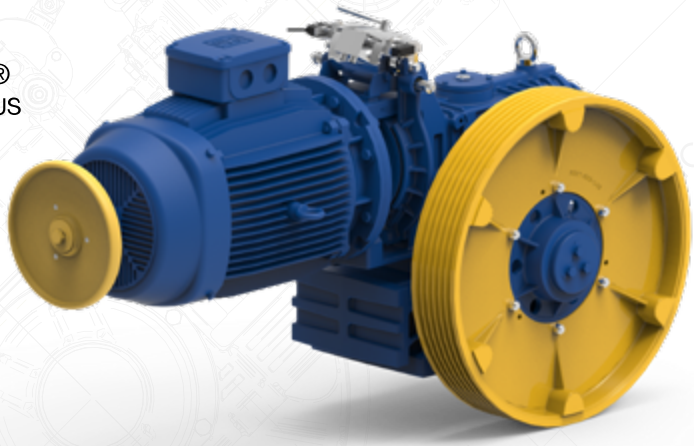
MANUAL

Montanari Group
GEARLESS&GEARBOX
TRACTION MACHINES

INSTALLATION, USE AND MAINTENANCE
GEARED TRACTION MACHINES



www.montanarina.com

REV00_01_2026

CHOOSE MONTANARIAPP! Available **mobile and desktop.**

A unique container of all documentation available for gearboxes, gearless, speed governors and safety gears.

You may check your supply, configure the inverter, download manuals, tech reports, certificates and much more.

Search for Montanari Giulio mobile App, available on Google Play and App store.

SCAN THE QR TO DOWNLOAD ANDROID APP

SCAN THE QR TO DOWNLOAD iOS APP

SCAN THE QR FOR THE DESKTOP APP

REV.	DATE	DESCRIPTION	EDITED BY	VERIFIED BY	APPROVED BY
0	20/01/2026	FIRST REDACTION	Marketing Dept	Technical Dept	ALBERTO MANTOVANI

INDEX

1. STANDARD REFERENCE 9
2. GENERAL NOTES 9
3. TRANSPORT 9
3.1 Unload 10
4. WAREHOUSE STORAGE 11
5. INSTALLATION 12
5.1 Handling 12
5.2 Assembly on the base 13
5.3 Lubrication 15
5.4 Electrical wirings 16
5.5 Commissioning 21
5.6 Brake shoe adjustment 22
6. USE 22
7. MAINTENANCE 23
7.1 Tightening moment 24
7.2 Axial clearance check on thrust bearing 25
7.3 Crown and worm clearance check 25
7.4 Brake: brake shoe wear 25
7.5 Oil: replacement and level check 26
7.6 Oil: seals check 26
7.7 Traction sheave: groove wear check 26
7.8 Replacement of components 26
7.9 Disposal of packaging and end-of-life product 26

SCOPE

The scope of this lift gears manual is to supply instructions for:

- Installation
- Use
- Maintenance.

IMPORTANT - WARNING:

This manual does not cover the procedure for disenabling the entire plant: it contains only the instructions relative to the lift gear. Consequently, before beginning installation operations for the lift gear you must obey the instructions given in the use and maintenance manual for the plant and adopt all precautions laid down by current safety legislation.

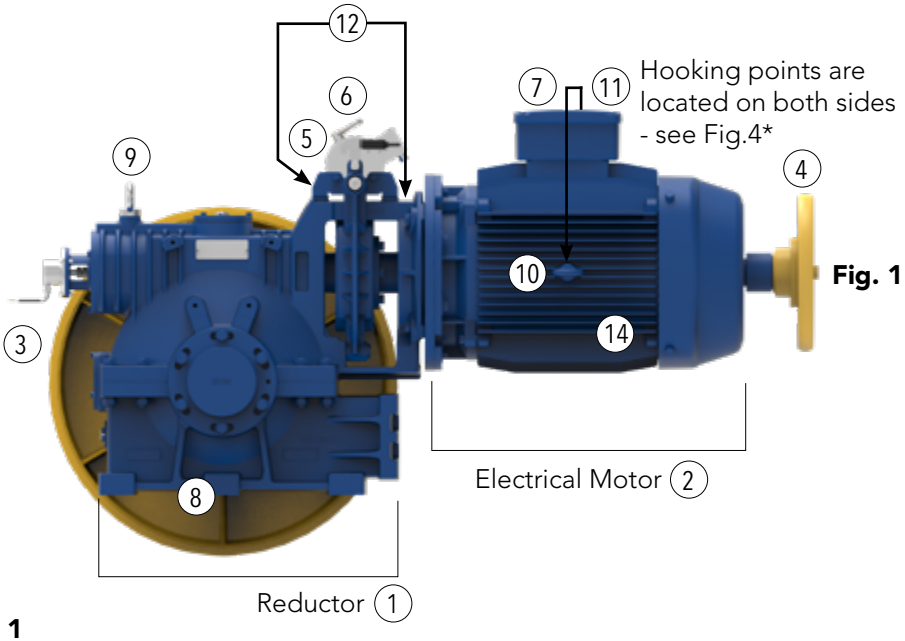


Fig. 1

Tab. 1

GEARED MACHINE	
Rif. No	Description
1	Reductor
2	Electrical Motor
3	Traction Sheave
4	Flywheel
5	Electromagnet
6	Braking device (Tab. 3 - Fig. 5)
7	Terminal box
8	Gear base
9	Hooking points/eyebolts for hoisting (Par. 5.1)
10	
11	
12	Punched Serial Number
13	Sticker label
13a	QR code for app
14	Motor Label

