

## WARNING

The manufacturer must be notified of the following when ordering parts:

- 1) Gearbox type
- 2) Machine serial number indicated in the order confirmation, or in the gearbox data plate, or engraved on the gearbox body (*Pag. 33*).

These data enable **SASSI S.p.A.** to provide spare parts together with detailed instructions for their use.

**PAY CAREFUL ATTENTION TO THE PERFORMANCE DATA CONTAINED IN THE SASSI S.p.A. GENERAL CATALOGUE FOR CONDITIONS AND LIMITS REGARDING USE.**

**ALL OPERATIONS INDICATED IN THIS HANDBOOK MUST BE CARRIED OUT BY AUTHORIZED PERSONNEL.**

**THE GUARANTEE IS NO LONGER CONSIDERED EFFECTIVE IF ANY PARTS ARE REMOVED FROM THE GEARBOX.**

## GENERAL TECHNICAL INFORMATION

### COMPLETE GEARBOX WITH MOTOR

- **European reference norms:** EN 81-1: 1998 + A3: 2009
- **Vibrations:** EN 60034-14
- **Noise:** EN 60034 - 9

### THREE-PHASE ASYNCHRONOUS MOTOR - 1 or 2 POLARITY

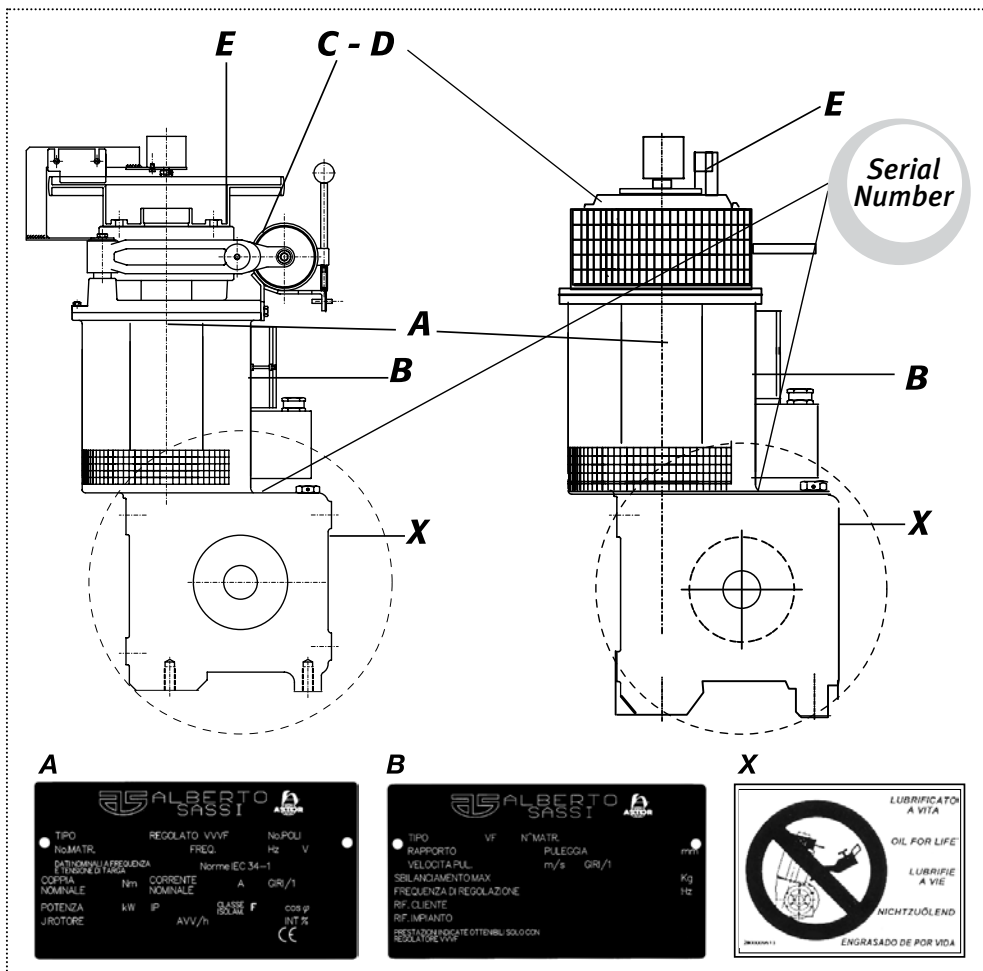
- **Constructive norms:** EN 60034-1 EN 60034-2  
EN 60034-8 - EN 60204-1 EN 60034-5
- **EMC Norms:** EN 12015 - EN 12016 -2005 EN 61000-6-3: 2007  
EN 55011: 1999 EN 55014: 2008

### ELECTROMAGNETIC BRAKE

- **European reference norm:** EN 81-1: 1998 + A3: 2009
- **EMC Norms:** EN 12015 - EN 12016:2005 EN 61000-6-3: 2007  
EN 55011: 1999 EN 55014: 2008

## IDENTIFICATION PLATES FOR GEARBOXES AND MOTORS

EXAMPLES OF DATA PLATES ON THE MACHINE WHICH MAY VARY IN QUANTITY AND POSITION IN ACCORDANCE WITH THE CONFIGURATION



- A.** PLATE FOR ELECTRICAL MOTOR
- B.** PLATE INDICATING THE MANUFACTURER'S DATA RELATIVE TO THE GEAR TYPE
- C.** PLATE OF THE BRAKE MANUFACTURER
- D.** PLATE FOR THE BRAKE DATA
- E.** ADHESIVE PLATE "UP/DOWN"
- X.** ADHESIVE PLATE "OIL FOR LIFE"

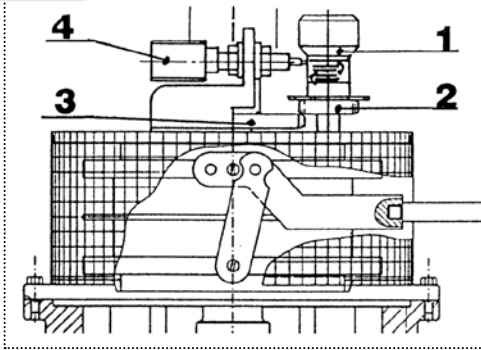
### IMPORTANT:

*In case of motor replacement, the cover of the terminal box with the gear plate must be reused.*

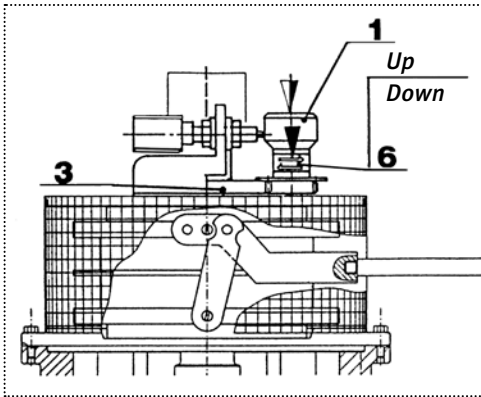
## MANUAL OPERATIONS ON THE BRAKE IN CASE OF EMERGENCY

TO CARRY OUT MANUAL OPERATIONS ON THE GEAR IN CASE OF EMERGENCY PROCEED AS FOLLOWS: **DISCS BRAKE TYPE**

### Mody



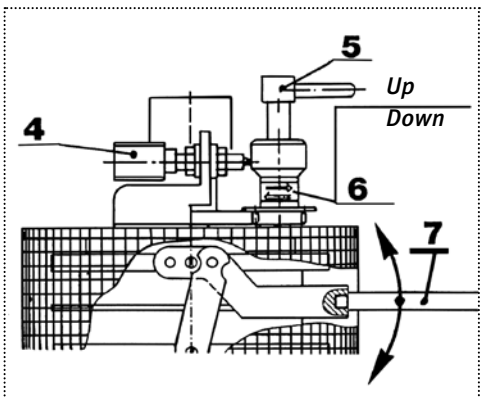
- A) Switch off the main switch in machine room.
- B) Press downwards the button **1** (*the button has two positions*) so that gear **2** meshes with gear **3**.
- C) Check that the knob of the button **1** while getting down has moved a side the feeler pin of the emergency microswitch **4**.
- D) Insert the key **5**, if possible a ratchet wrench with square 1/2" head, in the hole of push button **1** and turn in the direction indicated by the arrow positioned in the plate **6** fixed in the cylindrical part of push button **1**, in this way You act alternatively on the lever **7** for the manual opening of the brake.



### ALTERNATIVE OPERATION:

**Brake open:** wrench **5** rotation under load.  
**Brake closed:** wrench **5** back in position.

- E) Once terminated the operation, remove the square wrench **5** and lift the push button **1** in order to get free the micro **4** thus starting the installation again.



*The double front discs brake is adjusted and set directly in our Works.*

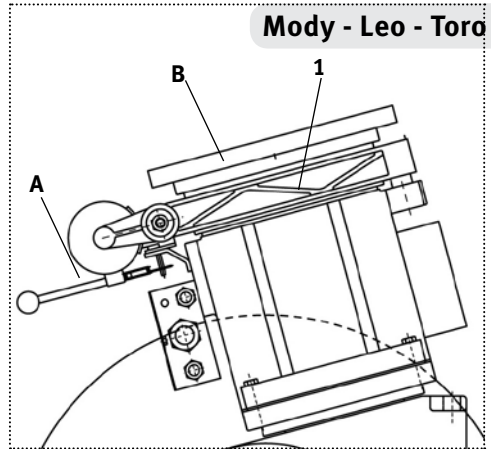
*Do not carry out any intervention on the brake!  
In case of necessity contact directly the supplier of the brake.*

## INSTRUCTIONS ON MANUAL OPERATION IN CASE OF EMERGENCY- DRUM BRAKE TYPE

CARRY OUT THE FOLLOWING OPERATIONS IN THE ORDER  
INDICATED: **DRUM BRAKE TYPE**

- 1) Switch off the main switch in machine room.
- 2) Firmly hold the flywheel **B** for the manual operation.
- 3) Open the brake shoes **1** by acting on lever **A** and constantly exerting a sufficient force to open them.  
Move the flywheel **B** in the most suitable direction in order to take the cabin to the nearest floor and level with the reference mark on the steel ropes (where existing).
- 4) Release the brake lever **A**.

**WARNING: NEVER REDUCE BRAKE SPRING TENSION TO FACILITATE THE MANUAL OPERATION**



*In case of safety brake on the slow shaft, before carrying out any of the operations listed above, release the brake manually according to the specific instructions of the safety brake.*

## SAFETY AND MAINTENANCE INTERVENTIONS

### FITTING THE ROPE CLAMP

*Should the counterweight be laid down to carry out interventions on the installation or to manually lift the cabin by means of the sheave, a ROPE-CLAMP must be fitted.*

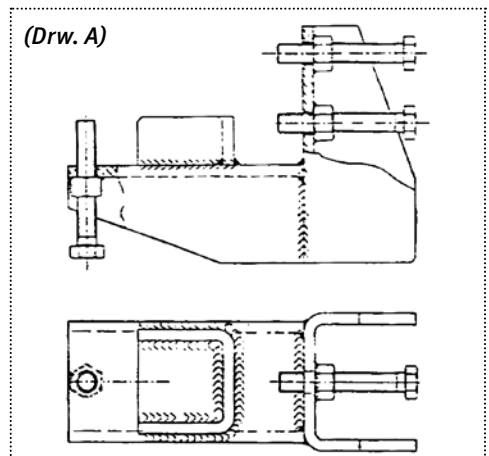
### Mody - Leo - Toro

This tool (*Drw. A*) is made up of a bent and welded L bracket with thrust screws and a plate. It is applied to the sheave as showed in *drw. B pag.36*.

