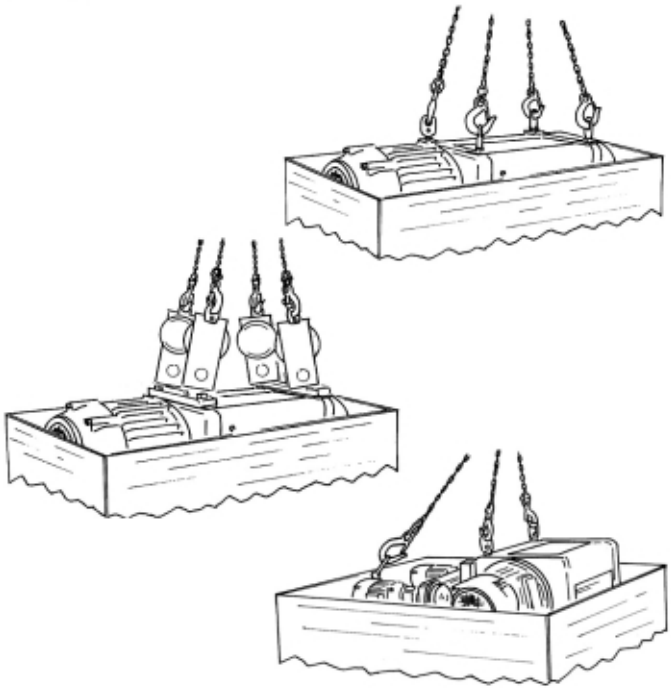
3.3.2. PACKAGE REMOVAL

To extract the hoist from the package no special slings are required.

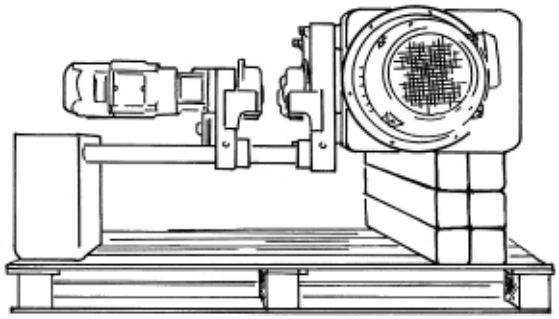
Use adequate slings for the mass of the hoist to be lifted.

After package removal, visually check the hoist for integrity before starting the installation.

To extract the hoist, hook the to the points provided, as shown in the illustrations.



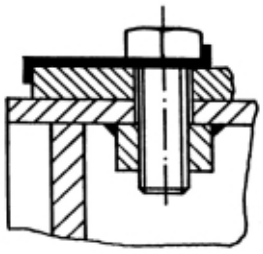
Once the hoist is removed from the packaging, put it on a pallet and ensure its stability.



3.4 ASSEMBLY OF THE COMPONENTS

Verify that the technical data of the hoist comply with the foreseen kind of operation, especially that the hook travel is not shorter than required and that the operation capacity is equal or higher, than the loads to be lifted.

To assembly the hoists Type 5C1 (suspended type) always use the lock tab under the head of the bolt and bend it as shown.



In case of hoist with monorail trolley Type 3 and Type 83, the trolleys are delivered with a pre-set beam width. This value is indicated in the order confirmation. Check for compliance and verify the space required on the catalogue.

Beam flange + 3÷4 mm

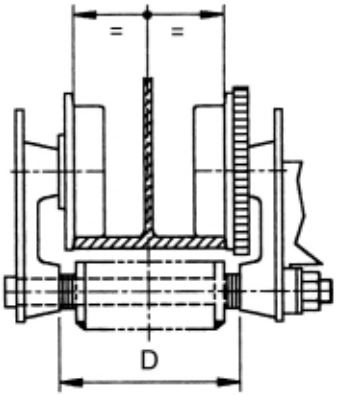
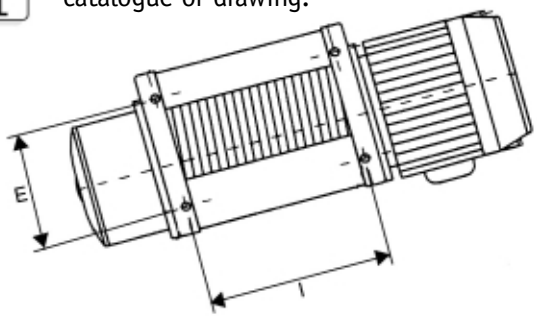
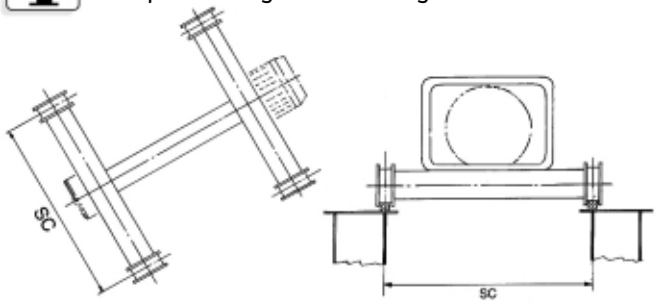


Fig. 1

Verify the feet base for hoists Type 5 as per catalogue or drawing.



Verify the gauge of double rail trolleys Type 53 as per catalogue or drawing.

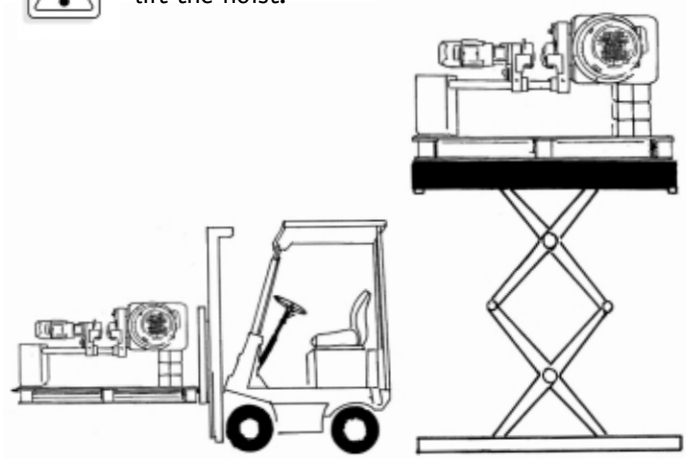


For any changes, please contact the Technical Department of MISIA.

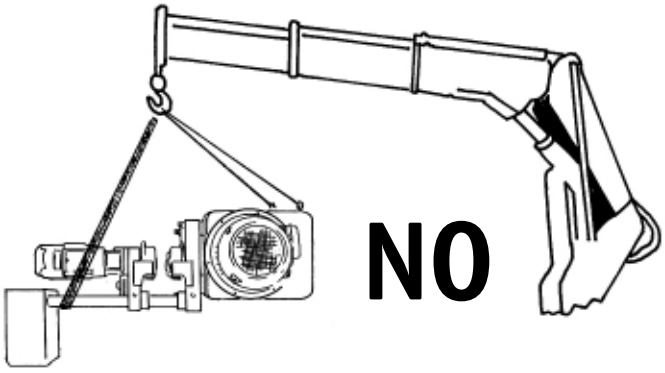
3.5 MOUNTING OF THE TROLLEY TYPE 3 AND 83 TO THE TRAVERSING RAIL

With the hoist on the pallet, lift it vertically with a lift truck or platform.

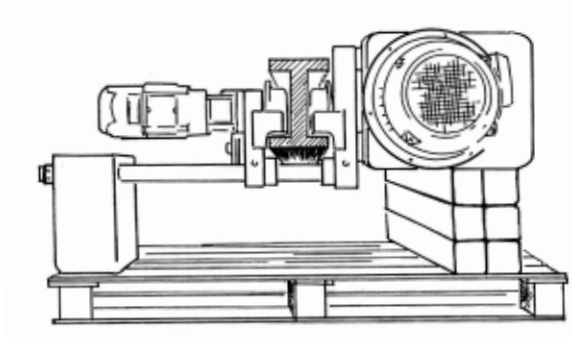
The step to be performed is to elevate, not to lift the hoist.



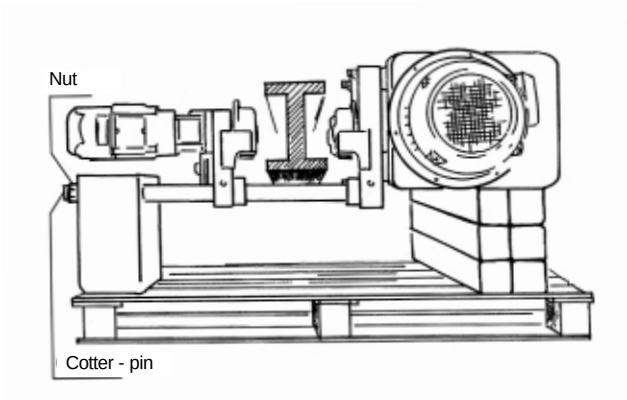
Do not use derricks for this step, otherwise the slings during the lifting would hinder the mounting on the rail.

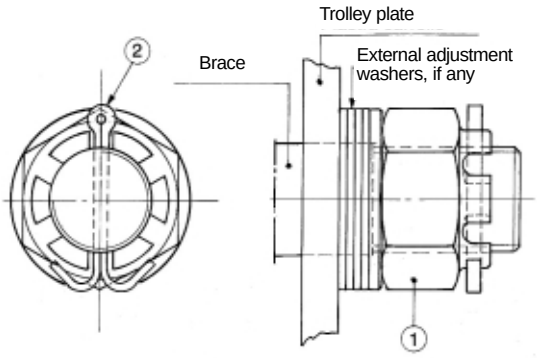


If the rail has one open end, fit the trolley on the open end of the rail and lock the rail end with a fixed stopper.



To mount the hoist on a closed end rail, widen the plate on the nut side proceeding as follows:





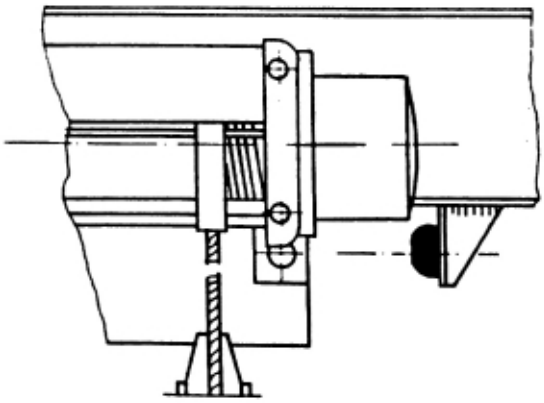
Remove the cotter pin Item 2, loosen the nut Item 1 until the plates spread enough to allow the wheels to pass on the external edge of the beam flange.

Place the trolley in position and restore the proper wheel base, paying attention to leave 3...4 mm between the beam flange and the wheel edge as shown 1 on page 19.

Press the plate against the inner spacers, tighten again the nuts paying attention that the slot of the slotted nut Item 1 is aligned with the hole of the tie bolt, insert the cotter pin Item 2 and bend the ends of the cotter pin so that it cannot came out.

In case of low headroom trolleys, before opening remove the counterweight, paying attention to put it again in position before tightening of the nuts.

After the mounting, verify that the trolley travels smoothly and that there are no obstacles, such as projections on beam flanges, junctions plates, bolt heads, etc.
Provide for rubber stopper at the ends of the trolley way as shown below.



On request, low headroom trolleys are available with counterweight made of steel sheets with a pre-set weight located at the end of the tie bolts on the side of the travel gearmotor, or with ballast container to be filled before mounting the trolley to the monorail as per table below. After filling the container with the ballast, we recommend covering it with at least 2 cm concrete. Verify the proper balance and the grip of the driving wheels with trolley without load, in order to prevent slipping.

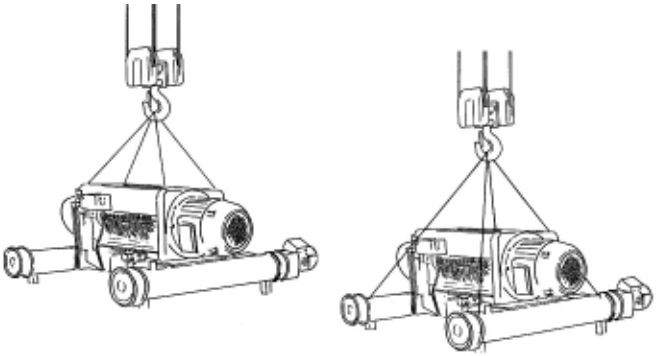
Ballast for counterweight trolleys Type 83

Type	Hook travel	VERSION "S2"				VERSION "S4"			
		Motor type	Ballast *kg*	Motor type	Ballast *kg*	Motor type	Ballast *kg*	Motor type	Ballast *kg*
MA	S	N and V	22	NA and VA	30	N and V	/	NA and VA	/
	T		24		32		24		32
	Q		28		36		28		36
	R		32		40		32		40
MB	S		40		65		/		/
	T		45		70		45		70
	Q		60		85		60		85
	R		75		100		75		100
MC	S		40		65		/		/
	T		45		70		65		90
	Q		60		85		80		105
	R		75		100		95		120
MD	S		130		180		/		/
	T		140		190		150		200
	Q		175		225		185		235
	R		200		250		210		260
ME	S	N	210	NA	240	N	230	NA	270
	T		240		270		290		330
	Q		270		300		310		360
	R		300		330		340		390

Indicated values are informative (for counterweights with container).

3.6 DOUBLE RAIL TROLLEY MOUNTING

Lift the trolley hoist with a mobile crane using the hold points provided for and lay it on the previously arranged travel rails, after having checked the exact gauge of the runways.



Check the anti-fall brackets for proper mounting.

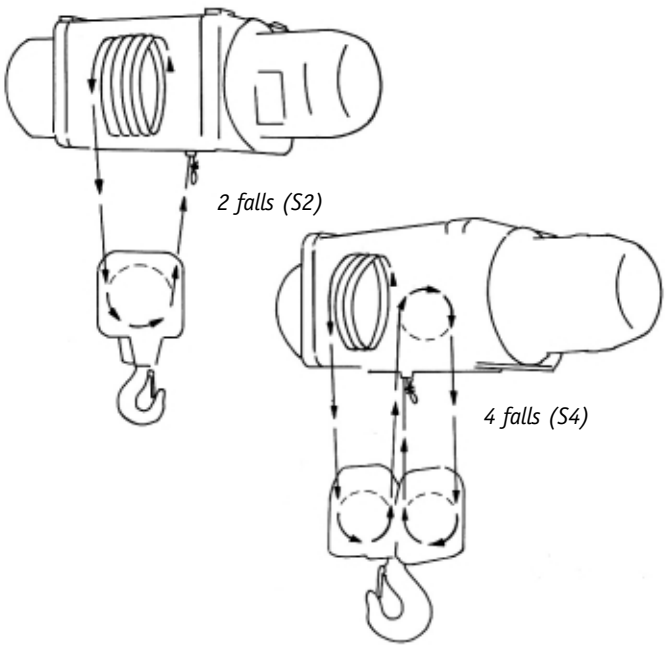
3.7 LOWER BLOCK MOUNTING

To ensure the safe and reliable operation of the hoist, special care must be given to the fixing of the two rope ends, observing following instructions.

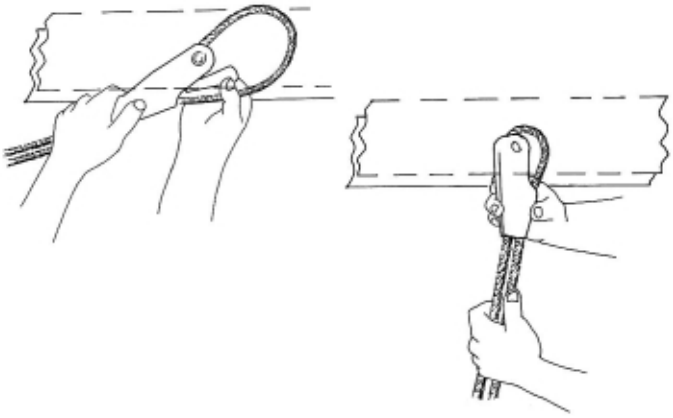
For transport reasons, the lower block is delivered loose, detached from the ropes. In this case, perform the lower block mounting paying attention to the following points:

- **the rope should not be twisted, but tight.**

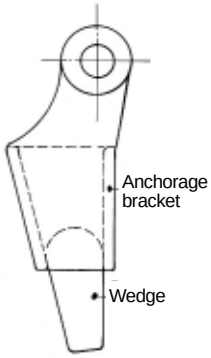
To mount the lower block of rope hoists with 2 or 4 falls, follow the indications in the figures.



Pass the rope through the pulleys and fix it to the relevant traverse inserting the wedge into the seat of the socket without twisting the rope.

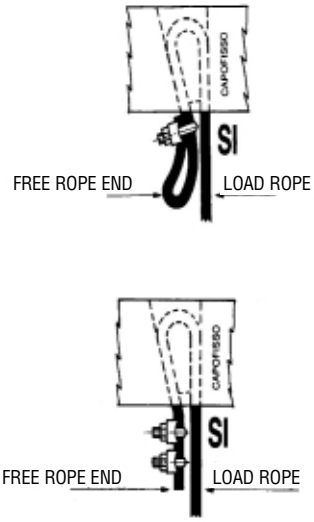


Before inserting the rope in the socket, make sure that the wedge supplied cannot come out from the lower hole of the socket without the rope wrapped around it, as shown below.



After that, fasten the supplied clamps to the free rope end.

Proper clamp fastening:



3.8 ELECTRIC EQUIPMENT

Caution: Before starting the assembly and the start up of the electric hoist, visually check the there are no mechanical or other damages caused by the transport.

Connection to the power supply line for hoists with electric equipment

First of all, check if the rated voltage and frequency on the identification plate of the hoist comply with the technical data of the power supply line of the workshop. After that, perform the connection and the start up of the electric hoist observing the wiring diagram located inside the electric equipment. If the feeding cable of the hoist does not form part of the delivery, determine its section in mm2 taking into account the necessary length and the current consumption of the motors, refer to section 3.10 “Start up” on page 24.

3.9 CONNECTION OF HOISTS WITH ELECTRIC EQUIPMENT

Before switching on the hoist motor, check if the voltage and frequency of the power supply line of the workshop comply with the data on the identification plate of the hoist. Considering that bipolar motors generally have only one feeding voltage, it is impossible to change the voltage inverting the connection in the terminal box.

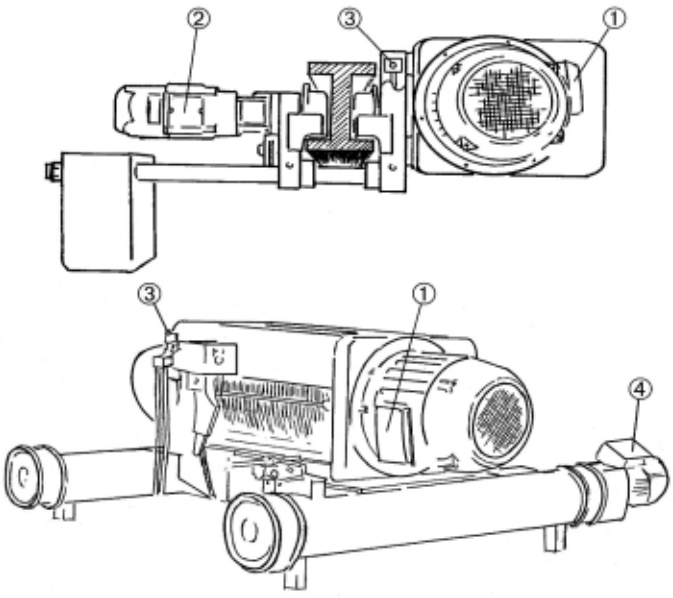
Verify that, under worst operating conditions (i.e., with the greatest number of users operating) and with the hoist at full load, the voltage at the motor terminals remains within a tolerance of +/- 10% of the rated voltage.

Forcefully tighten the terminals in order to avoid loose contacts.

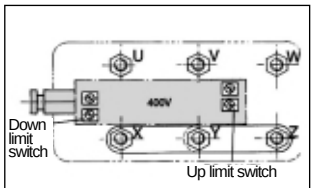
Make sure that the wiring diagrams of the electric system and of the terminal box refer to the installed hoist.

Define the capacity of the fuses accordingly to the amperage of the electric motors of hoist and trolley (Tab. 2-3-4-5 on page 23).

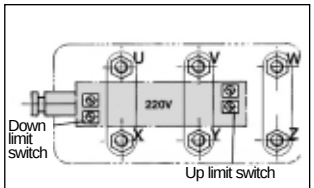
Determine the section in mm2 of the feeding cable, taking into account the necessary length and the current consumption of the motors (Tab. 6 on page 24).



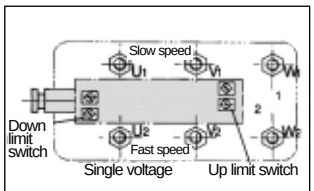
POS. 1
HOIST CONE MOTOR



1 speed - 400 V

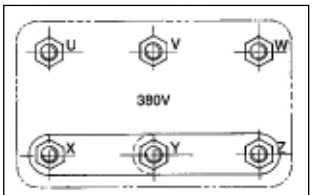


1 speed - 230 V

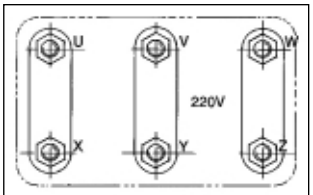


2 speed SINGLE VOLTAGE

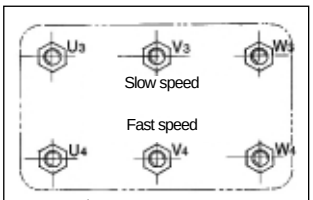
POS. 2 and 4
TRAVEL MOTOR



1 speed - 400 V

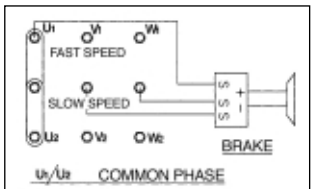


1 speed - 230 V

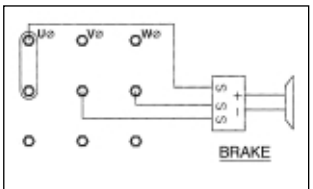


2 speed SINGLE VOLTAGE

TROLLEY MOTOR BRAKE CONNECTION IN D.C.