Fig. 2

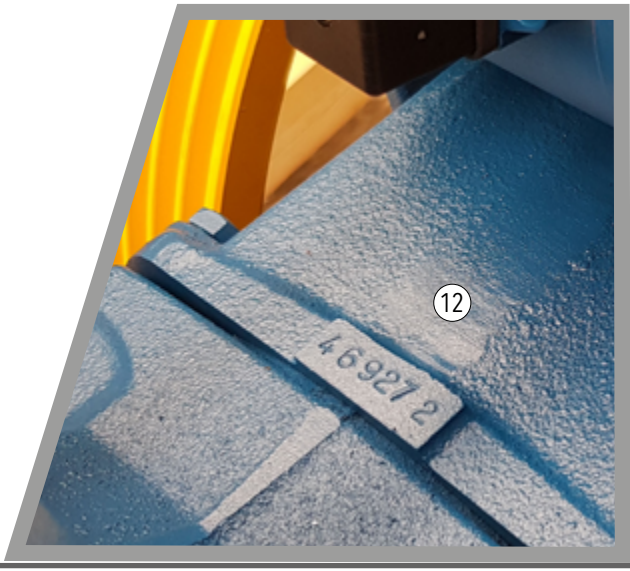
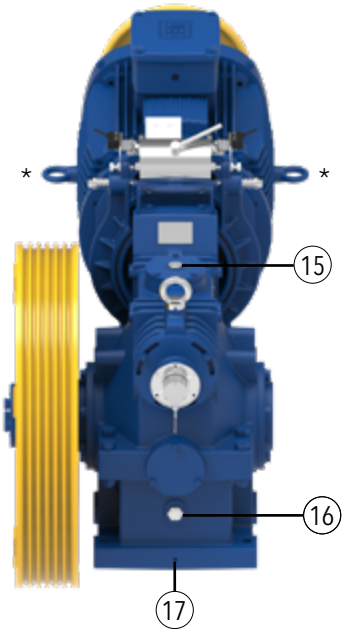


Fig.4



OIL	
Ref. No	Description
15	Filling plug
16	Transparent level indicator
17	Emptying plug

Tab. 2

BRAKE DETAIL	
Ref. No	Description
18	Brake lever
19	Electromagnet
20	Brake adjustment screw
21	Brake adjustment springs
22	Brake shoes
23	Brake sheave

Tab.3

Fig. 3

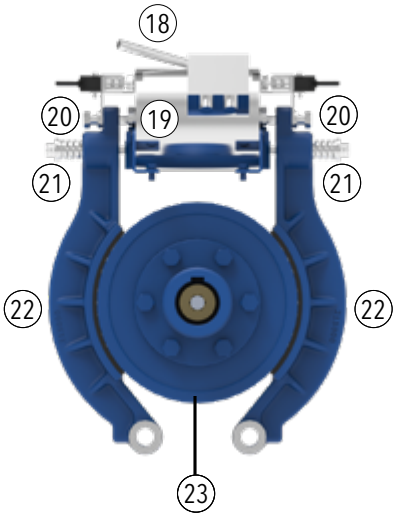


Fig. 5

These operating instructions are an integral part of the supplied gearbox and must always be kept within easy reach for consultation.
All persons involved in the installation, operation, maintenance and repair of the unit must have read and understood the instructions.
No liability is accepted for damage, breakage or accident caused by failure to follow the instructions provided in this manual.
The Montanari gearbox (referring to all models listed in the said manual) described herein has been designed and manufactured in accordance with the recognized safety standards and the state of the art technical development applied at the time of printing these instructions.
To make technical improvements, Montanari reserves the right, if deemed necessary, to modify the units and accessories, preserving their essential characteristics and improving efficiency and safety.

Copyright
All rights to these operating instructions belong to Montanari Giulio & C. S.r.l.
The information in this manual may not be reproduced or used in an unauthorized manner or made available to third parties without prior permission.
If you have any questions, please contact:

MONTANARI GROUP
HEADQUARTERS - MONTANARI GIULIO & C. S.r.l.
Via Bulgaria, 39 - 41122 - Modena - Italy
Phone: +39 059 453611 - Fax: +39 059 315890
www.montanarigiulio.com
info@montanarigiulio.com

MONTANARI NORTH AMERICA
NORTH AMERICA BRANCH
551 Fifth Avenue - Suite 1810 - New York - NY - 10176
www.montanarina.com
info@montanarina.com

Montanari
NORTH AMERICA Inc.

1. STANDARD REFERENCE

Tab. 4

N	Norm	Description
1	UNI 10147	Maintenance: Terminology.
2	ASME A17.1	Safety Code for Elevators and Escalators
3	ASME A17.5	Elevator and Escalator Electrical Equipment

The regulations are to be taken as a reference and are not necessarily fully applicable to these technical instructions.

2. GENERAL NOTES

The operations described in this manual must be carried out by qualified personnel equipped with standard shop floor tools. The entire plant must be disenabled before any maintenance operations are attempted. Lift gears are normally designed to function at 50% ciclic duration factor at maximum load, but for travels not in excess of 45 sec.

For installations that require higher performance, contact our engineering office.

When ordering any spare parts the lift gear serial number must always be specified. This number is printed on the sticker (Fig. 3) or punched onto the shaft near the motor flange (Fig. 1 - Fig. 2 - Tab. 1).

3. TRANSPORT

All machines are packed in cases or cages (Fig. 7). In some cases they are assembled on wooden pallets for proper transportation by truck.
IMPORTANT: cases and cages are not load-bearing and so they must not be placed on top of one another.

