



APEMAT 190



**INSTRUCTIONS FOR USE AND MAINTENANCE
COMPREHENSIVE CATALOGUE & SPARE PARTS**

CT. 200.318

Serial number

CONTENTS

USE AND MAINTENANCE

1. - General information	5
1.1 - Introduction	
1.2 - General information	
2. - Description of the equipment	6
2.1 - Type of machine	6
Manufacturer's registration plate	
Location of the manufacturer's registration plate	
Location of the machine serial number	
2.2 - Description of the machine	7
2.3 - Measurements of the machine	8
2.4 - Technical data regarding the machine	8
3. - Transporting the machine	9
3.1 - Transporting	
4. - Using the machine	10
4.1 - Operating principles	10
4.2 - Materials for pumping	
4.3 - First operations	11
Positioning the machine	
Electrical connection	
Hoses – anchoring the hoses	12
Coupling devices	
Connections	14
4.4 - Starting the machine	16
Preventive checks	16
Starting the machine	17
Loading the material	18
Pumping cycles	
4.5 - Washing and stopping the machine	20
4.6 - Important points	22
Using the material	
Connections	
5. - Care and maintenance of the machine	24
5.1 - Operations for which the operator is responsible	24
5.2 - Maintenance work to be performed by qualified personnel	26
Operations to be performed every 250 hours	
Operations to be performed every year or 1.000 hours	
6. - Trouble shooting	28
6.1 - Faulty mix	28
6.2 - Work to be performed by the operator	29
6.3 - Work to be performed by qualified personnel	
7. - Responsibility of the operator	30

SPARE PARTS

Table 1 - Chassis	32
Table 2 - Pressure tank	34
Table 3 - Pneumatic system	38
Table 4 - Loading bucket	40
Table 5 - Hydraulic system (EB version)	42
Table 6 - Hydraulic system (EB/P version)	44
Table 7 - Scraper	46
Table 8 - Switch board	48
Table 9 - Standard equipment Cam - lock couplings	50
Table10 - Standard equipment Perrot couplings	52
WIRING DIAGRAM	
Table11 - Wiring diagram	56

IMPORTANT

Read and carefully follow the instructions contained in this booklet. By doing so, you will thus help prevent accidents, be fully covered by the manufacturer's warranty, and have always available an equipment that is perfectly efficient and ready to use.

Operation and maintenance of this equipment must be performed only by skilled personnel who are well aware of the dangers inherent to the machinery itself.

You must obey the regulations concerning the prevention of work accidents as well as current laws regarding safety in the work place.

The manufacturer shall not be liable in any manner whatsoever for injury or damage to persons and things resulting from unauthorized changes in or modification of this equipment.

ELECTRIC MIXING AND PUMPING MACHINE FOR SCREEDS, BRICK LAYER MORTARS, PLASTER AND SMALL CONCRETE FOR SMALL CONCRETE POURS

APEMAT 190

The equipment's serial number:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

You are strongly advised to enter your equipment's serial number in the space above which must always be referred to in order to facilitate the work of the personnel in charge, and it must likewise be mentioned when requesting service assistance or spare parts.

We reserve the right to make any technical modification whatsoever in the interests of improving this machinery, even if such modifications are not mentioned in this booklet.

Written authorization from Turbosol must be obtained for any and all reprinting or reproduction, even in part, of the information contained in this booklet.

SYMBOL KEY

DESCRIPTION



It is compulsory to read this maintenance booklet prior to operating the machine



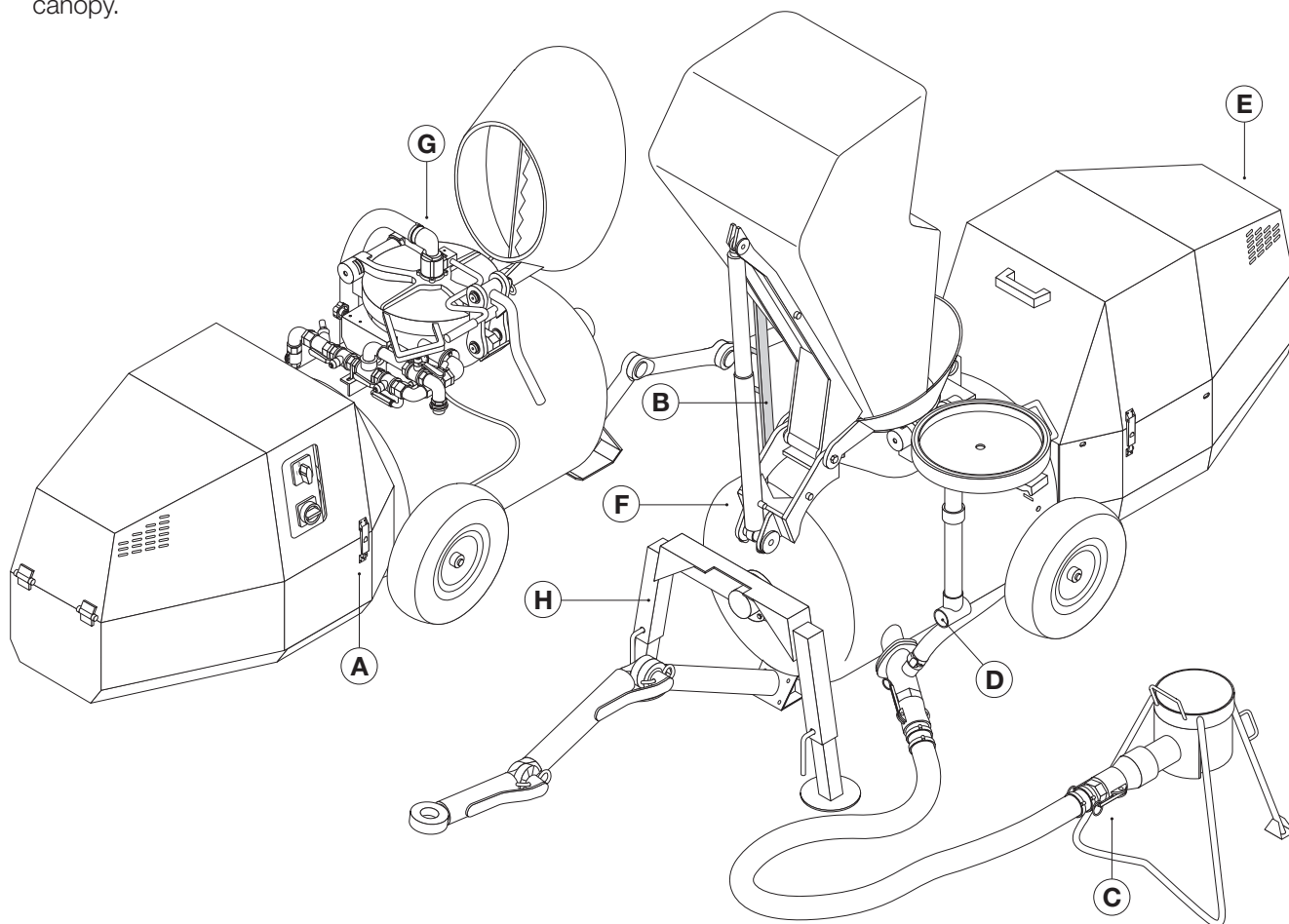
It is compulsory to ready this maintenance booklet for what regards ordinary and general maintenance.



Danger:
electrical shock hazard.

BE CAREFUL:

- A** - Work when the canopy is closed.
- B** - Lock the bucket with the safety device during the transport.
- C** - The machine must not work if not connected to the discharge hopper.
- D** - Check that no one is standing too close to the pressure discharge hose.
- E** - Moving parts and hot parts are present inside the canopy.
- F** - The material vessel is under pressure when the material is conveyed.
- G** - The vessel hatchway is fitted with safety device. The safety grill inside can be opened only when the mixer stops.
- H** - Lower the jacklegs in the EB/P version when the machine is in operation.



1 - GENERAL INFORMATION

1.1 - INTRODUCTION

The electric mixing and conveying machine APEMAT 190 can be supplied in 3 versions and with various accessories. As a result, some of the components and parts described in this booklet may not be included with your own equipment.

We have taken special care to clearly illustrate the different variations in order to make it easier for you to distinguish the use and maintenance instructions applicable to your own machine.

Please read these instructions carefully prior to turning on your equipment and follow the instructions carefully.

For whatever other information you might require, TURBOSOL PRODUZIONE S.P.A.'s customer service is at your complete service.

TURBOSOL PRODUZIONE S.P.A.
Via Volta, 1
31030 Pero di Breda di Piave (TV) - ITALIA

Tel. 0039 - 0422 - 90.2.51
Fax 0039 - 0422 - 90.44.08
<http://www.turbosol.it>
e-mail: info@turbosol.it

1.2 - GENERAL INFORMATION

TURBOSOL Machinery

This machinery is the product of our lengthy experience and continuous development. The know-how thus acquired, together with our stringent requirements for high quality, constitutes the basic guarantee for manufacturing low-wearing machinery which offers total reliability at low servicing costs.


Precautions to take when the machine is operating

Maintenance or repair work must be carried out only when the machine is turned off. Whatever safety devices that have been removed in order to complete such work must be mounted again after maintenance has been carried out.

Care and maintenance


Care and maintenance are vitally important in making it possible for the machinery to operate as expected. It is therefore essential that all maintenance be performed on schedule and that all required maintenance be carried out with extreme care.

Safety

 This symbol marks every reference to safety in this booklet, and it must be scrupulously observed.

The personnel in charge must be fully informed about all safety regulations. Safety and accident-prevention regulations currently in effect in your area or country must likewise be observed.

Training

 This symbol indicates that the personnel operating this machinery must have received special training in regard to the correct manner in which such operation must take place.


TURBOSOL SERVICE

For any problem related to trouble with this machinery or when you need spare parts, contact your local TURBOSOL dealer.

2 - DESCRIPTION OF THE MACHINE

2.1 - TYPE OF MACHINE

Manufacturer's registration plate

				
TURBOSOL				
TURBOSOL PRODUZIONE S.P.A.				
VIA MARCHE, 50 - 31030 PERO DI BREDA - TV - ITALIA				
TEL. 0039.0422.90251 - FAX 0039.0422.904408				
E-mail: info@turbosol.it - http://www.turbosol.com/				
SERIE	MODELLO	MATRICOLA N°	ANNO	
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
KG	KW	V	A	Hz
			(A)	(B)

The type of machine **(A)**, its serial number **(B)**, and data on the machine's operating power are printed on the manufacturer's registration plate.