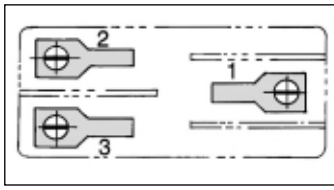


2ª SPEED SINGLE VOLTAGE



1ª SPEED SINGLE VOLTAGE

POS. 3 LOAD LIMITER



1 = COMMON (BLACK)
2 = N.O. CONTACT (BLUE)
3 = N.C. CONTACT (BROWN)

Motor current consumption

Hoist motors Table 2

Motor			Rated current (in A)		Protection fuses type "aM" for the motor	
Size	Type	Power *kw*	230 V	400 V	230 V	400 V
1608-6	N	1,5	11,5	6,5	16	10
2008-6		3	21	12	25	20
2011-6		4,5	28,5	16,5	32	25
2412-6		8	45	26	63	32
2714-6		12,5	66,5	38,5	80	63
1608-4	V	2,3	11,5	6,5	20	16
2008-4		4,5	22,5	13	32	25
2012-4		7,5	31	18	50	32
2714-4		12	52	30	63	63
2110-6/24	NA	1,5/0,33	10,5/9,5	6/5,5	16	10
2612-6/24		3/0,75	15/13	8,5/7,5	25	20
2714-6/24		4,8/1	21/20	12/11	32	20
3317-6/24		8/1,7	31/26	18/15	63	32
3517-6/24		13/3	55,5/69	32/40	80	63
2110-4/24	VA	2,2/0,33	11,5/12	6,5/7	20	16
2612-4/24		4,5/0,75	17,5/11,5	10/6,5	25	20
2714-4/24		7,5/1	26/20	15/11	32	32
3317-4/24		12,5/1,7	43/28	25/16	63	63

Travel motors monorail trolley Type 83 Table 3

Motor		Rated current (in A)		Protection fuses type "aM" for the motor	
Poles	Power *kw*	230 V *A*	400 V *A*	230 V *A*	400 V *A*
2	0,18	1,4	0,75	2	2
2	0,24	1,7	0,85	4	2
2	0,30	2	1,20	4	2
2	0,60	3,5	1,80	4	4
2/8	0,18/0,045	1,4/1	0,75/0,75	2	2
2/8	0,24/0,06	17/1,4	0,85/1,10	4	2
2/8	0,30/0,08	2/1,4	1,20/1,20	4	2
2/8	0,37/0,09	3,1/3	1,80/1,0	4	4

Travel motors monorail trolley Type 3 Table 4

Motor		Rated current (in A)		Protection fuses type "aM" for the motor	
Poles	Power *kw*	230 V *A*	400 V *A*	230 V *A*	400 V *A*
6	0,12	1,5	0,85	2	2
8	0,10	1,4	0,82	2	2
	0,32	2,8	1,6	4	2
6	0,37	3,1	1,8	4	4
4/12	0,18/0,06	1,9/1,2	1,1/0,7	2	2
	0,37/0,10	2,6/1,9	1,5/1	4	2

Travel motors double rail trolley Type 53 Table 5

Motor		Rated current (in A)		Protection fuses type "aM" for the motor	
Poles	Power *kw*	230 V *A*	400 V *A*	230 V *A*	400 V *A*
4	0,25	1,5	0,85	4	2
	0,37	2,4	1,4	4	2
	0,55	3,3	1,9	4	2
	0,75	3,7	2,1	6	4
	1,1	6,1	3,5	8	4
4/12	0,25/0,08	1,6/1,6	0,90/0,95	4	2
	0,37/0,12	2,4/2,4	1,4/1,4	4	2
	0,55/0,18	3,1/3,3	1,8/1,9	4	2
	0,75/0,25	3,7/4,4	2,1/2,5	6	4
	1,1/0,37	6,1/6,1	3,5/3,5	8	4

Rev. 11/2003

3.10 START UP

Verify the function of the power supply line and the capacity of the main magneto-thermal line circuit-breaker in relation to the motor powers and the relevant current consumption.

Make sure that the gearboxes are lubricated and that there are no oil leaks.

Verify that rope, drum, pulleys and rope guide are lubricated with grease grade SAE 30.

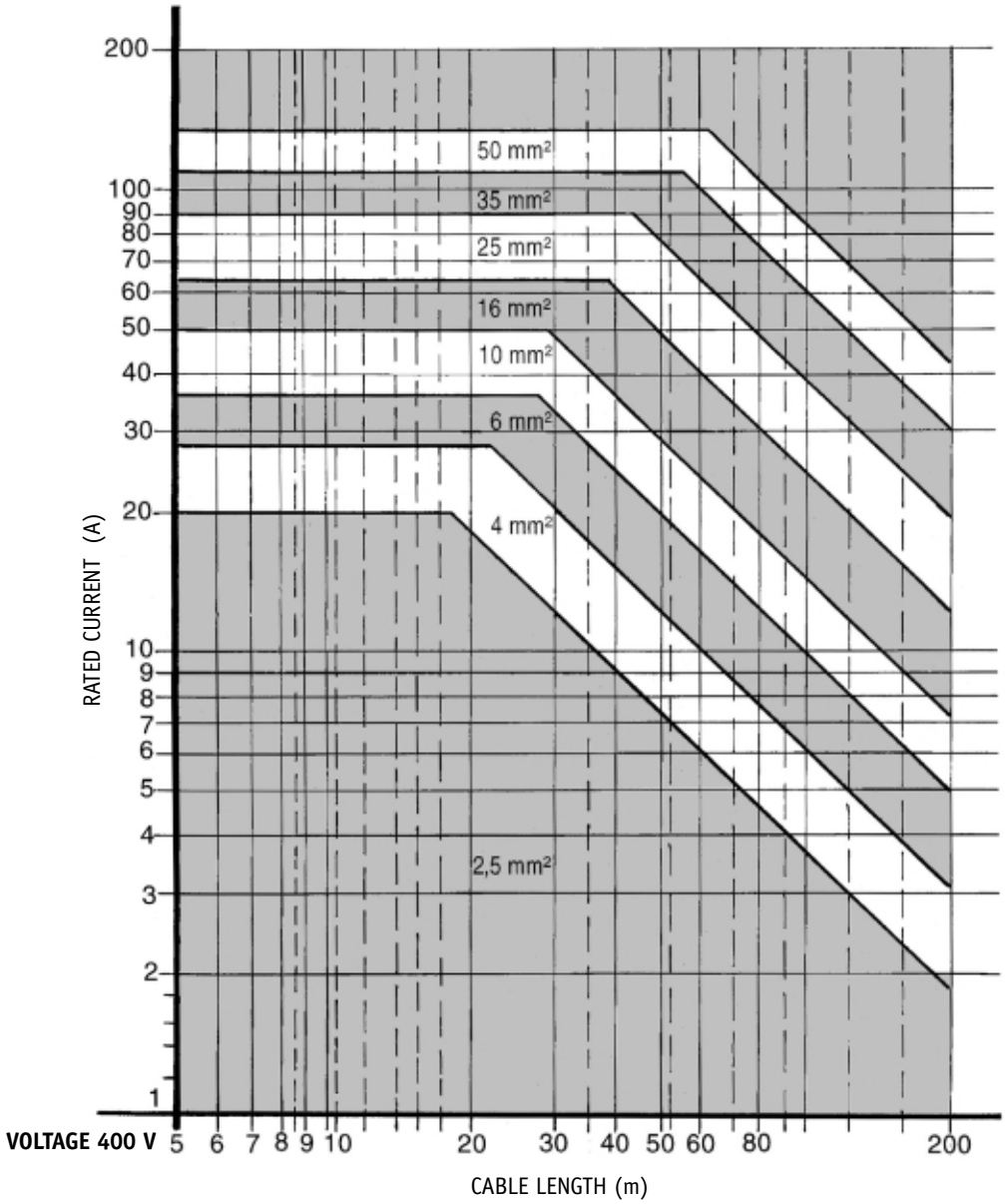
Verify the proper installation of the rope into the socket and that the rope is not tensioned.

Check the stop limit switches for proper position and fastening.

Verify that the cable section of the power supply line, in compliance with the current consumption of the motors (as shown in Table 2 on page 23) correspond to the content of Table 6.

Verify the tightening of all fastening screws of the components.

Cable section for power supply trailing cables Table 6



3.11 FUNCTION CHECK AND ADJUSTMENTS

3.11.1. UP-DOWN LIMIT SWITCHES

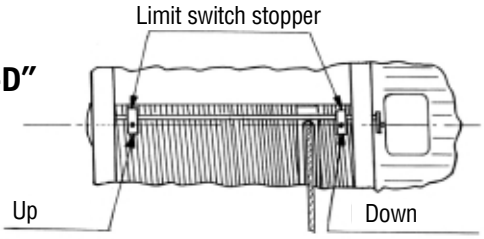
The installed limit switch has the function to stop the lifting in EMERGENCY cases only. In case of necessity to use it as a normal operational stop, a further limit switch should be installed.

After connection with the main power line, check that the hook is lifted when the "up" button is pressed. If this is not the case, reverse two phases of the power supply.

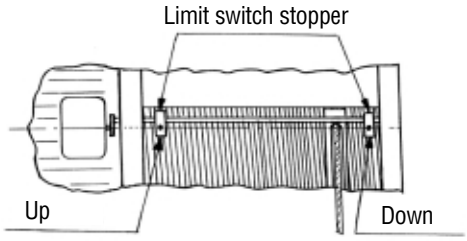
This step is extremely important because the proper operation of the up and down limit switches depends on it.

Take care to position the up and down limit switch stoppers at the correct locations on the limit switch control rod, so that the switch operates when the hook is at the desired height.

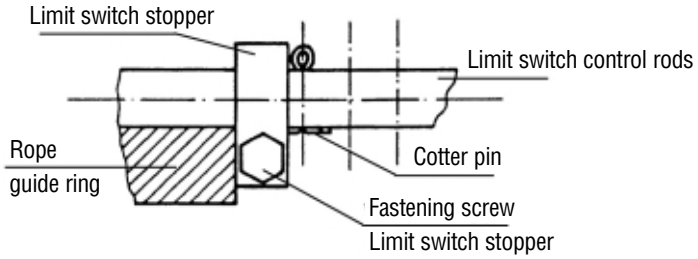
Type "A-B-C-D"



Type "E-F"

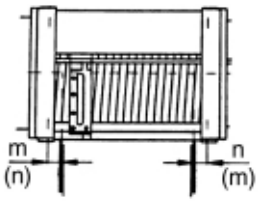


Detail L.S. STOPPER MOUNTING



The max rope approach to the feet base should never exceed the values of Table 7.

m= Coiled rope side for hoists A-B-C-D
(n)= Uncoiled rope side for hoists E-F



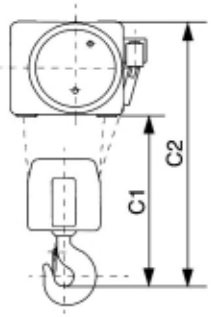
n= Uncoiled rope side for hoists A-B-C-D
(m)=Coiled rope side for hoists E-F

Rope outlet positions Table 7

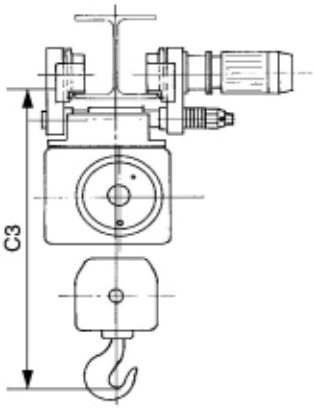
Hoist		A	B	C	D	E	F
Hook travel		**S÷R**	**S÷R**	**S÷R**	**S÷RZ**	**S÷X**	**P÷T**
Type 5-3-53	m/n	41/41	40/51	40/51	48/60	50/75	55/90
Type 83 vers. S2	m/n	41/41	50/51	50/51	65/65	/	/
Type 83 vers. S4	m/n	41/41	50/51	60/60	65/65	/	/
Hook travel		**Z÷X**	**Z÷X**	**Z÷X**	**X**		
Type 5-3-53	m/n	40/51	48/60	48/60	/	/	/
Type 83 vers. S2	m/n	50/51	65/65	65/65	50/75	/	/

Positioned at the "up" limit switch, the lower block should show the measures indicated in Tab. 7 and should be at the distance indicated in Tab. 8. For lifting speeds over 8 m/min. this distance must be increased of at least 50 mm.

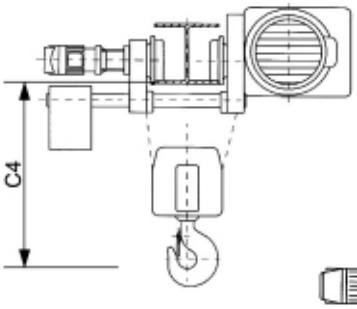
Type 5-5C1



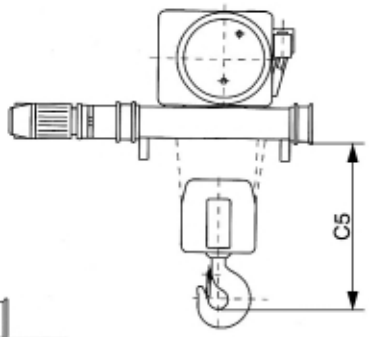
Type 3



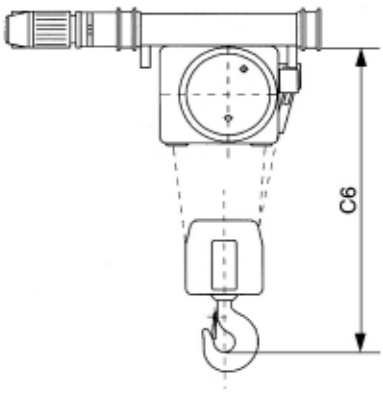
Type 83



Type 53



Type 53C1



Hook travel P÷R

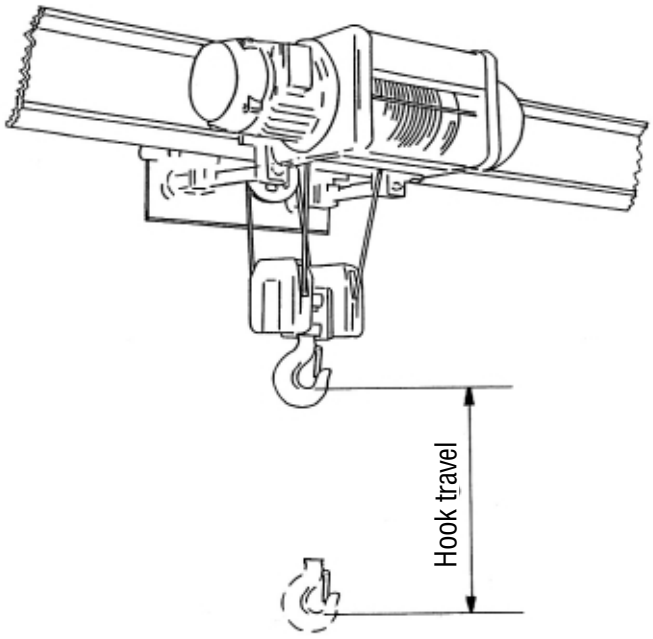
Version S2 (2 rope falls)							Table 8
		"M" series					
		A	B	C	D	E	F
Type 5	C1	450	550	620	710	840	1100
	C2	770	885	985	1145	1370	1700
Type 3	C3	955	1100	1200	1400	/	/
Type 83*	C4	605	590	660	870	930	/
Type 53	C5	/	550	620	710	840	1100
Type 53C1	C6	/	885	985	1145	1370	1700
Version S4 (4 rope falls)							
		"M" series					
		A	B	C	D	E	F
Type 5	C1	415	525	565	825	840	1000
	C2	735	890	930	1130	1355	1600
Type 3	C3	920	1140	1180	1380	/	/
Type 83*	C4	670	640	650	830	855	/
Type 53	C5	415	525	565	695	825	1000
Type 53C1	C6	735	890	930	1130	1355	1600

Hook travel Z X

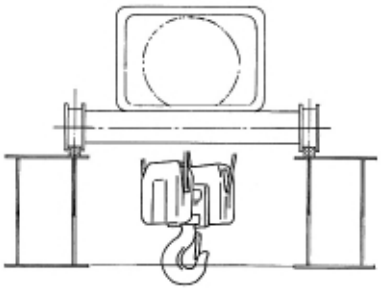
Version S2 (2 rope falls)					Table 8 A
		"M" series			
		10	20	32	50
Type 5	C1	450	550	620	710
	C2	815	980	1050	1145/1240
Type 3	C3	965	1145	1215	1310/1325
Type 83*	C4	630	710	780	870
Type 53	C5	/	550	620	710
Type 53C1	C6	/	980	1050	114/1240

* ***NB:*** *The measures indicated for the type 83 (C4) are for beam flange up to max 300 mm.*
For bigger beam flange, the measure C4 increases of 12 mm every 10 mm beam width.

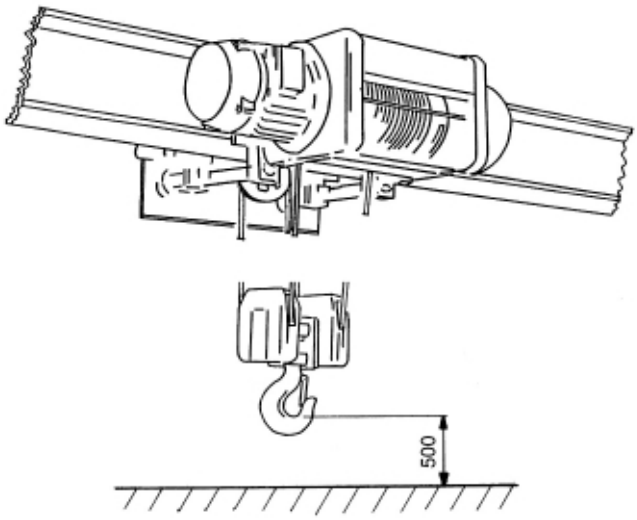
Run the lower block along the whole pre-set hook travel and check that it stops correctly when it reaches the stopper on its way up and down.



In case of hoist with double rail trolley Type 53, the internal edge of the hook jaw should not be deeper than the lower edge of the beam.



The setting of the down limit switches must stop the lowering when the lower edge of the hook has reached a distance of 500 mm from the floor.



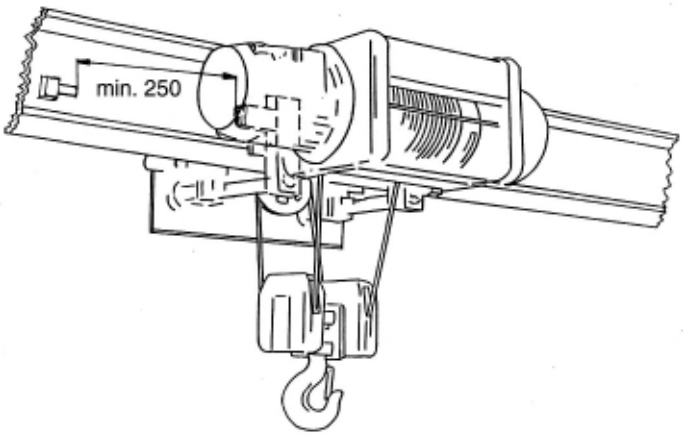
3.11.2. TROLLEY TRAVEL LIMIT SWITCH

Perform the connection to the main power line.

Do not interfere with the internal connections of the trolley/hoist or of the pendant.

Pressing the push-buttons “right-left”, run the trolley along the whole length of the beam and check that it stops correctly.

Check the proper position of the stopper of the limit switch of the trolley, in order to ensure an adequate overrun room and avoid collisions the trolley and the fixed stopper.



3.11.3. BRAKE RELEASE

In the “jogging” mode, check that the brake disk detaches from the brake pad, thus freely rotating without rubbing.

3.11.4. NOISE LEVEL

Verify the absence of abnormal noise during the lifting and the travel, such as: squeaks, cyclic noises, abnormal vibrations, etc. The noise level of the hoist, even with full load, must always be less than 85 dbA and constant.

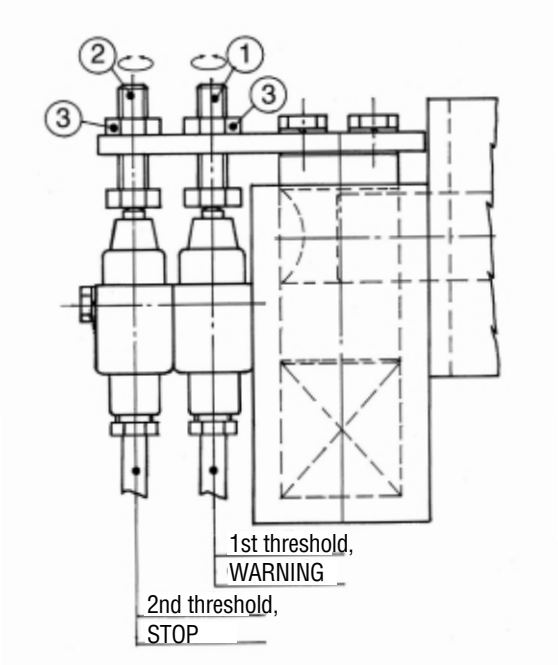
3.12 LOAD TESTS

3.12.1. LOAD LIMITER FUNCTION CHECK

The electromechanical load limiter is statically pre-set by the manufacturer. Should it not work properly during the installation and the final test of the equipment, perform its setting as follows:

1st threshold, warning: Apply the rated load, switch-on the hoist motor and set the reaction of the microswitch with the adjusting screw Item 1, after loosening the locknut Item 3; turning the screw counterclockwise if the limiter acts beforehand, or clockwise if it does not reacts. After the adjustment, tighten the locknut Item 3.