Tab. 5

GEARBOX MODEL	MAX WEIGHT lbs
M98H	1543
M105	2976
M105AL	3197
M109	3527
Notes: The weights shown are to be considered as maximum, but not inclusive of any bedframe or casings related to the lift gear	

3.1 Unload

The product must be unloaded from the carrier's vehicle using equipment that is suited to the weight and size of the lift gear. See Tab. 5.
All packaging is suitable for handling with forklifts or lift trucks (Fig. 6).

IMPORTANT: please check the status of the goods when delivered. If damaged, you must not install the equipment.

Fig. 6

4. WAREHOUSE STORAGE

Even if the lift gears are still packaged, they should be stored in dry places protected from bad weather conditions.
After disposing of packaging ensure that dust does not settle on the equipment
In case of long term storage please contact Montanari Giulio & C. at the contact information available at the end of this user's manual.

Fig. 7

5. INSTALLATION

5.1 Handling

Handling can be done on the assembled (Fig. 8) or separated (Fig. 9) Gearbox.
Use lifting straps or chains (not supplied) to handle the Gearbox.
During handling, avoid contact between lifting devices (straps, chains,...) and delicate Gearbox devices such as microcontacts, sensors, terminal box. Also position lifting devices so as to avoid loading the weight on certain critical areas such as:

- shafts that jut from electric motors, with or without flywheels;
- all braking organs: brake sheave, shoes, electromagnets, pins with springs;
- lift gear/motor couplings;
- flanges for tachometric dynamo or encoders.

When handling the assembled Gearbox (Fig. 8), it is absolutely forbidden to lift the machine by using only the attachment points or eyebolts on the electric motor. Failure to observe these indications may create dangerous situations and moreover damage the lift gear irreparably.
Take special care not to subject the lift gear to collision. Take special attention to the following parts:

- flywheel;
- encoder;
- tachometric dynamos;
- brake shoes;
- brake magnet etc..

Disassembling any part of the lift gear, including the motor, without authorisation, for whatever reason, will invalidate any form of guarantee.
If it is necessary to disassemble parts of the gearbox to facilitate transport/handling, contact Montanari Giulio & C. at the references indicated at the end of the manual.

Fig. 8
Assembled Gearbox

Fig. 9
Separated Gearbox

IMPORTANT: GEARBOXES WITH SUPPORT

THE RED SCREW PREVENTS THE SUPPORT FROM SLIPPING OUT DURING TRANSPORT, STORAGE AND INSTALLATION.
REMOVE IT BEFORE PUTTING THE GEARBOX INTO OPERATION

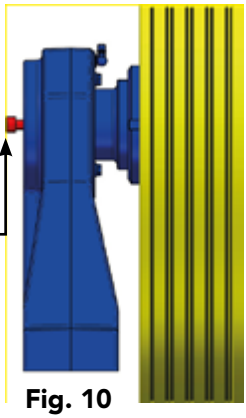
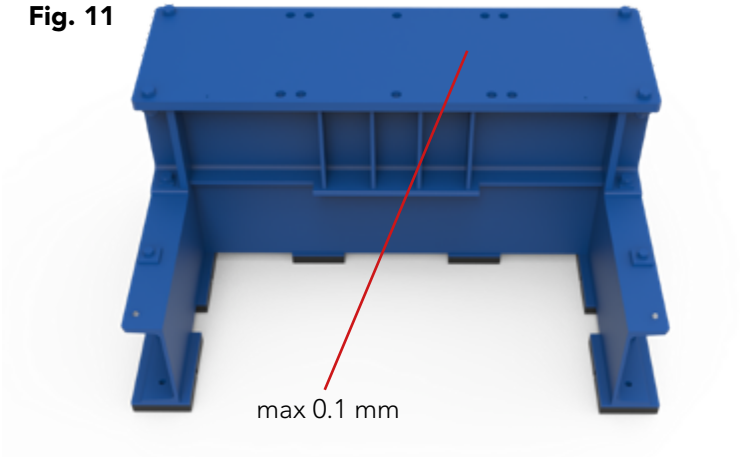


Fig. 10

5.2 Assembly on the base

Use a level to ensure that the base is perfectly horizontal, both in a cross and lengthwise direction.
Ensure that the support surface is flat, with maximum tolerance of 0.1 mm (Fig. 11).
If not, shim adequately.

Fig. 11



Planarity Check:
- Rest the lift gear base on the bedframe.
- Verify that the area near mounting holes closely fits and is coincident.
- Proceed to fix the lift gear by tightening bolts cross-wise.

In the the following page (Fig. 12a - b - c - d) the correct lift gear assembly is shown in all variations.

