

## CHAPTER 2

## TECHNICAL DATA

### 2.1 TECHNICAL DATA

#### 2.1.1 Overall dimensions (see Table 7.1 page 38)

#### 2.1.2 Running features

Tab. 2.1

Product	Special paper
Grammage range	41-450 gsm (11-120Lb/1300Ft2)
Consistency	0.7-1.20%
Retention	90-95%
Furnish	Cotton-Cellulose
Operating speed	46-230 m/min (150-750 fpm)
Max design speed	243.2 m/min (800 fpm)
Max. flow at slice	8360 Lit/min (2200 gpm)
Min. flow slice	3800 Lit/min (1000 gpm)
Design flow at slice	6800 Lit/min (1800 gpm)
Pond width	2794 mm (110")
By pass dimensioning	10%
Top lip horizontal adjustment	50 mm (+20,-30)
Top lip vertical adjustment	50 mm
Top lip cleaning position	80 mm (Vertical)
Top lip horizontal movement	Motorized
Top lip vertical movement	Motorized
Throat roll diameter	155 mm (6.102")
Open area / holes diameter	40% / 22mm straight pattern
Slice roll diameter	155 mm ( 6.102")
Open area / holes diameter	51.4% / 22 mm spiral pattern

### 2.1.3 Gear-motors features

*Tab. 2.2*

Installed power	N.2 - 1,1 kw - N.1-0,55 kw
Poles	4
Shape	M4
Protection	IP55 - IP54
Voltage	460V 60Hz
Motor speed	1400 r/min. - 1360 r/min.

### 2.1.4 Materials

The headbox is completely built in stainless steel AISI 304.  
Lower lip is made of a special stainless steel, with a limited thermal expansion, to avoid distortions when production cycle re-starts with a temperature in the headbox different than fixed one.

**CHAPTER 3****INSTALLATION****3.1 CHOICE OF OPERATORS****3.1.1 Operators training**

Any operation ( assembling, disassembling, maintenance, repairing work, etc.) can be performed by duly trained, authorized personnel.

**3.1.2 Responsibility**

The responsibilities for the use of the system shall be clearly defined and respected, so as to remove any doubt concerning competence regarding running safety.

**3.1.3 Maintenance and repairing**

The maintenance and the repairing require special knowledge and can be performed only by skilled personnel. Maintenance personnel shall be provided with proper safety devices (non-slip shoes, gloves, etc.).

**3.2 TRANSPORTATION**

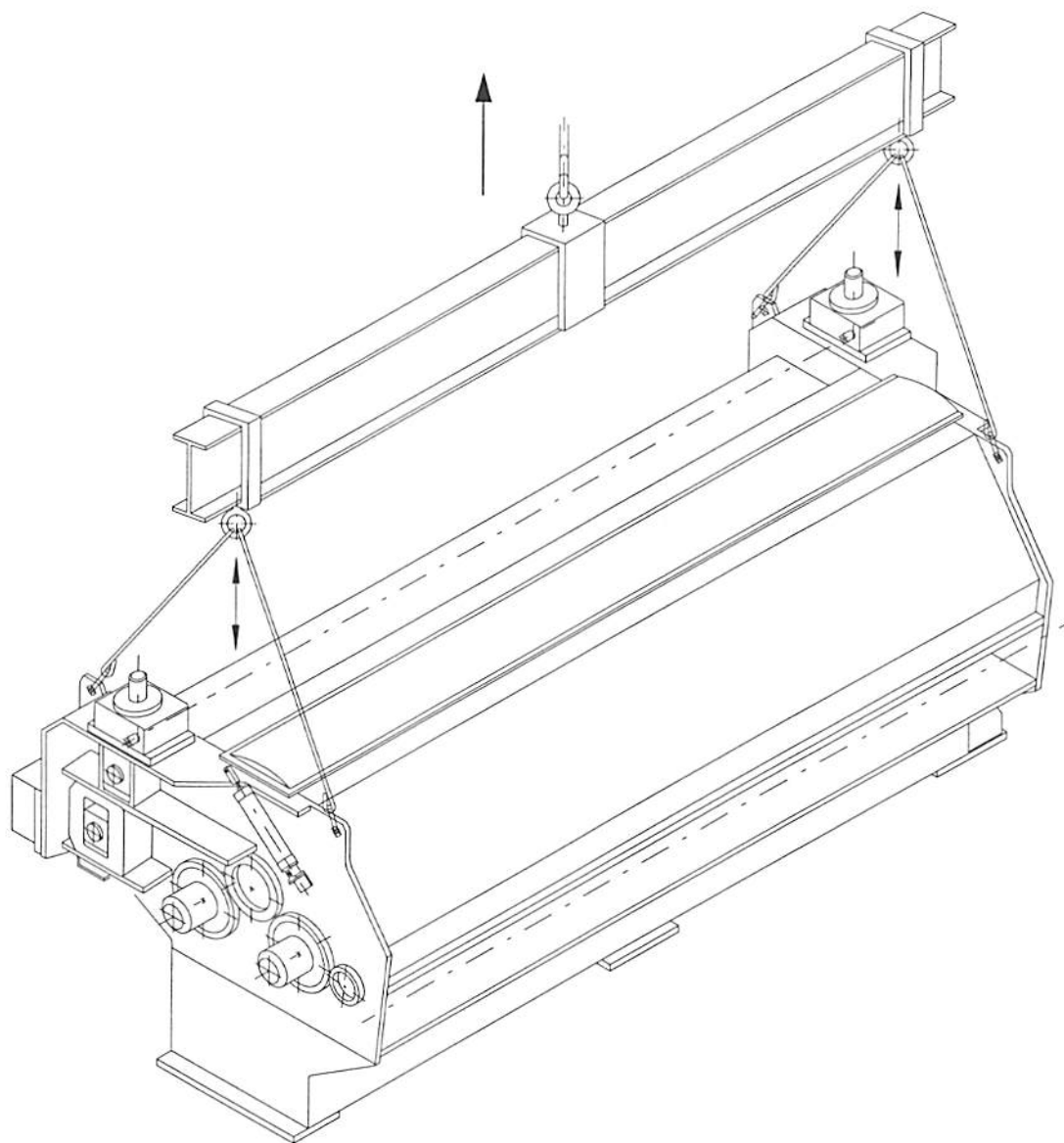
Transportation shall be done by qualified forwarders, able to guarantee a proper handling of equipment shipped. COMER declines any responsibility in case of transportation at customer's care or in case of forwarders chosen by customer.

Provide a special, bounded area, with plane floor, for unloading operations. Open the packing ( if any) from upper side and extract the machine, lifting it vertically, further to an adequate slinging at due points.