2nd threshold, stop of the movements: apply a load 15% higher than rated load, switch-on the hoist motor and set the reaction of the microswitch with the adjusting screw Item 2, after loosening the locknut Item 3; turning the screw counterclockwise if the acts beforehand, or clockwise if it does not reacts. After the adjustment, tighten the locknut Item 3.



3.12.2. DYNAMIC TEST

Prepare adequate weights for the load tests as follows: rated capacity x 1,1 and proper slinging and lifting equipment.

Sling the load taking care to position the hook vertically above the load itself, to avoid oblique pulls.

Tension the slings slowly, avoiding jerks.

Tension the slings using the “slow” speed, if available.

Slowly lift the load and make sure that it happens smoothly, without abnormal noise level, bends or structural settlements.

Repeat the test at maximum speed, carrying out the previous checks.

Check that the ”up and down” emergency limit-switches are properly working.

Check that the brake is working properly, making sure that the mass is stopped within an adequate time and that there are no abnormal slipping of the load when the button is released.

Perform the same checks also for the horizontal travel operation, without lifting the load at the maximum height (lift it at 1 m distance from the floor).

Operate first at slow speed, if available, and then at the maximum speed.

Check the trolley for smooth running on the beam and make sure that there are no abnormal noise or structural settlements.

3.12.3. STATIC TEST

Perform the static tests without switching-on the hoist and travel motors.

Lift the rated load, hold it suspended and gradually apply on it masses up to an overload of 25% of the rated capacity, for hoists over 1000 kg, respectively 50% for hoists up to 1000 kg.

During this step the load should not be moved.

Verify that with the mass suspended (rated load plus overload) no slipping, abnormal noise level, permanent deflections and structural settlements occur.

Verify that pressing the “UP” push-button the lifting is not activated, as a consequence of the intervention of the load limiter.

4. OPERATION AND MAINTENANCE INSTRUCTIONS

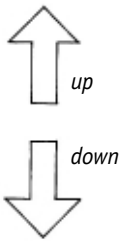
4.1 HOIST FUNCTIONS - "Intended purpose"

The electric rope hoist is intended to handle goods or materials (by vertically lifting in the space) with the load hook and appropriate accessories, in industrial, craftman or commercial installations and is not suitable for civil uses, unless suitably adapted to this purpose. The hoist can be used in stationary or travelling operation on a trolley on bridge, jib or portal cranes, etc. or monorails.
Basically, the hoist/trolley assembly performs its duty by means of two main movements:

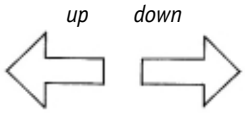
- vertical lifting of the load with the hoist;
- horizontal travelling of the load with the trolley.

These movements are controlled by push-buttons on the pendant as follows:

- UP and DOWN push-buttons for the LIFTING function



- RIGHT and LEFT push-buttons for HOIST TRAVEL function



The push-buttons activate the function when they are hold pressed and of "graduated" type with two positions, the first one for the "slow" speed and the second one for the "fast" speed.
The red mushroom EMERGENCY STOP button on the pendant activates the STOP function if completely pressed. To enable the operation of the hoist, turn the EMERGENCY STOP button clockwise and lift it in its original position.
The hoist can also be operated by a radio control system; the push-buttons have the same functions as specified above, and the pendant is free, and not connected to the hoist.

4.2 BEFORE STARTING

Before operating the hoist, perform the following:

Visually check the equipment for integrity;

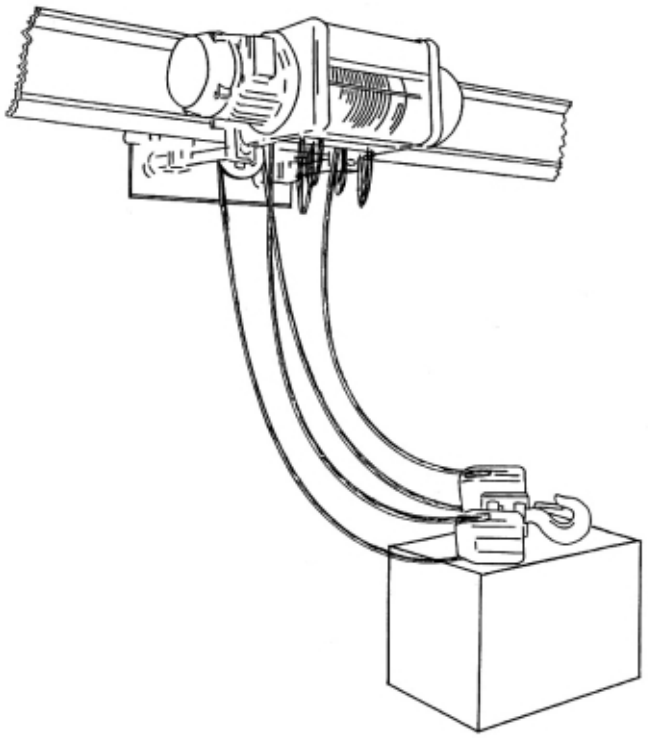
Switch-on the power turning the main switch to "ON" or "1";

Verify the function of the hoist checking the movements described in the previous section (HOIST FUNCTIONS - "Intended purpose") and performing the preliminary checks described in Chapter "WHAT MUST ALWAYS BE DONE!" on page 31.

4.2.1. LIFTING

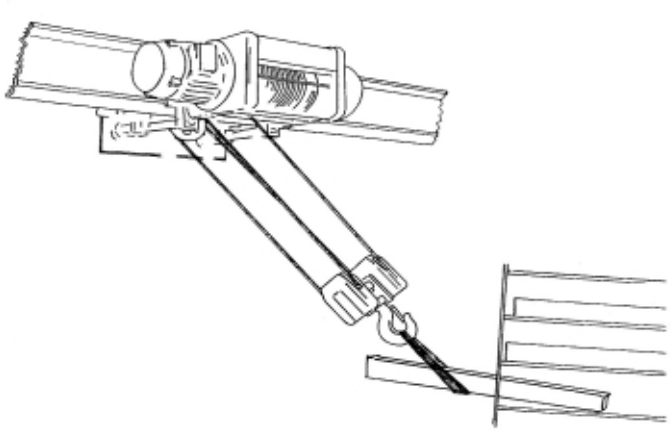
The operator must pay attention to hold the lifting ropes always taut, never laying the hook on the floor or on the loads to be lifted.

Slack ropes may twist, spring out from the drum windings or from lower block pulleys, form knots, suffer even serious damages and cause unexpected danger situations.



The operator must strictly avoid oblique pulling of the load, which is always dangerous and hard to control, and especially oblique pulling as shown in the Figure, which

could in addition cause the damage of the rope guide and of the grooves with consequent uneven coiling.



4.2.2. TROLLEY TRAVEL

It is essential to avoid forceful impacts between the trolley and the end stoppers, , in order not to seriously damage the mechanical components and the structure. It must be kept in mind that the limit switches are placed in a position that allows the full travel of the trolley when this approaches them at low speed, and that the required braking distance increases with the speed. Consequently, the operator must always slow down the travel speed when the trolley approaches the rail ends.

4.2.3. EMERGENCY AND INTERLOCK DEVICES

To disconnect the power supply to the equipment, switch-off the line circuit-breaker or press the "EMERGENCY STOP" button on the on the pendant. An electrical and mechanical interlock on the hoist and travel motors prevents the simultaneous rotation in two directions; The electric interlock on the hoist motors for slow and fast speed prevent the simultaneous power feeding. The voltage lack causes the immediate stop of all movements of the hoist, since the electric motors are equipped with automatic negative brakes.

4.2.4. SAFETY DEVICES

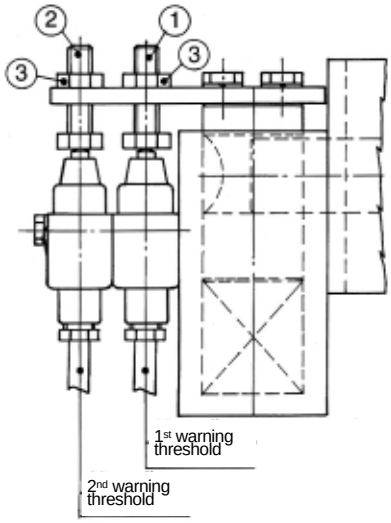
The lifting limit switch, which limits the max hook travel, and the trolley travel limit switch are safety devices, not meant to be systematically used as normal stop or enabling devices for further operations. The load limiter with two reaction thresholds (first: WARNING, second: STOP) prevent the operation of the hoist with an overload. The lifting hook is equipped with a safety catch preventing the accidental release of the slings.

4.2.5. LOAD LIMITER

The load limiter on the rope hoists has two reaction thresholds with following settings:

- The 1st threshold signal the reaching of the rated load.
- La 2nd threshold deactivates the lifting and travel functions, exception made for the load lowering.

Accordingly to the FEM standard 9.761, the user must check at least once a year the settings of the reaction limits of the 2 thresholds, by means of suitable test loads with known weights, and/or using a load cell with display of the stress values. The results of the yearly check must be reported in the relevant check booklet.

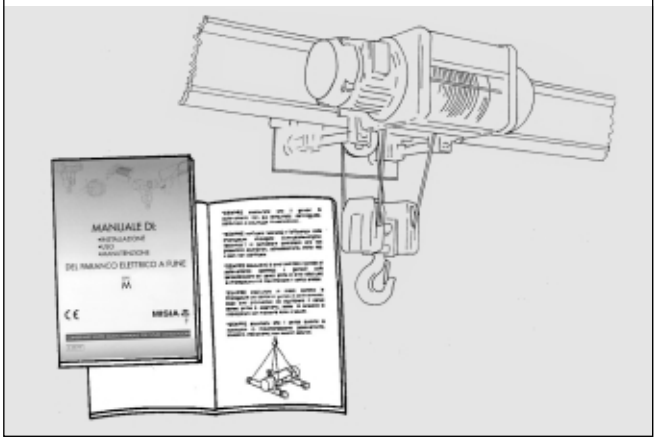


4.3 WHAT MUST ALWAYS BE DONE!

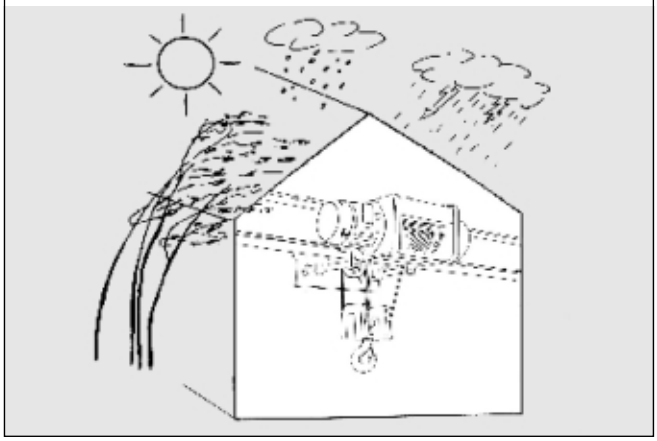
Precautions and operation criteria

The proper use of the hoist allows to fully exploit its capabilities in complete safety. These potentialities are granted only strictly observing under mentioned instructions. Therefore:

ALWAYS observe the indications and instructions of the installation and operation manuals and check the components and the parts of the hoist for integrity.

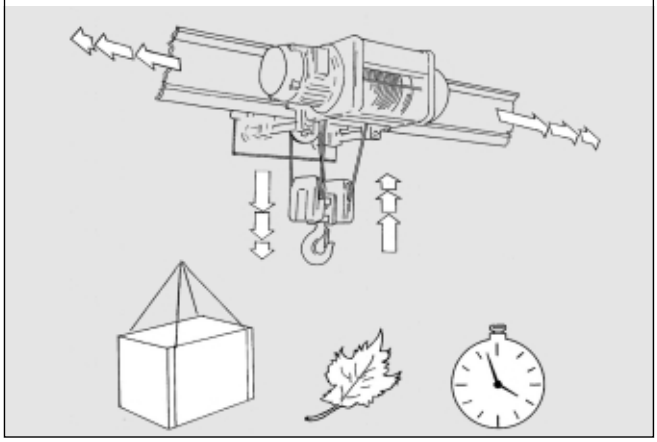


ALWAYS make sure that the hoist operates protected from atmospheric agents (rain, wind, snow, etc.).

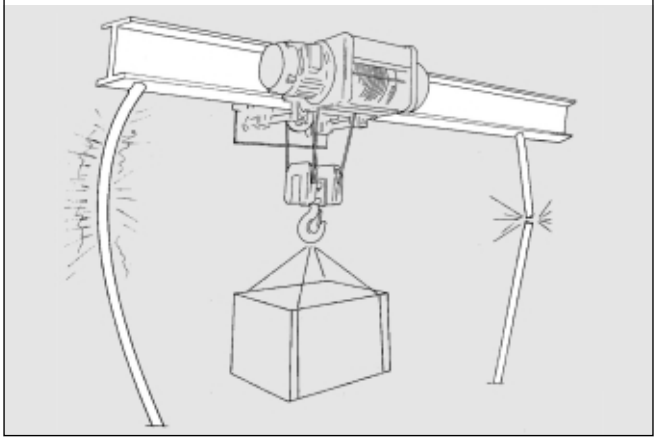


ALWAYS observe the instructions and the warning labels on the hoist and in the working areas. These are accident-prevention warnings and must always be readable.

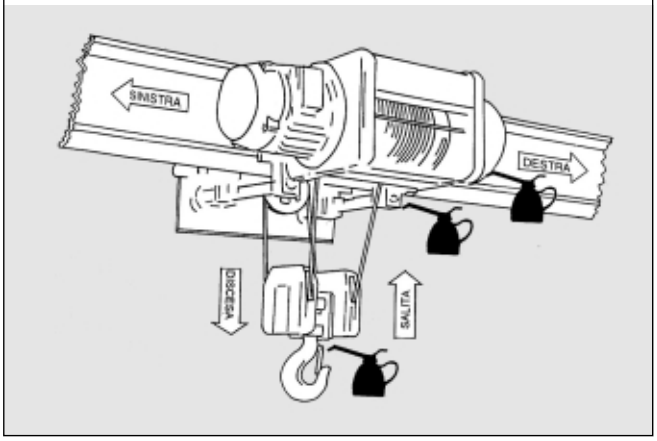
ALWAYS verify that the hoist is suitable for the work to be done (duty cycles - intermittent duty - running time - load to be handled)



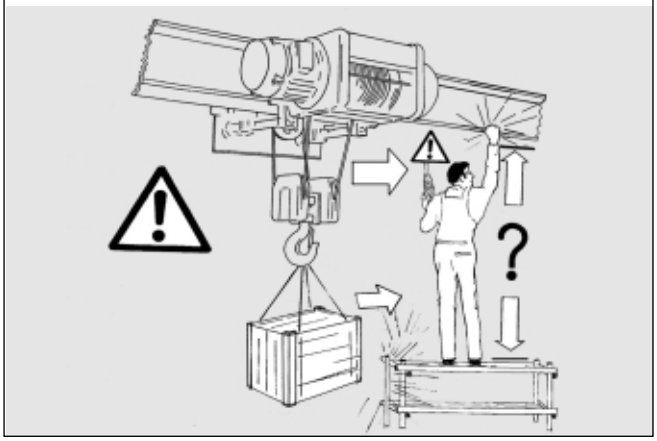
ALWAYS check the hoist and trolley supporting structures for solidity.



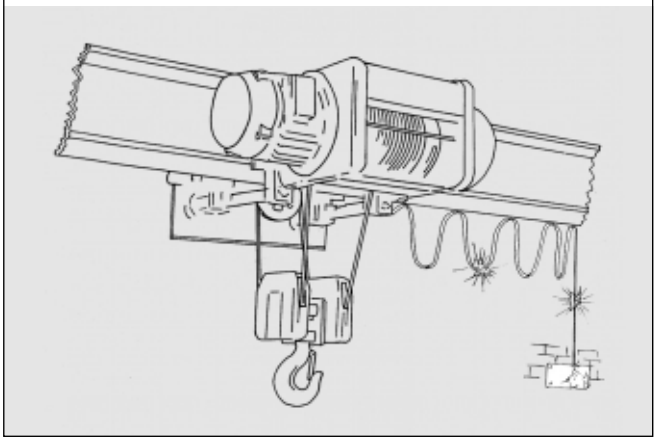
ALWAYS make sure that the hoist is adequately lubricated (ropes, drum, pulleys, lower block-hook, pendant, limit switches, gearboxes, trolley wheels, etc.).



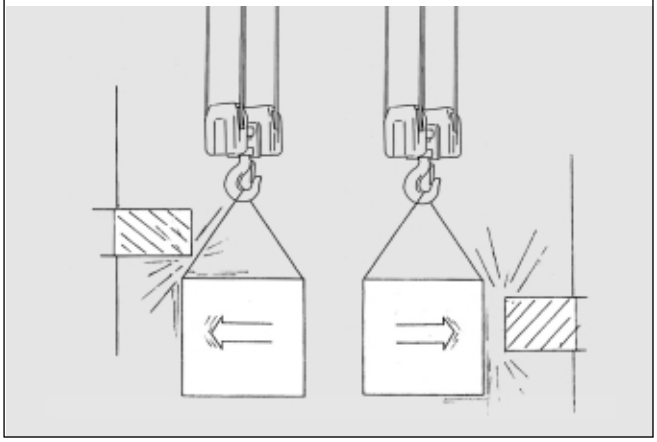
ALWAYS make sure that the way of the trolley, hoist and load is at a height preventing collisions with the operator.



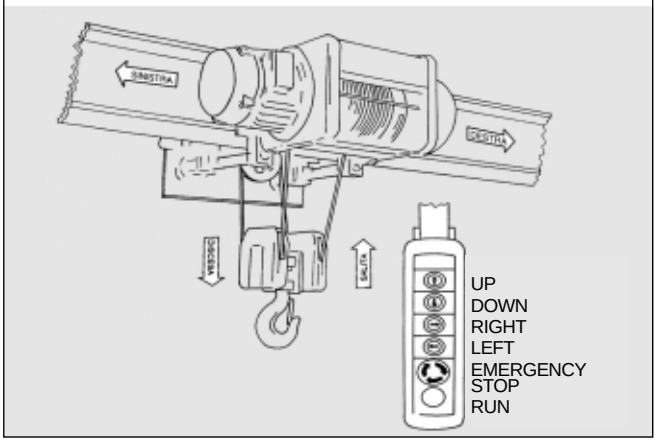
ALWAYS check the electric system; especially for proper connections, and make sure that there are no loose or dangerous connections. Check the motors (hoist and trolley) for proper operation.



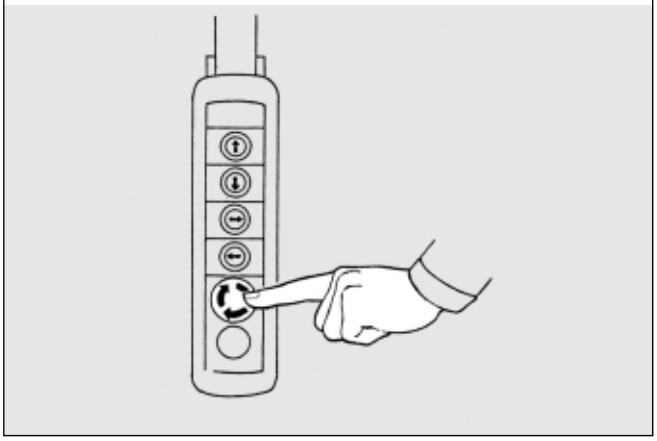
Before starting any operation, **ALWAYS** make sure that there are no obstacles on the way of the trolley-hoist.



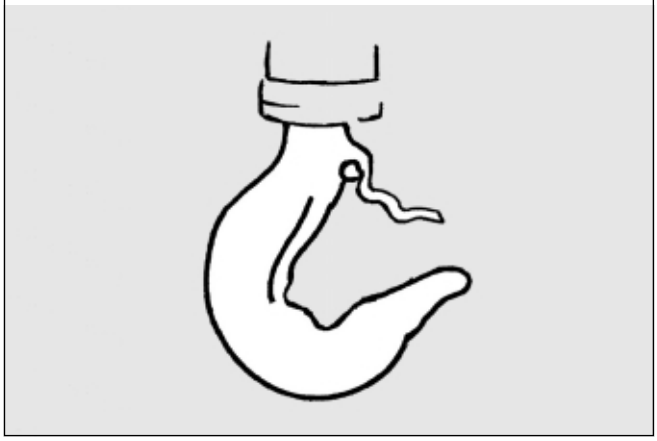
ALWAYS verify the correspondence of the movements of trolley and hoist.



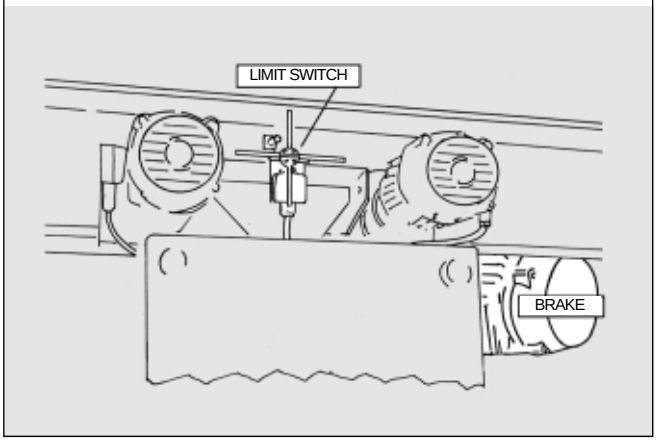
ALWAYS test the operation of the EMERGENCY STOP button.