VARIATIONS

Fig. 12a

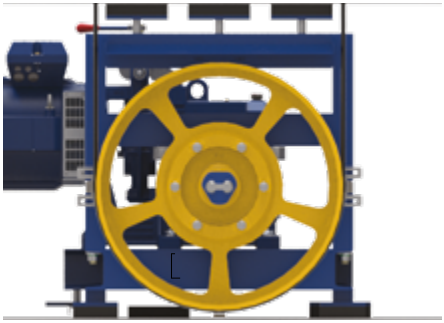


Fig. 12b

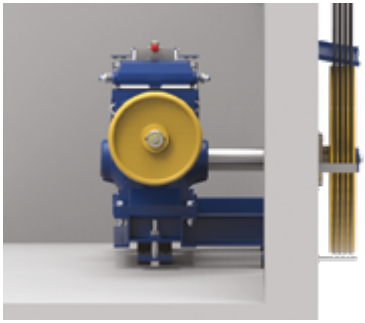


Fig. 12c

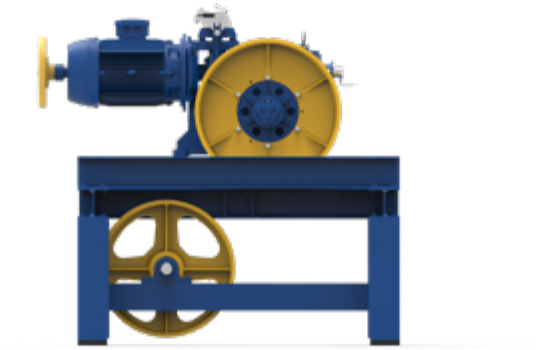
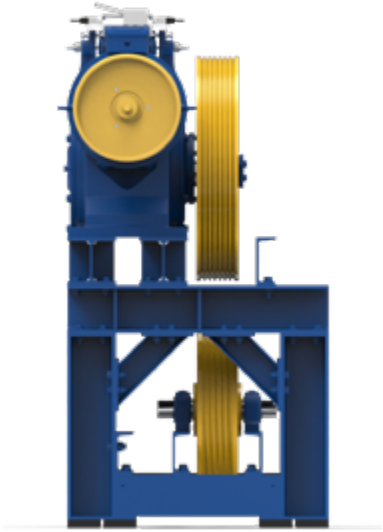


Fig. 12d



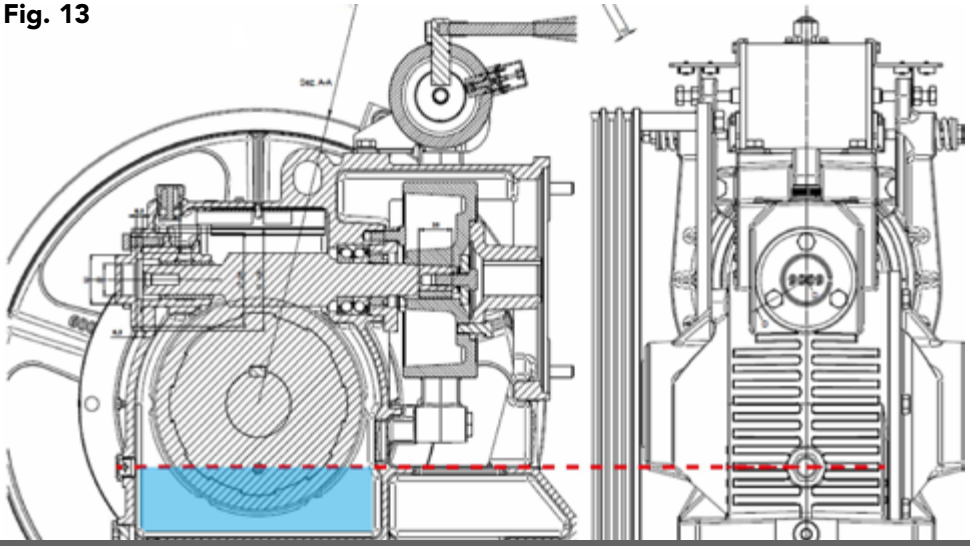
For all executions,
rubber insulation sub-frame.

Tolerance of difference in level between gear and steel bedframe: 0.1 mm.

5.3 Lubrication

First Start: oil filling and level check (Fig. 4 - Tab. 2).
Pour lubricant into the lift gear using the special filling hole as far as the sightline on the transparent level indicator (Fig. 13).

Fig. 13



Check lubricant level periodically.
Ensure there are no traces of oil on the brake sheave, brake shoes and traction sheave.

Oil check and replacement (see Maintenance par. 7.4)

Tab. 6

RECOMMENED LUBRICANTS		
Mineral*	**Syntehetic PAO*** MIXABLE WITH MINERAL OIL	**Syntehetic PG - PAG** NOT MIXABLE WITH OTHER TYPE OF OIL
CASTROL ALPHA SP 220	CASTROL ALPHASYN EP 220	Omala S4 WE 220
MOBILGEAR 630	MOBIL SHC 630	
ESSO SPARTAN 220	MOL Ultrans Synt HC 220	
AGIP BLASIA 220		
SHELL OMALA S2GX 220		

***OR** oil with additive EP and with viscosity not less than ISO VG 220

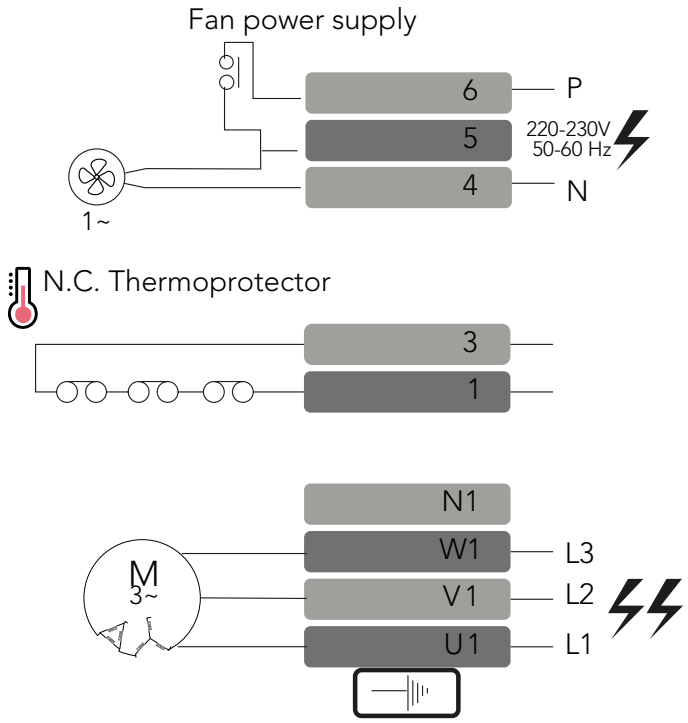
5.4 Electrical wirings

Wire up the electrical motor following the indications on the wiring diagram in the terminal box (Fig. 1 - Tab. 1).
The wiring schemes are included here.