The meaning of the various symbols used is as follows:

(A) = Type of machine : **APEMAT 190 E (B) (/P)**

APEMAT 190 = *Mixing and pumping machine for cementitious screeds*

E = *Electric version*

B = *With loading bucket*

/P = *With scraper*

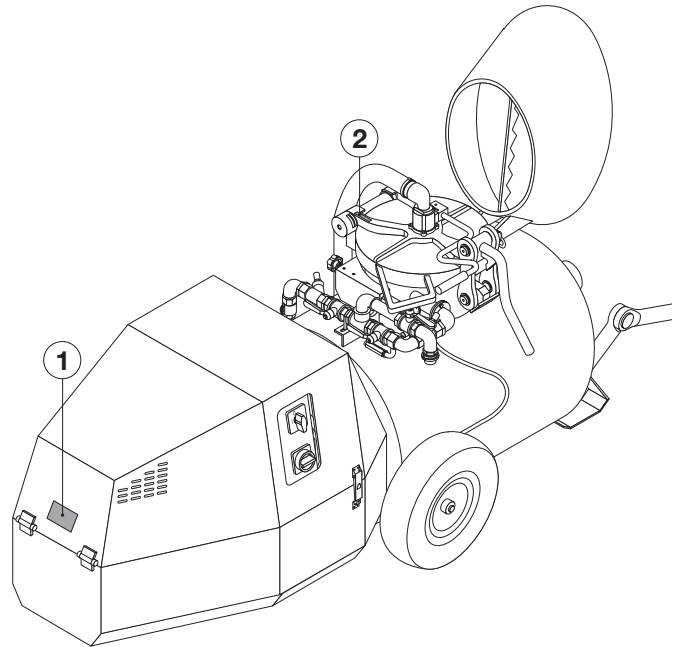
(B) = The machine's serial number: **NNNNN/AA**

NNNNN = *The machine's serial number*

/AA = *The year of manufacture*

Location of the Manufacturer's registration plate

The manufacturer's registration plate **(1)** is attached to the chassis of the machine.



Location of the machine's serial number

The machine's serial number **(2)** is printed on the chassis as well as on the manufacturer's registration plate.

2.2 - DESCRIPTION OF THE MACHINE

The machine is standard fitted with

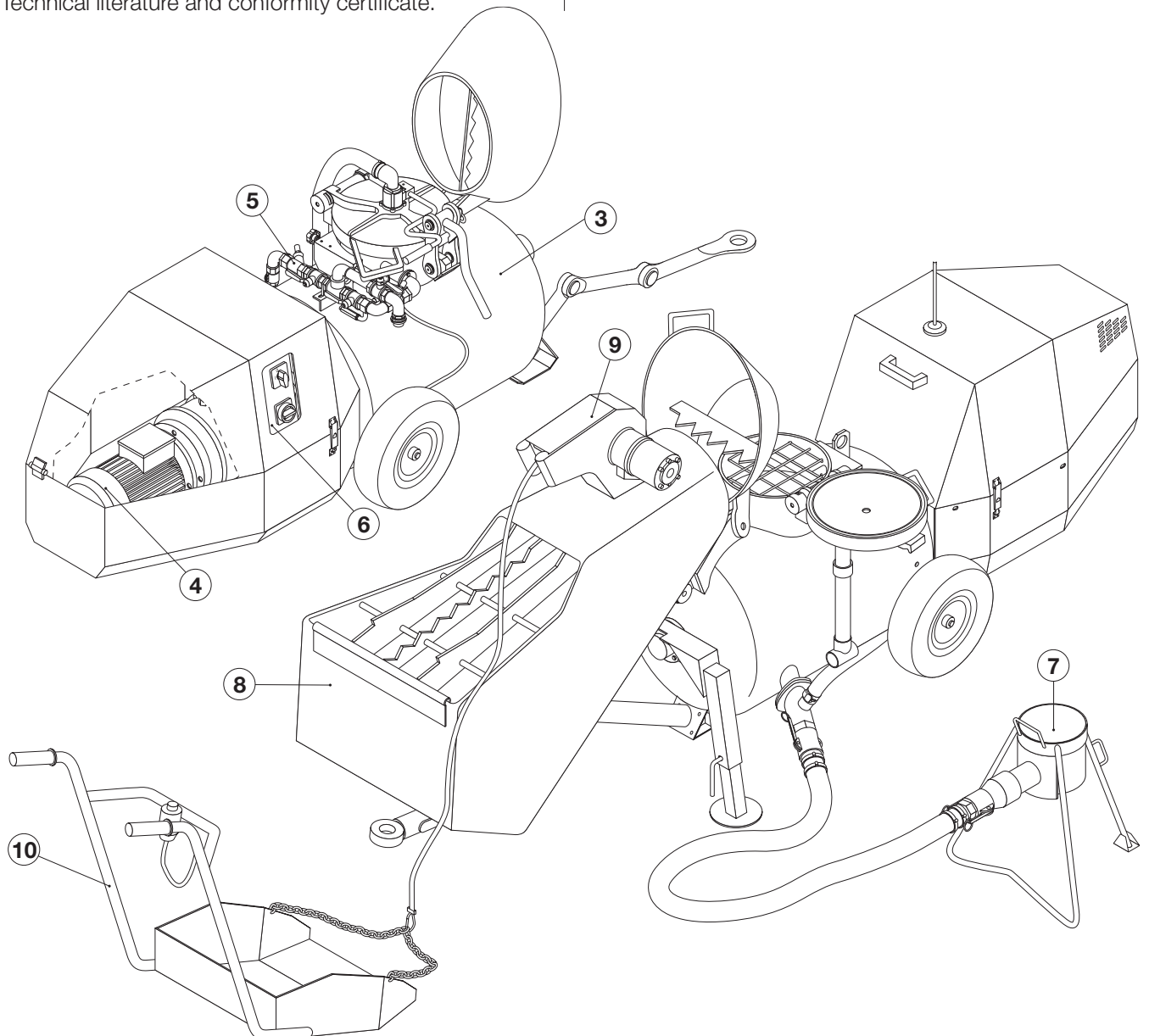
- Protection frame for mechanical parts.
- Pneumatic wheels and articulated towbar.
- Approved pressure vessel with wear-resistant plates .
- Mixer with paddles.
- Delivery collector Ø 50 with cam-lock couplings or Ø 65 Perrot couplings.
- EC approved control board.
- 30 meters (20 + 10) rubber hoses Ø 50 with cam-lock couplings or 30 meters (20 + 10) rubber hoses Ø 65 with Perrot couplings.
- Steel elbow clamp.
- Discharge hopper.
- Loading bucket (*EB version*).
- Skip with cable storage device and scraper (*EB/P version*).
- Accessory box and hose clamp.
- Technical literature and conformity certificate.

Main components

The machine is made up basically of:
a pressurized vessel for the material **(3)**,
an electric motor **(4)**,
a pneumatic system **(5)**,
a switch board **(6)**,
a discharge hopper **(7)**.

And for the version APEMAT 190 EB:
a loading bucket **(8)** with an hydraulic power pack to lift it.

And for the APEMAT EB/P version:
a skip with cable storage device **(9)**
and scraper **(10)** with hydraulic system and radio control
for activating the scraper.



2.3 - SIZES OF THE MACHINE

Here are the machine's sizes and their gross weights (ready for use).

Version APEMAT 190 E

LENGTH	WIDTH	HEIGHT	WEIGHT
1.750 mm	1.020 mm	1.250 mm	390 kg

Version APEMAT 190 EB

LENGTH*	WIDTH	HEIGHT**	WEIGHT
2.930 mm	1.020 mm	2.150 mm	540 kg

Version APEMAT 190 EB/P

LENGTH*	WIDTH	HEIGHT**	WEIGHT
2.930 mm	1.020 mm	2.150 mm	590 kg

* In working position with lowered loading bucket.

** with vertical loading bucket.

2.4 - TECHNICAL DATA

		190 E	190 EB - EB/P
Max. working pressure		6 bar	6 bar
Max. compressor pressure		7 bar	7 bar
Max. vessel pressure		7,2 bar	7,2 bar
Recommended compressor output at 6 bar	min	2.400 - 2.500 l/m'	2.400 - 2.500 l/m'
	max	5.000 l/m'	5.000 l/m'
Feeding tension		230 ± 10% VCA	230 ± 10% VCA
Feeding frequency		50 Hz	50 Hz
Electric motor power		2,2 kW	2,2 + 0,75 kW
Mixer motor absorbed current		12,9 A	12,9 A
Max. short-circuit current		6 kA	6 kA
Oil change gear-box (Agip BLASIA S220 - 0,8 l)		every 1.000 hours	every 1.000 hours
Material vessel capacity		190 l	190 l
Loading bucket capacity		---	200 l
Pressure of loading bucket hydraulic system		---	130 bar
Oil change, hydraulic system (ELF OLNA DS 32 - 6,0 l)		---	every 1.000 hours
Average output x cycle (approximate)		140 - 160 l	140 - 160 l
Delivery distance (with compressor of 2.500 l/m')		70 - 80* m	70 - 80* m
Height delivery (with compressor of 2.500 l/m')		30 - 40* m	30 - 40* m
Rubber hose, material delivery **		Ø 50 x 66	Ø 50 x 66
		Ø 65 x 84	Ø 65 x 84
Max. conveyable granulometry	Ø 50 x 66	0 - 10 mm	0 - 10 mm
	Ø 65 x 84	0 - 15 mm	0 - 15 mm
Temperature in the work environment		to -5° from + 35° C to -5° from + 35° C	
LwA warrantied (90% confidence level, law 2000/14/CE), tested by ISET, Notified Body n° 0865		81 dB(A)#	81 dB(A)#

N.B.: * Maximum distance and height cannot be reached at the same time.

