



MaterMacc

USE AND MAINTENANCE HANDBOOK

VACUUM PRECISION PLANTER Mod. MSO



Carefully read this Handbook before using the machine



Matermacc S.p.A.
Via Gemona, 18 - 33078 - San Vito al Tagliamento (PN) ITALIA
Telefono 0434/85267 telefax 0434/85517 www.matermacc.it e-mail info@matermacc.it

INTRODUCTION

This manual contains the description of the functioning and the instructions necessary in order to execute the main operations of use, the ordinary and periodic maintenance of the machine correctly.

This handbook is subdivided in chapters that are easily identifiable and consultable.

The indications contained in this handbook are intended for a professional user, who must have specific knowledge of the modalities of use of the machine, must be an authorized person, instructed and opportunely trained.

The use of original accessories and spare parts is recommended. Besides losing the warranty the use of non original spare parts could cause danger and reduce the duration and the performances of the machine.

In case of cession or sale this handbook must be always delivered with to the machine. If damaged or lost a new copy must be requested to the machine Manufacturer or previous owner. The handbook is considered an integrating part of the machine.

COPYRIGHTS

The copyright of this handbook belong to the machine's Manufacturer. This handbook contains texts, drawings and illustration that are technical and cannot be disclosed or transmitted to third parties, in whole or partially, without prior written authorization by the machine's Manufacturer.

INFORMATION ON THE HANDBOOK

This handbook is to be considered and integrating part of the machine and must accompany it if it is resold and until it is demolished.

In case of loss or damaging of this handbook request a new copy to the manufacturing company (insert Manufacturer's name, address and telephone number) or to the Retailer (insert Retailer's name, address and telephone number).

The specific pictograms are inserted on the machine and the operator must ensure that they are kept in perfect state and replaced when illegible.



The presence of this symbol indicates that it is necessary to pay the maximum attention to the topic that is dealt.

The CE Declaration of Conformity is attached to this handbook (if the machine is CE branded).

It is possible that some devices described in the handbook are not present on Your machine, due to the chosen preparation and the market for which the machine is intended.

HANDBOOK UPDATING

The information, descriptions and illustrations in this handbook reflect the state of the machine at the moment of commercialization of the machine.

The Constructor reserves the right to make change, at any time, to the machines for commercial or technical reasons. These alterations do not obligate the Manufacturer to intervene on commercial vehicles sold up to that moment nor to consider this handbook an inadequate publication.

Any integration that the Manufacturer considers opportune to make later will have to be preserved together with this handbook and considered as an integrating part of it.

WARRANTY

- Verify on delivery that the equipment has not been damaged during the transport and that the accessories are integral and complete.
- Any claims must be made in writing within 8 days from reception.
- The warranty against any defect of the materials is valid one year from the delivery date of the machine.
- The warranty does not include shipment expenses (the material travels at risk and danger of the address-see).
- Any damage caused to people or things are excluded from the warranty.
- The warranty is limited to the repair or free replacement of the faulty piece.
- The retailers and the users are not entitled to any indemnification from the manufacturer for any damages (costs for work, transport, defective job, direct or indirect incidents, no profit on harvests, etc).

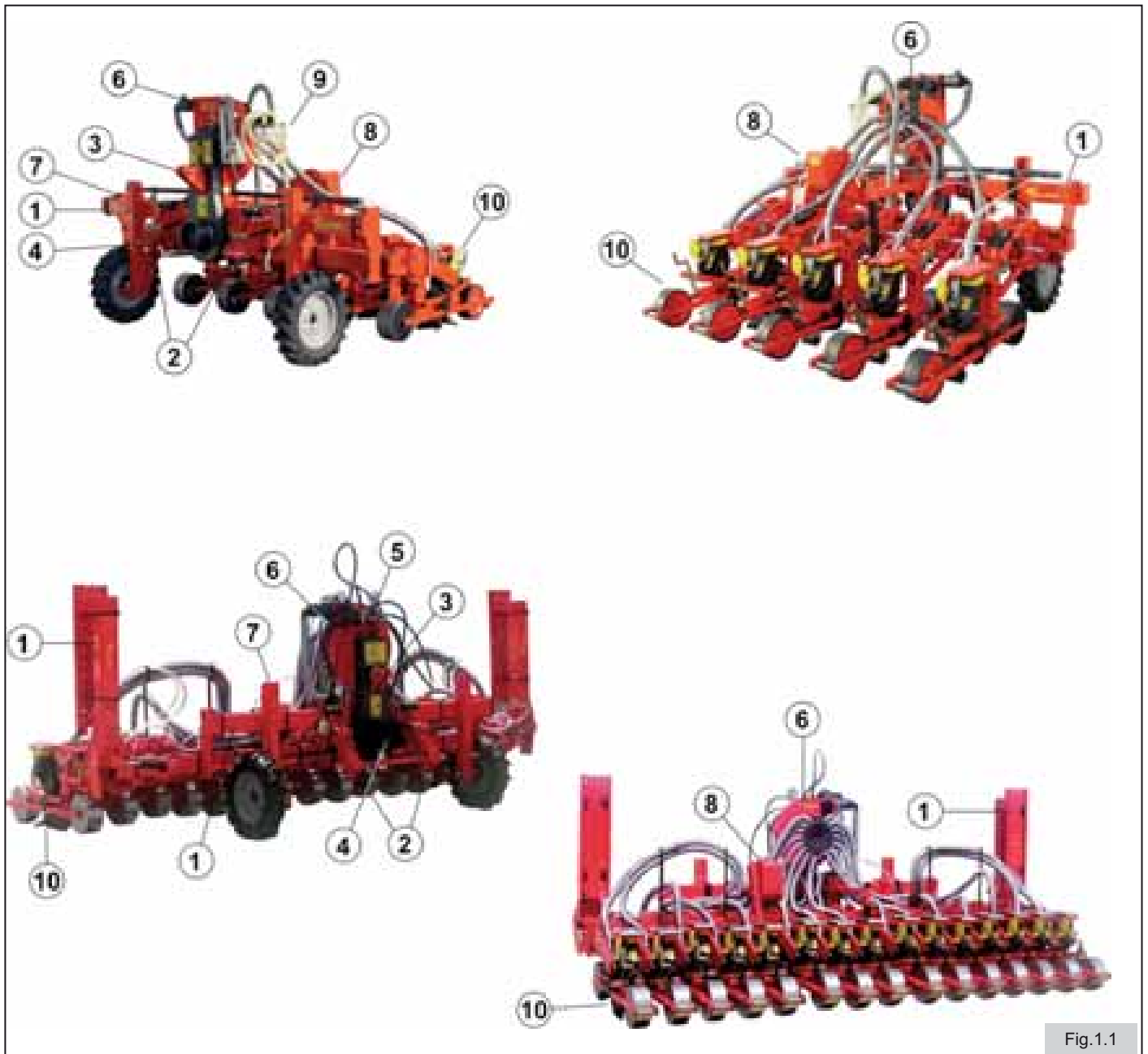
WARRANTY DECLINE

- Besides what is reported in the supply contract the warranty declines:
 - In case the limits referred to in the technical data table or in other tables in the handbook are exceeded.
 - In case the instructions described in this handbook have not been followed carefully.
 - In case of wrong use, faulty maintenance or mistakes made by the client.
 - In case of non original spare parts.
 - The contractual guarantee is not applied if the cited conditions are not respected even only partially.
 - The use of spare parts not approved by the Manufacturer invalidates every guarantee and releases the Manufacturer of Retailer from every liability due to malfunctioning or incidents.
 - The removal or modification of the shelters and protections releases the Manufacturer from every liability due to damages to things and/or people.
 - However, the Manufacturing Company is available to assure an immediate and accurate technical attendance and all that can be necessary for the better functioning maximum production of the equipment.
-

INDEX**INTRODUCTION****COPYRIGHTS****INFORMATION ON THE HANDBOOK****HANDBOOK UPDATING****WARRANTY****WARRANTY DECLINE**

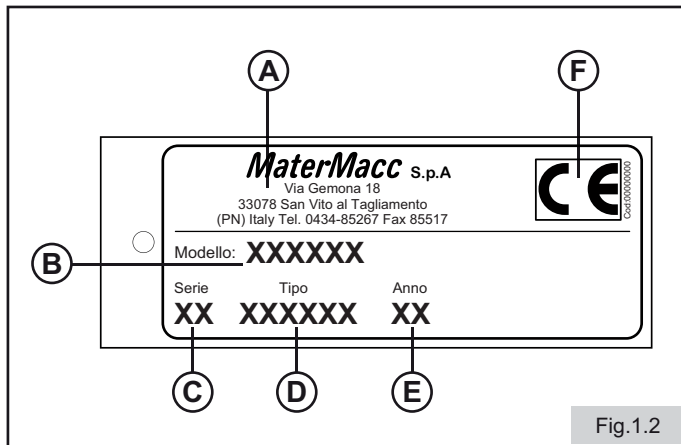
1 Identification of the machine.....	1-01
1.1 Identification data.....	1-02
1.2 Information on machine.....	1-02
1.3 Technical da.....	1-03
1.4 Storage.....	1-04
1.5 First use or restart after o long period of inactivity.....	1-04
1.6 Scrapping.....	1-05
1.7 Safety regulations and accident preventing.....	1-05
1.8 Safety signs.....	1-08
2 Movement and transport.....	2-01
3 Driving on a public street.....	3-01
4 Functioning of the machine.....	4-01
4.1 Controls.....	4-01
4.2 Visibility.....	4-01
5 Use of machine.....	5-01
5.1 Connection of machine to the tractor.....	5-01
5.2 Machine start-up.....	5-02

5.4 Hydraulic connections.....	5-04
5.5 Main frame.....	5-05
5.6 Machine start-up.....	5-14
5.7 Tank supplying.....	5-14
5.8 Collection of seed residues.....	5-14
5.9 Sowing.....	5-15
5.10 Moving away from the machine.....	5-16
6 Regulation.....	6-01
6.1 Suction adjustment.....	6-01
6.2 Adjustment of the pneumatic seed releasing.....	6-03
6.3 Adjustment element.....	6-04
6.4 Setting the sowing interval.....	6-14
7 Maintenance.....	7-01
7.1 Maintenance interventions.....	7-01
7.2 Interventions frequency.....	7-03
7.3 Spare parts.....	7-04

1 IDENTIFICATION OF THE MACHINE

Fig.1.1

- 1) = Main frame
- 2) = I and II point
- 3) = III point
- 4) = PTO
- 5) = Hydraulic connections
- 6) = Vacuum pump
- 7) = Adjustable wheel stand
- 8) = Gear box
- 9) = Seed tank
- 10) = Planting unit

1.1 IDENTIFICATION DATA



Every single machine is equipped with an identification plate (Fig. 1.3), containing the following data:

- A) Name, company name and address of the manufacturer.
- B) Machine model.
- C) Machine type.
- D) Machine serial nr.
- E) Year of manufacture.
- F) CE Imprinting.

1.2 INFORMATION ON MACHINE

1.2.1 PROVIDED USES

The machine can operate only by means of tractor supplied with a lifting group and a universal three-points connection.

It is suitable generally for the seeding of Swiss chards and vegetables in general, etc

The seeds are distributed continuously and deposited in the land by means of plowers with hay-cutters or disc units.

The amounts to distribute are regulated through a gear that derives its motion from the movement of the wheel by traction.

This agricultural equipment can operate through a cardan shaft or hydraulic power take-off (optional) applied to the power take-off of an agricultural tractor.

The machine has been planned and built in order to operate in open air, so the performances are not conditioned by atmospheric agents.



Every use of the machine different from that indicated above is to be considered non-authorized and dangerous.

1.3 TECHNICAL DATA

Hereafter the data related to the various models of MSO sowers are reported.

MODEL	N° of rows	Version	Weight		Power required	Capacity	
			base	fertil		seed	fertil
			(Kg)		(Hp)	(dmc)	
MSO	2	Rigid Tool Bar 200 cm	380	460	30-50	20	12
	3	Rigid Tool Bar 200 cm	425	505	30-50	30	24
	4	Rigid Tool Bar 200 cm	470	600	30-50	40	24
	5	Rigid Tool Bar 200 cm	515	645	40-60	50	36
	6	Rigid Tool Bar 250 cm	560	740	40-60	60	36
	7	Rigid Tool Bar 300 cm	605	785	60-80	70	48
	8	Rigid Tool Bar 300 cm	650	830	60-80	80	48
	8	Rigid Tool Bar 390 cm	650	830	30-80	80	48
	15	Hydraulic folding Tool Bar 390/560 cm	1250	1380	80-100	150	96
	18	Hydraulic folding Tool Bar 390/560 cm	1390	1870	80-100	180	108

The technical data will not be binding on MATERMACC S.p.A. We reserve the right to modify them without any prior notice.

1.4 NOISE LEVELS

The only noise emitted from the machine that does not depend from the interaction of the machine with external factors, is connected to the depressor.

This noise has been measured and the value of continuous acoustic pressure is above **80 db (A)**.



When the limit of 80 db (A) is exceeded it is mandatory for the operator or anyone who approaches the sowing machine while in function to use suitable protections for the auditory apparatus like, for example, a soundproofed, cabin, earplugs, etc.

1.5 STORAGE

If the machine is stopped for long periods, it is necessary to store it in a place protected from atmospheric agents and protect it in order to avoid damaging.

Before storage it is advised to clean all the machine carefully and lubricate all the mechanical units adequately in order to protect it from rust.

Verify that the storage temperature is comprised between 0 °C and 50 °C.

Before stopping the machine for long periods, it is opportune to operate as follows:

- **wash the equipment with abundant water, in particular the chemical substances tanks, then dry it;**
- **check it carefully and replace any damaged or worn parts;**
- **grease the depressor strap and replace it;**
- **grease all the mechanical units, the blocking hinges;**
- **grease the transmission chains, grease all the transmission chains, use a lubricant over all the non painted parts;**
- **keep the machine in a sheltered area, if possible, on a flat a strong surface;**

- **verify the correct blocking of all nuts and bolts;**
- **protect the equipment with a cloth;**
- **remove the control console from the tractor's cabin.**

1.6 FIRST USE OR RESTART AFTER A LONG PERIOD OF INACTIVITY

Before using the machine for the first time or after along period of inactivity, it is necessary to carry out what follows:

- **verify that the machine has no damaging;**
- **verify the mechanical units that must be in good state and not rusted;**
- **verify the correct functioning of the light bars (if present);**
- **grease carefully all the mobile parts;**
- **verify that not there are leakages of oil coming from connections or pipings;**
- **verify that all the protections are placed correctly;**
- **set the sowing machine into action idly, the flow of air frees the ducts from the presence of condensates and removes any impurity.**

1.7 SCRAPPING

In case of scrapping, the machine will have to be disposed in specific rubbish dumps, in keeping with the enforced legislation.

Before proceeding to the scrapping, it is necessary to separate the plastic or rubber parts.

Recuperate any exhausted oils and dispose them in the appropriate collection centres.



The used oil must be opportunely recuperated and not dispersed in the environment as according to the enforced norms it is classified like dangerous waste and as such it must be sent to the specific collection centres.

For the collection of exhausted oils, it is obligatory to refer to the "Obligatory Consortium of Used Oils".

The parts made up only from plastic material, aluminum, steel, can only be recycled, if collected in the specific centres.

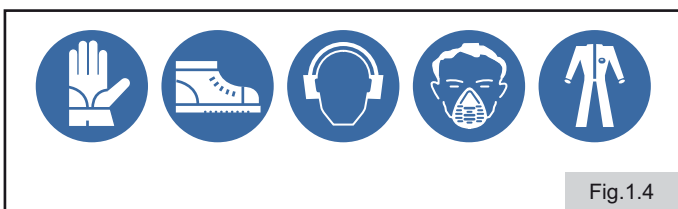
1.8 SAFETY REGULATIONS AND ACCIDENT PREVENTING

A correct use of the machine, the scrupulous observance of the norms listed here and the rigorous application of all the precautions for preventing any situation of danger will avoid danger of incidents or accidents, will make the machine operate better and longer and reduce breakdowns to the minimum.

Matermacc declines any and every objective or subjective responsibility if the behaviour norms referred in the handbook are not applied and respected.