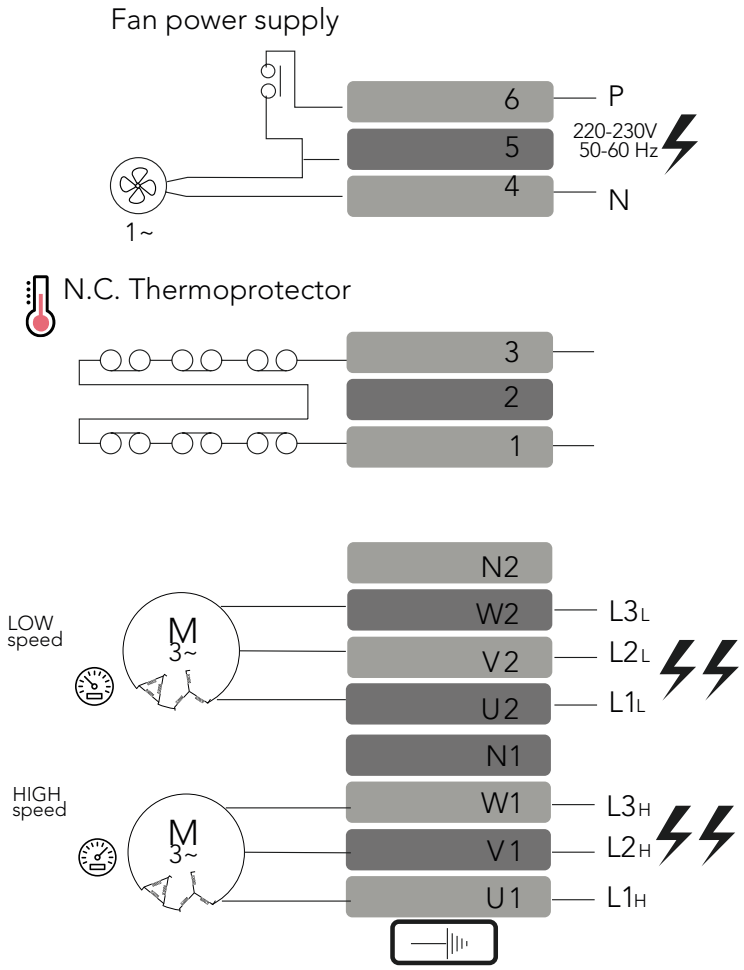
- Scheme Motor A: 1 - 2 Speed and NC Thermoprotector (AC1 - AC2 - VTF).
- Scheme Motor A: 1 - 2 Speed and NC Thermoprotector (AC1 - AC2 - VTF) for Penta.
- Scheme Motor B: 1 - 2 Speed and PTC Thermistors MPV.
- Scheme Motor C: CTF.

WARNING: refer always to the wiring diagram inside the terminal box.

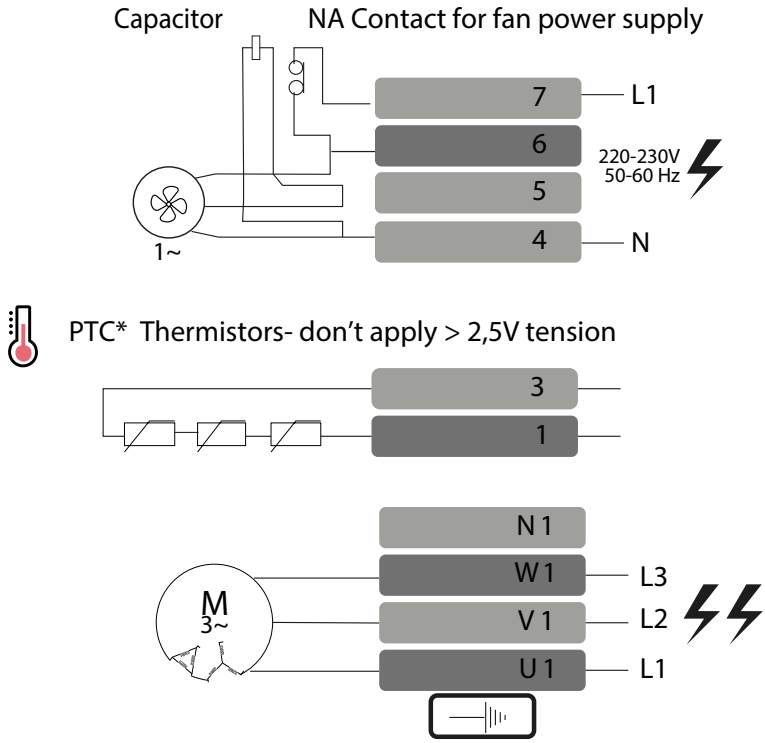
Motor Scheme A
1 Speed: AC1 - VTF with thermpoprotector NC