Headboxes of middle and small size, for volume reasons, the manifold and shape-limiters are shipped dismantled.

On the headbox sides some holes are provided for fixing lifting ropes. Ropes shall be provided with eye-hook at the ends.

Fig. 3.1 at page 15 shows the system and tools necessary for a proper lifting operation, with the aim to avoid any deformation of sides, which would affect the regular movement of headbox higher lip.

*Fig. 3.1*

**STOP: Rope traction must be vertical.**

In case the diffuser is supplied disassembled, its transportation is done by a proper packing, preventing any damage. When the box is open, the diffuser-lock keeps fixed on transportation frame.

Advise COMER about any missing component.

Check the packing list, identifying any item numerically, showing description, quality and, if necessary:

- Weight;
- Dimensions;

*Tab. 3.1*

Type	Weight
Headbox CAP 2794	11 Ton (Static) 14,3 (Dynamic)



**WARNING:**

- Use lifting trucks travelling cranes or truck cranes to lift or move the packing;
- Provide packing destruction according to law provision;
- Use proper slinging on the basis of mass of machine to be lifted.



**STOP:**

- After extracting the machine visually check its integrity before starting installation.
- For extracting it, follow instructions of Fig. 3.1 page 15.

### 3.3 DESCRIPTION OF POSITIONING OPERATIONS

Check carefully the equipment after dispatch to find out any damage which may be occurred during transportation.

Make sure that features of the machines and materials at vendor's charge correspond to what specified in the order confirmation to guarantee a proper installation.

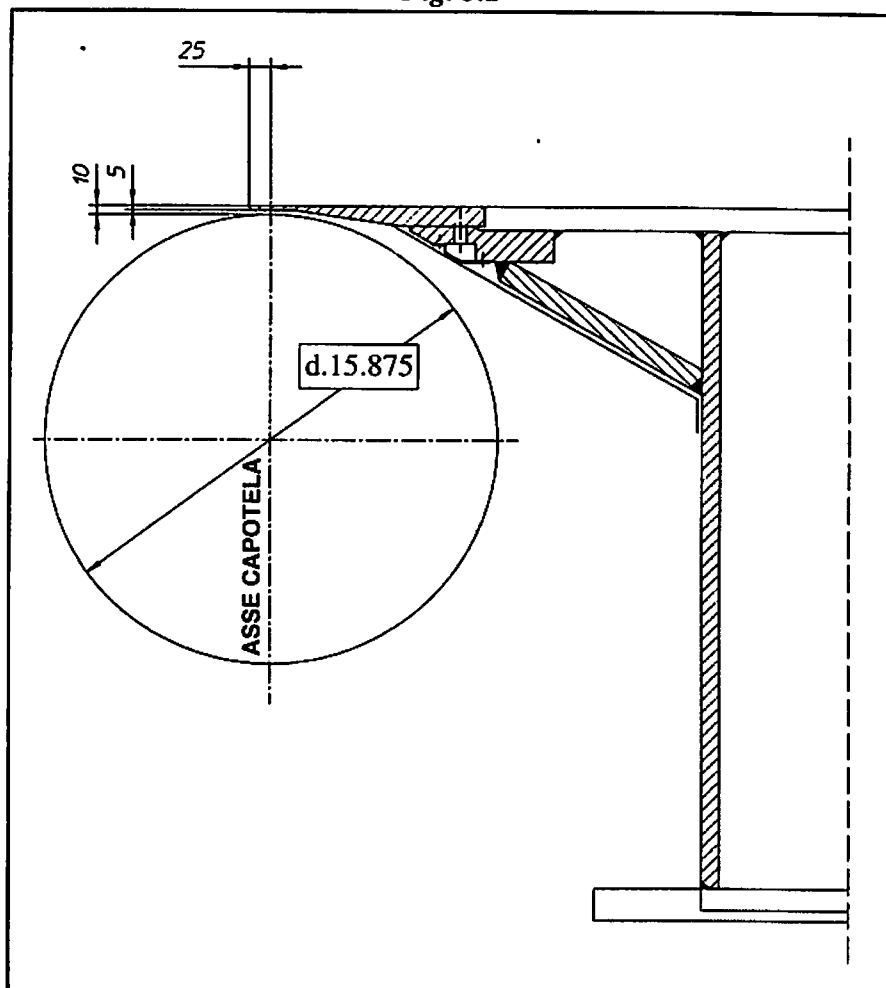
- Verify if foundations or fixed support are suitable to bear machine weight;
- Verify if electrical supply and values of tension and current are adequate, according to data specified in the order confirmation;
- Make sure that documentation supplied refers exactly to the machine to install.

#### 3.3.1 Positioning

- The headbox must be positioned, in respect of breast roll, according to Fig. 3.2 page 17.
- Upper lip end must jut out 25 mm in respect of breast roll axis.

- The free area between the lip upper surface and breast roll must be of 10 mm.

*Fig. 3.2*



### **3.3.2 Foundations control**

- Foundations (at client's care) shall be calculated by a civil engineer, according to rules in force in the country where the machine will be installed.
- Check foundations dimensions, which shall be in accordance with sketches supplied.

### **3.3.3 Machine setting**

Lift the machine by an adequate lifting system. Application points for the lifting are positioned in the upper cover and in the base (see Fig. 3.1 page 15).



**STOP:** Before the machine positioning, remind to insert foundation bolts in the related holes foreseen on the base.



**WARNING:** For lifting operations use just devices having proper loading efficiency.



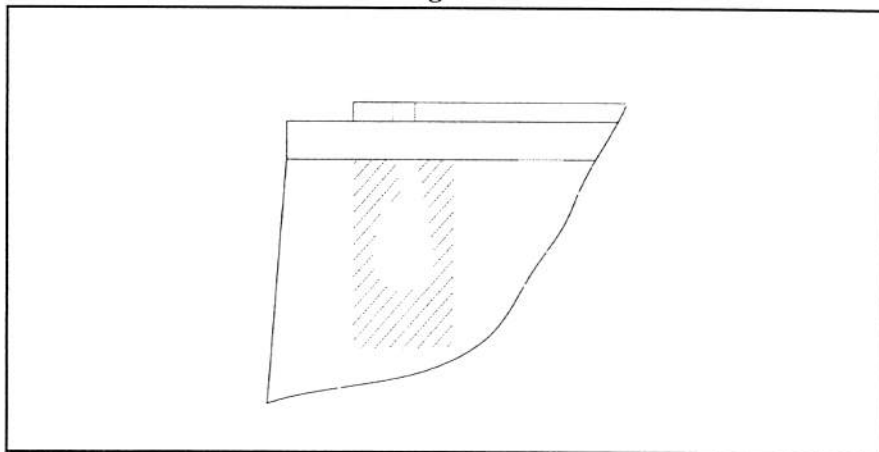
**DANGER:** Pay attention to suspended loads!  
The complete load or just a component may break off!