- The machine is not indicated for being used in other sectors apart from that agricultural one.
- The machine must be used from by a single operator driving the tractor.
- A different use from that specified is considered improper.
- The machine must be used exclusively from authorized, instructed staff opportunely trained. The assigned operator, besides having read and assimilated the instructions contained in this handbook, must be sufficiently prepared on the correct use of the machine and must have a driver's license. We remind to refer to the manufacturer in case of doubts on the use of the machine and on the interpretation of this handbook.
- The handbook must be always at reach in order to be able to consult it if needed. Should it be lost or damaged, it is necessary to request the substitutive copy to Matermacc.
- The operator must assess that during the machine's operation no person or animal stops within the operating range of the machine, Never action the machine near people who are close to the operating range (stopping or passing by).
- Do not use the machine if tired, ill or under the effect of alcohol, medicine or drugs.

- This machine is usually used during the day should it be, exceptionally, necessary to use the machine at night or in conditions of reduced visibility the lighting system supplied with the tractor must be used or an auxiliary system of lighting system.
- Any arbitrary modification to this machine releases Matermacc from any responsibility for damages or lesions that can occur to the operators, third parties and things.
- Verify the machine carefully before starting it up.
- Matermacc cannot contemplate every improper use that is unpredictable and can cause a potential risk.
- The signs placed on the machine assure a series of important indications: their observance is necessary for YOUR safety.
- Make sure that all the safety pictograms are readable. Clean them and if necessary replace them with new labels.
- Before using the machine, to make sure that all the safety catches are placed correctly in their place and in good state; in case of breakdowns or damaging to the protections replace them immediately.
- Before descending from the tractor and before every maintenance operation, action the stationing parking brake, turn the engine off, remove the ignition key from the dashboard and to take care of it.
- The staff must use the emergency equipment and the personal protective devices while operating and carrying out maintenance on the machine.
- We recommend the operator assigned to the machine not to wear clothing that could be caught by the machine.
- During the use, the machine could emit dust. It is advised to verify the filters on the cabin ventilation system periodically or use suitable protection systems for the respiratory tracts such as anti-dust masks.
- During use the operator must have sufficient visibility on working areas considered as dangerous, therefore it is opportune to keep the mirrors supplied on the tractor clean and in a perfect state.
- The machine must never be left unguarded while in motion.
- Keep the machine clean from foreign material (debris, tools, various objects), that could damage functioning or cause damages to the operator.
- Avoid operating on muddy or loose soil.
- Verify the wear of the hydraulic tubes. Replace them if deteriorated.
- Do not use the controls or flexible tubes as handles; these components are mobile and do not offer a stable support.
- Any alteration on the machine could cause safety problems. Should this occur the user will be held the only person liable for any accident.
- It is absolutely prohibited to remove or to tamper the safety catches.
- Assess the good conditions of the emergency pictograms. If the pictograms are deteriorated they must be replaced with others original ones requested to the manufacturer and placed in the position indicated in the use and maintenance handbook (paragraph 1.9.2).
- Pay attention to the risk of not intentional contact of the sowing machine's arms with high voltage cables.
- Never use the machine to transport people, animals or objects.



- Attach the machine, as provided, to a tractor that has a suitable power and configuration by means of the appropriate device (lifter), in compliance with the norms.
- The attachment hinges category of the equipment must correspond to that of the lifter attachment.
- Pay attention when operating in areas with the arms lifted.
- Pay the maximum attention during the equipment coupling and uncoupling phases.
- It is absolutely prohibited to stand between the all-purpose tractor and the attachment to manoeuvre the lifting control from outside.
- It is absolutely prohibited to stand between the all-purpose tractor and the machine with the engine on and cardan inserted.
- Do not remove the protection grid inside the loading hopper, in order to avoid risks of possible contacts with mobile elements.
- The application of an additional equipment to the tractor involves a different distribution of the masses on the axles. Therefore it is advisable to add suitable ballasts to the front part of the all-purpose tractor in order to balance the masses on the axles.
- Respect the maximum mass provided for the axles, the mobile mass, the regulation on the transport and the street code.

1.9 SAFETY SIGNS

Assess the good conditions of the emergency pictograms. If the pictograms are deteriorated, they must be replaced with other original ones requested to the manufacturer and placed in the position indicated in the use and maintenance handbook.

Make sure that the emergency pictograms are readable. Clean them using a cloth, water and soap.

1.9.1 COLLOCATION OF THE PICTOGRAMS



Fig.1.5

1.9.2 DESCRIPTION OF THE PICTOGRAMS

ATTENTION the regulation and maintenance operations must be carried out after reading the use and maintenance handbook, with the machine stopped and the key removed.




Fig.1.6

ATTENTION DANGER of fluids under pressure. Read the handbook before intervening and consult a doctor in case of wounds.




Fig.1.7

ATTENTION DANGER of crushing. Do not stop between the traction engine or and the machine.



Fig.1.8

ATTENTION DANGER of crushing. Do not stop between the traction engine or and the machine.




Fig.1.9

ATTENTION DANGER - of chopping of the hands.




Fig.1.10

ATTENTION Prohibited to mount and be transported.



ATTENTION - Kinematic mechanisms in movement. If you approach the machine without the due precautions there is a high risk of accident..



ATTENTION DANGER of catching and dragging. Do not put your hands near the driving shaft in motion.




Fig.1.11

ATTENTION Maximum limit of rpm.

DANGER-of contact with cardan shaft in motion

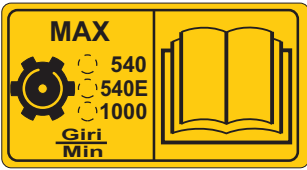


Fig.1.12

ATTENTION DANGER of toxic substances.



ATTENTION DANGER
of falling of suspended parts.



Fig.1.13

ATTENTION NOISY AREA this sign marks the zones of the machine where the noise level can be such to provoke damages to the auditory apparatus. In presence of this, it is mandatory to use protective devices for the auditory apparatus of the type prescribed by the enforced norms.



Fig.1.14

LIFTING POINT



Fig.1.15

ATTENTION Use the required Individual Protection Devices.



Fig.1.16

GREASING POINTS



Fig.1.17

2 MOVEMENT AND TRANSPORT

Pay the maximum attention to safety during the loading and unloading operations that have to be carried out by qualified staff (people assigned to slinging operations and to the carriage, etc.).

In case of lifting the machine, it is obligatory to use of the appropriate lifting points indicated by the pictograms.

A motor vehicle with suitable power and dimensions must be used for the transport of the machine, opportunely predisposed.

Once loaded, the machine must be fixed using anchorage ropes.



Attention to the transmission axles.

In the event that the sowing machine is equipped with a fertilizer spreader and/or micro-granulator make sure that the chain ropes used for the movement do not force the tanks or the transmissions.

3 DRIVING ON A PUBLIC STREET



If it is required to drive on a public street, it is mandatory to strictly respect the Driving Code paying particular attention to the speed.

When driving on the street it is fundamental to respect the driving code of the residing Country.

Any accessory used for the transportation must be equipped with specific signals and adequate protections.

Before starting to drive, install optional lights.

It is mandatory to equip the machine with a yellow or orange flashing light.

Before starting to drive on a public street from a non-paved or dirty surface, it is required to clean the wheels of the tractor carefully from any presence of mud.

When driving on a public street, the machine must be in the transport position and the power socket of the tractor must be unplugged.

The weight of the machine modifies the stability of the combination tractor-sower, influencing the steering ability as well as the breaking ability, it is thus important to proceed with a moderate speed.

In particular, always remember that the front shaft must always be loaded with a weight equal to 20% of the combination tractor-sower.

Verify the lifting ability and the stability of the tractor through the following formula and, if needed, apply the ballasts.

$$I_{F,min} = \frac{(I_R \times (c + d)) - (T_F \times b) + (0,2 \times T_E \times b)}{a + d}$$

Please Note: in the present calculation the accessories mounted on the rear and the combinations front/rear have been taken into consideration.

Example of instructions for the stability of the combination tractor-sower.

Legend

T_E [kg] Weight of unloaded sowing machine. ①

T_F [kg] Load on the front shaft of the unloaded tractor. ①

T_R [kg] Load on the rear shaft of the unloaded tractor. ①

I_R [kg] Combined weight of the equipment carried on the rear/rear ballast. ②

I_F [kg] Combined weight of the equipment carried on the front/front ballast. ②

a [m] Distance between the centre of gravity of the combined equipment carried on the front/fron ballast and the centre of the front shaft. ② ③

b [m] Tractor's wheelbase. ① ③

c [m] Distance between the rear shaft centre and the centre of the lower connection points. ① ③

d [m] Distance between the centre of the lower connection points and the centre of gravity of the combination of the equipment carried on the rear/rear Ballast.

① See the instruction manual of the tractor.

② See the instruction manual of the equipment.

③ To measure.

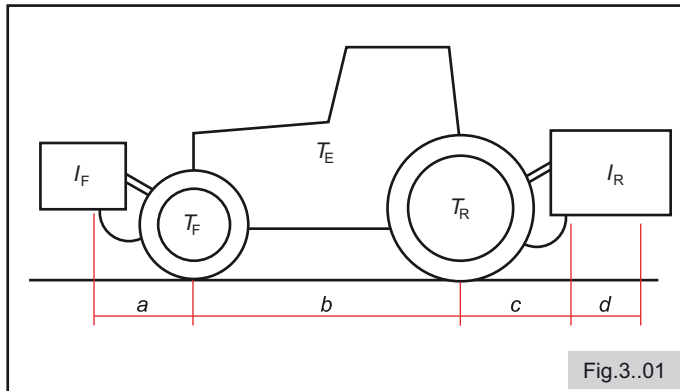


Fig.3..01

- It is very important to remember that the road-holding and the steering and breaking abilities may be influenced, even heavily, from the presence of the of any equipment or bear that is being carried.
- On bends, particular attention must be paid to the centrifugal force on the machine with or without the carried equipment, especially on sloping streets or grounds.
- For the transportation, set and fix the chains of the lifting side arms of the tractor; verify that the lids of the seeds and fertilizer tanks are well sealed; put in block position the lifting lever of the hydraulic lifter.
- All transports on street must be made with empty tanks and with a maximum speed of 25 km/h.
- The transports made outside the working area must be carried out with the equipment in transport position. This also implies that all hydraulic connection must be unplugged from the tractor.
- When the equipment or other bears obstruct the visibility of the lighting disposals or signals, these must be correctly reproduced on the equipment, as regulated in the driving code of the residing Country.

4 FUNCTIONING OF THE MACHINE



Verify that during the work, all of the machine parts function correctly. Please note that most of the accidents and damages are often caused for not tightening up correctly the fixing parts.

- Since during the first period of the machine's life there is a general settlement of all the mechanical parts and of the hydraulic connections, it is fundamental to carry on the inspections on the machine with the maximum precision.
- Before using the machine, verify that no animals or people are standing in or within the working area.
- It is absolutely prohibited to take off and/or modify the protections on the machine.
- Do not use the machine when ill, tired or under the effect of medications, drugs or alcohol.
- Before using the machine, it is fundamental learning the controls panel and their function.
- While opening or closing the folding frame, do not stand for any reason by the machine.
- The machine must be used by a single operator driving the tractor.

4.1 CONTROLS

All the controls are highlighted by the specific signals indicating their function and explaining through pictorials their actions and positions in the cabin.

4.2 VISIBILITY

Checking of the operation areas is possible through the rear mirrors sited on the tractor and by the sight of the operator.



WARNING- while driving in reverse gear there may create some shade zones which are not visible through the rear mirrors

5 USE OF MACHINE



Before using the machine, it is necessary to familiarize with the controls and its operating abilities.

In every circumstance the body of the operator must be all inside the cabin, in order to reduce the possibility of being exposed to any external dangers.

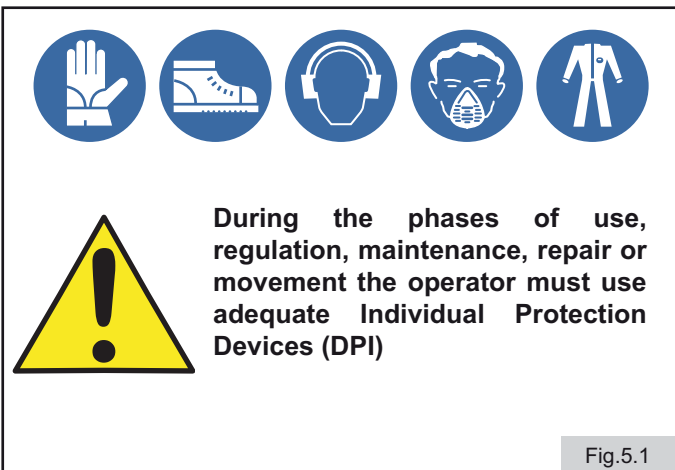
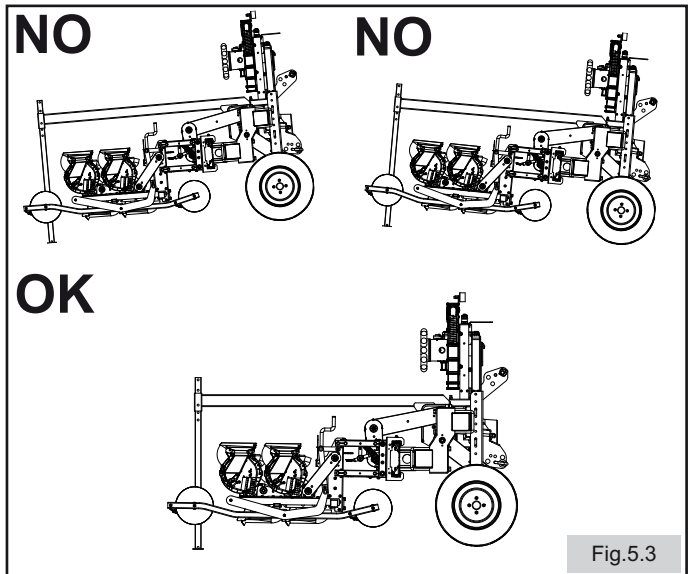
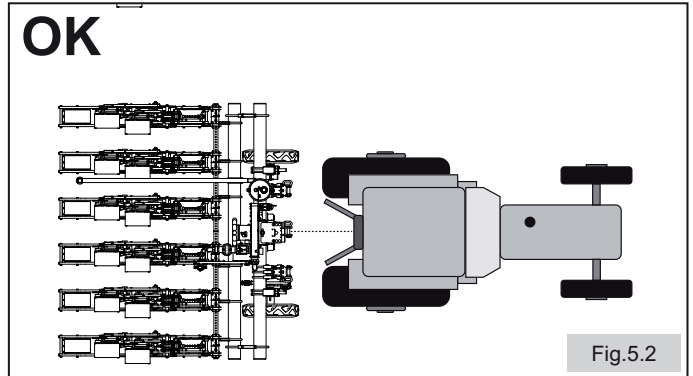
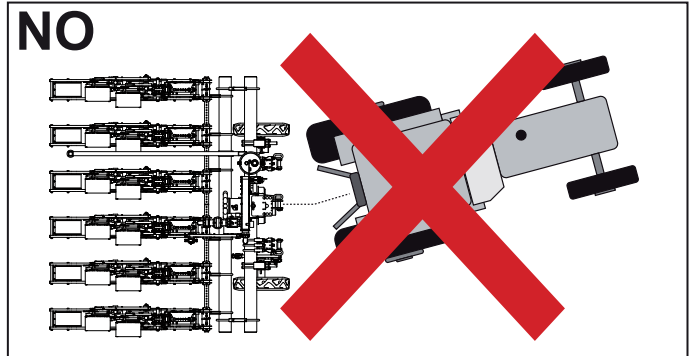
Before coming down from the tractor and before every operation of maintenance and regulation, action the parking brake, switch the engine off, remove the ignition key from the dashboard and wait for all the mobile elements to stop.

The safety of the operator and the people present around the machine depends on the ability of judgment and caution in using of the machine. Therefore, it is necessary to know the position and the functions of all the controls (see Fig. 5.1).

The machine must be always found in perfect state of operation and must be repaired with replacement parts only originates them.