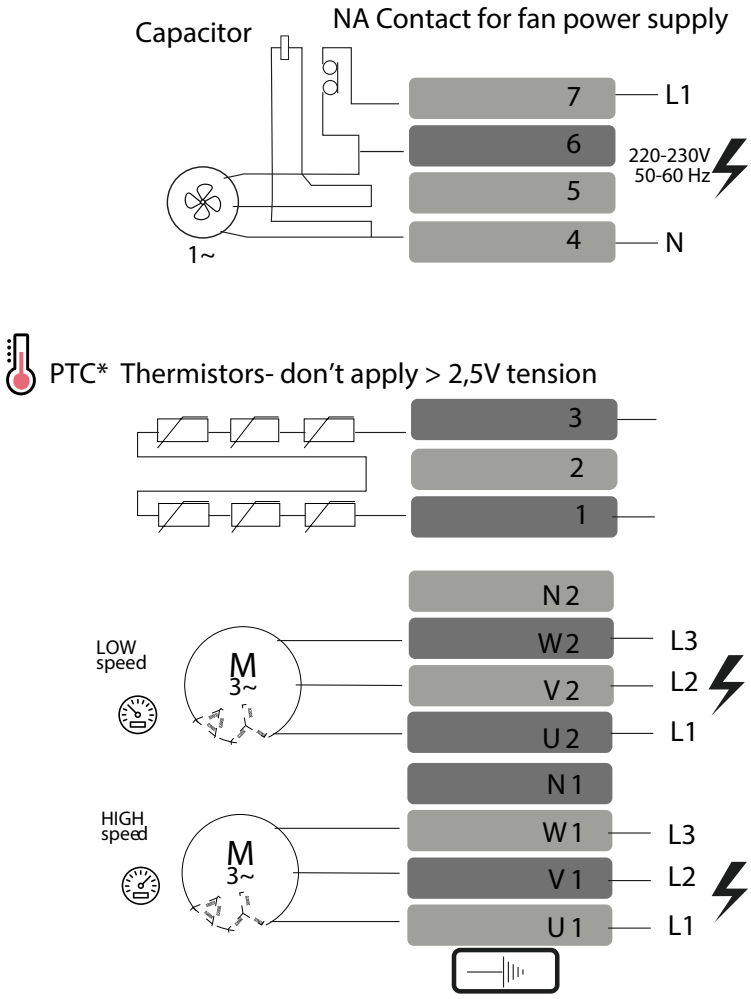
Motor Scheme A
2 Speed: AC2 with NC Thermprotector



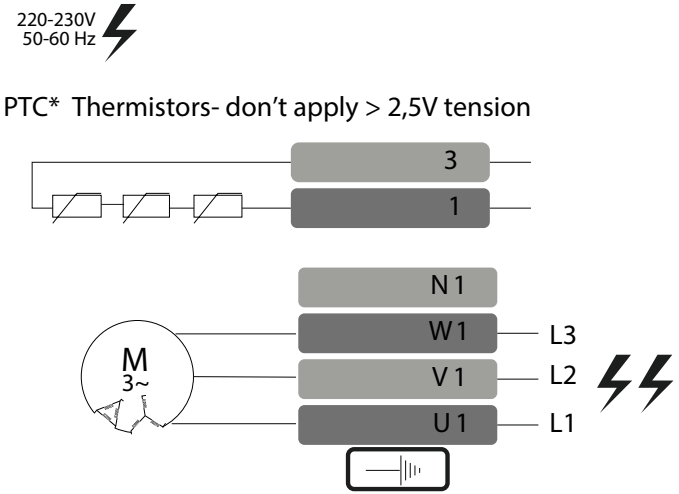
Motor Scheme B
1 Speed: MPV with Thermistors



Motor Scheme B
2 Speed: MPV - with Thermistors PTC



Motor Scheme C: CTF



Connect the brake electromagnet in parallel using the relevant terminal board (Fig. 14).

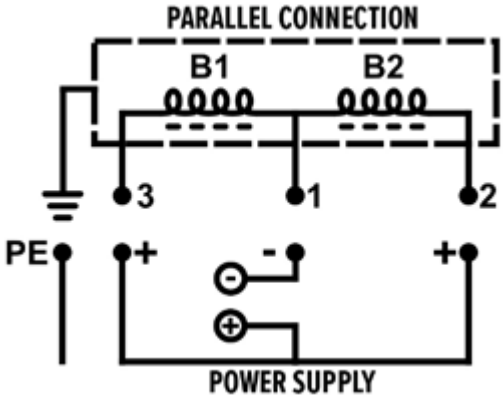
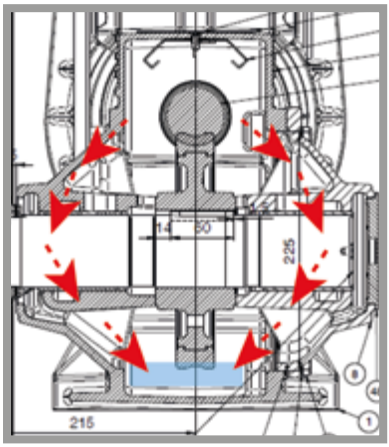


Fig. 14

5.5 Commissioning

Use the handwheel to effect a 360° manual movement of the traction sheave, so that the oil can distribute itself uniformly (Fig. 15).

Fig. 15



Ensure the lift gear is working correctly by starting it up before applying ropes and hence load. Only after completing these operations should the ropes be applied.

IMPORTANT: the first complete travels, with ropes applied, should be carried out according to following schedule (Tab. 7).