** Use only hoses made specially for this machine.

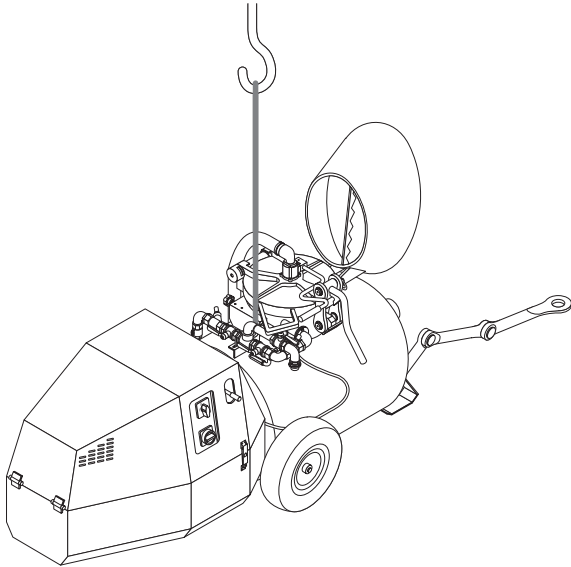
The operator must wear acoustic protection earplugs which guarantee a reduction of at least 20 dB(A).

3 - TRANSPORTING

3.1 - TRANSPORTING

Version 190 E

Connect the cable to the red painted lifting eye, as shown on the drawing.



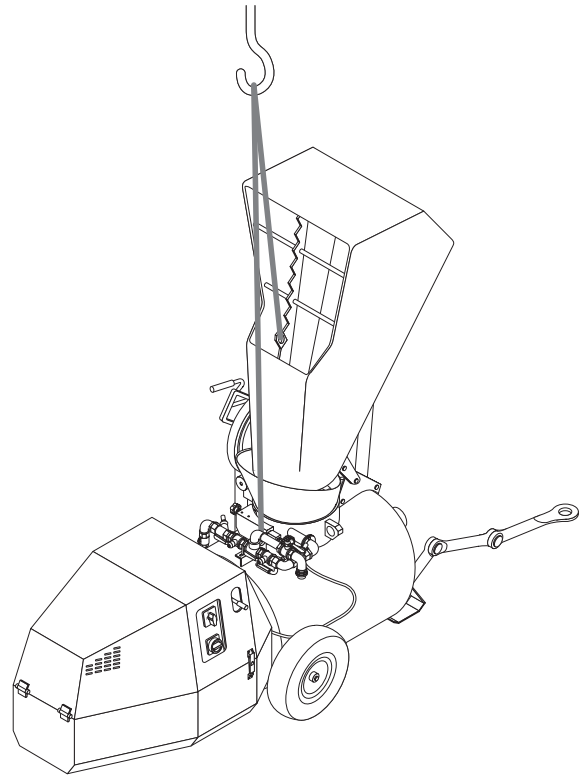
Use only hook and cable that have been tested and approved for lifting 1.000 kg.



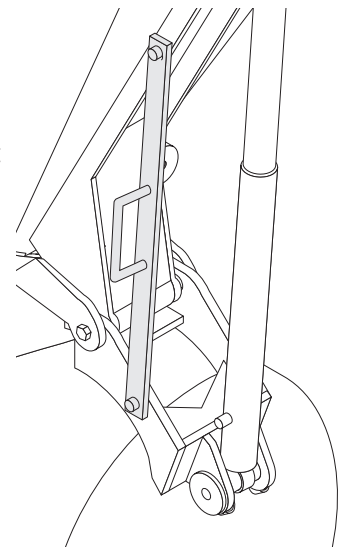
Before lifting up the machine, make certain that no one is standing too close to it.

Version 190 EB - EB/P

Connect the cable to the red painted lifting eyes on the loading bucket and on the vessel.



The loading bucket must be in vertical position and locked with the red painted safety bar.



Use only hook and cable that have been tested and approved for lifting 1.000 kg.

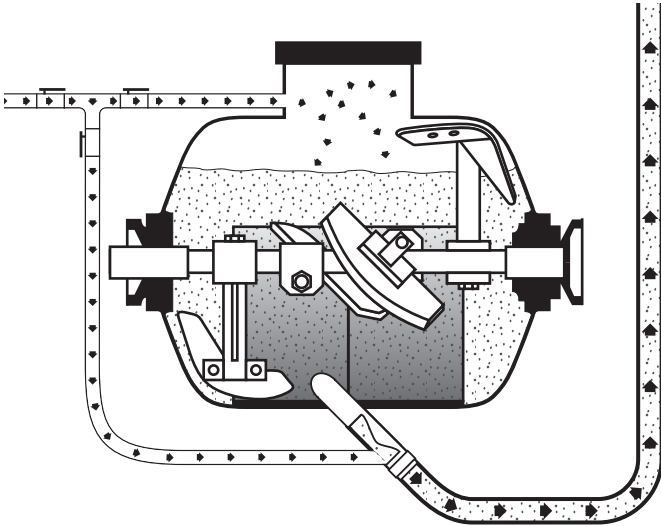


Before lifting up the machine, make certain that no one is standing too close to it.

4 - USE OF THE MACHINE

4.1 - OPERATING PRINCIPLES

The APEMAT 190 EB consists basically of a vessel that has the dual role of mixer and pressurised tank to convey the material. The vessel, lined on the inside with replaceable wear-resistant plates, is to be filled to three-quarters (3/4) height with material (sand, a binder and water) all of which is then evenly stirred by the mixer paddles. Close the hatchway and the pumping begins.



The vessel itself is pressurised through a compressor and the material, pushed through the hose by the paddles towards the outlet collector, is conveyed to its point of use.

Air is blown into the outlet collector to create “air plugs” and thus facilitate delivery of the material.

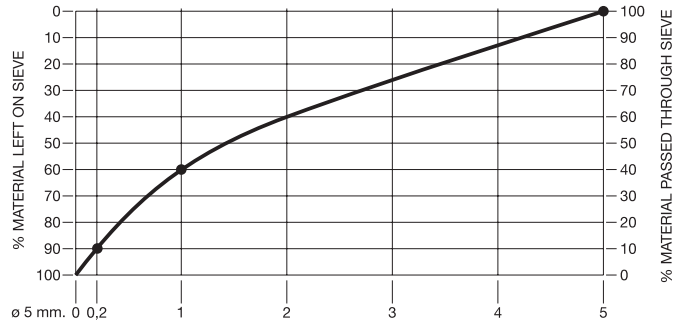
The work cycle stops and starts: a loading phase is followed by a delivery phase.

The use of the bucket, filled by the operator during the conveying phase, allows for a significant reduction in the time needed for loading.

4.2 - PUMPABLE MATERIALS

These are some basic suggestions on how preparing the mixes to convey with APEMAT 190 E:

- Sand has to be in granulometric curve::



Use, for instance, sand with granulometry : 1/3 from 0 to 1 mm;
1/3 from 1 to 4 mm;
1/3 from 4 to 8 mm.

- **The sand must be washed::**

the fine-grain portion, with a granulometry less than 0,25mm, must not be greater than 10%;
for a batch of 150l., one normally uses 25 kg. (half bag) of cement.

- The water/cement ratio must not be greater than $0,4 \div 0,5$: this means using $6 \div 10$ l. of water for each batch, according to the quantity of cement and the dampness of the sand.

Applications

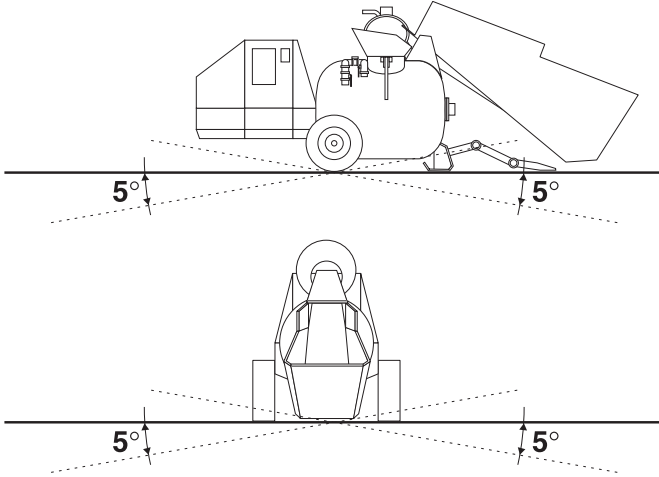
APEMAT 190 E is suitable to work with many types of materials:

- Mixing and pumping of screeds.
- Mixing and pumping of any type of sands, pebbles, etc in granulometric curve, directly to the jobsite.
- Mixing and pumping of expanded clay, polystyrene, perlite, vermiculite, cork, etc.
- Mixing and pumping of brick layer mortar and concrete with granulometry up to 15 mm in accordance with the diameter of the connected hoses.

4.3 - FIRST OPERATIONS

Placing the machine

Place the machine in the most horizontal possible position: the maximum gradient allowed is 5° both lengthwise and sidewise.

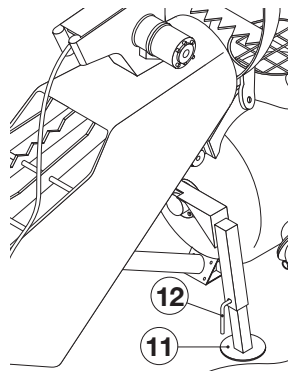


The machine must be placed at that point on the jobsite where you can take best advantage of the hoses' operating range.

Fix the tow-bar that must lay down on the floor. By this way, the machine has a better firmness during the working cycles.



In the version with scraper (EB/P version), lower the jacklegs (11) and fix them with the relative pins (12).



Prepare the necessary material for the cleaning of the machine (water hose, washing sponges, a.s.o.)



Leave at least 80 cm. of clear space around the machine and set up a working area free of holes and dangerously protruding edges.

Electrical connection

Connect the machine to the site electric control panel by means of a neoprene cable (scratch-resistant rubber) labelled HO7 RN-F and having a minimum section:

- 3 x 4 mm. for distances of up to 20 m;
- 3 x 6 mm. for distances of up to 50 m;
- 3 x 10 mm. for distances of up to 100 m.

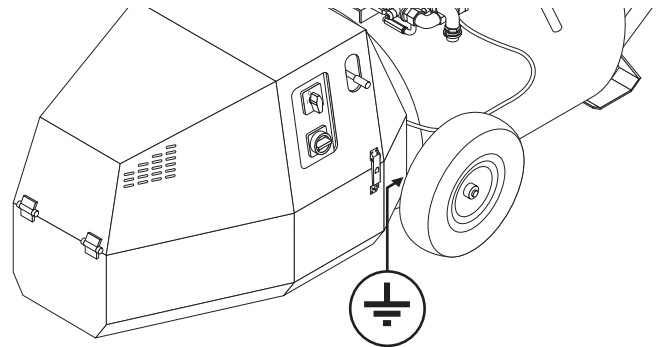


If a cable of inadequate section is used, the machine does not work properly.