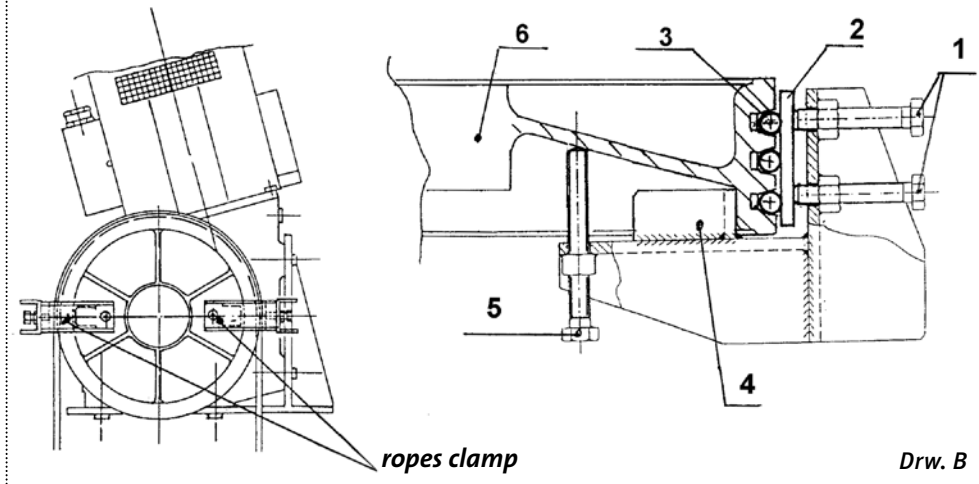
The screws **1** exert pressure on plate **2** which bucks the ropes **3**, while the projection **4**, fixed to the bracket, bucks the pressure of screws **1** under the sheave edge.

By means of screws **5** the position of the bracket can be adjusted, but it has to be kept in orthogonal position with regard to the sheave **6**. (see *drw. B pag.36*).

Act on the screws **1** and **5** simultaneously and alternately.



**IN THIS POSITION THE ROPES ARE CLAMPED.**



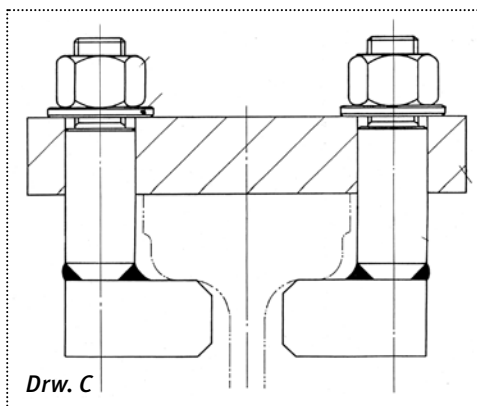
Fit one rope clamp to rest the installation.  
Fit two ropes clamps to lift the cabin by hand  
(refer to drw. B).

Move them alternately according to the  
sheave rotation

**Toro**

The same procedures seen at previous point are valid also for the rope clamp of **drw. C**.

This rope clamp can be used for sheave with flange and allows the clamping of the ropes by bucking the flanks of the same ropes.

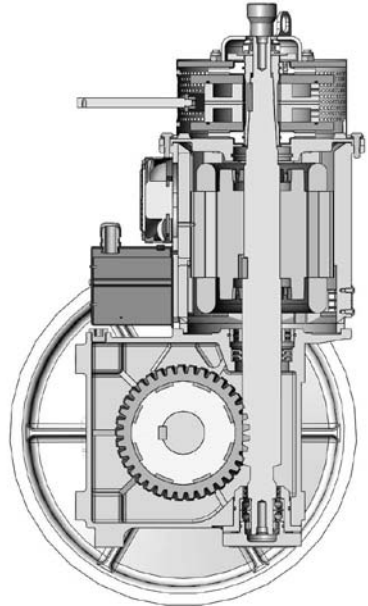
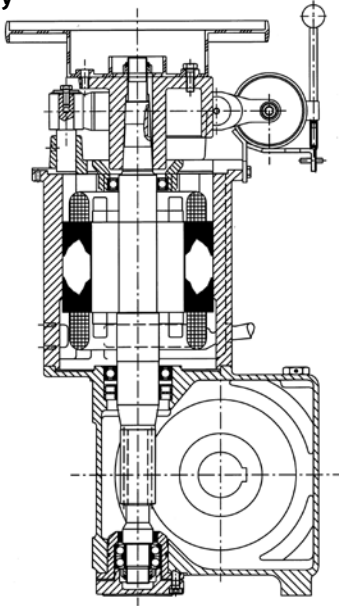


| TIPO MACCHINA | Ropes clamp code (fig. A) |            | Ropes clamp code (fig. C) |            |
|---------------|---------------------------|------------|---------------------------|------------|
| Mody          | 3000004420                |            | ----                      |            |
| Leo           | 3000004420                |            | ----                      |            |
| Toro          | 3000004420                | 3000004430 | 3000004000                | 3000004020 |
| Sheave width  | 90 mm*                    | 115 mm     | 80 mm                     | 115mm      |

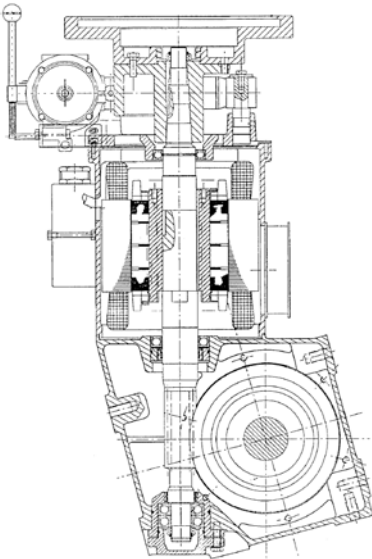
\* Mody = 80 mm

# WORM SECTION

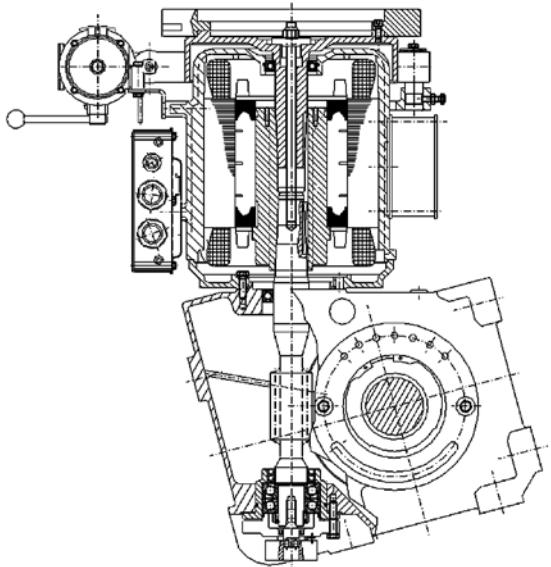
**Mody**



**Leo**



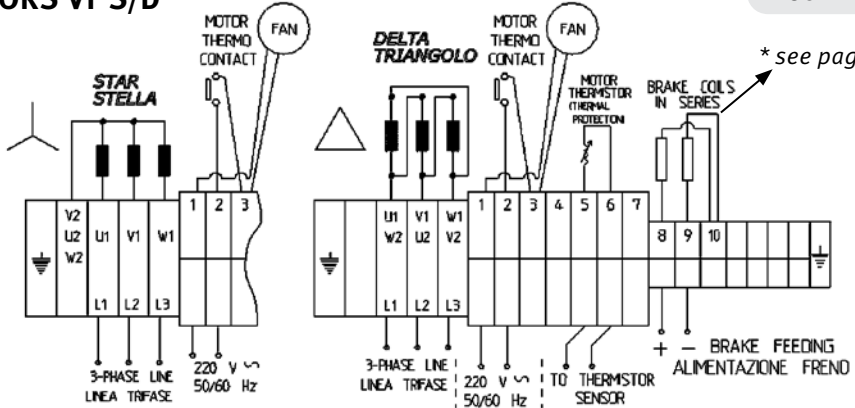
**Toro**



# DIAGRAMS FOR ELECTRIC CONNECTIONS

## MOTORS VF S/D

Leo - Toro



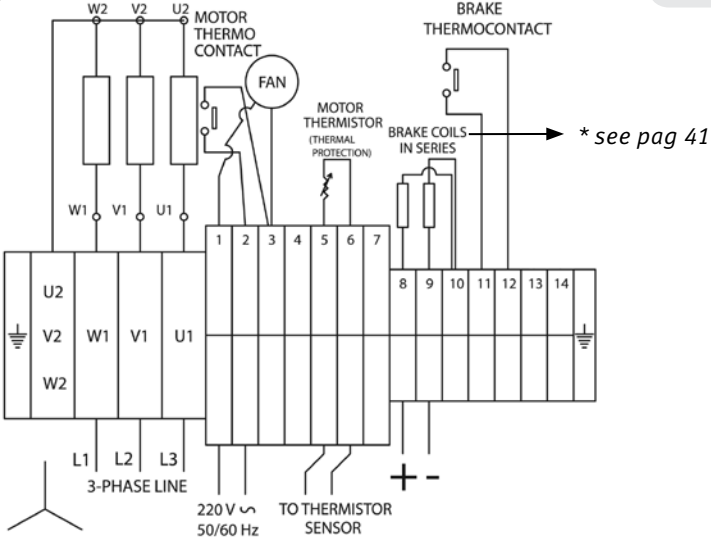
NOTES  
NOTE

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|  |  |     |                           |                                       |
|--|--|-----|---------------------------|---------------------------------------|
| THERMOCONTACT<br>TERMOCONTATTO   |  | (2) | 220 V c.a. - 1 A          |                                       |
| THERMISTOR<br>DO NOT APPLY<br>VOLTAGE > 5V<br>TO THERMISTOR<br>TERMINALS | TERMISTORE<br>NON APPLICARE<br>TENSIONI > 5V<br>AI TERMINALI<br>DEL TERMISTORE | (5) | TEMPERATURE<br>T < 145° C | RESISTENCE<br>VALORE<br>200 ± 800 Ohm |
|  |  | (6) | T > 145° C                | RESISTENZA<br>VALORE<br>≥ 4 KOhm      |