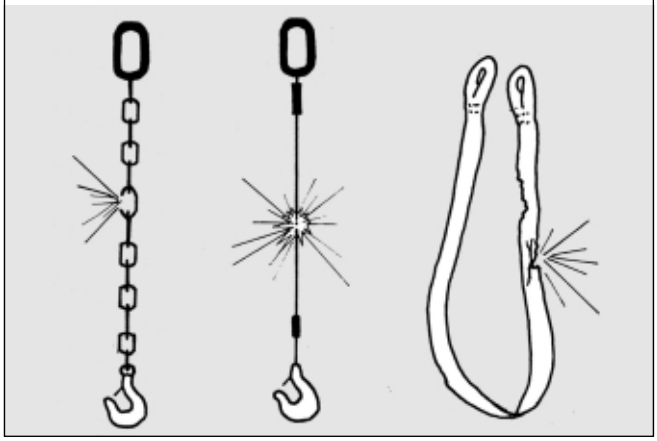
ALWAYS make sure that the lifting hook is not worn, damaged, without safety devices (safety catch).



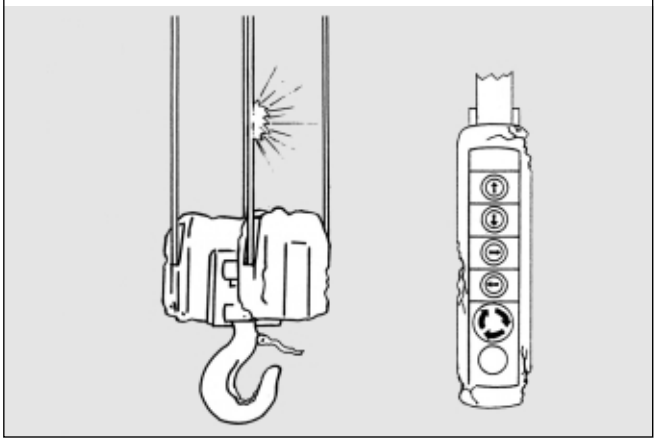
ALWAYS check with regularity the efficiency of brakes and limit switches, testing their functions.



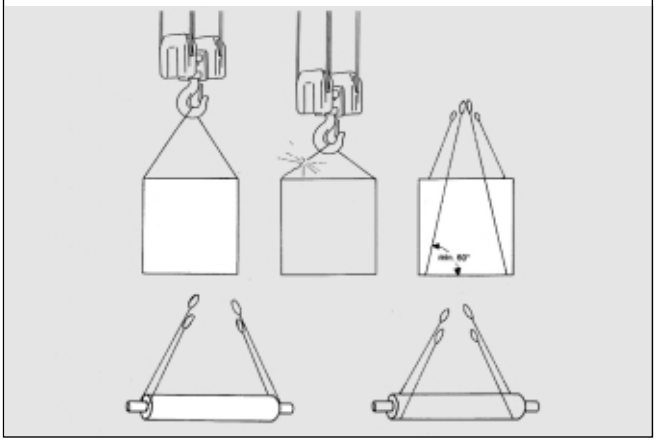
ALWAYS check the suitability and efficiency of the slings used (ropes-chain-belts-bands-etc.); in particular, check that there are no tears, squeezing, broken strands or parts without lubrication.



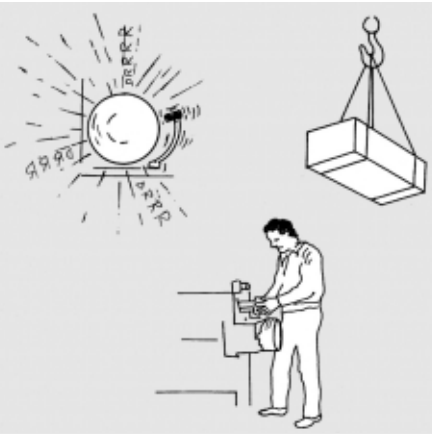
ALWAYS check ropes, lower block hook, load limiter and pendant for integrity and efficiency.



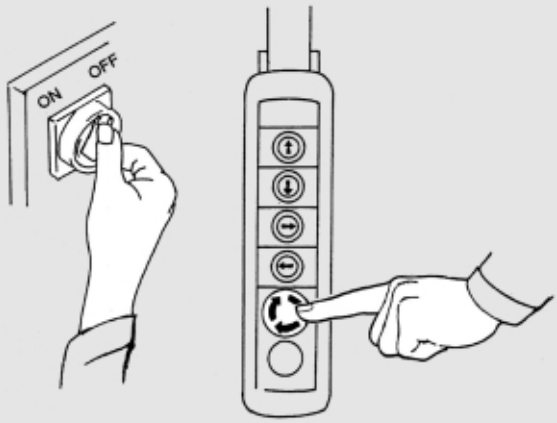
ALWAYS attach properly the slings to the lifting hook, after balancing the load before lifting it, ease the slack out of the slings with slowly and safe manoeuvres.



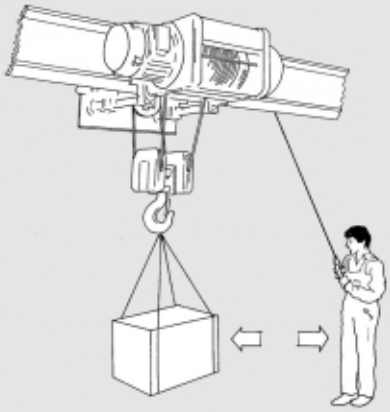
ALWAYS signal the start of the load handling operations to bystanders and persons standing in the working area of the trolley-hoist.



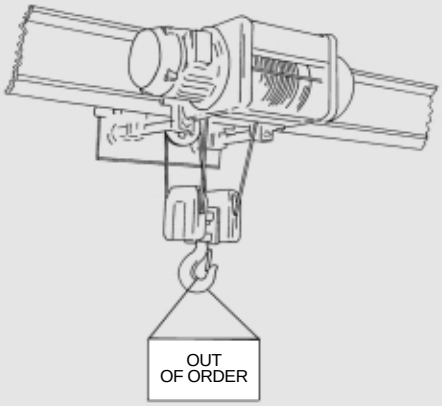
Before leaving the working place, **ALWAYS** press the switch-off button on the pendant and the main switch supplying power to the hoist.



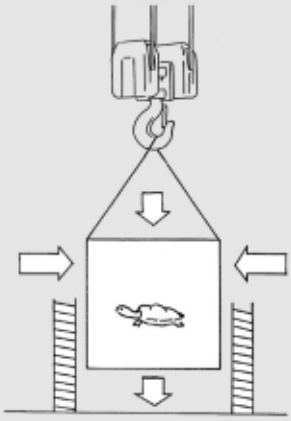
ALWAYS stand clear of the lifted load



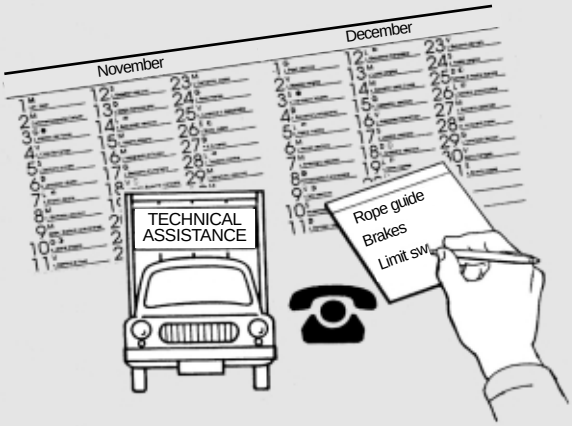
ALWAYS inform the safety manager of any operation defects (faulty operation, suspected breaks or abnormal noises) and put the hoist out of service.



ALWAYS use "low" speeds for approaching and spotting manoeuvres, for short distances.



ALWAYS observe the maintenance schedules and record, after each inspection, any observations, especially concerning hook, rope, brakes and limit switches; comply with art.375 and 376 of the DPR 547/55.

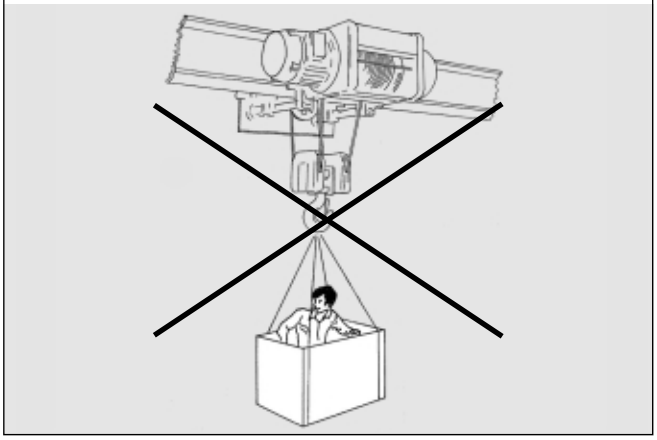


4.4 WHAT MUST NEVER BE DONE!

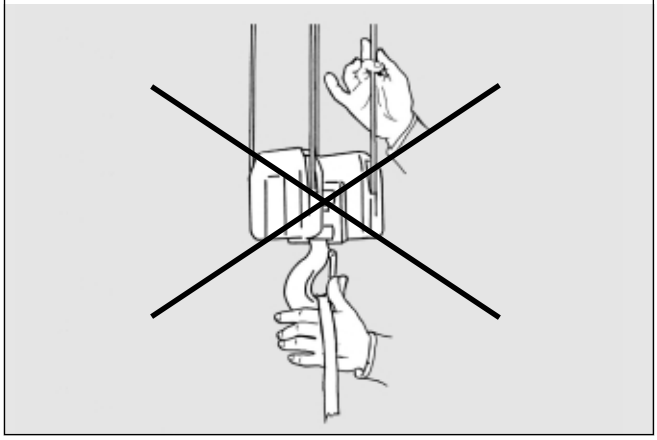
CONTRAINDICATIONS AND IMPROPER USE

The use of the rope hoist for forbidden manoeuvres, its improper use and a poor maintenance, not only may generate serious danger situations for the safety of the workers and damages to the working place, but also prejudice the function and the intrinsic safety of the equipment. The actions described below obviously cannot cover all possible "improper uses" of the hoist, nevertheless represent the most "reasonably" foreseeable and must be considered as severely forbidden. Therefore:

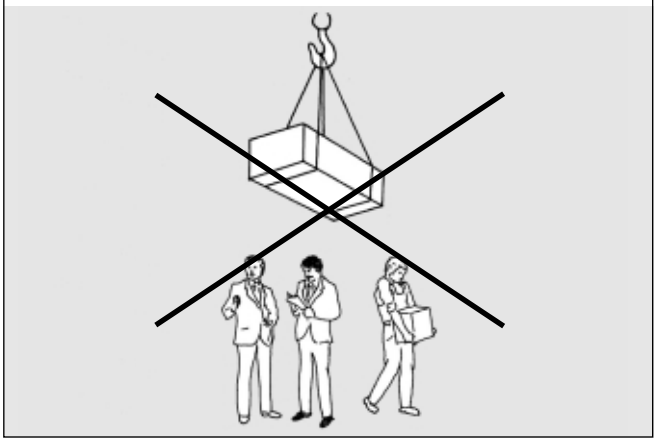
NEVER leave the suspended load unattended.



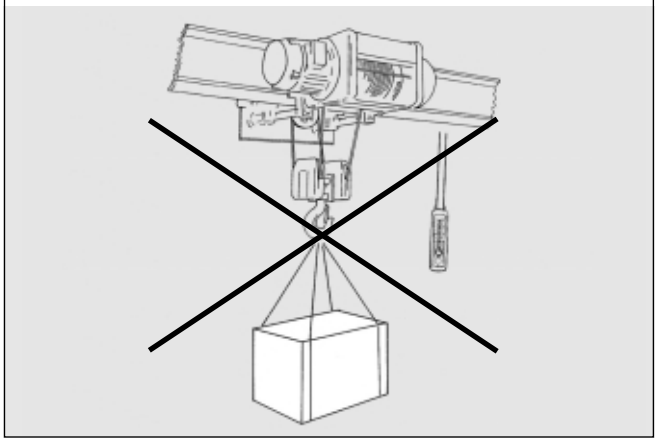
NEVER place hands in rotating pulleys, moving ropes, sling being tensioned in load contact area, or between hook and sling.



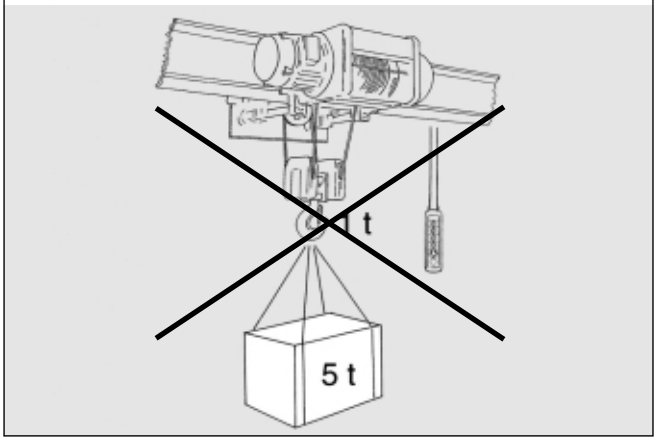
NEVER lift a load with persons walking underneath. **NEVER** walk, stand, work and operate under a suspended load.



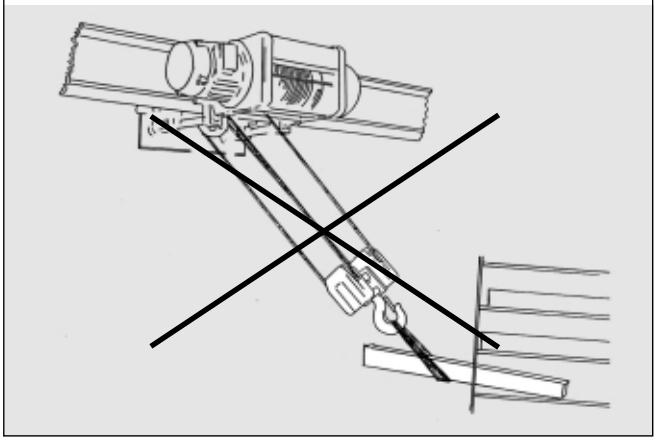
NEVER leave the suspended load unattended.



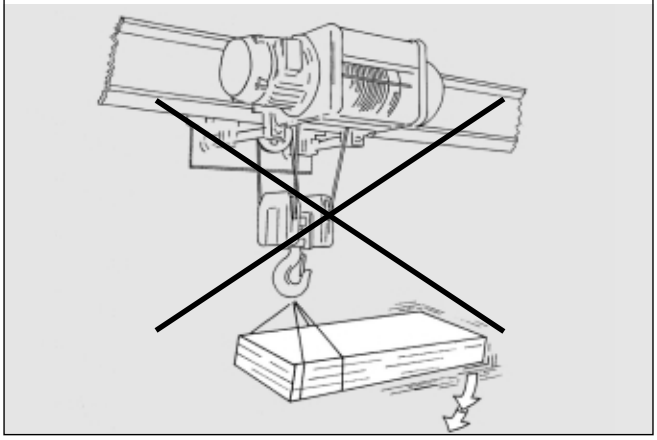
NEITHER lift, NOR attach to the hook heavier loads, than the rated capacity.



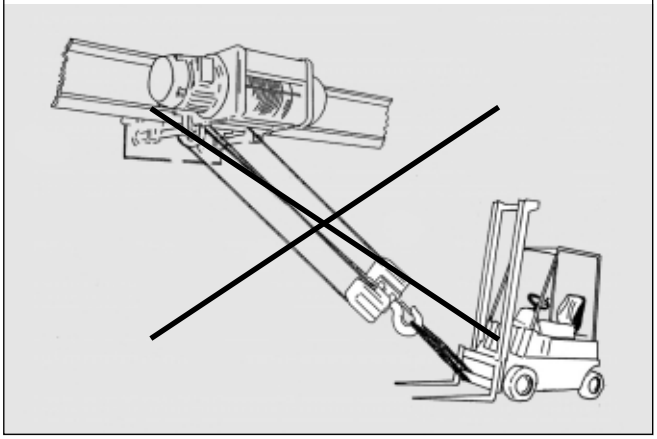
NEVER diagonally stretch the rope.



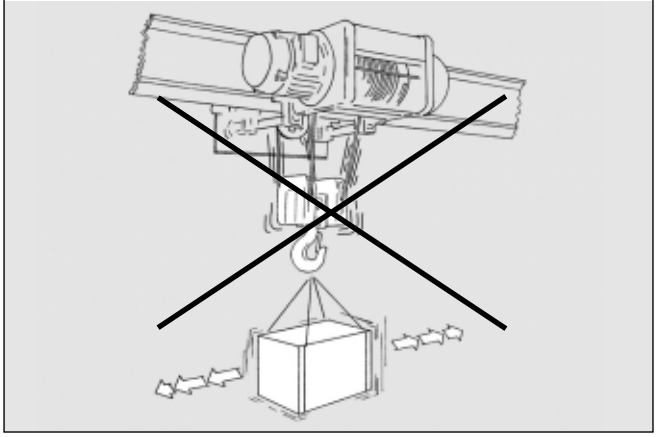
NEVER lift unbalanced loads.



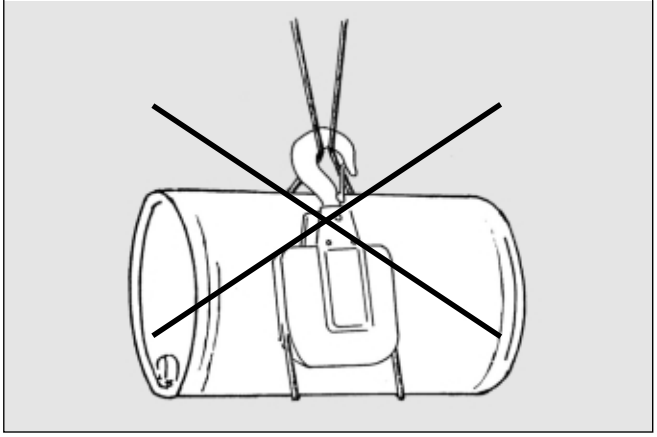
NEVER use the hoist to tow or pull.



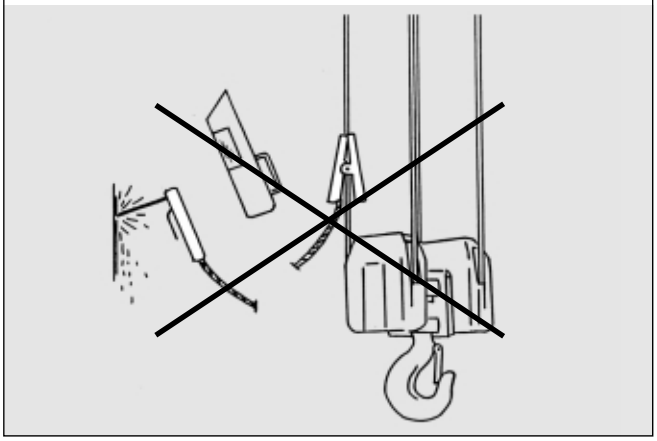
NEVER swing the load or the hook during the travel.



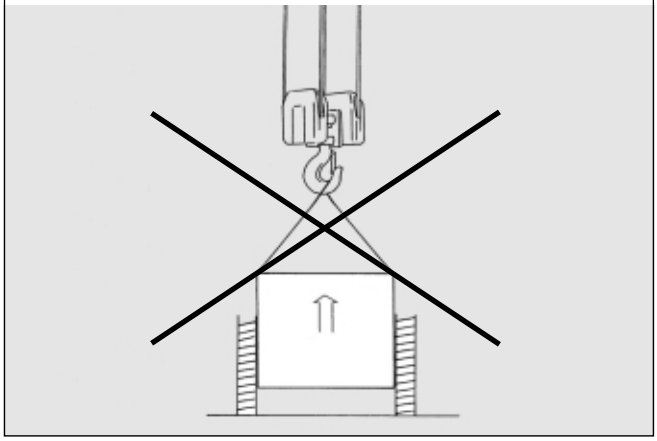
NEVER use the rope of the hoist to sling the load.



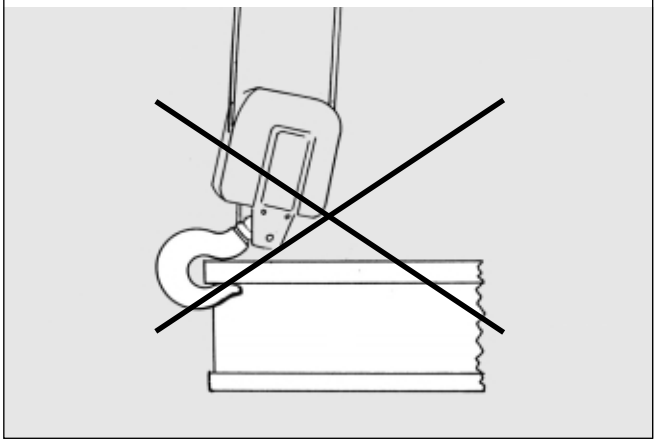
NEVER use the rope as a ground for welding.



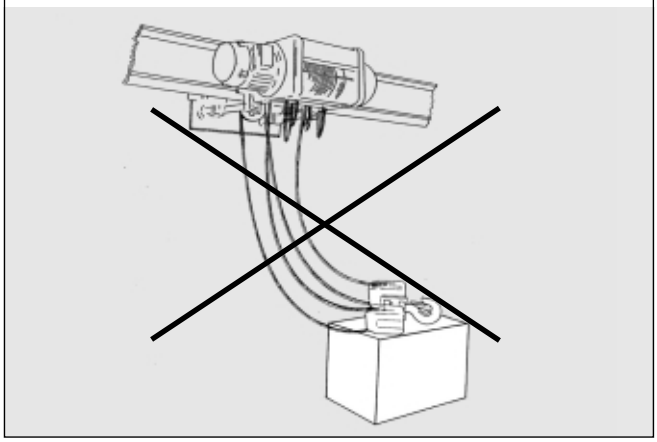
NEVER lift "guided" loads.