The jobsite's electrical system must have:

- a minimum operating power of 3,3 kW,
- be properly grounded ,
- 16A fuses (type Am),
- highly sensitive differentials (30 mA),
- no matter what - must meet all the regulations currently in effect in the country where the machine is being used.

Connect the machine's ground terminal to the control panel's ground post by means of a cable having a section never lower than 16 mm².



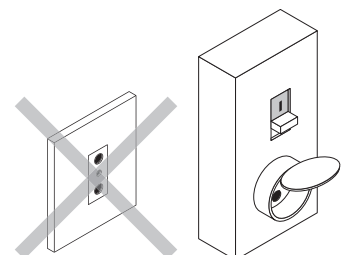
The machine may also be operated with the 3,3 kW power usually available in any home.

In this case, it is compulsory for the electrician to derive an electrical switch board (directly from the meter of the company which supplies the electric energy) with a 16 A socket for industrial uses, fuses of 16A on the socket, highly sensitive differentials (30 mA),

The power issued from the home meter must be used only for the machine.



It is absolutely forbidden to connect the machine to a socket designed for home use.

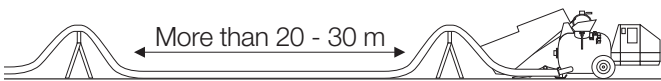


Hoses

Lay the hoses down and limit their extended length as much as possible (thereby shortening transportation and wear time) and check at the same time that they are in good conditions.

If the initial stretch is horizontal, lift that section of the hose closest to the machine (e.g., by making use of a tripod) so as to prevent deposits and air from flowing out freely.

It is recommended to use a second tripod in case of long hoses (more than 20 - 30 m).



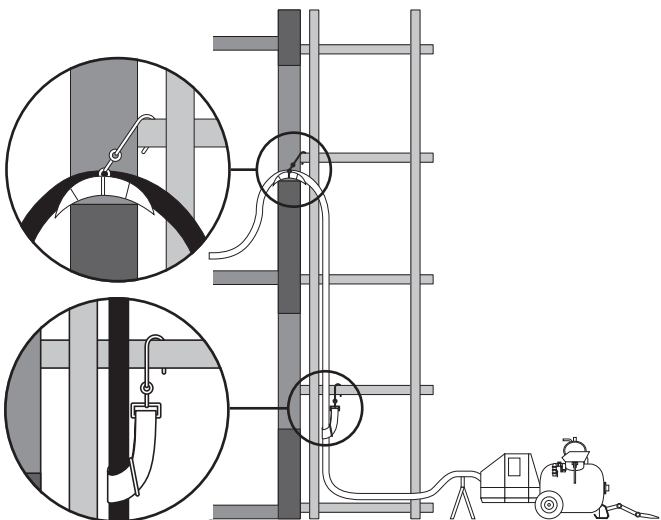
Use only those hoses and coupling devices originally supplied with the machine.

The hoses must be connected by TURBOSOL PRODUZIONE S.P.A. or by firms explicitly authorized by TURBOSOL.

In no case whatsoever shall TURBOSOL PRODUZIONE S.P.A. be held liable for injury or damage to persons or things resulting from the use of non-original hoses or coupling devices.

Anchoring the hoses

The hose line must be properly anchored: use the hose-belt to anchor the vertical portions and the appropriate hose-elbow at the floor.

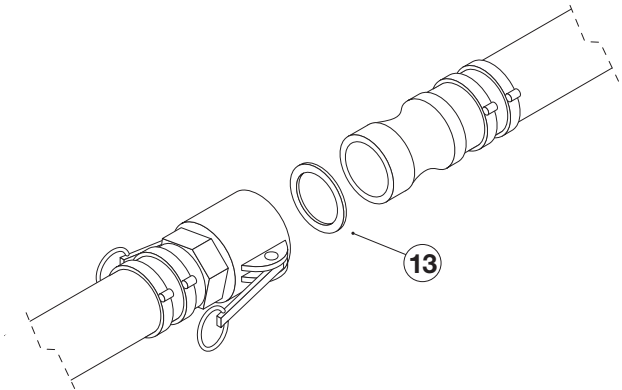


Coupling Devices

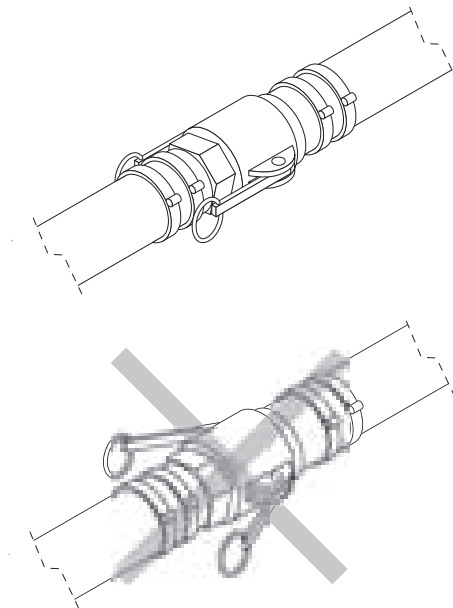
Check to be certain that the coupling devices are clean and in good working order.

• Cam-lock couplings

When you connect the hoses, check that the rubber ring (13) is mounted.



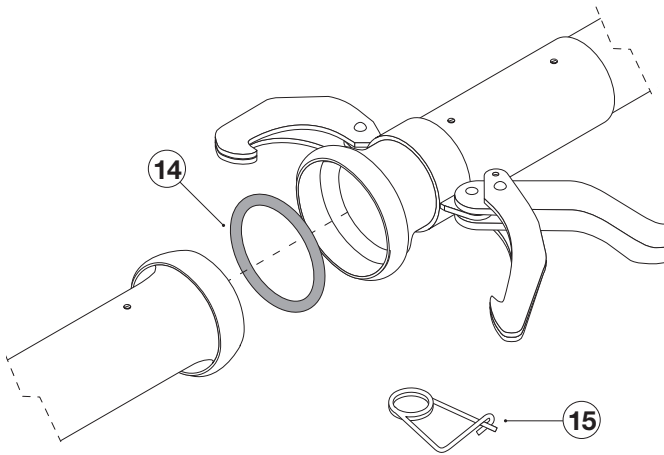
lock the levers tightly.



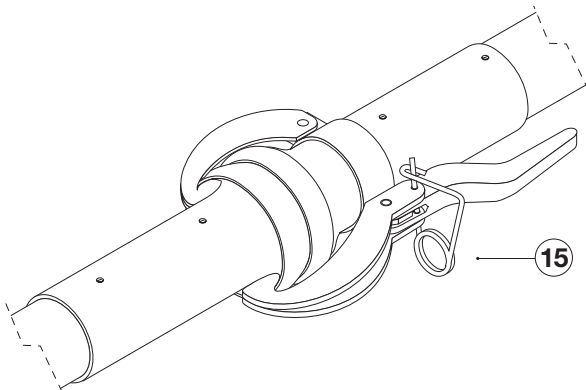
Hoses \varnothing 50 x 66 - length of 10 or 20 meters for max. pumpable granulometry of 0 - 10 mm.

• **Perrot couplings**

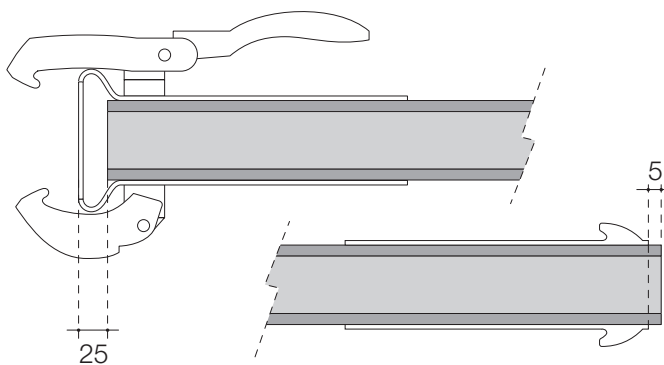
When you connect the hoses, check that the rubber ring (14) is mounted.



lock the levers tightly with the safety stop (15).



If you have to replace the rubber hoses, connect the new ones abiding by the measures given on the drawing underbelow.



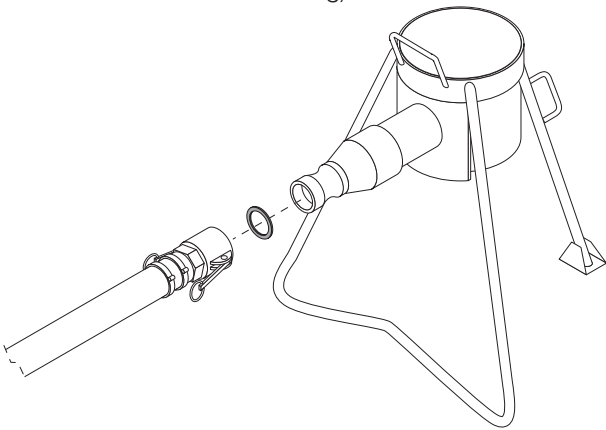
Hoses \varnothing 65 x 84 - length of 10 or 20 meters for max. pumpable granulometry of 0 - 15 mm.

Connections

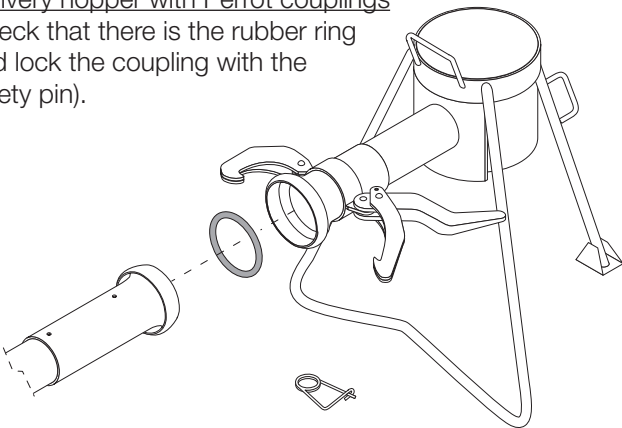
Connect the first part of hose to the delivery collector on the vessel

Connect the delivery hopper to the final part of the hose and place it at the arrival point of the material.