- Position the machine over the base (making foundations bolts match with related traps).
- Insert on foundation bolts the rods dia.20 mm (see Fig. 3.3 page 18). In this way the system complete steadiness can be guaranteed.
- Tighten foundation bolts.
- Proceed with final casehardening of the machine, using a high strength plastic cement.



**STOP:** Check the proper filling of related foundation traps (see Fig. 3.3 page 18).

*Fig. 3.3*

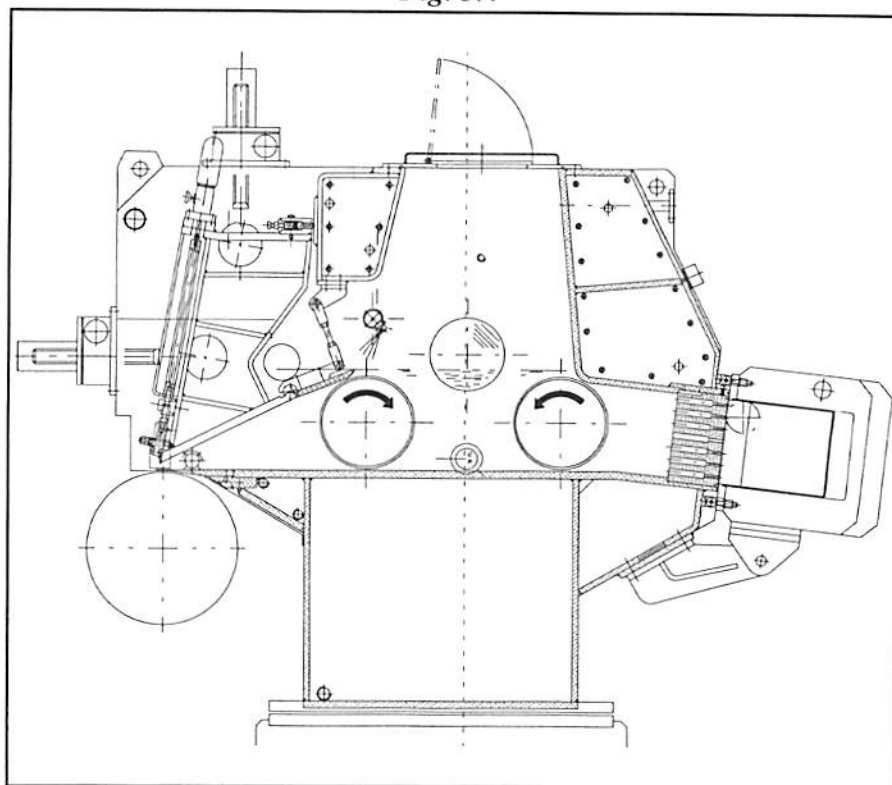


- With this aim, we'd suggest the use of high pressure pumps for cement injection.
- Finally provide connections to energy supplies (electric and hydraulic).

**Before the start-up check as follows:**

- Verify presence of water in the sprayer-pipe.
- Operate the rectifier rolls, the peripheral speed of which shall be approx. The same as the stock speed inside the headbox.
- Check if rotation direction of the rolls is the proper one (see Fig. 3.4 page 19) .

***Fig. 3.4***



- Proceed with a first mobile lip adjustment, acting on push-buttons of control panel for the horizontal and vertical movement.
- Open partially air valve for adjusting headbox pressurization.
- Supply compressed air in the control net of headbox pressurization.
- Adjust air pressure reducer at a pressure of approx. 0.3 bar.

**Preparation for first start-up:**

Find here below operations to perform after headbox installation or in case of any modification to feeding piping:

- Open completely the valve positioned in the manifold recirculation.
- Lift completely front wall.
- Check if rectifier rolls are stopped.



- Start up the pumps and supply just water for approx. 15 minutes.
- Upon this cycle end, close recirculation valve and lower slowly front wall up to bring mobile lip into operation position.
- Continue for further 10 minutes, then stop the pump.
- Open the manifold and the headbox cover and check if any extraneous bodies have stopped in the diffuser holes and between the rectifier rolls and the headbox bottom.
- Close again the headbox cover and position again the feeding manifold.
- Check if inside the screen there are any extraneous bodies, which, later on, may reach and damage the headbox.

Now the headbox is ready for further stage.

**CHAPTER 4****SAFETY INFORMATION****4.1 DANGEROUS AREAS****4.1.1 Definition**

Area inside and/or near the machine, where the presence of the operator represents a risk for his safety or health.

The measures adopted by the manufacturer have the aim to eliminate any risk of accident both during machine operational life and during assembling or dismantling stages. Furthermore devices used shall imply a safety distance so as to prevent any contact with the dangerous area by the operator (Norms UNI EN 294, UNI EN 349).

The machine has been designed so as to exclude any dangerous situation.

Anyway the non observance of instructions pointed out in this manual (safety devices) may cause serious damages both to operators health and system running.

The client shall adopt proper safety measures, so as to guarantee the complete protection of the operator during production, maintenance and cleaning stages of the machine.



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**STOP:** COMER company declines any responsibility in case these rules are not respected.

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The machine we are analysing does not imply dangers as moving units are completely isolated by the machine body.

Only maintenance stage requires special care.

The machine cannot be used in environments at risk of explosion and fire. In this last case, for electrical section, it is recommended to respect rules of Norm EN 60204/1

## 4.2 SAFETY DEVICES

### 4.2.1 General requisitions

Protections and safety devices:

- Shall have a solid construction;
- Shall exclude additional risks;
- Shall not be easily compromised or deactivated;
- Shall be positioned at a proper distance from the dangerous area;
- Shall not prevent too much the visual control of operation cycle;
- Shall allow interventions of responsible people for the installation and/or the replacement of any component or maintenance work.



**WARNING:** Before any start-up, make sure that all safety devices have been properly installed.



**WARNING:** COMER strictly forbids the commissioning of the machine in case safety devices are damaged or incorrectly installed.



**STOP:** COMER declines any responsibility in case these instructions are disregarded.

## 4.3 START-UP

### 4.3.1 Start-up

If all operations listed in the previous 2 chapters, the headbox is ready for the commissioning.

- Record on the control panel the "set point" of headbox level regulator at a proper value for the production desired. Position it in automatic.
- Record the set-point of the headbox pressure regulator at a proper value for the capacity you want to keep.
- Position the mobile lip in the theoretical running position.
- Start-up the screen.
- Activate the feeding pump.