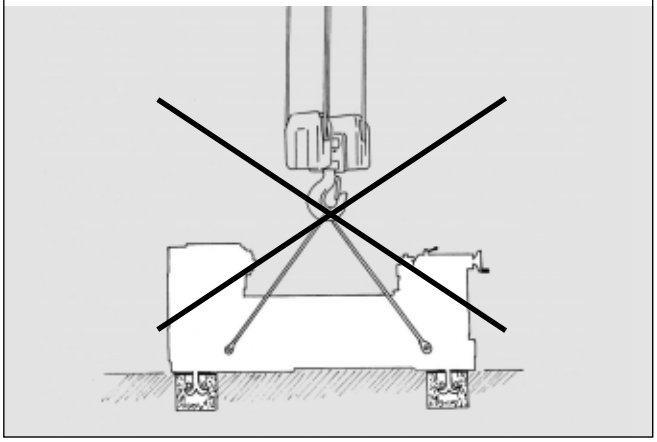
NEVER rig a load to the point of the hook.



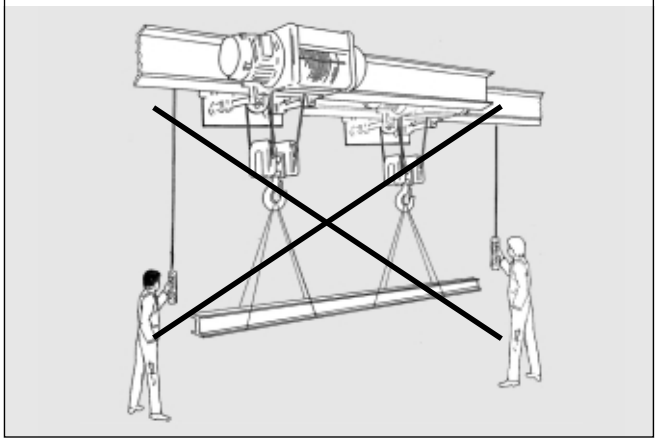
NEVER continue to lower the hook after positioning the load causing the rope slack.



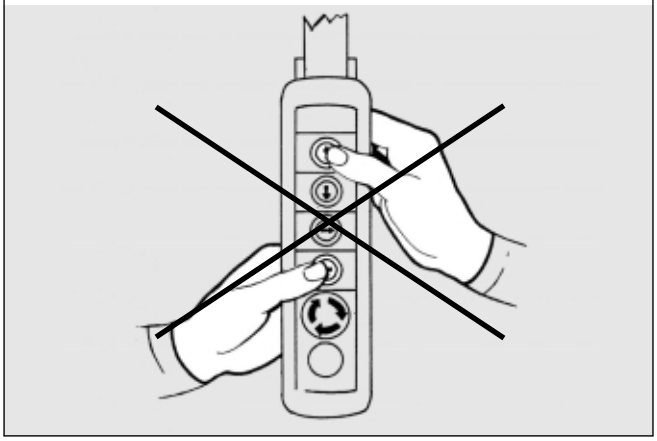
NEVER use the hoist to keep stretched parts fastened to the floor.



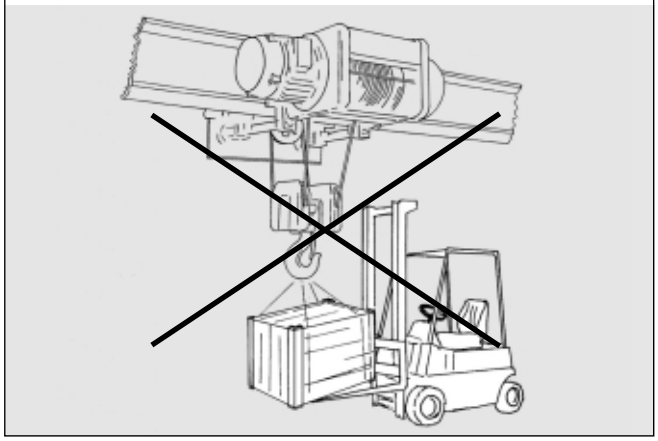
Without adequate safety procedures, **NEVER** lift a single load with two hoists.



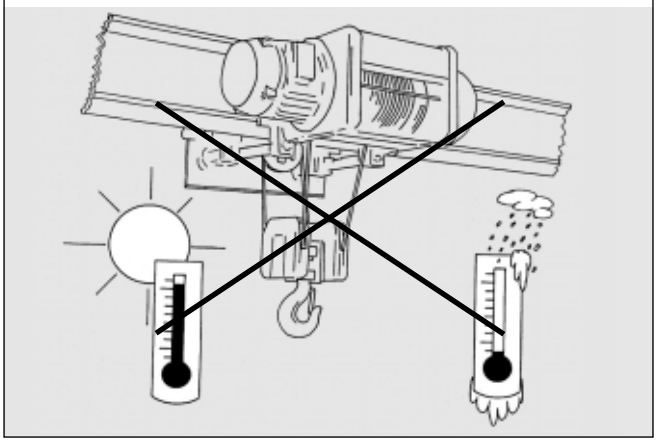
NEVER use the hoist with two simultaneous movements. Before starting a movement, wait for the first movement to stop completely before starting the next one.



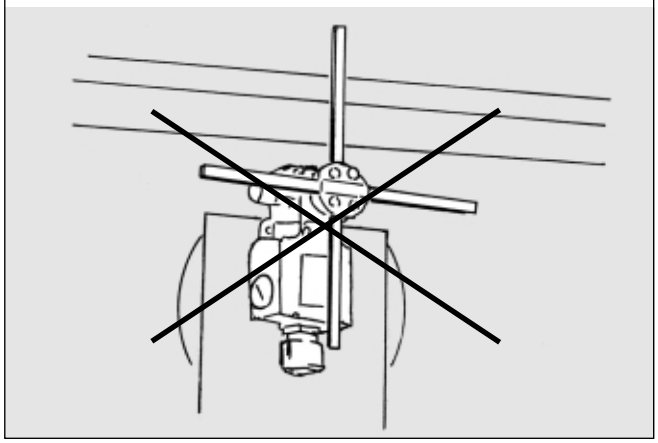
If the load remains suspended due to a fault of the hoist, **NEVER** tamper with the brake, but use suitable means to release the load.



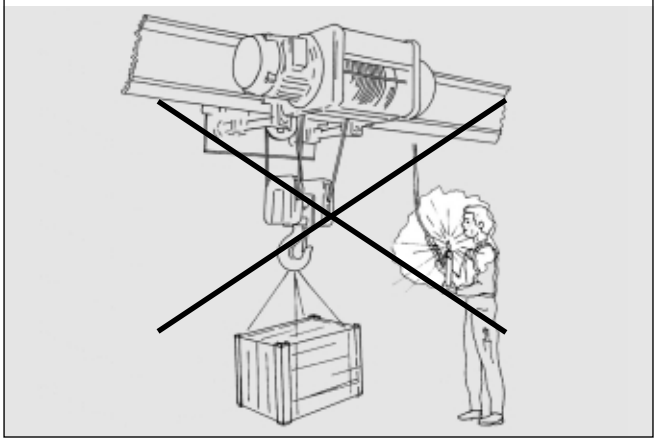
NEVER use the equipment under unsuitable environment conditions (-10°C +40°C; 80%).



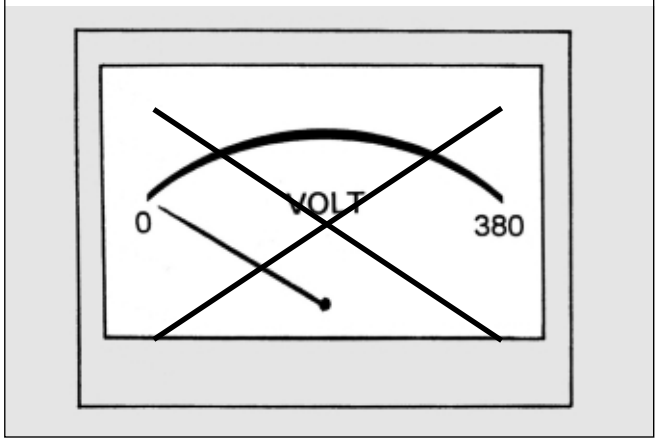
NEVER continuously use the UP and DOWN limit switches of the trolley-hoist.



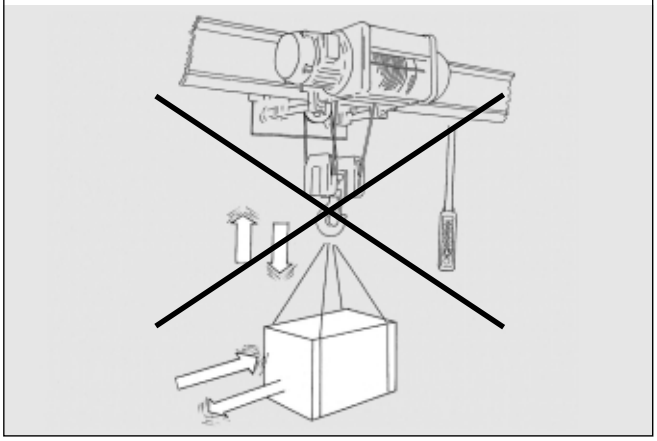
NEVER use the hoist with insufficient lighting conditions in the working area.



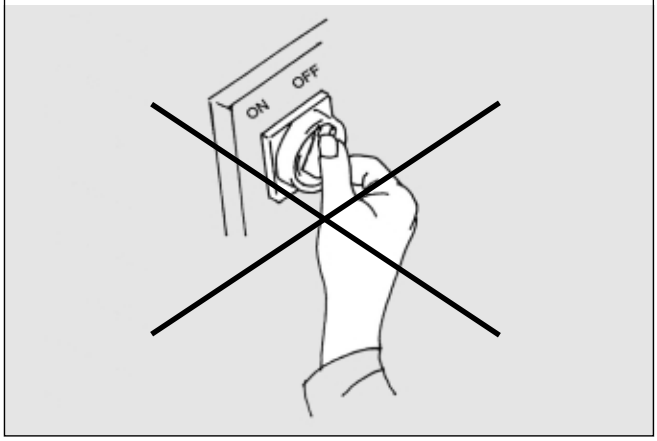
NEVER use the hoist in the presence of a strong voltage drop or of an accidental lack of one of the three phases.



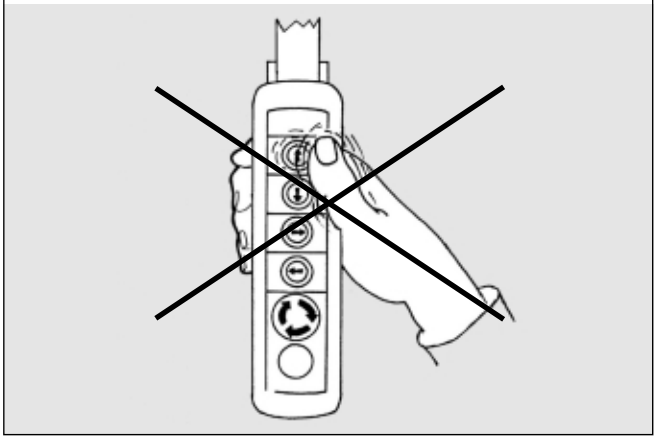
NEVER sharply reverse the direction during the lifting and hoist travel.



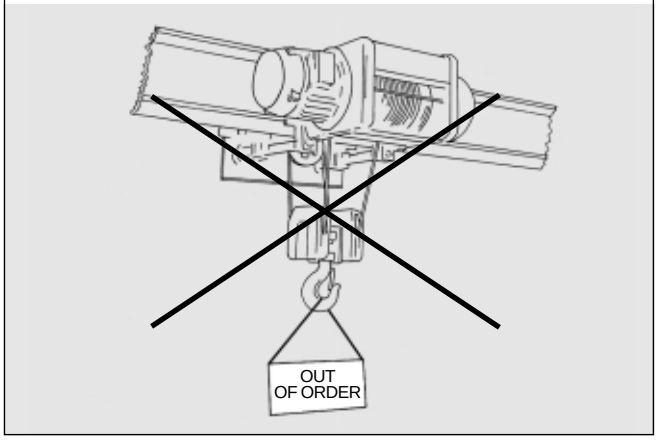
NEVER leave the hoist at shift end without performing the relevant safety procedures.



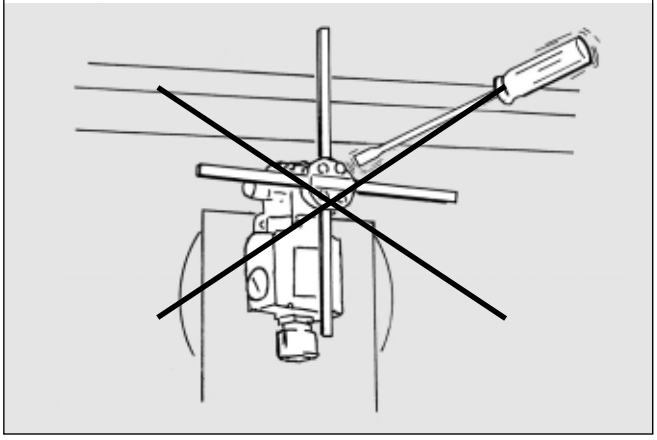
NEVER repeatedly press the push-buttons of the hoist.



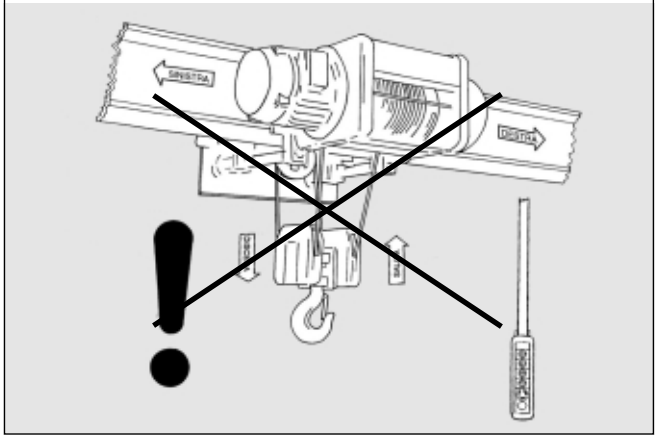
NEVER perform maintenance, inspection or repair steps without having previously put the hoist out of service, or with a suspended load and without having performed the relevant safety procedure.



NEVER change the settings of the safety devices and/or tamper with the equipment.



NEVER use the trolley/hoist unless all its functions are working properly.



4.5 OPERATION

4.5.1. WORKING AREA

The working area must have following features:

- Min. temperature: -10°C; Max. temperature: +40°C; Max. humidity: 80%;
- The standard trolley/hoist set cannot be used in presence of corrosive and/or abrasive fumes, smoke or dust, with fire or explosion risk, and in any case it cannot work where the use of explosion-proof components is prescribed.
- Furthermore it must not be used in areas with strong electromagnetic fields which may generate electrostatic discharges.

Further features of the working area:

Indoors - In this case the hoist does not require any particular precaution, since it is not exposed to atmospheric agents.
Outdoors - The hoist can be exposed to atmospheric agents during and after the use. Whenever possible, it will be necessary to protect the trolley/hoist and its electric components with roofing or shelters. To avoid oxidation, protect the structure with suitable treatments and lubricate the mechanisms.

4.5.2. OPERATOR

The operator must be fit for the work and, from the psycho-physical point of view, able to meet the requirements concerning the operation of the trolley/hoist in its intended purpose.

The operator must not allow to approach the trolley/hoist during its use and must prevent its use by foreign personnel (especially by people under 16).

He must follow the directions received to get maximum efficiency, minimum consumption and highest safety for himself and for the others when using the trolley/hoist. In particular, he must strictly observe the instructions of this manual.

4.5.3. PERMISSIBLE LOADS

Shape and dimensions of the loads must comply with the features of the handling location and with the used equipment.

Loose or bulky materials must be put in suitable containers (to prevent them from accidentally falling), and equipped with suitable hooking means.

Changes in the static configuration of the loads during the lifting must not be possible.

4.5.4. NOT PERMISSIBLE LOADS

Loads, whose mass and accessories - if any - included , exceed the capacity of the equipment.
Dangerous classified loads for their chemical-physical features (e.g.: flammable materials, explosives, etc.).

4.5.5. LIFTING ACCESSORIES

Generally admitted accessories:

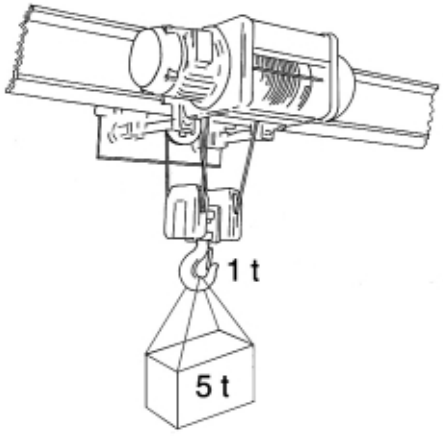
Slings made of ropes, chains and/or textile slings, if necessary equipped with suspension rings and end hooks.
Lifting accessories between the load and the hook, such as: hangers, pliers, suckers, magnets and electromagnets, etc.
These accessories must be used in compliance with the instructions of their manufacturers.
Their muss must be deducted from the rated capacity of the trolley/hoist to determine the useful liftable load.

Generally not admitted accessories:

All those accessories, whose functional and performance features can generate higher dynamic stresses in the trolley/hoist, than permissible.
Not permissible are, for instance, accessories that allow to release immediately the load (if not foreseen in the project), which can therefore cause dynamic overstresses and/or accidental overloads. Accessories limiting the free handling of the load, or connected with separate power lines; etc.

When using a MISIA electric rope hoist, the operator must observe the directions given in order to obtain best efficiency and maximum safety for himself and for other people. In particular, it is very important to strictly obey following prescriptions:

Capacity - The capacity limit must never be exceeded (handling heavier loads, than the rated capacity, or overloads, or changing the settings of the load limiter), although determined with wide safety margins.



Manoeuvres - It is a good practice to carry out one movement at a time, since only this way a manoeuvre can be started, stopped and constantly followed by the operator, who must avoid repeated switching on/off in case of short movements. In fact, it is not true that manoeuvres activated with "short bursts of current" are advantageous. Only a precise definition of the manoeuvre's starting and ending time allow real savings of time and energy.

Lighting - The hoist and trolley are not equipped with an own standard lighting system. The ambient lighting must allow the full safely operation of the hoist for the intended purpose. When carrying out maintenance steps in badly lit areas and/or parts of the hoist, a portable lighting system must be prepared, taking care to avoid patches of shadow which may obstruct or reduce the visibility at the point where the work is being done or in the surrounding areas.

4.6 SWITCHING OFF AT WORK END

To switch off the hoist at shift end, observe the following:

Remove the load handling slings from the lifting hook.

In case of hoist with trolley, move the equipment to the area chosen for its storage during its standstill.

Lift the hook in order to avoid dangerous interference with persons and objects under the equipment.

Stop all movements of the hoist pressing the "STOP" button.

Position the pendant where it cannot disturb.

Disconnect the power supply to the hoist turning the main switch to "OFF" or "0" (zero).

4.7 MAINTENANCE

The maintenance schedule includes ordinary procedures, such as inspections, checks and tests directly performed by the operator and/or by qualified maintenance personnel of the workshop, and periodical procedures, including adjustments, lubrication, performed by staff trained by the manufacturer by means of specific courses or publications.

4.7.1. MAINTENANCE

Maintenance covers ordinary procedures that may be carried out directly by the operator or by specialised technicians accordingly to the prescriptions of this manual and which do not require the use of special instruments and tools.
The procedures consist of:

Daily steps performed by the operator and including:
- general visual checks;
- functional tests (of motors, limit switches, brakes without load, "START/STOP" push-button;
- condition check of ropes and hooks.

Weekly steps performed by specialised technicians, including:
- visual check of each mechanism and of lubricant leaks;
- functional check of the brakes with load;
- check of the limit switches and, if necessary, lubrication of the mechanisms, levers or control cams of the limit switches, to ensure the proper function and limit the wear;
- check of function and integrity of the pendant and of the relevant cable.

Monthly steps performed by specialised technicians, including:
- check of ropes and rope guide for efficiency;
- check of pulleys for wear;
- check of wheels for wear;
- check and cleaning of plug and socket connectors;
- check of oxidised contacts: after cleaning, cover them with a thin layer of Vaseline;
- lubrication check of the cable trailers and of the cables;
- check of the efficiency and integrity of the power supply line and of its components;
- visual check of the equipment inside the control boxes, to ascertain the presence of dust, if any.

The recommended steps are indicative; they may be increased or decreased accordingly to the operation time of the hoist.

4.7.2. PERIODIC MAINTENANCE

The periodic maintenance includes steps performed by trained staff and concerning adjustments and lubrications (for the latter, refer to section 4.8 “Lubrication” on page 46), as indicated in table 11 and 12.
During the maintenance of mechanical and electrical components, switch-off the main isolating switch and place an “out of service” notice on the hoist.
For the single components of the equipment, observe following instructions:

Ropes and fasteners - Check the condition of the rope to judge the possible deterioration. Rope and rope guide are wear parts, regular lubrication makes their life longer. It is often possible to improve the performances of the ropes finding out the causes of their deterioration. This can be done analysing the old rope. During the inspections it is advisable to carefully observe the parts of the rope coiled on the pulleys and the fixing points at the ends. Note the date and the results of the checks as described in the relevant table, in order to be able to plan when the rope is to be replaced.
The decision to replace the rope according to the UNI ISO standard 4309/84 must be taken first of all considering the number and the location of broken strand wires, by the degree of wear and corrosion, by other important damages or tears. The ropes must be replaced when the visible broken wires reach the maximum deterioration values given for one of the two reference lengths (table 9), corresponding to 6 or 30 times the rope diameter. Keep in mind that breaks often are hard to identify, since the ends of the broken wire remain in the original location, without protruding from the surface of the rope.
To see these breaks, it is necessary to remove the grease covering the rope, to slide a piece of soft wood along the rope and, if possible, to bend the rope manually, in order to force the wires ends to raise making themselves visible. The rope check must be performed “without load”, to ease the visualisation of possible breaks and to foresee a bending radius roughly corresponding to the pulley radius.

CHECKS DURING THE INSPECTION:

Number of broken wires - Basing on the features of the rope, it is possible to find out in table 9, “Limit number of visible broken wires”, the maximum permissible number of visible wire breaks on any rope section. In case of higher values, than those shown, the rope must be replaced.