## MOTORS 240 VF

Leo - Toro



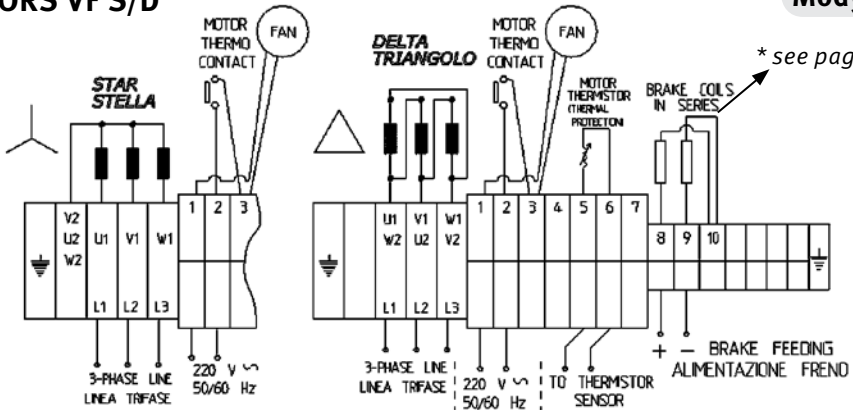
NOTES NOTE

|  |  |                           |                           |                                 |                                |
|--|--|---------------------------|---------------------------|---------------------------------|--------------------------------|
| THERMOCONTACT<br>TERMOCONTATTO   |  | 220V c.a. - 1 A           |                           |                                 |                                |
| THERMISTOR<br>DO NOT APPLY<br>VOLTAGE > 5V<br>TO THERMISTOR<br>TERMINALS | TERMISTORE<br>NON APPLICARE<br>TENSIONI > 5V<br>AI TERMINALI<br>DEL TERMISTORE | TEMPERATURE<br>T < 145° C | TEMPERATURA<br>T > 145° C | RESISTENCE<br>VALORE<br>300 Ohm | VALORI<br>RESISTENZE<br>4 KOhm |

# DIAGRAMS FOR ELECTRIC CONNECTIONS

## MOTORS VF S/D

Mody

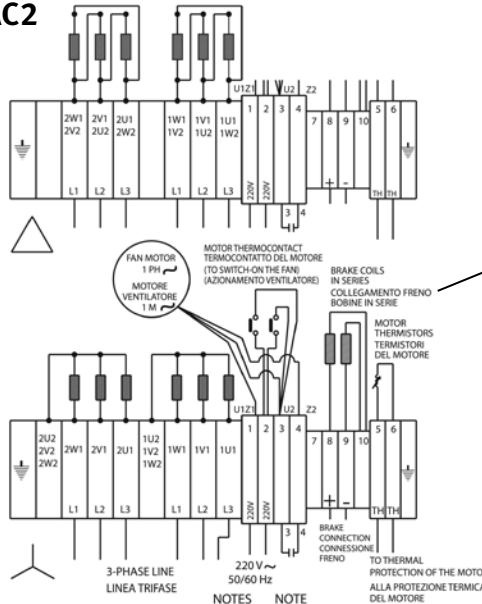


NOTES  
NOTE  
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|  |     |   |
|--|-----|---|
| TERMOCONTACT<br>TERMOCONTATTO  | (2) | 220 V c.a. - 1 A                                    |
| THERMISTOR<br>DO NOT APPLY<br>VOLTAGE > 5V<br>TO THERMISTOR<br>TERMINALS<br>TERMISTORE<br>NON APPLICARE<br>TENSIONE > 5V<br>AI TERMINALI<br>DEL TERMISTORE | (5) | TEMPERATURE TEMPERATURA                             |
|  | (6) | RESISTENCE VALUE VALORE RESISTENZA                  |
|  |     | T < 145°C<br>200 ± 800 Ohm<br>T > 145°C<br>≥ 4 KOhm |

## MOTORS 270 AC2

Toro



NOTES NOTE

|  |           |   |
|--|-----------|---|
| TERMOCONTACT<br>TERMOCONTATTO  | (2)       | 220 V c.a. - 1 A                                    |
| THERMISTOR<br>DO NOT APPLY<br>VOLTAGE > 5V<br>TO THERMISTOR<br>TERMINALS<br>TERMISTORE<br>NON APPLICARE<br>TENSIONE > 5V<br>AI TERMINALI<br>DEL TERMISTORE | (5)       | TEMPERATURE TEMPERATURA                             |
|  | (6)       | RESISTENCE VALUE VALORE RESISTENZA                  |
|  |           | T < 145°C<br>200 ± 800 Ohm<br>T > 145°C<br>≥ 4 KOhm |
| HIGH SPEED W. ALTA VELOCITA  | 2U1 - 2U2 | 2V1 - 2V2   |
| LOW SPEED W. BASSA VELOCITA  | 1U1 - 1U2 | 1V1 - 1V2   |

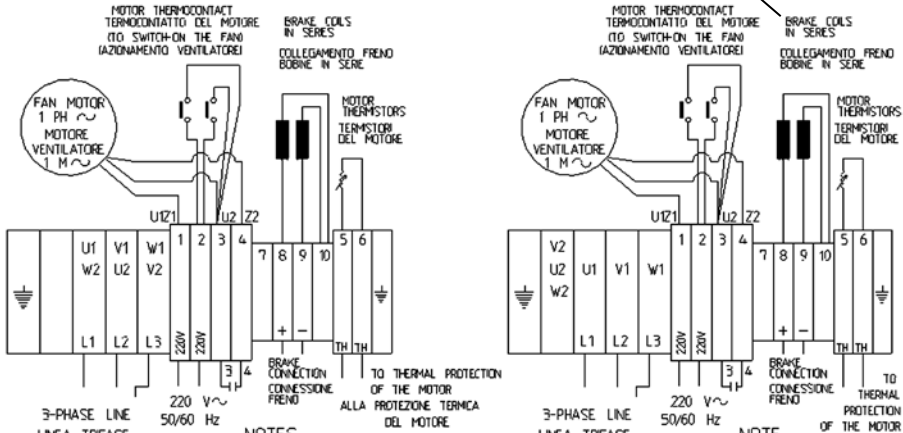


# DIAGRAMS FOR ELECTRIC CONNECTIONS

## MOTORS 240 AC

\* see pag 41

Toro



NOTES

NOTE

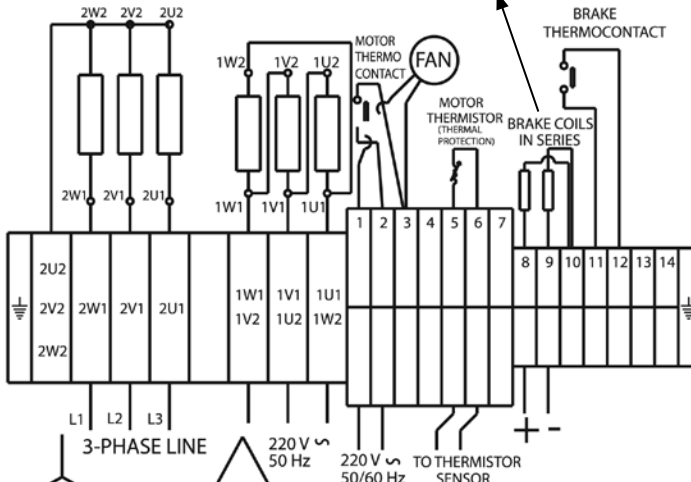
|   |     |             |             |              |
|---|-----|-------------|-------------|--------------|
| THERMOCONTACT<br>TERMOCCONTATTO   | (2) | 220 V c.a.  | -           | 1 A          |
| THERMISTOR<br>DO NOT APPLY<br>VOLTAGE > 5V<br>TO THERMISTOR<br>TERMINALS        | (5) | TEMPERATURE | TEMPERATURA | RESISTENCE   |
| THERMISTORE<br>NON APPLICARE<br>TENSIONI > 5V<br>AI TERMINALI<br>DEL TERMISTORE | (6) | T < 145 °C  |             | 200 ± 80 Ohm |
|   |     | T > 145 °C  |             | 4 ± 0,03 Ohm |



## MOTORS 240 VF 4 4E

\* see pag 41

Toro



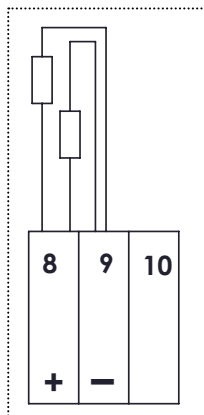
NOTES NOTE

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|   |             |             |            |
|---|-------------|-------------|------------|
| THERMOCONTACT<br>TERMOCCONTATTO   | 220V c.a.   | -           | 1 A        |
| THERMISTOR<br>DO NOT APPLY<br>VOLTAGE > 5V<br>TO THERMISTOR<br>TERMINALS        | TEMPERATURE | TEMPERATURA | RESISTENCE |
| THERMISTORE<br>NON APPLICARE<br>TENSIONI > 5V<br>AI TERMINALI<br>DEL TERMISTORE | T < 145 °C  |             | 300 Ohm    |
|   | T > 145 °C  |             | 4 KOhm     |

ACVF 4/4E

## DIAGRAMS FOR ELECTRIC CONNECTIONS



\* Reference plan for those brakes ordered and connected in parallel in factory.

plan for brake connection in parallel.

### Motors AC2

The connections in AC2 motors depend to the feeding voltage: Star 380-400V, Delta 220-230V.

To change from Star to Delta connection, disconnect the red wires U<sub>2</sub>, V<sub>2</sub> and W<sub>2</sub> from Star centre, and connect them according to the plan (U<sub>2</sub> with V<sub>1</sub>, V<sub>2</sub> with W<sub>1</sub> and W<sub>2</sub> with U<sub>1</sub>).

On the contrary, to change from Delta to Star connection, disconnect the red wires U<sub>2</sub>, V<sub>2</sub> and W<sub>2</sub> from the terminals of the previous point and connect them in the terminal of Star centre.

**IMPORTANT:** Check real net voltage before changing connection type in 2 speed motors.

### Motors VF

The connection type Star or Delta depends on the feeding voltage. With feeding voltage 380-400V the connection is Star type, while with voltage 220-230V is Delta type.

To change from Star to Delta connection, disconnect the red wires U<sub>2</sub>, V<sub>2</sub> and W<sub>2</sub> from Star centre and connect them according to the plan (U<sub>2</sub> with V<sub>1</sub>, V<sub>2</sub> with W<sub>1</sub> and W<sub>2</sub> with U<sub>1</sub>).

On the contrary, to change from Delta to Star connection, disconnect the red wires U<sub>2</sub>, V<sub>2</sub> and W<sub>2</sub> from the terminals of the previous

point and connect them in the terminal of Star centre.

**IMPORTANT:** in both 2 speed and VF motors always connect 220 AC voltage to terminals 1 and 2 of the fan.

### Motors VF 4 / 4E

The principal winding of this type of motor has a Star connection (with feeding at 380-400V), while the secondary emergency one has a Delta connection (with feeding 220-230V).

### Motors VF STAR DELTA

The connection type Star or Delta depends on the condition of use of the gear, which can be found in Sassi catalogue and is not linked to the feeding voltage.

To change from Star to Delta connection, disconnect the red wires U<sub>2</sub>, V<sub>2</sub> and W<sub>2</sub> from

Star centre and connect them according to the plan (U<sub>2</sub> with V<sub>1</sub>, V<sub>2</sub> with W<sub>1</sub> and W<sub>2</sub> with U<sub>1</sub>).

On the contrary, to change from Delta to Star connection, disconnect the red wires U<sub>2</sub>, V<sub>2</sub> and W<sub>2</sub> from the terminals of the previous point and connect them in the terminal of Star centre.

## OPENING THE PLYWOOD BOXES

The nails must be removed to open the plywood boxes.

In order to prevent the wood from splintering use the tool shown in figures **A** and **B**.

This special tool is a right-angle tube. Its short end has a **V** shaped groove with a sharpened edge. Place the centre of the shar-

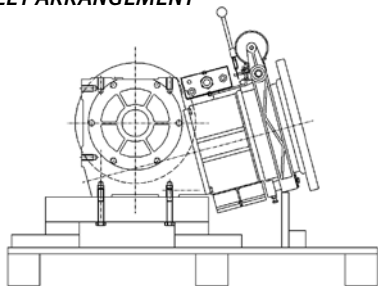
pened side on the nail and strike the tube with a hammer until the lip is inserted in the wood, then turn the tube using the tube elbow as leverage so that the nail is lifted upwards. Continue lifting so that the nail head fits into the **V** groove and is then removed.