Delivery hopper with cam-lock couplings
(check that there is the rubber ring).



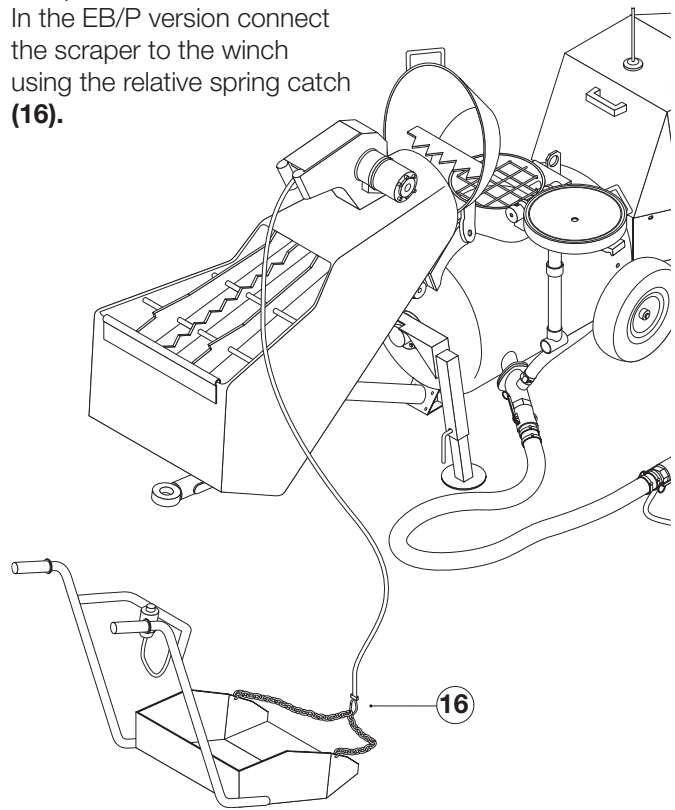
Delivery hopper with Perrot couplings
(check that there is the rubber ring and lock the coupling with the safety pin).



! The machine must not run if the delivery hopper is not connected.
Without delivery hopper when pumping, the hoses movement is uncontrollable and highly dangerous.

Scraper

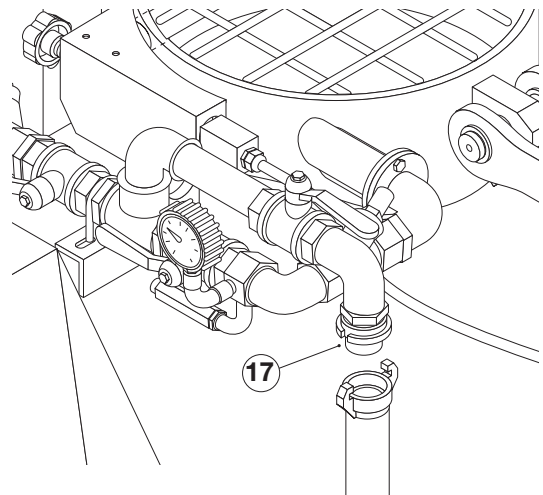
In the EB/P version connect the scraper to the winch using the relative spring catch **(16)**.



Auxiliary compressor

Connect the compressor to the machine **(17)**.

As auxiliary compressor can be used a standard compressor with a minimum output of 2.400 l/min. to a maximum of 5.000 l/min.



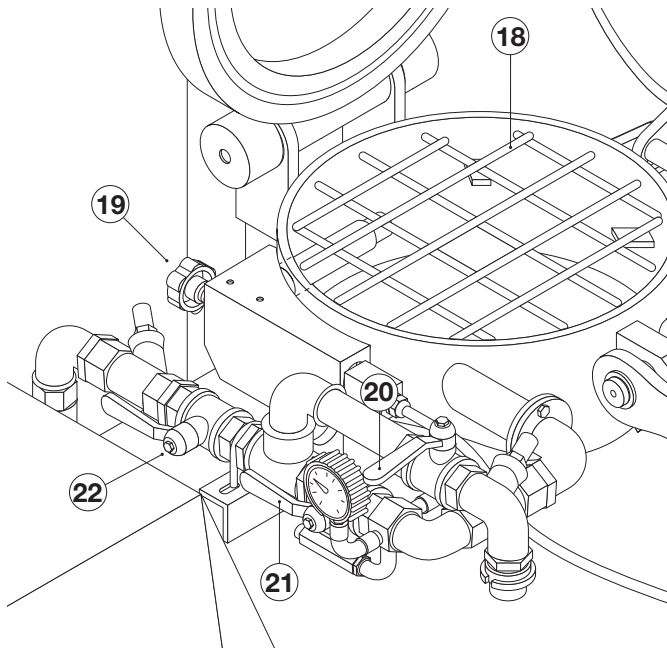


4.4 - OPERATING THE MACHINE

Preventive checks

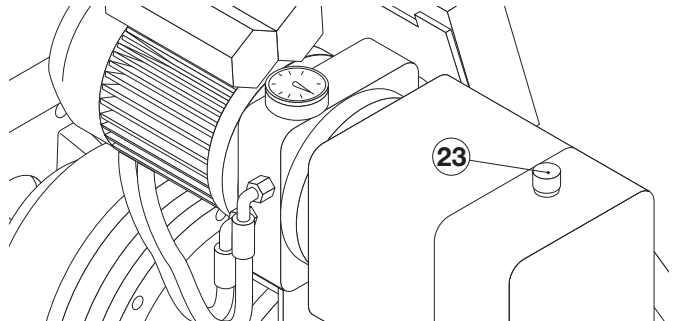
Check as follows:


- Check that the safety grill **(18)** placed on the hatchway of the material vessel is tightly fixed.



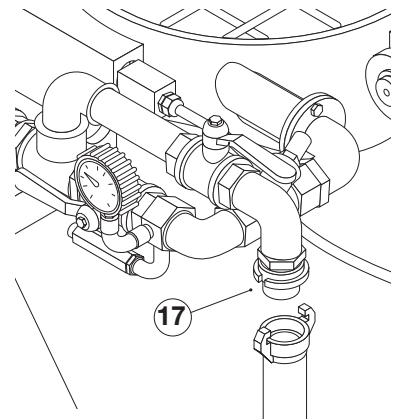
- Check that the locking knob **(19)** of the grill is tightly screwed; otherwise, the safety device connected to the cut-out switch does not allow the starting of the machine.
- Check that the canopy is closed
- Check that the main cock **(20)** is closed and that the service cocks **(21-22)** are open, as shown

- Check the oil level of the loading bucket hydraulic system **(23)** version *EB*
To fill up use: **ELF OLNA DS32**





 Check oil level and eventually fill up with lowered loading bucket .

- Connect the compressor to the machine **(17)**.
As auxiliary compressor can be used a standard compressor with a minimum output of 2400 l/min. to a maximum of 5000 l/min.
For the connection, use a hose with dia. 25 mm and max. length of 15 m.



- Connect the cable of the site switch board to the socket placed under the switch board of the machine.

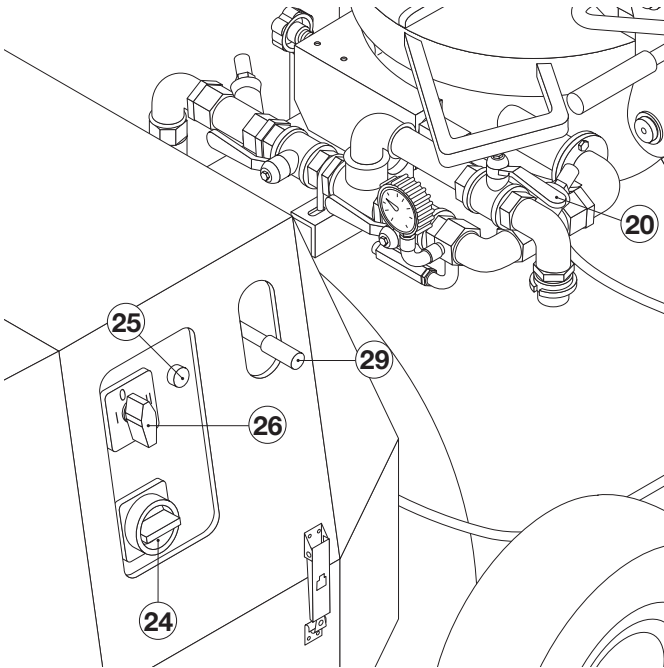
 After completing maintenance or repair work, make sure that all the safety devices have been put back in place and that no tools have been left inside the canopy or the material vessel.

 Before turning the machine on, make certain that no one is standing too close to it i.e., everyone should be at least one (1) meter away or out of the bucket's or loading paddle's operating range.

 Before turning the machine on, it is compulsory to do the ground connections.

Starting the machine

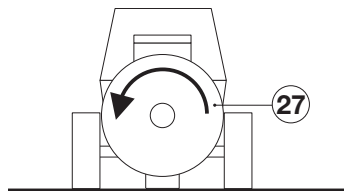
Start the machine by turning the main switch **(24)** (red knob on a yellow background) to position 1: the blue lamp lights **(25)** displaying the running of the tension limiter. When the feeding voltage is correct, the lamp lights.



If the lamp goes out during the starting, it means that the voltage is not sufficient. Check the feeding line (cable section and site switch board).

On the version with loading bucket (EB), the main switch **(24)** controls the hydraulic power pack too.

Turn now the start switch **(26)** to position 1: During the pumping, check that the electric motor is spinning as indicated by the arrow **(27)**.

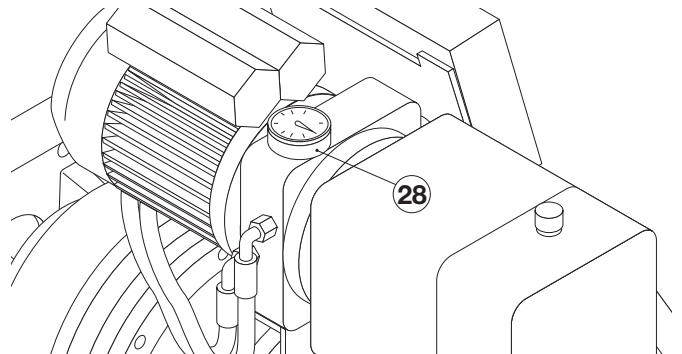


! If a mixer jamming in the vessel happens, the reversing of the rotation has to be done when the motor (and the mixer too) is switched off by turning the start switch **(26)** to position 2.