Rope diameter decrease - If a wire core rope shows a decrease of 15% or more of its rated diameter (due to stretching in the bending area), it must be replaced.

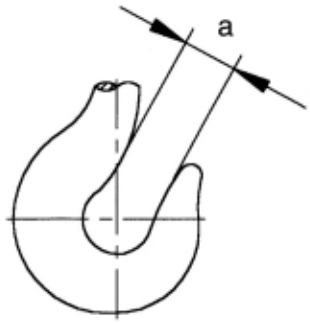
Rope corrosion and wear - If case of decrease by 10% or more of the rated rope diameter due to corrosion or wear, the rope must be replaced even in absence of broken wires.

Rope deformation - Helical deformations with diameter decreases concentrated in short sections of the rope and local flattening or angular deformations due to severe external causes. In the first case, the deformation causes irregular movements of the rope while it is running, which are the primary cause of greater wear and wire breaks; in the second case, the defect often occurs at the rope end sockets.

Heat influence - Ropes exposed to exceptionally high temperatures (externally shown by the annealed iron colour assumed by the rope) must be replaced.

Above causes are detailed described in the ISO standards 4309.

Hook - Verify the function of the safety catch and of the rotation lock. Check the deflection pulleys of the rope for smooth rotation. The pulleys of the hook can be easily visually checked observing the inclination without load during the lifting and the subsequent lowering. If the hook during these travels shows a considerable inclination, first on one side and than on the other, from the vertical, this means that the pulley friction is excessive and the pulleys must therefore be disassembled to check their running surfaces.
With released rotation lock check the wheel for smooth running, without too much friction and jerk-free. Otherwise remove it and check the bearing. Check the area in contact with the slings for wear.
Check the hook for cracks or bends. To measure the bending, measure the distance between the stem and the point of the hook as shown in the Figure. If the measured value is 5% higher than the value originally measured on the new hook (a) according to table DIN 15401, we recommend replacing the hook.



Limit number of visible broken wires Table 9

Number of load bearing wires in outer strands[1]	Typical examples of rope construction[2]	Number of visible broken wires,[3] due to rope fatigue in a lifting devices causing the obligatory replacement for: Mechanism type group M1, M2, M3, M4				Mechanism type group M5, M6, M7, M8			
		ordinary lay		equal lay		ordinary lay		equal lay	
		over a length of				over a length of			
n		**6 *d***	**30 *d***	**6 *d***	**30 *d***	**6 *d***	**30 *d***	**6 *d***	**30 *d***
51< ***n*** < 75	6x19 (19/9/1)*	3	6	2	3	6	12	3	6
76< ***n*** < 100		4	8	2	4	8	16	4	8
101< ***n*** < 120	8x19 (9/9/1)* 6x19 (12/6/1) 6x19 (12/6+6F/1) 6x25FS (12/12/1)*	5	10	2	5	10	19	5	10
121< ***n*** < 140		6	11	3	6	11	22	6	11
141< ***n*** < 160	8x19 (12/6+6F/1)	6	13	3	6	13	26	6	11
161< ***n*** < 180	6x36 (14/4+7/7/1)*	7	14	4	7	14	29	7	14

1) *Filler wires are not considered as load-bearing wires and are therefore excluded from the inspection. In multilayer ropes, only the visible external layer is to be inspected. In ropes with steel core, this is considered as an internal strand and therefore not considered.*
2) *To calculate the number of broken wires, round the value to a whole number. For ropes with external wires with larger section, than normal, the special construction is down-graded in the table and indicated by an asterisk*.*
3) *A broken wire may have two visible ends.*
d *= rated rope diameter.*

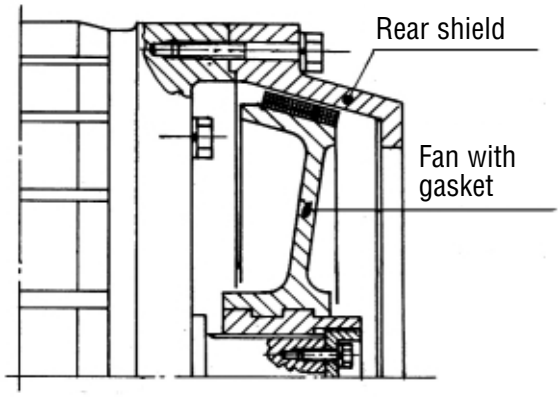
Pulley - - Check each rotating pulley for smooth running; in case of irregularities, disassembly it and check the relevant bearing. Check the wear of the groove (the permitted groove wear of the pulley is 25% of the original dimension of the pulley). Pulleys with cracks and breaks on the edges must not be used.

Drum - Check the tightening of the rope fastening screws and the wear. Check the integrity of the thread.

Gearbox - Check for abnormal vibrations which may b e caused by damage of a bearing; in this case, disassembly the gearbox to replace the bearings.

NB: For the hoists A-B-C-D the gearbox is outside the hoist, while for the hoist type E-F it is inside the rope drum.

Brakes on brake motors - check the friction surfaces on the mobile fan and on the brake housing of the motor for wear.



Wheels - Check the wheel flanges and the rolling surfaces for wear; if the thickness of the flange and/or of the rolling surface shows a higher wear, than shown in Tab. 13 and 14 (page 48 and 49), the wheels must be replaced. Verify the running noise of the bearings; an abnormal noise means that the bearing must be replaced.
Check the junctions wheel/axle and axle/gearbox for clearances; the presence of clearances means that the axle and/or the wheels must be replaced.

Stoppers - Check that the end stoppers are not bent and steady fastened to the structures. Furthermore, check that the stopper does not show signs of breaks or permanent distortion and is properly fixed to its support.

Electric equipment - If the electric equipment is included in the supply, check the moving parts of the contactors for smooth movement; otherwise, the electromagnet might not be strong enough to ensure enough pressure between the contacts. It is also necessary to check the cleanness of the contact surfaces between stator and rotor, in order to prevent the film formed by rust inhibitors to collect dust and cause the contactor to stick. Never lubricate the contacts with oil, which can carbonise and offer resistance to the passage of current, causing local overheating which shorten the life of the electromagnetic switch. Remove oxidation with a very fine file, and never with sandpaper or similar. In addition, check the contacts for wear, replacing them if (particularly in case of irregular wear) this prejudices the alignment of the assembly, or weakens the pressure spring, so that the two contact surfaces not always come in contact. Check auxiliary contacts with the same procedure. In case of disassembly, handle the coil very carefully to avoid damaging the winding, especially its ends. To avoid loose connections, overheating or noise, check the correctness of the supply voltage of the coils.

Limit switches - Check their condition and proper operation (operate the limit-switches manually several times). In particular, for the limit-switches of the movements, check their operation during an ordinary manoeuvre, testing first at low speed. Make a statistical check on the ir resistance to atmospheric agents. Check the mechanical integrity of the moving parts (lever and springs) and check the tightness of the fastening screws.

Fuses - Keep a regular stock of each type of fuses fitted, so that they can be quickly replaced with the same type of fuse if necessary, see Tab. 2-3-4-5 (page 23).

Terminals - Periodically check that the terminals are properly tightened; check that the identification number is clearly visible and fastened to the terminal; check the integrity of the heat insulating material and replace promptly if cracked or broken.

Timers - Check and clean the contacts with the same procedure of the contactors; check the intervention simulating an external operation and, in case of damage, replace the damaged part.

Motors - Clean the motor removing any dust settled on the case that could hinder the regular cooling. Check that the ventilation openings are not obstructed. With the motor running at normal operation range, check the noise level, the temperature and the presence of any play in the rotor mountings. In case of even minimal play, temperatures close to the mounting higher than those of the case and/or high noise level, replace the bearings. With the motor running at normal operation range, check the temperature of the case using a temperature probe.
Temperatures above 110°C reveal, in fact, that the motor is overloaded; in this case, look for the causes inside the equipment and check the duty for which the hoist is intended; check the current consumption and the voltage, comparing them with the rated values shown on the rating plate of each motor (see tables 2-3-4-5, page 23).

4.7.3. MAINTENANCE SCHEDULES AND INTERVALS

The intervals between the maintenance procedures shown in table 10 below refer to a hoist working under normal duty conditions as stated by the FEM standards 9.511 for the group 1Am. For heavy duty conditions, the frequency of the maintenance operations must be increased.
This consideration is also valid if the hoist is used in a higher duty class, than the one specified. In case of normal and proper use of the hoist, its overhaul may be performed after a running time of approx. 10 years accordingly to the FEM standard 9.755 (S.W.P.).

The recommended intervals are indicative and may be changed in compliance with the duty class for which the equipment is used.

Recommended periodic maintenance and inspections Table 10

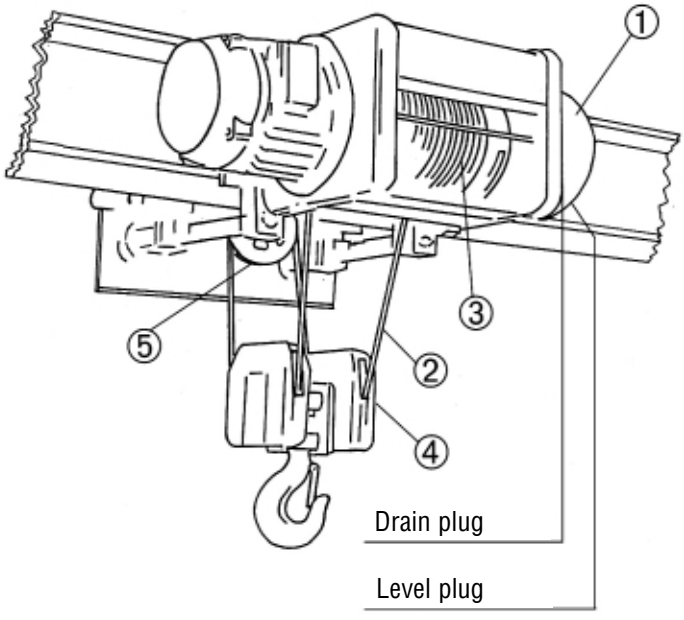
Equipment components	Intervals					
	1st maintenance		Periodical inspections			Maintenance
	after 3 months	after 12 months	daily	weekly	monthly	every
INSPECTION OF ROPES AND FASTENERS	X				X	6 months
LIMIT SWITCH FUNCTION	X		X			6 months
LOAD LIMITER	X			X		1 year
HOOK CONDITIONS		X		X		1 year
GEARBOX FUNCTION		X			X	1 year
BRAKES FUNCTION	X		X			6 months
BRAKE PLAY ADJUSTMENT	X					6 months
INSPECTION OF WHEELS/ GASKETS/ ROLLING BEARINGS		X				1 year
STOPPER CONDITIONS		X				1 year
INSPECTION OF THE ELECTRIC EQUIPMENT	X				X	1 year
PENDANT	X		X			3 months
FASTENING BOLTS	X					6 months

4.8 LUBRICATION

A careful management of the lubrication operations of the equipment and the mechanisms is the preliminary condition to ensure the suitability of the hoist for the planned duty and its long duration.
The lubricating capacity decreases with the time, therefore lubricants must be added or changed.
The lubrication of the hoist is very simple and can be done by unskilled personnel, provided that the instructions in this manual are strictly followed and that the necessary checks and fillings up are carried out at the intervals shown in the "Lubrication table" (Tab. 11 on page 46 and Tab. 12 on page 47).

Draining and change of the hoist gearbox oil:

- Drain the oil at a temperature of at least +20°C (in case of room temperature <20°C, it is necessary to run the gearbox without load for a few minutes in order to warm the oil before draining it);
- Remove the drain plug and let the oil flow out, wash the gearbox with gasoline, carry out a few no-load manoeuvres and then drain completely;
- Pour in the oil very slowly to allow time for it to reach the level; take care not to exceed the check level;
- the lubricant type must never be more fluid than the one specified, to prevent leaks;
- the quantity is indicated in Tab. 12 on page 47.

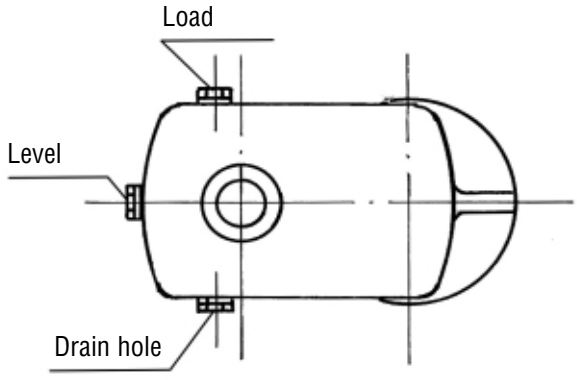


The gearboxes of the monorail trolleys Type 3 and 83 are maintenance-free, since the used lubricant has high EP-features, wear and oxidation protection capacity and a very high viscosity.
Being "Long Life" lubricated, the gearboxes do not need any oil change or filling-up.

The gearbox of the hoist type "E-F" and "D Size x" is pre-lubricated and does not require maintenance, since the lubricant used has high EP-features, wear and oxidation protection capacity and a very high viscosity.
Being "Long Life" lubricated, the gearbox does not need any oil change or filling-up.

Draining and change of the gearbox oil of double rail trolleys Type 53:

- Drain the oil at a temperature of at least +20°C (in case of room temperature <20°C, it is necessary to run the gearbox without load for a few minutes in order to warm the oil before draining it);
- Remove the drain plug and let the oil flow out, wash the gearbox with gasoline, carry out a few no-load manoeuvres and then drain completely
- Pour in the oil very slowly to allow time for it to reach the level; take care not to exceed the check level;
- the lubricant type must never be more fluid than the one specified, to prevent leaks;
- the quantity is indicated in Tab. 11.



Lubrication table Table 11

Gearbox type	Oil	Quantity	Interval
160	FINA CERAN AD	0,5 dm³	3 years
200		0,8 dm³	
250		1,0 dm³	
315		1,2 dm³	

Lubrication table Table 12

Lubrication point	Item	Oil	Grease	Interval			
				1 month	3 months	6 months	Yearly
1	Hoist gearbox	FINA CERAN AD					3 years
2	Rope	/	FINA MARSON LM GRAFITATO graphitized, brush lubrication as necessary		X		
3	Rope drum					X	
4	Lower block pulleys						1 year
5	Rope deflection pulley						1 year

Lubricant quantity Table 12A

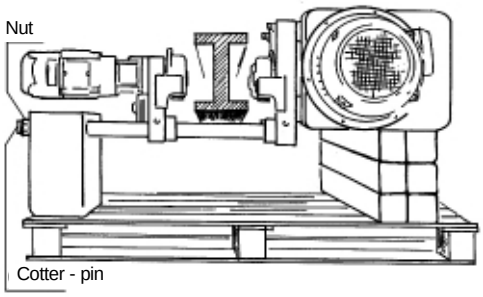
	"M" series							
Hoist gearbox	A		B		C		D	
	Hook travel	Quant. kg	Hook travel	Quant. kg	Hook travel	Quant. kg	Hook travel	Quant. kg
	S÷R	0,7	S÷R	1,0	S÷R	1,0	S÷R	1,4
	"M" series							
Hoist gearbox	10		20		32		50	
	Hook travel	Quant. kg	Hook travel	Quant. kg	Hook travel	Quant. kg	Hook travel	Quant. kg
	Z-X	1,0	Z-X	1,4	Z-X	1,4	Z	1,4

4.9 REPLACEMENTS

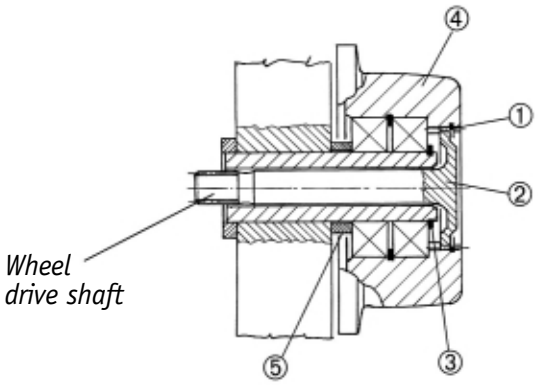
REMOVAL AND INSTALLATION PROCEDURE

4.9.1. MONORAIL TROLLEY

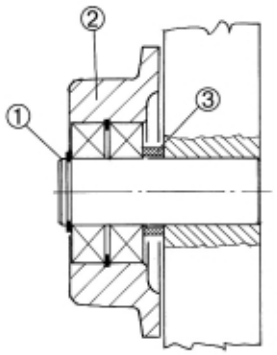
Replacements of components of the hoist or of the trolley must be performed by skilled and trained technicians with specific knowledge of lifting equipment.



MONORAIL TROLLEY type 83
DRIVING WHEEL
Removal: Remove the ring Item 1 on the grooved hole. Pull out the pin Item 2, remove the ring on the wheel axle Item 3 and pull out the wheel with a puller.
Installation: Verify the position of the spacer Item 5, install the wheel, Item 4, fit the ring Item 3, insert the pin Item 2 turning it till the groove gets perfectly into the gearbox, fit the ring Item 1 in its seat, check the wheel for smooth running switching-on the motor.



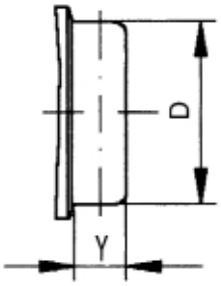
MONORAIL TROLLEY TYPE 3 AND 83
IDLE WHEEL
Removal: Remove the ring Item 1, pull out the wheel Item 2 with a puller.
Installation: : Verify the position of the spacer Item 3, install the wheel Item 2 and fit the stop ring Item 1.



Wheels must be replaced when the original dimensions change as shown.

Max. tolerance on dimension D: - 5% of the original value.

Max. tolerance on dimension Y: + 10% of the original value.



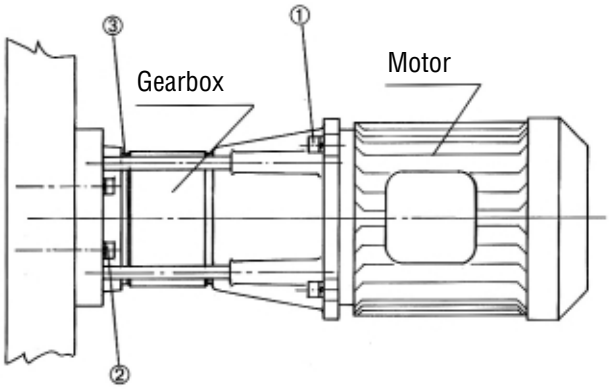
Original dimensions of the (standard) wheels Table 13

Type 83	D	100	125	155	195	250
	Y	40	40	45	45	45
Type 3	D	120	175	210	225	250
	Y	32	40	40	50	50

If during the periodical inspections the measured internal dimension of the wheels exceeds the dimension "beam flange + 3 ÷ 4 mm", it is necessary to restore the old dimension varying the closure of the side plates of the trolley as shown in section 3.4 "Assembly of the components" on page 18 (deduct the measured difference from the D dimension.)

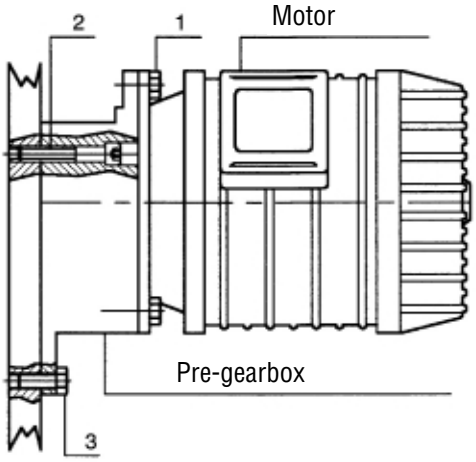
HOIST TRAVEL MOTOR TYPE 83
Removal: Trolley hoist with wheels ø 100 and 125: Loosen the stud bolts Item 3 and pull out the motor. Trolley hoist with wheels ø 155-195-250: Loosen the screws Item 1 and pull out the motor.
Installation: Trolley hoist with wheels ø 100 and 125: Install the motor and tighten again the stud bolts Item 3. Trolley hoist with wheels ø 155-195-250: Install the motor and tighten again the screws Item 1.

GEARMOTOR TYPE 83
Removal: Loosen the 4 screws Item 2 and pull out the gearmotor unit.
Installation: Install the gearmotor oscillating it, so that the seat the gearbox perfectly fits into the projection of the wheel drive shaft (indicated on page 47), and then definitively tighten the 4 screws Item 2.



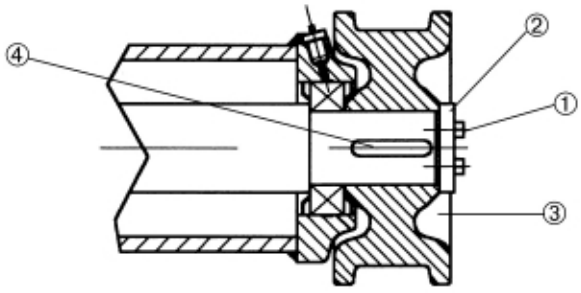
HOIST TRAVEL MOTOR TYPE 3
Removal: Loosen the 3 screws Item 1 and pull out the motor.
Installation: Install the motor turning it so that the drive shaft perfectly fits in its seat, paying attention to align the driving gear with the gear of the gearbox of the trolley (o pre-gearbox); and then definitively tighten the 3 screws Item 1.

PRE-GEARBOX TYPE 3
Removal: remove the motor as previously described, and then loosen the screws Item 2 and 3 and pull out the pre-gearbox.
Installation: Install the pre-gearbox turning it so that its seat perfectly fits into that of the plate of the trolley. Place the pre-gearbox in its original position, tighten the screws Item 2-3, install the motor as previously described.



4.9.2. DOUBLE RAIL TROLLEY Type 53

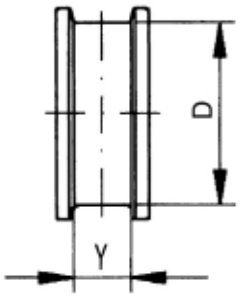
Wheel removal: Loosen the screws Item 1, remove the wheel stopper Item 2 and pull out the wheel Item 3 with a puller. **NB:** To remove the wheel from the gearmotor side, first remove the gearmotor (see page 49).
Wheel installation: Check that the key Item 4 is properly positioned, install the wheel Item 3, place the wheel stopper Item 2 and tighten the screws Item 1.
NB: To install the wheel from the gearmotor side, first install the wheel and then the gearmotor (see page 49).