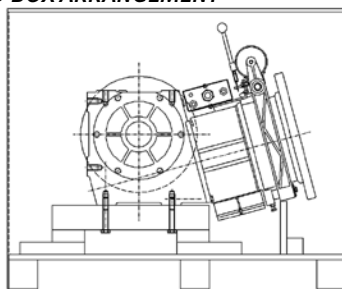
## PACKING AND HANDLING

THE GEAR CAN BE HANDLED FOR SHIPPING  
IN PALLET / CARDBOARD BOX / BOX

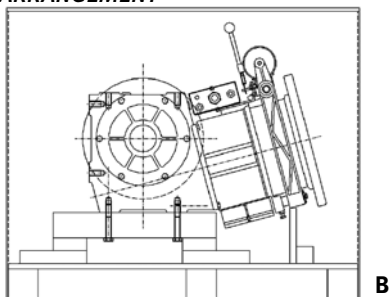
### PALLET ARRANGEMENT



### CARD BOX ARRANGEMENT



### BOX ARRANGEMENT



#### NOTE A:

No overstorage during transport.

#### NOTE B:

One box (*only one!*) can be stacked onto another one only if the boxes have identical dimensions.

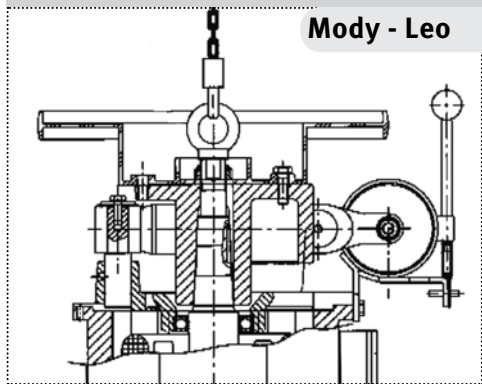
## UNPACKING AND HANDLING

During removal from packing take care to the moving parts (*fly-wheel, brake drum*), which, if damaged, could interfere with the machine balancing carried out in our works.

For the positioning on the frame see page 44/45 and following.

### DISCS BRAKE TYPE

#### Mody - Leo

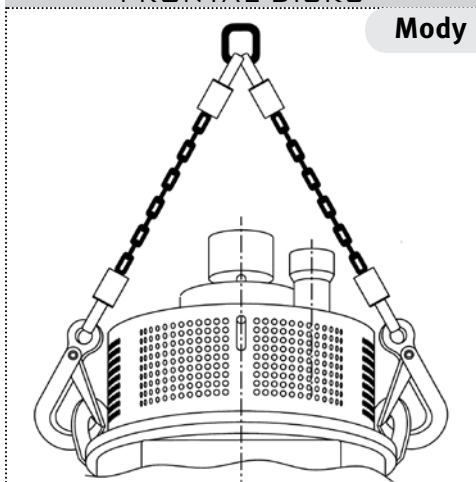


The gear is delivered with the lifting eye-bolt already mounted to the M14 hole of the worm shaft. (*see picture*). Once removed from the packaging, fix a chain to the eye-bolt for handling and transport.

For **Leo**: Once positioned the gear, remove the eye-bolt and fit the plastic cover supplied together with machine, by pressing it.

### VERSION WITH BRAKE TO FRONTAL DISKS

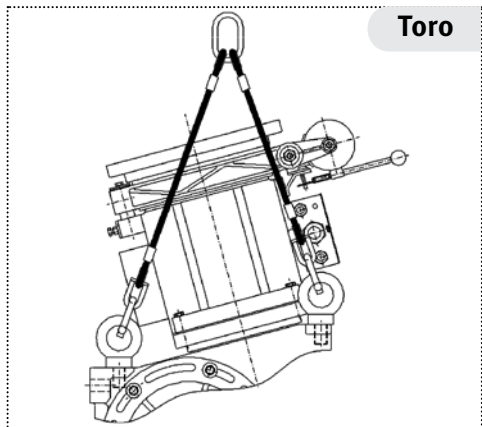
#### Mody



The gear is delivered with the couplings for machine handling already mounted.

Once removed from the packaging fix a chain to the lifting hooks to carry out the handling operation.

#### Toro



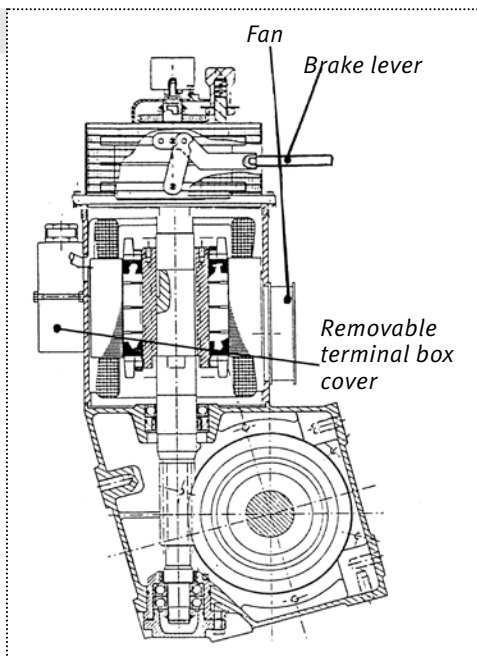
The gear is equipped with threaded holes M24x3 for eye-bolts (*not supplied*) to help the handling operations. (*see picture*).

## MACHINE START

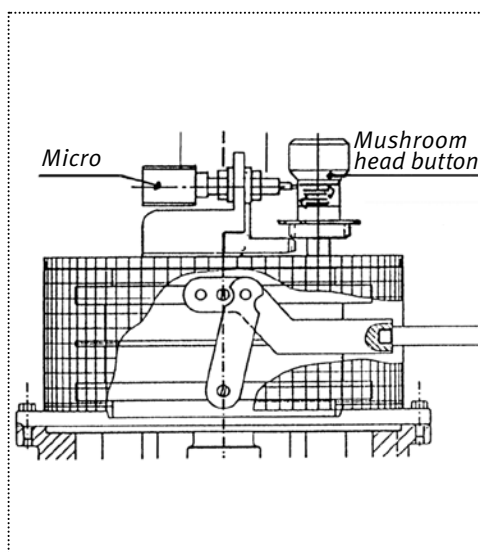
BEFORE MACHINE START, CARRY OUT THE FOLLOWING OPERATIONS: **DISCS BRAKE TYPE**

### Mody

- 1) Remove the brake lever from the packaging and fit it by tightening home.
- 2) Open the cover of the terminal box and take the wire clamp and the electric diagram.
- 3) Take the microswitch and the relative hexagon nuts and washers, which can be found in the bag contained in the terminal box.
- 4) Fit the microswitch in the slot positioned in the aluminium cover and fix it through the relative nuts and washers, by doing this bring into contact the feeler pin of the micro with the cylindrical part of the mushroom-head push button.



**IMPORTANT NOTE:** *the gear already contains the right amount of oil. (see page 56/57)*



### NOTE ON THE FUNCTIONING OF THE MICROSWITCH:

Once fitted, the microswitch must be connected to the control panel of the installation, so that its contact, normally closed, is placed in series to the power fail circuits of the installation.

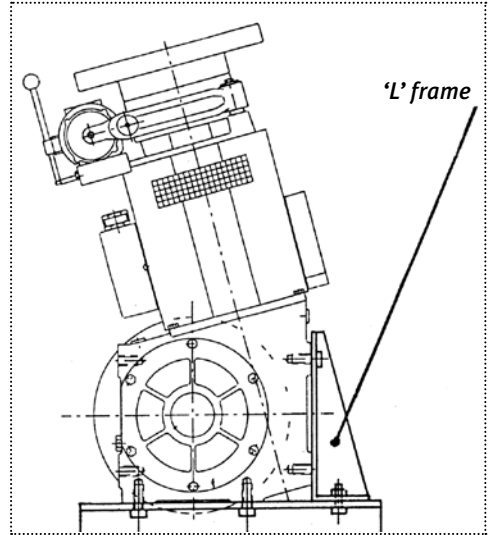
To carry out the manual operation the mushroom-head push button must be pressed.

In this way the contact of the microswitch gets opened and the installation stops as long as the mushroom-headed push button remains pressed.

## FIXING TO THE FRAME

### Leo

Take care to position the gear either in vertical or in horizontal position on a “L” frame as indicated in the figure (*the frame is supplied with the machine*).



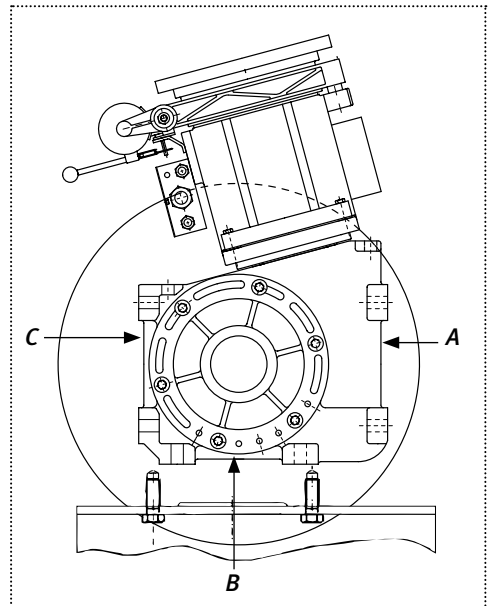
### Mody - Toro

Take care to position the gear either in vertical or in horizontal position on a frame.

This frame must be fixed in a way able to support the installation loads and has through holes for the fixing of the gear. For this purpose the drawings at *page 46/47* shows the overall and fixing dimensions required.

The gear presents only **ONE POSITION FORTHE SHEAVE** and the useful lower horizontal and vertical bearing/supporting surfaces are **A, B** and **C**.