5.1 CONNECTION OF MACHINE TO THE TRACTOR

The machine must be connected to the tractor with a power take off activated at 500 rpm, with weight and suitable power, in compliance with the enforced requirements in the country in which the machine is uses.



For the coupling of the tractor to the machine, the operator must move the tractor with the reverse gear until it reaches the connections on the machine with the back lifters (Fig. 5,2).

- Action the parking brake of the tractor, switch the engine off, remove the ignition key and step down.
- Insert the hinges and the relative plugs/safety forelocks.
- Connect the third point (tightener) of the machine to the tractor, lift the machine until the power of the machine and tractor are at the same height and register the tightener bringing the machine in the horizontal position.

- Block the lifting bars of the tractors, in order to avoid the machine oscillating laterally, as this compromises the cross-sectional stability of the complex.
- It could happen that the compression wheels are not in axle with the track left from the plough discs or cutters and therefore they do not compress well. This is due to the fact that the sowing machine is NOT regulated well on the lifting connections. It is necessary then to regulate them without fixing them in a rigid way leaving some millimetres of space. The sowing machine must be connected as shown.

5.2 CARDAN SHAFT ASSEMBLY



Before using the cardan transmission read the attached usage norms carefully.

The sowing machine provides the use of cardan transmissions certified CE.

The use of not certified cardan transmissions is prohibited. The non compliance with this norm annuls the safety certification for the sowing machine automatically.

Accidents caused by catching and dragging in the transmission units can cause serious and mortal consequences and is due to the default of protections of these units and from the use of fluttering clothes that can be caught by moving parts.

The cardan shafts must be equipped with safety pictograms.

- The cardan shaft must be fixed correctly to the P.D.P, respecting the direction of assembling indicated on it and fixing the chains in order to avoid the spinning of the protection.
- Before inserting the power take-off, ensure that there are no people or animals in the operating area and that the chosen regime corresponds to the one that is allowed. Never exceed the provided maximum.
- Insert the cardan shaft on the grooved shaft of the sowing machine holding the safety plug, release the safety plug and withdraw with the cardan until the plug engages making a “clack” sound in its seat. If the release of the plug is not perceived, repeat the procedure. **The protection must not show ruptures.**

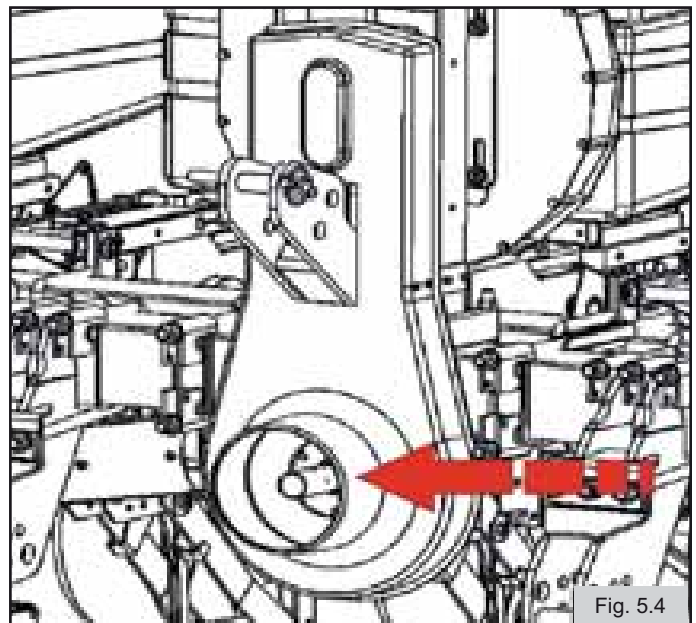
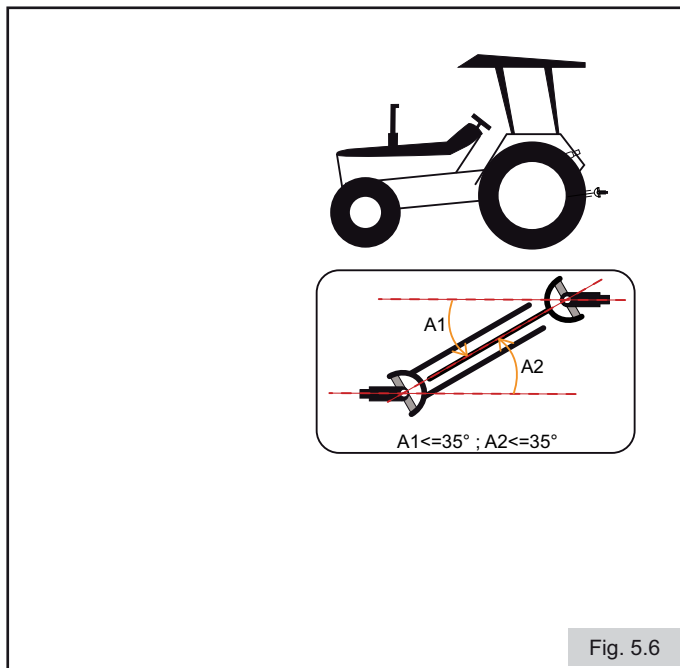
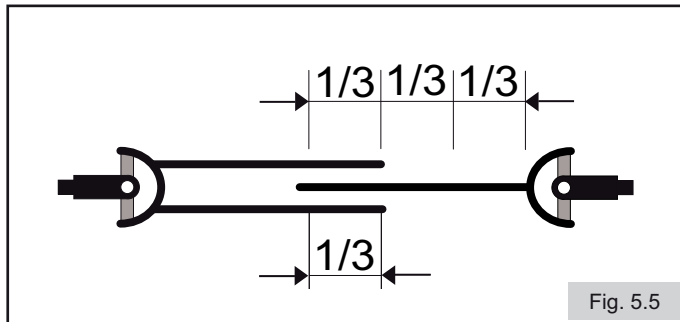


Fig. 5.4

- Insert the cardan shaft on the grooved shaft of the sowing machine holding the safety plug, release the safety plug and withdraw with the cardan until the plug engages making a “clack” sound. If the release of the plug is not perceived, repeat the procedure. **The protection must not show ruptures.**
- **Avoid in any way to jump over the area comprised between the tractor and the machine with or without the moving cardan.**

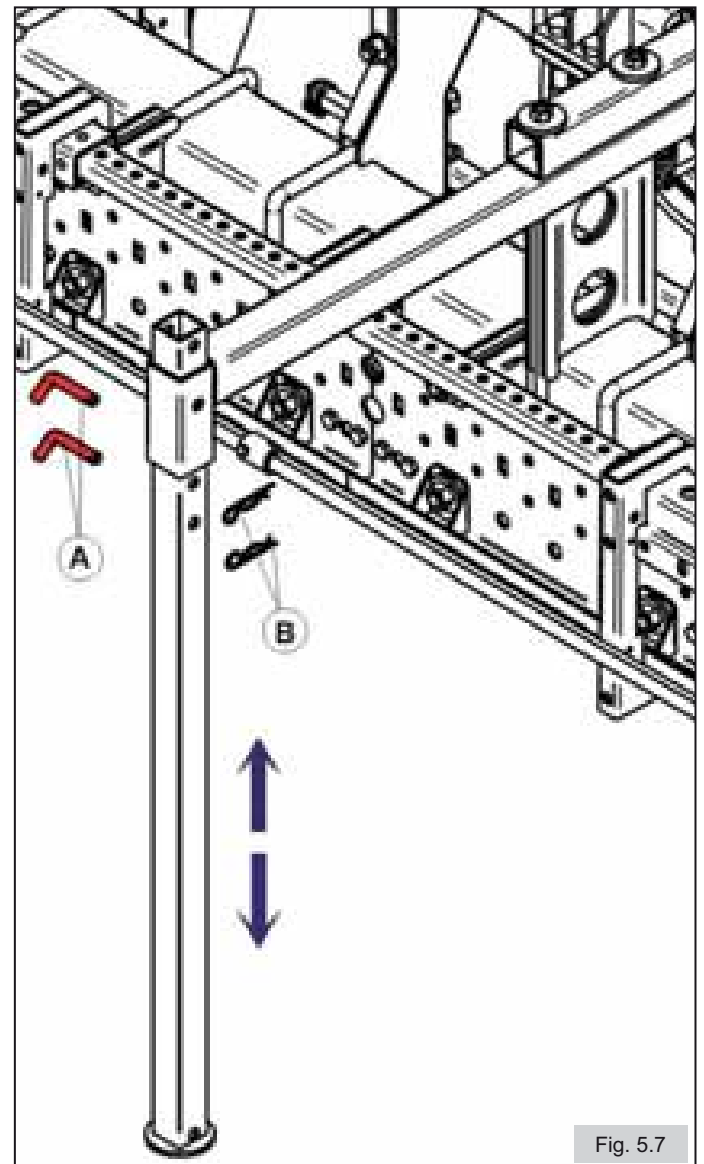
- If the machine is connected for the first time to the tractor, make sure that: In the conditions of maximum steering the cardan is not completely closed in order to avoid causing damages to the multiplier. In the event that the cardan is too long, it is necessary to shorten it by cutting it as much as necessary.
- **In any operating condition the telescopic tubes must overlap for at least 1/3 of their length (Fig.5.5).**
- **Work with contained and equal joints corners.**
- **Disconnect the movement bite when the corners of the joints exceed 35°.**
- **Always reduce the number of revolutions when they exceed 10°.**
- After disassembling the cardan shaft, replace the protection cap on the power take off shaft.



5.3 PARKING DEVICE OF THE SOWING MACHINE

To operate the parking device of the drill do the following

- Remove the pins **A** and **B**.
- Adjust the height of the foot.
- Replace the pins **A** and **B**.



5.4 HYDRAULIC CONNECTIONS

When connecting hydraulic tubes to the hydraulic system of the tractor, pay attention that the hydraulic systems of the operating machine and the tractor are not in pressure.

The hydraulic connections between tractor and machine must be marked by means of colours, in order to exclude wrong usage. If an exchange occurs there could be danger of accident.

During transport on road, the hydraulic connections between tractor and machine must be disconnected and fixed in the appropriate support (Fig.5.8).



ELECTRICAL CONNECTIONS

Connect the BLUE and BROWN threads of the power supply cable at a voltage of 12V DC.

No polarities must necessarily be complied with when connecting the BLUE and BROWN threads to (+) and (-) 12v.



For your connection select a point of the electrical installation that assures a power capacity of at least 5A. Make sure the sections of the main cable and any connecting plugs are adequate and protected by fuses to assure the correct operation of the gearbox.

5.5 MAIN FRAME

5.5.1 FIXED FRAMES

The sowing components are assembled on the load-bearing frame for inter-row sowing. Specific frame requirements are noted at the time of purchase. If, for whatever reason, the sowing components require modifying, then request authorisation for such changes from the MATERMACC S.p.A. technical office.

5.5.2 MAIN FRAME EASY-SET

It has been made to make the adjustment of the sowing row spacing easier and faster thanks to the easy set system mounted on the main frame.

This system allows to let the sowing elements slide lengthwise on a guide mounted in parallel to the frame.

The distance between sowing elements can be adjusted quickly by the relevant positioning lever supplied standard with the sowing machine.

In view of the length of the supporting frame and all the EASY-SET guides different working widths can be obtained.

The seeder is delivered as per the initial order description; with sowing components positioned for an inter-row distance as described in the purchase order.

5.5.2.1 HOW TO MODIFY THE ROW SPACING

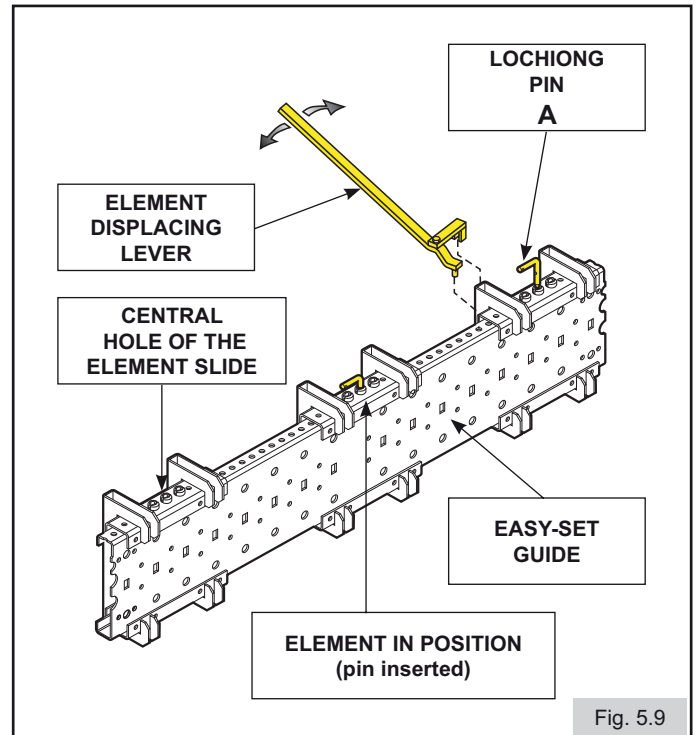


The sowing machine is delivered with a number of sowing elements positioned at a row spacing corresponding to the one specified upon order.

The sowing elements shall be displaced with the machine lifted from the ground. It is strictly forbidden to insert any part of your body under the machine or under the sowing element!

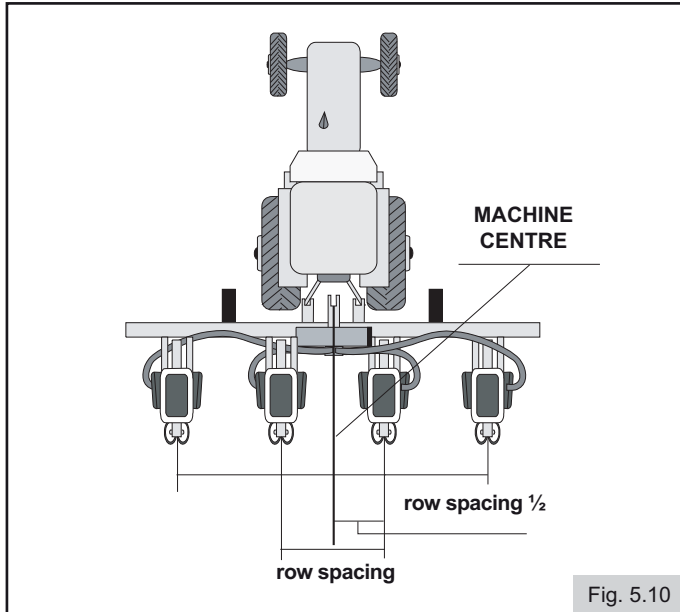
To modify row spacing proceed as follows:

- Lift the sowing machine from the ground.
- Remove locking pin (A) that locks the
- Elements in position (Fig.5.9).
- By means of the lever displace the element to the required distance (to measure the distance see paragraph 5.5.2.3).
- Lock the elements by inserting pin (A) again.



5.5.2.2 HOW TO DETERMINE THE ROW SPACING

To position the sowing elements refer to the machine centre.



From the centre of the machine position the elements next to the center at a distance equal to half of the row spacing (the distance between them must obviously be equal to the total row spacing).

Starting from these elements position the remaining ones. After positioning make sure that the row spacing corresponds to the required one.

5.5.2.3 ROW SPACING ADJUSTMENT

The supporting guide of the EASY-SET system is equipped with positioning holes at a distance of **25 mm** from one another.

The element slide has 3 holes at a distance of 33 mm from one another.

The two devices can be combined to adjust the row spacing at a pitch of **25/3 cm**.

This means that for row spacing multiple of 25 mm (therefore the most common ones such as 450, 500, 600, 750, 800) the number of holes between two elements will be a whole number as to the central hole of the element slide.

For example, if the distance between two elements should be 450 mm, the central hole of the reference element shall be 18 holes away from the central hole of the element to be positioned. (**in fact $18 \times 25 = 450$**) (Fig.5.15).