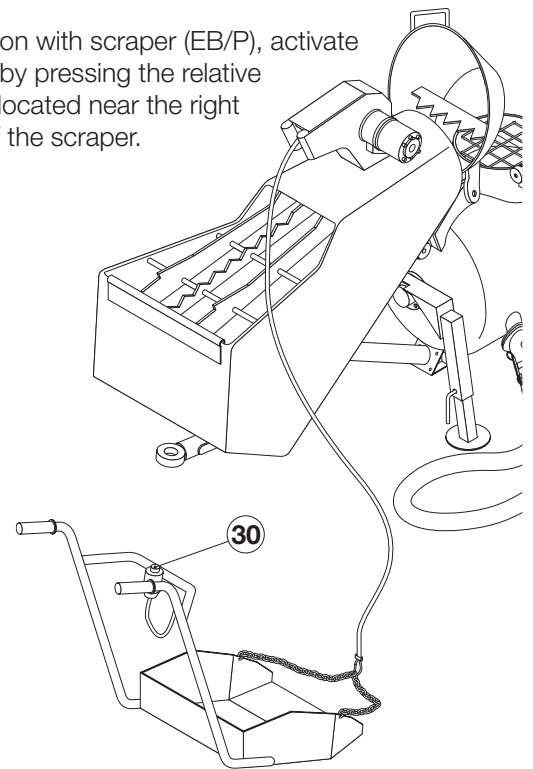
Check that the auxiliary compressor works correctly: open and close the main cock **(20)** a few times.

On the version with loading bucket, check the pressure of the pneumatic system on the gauge **(28)** inside the canopy by lifting the loading bucket up to, with the lever **(29)**, the end of its stroke.

The right pressure is 130 bar.



On the version with scraper (EB/P), activate the scraper by pressing the relative button **(30)** located near the right hand grip of the scraper.



! Use nitrile gloves to protect yourself against cuts and scratches, preferably models having a CE 940072 certification.

Loading of the material

The mix must be semi-dry



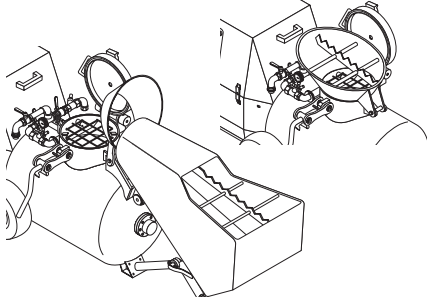
The safety grill must be well mounted and locked.

Prepare the mix as follows:

- Start the mixer by using the switch **(26)** on the switch board (position 1).

- Tilt the manual-loading funnel on the hatchway (*E version*)

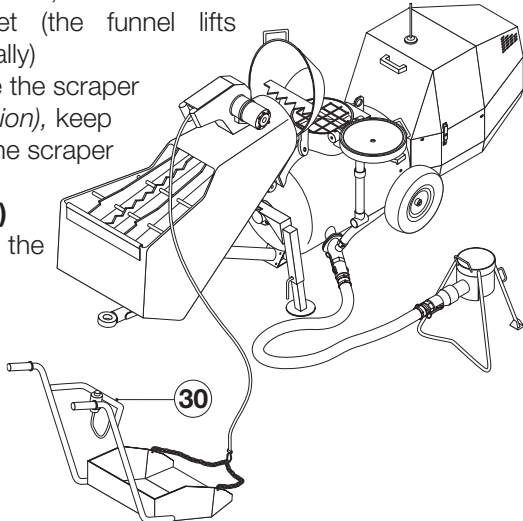
- Place the loading bucket (*EB version*) in position for loading the material;



- Load 50% of the sand, than 100% of the binder (cement), then all the water and finally the remaining 50% of sand. For the version with loading bucket (*EB version*), the material is loaded into the loading bucket; then trough the lever for the loading bucket control, start to unload the material into the vessel.

When the bucket is half loaded, put all the water directly into the bucket, then finish to load the material and lower the bucket (the funnel lifts automatically)

To activate the scraper (*EB/P version*), keep pressing the scraper operation button **(30)** located on the scraper.



To get a mix that is both better and quicker, fill the tank to 3/4 (150 l).

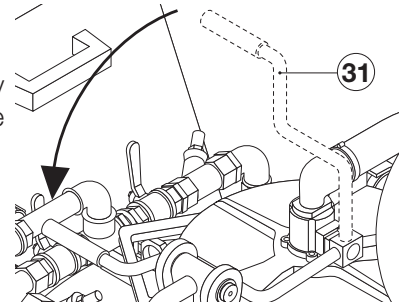
- Lift the hopper for the manual loading (*E version*)

- Clean the edge of the hatchway in order to make sure that the seal will not leak.



Use nitrile gloves for protection against cuts and scratches, preferably gloves having CE 94 0072 certification.

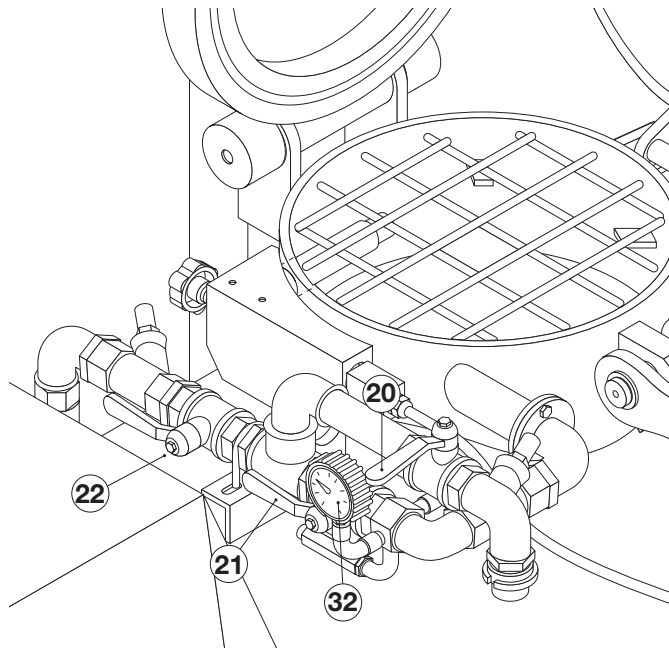
- Close the hatchway and cock by using the safety lever **(31)**.



Pumping cycles

During the first pumping cycles, it is necessary to find the correct position of the cocks which regulate the flow of air to the material vessel and to the material outlet collector:

Completely open the main control cock **(20)**



Open to 3/4 the cock **(22)** which regulates the air flow to the material outlet collector and open 1/4 of the way the cock **(21)** which regulates the air flow to the material vessel.

Check that the gauge displays a working pressure **(32)** that goes from a minimum of 3,5 to a maximum of 5,5 bar.

It is advisable to start with more air in the delivery collector than into the vessel

Once the correct setting has been found, it is usually no longer necessary to regulate the cocks because will simply use the main control cock **(20)**.

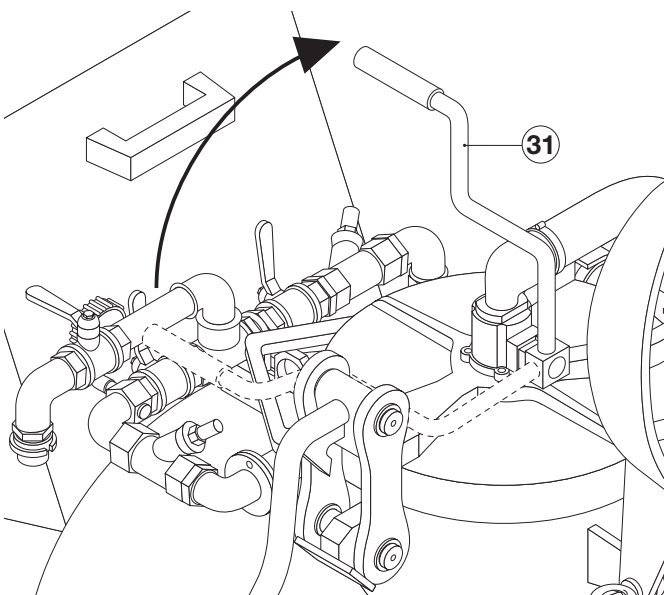
GENERAL RULE: If the pumping pressure increases, gradually open the cock **(22)** that regulates the flow of air to the material outlet collector; if the pressure goes down, close that cock gradually but never completely and open gradually the cock **(21)** that sets the flow of air to the vessel.

With mixes as concrete, mortar etc, it is compulsory to give more air in the vessel than in the delivery collector hose.

The conveying of the material is finished when the air pressure shown on the gauge **(32)** in the material vessel drops below one 1 bar.

At this point:

- Close the main control cock **(20)**;
- Wait for the pressure to drop below 0.3 bar;
- Use the safety lever **(31)** to open the lid;

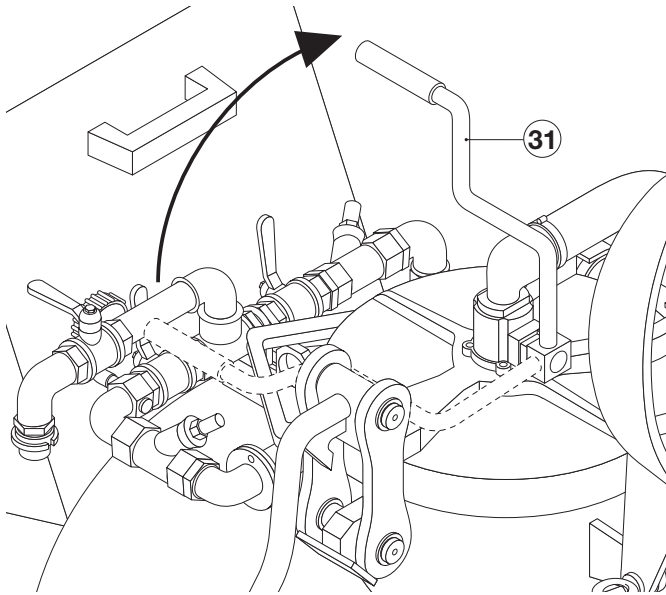


- Wait for the pressure to drop to 0 bar;
- Open the hatchway;
- Begin a new loading cycle.