- On the headbox pressure regulator, set the speed value at 80% in case of max. production or at a lower proportional value for lower productions.
- Set basis-weight valve at an adequate volume.
- Activate the stock pump, starting the production.
- Check, through inspection hole on headbox side, the headbox level and, if necessary, modify it acting on related regulator.
- Make sure that the stock, getting out from the headbox, reaches the wire properly, so : partially (circa 10%) before the foil and the rest above. If necessary, modify the position of the mobile lip, moving it forward, to make the stock have an anticipated impact on the wire, or withdraw it to get the opposite effect.
- If the stock distribution is not uniform on the wire, adjust locally the mobile protrusion, acting on micro-jacks.
- When the headbox running is regular, set the headbox pressure regulator in automatic position.



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**STOP:** After performing the commissioning, headbox regulations occur automatically, without the operator intervention.

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Any level variation inside the headbox is recorded by pertinent transmitter, which modifies the signal sent to the regulator.

The regulator acts on air regulation valve, varning the pressure inside the headbox.

The pressure tranmitter records this variation and modifies the signal sent to its regulator, as well.

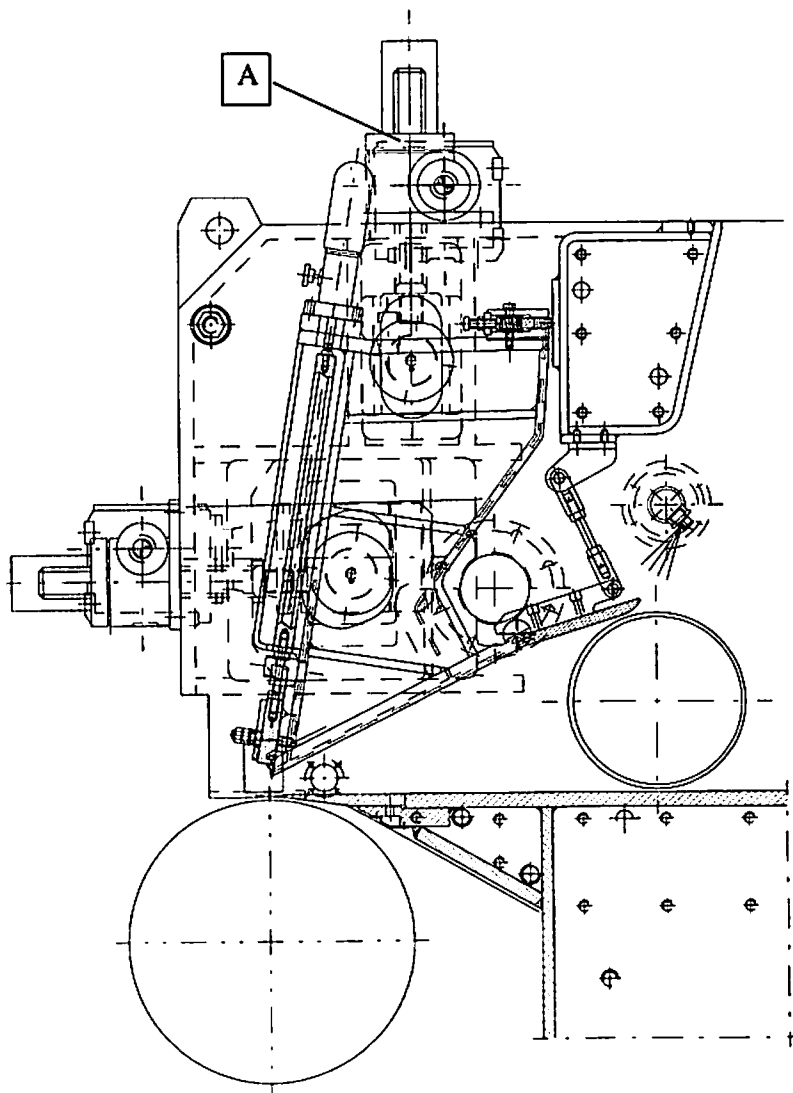
The regulator, in accordance with the system type, acts on feeding pump revolutions or on the recirculation valve of the pump itself.

The headbox capacity will increase or decrease on the basis of the situation, resetting the pressure (The capacity increases if pressure decreases and vice versa).

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**CHAPTER 5****INSTRUCTIONS FOR THE OPERATOR****5.1 RUNNING MODES****5.1.1 Vertical movement (see Fig. 5.1 page 25)**

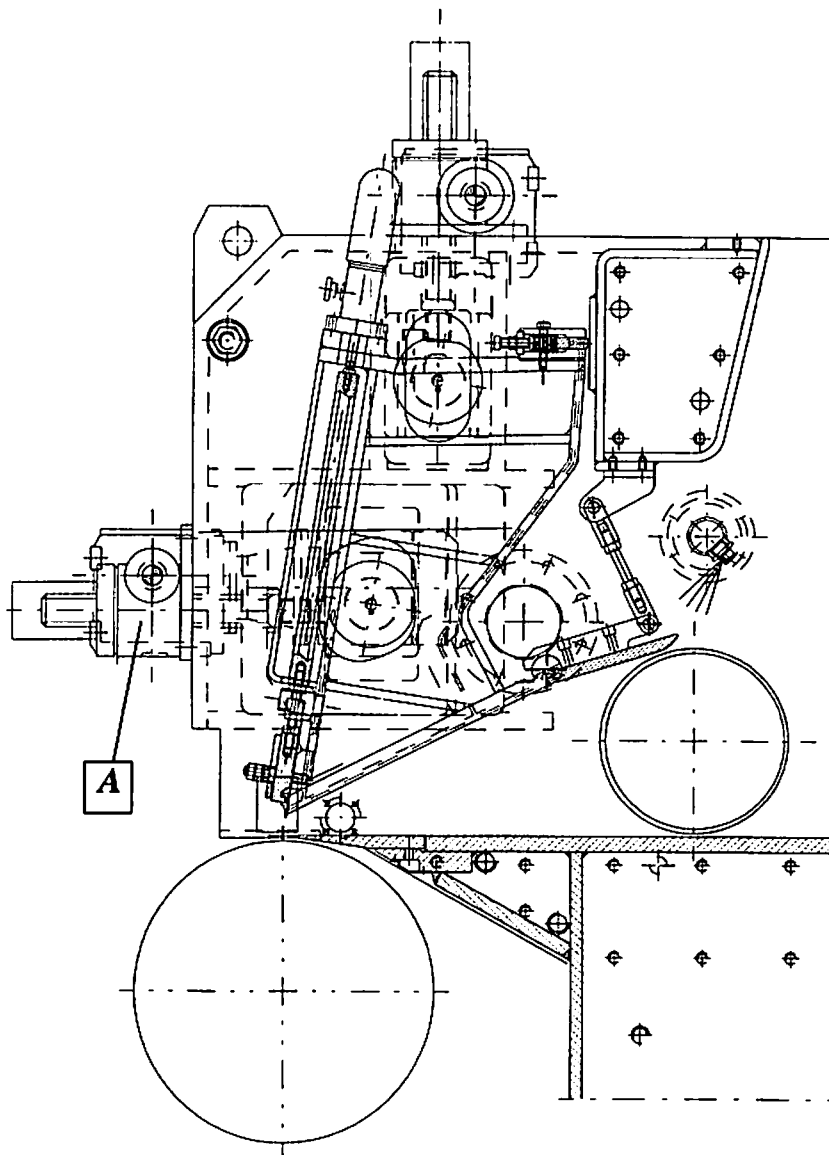
The outflow width can be changed by the vertical movement of the mobile wall, acting manually-through a hand-wheel-a set of screw-jacks (A).