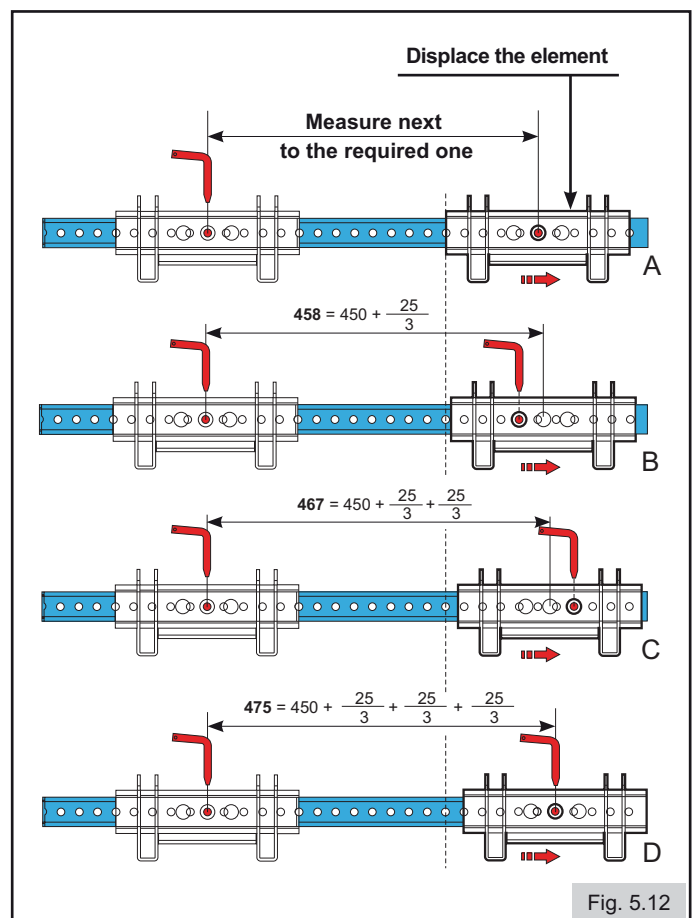
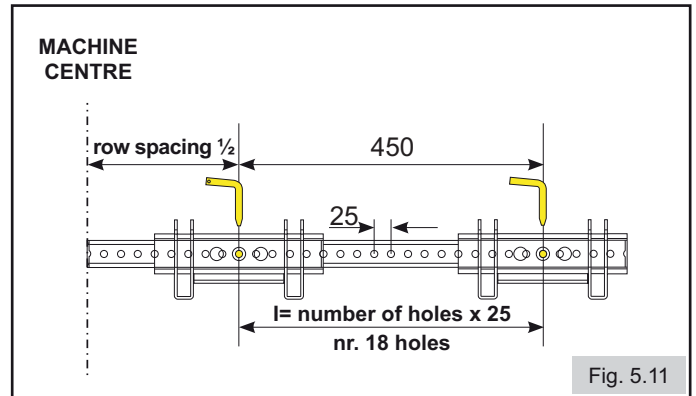
Then insert the locking pin of the element to be positioned in the hole corresponding to the one of the reference to that of a reference element.

For row spacings multiple of 25 mm the locking pin should always be inserted in the central hole of the element slide.

If distance where the sowing element should be positioned is not an exact multiple of **25 mm**, you can get very close to the row spacing required.

For example, if the required distance is **460 mm** proceed as follows:

- Displace the element in order to position its central hole as close as possible to the required size. (in this case 450 mm) (Fig.5.12-A);
- Then make one of the side holes of the element slide coincide with one of the holes of a slide to displace the element of approximately 10 mm.
- The element locking pin should be inserted in either lateral holes. (Fig.5.12-B).
- Make the other lateral hole coincide by displacing the element of approximately another centimeter (Fig.5.12-C).
- Let the central hole of the tool bar slide with a hole of a guide coincide again. We have moved a hole pitch therefore 25 mm (Fig.5.12-D).



After positioning all the elements at the required row spacing make sure that the elements are all set at the same distance.

5.5.2.4 QUICK CHANGE OF SOWING CONFIGURATION

Model EASY-SET of MATERMACC sowing machines permits to change row spacing very quickly. For example you can transform a machine configured with 6 rows 450 into a 4 row machine 750. The user shall then decide how to cut off the two sowing elements from work.

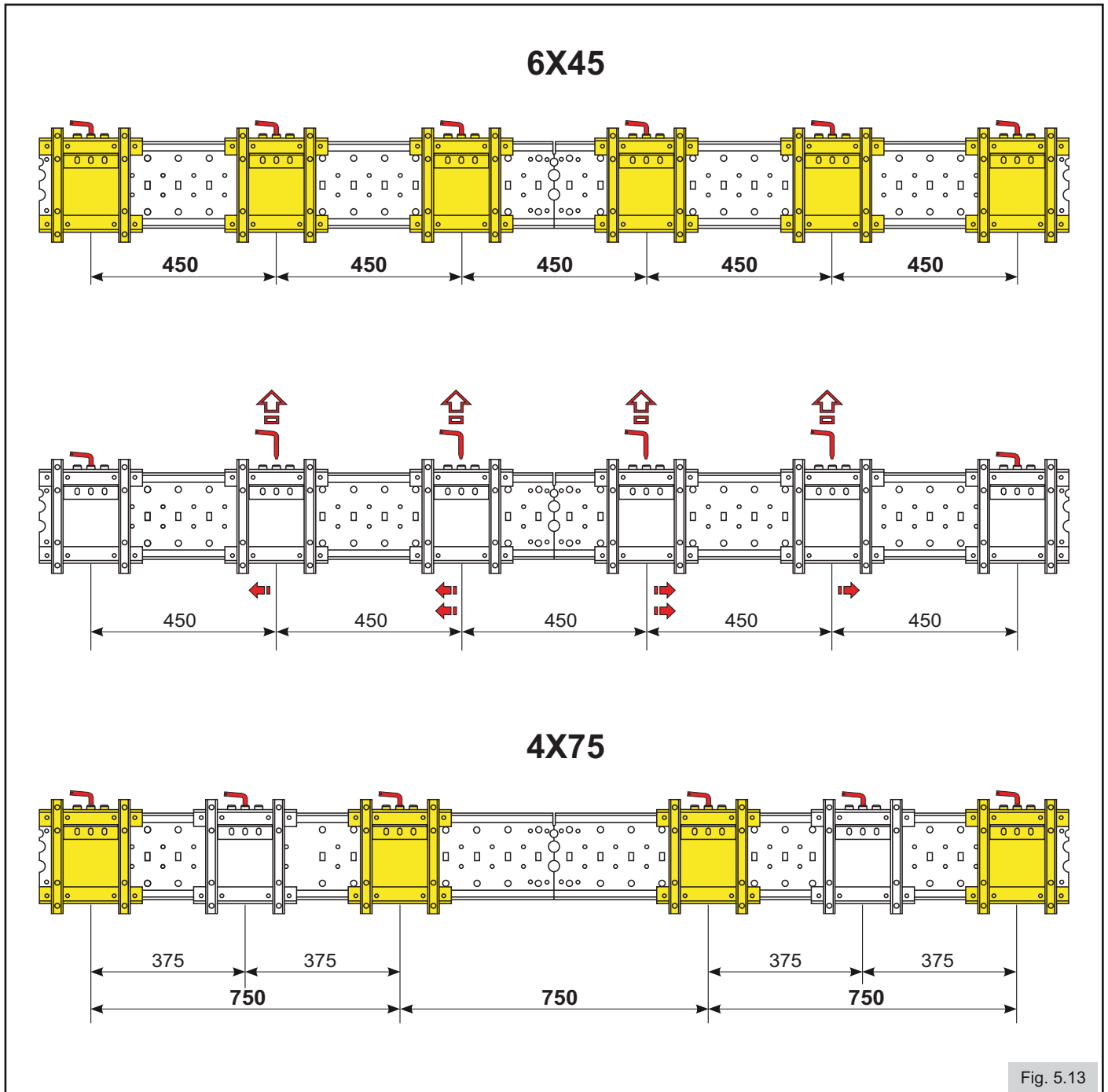


Fig. 5.13

5.5.3 FOLDING FRAME

This type of frame allows a machine to circulate on the road with a considerable reduction of its working width.

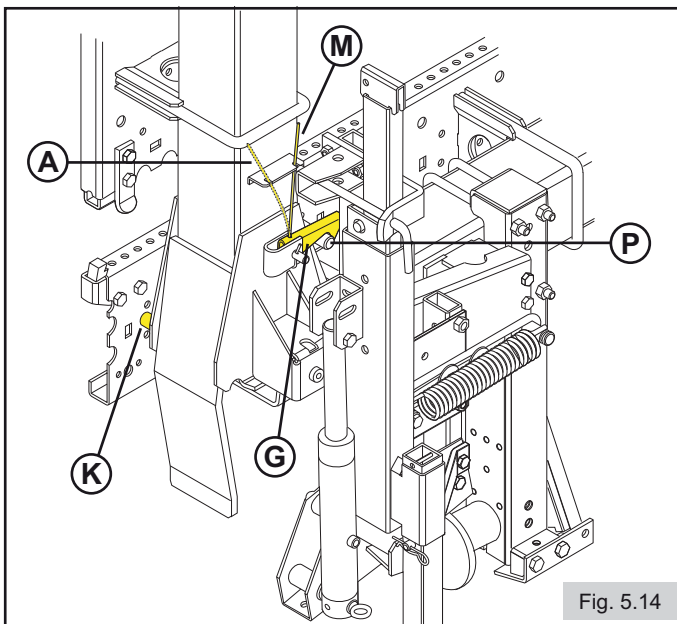
MANUAL OPENING/CLOSING



Make sure that during these movements no one and nothing can be found very close to the mobile parts.
Make sure these parts cannot hurt you.

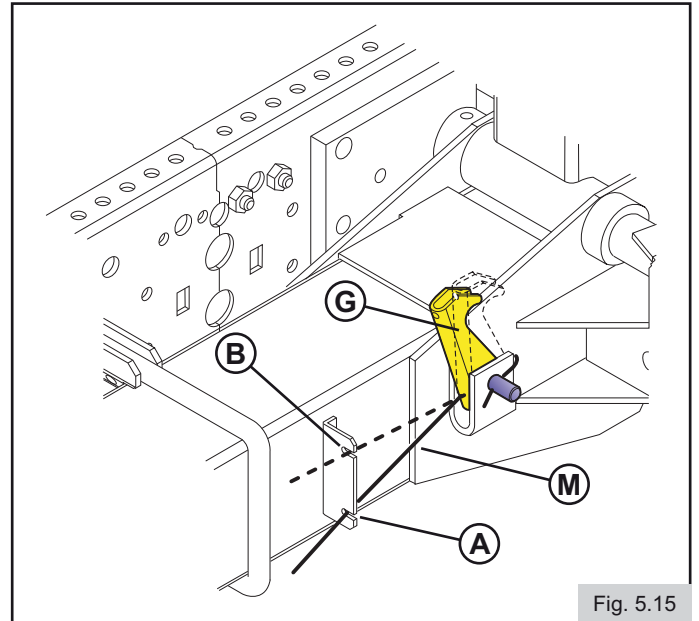
Closed machine (arm opening)

- Take spring **M** to position **A** (Fig.5.16) on both arms.
- Richiudere leggermente i bracci finché il gancio **G** non è scattato e quindi a liberato il perno **P** (Fig.5.16).



Machine open (arms closing)

- Take spring **M** from position **A** to position **B** (Fig.5.17)
- Close the side arms.
- Make sure hook **G** has hooked in bolt **P**.
- Release the arms.



HYDRAULIC OPENING/CLOSING



Check that the hydraulic piping has been connected correctly.

Machine closed (arms opening)

- Take spring **M** to position **A** on both sides (Fig.5.15).
- By acting on the hydraulic control of the tractor close the arms slightly until hook **G** releases bolt **P**.
- By acting on the hydraulic control open the arms completely so that bolt **K** of the arm hooks onto the frame (Fig.5.16).

A questo punto è possibile posizionare gli elementi di semina (vedi par.5.5.3.1).

Machine open (arms closing)

- Before closing the side arms compact the sowing elements at the centre, then proceed as follows:
- Take spring **M** from position **A** to position **B**.
- By acting on the hydraulic control of the tractor close the arms and make sure hook **G** has hooked on bolt **P**.
- Release the arms by releasing the circuit pressure.

5.5.3.1 OPENING/CLOSING SOWING ELEMENTS

Once the side arms are open the sowing elements can be positioned at the required distance.

This operation is made possible by the EASY-SET system. In fact each element have a slide that allows it to slide along guide. The stroke is limited by rings and the end of stroke that determine the row spacing. Replacing the set of rings that has been mounted the row spacing can be changed.

The elements opening/closing is only hydraulic and only when sowing machine in correctly inched to the tractor and lifted from the ground.

The opening operation must be carried out only after the side arms have been opened.

Component closing operations should be carried out prior to closing the lateral arms (the arms can not be closed given that they are held by the locking catch located behind the central frame).

Therefore, the operations to be carried out are the following:

OPENING

- **Elements compacted in the centre (opening).**
- Make sure the side arms have been lowered and the sowing machine is lifted from ground.
- Holding pressed the button to act on the hydraulic command of the tractor to open the elements.

CLOSING

- To lift the earth sower.
- Holding pressed the button to act on the hydraulic command of the tractor to close the elements.
- When the elements are compacted at the centre you can close the side arms.

It is recommended these operations be repeated to familiarized to the controls.

For the first times check that the elements are actually at the required row spacing.

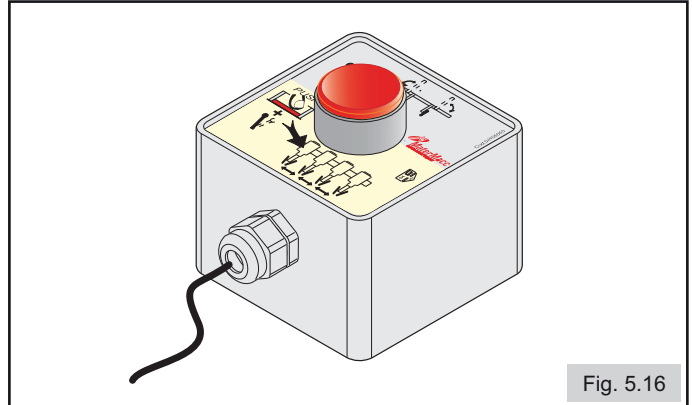


Fig. 5.16



Before compacting the sowing elements at the center or taking them to their working position make sure the side guides are perfectly aligned with the central one.