Wheels must be replaced when the original dimensions change as shown.

Max. tolerance on dimension D: - 5% of the original value.

Max. tolerance on dimension Y: + 10% of the original value.



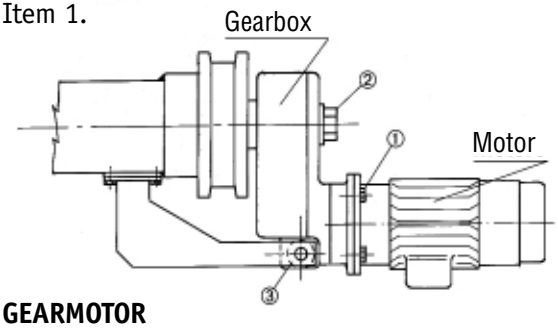
Original dimensions of the (standard) wheels Table 14

Type 53	D	160	200	250
	Y	50	60	60

HOIST TRAVEL MOTOR

Removal: Loosen the 4 screws Item 1 and pull out the motor, remove the half-coupling from the drive shaft using a puller.

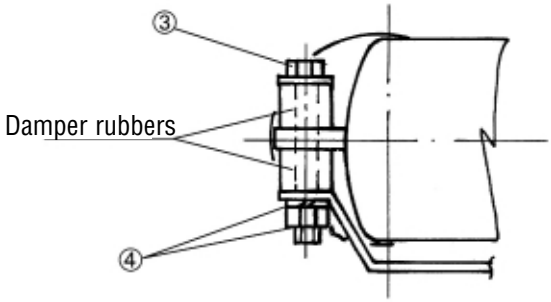
Installation: Install the half-coupling on the drive shaft, verify that the rubber of the flexible coupling is placed into the seat of the half-coupling fitted to the gearbox, and install the motor carefully tightening the screws Item 1.



GEARMOTOR

Removal: Remove the screw Item 2 and the relevant washer, remove the screw Item 3 on the torque rod, and pull out the planetary gear from the shaft of the trolley.

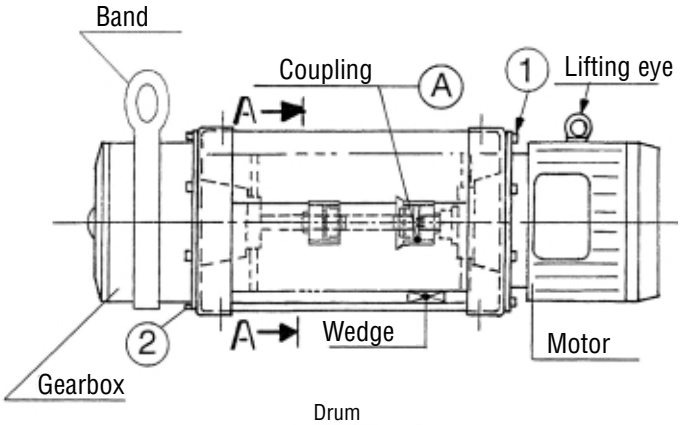
Installation: Verify the presence of the key into the shaft seat, fit the gearbox on the shaft. Fit the damper rubbers on the torque rod as shown, and tighten the screw Item 3. Fit the nut and washer Item 4.

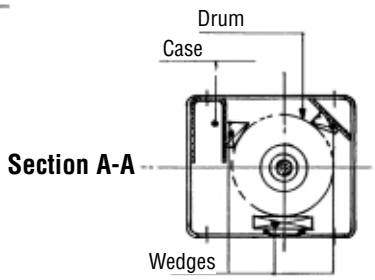


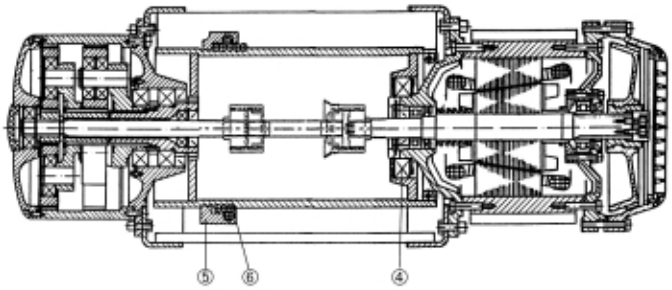
4.9.3. HOIST MOTOR

Removal: insert wooden wedges between the drum and the case to prevent the drum from falling, loosen the screws Item 1, pull out the motor slinging it to the lifting eye fitted before.

Installation: Check the two half-couplings (the inside the grooved seats and the external teeth) for wear. Insert the intermediate shaft into the half-coupling on the gearbox side (Item 3) and verify the proper fitting of the half-coupling on the motor side (Item 4) and the proper position of the drum (in order to avoid shifting during the removal). Hold the motor with slings or bands fastened to the lifting eye provided and oscillate it in order to match the male and female hub and the seat of the drum bearing until the proper position is reached. Finally, tighten the screws Item 1 and connect the limit switch rod with the relevant fork to the outer pin of the base.







Never use the fastening screws to approach the motor to the case, since this could damage the couplings and the relevant stop rings. Install and tighten the fastening screws (Item 1) only after proper positioning of the motor into the seat of the case.

This step, if performed as above described, requires special experience and therefore only skilled technicians can be entrusted with it. Whenever possible, we recommend to install the motor with the hoist on the floor in vertical position.

4.9.4. LIFTING GEARBOX OF HOISTS TYPE "A-B-C-D"

(see Fig. page 49 "motor removal")

Removal: Fit wooden wedges like for the motor removal, on the gearbox side, loosen the screws Item 2, pull out the gearbox balancing it with sling bands.

Installation: Proceed as described in section 4.9.3. (hoist motor installation), first placing the motor side half-coupling (Item 4), then the relevant intermediate shaft and inserting the gearbox until reaching of the proper position, then tighten all the screws (Item 2).

Never use the fastening screws to approach the gearbox to the case, since this could damage the couplings and the relevant stop rings. Install and tighten the fastening screws (Item 2) only after proper positioning of the gearbox into the seat of the case.

Whenever possible, we recommend to remove and install the gearbox with the hoist on the floor in vertical position to facilitate the procedure.

4.9.5. ROPE

Before fitting a new rope, it is necessary to check the pulley grooves and the drum thread for wear or bends due to the winding of the old rope. If necessary, replace the damaged parts. Wind-off the new rope coil, without twisting it, so as not to cause bends.

WRONG *RIGHT*

To install the rope guide proceed as follows: Loosen the screws Item 1 (Fig. 1), detach the rope guide shoe Item 2 (Fig. 1), remove the rope clamp spring (Fig. 2), pull out the rope guide ring from the drum (Fig. 3).

Fig. 1

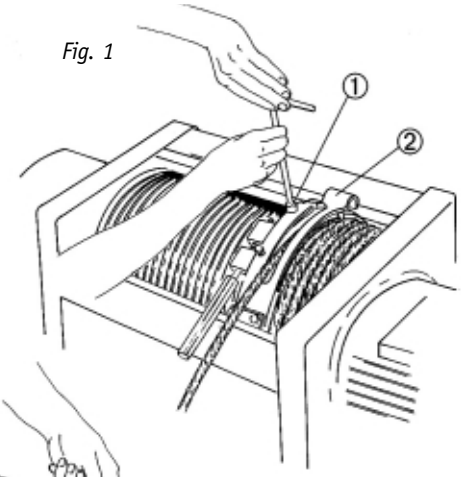


Fig. 2

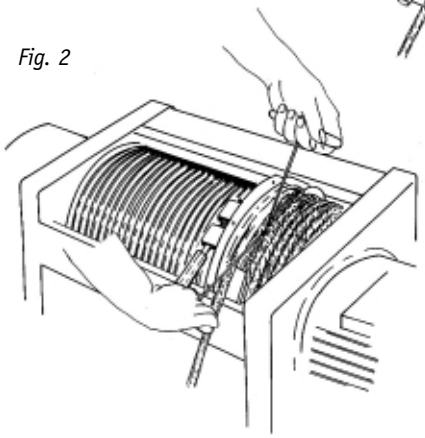
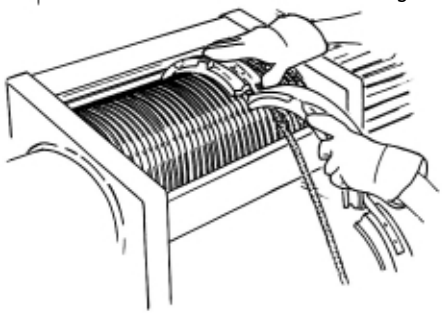


Fig. 3



The removal of the rope guide of the hoists type "A-B-C-D" is shown in the figures, whereas for hoist type "E-F" it is mirror-inverted in respect to the illustration.

Rope removal: Pull out the wedge (Fig. 4), and then extract the rope end from the socket and pull out the rope from the lower block pulleys and the deflection pulley, if any. Fully unwind the rope from the drum by pressing the "DOWN" button on the pendant, until the end of the drum. Loosen the fastening screws of the rope clamps (Fig. 5).

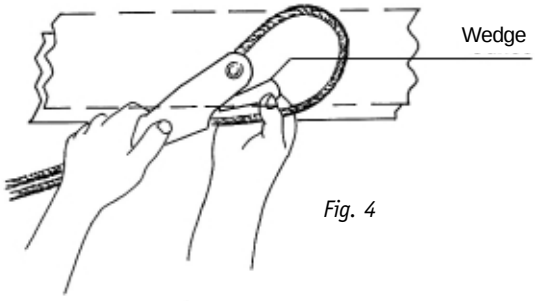


Fig. 4

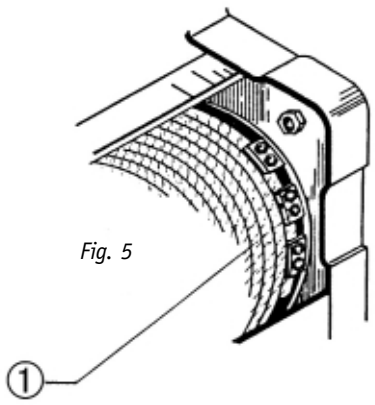


Fig. 5

Installation of the new rope: Insert the rope in the last clamp letting the rope end come out of approx. 40 mm; tighten the clamp screws (Fig. 5 - Item 1) pressing the rope until it is definitively clamped.
Press the "UP" push-button of the pendant and, while holding the rope tight, wind it up till the middle of the drum, to allow the installation of the rope guide ring.

For hoists type "A-B-C-D", the rope winding starts from the motor side with left-hand thread drum, for hoist type "E-F" the rope winding starts on the side opposite to the motor with right-hand thread drum.

Rope guide ring installation: Place the rope guide ring (Fig. 6) into the drum grooves.
With the special pliers, narrow the ring ends using the 2 holes on the ring ends (Fig. 7). Install the rope clamp spring in its slot inside the ring, (Fig. 8) and close it hooking it (Fig. 9). Fit the rope guide shoe (Fig. 10) and tighten the screws Item 1 (Fig. 11).
After the installation of the rope guide ring, pass the free rope end through the pulley of the lower block and then fasten it on the wedge socket, as described in the section "Lower block mounting" 3.7. on page 21 of the installation manual.

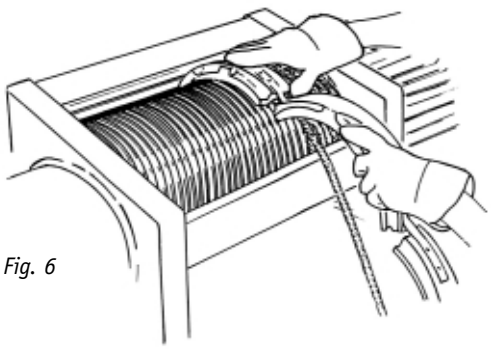


Fig. 6

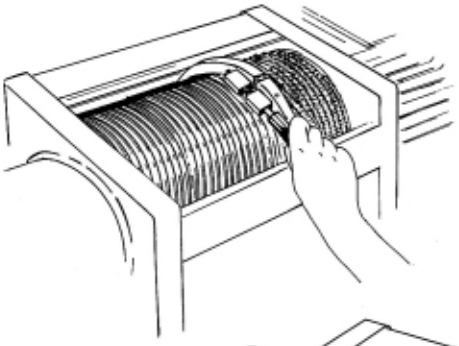


Fig. 7

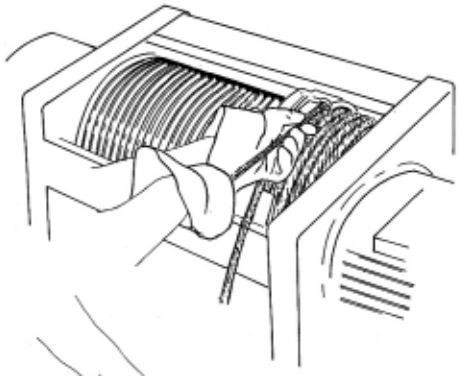


Fig. 8

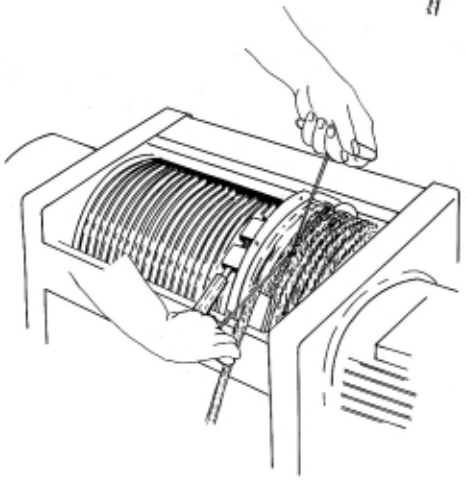


Fig. 9

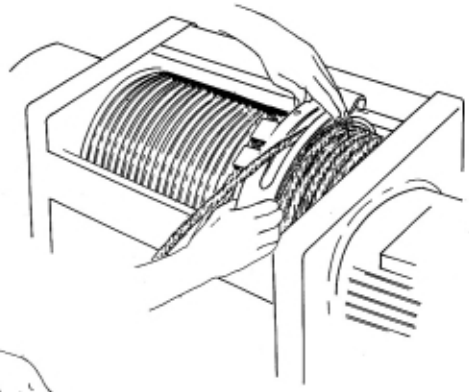


Fig. 10

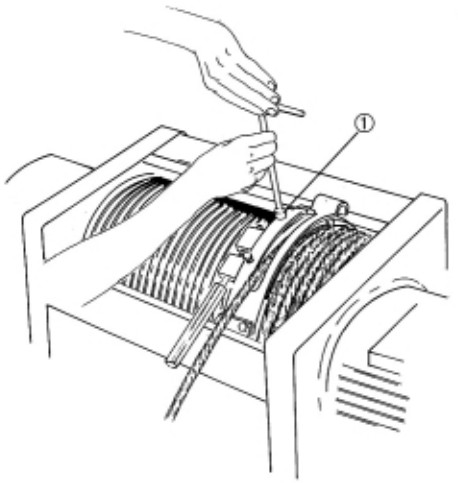


Fig. 11

The installation of the rope guide ring for hoists type "A-B-C-D" is shown in the figures, for hoist size "F" it is mirror-inverted in respect to the illustration.

Rope guide hoists "E-F"

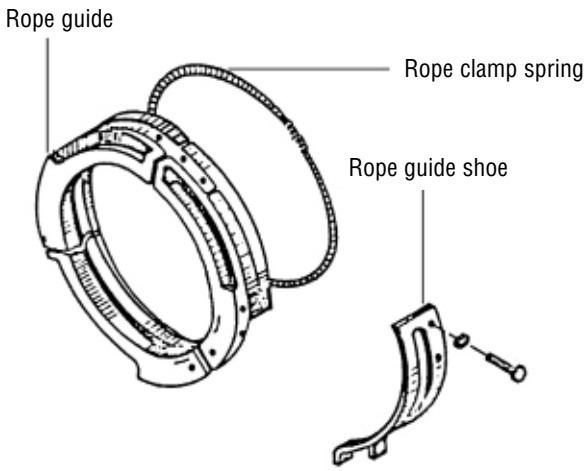


Fig. 12

Rolling rope guide for hoists

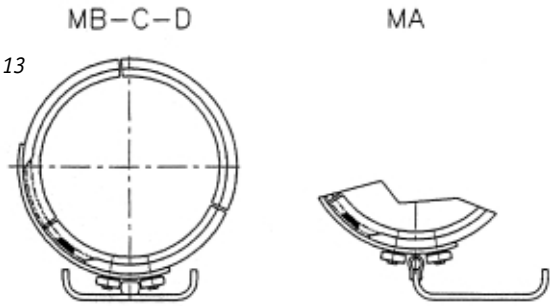


Fig. 13

4.9.6. LIFTING BRAKE FAN

Removal and installation: First make sure that t there is no load applied, loosen the screws Item 1 (Fig. 16), remove the brake housing Item 2 (Fig. 16) and remove the brake adjusting ring nut Item 3 (Fig. 16) with the special wrench (Fig. 17). Remove the brake fan Item 4 (Fig. 18) with a puller. Install the new fan pushing it forward with a lead mallet, install the brake housing Item 2 (Fig. 16) and the screws Item 1 (Fig. 16), and then perform the adjustment as shown in the section "brake fan adjustment".

Fig. 16

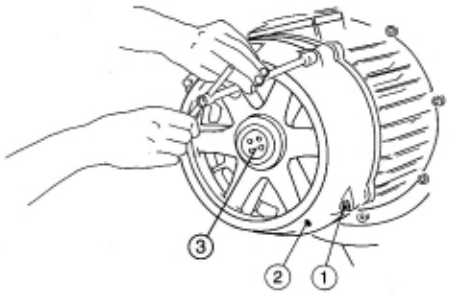


Fig. 17

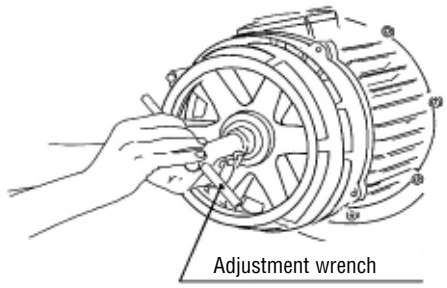
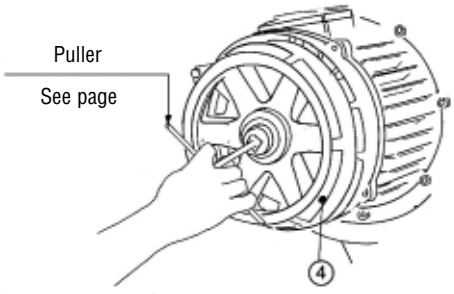


Fig. 18



4.9.7 TROLLEY TRAVEL BRAKE (MOTORS WITH CYLINDRICAL ROTOR)

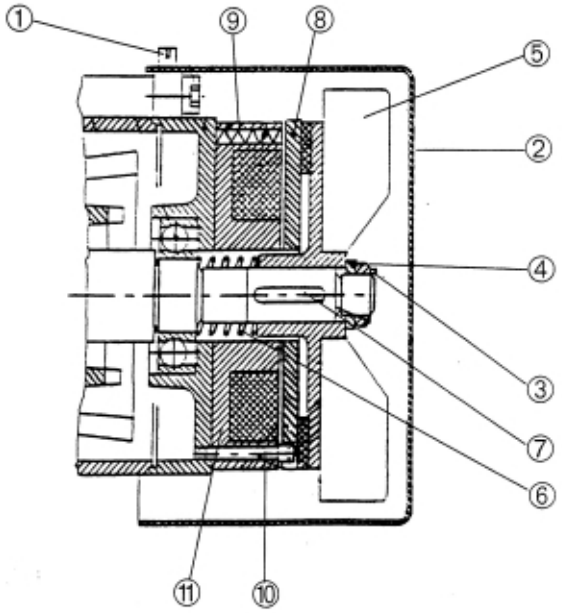
Brake fan removal: loosen the screws Item 1, remove the cover Item 2, loosen the screw Item 3 and the nut Item 4, pull out the brake fan Item 5.

Brake fan installation: check the right locating of the spring Item 6 and the key Item 7, put the brake fan Item 5, tighten the nut Item 4 and the screw Item 3, put the cover Item 2 and tighten the screws Item 1.

NB: check that the brake stops correctly, in this case adjust it, as described in section 4.10.2. "adjustment of trolley motors" on page 54.

Electromagnet removal: follow the same rules as in the above section "Brake fan removal", then pull out the movable keeper Item 8, the springs Item 9 and loosen the screws Item 10. Disconnect the feeding cables of the electromagnet Item 11 from the motor terminal block and pull whole.

Electromagnet installation: connect the electromagnet feeding cables Item 11 following the rules of page n. 22. Put the electromagnet Item 11, tighten the screws Item 10, put the spring Item 9, put the removable keeper Item 8 and check the right locating of the spring Item 6 and of the key Item 7. Put the brake fan Item 5, tighten the nut Item 4 and the screw Item 3, put the cover Item 2 and tighten whole with the screws Item 1.



4.10 ADJUSTMENTS

4.10.1. ADJUSTMENT OF THE HOIST MOTOR BRAKE

This step must be performed with standstill hoist and without load.
Loosen the screws Item 1 and remove the grille Item 2, (Fig. 19). With the brake applied, measure at any point between the brake fan (Fig. 20) and a surface of the bell. After this measurement, axially push the fan inside the motor with the aid of a lever and make another measurement, recording the difference (fig.20). If the difference is greater than the rated values (0.8/1.2 mm) proceed as follows:

- Loosen the screws (Fig. 21) and then turn the adjusting ring nut clockwise to take up any axial shifting greater than the rated value, bearing in mind that one complete turn of the ring nut corresponds to 2 mm (Fig. 22). After this take up operation, repeat the measurement with the brake released (fig.20), checking that the axial shifting is within the rated value, then put back the screws and the grille in their positions (Fig. 19).