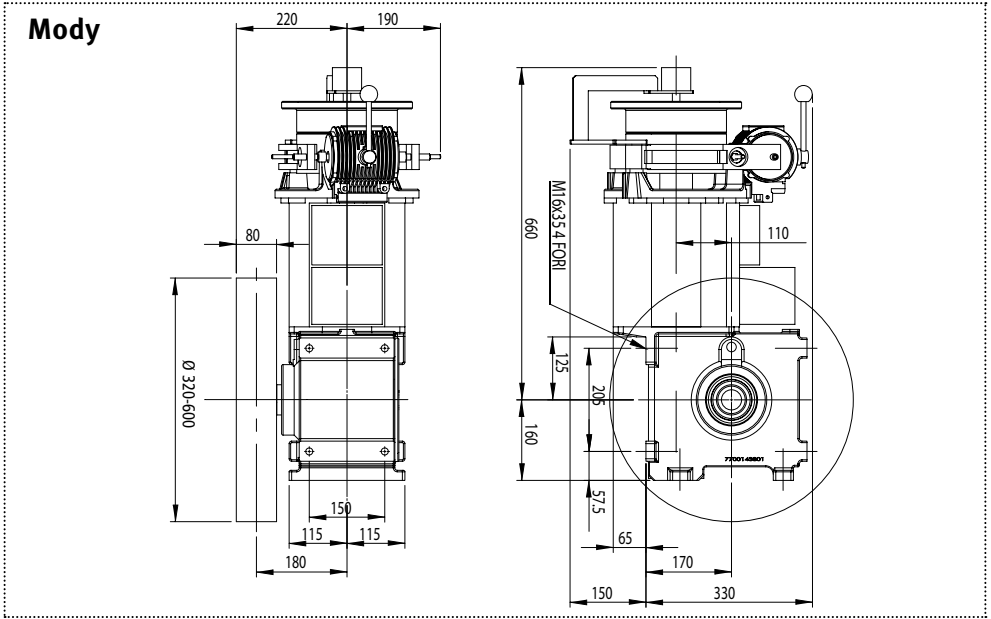
**NOTE: the gear must be fixed by means of screws with a class of resistance of at least 8.8 and using a tightening torque of 170 Nm (Mody-Leo) or 500Nm (Toro).**



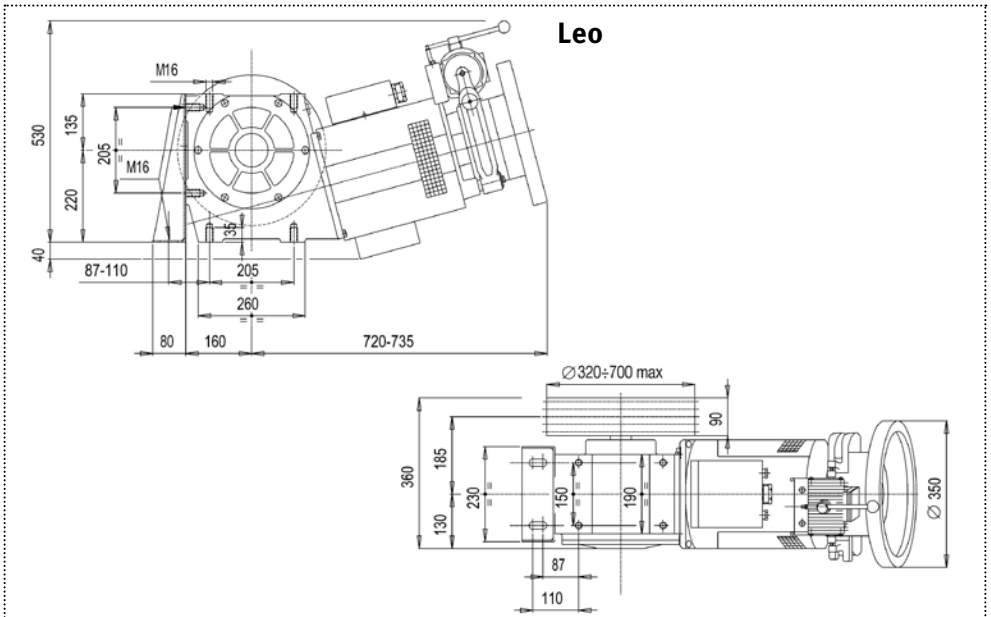
| TIGHTENING TORQUE<br>FIXING SCREWS TO THE FRAME |        |
|---|--------|
| Mody - Leo                                      | 170 Nm |
| Toro  | 500 Nm |

# FIXING TO THE FRAME

## GEAR WITH FIXING AND OVERALL DIMENSIONS

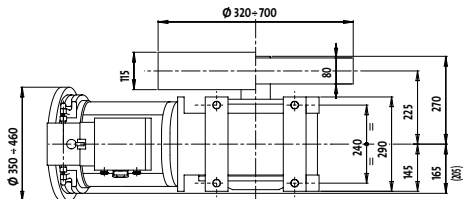
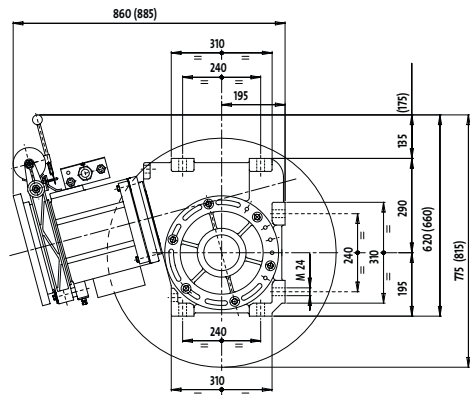
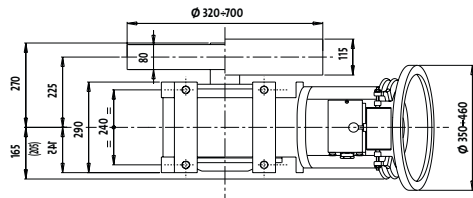
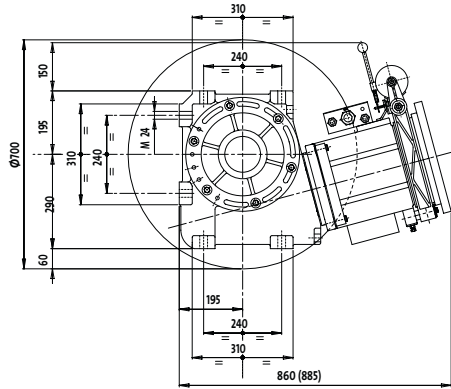
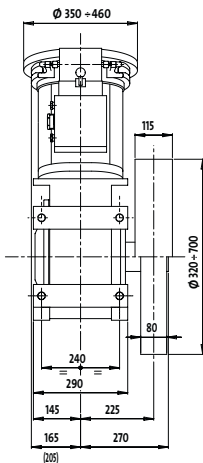
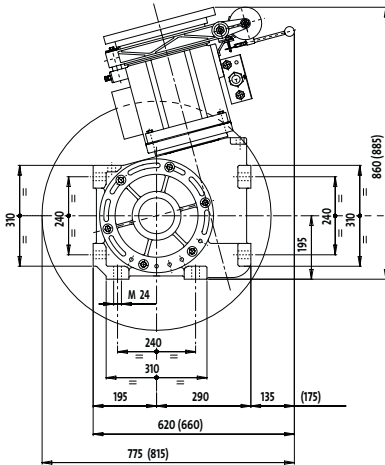


## GEAR WITH FIXING AND OVERALL DIMENSIONS



## FIXING TO THE FRAME

## GEAR WITH FIXING AND OVERALL DIMENSIONS

**Toro***(dimensions in brackets = Motor 270)*

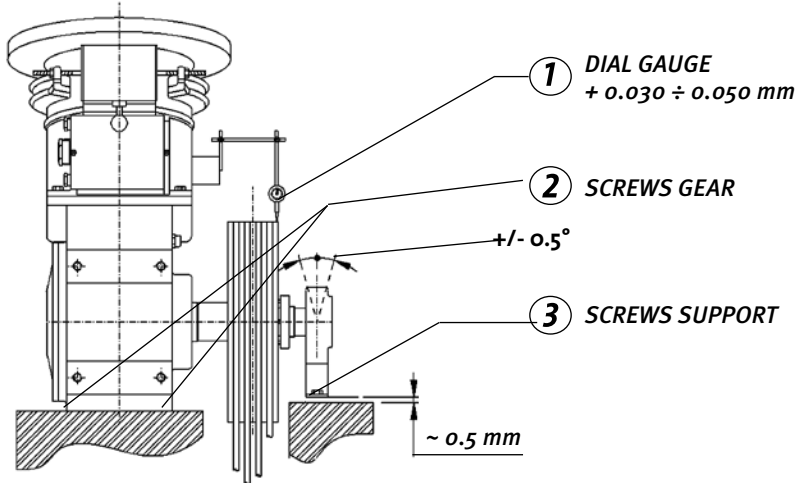


## POSITIONING ON THE FRAME

### Mody - Leo - Toro

THESE OPERATIONS ARE STANDARD PRACTICE WITH ALL MACHINES MOUNTED ON A FRAME AND SERVE TO KEEP THE SLOW SHAFT PERFECTLY HORIZONTAL ONCE THE PLANT IS IN TRACTION. THEY PREPARE THE FRAME FOR THE INEVITABLE STRUCTURAL DEFORMATIONS WHICH COULD OCCUR.

#### CASE A: SLOW SHAFT WITH EXTERNAL SUPPORT, ROPES DIRECTION DOWNWARDS



Set the gearbox on the frame and check that a space exceeding **0.5 mm** remains between the frame and the support.

If not, the gearbox should be raised using calibrated shims until the required height is reached.

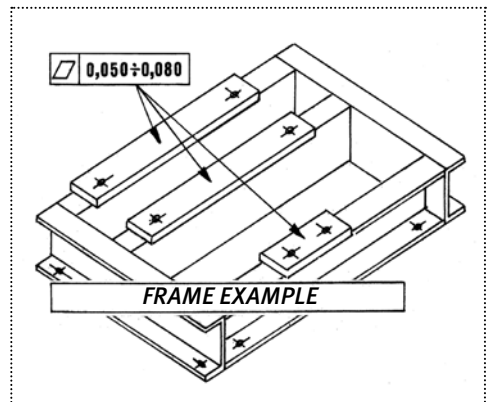
Fit and completely tighten the bolts to fix the gearbox to the frame. Mount the magnetic base with dial gauge as shown in the drawing.

After re-setting the dial gauge, insert the calibrated shims between the support and the support surface so that the dial gauge indicates a change in height of approx. **0.03 ÷ 0.05 mm**.

Now fit the fixing bolts for the external support and completely tighten. For tightening torque see following chart.

The dial gauge, after fixing, must show a change in height of approx. **0 ÷ 0.05 mm**.

If not, add or remove shims under the external support until achieving the value indicated above.



| DIAMETER | TORQUE |
|----------|--------|
| M16      | 170 Nm |
| M18      | 283 Nm |
| M20      | 400 Nm |
| M24      | 500 Nm |

## CASE B: SLOW SHAFT WITH EXTERNAL SUPPORT, ROPES DIRECTION UPWARDS

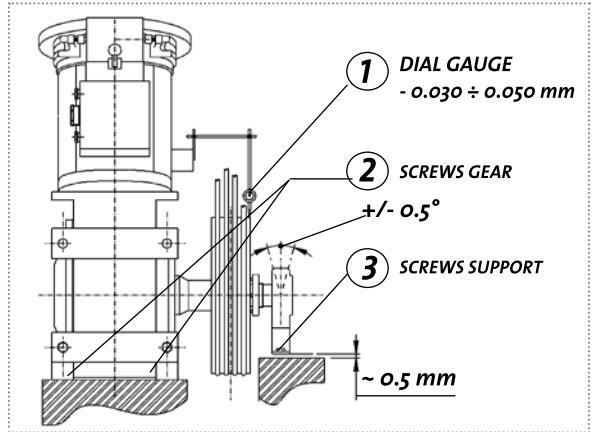
Set the gearbox on the frame in alignment with the appropriate fixing holes and check that a space exceeding  $0.5 \text{ mm}$  remains.

If not, the gearbox should be raised using calibrated shims until the required height is reached. Insert and completely tighten the bolts fixing the gearbox to the frame.

Mount the magnetic base with dial gauge as shown in the drawing.

After re-setting the dial gauge, insert calibrated shims between the support and the support surface (a smaller amount than that indicated in case A) so that a space is left of approx.  $0.1 \text{ mm}$ .

Fit and completely tighten the fixing bolts to the external support.  
For tightening torque see chart on page 48.



The dial gauge, after fixing, must show a lowering of approx.  $0.03 \div 0.05 \text{ mm}$ . If not, add or remove shims under the external support until achieving the value indicated above.