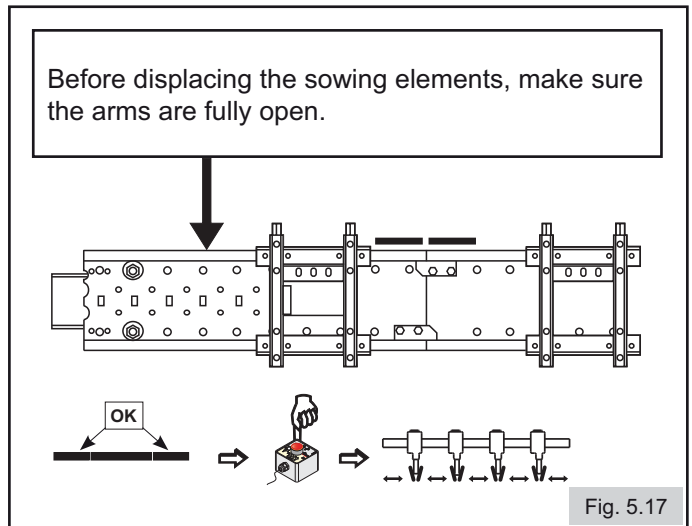


Fig. 5.17

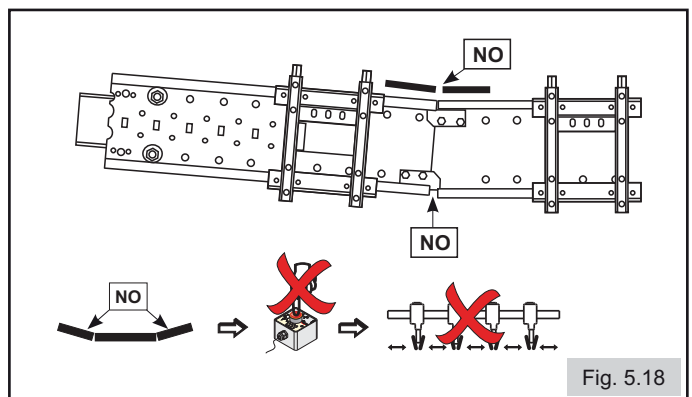


Fig. 5.18

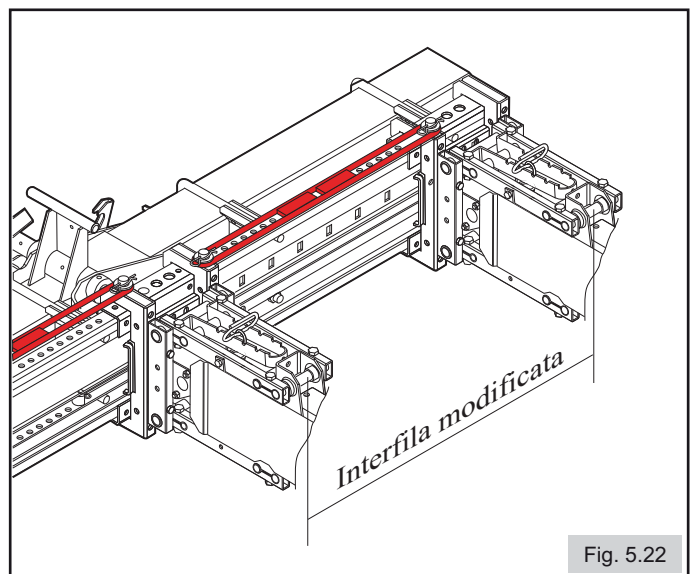
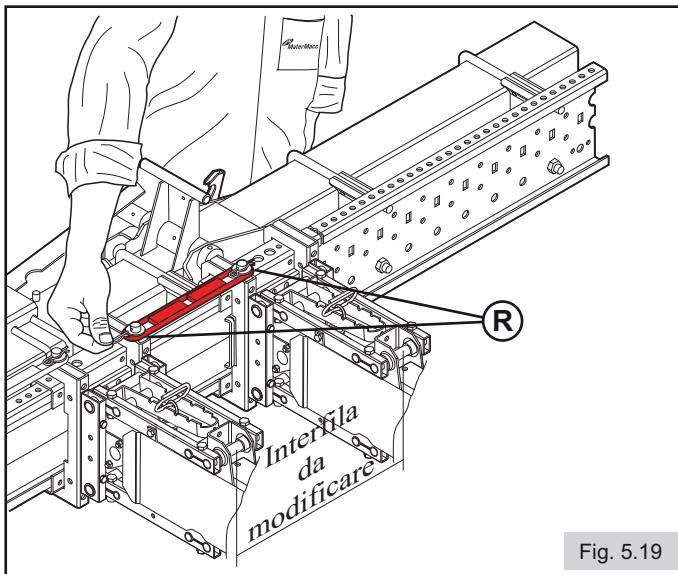
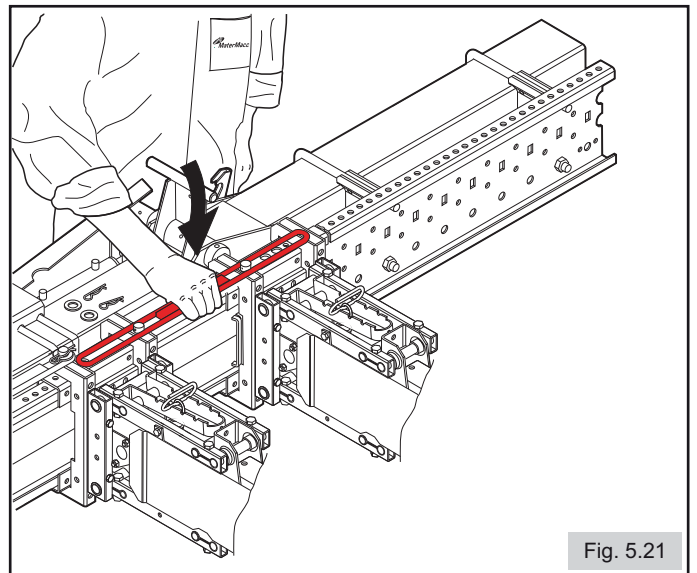
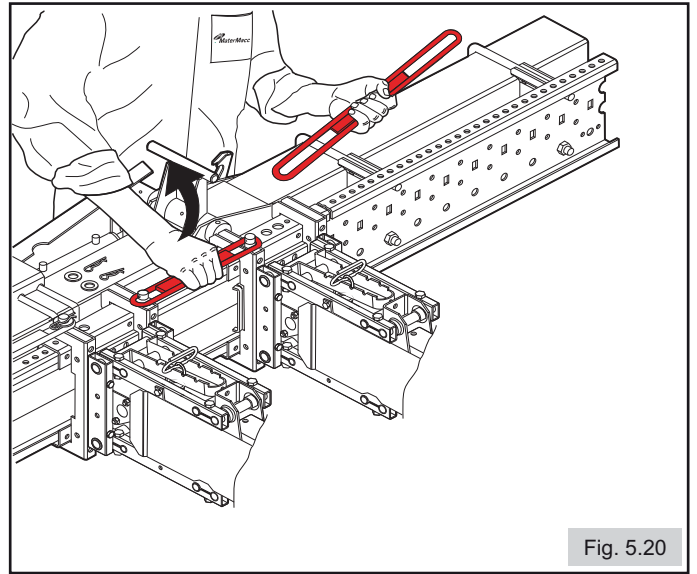
5.5.3.2 SETTING THE ROW SPACING

MATERMACC sowing machine does not have any fixed row spacing.

This spacing is limited by the set of row spacing rings that you have mounted, therefore by changing the set of rings you can set the required row spacing.

- Compact the sowing elements at the centre.
- Remove the R pin and the washers (Fig.5.19).
- Remove the spacing rings mounted (Fig.5.20)
- Mount the spacing rings relevant to the row spacing you have chosen.
- Fix the rings with the washers and the R pins that have previously been removed (Fig.5.21).
- By acting on the hydraulic control of the tractor and on the Joystick take the elements to working position.

After mounting the kit of rings relevant to a specific row spacing, MAKE SURE THAT the sowing elements



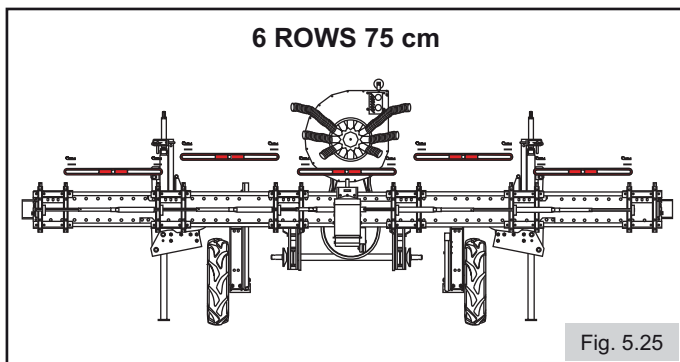
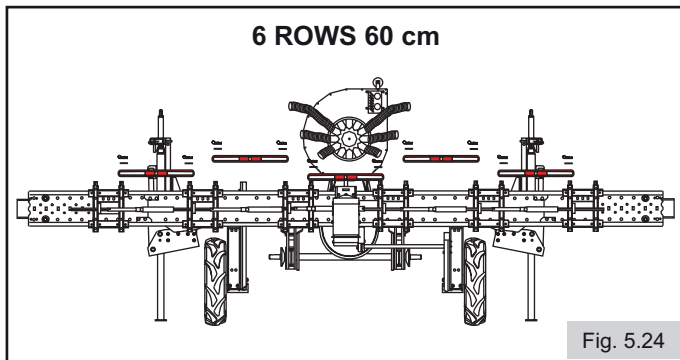
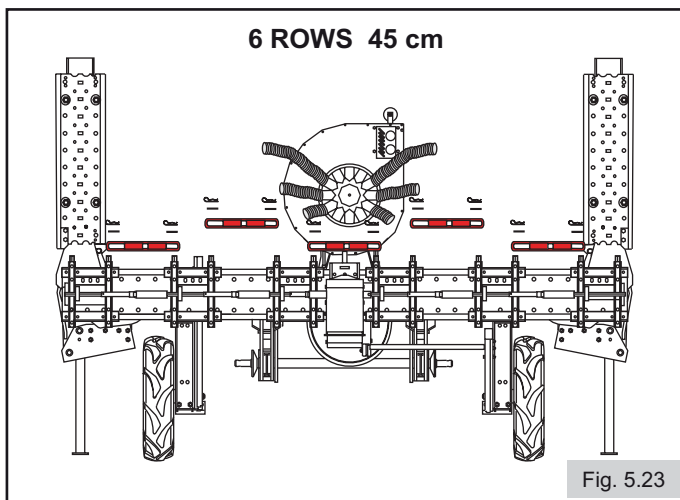
For some configuration it might be necessary to use some special rings to be mounted in specific positions.

Mount the row spacing rings by following the mounting diagram. A wrong position of the rings can damage your machine.

Fig.5.23 - 5.24 - 5.25 how how you can transform a machine configured to sow on 6 rows 45 into a machine sowing on 6 file 60 or 6 file 75.

The same figures also show how to position the row spacing rings to obtain the above mentioned configuration.

EXAMPLE HOW TO MOUNT THE EASY-SET RINGS



5.5.3.3 ADJUSTMENT AT THE END OF STROKE EASY-SET CYLINDER

The cylinder for element movement too, is equipped with a safety device limiting its maximum run.

This adjustment depends on the row spacing you have chosen and must be carried out whenever this spacing changes.

This row spacing specified in the purchase order is usually preset on the device.

When the row spacing changes, this device must be adjusted, therefore we recommend to proceed as follows:

- Open the side arms
- Mount the row spacing rings relevant to the required distance
- Remove pin **S** from both hands (Fig.5.26).
- Take the element to the end of stroke thus preventing the stem for bending (open slowly)(Fig. 5.27).
- Re-insert pin **S** (Fig.5.28).
- End your adjustment by acting on screw **2** and nut **3** (Fig.5.29).

After adjusting screw 2 and nut 3 part B must no have any play

Close the elements and open them again by checking that:

- the stem **DOES** not bend
- the elements are positioned at the set row spacing.

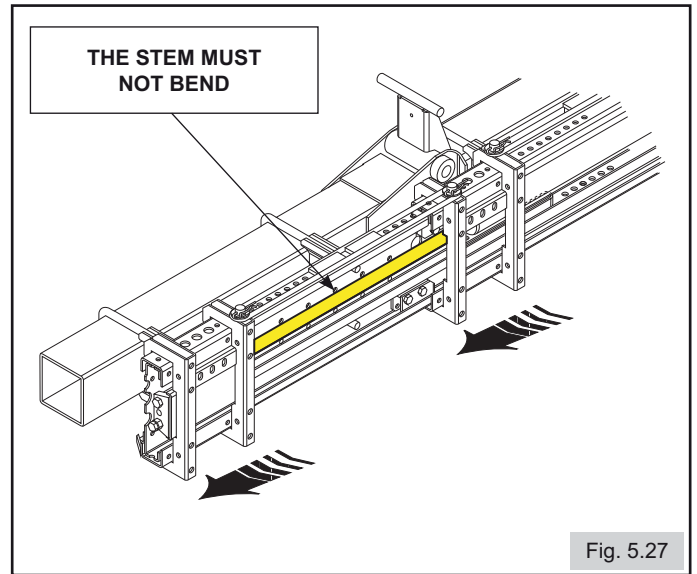


Fig. 5.27

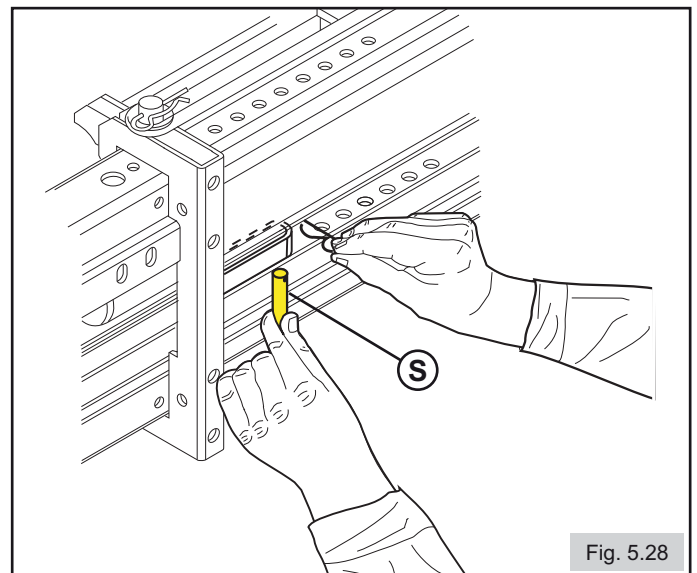


Fig. 5.28

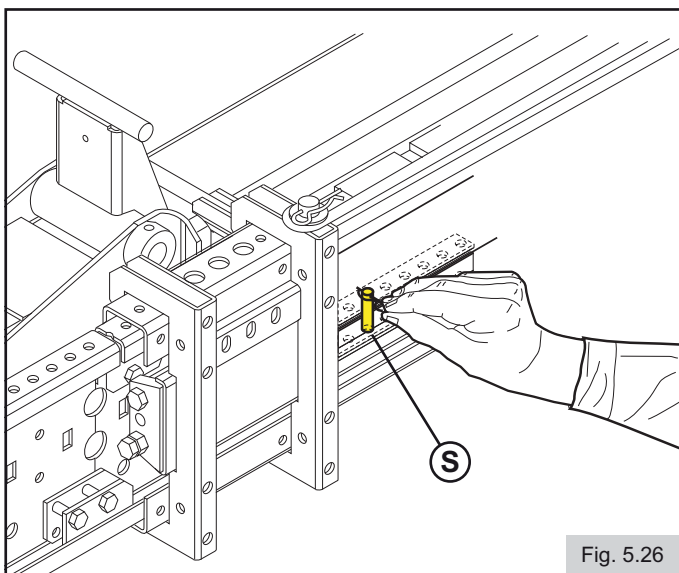


Fig. 5.26

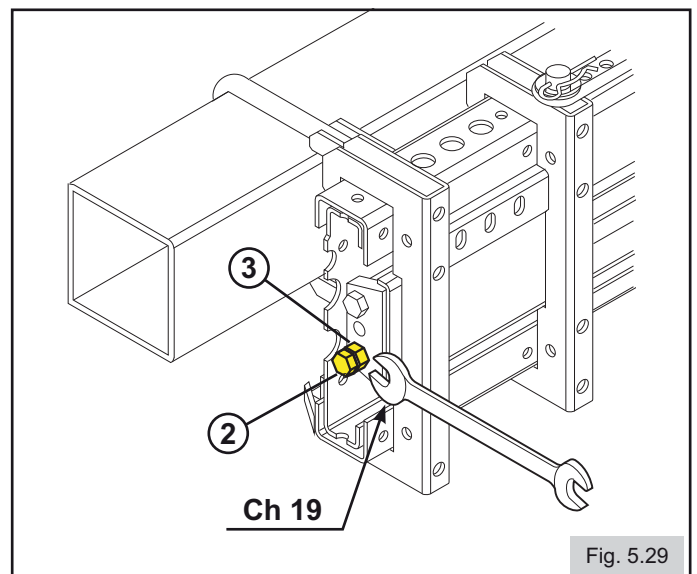


Fig. 5.29

5.6 MACHINE START-UP

Before using the machine, it is necessary to familiarize with the controls and their operation capacity.

Before starting the work make sure that there are no people or animals in the action area.

Before starting the job, verify perfectly that ALL the protections of the machine are integral and working.

5.7 TANK SUPPLYING

The supply of the tanks can be made by hand. Remember that the lifting of weights exceeding 30 kg requires the intervention of more operators.



During the loading and unloading phases of the tanks, the operator must use adequate Individual Protection Devices (gloves, coveralls, masks, etc)

- The tanks must be filled once the land to be sowed is reached.
- Lower completely the lifter and activate the tractor's parking brake.
- Check that the stoppers of every tank are closed, then proceed to the filling of the tanks.
- All the tank's loading and unloading operations are carried out on the land to be sowed, with the sowing machine stopped on the land, the chassis open, parking brake set in action, engine stopped and ignition key removed from the control panel.
- It is advisable to carry out these operations in a flat area without obstacles..
- Ensure that nobody can approach the chemical substances.
- Pay attention so that no foreign objects enter the tank during the filling operations.
- To control that stoppers of every tank are closed, therefore to proceed to the filling of the tanks.