**Fig. 5.1**

### 5.1.2 Horizontal movement (see Fig. 5.3 page 27)

The outflow width can be changed by the horizontal adjustment of mobile wall, activating by a hand-wheel a set of screw-jacks (A).

*Fig. 5.2*



### **5.1.3 Upper lip - movements and positioning**

The transversal basis-weight profile can be adjusted, setting the upper lip (A), through regulation screw-jacks (B), set by regular intervals on the headbox length and provided with position indicators with centesimal division.

To avoid permanent deformations of upper lip (A), which make it useless, max correction shall not exceed 0,2 mm. This protrusion can be modified from a min. of 3 mm to a max. 10 mm.

### **5.1.4 Rectifier rolls**

The rectifier rolls are positioned on the headbox sides by means of flanges, which, when removed, allow the roll extraction.

The rectifier rolls must rotate in opposite directions each other (see fig. 3.4 page 20) so, the front rectifier roll rotates in anticlockwise direction, observed from operator side, while the back roll rotate in clockwise direction.

The supports are provided with ball-bearings and sealing rings, angus type, grease lubricated.

The front roll drilling is spiral type, its open area is 51,4% approx, while the back roll drilling is straight type and its open area of 40%.

The drive unit is composed of a gear-motor, transmitting the rotation to the rectifier roll by an elastic joint .

At back centre, between the 2 rectifier rolls, there re 2 plexiglass sights.

**CHAPTER 6****MAINTENANCE****6.1 GENERAL  
CONSIDERATIONS**

**WARNING:** During any maintenance stage only original COMER spares shall be adopted.

COMER declines any responsibility in case this prescription is disregarded.



**DANGER:** Before performing any ordinary or extraordinary maintenance intervention the operator shall make sure that:

- The machine is stopped;
- There is NO electrical supply;
- A proper maintenance stage signal is present.



**STOP:** In case of accident due to non-observance of instructions, COMER declines any responsibility.

Maintenance operations are necessary to keep unchanged technical, preoduction and safety conditions, set by the manufacturer.

In case of the headbox, the user shall take care as follows:

It is recommended that at any machine stop, the headbox is washed with clean water, so as to avoid that fibres or charges present in the stock adhere to internal surfaces of the hedbox.

In case of long stops, due to repairing works, vocation, etc. it is recommended to wash the headbox by chemical substances, respecting instructions of suppliers.

Any detergent available at the mill can be used:

- Hydrogen chloride (HCl) diluted at a concentration of 2-3%, at a max. temperature of max. di 40° C. The treatment time is of approx. 1 hour.
- Sodium hydroxide (Na OH) diluted at 10%.





**WARNING:** Start with washings at a low concentration, increasing it when required, avoiding any alteration of surfaces finishing degree. Washing by detergents shall be always followed by a deep rinsing by fresh water.

## 6.2 ORDINARY MAINTENANCE

Ordinary maintenance is performed periodically and with special care on machine components which need interventions for replacement or cleaning.



**STOP:** To guarantee a safer running of the machine, perform periodically the maintenance according to instructions supplied by the manufacturer.

Components normally subjected to ordinary maintenance are:

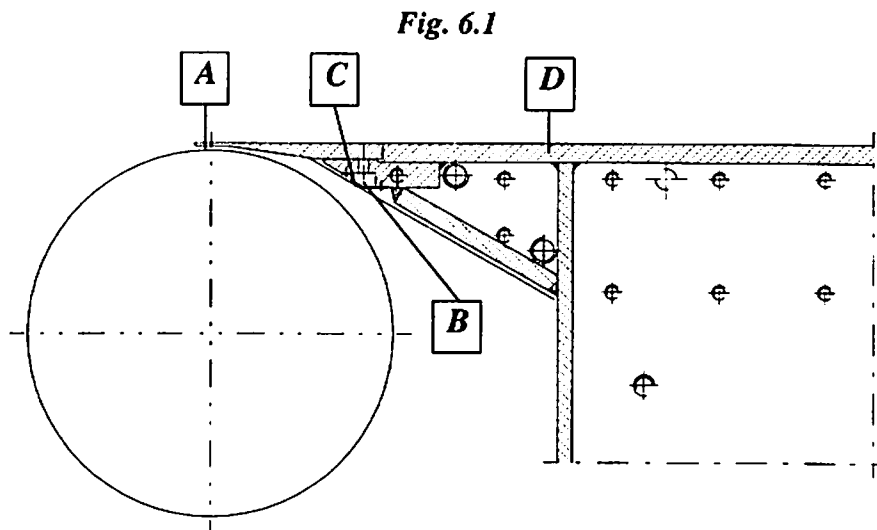
- Lower lip
- Upper lip
- Internal side cleaning
- Rectifier rolls

### 6.2.1 Lower lip (see Fig. 6.1 page 30) .

Lower lip (**A**) is fixed to headbox base (**D**) by screws (**B**).

For its replacement, follow this procedure:

- Lower breast roll.
- Remove spray-protection (**C**) fixed to the base (**D**).
- Remove the screws (**B**) and extract the lip in the same direction as wire running.
- Position the new lip in the proper housing and make sure that, along joining line between the lip and the headbox internal side, there are no steps.
- In this case, add under the lip some calibrated small plates of adequate thickness.
- Fix the lip by screws (**B**) and install again spray-protection (**C**).



### 6.2.2 Upper lip ( see Fig. 6.2 page 31)

The upper lip (A), for its important service and its special manufacture, during replacement operations, shall be handled with deep care.