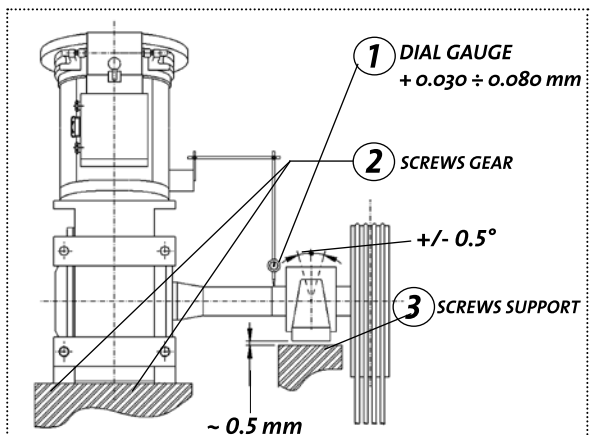
## CASE C: SLOW SHAFT WITH INTERMEDIATE SUPPORT, ROPES DIRECTION DOWNWARDS

Set the gearbox on the frame in alignment with the appropriate fixing holes, position the shims, if needed, under the support, and check that a space exceeding  $0.5 \text{ mm}$  remains between the shim and support.

If not, the gearbox should be raised using calibrated shims until the required height is reached. Fit and completely tighten the bolts fixing the gearbox to the frame. Mount the magnetic base with dial gauge as shown in the drawing.

After re-setting the dial gauge, insert the calibrated shims between the support and the support surface so that the dial gauge indicates a change upwards of approx.  $0.03 \div 0.08 \text{ mm}$ .

Now fit the fixing bolts for the external support and completely tighten. For tightening torque see chart on page 48.



The dial gauge, after fixing, must show a change upwards of approx.  $0 \div 0.08 \text{ mm}$ .

If not, add or remove shims under the external support until achieving the value indicated above.

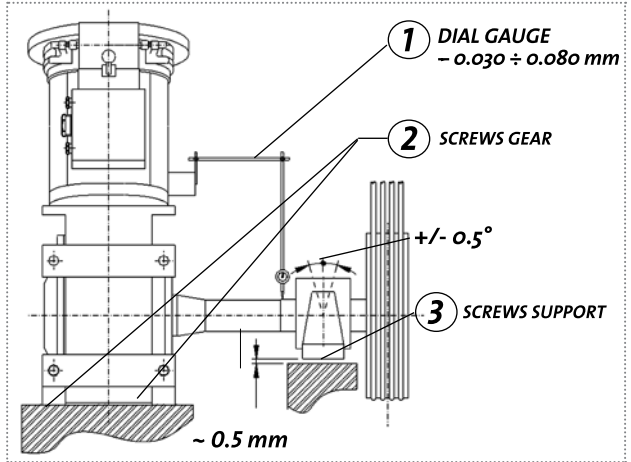
## CASE C: SLOW SHAFT WITH EXTERNAL SUPPORT, ROPES DIRECTION UPWARDS

Set the gearbox on the frame in alignment with the appropriate fixing holes, position the shims, if needed, under the support, and check that a space exceeding  $0.5\text{ mm}$  remains between the shim and support.

If not, the gearbox should be raised using calibrated shims until the required height is reached. Fit and completely tighten the bolts fixing the gearbox to the frame.

Mount the magnetic base with dial gauge as shown in the drawing.

After re-setting the dial gauge, insert the calibrated shims between the support and the support surface so that the dial gauge indicates a change inferior to that indicated in case C so that a space of approx.  $0.1\text{ mm}$  remains.



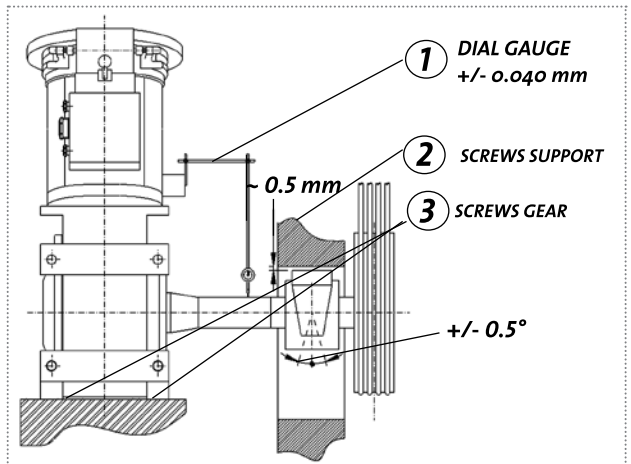
Now fit the fixing bolts for the support and completely tighten. For tightening torque see chart on page 48. The dial gauge, after fixing, must show a lowering of approx.  $0.03 \pm 0.08\text{ mm}$ . If not, add or remove shims until achieving the value indicated above.

## CASE E: SLOW SHAFT WITH INTERMEDIATE SUPPORT, ROPES DIRECTION UPWARDS

Set the gearbox on the frame in alignment with the appropriate fixing holes position the shims, if needed, under the support, and check that a space exceeding  $0.5\text{ mm}$  remains between the shim and support. If not, lower the gearbox support surface until the indicated value is reached.

Fit and completely tighten the bolts fixing the gearbox to the frame. Mount the magnetic base with dial gauge as shown in the drawing.

After re-setting the dial gauge, insert the calibrated shims between the support and the support surface without ever forcing the shims which could otherwise alter the dial gauge value of "0". Now fit the fixing bolts for the support and completely tighten.



For tightening torque see chart on page 48. The dial gauge, after fixing, must indicate a  $\pm 0.04\text{ mm}$  value modification.

If not, add or remove shims until achieving the value indicated above.

# INSTALLATION AND OPERATING INSTRUCTION FOR EMERGENCY BRAKE ON SLOW SHAFT

## GENERAL NOTES

In case of emergency brake on the slow shaft please refer to the specific Owner's handbook of the brake fitted to the machine.

The handbooks (*brake DF by Alberto Sassi, brakes by Mayr and Warner*) are supplied with the machine.



**IMPORTANT !!**  
**PAY ATTENTION TO THE ELECTRICAL CONNECTIONS OF THE BRAKE AND TO THE HAND RELEASE SYSTEM, IF PRESENT**

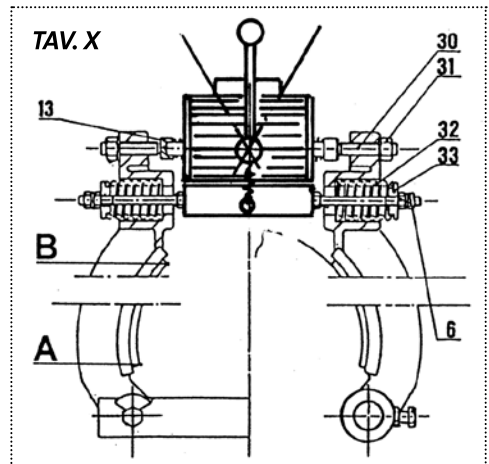
## BRAKING ADJUSTMENT - DRUM BRAKE

### Mody - Leo - Toro

Adjustment should be done with the machine **UNDER LOAD**. When the machine is operating and therefore when the electromagnet is energised, loosen locking nut **31** and slightly loosen adjustment screw **30** until the brake unit rubs against the brake drum (*see chart X*). At this point re-tighten screw **30** the minimum necessary until rubbing ceases between the shoes and the brake drum when the machine is moving. Tighten lock nut **31** and repeat the operation with the second shoe. Intervention is then possible on the spring pre-load to adjust braking intensity.

Unscrew safety locking nut **6** and use the remaining nut to increase or decrease spring tension **32** until desired braking is achieved; then re-lock external locking nut **6**.

Repeat the procedure for the other shoe. Periodically observe the wear of the brake linings on the gearbox which reduces braking efficiency due to the decrease in spring preload. Do not perform any intervention on the brake by only increasing the preload, the complete adjustment procedure must be carried out using the adjustment screw **30**, as seen at the beginning of this chapter, so that the end stops **13** is not increased.



To replace the shoes, see the next chapter on *“Brake adjustment”* to ensure perfect fitting of the new brake linings to the brake drum.

Please note that it is practically impossible to determine how often the brake should be adjusted, in fact, this depends on the type of machine, its use and the timing of the brake shoe opening and closing movements.

**N.B. Brake shoes with linings must be replaced when the thickness is 2 mm at the point of maximum wear.**

## BRAKE ADJUSTMENT

### Mody - Leo - Toro

Adjustment should be done when the machine is supported. First check that when the electromagnet is turned on, the brake unlocks. If this does not occur, proceed as follows: (*refer to chart x*).

When the brake is turned off, loosen locking nuts **31** and loosen set screws **30** so that they are distanced by a few millimeters (*approx. 4*) from end stops **13**, manually checking that the end stops **13** are in the external end position. Loosen nuts **6** leaving washers **33** in contact with springs **32**.

With the shoes in contact with the drum, re-tighten set screws **30** moving end stops **13** towards the brake centre by 1 mm, and then tighten locking nuts **31**.

With the electromagnet energised, check that the friction lining of the shoe does not touch the brake drum; just check that in point **B** of the drawing a space of at least *approx. 0.5/0.8 mm* exists.

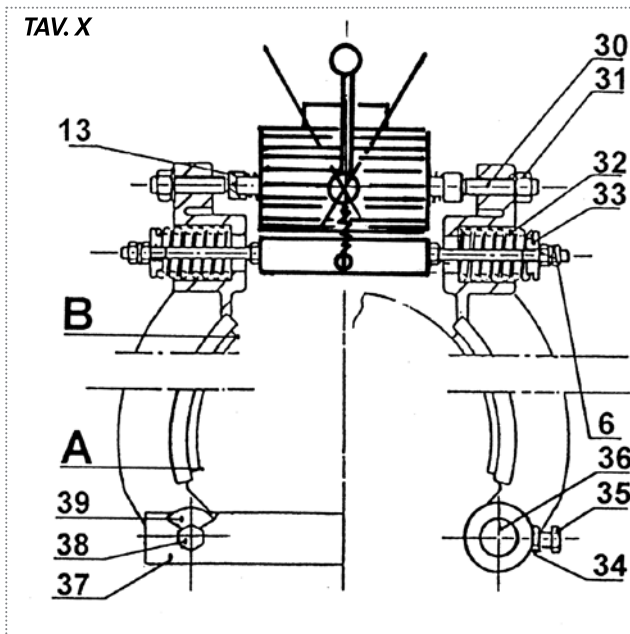
This space should extend along the complete arc of the brake lining even if it slightly decreases up to point **A**.

If this does not occur, only in this case, it becomes necessary to adjust the eccentric pin which regulates the brake shoe-drum coupling. With the electromagnet de-energised, loosen locking nuts **31** and set screws **30** so that they are distanced by several mm (*approx. 4*) from end stops **13**, manually checking that the end stops **13** are in the external end position.

Loosen nuts **6** leaving washers **33** in contact with springs **32**. Back off screws **38**, disconnect the pin connection **37** from the Belleville springs **39**.

Loosen the nuts **30** and screws **35** and adjust the eccentric pins **36** (*using a spanner or screwdriver according to machine version*) until the shoes fully engage with the brake drum.

Tighten screws **35** and nuts **34**, fit the Belleville springs **39**, pin connection **37** and



tighten screws **38**. Next, with shoes in contact with drum, tighten the adjusting screws **30** to move the end stops **13** approximately 1 mm toward the brake centre, and tighten the lock-nuts **31**. This done, adjust spring **32** as described in the chapter "*Braking adjustment*".