5.8 FILLING THE TANKS

- Open the distributor cap, 2, in (Fig.5.30) in order to discharge the residual seed from the Magicsem seed metering device.

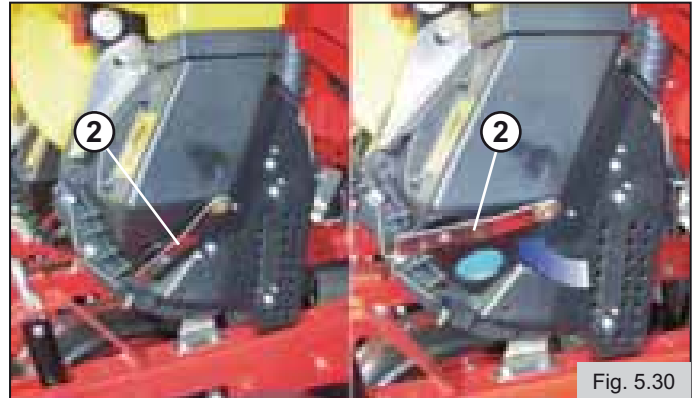


Fig. 5.30

Fertilizer spreader discharge tank (if supplied)

- Position the neck of an empty bag under the tank discharge units.
- Press plug holder 5 and displace plug 4 from position A to position B (Fig.5.31).

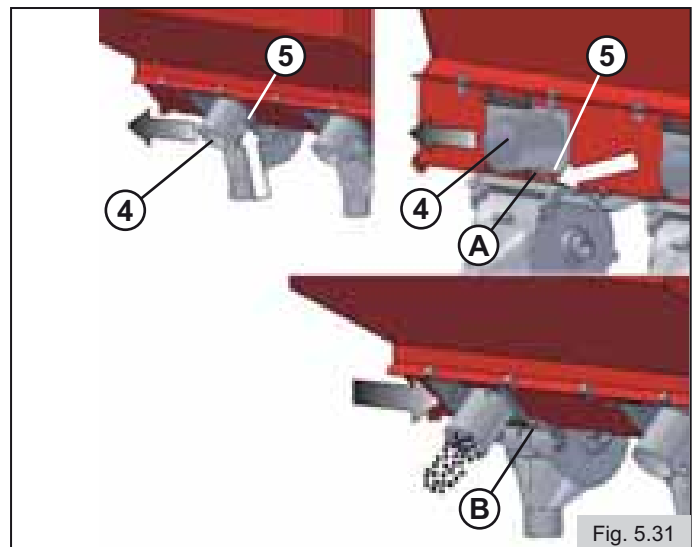


Fig. 5.31

5.9 SOWING

Once the sowing machine is correctly towed and connected with a tractor, you can prepare it for sowing.

Preliminary operations

- Check that all transmission drive lines are connected correctly.
- Load the seed tanks, ensuring that no foreign bodies enter the tanks.
- Free the side arms of the frame
- Appoggiare la macchina a terra sbloccando il dispositivo di stazionamento (cap.5.3).
- Open the machine and set the elements for sowing.

Configuration

- The set of seeding discs mounted must be suitable for the type of seed used.
- The gate must be suitable for the type of the seed and of ground
- The two gears for sowing interval adjustment you have chosen must be mounted on the gearbox and the chain tightener handle must be hooked correctly.
- Tutti gli scarichi siano chiusi prima di procedere al riempimento degli stessi.
- The set of end of stroke rings corresponds to the row spacing you are selecting.
- The safety device on element sliding is adjusted as to the set of end of stroke rings that you have mounted.

Adjustment

- Adjust the sowing depth.
- Adjust the furrow closing and compacting wheels.
- Adjust the overflow gate.

Then you can start the PTO of the machine (with the machine lifted from ground) and proceed with the following operations:

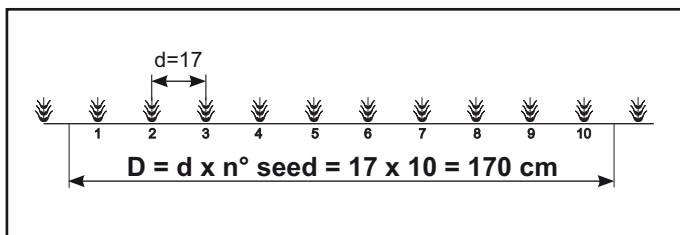
Setting-up

- Progressively take your PTO to approximately 500 RPM.
- Make sure the vacuum meter indicates a vacuum value higher than or equal to 35 mB.
- Position the selector in an intermediate position (approximately around 6).
- Turn with your hands the wheel transmitting movement to the seed distributor in the direction of forward movement.
- Make sure all discs load the seeds.
- Make sure the seeding disc has a seed in each hole. If downstream the selector you should notice any double seeds, take the selector towards lower numbers and vice versa if you notice any voids take the selector towards higher numbers.
- Adjust all the selectors at the same value. **The selector shall be adjusted whenever the variety of seed changes.**

Checks while sowing

Once all the previously mentioned operations have been carried out, the sowing machine is ready for working. However we recommend you to run a few meters in both directions to make sure that you are sowing as required. In particular:

- Make sure that the number of seeds per linear meter corresponds to the required one. **For example. If the set distance is $d=17\text{cm}$ it means that there should be 10 seeds in 170 cm, counted as shown in the figure below.**



- Make sure that the various products are distributed evenly.
- At the end of each run, while changing direction or when stopping to check, do not stop the PTO, but keep it at RPM sufficient to keep the seeds attached to the disc.
- Avoid turning and driving in the reverse, when the machine is under ground. **ALWAYS LIFT** the machine to change direction and reverse gear.
- Make sure the row tracer has been correctly adjusted by measuring the row spacing between the two outer rows.
- Do not work with the PTO synchronized with the wheels.
- In the event of machine pin plug breakage, etc., shut down the machine immediately, remove the plug and replace.
- The use of non original plugs, or plugs with higher resistance may seriously damage the seeder.
- Check the seed metering device frequently during sowing operations. Regulate the selector if seed distribution is irregular.
- In the event suction pull diminishes or fails, check the pipes are not perforated or blocked. If so, replace or clean. If necessary, also check the suction fan transmission belt.

- Ensure that sowing speed is aligned with the type of ground being worked in order to avoid any machine breakage or damage.
- Do not lower the seeder whilst the tractor is in movement in order to avoid blockage or damage to the plough furrow openers.
- It is forbidden for persons to stand or work in proximity of containers with chemical substances, or open containers when the seeder is operating, or about to do so.

5.10 MOVING AWAY FROM THE MACHINE

When the machine is parked, it is necessary:

- To set the tractor's parking brake into action;
 - Disconnect the power plug of the tractor;
 - Place the machine on flat ground, making sure that it is stable;
 - Stop the tractor's engine;
 - Extract the ignition key from the control panel and guard it;
 - Descend from the driving position;
 - Detach the cardan shaft, acting on the anti-thread triggers.
 - Place the cardan shaft on the appropriate support;
 - Remove the plug and hinge and detach the tie-rod (third point);
 - Fix the third point to the appropriate support on the tractor;
 - Remove the anti-thread plugs and connection hinges and then the back hydraulic lifting arms of the tractor form the connection points on the machine;
- return on the tractor;
- start the tractor and move away carefully.



It is necessary that the land on which the machine is parked is flat and within a protected area in order that unauthorized staff can approach it.

6 REGULATION

6.1 SUCTION ADJUSTMENT

The adjustment and control of the suction and of the belt stretch are important operations for the good results of your sowing.

To adjust the suction proceed as follows:

start the PTO and increase the number of engine revolutions slowly by checking the suction value shown by the vacuum meter;

in view of the seed size, the following values can indicatively be taken as correct:

30 ÷ 40 mBar for small and light seeds;

35 ÷ 45 mBar for large and heavy seeds.

For a good success of your seeding, we recommend a vacuum of approx. 40 mBar corresponding to approx. 400 rev/min. of the PTO.

The machine has been preset for a 540 rpm PTO (**STANDARD VERSION**).

Should you need to increase the PTO rpm, two supplementary pulleys are available (UPON request), as specified in (Fig.6.1).

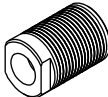
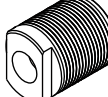
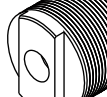
RPM	STANDARD 540	OPTIONAL	
		700	1000
VERSION			

Fig. 6.1

6.1.1 CHECK OF WEAR AND TENSION TENSION

The vacuum pump performance is mostly connected with the level of wear and with the stretch of the belt

Therefore at the beginning of each sowing season it will be necessary to check the belt conditions.

The operations to be carried out are the following:

Note The operations shall be carried out the machine at rest (detached from tractor).

- Remove crankcase **9** by loosening the four screws **V** (Fig.6.4);
- Check the state of the belt, if it is worn or damaged, replace it with a new one; to do so proceed as follows:
 - Loosen nuts **A** (Fig.6.2).
 - Loosen nut **F** (Fig.6.2).
 - Loosen screw **C** of belt tensioning device **20** (Fig.6.2).
 - Replace belt.
 - Stretch the belt by tightening screw **C** of Belt straightener **20** until sleeve **B2** is approx. 0.5 mm far from **B1** (Fig.6.3.a).
 - A correctly stretched belt shall not give way when pressed manually.
 - To shut nut **A**.
 - To shut nut **F** (Fig.6.2).
 - Reassemble the crankcase **9**.

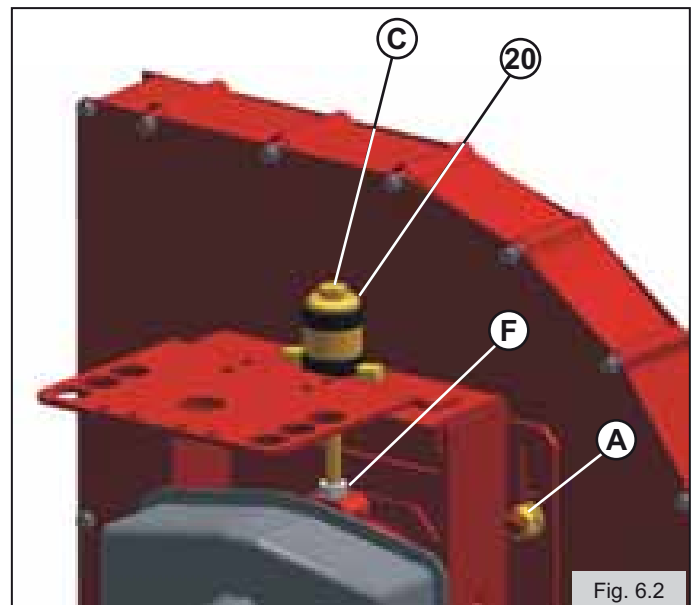
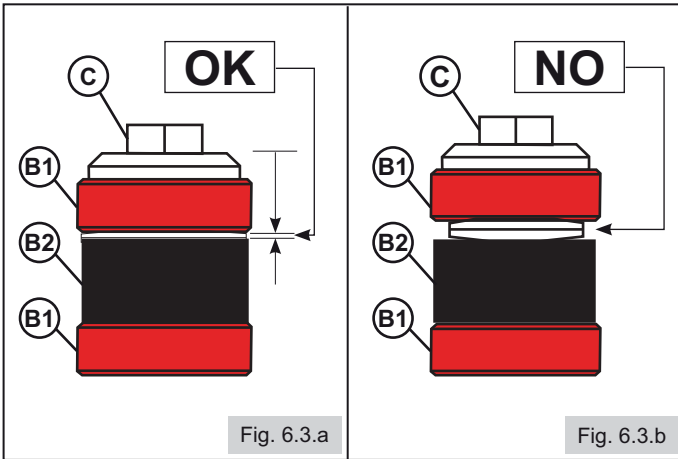
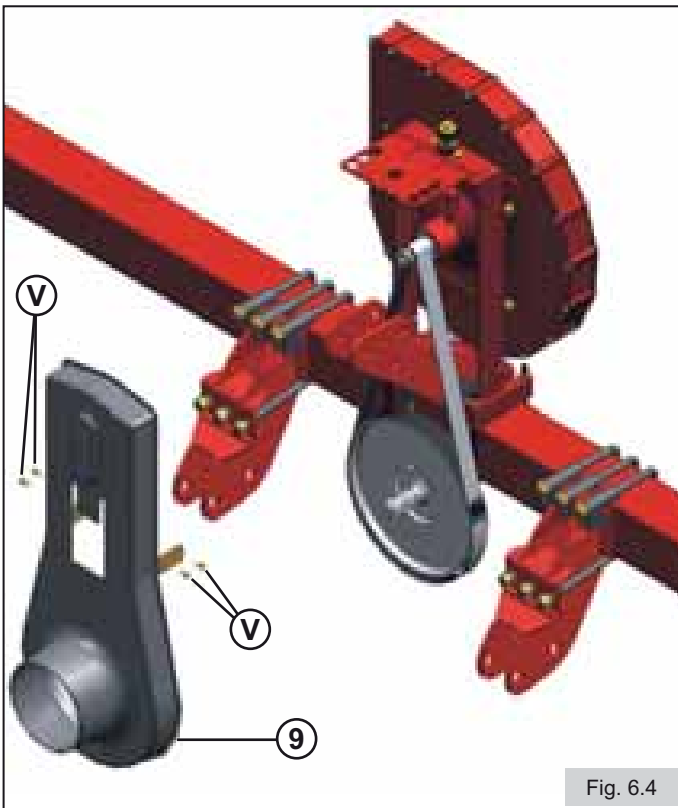


Fig. 6.2



Should you need to adjust the vacuum act on the rpm of the PTO and/or on valve 4 in order to find the best possible compromise.



6.2 AJUSTMENT OF THE PNEUMATIC SEED RELEASING

This adjustment permits to adjust the release and cleaning of the seed off the disc.

You can set a 3 mBar pressure value approx

Should this value not be suitable to the kind of sowing you wish to obtain you can either increase or reduce such a pressure by acting on adjusting valve **8**.

Check the pressure on pressure indicator **7** next to the column marked as (SEED RELEASING GAUGE).

For a correct operation of the adjusting valve particularly at the beginning of the season, clean air filter **14** (Fig.6.7) and proceed as follows:

- Loosen ring nut **G**;
- Extract filter **F**;
- Clean filter with an air jet;
- Mount filter back in place and tighten ring nut **G**.

6.2.1 SEED AGITATION SYSTEM ADJUSTMENT

This function permits to agitate the seeds in the distributor in order to load the seeds on the disk even the quantity of seeds in the distributor is small.

You can set a 25 mBar pressure value approx Should this value be unsuitable to your sowing operation you can either increase or reduce the pressure by acting on adjusting valve **10**.

Check the pressure on pressure indicator **9** next to the column marked as (AGITATOR GAUGE).

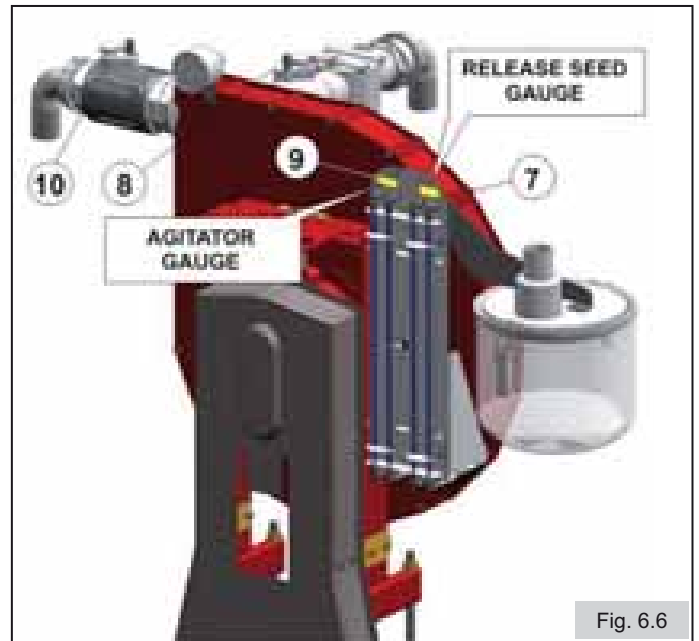


Fig. 6.6



Fig. 6.7

6.3 ELEMENT

Each sowing element can sow 1 to 3 rows of seeds in view of the type of sowing required. This thanks to the fact that the plowshares and the discs are easily interchangeable.