Tab. 7

n Travels	Description
4-5	Load about 1/2 of the operating capacity to avoid lift overload
4-5	Load that is about 1/4 of the operating capacity
4-5	Empty car
4-5	Load that is about 3/4 of the operating capacity
4-5	Full load

ATTENTION: with empty cabin or full load cabin it is necessary to respect a 50% inermittence; therefore for a given working time the same pause time is required.

5.6 Brake shoe adjustment

Lift gears are normally supplied with brake shoe openings already adjusted.
If further fine-tuning is required, proceed as follows (Fig. 5 - brake detail).
The brake shoes should open with the least possible run.

- Use the brake lever to open the brake shoes (Fig. 5).
- Tighten or loosen the special adjusting screws to ensure that between the brake shoes and the brake sheave is at a min.
- Make different test in order to verify there is no friction between the brake shoes and brake sheave.
- In case of friction, tighten the regulation screw of a quarter turn each time until friction disappears.

The stopping distance will depend on how springs are tuned and they require adjustment from time
to time according to load and in compliance with regulation EN81-20 par. 5.9.2.2.2.1 and 6.3 .1.
Ensure that during normal functioning the brake shoes open at the same time.

Check brake shoe
(see maintenance par. 7.4)

6. USE

Lift gears are designed and built to serve as hoisting apparatus for Passenger Lifts and Freight Lifts in compliance with the relative standards (UNI 10147 - ASME A17.1 - ASMEA17.5) and therefore any other use is to be considered improper.
The lift gears may not be used in plants with features that differ from those specified at the time of ordering the lift gear (e.g. capacity, speed, etc.).

- The winch can only be used to release the safety gear blocks manually (by means of a flywheel motor) and not electrically. Act on the balance of the system to facilitate the releasing manoeuvre.
- The geared machine must be installed in a building or in a closed travel compartment.
- Do not use the geared machine in an explosive atmosphere.
- The room temperature must be between 0°C and +40°C.
- Assembly, installation, trial, inspection or manoeuvre must be carried out with great care by qualified and trained personnel to comply with the UNI 10147 and ASME A17 standards.
- The manufacturer cannot be held responsible for damage caused by incorrect assembly or incorrect installation.
- Before starting work, make sure that adequate lifting and handling equipment is available.
- No welding work must be carried out on the unit.
- The unit must not be used as a grounding point for welding operations. The bearings can be irreparably damaged.
- All fixing points specified by the manufacturer must be used. The air supply for cooling must not be
- prevented.
- For installation above 1000 m above sea level contact the technical office for the correct sizing of the electric motor.
- Maximum permitted humidity 95%, not humid environment.

7. MAINTENANCE

REFER TO FIG. 16 FOR ALL OF THE FOLLOWING OPERATIONS.

1. ELECTRIC MOTOR DISASSEMBLY

- Stop the lift and turn off the current to the control panel.
- Disconnect the electric cables.
- Secure the electric motor M with suitable lifting system using the eyebolts E on the electric motor.
- Mark the position of the motor hub MH in relation to the brake sheave BP.
- Unscrew all bolts B.
- Unscrew all bolts A.
- Lift the electric motor for the complete disassembly.

2. ELECTRIC MOTOR ASSEMBLY

- Clean the motor hub MH surface and the brake sheave BP surface, the connection motor surface MS and relative gearbox connection flange surface CF.
- Lift the electric motor M with suitable lifting system using the eyebolts E.
- Screw for a few millimiter bolts A, just to allow the rotation of the rotor using the flywheel F.
- Rotate the flywheel F to match the motor hub MH holes and threaded holes on the brake sheave BP; if there is a sing on the motor hub MH, please replace the rotor in the original position.
- Screw and tighten bolts B.
- Proceed to cross tighten bolts A following the right torque value (Tab. 8).
- Connect the electric cables.

3. TRACTION SHEAVE DISASSEMBLY

- Stop the lift, turn off the current to the control panel and remove the ropes from the traction sheave T.
- Unscrew nuts D and remove the relative bolts C.
- Use the threaded holes on the traction sheave T as a puller from the traction sheave hub TH if they are present.

4. TRACTION SHEAVE ASSEMBLY

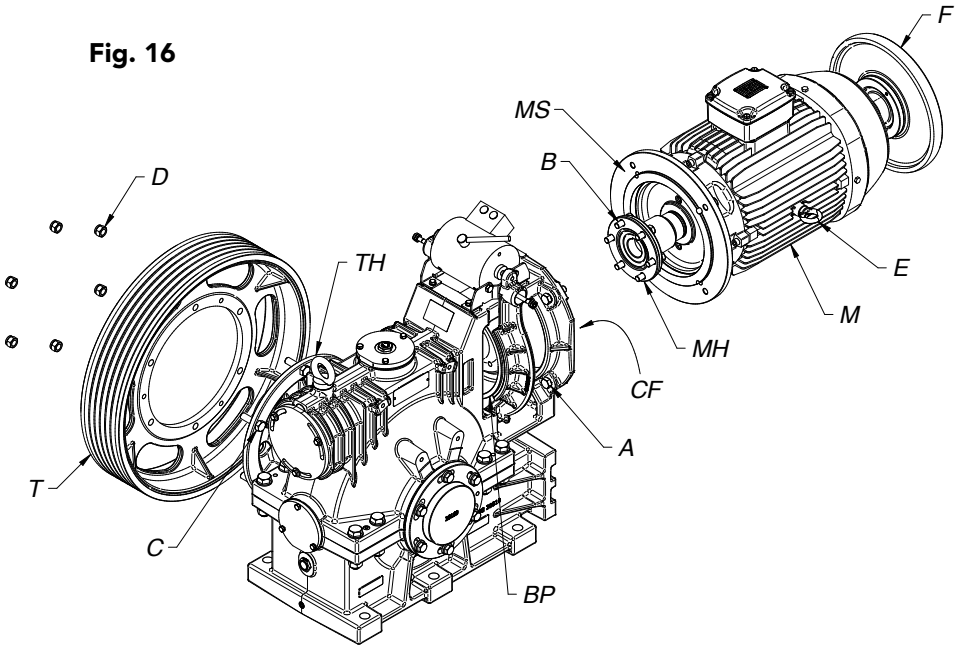
- Place the traction sheave T holes to match the traction sheave hub TH holes.
- Screw the nuts D onto the bolts C.
- Cross tighten nuts D to the appropriate torque amount (Tab. 8).