## FITTING THE ENCODER TO THE THRUSTBEARING COVER - STANDARD COUPLING (NOT FOR Mody)

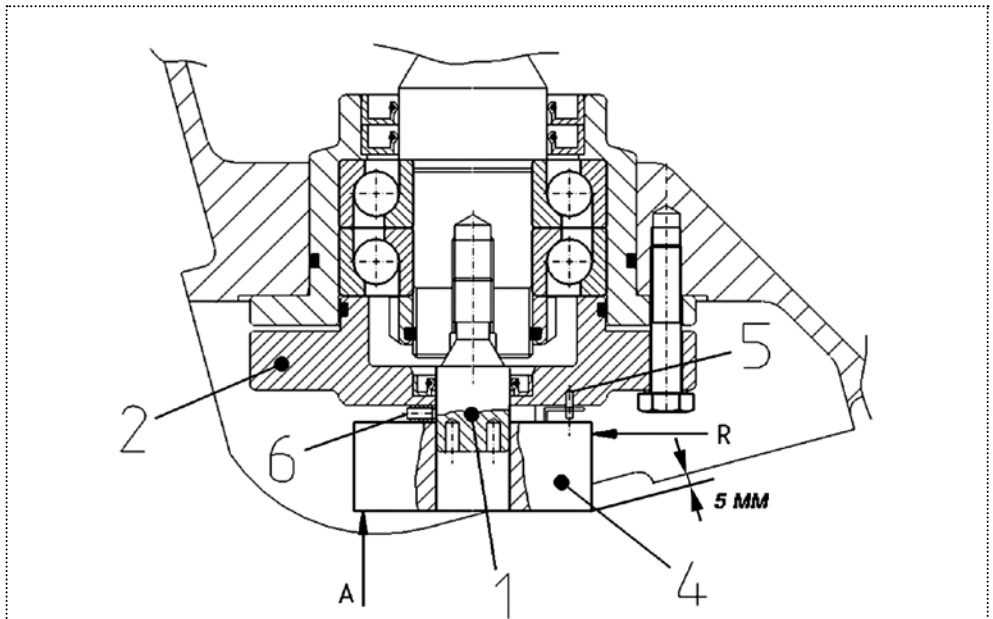
IN CASE THE GEAR IS ALREADY INSTALLED, BEFORE FITTING THE ENCODER, SWITCH OFF THE MAINS SWITCH IN CONTROL PANEL.

### Leo - Toro

- 1) The gear manufactured with the predisposition for the encoder coupling on thrustbearing side are equipped with the special cover **2** (see *drawing*). This predisposed cover protected by a yellow plastic plug (*not indicated in drawing*) which can be removed once the machine is "cold" to avoid any grease leakage from thrustbearing.
- 2) The standard bolt, which is already mounted to the ending part of the worm, has a diameter apt to the fitting of some type of encoder with hollow shaft of  $\varnothing 25$  mm.
- 3) To assemble the encoder **4**, move it coaxially along bolt **1** till a distance of **0.5 mm** from cover **2** and centre the plug **5** in the special antirotation holder. The standard plug has a  $\varnothing$  of **3 mm** and is positioned at a distance of **32.5 mm** from rotation axis.

- 4) Slightly move the three dowels M4 nr. 6 alternately towards the shaft 1 by means of Allen wrench in order to centre the encoder; then tighten them in the same way. Check that during the rotation of the motor axis the encoder does not move incorrectly causing a wrong centring. The maximum allowable values of the standard encoder are lower or equal **to +/- 0.1 mm** in radial direction (**R**) and lower or equal **to +/- 1 mm** in axial direction (**A**), and are measured by means of a dial gauge. Should not this occur, please repeat procedures at points **3** and **4**.
- 5) Once assembled, the encoder is protruding from the supporting surface, if the gear is mounted in vertical position.

**In case you intend to fit this encoder on a gear not predisposed, please contact Alberto Sassi Spa to receive the specific instructions.**

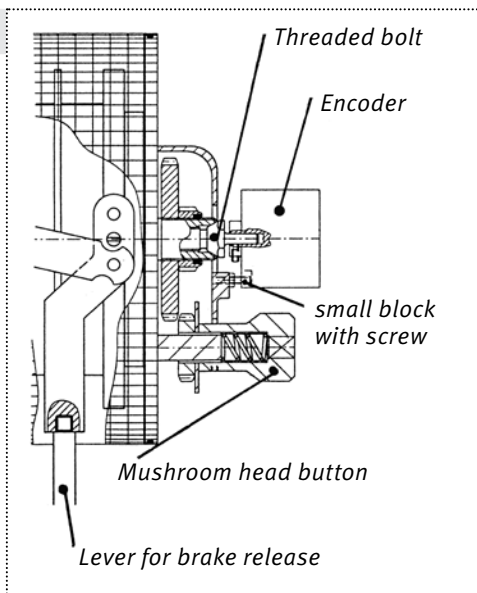


## ENCODER FITTING - MOTOR SIDE

### DISCS BRAKE VERSION Mody - Leo

Once positioned the gear, to fit the encoder proceed as follows:

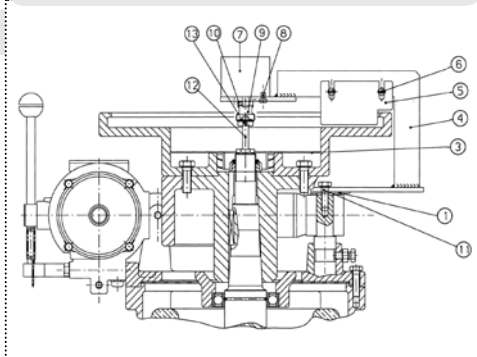
- 1) Fit the threaded bolt tightening it with 100 Nm.
- 2) Remove the small block with the screw together with the locknut from the encoder and tighten the small block fully home in the relative threaded hole of the aluminium cover. Carry out this tightening procedure in accordance with the following operations described in point 4 and 5.
- 3) Insert the encoder in the shaft of the threaded bolt with the notch stop inserted in the small block.
- 4) Tighten the locknut of the small block against the aluminium cover and adjust the related side set screw on the encoder.
- 5) Fix the encoder to the shaft tightening the two side screws.



### DRUM BRAKE VERSIONS Mody - Leo

- 1) In case the gear is not fitted with the right yellow protective plastic cover 3 already equipped with the central bore, remove the existing one and create the central bore ( $\varnothing 35\text{mm}$ ) in it.
- 2) Fit the pin 12 at the ending part of the worm; apply a drop of Loctite 243 on the threaded part, screw with a torque of 100Nm then fit the cover 3 again (LEO);
- 3) Mount the encoder 7 on the bracket 4 by means of the three screws 8;
- 4) Fit the elastic coupling 9 to the axle of the encoder 7, tighten the setscrew 10;
- 5) Fit the coupling 4 to the bracket 1 which connects the shoes pins by means of screws 11 directly to the brake shoes pins. Take care to centre the joint 9 on the pin 12;
- 6) If necessary, slightly uscrew the two screws 11: in this way you can move the bracket 1 and centre the encoder as regards the axle 12 more easily. Screw the screws 11 with a torque of 25 Nm;

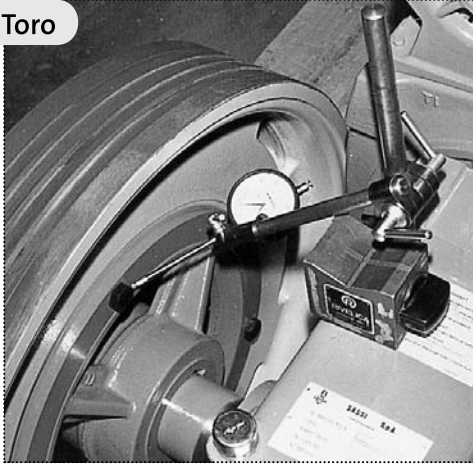
*N.B. for Toro please contact Alberto Sassi S.p.A.*



- 7) Screw the screw 13 checking that it clamps the joint 9 to the pin 12;
- 8) Fit the protection 5 to the bracket 4 by means of the two screws 6;
- 9) Turn the flywheel to check that the coupling is centred; if necessary, repeat the operations at points 6 and 7.

## CHECKING THE WORM/WORMWHEEL BACKLASH

### Toro



It is extremely important to check the worm/wormwheel backlash (see picture). Remove the cables from the sheave, place a dial gauge on one of the surfaces of the

gearbox head so that the probe is positioned against the head of one of the screws joining the flange with the cable sheave (*sheaves type*).

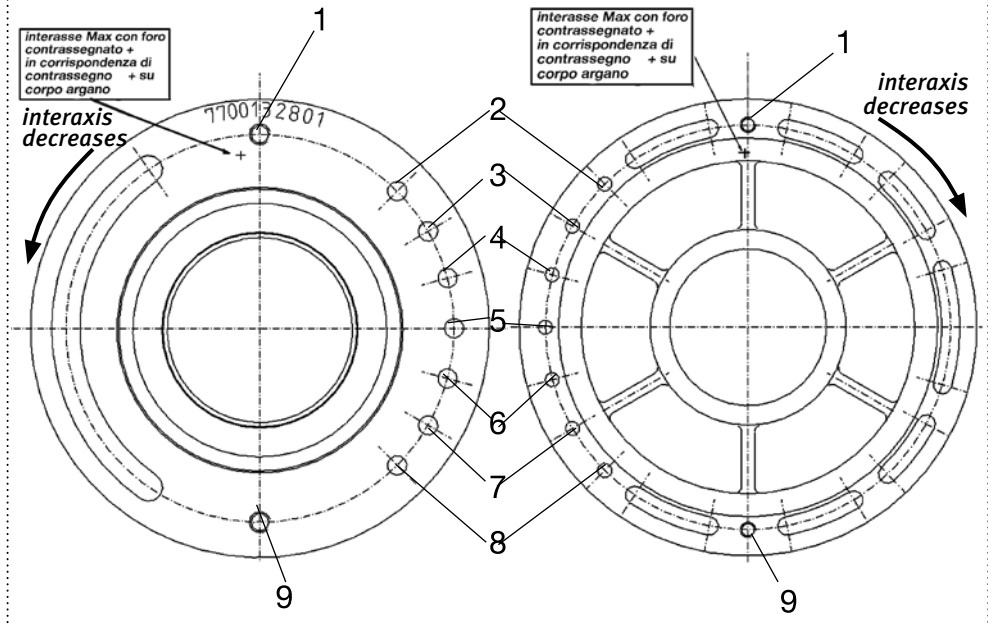
Close the brake and manually turn the sheave to the left and to the right so that the radial backlash can be measured by the dial gauge.

The position of the flange bolts on the flange for sheave correspond more or less to the position of the wormwheel reference radius of the wormwheel that is **136 mm**.

In case of spoked type pulley equip the probe of the dial gauge with an extension to reach one of the internal spokes at a distance o **136 mm** from the slow axis.

FRONTAL VIEW OF FLANGE  
EXTERNAL TO SLOW SHAFT

FRONTAL VIEW OF FLANGE  
OPPOSITE TO SLOW SHAFT





## CHECKING THE WORM/WORMWHEEL BACKLASH

### Toro WORM/WORMWHEEL GEAR BACK LASH VALUES.

Check every 3000 running hours or at least once a year whether the maximum values of the a/m backlash exceed **0.3 mm** in case of gear with sheave diameters of more than **560 mm**, or **0.5 mm** in case of gear with sheave diameters less/equal than **560 mm**: in this case follow the following instructions.