4.5 - 4.5 WASHING THE MACHINE AT THE END OF WORK

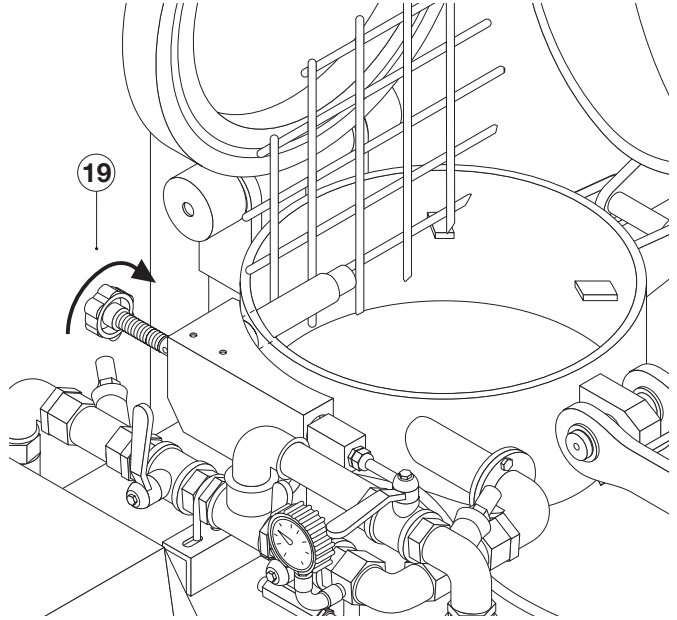
Once the last batch has been pumped, stop the mixer by turning the start switch (26) to position 0 .

- Open the cock with the safety lever (31);



- Wait for the pressure to drop to 0 bar.
- Open the hatchway.

- Unlock the safety grill by turning counter clockwise the knob (19) up to the end in order to open the grill.



The **safety device provided** is such that the shut down turns the main switch (24) to position 0. In that way, **the grill opens only when the mixer has completely stopped.**



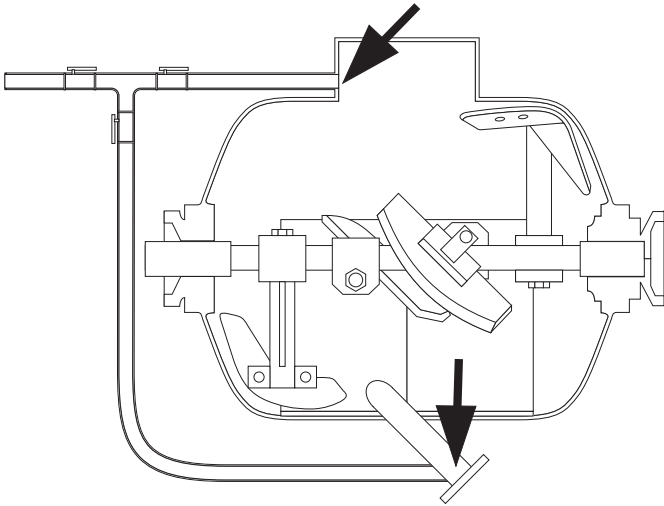
Before loosening a coupling on the material delivery hose, check to be certain that the main control cock is turned to position 0, that the cock with a safety lever is open, that the pressure gauge in the material tank shows a pressure of 0 (zero) bar and that there is no pressure inside the hoses.



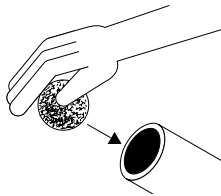
The operator must be carefully trained before doing this operation. Before the opening of a coupling, check that there is no pressure inside the hoses and that no one stands too close to the hoses. This operation, that could be dangerous, must be carefully carried on by qualified personnel.

- Disconnect the material delivery hose wash the machine with water inside and outside.
- Let the water flow out from the discharge collector.

- With a steady stream of water or better with an high pressure pump, wash the vessel internally and wash the hatchway as well the air delivery collector outlet.



- Insert a suitable washing sponge into the front end of the material delivery hose and connect the hose to the machine.



- Pour two or three buckets full of water into the material vessel and then pump that water out as you would in a normal pumping cycle.

To start the mixer again, you have to:

Close the grill, turn the knob **(19)** clockwise up to the end of its stroke to have the contact with the micro-switch (otherwise, the shut down switch does not lock), close the hatchway and the cock with the safety lever **(31)**.

Repeat this operation until you are certain that the hoses are completely clean.

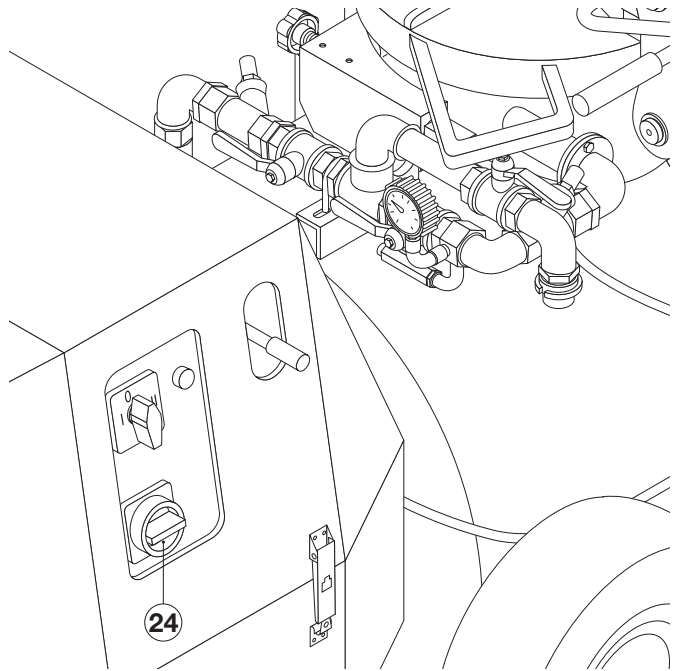


Never disconnect the delivery hopper until the washing of the material delivery hoses has been completed.



Never place your hand or a tool inside the delivery collector unless the motor is turned off.

- Arrestare la macchina portando in posizione 0 (zero) l'interruttore principale **(24)**.



Disconnect the air delivery hose from the material delivery collector and check to see that it is clean.

Check that the vessel inlet is clean.

4.6 - IMPORTANT POINTS

Using the material

Use only material that has been sieved. The safety hatch has a mesh that blocks only larger-sized pieces (and for practical reasons, a smaller mesh cannot be used); as a result, large-grain sand and pebbles might pass into the mix and cause obstruction at the vessel's outlet.

If hard pellets 1 or 2 cm. in diameter come out of the slide, it means that less water must be used with the material.

Never interrupt a delivery cycle halfway.

Connections



Before loosening a coupling on the material delivery hose, check to be certain that the main control cock is turned to position 0, that the cock with a safety lever is open, that the pressure gauge in the material tank shows a pressure of 0 (zero) bar



Before disconnecting the delivery hopper, check to be certain that the main control cock is turned to position 0 (zero), that the cock with a safety lever is open, that the pressure gauge in the material vessel shows a pressure of zero (0) and that there is no pressure inside the hoses.



The operator must be carefully trained before doing this operation.


Before the opening of a coupling, check that there is no pressure inside the hoses and that no one stands too close to the hoses.

This operation, that could be dangerous, must be carefully carried on by qualified personnel.



5 - MAINTENANCE OF THE MACHINE

5.1 - OPERATIONS FOR WHICH THE OPERATOR IS RESPONSIBLE

 Listed here below is the essential information needed for proper maintenance of this machine. The machine's operator must read those data before beginning to operate the machine.

Operations to be carried out daily

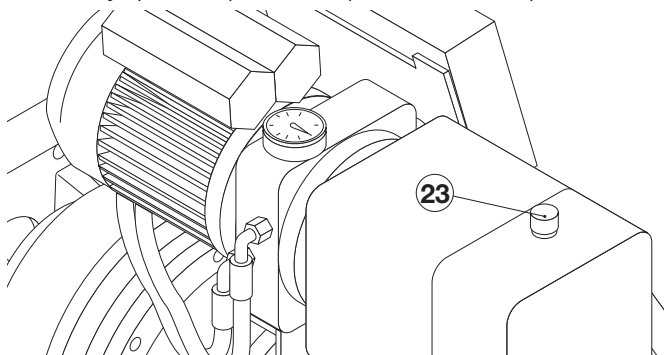
At the beginning of the work

• Check the oil level of the hydraulic system

(EB version)

Check the oil level of the tank **(23)** with the loading bucket in lowered position. If the oil level is not constant, check where the leak is and correct it.

Have only qualified personnel perform such repair work.



To refill use oil **ELF OLNA DS32**

At the end of the work:

Preventive care

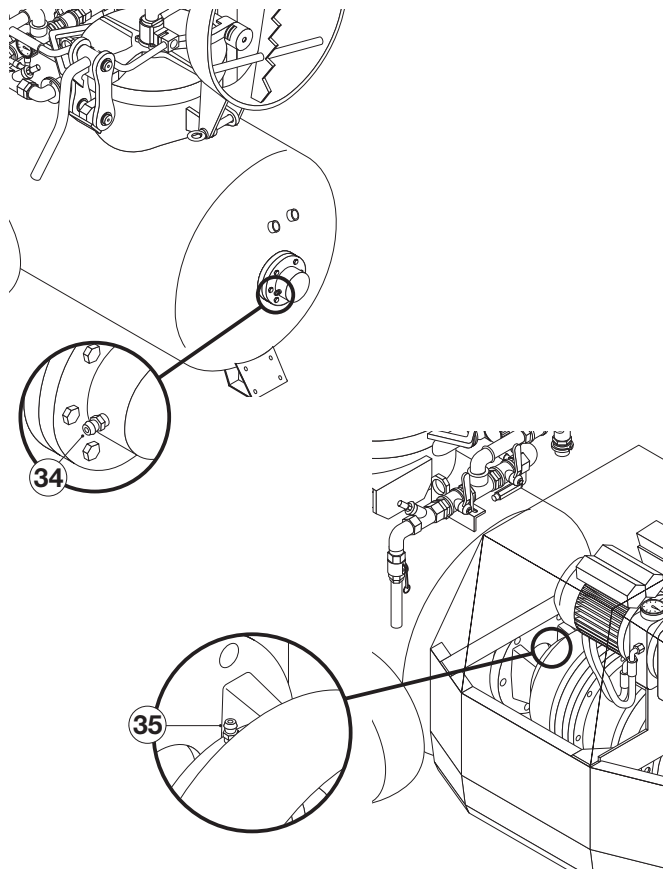
Once work has finished, it is advisable to spray demoulding liquid on the machine.