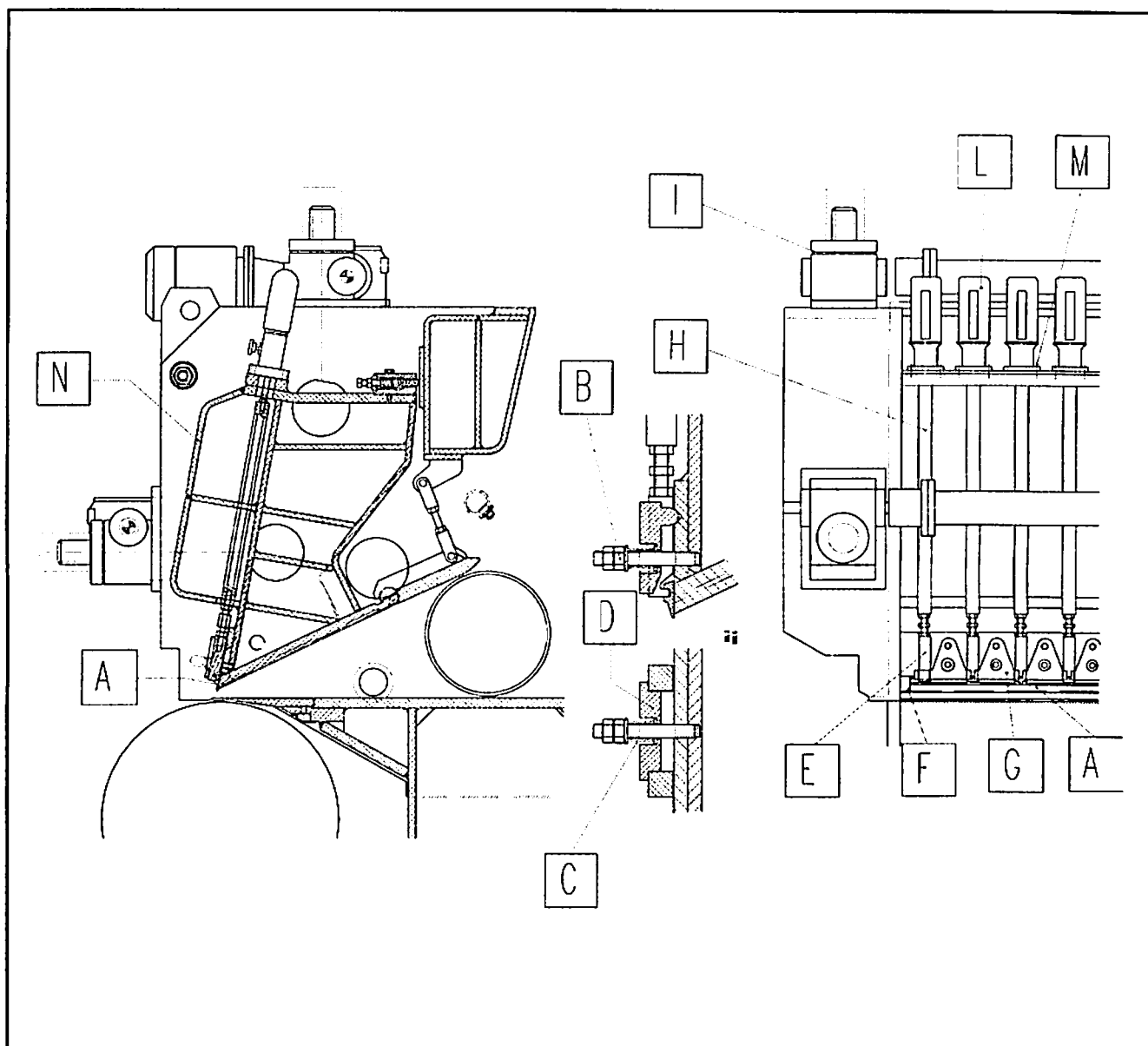
It is supplied fixed on a wooden support, preventing any damage or bending to outlet edge, making easier assembling operations.

For its replacement proceed as follows:

- Open upper lip of 25-30 mm and provide, over the lower lip, a wooden or felt protection, to prevent any damage.
- Loosen bolts nuts (B) unloading the springs (C).
- Loosen of 2÷3 mm the screws (M) locking adjusting jacks (L).
- Insert between the adjusting bolts (H) and the upper side (N) some wooden wedges, so as the hooks (E) unloose the hold and the upper lip can be removed.
- Remove the new lip from its protection.
- Check its length so as to be 0,1÷0,2 mm shorter than distance between the two sides of its sliding.
- If required, shorten the lip by shaping its .
- Insert the lip (A) in the proper housing and make sure that gaskets (F), positioned at the ends, adhere to back.
- Remove wooden wedges from the area under regulation bolts (H) and insert the hooks (E) in the lip housing (A).
- Tighten the screws (H) the nuts (B) repositioning the springs (C).
- Remove the protection positioned on the lower lip.

Check the planarity and parallelism of outflow width by a proper instrument or by calibrated locks, making them slide along outflow width.

**Fig. 6.2**



### 6.2.3 Internal side cleaning (see Fig. 6.3 page 32)

To make easier the access to headbox internal side for cleaning operations, the manifold can be lowered.

#### Proceed as follows:

- Disconnect all piping connected to the manifold.

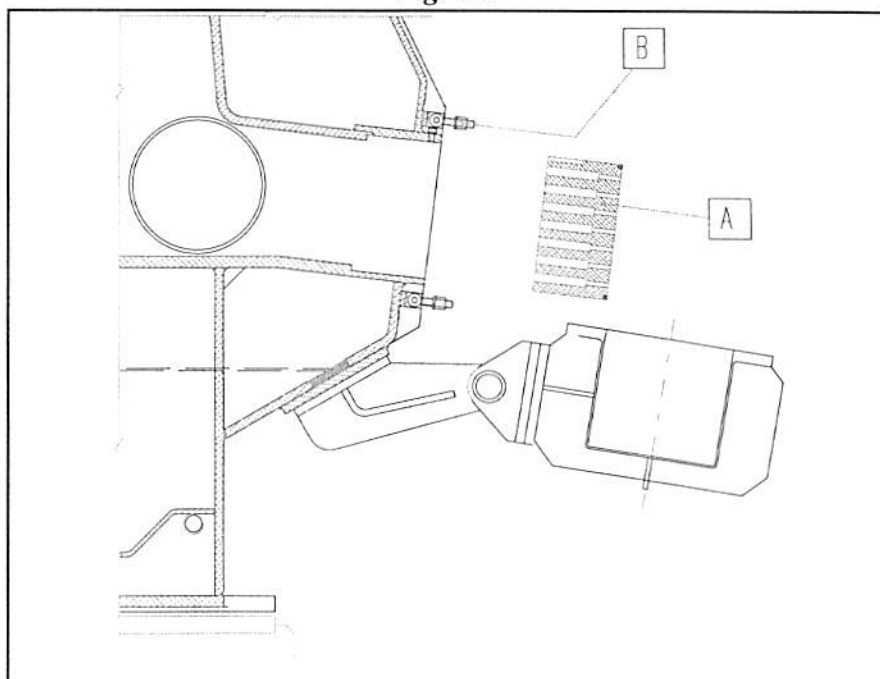
- Remove all fixing pins assembled to rectangular coupling flange between the manifold and the conical fitting and the pins assembled on the flange of recirculation tube.
- Loosen eye-bolts (**B**) fixing manifold flanges both in feeding side and recirculation side and release them from their housing.
- Make sure that there is no personnel near the manifold, so lower the manifold by means of a lifting device.
- Remove the plexiglass diffuser (**A**).
- Proceed with internal cleaning.