Below please find the description of two models:

MODEL F1 for sowing on **1 row**;
MODEL F2 - F3 for sowing on **2 or 3 rows**;

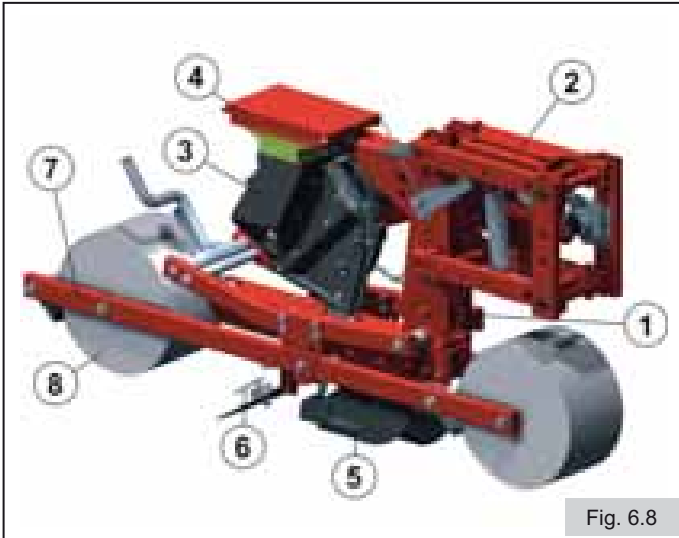


Fig. 6.8

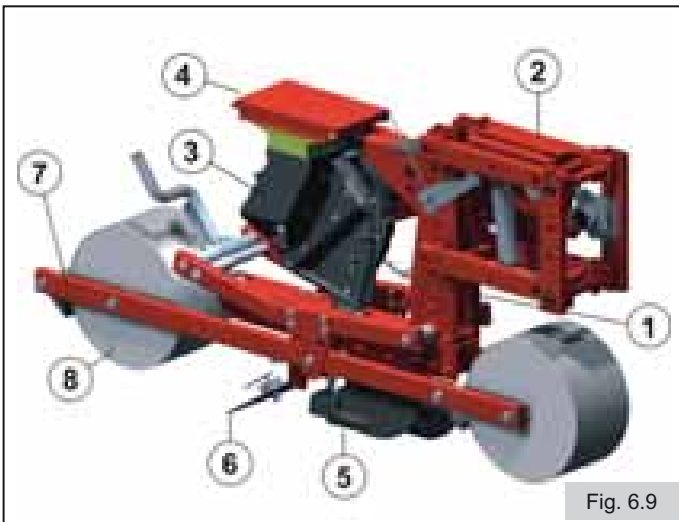


Fig. 6.9

Upon request one seed burying system can be converted into the other.

6.3.1 GENERAL DESCRIPTION

Each element (Fig.8.1) consists of a main frame **1** to which the following are fixed:

- A parallelogram structure **2** permitting the element to follow the ground configuration.
- A seed distributor **3** allows to change the disc from 1 to 3 sowing rows.
- A tank **4**;
- A seed burying system **5** interchangeable 1 to 2 or 3 rows;
- Different types of seed covering devices **6** in view of the kind of seed burying system you are using;
- A tilting system **7** for a correct adjustment of the sowing depth;
- A wide range of wheels **8** to prepare and compact the ground;

6.3.2 SEED DISTRIBUTOR

Based on the type of element (**MOD. F1** for sowing on 1 row; - **MOD. F2 - F3** for sowing on two or three rows), chosen upon purchasing, the machine a seed distributor model MAGICSEM is mounted.

The distributors consist of: (Fig.6.10 - Fig.6.11)

- A body **1** on which the following is mounted:
- the disc plate that is also used as seed agitator the pneumatic seals.
- A seed selector fixing and adjustment system
- A selector **2** (Mod.F1) (Fig.6.10) for sowing on one row, **5** (Mod.F2-F3) (Fig.6.11) for sowing on two or three rows.
- A sowing disc **3** interchangeable in view of the type and size of the seed.
- A lid **4** (**Mod.F1**) (Fig.6.10) for sowing on one row, **6** (**Mod.F2-F3**) (Fig.6.11) for sowing on two or three rows that carries out the function of guiding and containing the seed.
- The outer gaskets;
- The seed brush;
- An adjustable partition (fixed in case of colza and any small-size seeds) which is used to adjust the seed level in special situations such as on sloping grounds or with small-size seeds.
- This partition adjusts the width of the seed mouth in order to prevent the seeds from coming out of the distributor in case of overflow.
- The partition is adjusted by means of a spring on the lid (Fig.6.12);
- The brush for seed detachment in case of bad weather conditions (high humidity, fog etc);
- A small cylinder that keeps the selector attached to the disc.
- A discharge hole for recovering non-distributed seeds;
- An inspection window to check the regularity of the distribution and therefore the adjustment of the selector.



Fig. 6.10

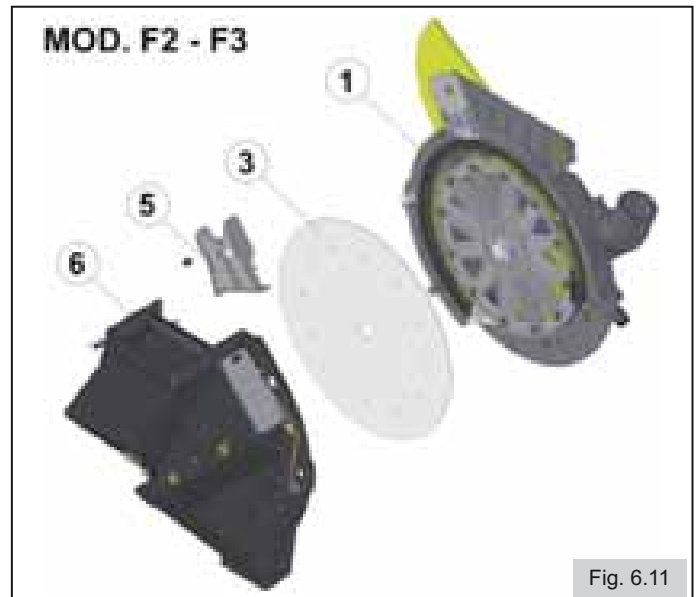


Fig. 6.11

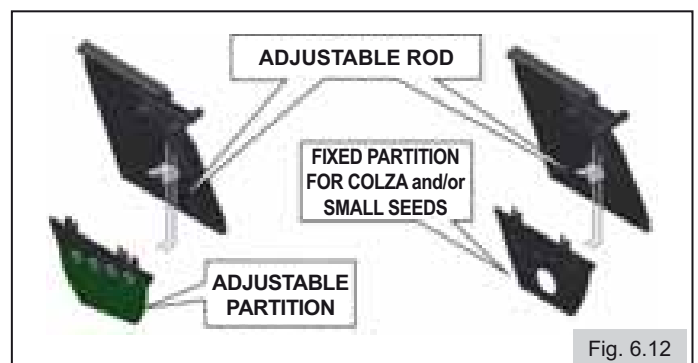


Fig. 6.12



Should the adjustable partition **NOT** be enough to prevent the overflow, it should be replaced by the fixed one after making an opening in it as shown by (Fig.6.13.)

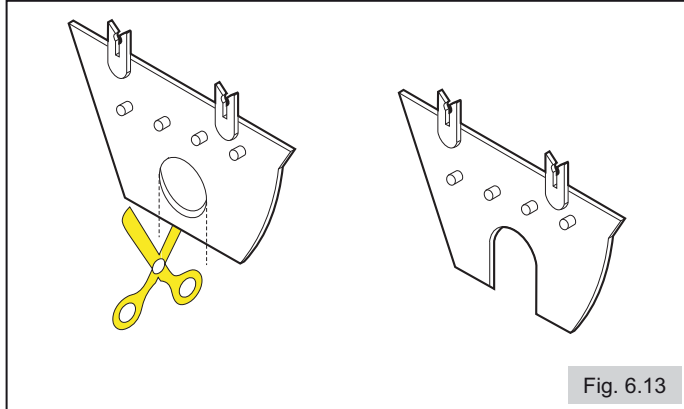


Fig. 6.13



For the correct operation of the distributor we recommend to keep all gaskets, seals, diaphragms, brushes, cylinder, bored disc and selector clean and in good working conditions.

Periodically make sure that all the gaskets are in good conditions.

6.3.3 OPENING OF THE MAGICSEM DISTRIBUTOR

Open the MSO distributor by lifting the springs on the lid in the relevant slots of the bolts. (Fig.6.14).

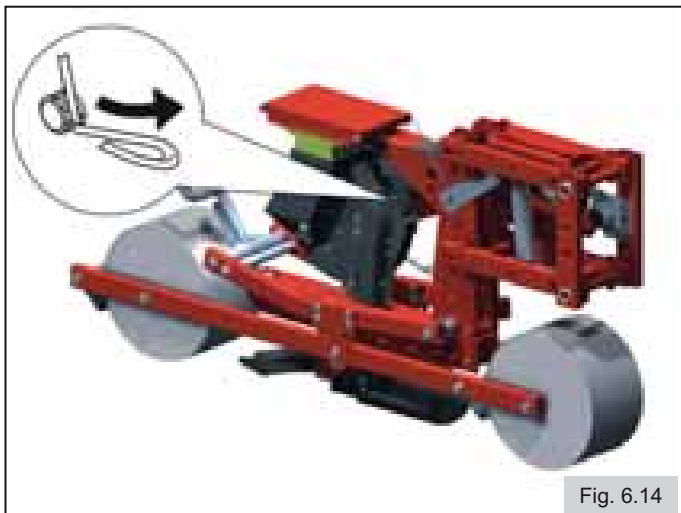


Fig. 6.14

6.3.4 HOW TO SELECT THE SEEDING DISC

The selection of the seeding disc shall be made in view of the type of seed you intend to sow, of the distance between the seeds along the same row and of the transmission ratio mounted on the gearbox.



Every distributor is supplied with a disc suitable to the culture specified upon ordering the machine. For discs either than the ones mounted on the machine please refer to your dealer or contact **MATERMACC S.p.A.** directly for information.

6.3.5 MOUNTING THE DISC, THE SELECTOR AND THE LID

The disc shall be mounted on the disc wheel of the distributor with the face with **MATERMACC** trademark and the specific data of the disc (code, number of holes, diameter) turned towards the lid. (Fig.6.15).

It is important for the disc to be well inserted in the fixing bolts. Therefore the disc shall be rotated until all the bolts and reference pins are fully inserted. The disc will then rest on the disc wheel and on the seals completely.

- **MOUNTING THE SELECTOR FOR MOD. F1**
- Once the disc has been inserted, insert selector **2** in fixing bolts **A** and **B**. (Fig.6.15).

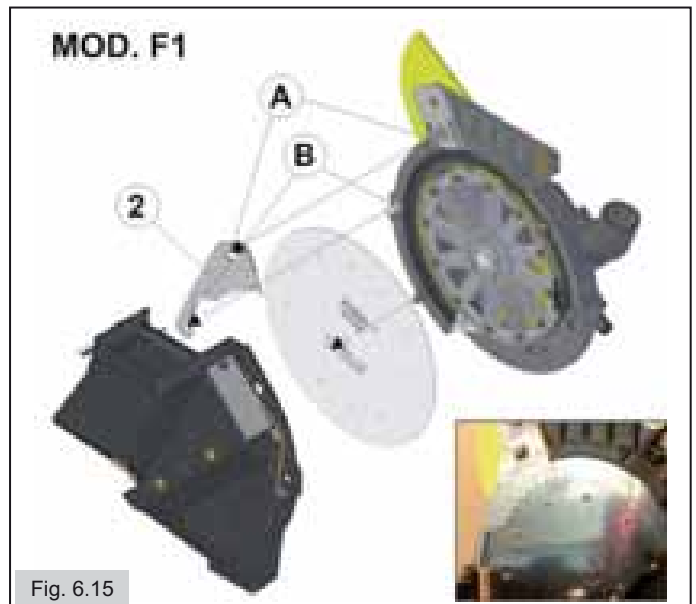


Fig. 6.15

- **MOUNTING SELECTOR 5 (MOD. F2-F3)**
 - Once the disc has been inserted insert selector 5 by fixing it with pin G in hole C. (Fig.6.16)

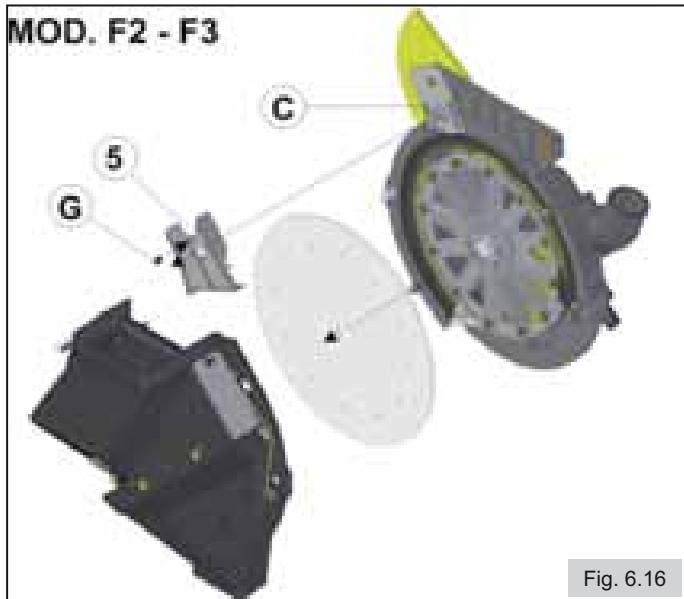


Fig. 6.16

- After inserting the disc and the selector close the distributor by means of the lid. Fix the lid to the bolts making sure the little cylinder presses the selector and not the disc (Fig.6.16).

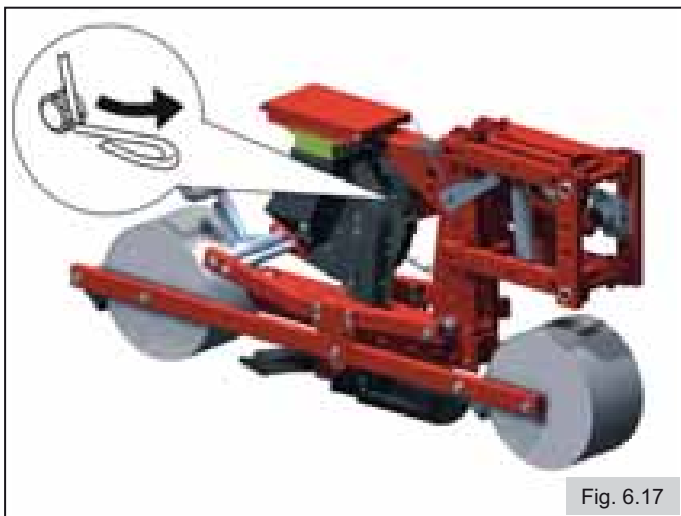


Fig. 6.17

- Move the selector adjusting lever L (Fig.6.18.A) to make sure that it can be free to move.
- This lever that acts on the selector permit to adjust the distribution of the seeds on each hole of the disc.
- Turn the pulling wheel manually to make sure that the disc turns freely.

- Before filling the tank, make sure the drain plug is closed.



If possible carry out all these operations in a clean, dry and not dusty place.

Dust and humidity can damage the disc and the gaskets.

Make sure the sowing machine is positioned on solid ground.

If it is hooked to tractor make sure you are on even horizontal ground, the PTO disconnected and the parking brake pulled.

6.3.6 SEED SELECTOR ADJUSTMENT

The seed selector shall be adjusted after carrying out many other operations and adjustments concerning other parts of the machine among which:

- Mounting and closing the distributors;
- Loading the tanks;
- Start PDF;
- Adjust vacuum and pressure

It is then possible to adjust the selector.