If the measure indicated is not reached with the above operation, it is necessary to replace the fan.

Fig. 19

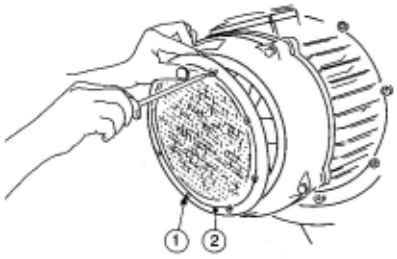


Fig. 20

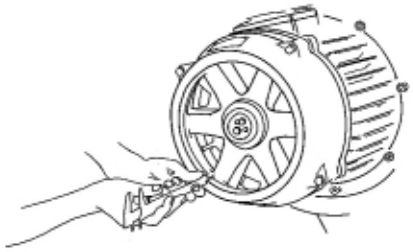


Fig. 21

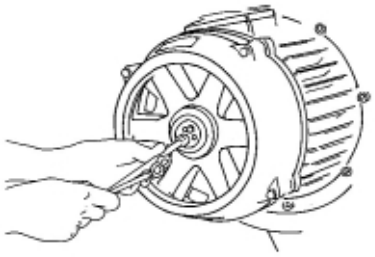
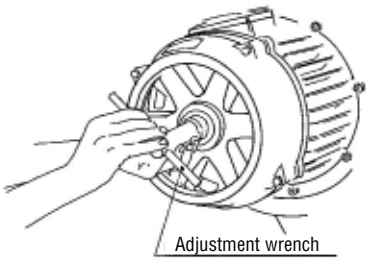


Fig. 22

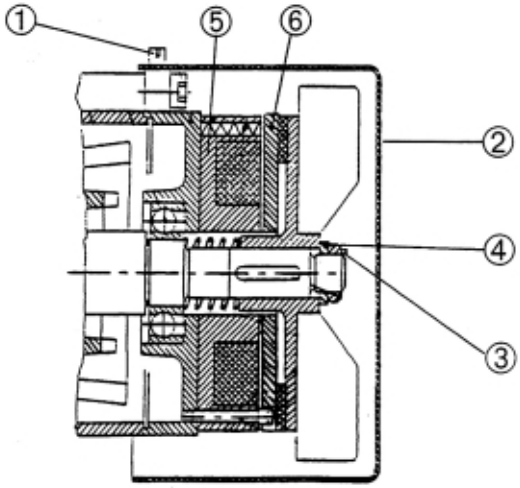


See page

CAUTION! The brake does not function properly with an axial shifting over 2,5 mm. The maximum permissible axial shifting of the rotor during the operation is of 2,5 mm.

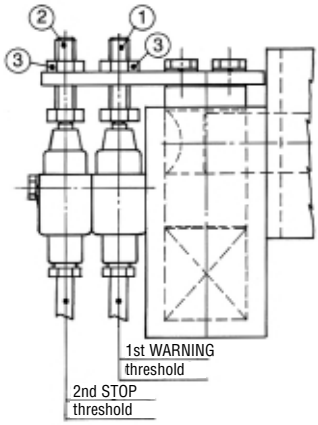
4.10.2. ADJUSTMENT OF TROLLEY MOTORS BRAKE (MOTORS WITH CYLINDRICAL ROTOR)

This step must be performed with standstill trolley and without load.
If the braking distance is longer than necessary, increase the brake torque as follows: loosen the screws Item 1 and remove the cover Item 2, loosen the screw Item 3 and loosen or tighten the nut Item 4 in order to adjust the brake opening.
NB: turning the nut clockwise the brake distance decreases and vice versa. The brake opening shall have a range between a minimum of 0,5 mm up to a maximum of 0,8 mm.
This value can be checked by putting a thickness meter between Items 5 and 6.



4.10.3. LOAD LIMITER ADJUSTMENT

1st reaction threshold: Apply the rated load and turn the screw Item 1 until the warning signal is given.
2nd reaction threshold: Apply the rated load plus 15% and turn the screw Item 2 until the stop signal of the lifting movement and of the horizontal travel movements is given. After the adjustment, make sure that the locknut Item 3 is tight.



4.11 TROUBLESHOOTING

Following tables show the possible malfunctions of the single functions of the trolley/hoist.
In Tables 15/16 are listed the fault, the relevant function and the possible cause.

Malfunctions table Table 15

Function/fault	Lifting	Travel	Cause
NO START	‹	—	- Up-down limit switches - UP/DOWN contactor - UP/DOWN push-button - Hoist motor - Load limiter
	‹	‹	- Check power supply trailing cable for hoist and trolley
	‹	‹	- Main power supply line - Low voltage transformer not functioning - Line contactor
	—	‹	- Limit switches right/left - Right/left contactor - Right/left push-button - Trolley motor
PARTIAL START (ONLY IN ONE DIRECTION)	‹	‹	- Limit switches, contactor or push-button of the function deactivated (reciprocally independent)
THE MOVEMENT IS NOT STOPPED WITHIN THE PROPER DISTANCE	‹	‹	- Brake of the function (in this case check for possible “slipping”)
THE MOVEMENT IS NOT STOPPED AT THE WAY LIMITS	‹ Moreover, load slips and is not held	‹	- Brake (see above) - Limit switches of the function
THE FUNCTION CONTINUES ALSO AFTER RELEASING THE RELEVANT PUSH-BUTTON	‹	‹	- Directional push-button - Relevant contactor - “False contact”
ABNORMAL NOISE FROM THE GEARBOX		‹	- Lubrication lack - Out of duty cycle
SQUEAKY NOISE DURING BRAKING	‹	—	- Presence of dust - Excessive play - Worn brake lining
SQUEAKY NOISE FROM THE DRUM, THE ROPE OR THE ROPE GUIDE	‹	‹	- Lubrication lack - Improper duty cycle
SQUEAKY NOISE FROM THE PULLEYS OR THE LOWER BLOCK	‹	—	- Lubrication lack - Improper duty cycle
SQUEAKY NOISE FROM THE WHEELS (JERKY OPERATION)	—	‹	- Rails not perfectly aligned - Lubrication lack - Out of duty cycle
CURRENT IN THE HOOK	‹	—	- Check electric equipment
THE TROLLEY WHEELS SLIP ON THE RAILS	—	‹	- Excessive lubrication of wheels or rails, or presence of paint, oil, etc.

Troubleshooting Table 16

Component/Fault type	Cause	Remedy
BRAKE SLIPPING	- Worn brake lining - Presence of oil and grease	- Adjust the play or replace the brake lining - Clean the brake lining
DISK BRAKE VIBRATION	- Improper supply voltage (too low) - Supply with only one phase - Excessive air gap between magnetic components	- Restore the original, proper conditions - Adjust the air gap
BRAKE OVERHEATING	- Improper duty cycle - Improper adjustment - Operation under unsuitable conditions or out of normal dut	- Restore the foreseen working conditions - Restore proper conditions
THE LIMIT SWITCH STUCK OPEN	- Clogging - Connections broken	- Clean and restore the original conditions
PENDANT PUSH-BUTTONS STUCK CLOSED	- Clogging	- Clean - Check the conductors of the pendant
STUCK CONTACTS OF THE ELECTROMAGNETIC SWITCHES	- Lack of maintenance - Operation under unsuitable conditions or out of normal duty	- Restore proper working conditions
MOTOR OVERHEATING	- Higher voltage fluctuations, as the permitted +/-10% - Lack of cooling air, possible clogging of air passages - Higher environment temperature, as planned for the operation - Operation of equipment not within the foreseen duty cycle	- Ensure the proper voltage supply - Restore the proper air circulation - Restore suitable environmental conditions or adapt the function features of the motor to the new conditions - Adapt the operation conditions to those planned
THE MOTOR DOES NOT START	- Blown fuse - The contactor interrupted the power supply - Overload, blockage, high start frequencies, inadequate protection	- Replace the fuse - Verify the contactor of the function - Repair the motor winding and ensure a better protection - Check the pendant
THE MOTOR STARTS WITH DIFFICULTY	- At the start, voltage or frequency well below their rated values	- Improve the conditions of the line or of the main power supply
THE MOTOR HUMS AND DRAWS MUCH CURRENT	- Faulty winding - The rotor contacts the stator - Lack of one phase of the power supply - Gearbox seized - Brake seized - Power cables short circuit - Motor short circuit	- Have repaired by a specialist - Check the main power supply and/or the contactor - Call for a specialised technician - Check and, if necessary, adjust - Repair the short circuit - Call for a specialised technician
SHORT CIRCUIT IN THE MOTOR WINDING	- Faulty winding	- Repair the motor winding
FALSE CONTACT	- Accidental activation of the function	- Check the pendant conductors

4.12 REMOVAL - NEW DESTINATION

Should it become necessary to remove the trolley/ hoist from its working position for extraordinary maintenance operations (repairs/replacements), or to install it in a new location, reverse the procedures described under "Mounting", section 3.5 on page 19 and sections 3.6-3.7 on page 21.

This operations must be carried out by specialists and a specially trained staff, with adequate tools and personal safety devices, as required by the standards

Should the user sell the trolley/hoist to another user (resale of used equipment to third persons) it is advisable to inform the manufacturer of the new destination, place and address of the new user, in order that MISIA S.r.l. can send updated information, if any, in connection with the hoist and/ or this manual.

4.13 RESTORATION AFTER STORAGE

Before putting in service a trolley/hoist which has been stored for a long time, following steps must be carried out:

Mechanisms:

- check for any lubricant leaks and replace any faulty seal;
- top up the lubricants;
- check that the mechanisms are properly fastened to the structure;
- remove any trace of rust from the sliding parts of the control devices;
- check the rope for integrity and clean and lubricate it, the pulley grooves and the drums;
- lubricate the thrust bearing of the hooks and the unpainted mechanical components (shafts, couplings, control rods);
- eliminate water deposits in hole components of the structure and of the mechanisms.

Electric system

- eliminate any condensation inside the motors sucking it from the open terminal boxes; dry blow with air;
- check the brakes for the integrity and function. Restore the proper air gap;
- check the limit switches for integrity and function;
- verify the integrity of the parts and of the electric and electronic components. Eliminate any condensation, wipe dry the contacts of the electromagnetic switches and protect all components with a suitable spray for electrical equipment. Carefully clean and apply a film of Vaseline on the mating surfaces and threaded covers of all containers;
- perform an electric strength test at 2000V, taking care to isolate any rectifier bridge or electronic circuit;
- check the trailing cables for smooth running;
- carefully check the function of the pendant.

4.14 DISPOSAL/SCRAPPING

If the hoist/trolley have to be scrapped, their parts must be disposed of in different ways according to the different characteristics thereof (e.g.: metal, oils and lubricants, plastic and rubber, etc.), possibly entrusting specialised authorised disposal companies, and in any case observing the law requirements for the disposal of solid industrial waste.

5. MAINTENANCE REGISTER

5.1. MAINTENANCE REPORTS

In these maintenance reports the user must record all performed maintenance steps at monthly, six-monthly and yearly intervals listed in Table 10 on page 45, noting the results and possible comments.
The report must state clearly the name of the maintenance worker and date of the maintenance step.

5.1.1. CONFIGURATION OF THE MAINTENANCE REGISTER

The register consists of a number of pages equal to the number of components listed alongside.

List A (recommended monthly, six-monthly maintenance)
- Ropes
- Hook
- Brakes
- Fastening bolts
- Electric equipment
- Limit switches

List B (recommended yearly maintenance)
- Rope guide
- Gearbox
- Wheels
- Stoppers
- Lower block
- Deflection pulleys
- Load limiter.

Monthly/six-monthly/yearly maintenance operation				
Component:				
Date	**Operation**	**Result**	**Signature**	**Remarks**

6. 4 SPARE PARTS

6.1. SPARE/WEAR PARTS LIST

The use of not original spare parts not only invalidated the guarantee, but can compromise the proper operation of the hoist.

Spare parts Table 17

Item	Hoist "M" series		A				B				C				D				E					F		
			Hook travel (m)																							
			S	T	Q	R	S	T	Q	R	S	T	Q	R	S	T	Q	R	S	T	Q	R	Z	P	S	T
1	COMPLETE HOIST MOTOR	N	16086				20086				20116				24126				2714A-6					2714-6		
		V	16084				20084				20124				27144				/					/		
		NA	2110624				2612624				2714624				3317624				3517A-6/24TP1					3517-6/24TP1		
		VA	2110424				2612424				2714424				3317424				/					/		
2	BRAKE FAN	N	1012572				1012588				1012588				1012609				1012621					1012621		
		V	1012572				1012588				1012588				1012621				/					/		
		NA	101259				101261				101263				101264				1212106					1012106		
		VA	101259				101261				101263				101264				/					/		
3	LIMIT SWITCH		*5095139/5094554				5094554				5094554				5094554				5094554					5094554		
4	DRUM BEARING		6015				6016				6016				6021				6024					6026		
5	ROPE GUIDE RING	Type 5	/				/				/				/				/					/		
		Type 83	/				/				/				/				/					/		
6	ROPE	Vers. S2	07230	07277	07418	07559	10233	10301	10441	10580	10271	10351	10505	10661	13226	13297	13439	13580	15362	15456	15596	15735	15871		20770	20107
		Vers. S4	/	07299	07430	07531	/	10316	10456	10595	/	10364	10518	10674	/	13317	13459	13600	15379	15483	15623	15762	15898		20780	20108
7	MICROSWITCH LOAD LIMITER		Z 15 GK 55																							

** Limit switch for motor N and V.*

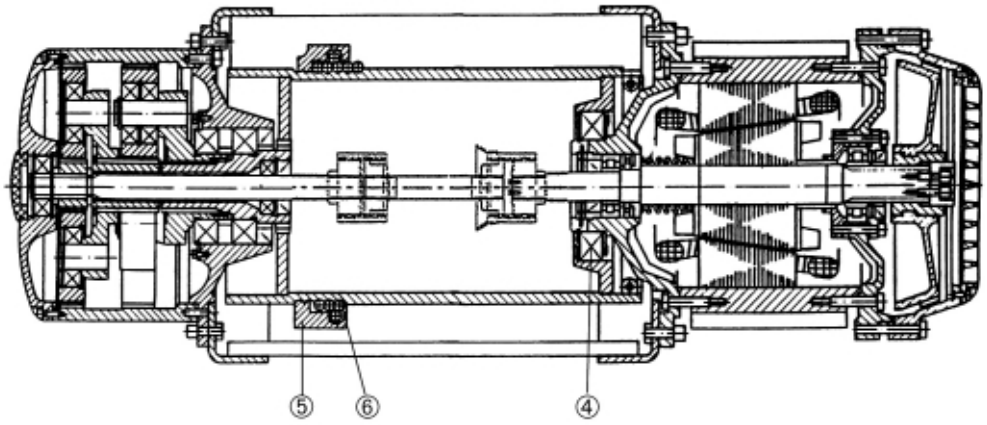
Spare parts Table 17 A

Item	Hoist "M" series		10		20		32		50	
			Hook travel (m)							
			Z	X	Z	X	Z	X	Z	X
1	COMPLETE HOIST MOTOR	N	20086		24126		24126		24126	2714A-6
		V	20084		20144		20144		20144	/
		NA	2612624		3317624		3317624		3317624	3517A-24/6TP1
		VA	2612424		3317424		3317424		3317424	/
2	BRAKE FAN	N	1012588		1012609		1012609		1012609	1012621
		V	1012588		1012621		1012621		1012621	/
		NA	101261		101264		101264		101264	1012106
		VA	101261		101264		101264		101264	/
3	LIMIT SWITCH		5094554		5094554		5094554		5094554	5094554
4	DRUM BEARING		6016		6021		6021		6021	6024
5	ROPE GUIDE RING	Type 5	/		/		/		/	/
		Type 83	/		/		/		/	/
6	ROPE		07795	07885	10730	10820	10825	10975	13745	13885
7	MICROSWITCH LOAD LIMITER		Z 15 GK 55							/

NB: *Ordering spare parts, always indicate: serial number of the hoist, year of manufacture and code number of the manual.*

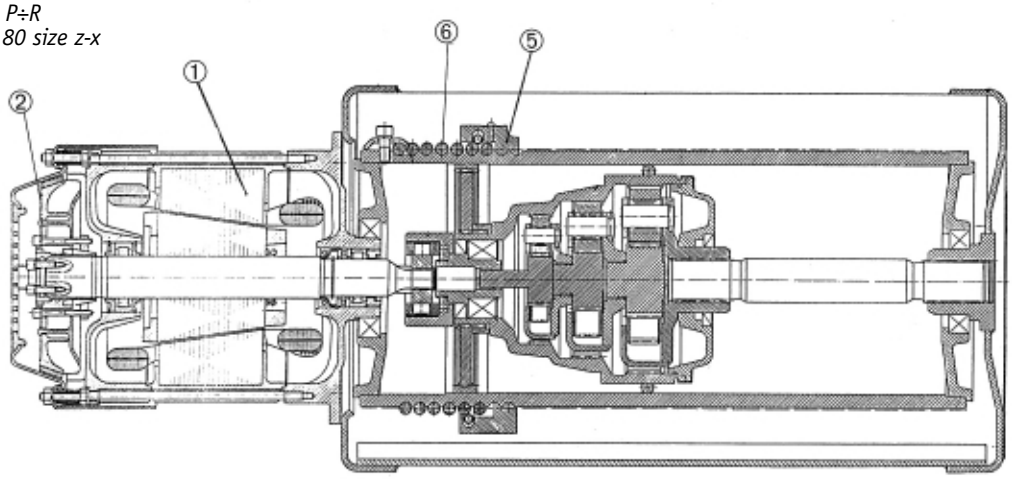
Type “A-B-C-D”

Hoists “A-B-C-D” size S÷R
Hoists 10-20-32 size z-x; 50 size Z



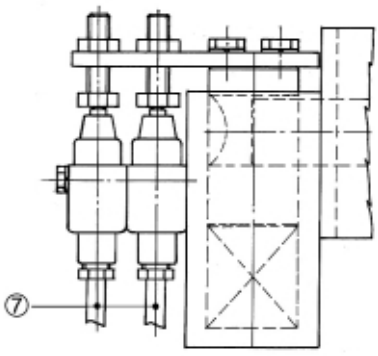
Type “E-F”

Hoists “E-F” size P÷R
Hoist 50 size x - 80 size z-x

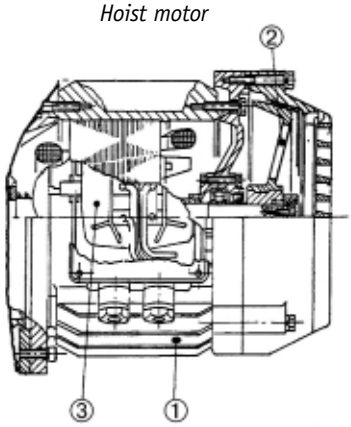


Details

Load limiter



Hoist motor



7. 5 MAINTENANCE TOOLS

6.1.2. WEAR PARTS FOR MONORAIL TROLLEYS

Trolleys Type 83						Table 18 A
Pos.	Description	Wheel diameters and code				
		ø 100	ø 125	ø 155	ø 195	ø 250
1a	Driving wheel	829957	829297	830710	829528	832638
2a	Idle wheel	829256	829296	829993	830715	832640
3a	Driving wheel shaft	827805	829802	829941	829513	828136

Trolleys Type 3						Table 18 B
Pos.	Description	Wheel diameters and code				
		ø 120	ø 175	ø 210	ø 225	ø 250
1b	Idle wheel	192565	148897	149009	257104	241004
2b	Driving wheel	192570	148851	8242124	257103	241003

6.1.3. WEAR PARTS FOR DOUBLE RAIL TROLLEYS

Trolleys Type 53				Table 19
Pos.	Description	Wheel diameters and code		
		ø 160	ø 200	ø 250
1c	Idle wheel	00405	250122	315105
2c	Driving wheels	00400	250109	315106

6.1.4. WEAR PARTS FOR TROLLEY MOTORS DETAIL BRAKE UNIT

Trolleys Type 83/3							Table 18 C
Pos.	Description	Motor type and code					
		63	71	80	90	100	112
1a	Brake disk	063	071	080	090	100	112
1b	Electro magnet	163	171	180	190	1100	1112

NB: *Ordering spare parts, always indicate: serial number of the hoist, year of manufacture and code number of the manual.*

			Table 20
Tool type	Function	Hoist motor Type	Code
ADJUSTMENT WRENCH FOR BRAKE FAN OF THE HOIST MOTOR *	AIR GAP ADJUSTMENT LIFTING BRAKE	1608-6	8002
		1608-4	
		2110-6/24	
		2110-4/24	
		2008-6	8003
		2008-4	
		2011-6	
		2012-4	
		2612-6/24	
		2612-4/24	
		2412-6	8004
		2714-6/24	
		2714-4/24	
		2714-6	8005
		2714-4	
		3317-6/24	
		3317-4/24	
		3517-6/24	8006
PULLER FOR BRAKE FAN OF THE HOIST MOTOR **	REPLACEMENT OF THE BRAKE FAN OF THE HOIST MOTOR	1608-6	8020
		1608-4	
		2110-6/24	
		2110-4/24	
		2008-6	8021
		2008-4	
		2011-6	
		2012-4	
		2612-6/24	
		2612-4/24	
		2412-6	8022
		2714-6/24	
		2714-4/24	
		2714-6	8023
		2714-4	
		3317-6/24	
		3317-4/24	
		3517-6/24	8024
PLIERS FOR ROPE GUIDE RING **	INSTALLATION OF THE ROPE GUIDE RING ON THE DRUM	/	9001
SPRING PULLER FOR ROPE GUIDE RING **	INSTALLATION/ REMOVAL OF THE ROPE GUIDE RING	/	9002

* *Wrench normally supplied with the hoist.*

** *Wrench and tools available on request.*

MISIA

MISIA PARANCHI srl
Via dei Lavoratori, 9/11
20092 Cinisello Balsamo (Milano) Italia
Tel. 02.61298983
Fax 02.6121769
www.misia.com - e-mail: info@misia.com