For the manifold assembling, follow inverse procedure, checking seal status and, if damaged, replace it.



**STOP:** Re-position the pins in their housings of coupling flanges between the manifold and feeding and recirculation piping, then proceed with final crossed tightening of all bolts.

*Fig. 6.3*



#### 6.2.4 Rectifier rolls (see Fig. 6.4 page 34)

##### Replacement of rectifier rolls bearings

The procedure for the bearings replacement is the same for both rolls, both for the support at operator side and support at drive side. Disassembling stages of bearings on drive side support of front roll are the following:

1. Disconnect motor from electrical supply (**C**) .
2. Loosen the screws (**D**) and remove the reducer flange coupling (**E**) with the complete drive unit.
3. Remove the joint (**F**) and locking ring-nut (**G**).
4. Remove the screws (**H**) and extract the support (**I**)
5. Replace the bearings(**L**).
6. For the assembling, follow inverse procedure.



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**STOP:** After the support disassembling, it is recommended to replace the sealing rings.

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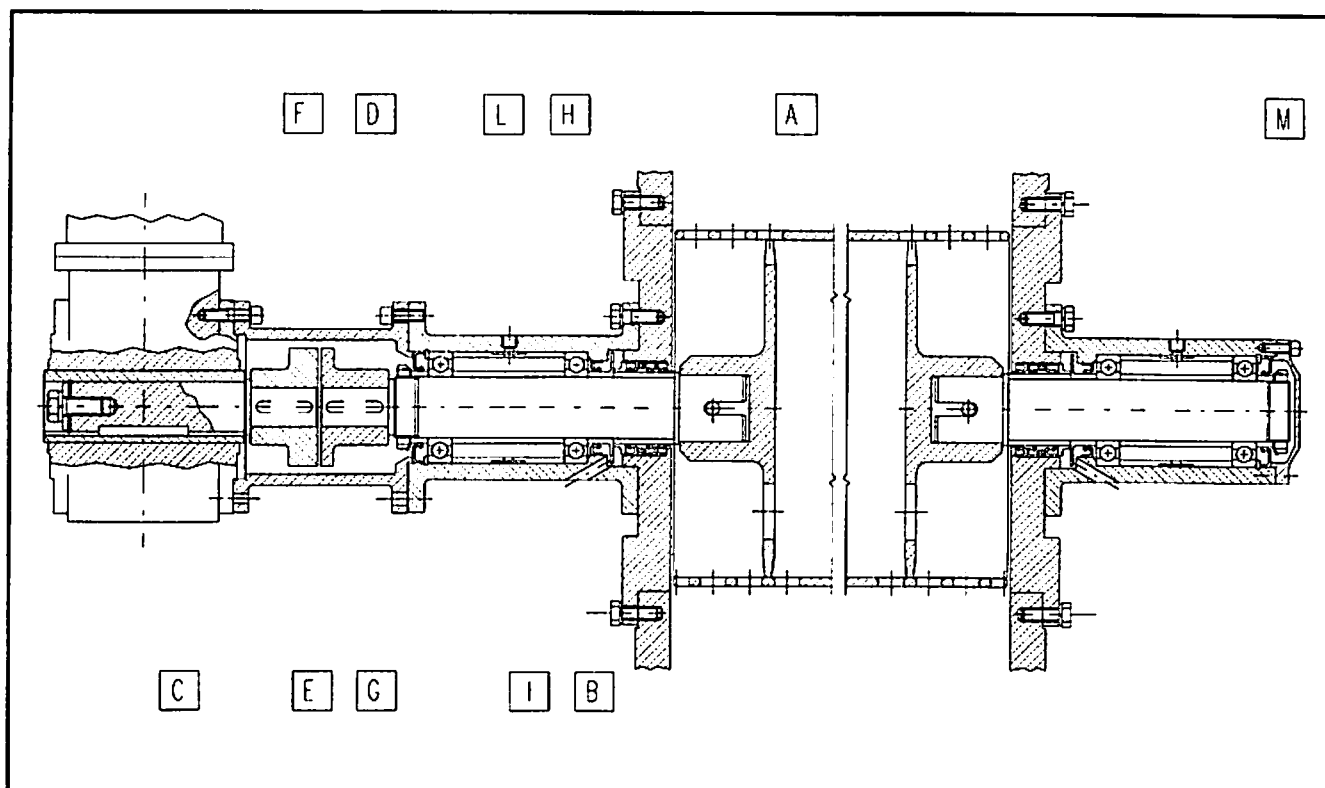
Add the grease in pertinent chambers, using type **MOBILUX EP** of Mobil, or an equivalent type.

#### **Rectifier rolls disassembling**

The extraction of the rectifier rolls can be performed both through the headbox side and the headbox cover.

The disassembling procedure is the same for both rolls. Here below you find the operations to carry out for disassembling the roll (**A**), through operator headbox side and through the cover.

- Insert between the rectifier roll (**A**) and the headbox bottom a felt cloth with the aim to avoid, during the roll extraction, that the slipping ruins the headbox internal surfaces.
- Remove the screws (**B**) then extract the support complete with gear-motor and drive pin.
- From the opening left, extract the rectifier roll with special care.
- For the roll assembling, repeat reverse operations.
- To extract the rectifier roll through the headbox cover even the support of rectifier roll drive side shall be removed.

**Fig. 6.4**


### 6.3 EXTRAORDINARY MAINTENANCE

The extraordinary maintenance is performed in special cases, where components involved are not usually subjected to wearing or breaking. Components subjects to extraordinary maintenance are:

#### 6.3.1 Foundation bolts

Verify the tightening and oxidation of all bolts; with special care check the status of foundation bolts. If necessary, paint them by two-components epoxy paint or by cold galvanizing.

### 6.4 LUBRIFICATION

To allow a good running, the bearings and angus sealing rings of rectifier rolls must be properly lubricated: their lubrication is useful to prevent direct contacts, metal over metal, between rotating part, so between rotating bodies, the races and the housings, and avoid the wearing and protect surfaces from corrosion.