7.1 Tightening moment

Tab. 8

SCREWS WITH LARGE PITCH THREADING ISO CLASS 8.8	
DIAM	**Moment**
mm	**Nm**
M8	25
M10	50
M12	86
M14	135
M16	215
M18	290
M20	410
M22	560
M24	710

Fig. 16



7.2 Axial clearance check on thrust bearing

- Normally all lift gears do not require any adjustment and indeed cannot be adjusted.

Checking procedure:

- Bearing clearance can be seen with the naked eye during reverse movement by watching the axial movement of the brake sheave compared to the brake blocks.
- Inform Montanari Giulio & C. Srl engineering office when this clearance appears on lift gears for which there is no adjustment possibility, to decide whether the bearing should be replaced.
- Even in case of excessive noise it may be necessary to adjust or replace the bearing itself.

7.3 Crown and worm clearance check

After every 3000 hours of use or at least once a year.
Checking Procedure:

- Stop the system with the empty car.
- Place the counterweight in a position so that the traction sheave cannot rotate.
- Open the brake by hand.
- Turn the flywheel manually in clockwise direction until the worm gear tooth pressure can be felt on the crown teeth. Mark the starting point on the brake sheave circumference.
- Turn the flywheel manually in counter clockwise direction until the worm gear tooth pressure can be felt on the crown teeth. Mark the point reached by shifting on the brake sheave circumference.
- Measure the circumference arc between the two marks.
- Compare the values obtained with those supplied by the table of admissible values (Tab. 9).
- The values given by the table are such that they would guarantee a situation of safety and have no correspondence with running comfort.
- When maximum clearance is exceeded, contact Montanari and **indicate the lift gear serial number.**

Tab. 9

TABLE OF ADMISSIBLE CROWN AND WORM CLEARANCE VALUES			
Model	**Ratios**	**Distance between two markers**	
		inch	**mm**
M98H	1/52 - 1/37 - 2/61	from 3/16 to 1" 3/4	from 5 to 44
M105 all versions	1/65 - 1/49 - 2/63 - 2/53	from 3/16 to 2" 1/8	from 5 to 54
M109	1/49 - 2/55 - 1/64	from 5/16 to 2" 3/8	from 8 to 60

7.4 Brake: brake shoe wear

Check brake shoe wear regularly.
If they are worn down they should be tuned once again.
Replace the brake shoes when the thickness of the material is equal to or less than 2 mm (5/64 in).

7.5 Oil: replacement and level check

First change:
- mineral oil - after 350 hours.
- synthetic oil - after about 700 hours.

Subsequent mineral oil changes:
- mineral oil every 12 - 18 months.
- synthetic oil every 24 - 36 months.

Oil Top-up Instructions:
Stop the lift gear and pour in the lubricant using the special filling hole, ensuring it reaches the sightline on the transparent level indicator.
Discharging lift gear oil:
Stop the lift gear and unscrew the discharge cap located on the base of the lift gear (Fig. 3) and then wait for all the lubricant to drain out.

7.6 Oil: seals check

All types of lift gears have gaskets (frictionless) and dynamic seals (with friction). Check regularly to ensure that there are no oil leaks on the lift gear: if there are such leaks, call our engineering office to have the worn gasket replaced as necessary.

7.7 Traction sheave: groove wear check

If groove wear is noted on the traction sheave, it will have to be replaced.
Request relevant instructions from our engineering office, specifying the type of lift gear and year of manufacture or indicating the serial number. **Do not re-machine the grooves unless specifically authorised to do so.**

7.8 Replacement of components

The instructions for replacement of any components should be requested each time from our Engineering Office, specifying the lift gear serial number.

7.9 Disposal of packaging and end-of-life product

The product consists mainly of steel, cast iron, iron and other materials such as rubber, plastic, etc., which are not particularly hazardous.
For this reason, disposal does not require any special safety procedures other than the conventional ones adopted for this type of waste.
Dispose of the product in compliance with the Environmental and Hygiene Regulations in force in the country it is installed in.
Contact a specialised company for disposal.
Please note that the classification of the waste is responsibility of the waste producer himself.
In the European Union, for disposal comply with the code 16.02.14 "Discarded equipment, other than those mentioned in 16.02.09 to 16.02.13".

Montanari Group
GEARLESS&GEARBOX
TRACTION MACHINES

MONTANARI GROUP HEADQUARTERS
Montanari Giulio & C. Srl
Via Bulgaria, 39 - 41122 - Modena - Italy
Tel: +39 059 453611 - info@montanarigiulio.com
www.montanarigiulio.com