The two flanges showed in the drawing of the previous page are positioned on the slow shaft and allow the adjustment of the worm/wormwheel backlash thanks to their eccentricity.

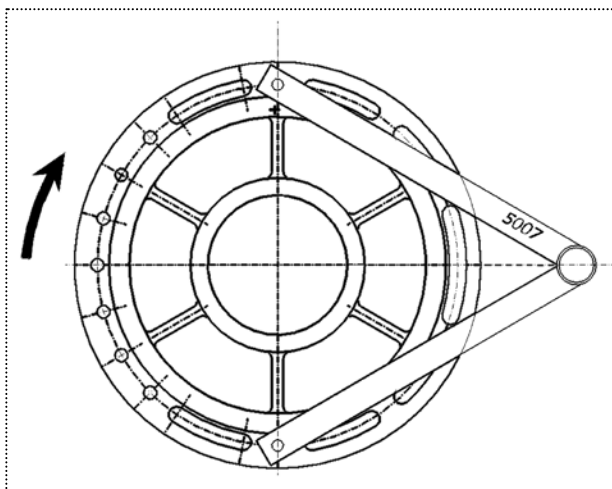
They have a series of holes - indicated with the numbers from 1 to 9 - useful for the inter-axis adjustment.

A rotation of the eccentric flanges corresponding to the distance existing between the two subsequent holes causes a change in the interaxis equal to about 4 hundredth of millimeter.

Very important: **this rotation must be carried out in both flanges in the same direction and of the same holes number to avoid wrong disalignment of the slow shaft.**

The condition of maximum interaxis worm/wormwheel is reached if both flanges are positioned with hole 1 in correspondence of the mark '+' present in the machine body; if the flanges are turned and blocked in the following holes the distance of the axis worm/wormwheel tends to constantly decrease. Carry out these operations without ropes and applied loads to the sheave.

To rotate the flange use tool 5007. At the end tighten the fixing screws M10 of the flange at a torque of 50Nm. Total screws: two in the flange on sheave side and eight in the opposite one.



## LUBRICATION MODY - LEO - TORO

The oil used for lubrication is a special oil with a synthetic polyalphaolefinic base, with special additives showing higher characteristics than normal "EP".

- **Do not top up.**
- **The quantity of oil is sufficient for the ove rall gear life.**

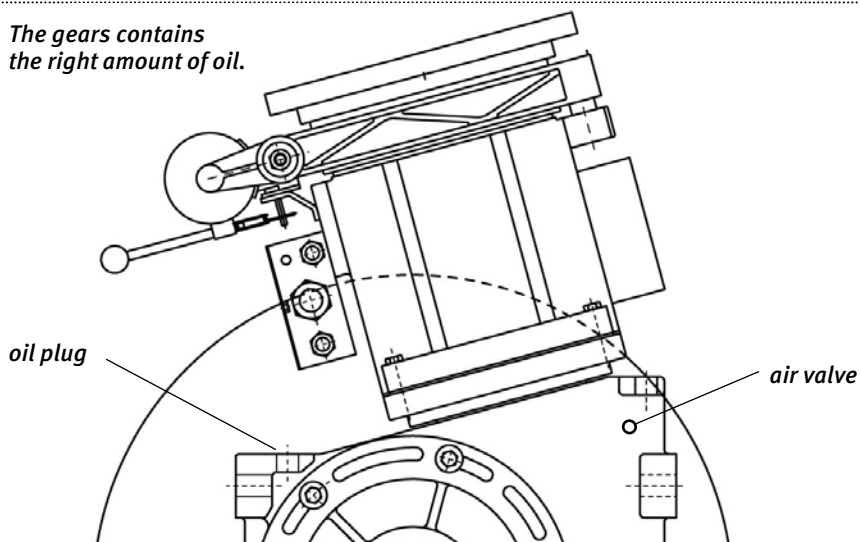
The gear is equipped with one oil plug positioned in such a way to facilitate the possible oil drainage independently from the final installation position.

On its side, on the casing, behind the sheave, there is an air valve, which enables the automatic release of the overpressure generated by the pumping of the working members.

| Type | Weight     |            | Oil qty |
|------|------------|------------|---------|
|      | disc brake | drum brake |         |
| Mody | 170 kg     | 171 kg     | 2.5 ℓ   |
| Leo  |            | 218 kg     | 3.5 ℓ   |
| Toro |            | 327 kg     | 6.5 ℓ   |

## LUBRICATION MODY - LEO - TORO

*The gears contains the right amount of oil.*



## REPLACEMENT OF THE SHEAVE

**Mody - Leo** The sheaves are expressly designed for each type of gear and do not present any sheave flange.

To fix the sheave to the slow shaft use a special ring nut (*see table*) with a unscrewing preventer screw (*dowel A*) M12 and tighten it axially by means of 4 screws M10 (**B**).

Screw the ring nut till the groove of the ring nut matches the hole M12 of the sheave; then position the screw (*dowel A*) M12 using Loctite 243. The ring nut is tightened by 4 high resistance M10 screws.

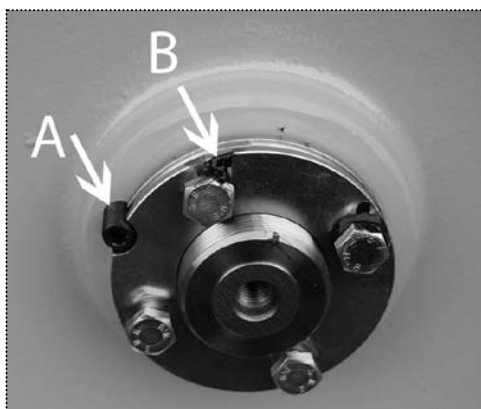
These screws are tightened in sequence with a tightening torque of 40 Nm and are specially developed to prevent the uscrewing of the ring nut.

As additional safety measure, Loctite type 243 is applied on the threads of the 4 screws M10 to strengthen the tightening of the ring nut.

A steel-made spacer between the ring nut and the sheave prevents the frontal screws from deforming the surface of the cast-iron hub, on which the a/m screws exert their pressure.

This fact assures a constant thrust.

At the end of the above described operations, put synthetic sealing wax on dowel M12 (**A**) and on one screw M10 to ensure a correct positioning and to avoid external tampering.



In case of sheave replacement, please contact **Alberto Sassi S.p.A.** to receive the required information.

## REPLACEMENT OF THE SHEAVE

| GEAR | RING NUT  | SCREWS  | TIGHTENING TORQUE |
|------|-----------|---------|-------------------|
| MODY | M40 X 1.5 | 4 X M10 | 40Nm              |
| LEO  | M55 X 2   | 4 X M10 | 40Nm              |

**Toro**

The traction sheaves are specially designed for gear Toro for diameters between 320 and 700 mm.

These are one part traction sheaves without flange; in case of periodical checks A. Sassi advise to replace the sheave when the action of the ropes have worn the undercut by the half of its initial depth value.

The sheaves of other type are coupled to a flange by means of 5 bolts M14, with related self locking nuts and one calibrated bolt M16x55.

For the replacement of this type of sheave please refer to the instructions valid for the previous sheave type.

To extract the sheave from the flange insert three screws M14 in the threaded holes in the flange (see *drw. particular. 58*).

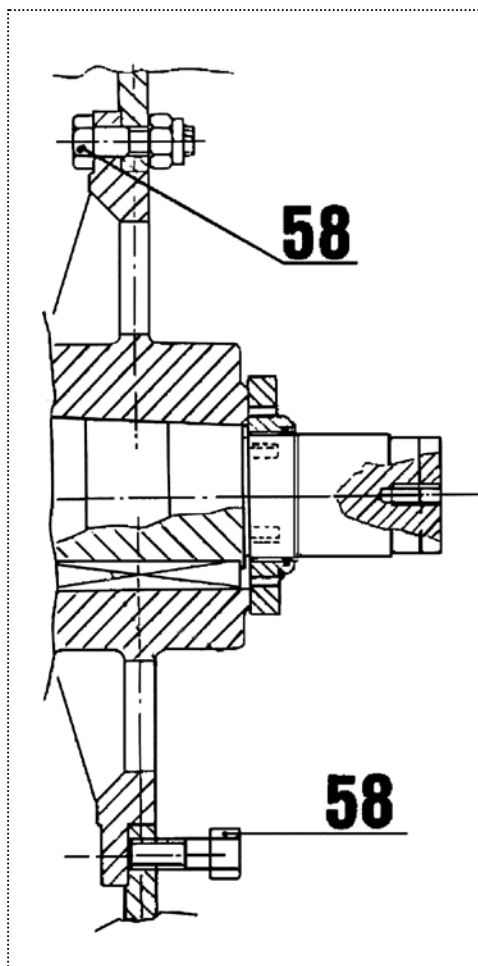
In case of replacement A. Sassi will supply sheaves with holes specially designed for bolts M14. The drilling  $\varnothing$  17mm with H7 tolerance for the calibrated bolt has to be carried out together with the flange to obtain the exact boring of the hole. The dimension of the calibrated section of the bolt is 17k6.

Both one part traction sheaves and sheaves are fixed by means of a special nut M65x2, which is locked by six M16 high resistance screws (see *picture pag 57*).

The screws are tightened in sequence with a tightening torque of 100Nm and are specially designed to prevent the unscrewing of the nut.

As additional safety measure, Loctite type 243 is applied to the threads to assure tightening. A steel-made spacer between the

ring nut and the sheave prevents the surface of the hub to be deformed by the frontal screws, which act on it. This fact assure a constant thrust.



## PERIODICAL CHECKS

Carry out the normal checks on the machine periodically. The frequency of the checks depends obviously on the operation cycles of the installation.

- every 6 months with operation cycles up to 2 hours a day
- every 3 months with operation cycles higher than 2 hours a day

Here follows we indicate the most important checks to be carried out on the machine.

**IMPORTANT! In case of interventions on the machine, please use only original spare parts supplied by ALBERTO SASSI.**

**OIL:** In case of light oil sweating in the ending part of the shaft or in the vent plug do not add oil. Should anomalous oil leakages occur, please contact directly the after-sales department of ALBERTO SASSI indicating the machine serial number to fasten the solution of the problem. (see page 33 plate B)

**GROOVES OF THE SHEAVES:** During the periodical checks regarding the wear condition of the grooves, control the depth of the undercuts. We suggest to replace the sheave only when the ropes have worn the half of the undercut depth.

**DISC BRAKE:** Check the noise level of the brake with double front disks during the opening and closing operations. The level should not exceed the average values, since the controls already carried out in our works foresee opening gaps extremely short.

Should the noise level increase in a strange way, please refer to the specific instructions regarding the dismantling and maintenance operations for the brake 30F0. During machine running, control that any strange noise occur between the brake.

**DRUM BRAKE:** As far as the brake drum is concerned, please refer to *page 58* and *59*

**In case of necessity contact directly the supplier of the brake.**

**BACKLASH:** the backlash between the worm/ worm-wheel should be checked every 3÷4000 running hours. With installation subject to high duty we suggest a check every 2 years.

Should the backlash exceeds 0,7 mm, please refer to **ALBERTO SASSI** or see relative chapter in the handbook for "*Fitting and unfitting repair parts*".