The grease can be used in most of applications to lubricate rotating bearings during normal running conditions.

Lubricating grease are mineral or synthetic thickened oils, in which thickening agent is usually a metallic soap: they contain also some additives which improve some qualities.

To properly choose a grease, it is necessary to consider important factors, as, in addition to consistency, the viscosity of its base oil, operating temperatures field, its anti-rusting properties and its capacity of supporting loads.

To grease the bearings, use the grease suggested (or an equivalent one) by the manufacturer:

**MOBILUX EP**

Greasing points are :

- Ball bearings of front and back rectifier rolls.
- Angus sealing rings of front and back rectifier rolls.
- Angus sealing rings of rotating sprayer pipe.

**For lubrication of machine components not manufactured by COMER see attached documentation§**



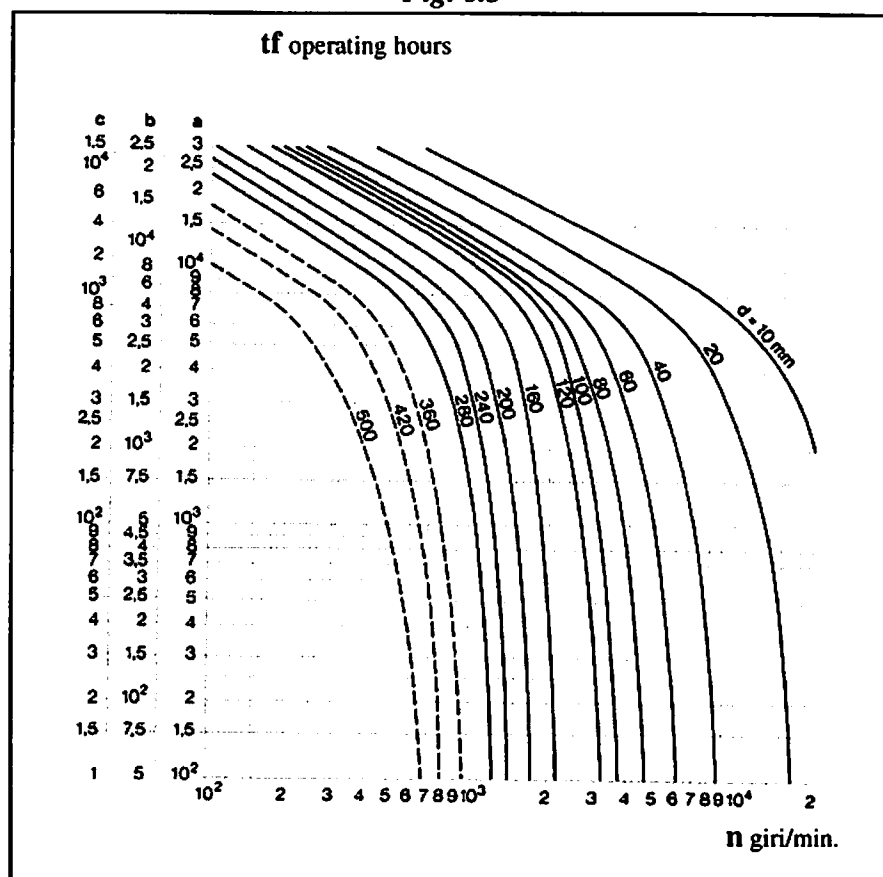
**WARNING:** The headbox is dispatched with non lubricated bearings. Before any start-up, then perform the lubrication using the suggested grease.

The use of unsuitable greases seriously affects the bearings life.

#### **6.4.1 Re-lubrication**

When the operation life of grease used is lower than the one foreseen for rotating for rotating bearings, the bearings must be re-lubricated. The re-lubrication must be performed when the lubrication is still satisfying.

The re-lubrication intervals  $t_f$ , for a certain type of bearings or for normal running conditions, can be found in the diagram (see Fig. 6.5 page 36) on the basis of rotating speed  $n$  of the bearing and of diameter  $d$  of its hole.

**Fig. 6.5**


Scale a: ball, radial bearings  
 Scale b: cylindrical roll bearings, small roll-bearings  
 Scale c: roll bearings, conical roll-bearings, ball, axial bearings;  
 cylindrical rolls full filling bearings (0,2 tf);  
 crossed cylindrical roll-bearings, with housing (0,3 tf);  
 cylindrical rolls, axial bearings, small rolls, axial bearings. swinging  
 rolls, axial bearings (0,5 tf)

On the basis of re-lubrication interval **tf** obtained, use one of the 2 procedures listed below:

- If re-lubrication interval is lower than 6 months, we'd suggest additions to existing grease in the bearings system at intervals corresponding at 0.5 tf:
- All the existing grease must be completely replaced after 3 refill operations.
- When re-lubrication intervals are higher than 6 months, we'd suggest to remove all the used grease from the bearings system and replace it by new one.
- The limit of 6 months must be considered as indicative time and must be evaluated together with instructions for lubrication and maintenance of the involved machine or system.



#### **6.4.2 Additions**

By adding in the bearings system small quantities of new grease at regular intervals, the grease used is replaced only partially.

The proper quantities for these additions are obtained the formula:

$$G_p = 0,005 D B$$

Where

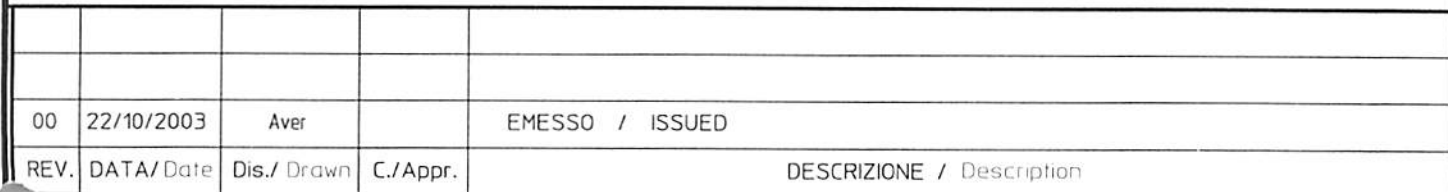
$G_p$  = quantity of grease to be added, g.

$D$  = External diameter of the bearing, mm.

$B$  = Total largeness of the bearings (for axial bearings mark total height  $H$ ), mm.

**CHAPTER 7****LIST OF SKETCHES AND DRAWINGS  
ATTACHED***Tab. 7.1*

<i>List of sketches</i>	
Instrumentation schedule	64303-4-SH
Installation	64921-0-CA
Foundation plane	64922-0-CA
Headbox section	64923-0-CA
Lip movement	64925-0-CA



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