Grease

• Mixer

With the machine running, lubricate the mixer supports **(34)** and **(35)** by using the grease pump provided.

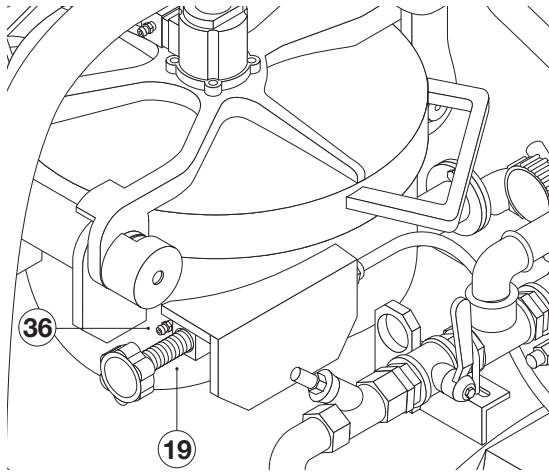
To make sure this operation has been carried out correctly, check to be sure that grease has flowed out inside the material vessel.



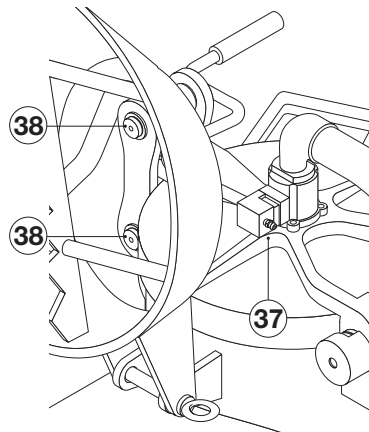
If you forget to perform this maintenance, the seals and supports will wear out in a few days' time (and you will note an outflow of slurry mixed with air).

At this point, you must immediately replace worn-out seals and supports, or else the chrome coating on the mixer shaft will be damaged.

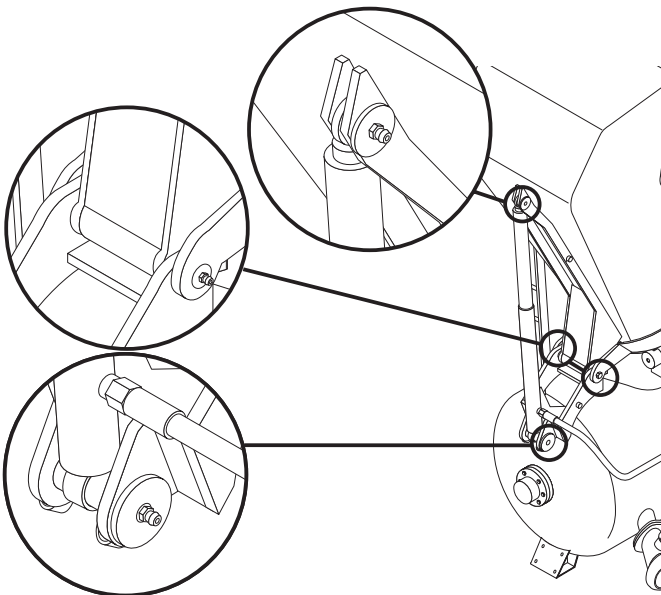
- Thread of the safety cap (19)
- Hinge of the safety grill (36)



- Cock of the safety lever (37)
- Pins of the connection plates (38)



- Loading bucket (EB version)
Grease the 4 loading bucket greasing points.



5.2 - MAINTENANCE WORK TO BE PERFORMED BY QUALIFIED PERSONNEL

Operations to be performed every 250 hours

• Mixer paddles

Check the wear-and-tear on the mixer paddles: if necessary, fine-tune their position so that the paddles are no more than 15 mm from the pressure vessel inner walls. If the paddles are worn down, replace them.

• Wear plates

Check the wear-and-tear on the material vessel's wear plates. If you find deep nicks or cuts so deep as to compromise the plates functional efficiency, have them replaced immediately.

In any case, the plate must be changed before it wears down excessively.



If the material vessel's wear plates are not replaced in due time and the vessel's lower wall becomes deeply nicked or scored (with holes in the plating), the material vessel will no longer be fit for use and will have to be replaced.

• Delivery collector

Check the wear-and tear on the material delivery collector and, if necessary, change it.

• Checks

Check to be certain the material vessel pressure gauge is working correctly and, if necessary, replace it.

Check the main control cock, the cock regulating the flow of air to the material vessel, the cock with the safety lever, the non-return valves.

• Tubes couplings

Check that the couplings of the hydraulic oil tubes are well screwed (*EB version*).

Operations to be performed every year or every 1.000 hours

- Change the oil reducer: 0,8 liters.
Use mineral oil **AGIP BLASIA S220**
- Change the oil of the hydraulic system.
- Check the wiring system.



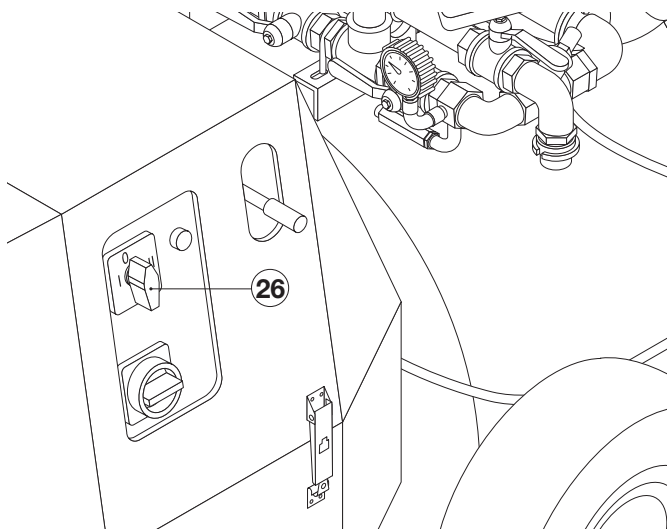
6 - TROUBLE SHOOTING

6.1 - FAULTY MIX

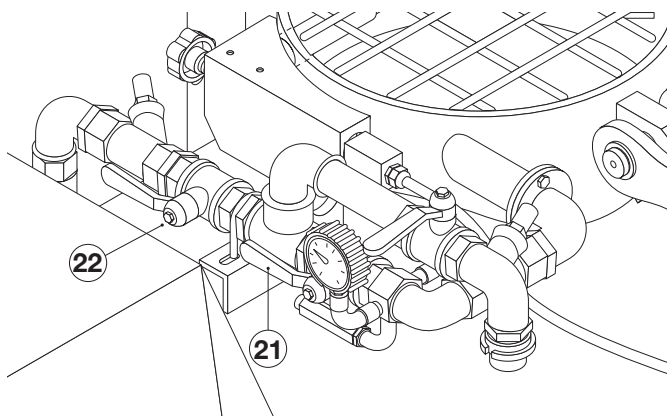
Faulty mix

A faulty mix (see page 12) or mistakes on the setting of the cocks **(21-22)** during the first part may cause a blockage of the material delivery hose: the material does not flow out from the slide and the material vessel pressure gauge indicates always a pressure of 7,0 bar.

In this case, set the start switch **(26)** to position 0, open slowly the cock upon the vessel with the safety lever.



The material vessel pressure lows quickly to zero. Open the hatchway.



Once you have discovered just where the blockage is taking place (and this part of the hose will be especially hard and stiff) shake the hose and maybe even hit it with a hammer until the stiffness disappears, a sign that the obstruction has been resolved.



Never disconnect hoses or delivery hopper, unless you are not completely sure that there is no pressure (0 bar) in hoses and vessel.



The operator must be carefully trained before doing this operation.

Before the opening of a coupling, check that there is no pressure inside the hoses and that no one stands too close to the hoses.

This operation, that could be dangerous, must be carefully carried on by qualified personnel.



Never try to unblock the hoses disconnecting one of them or the delivery hopper.

If you keep having blockages, check the mix and if necessary modify it (see p. 10).

6.2 - WORK TO BE PERFORMED BY THE OPERATOR

PROBLEMS	CAUSES	REMEDIES
Mixer shaft blocked with the material vessel empty	No grease in the supports.	<ul style="list-style-type: none"> • Grease the mixer supports.
	No electrical feeding [blue pilot lamp (25) off]	<ul style="list-style-type: none"> • Check the feeding line.
Mixer shaft blocked with the material vessel not completely full	No electrical feeding [blue pilot lamp (25) off]	<ul style="list-style-type: none"> • Check the feeding line.
	The feeding tension is not sufficient [blue pilot lamp (25) off]	<ul style="list-style-type: none"> • Use a cable with the proper section. • Check the switch board of the site
The loading bucket cannot be raised	No pressure in the hydraulic system	<ul style="list-style-type: none"> • Check the oil level and eventually refill with ELF OLNA DS 32. • Check the setting (130 bar) of the max. valve, lifting the loading bucket up to the end of the stroke.

6.3 - WORK TO BE PERFORMED BY THE QUALIFIED PERSONNEL

For other problems, please contact the qualified after-sales service.

7 - RESPONSIBILITY OF THE OPERATOR

The **PERSON IN CHARGE** of the machinery is responsible for assuring that whoever operates such machinery is well aware of the instructions contained in this use and maintenance manual, and in particular that said operator has received special training in the proper execution of those operations marked in the manual by the following symbol:



The warranty offered by the manufacturer becomes null and void if this machinery is not used in accordance with the instructions in this manual. In addition, this manual must always accompany the machine.

The machine's operator must be thoroughly taught and trained in regard to the operation and use of the machine itself and must sign this use and maintenance manual on the line reading "read and approved". If this procedure is not complied with, the operator is prohibited from using this machine.

Signature of the **PERSON IN CHARGE**

read and approved _____

read and approved _____

read and approved _____

Signature of the **OPERATOR**

read and approved _____

read and approved _____

read and approved _____