- Adjust the levers all the selectors in the middle position;
- Through the drive wheel to rotate one or two complete revolutions of the distributor disks
- Controlled by the inspector on the cover distribution of seeds on the disc.



Watch the moving parts after carrying out the adjustments and relevant checks carefully.

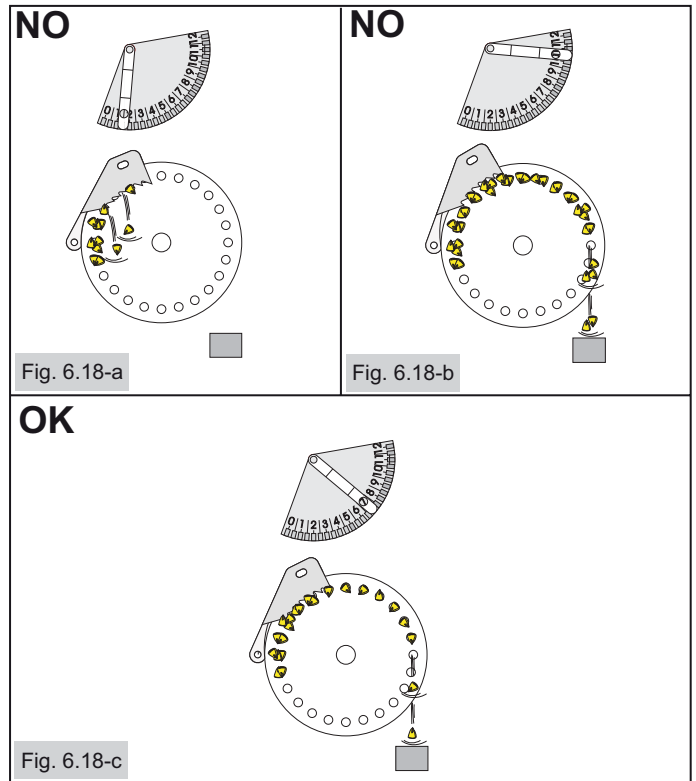
The check can point out three different situations:

- **A)** The holes in the seeding disc downstream the selector have no seeds or very few (Fig.6.18.a).
The selector is adjusted at too low a value, shift the lever towards higher values and start again from position 2).
- **B)** The holes on the distributor disc downstream the selector have more than one seed per hole (generally two or three) (Fig.6.18.b).
The selector is adjusted at too high a value, shift the lever towards lower values and start again from position 2).
- **C)** After acting on the selector each hole of the distributor disc only carries one seed (Fig.6.18.c). The selector is correctly adjusted
However we recommend you displace the lever a few notches in both directions to find the correct adjustment range. Then position the lever at the centre of such a range.

A perfect adjustment of the selector would demand to repeat such a procedure on each distributor. Normally it is just enough to find the adjustment value on a single distributor and adjust the other ones in a similar way. However check that the seeds are found on all the distributors particularly after a short time working.



It might happen, that independently from the position of the selector switch, no seeds can be found on the sowing disc holes. The cause might be lack of vacuum. Therefore adjust the suction before proceeding with the selector adjustment.

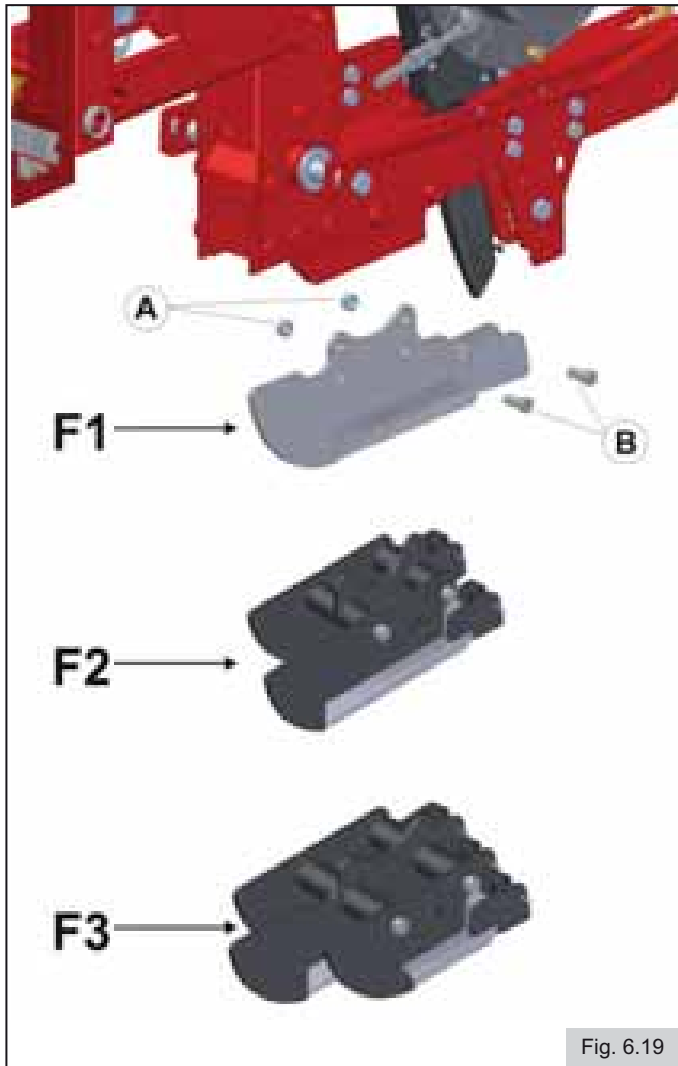


The selector shall be adjusted whenever the seeding disc or the seed type is changed (type and average size). However we recommend to carry out the adjustment whenever the sowing conditions change considerably.

6.3.7 SEEDING SYSTEMS

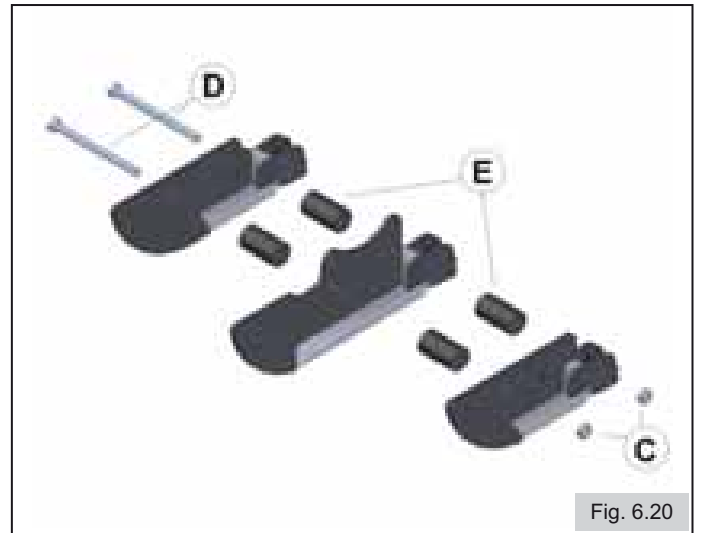
As already described before the MSO section can mount 1 to 2-3 interchangeable seeding listers.

- To change listers loosen nuts **A** and screws **B**
- Mount the type of lister you require by locking it with screws **B** and nuts **A**.

**6.3.8 ROW DISTANCE CHANGE (MOD. F2 -F3)**

To modify row distance for listers **MOD. F2-F3** follow the instructions below:

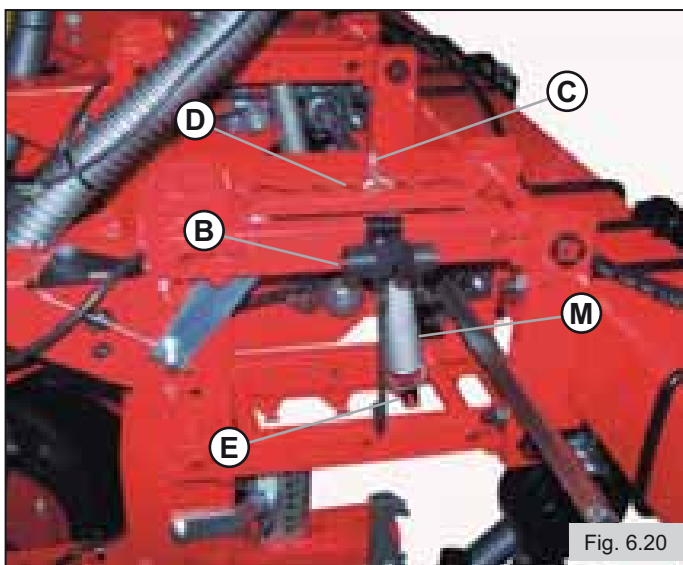
- Loosen nuts **C** and screws **D**.
- Remove bushes **E** and screws **D**.
- Mount bushes and screws for the required row distance.



6.3.9 MACHINE SETTING REDUCTION/ INCREASE OF ELEMENT

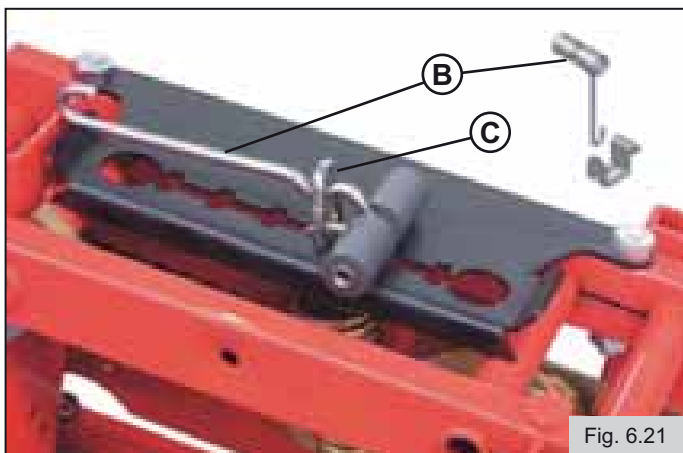
This disposal, to be used only where the ground requires it, must be used to increase or reduce the element in order to assure a correct and homogenic depth of sowing. The system is made of (Fig.6.20):

- A spring **A**.
- A handle **B**.
- A ring to hook the handle **C**.
- Two connections spring locators **D - E**.



Disposal's setting

Insert handle **B** inside the **C** ring as shown in (Fig.6.21).



By levering with the handle **B**, move the spring **A** on the desired position (Fig.6.22).

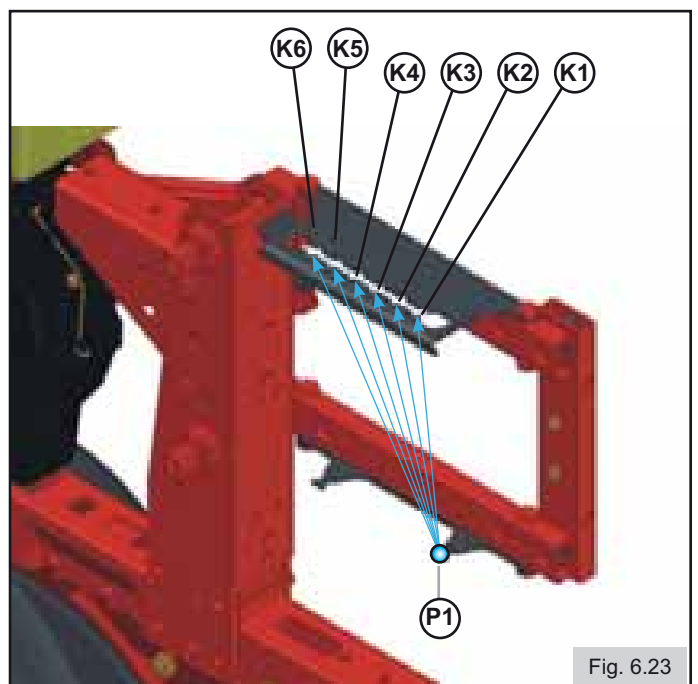


Spring Position M

P1 → $K1 = 0 \text{ kg}$ For soft grounds;
 $K2 = +4 \text{ kg}$

P1 → $K3 = +8 \text{ kg}$ For medium grounds;
 $K4 = +13 \text{ kg}$

P1 → $K5 = +20 \text{ kg}$ For hard grounds;
 $K6 = +27 \text{ kg}$



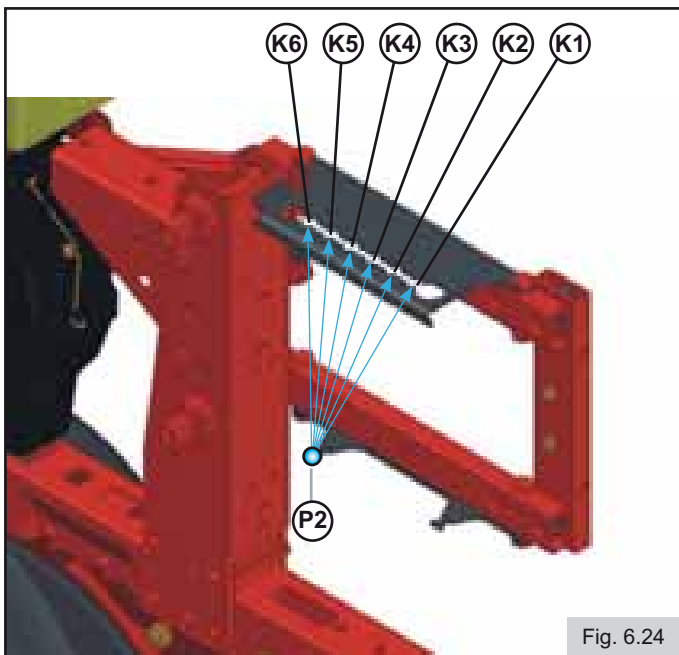
To further reduce the load of the element, move the spring **M** from position **P1** to position **P2**.

Spring Position M

P2 → **K1 = -27 kg**
P2 → **K2 = -20 kg**

P2 → **K3 = -13 kg**
P2 → **K4 = -8 kg**

P2 → **K5 = -4 kg**
P2 → **K6 = 0 kg**



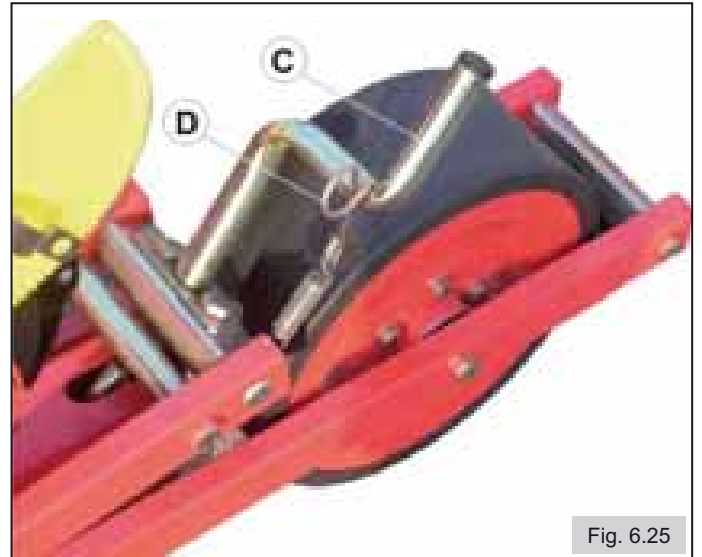
6.3.10 TILTING DEVICE

The element tilting device permits to adjust the sowing depth in the best way.

The depth is adjusted by acting on handle **C**.

To adjust the sowing depth act on handle **C** as follows:

- Unhook spring **D**;
- Turn the handle clockwise to reduce the sowing depth and counterclockwise to increase the sowing depth.
- Hook spring **D** again;



6.3.11 DEVICE FOR CUTTING OFF THE ELEMENT

Each element is equipped with a hooking system by which the element can be locked in the “high” position. This permits to cut off the element from sowing quickly (for example at the field edge) or anyway whenever it is necessary to disengage the sowing elements from the ground.

To hook the element:

Per agganciare l'elemento è necessario:

- Unhook spring **L** from position **D** (Fig.6.26);
- Lift the element until hook **P** is heard or seen click on the locking pin **Q** (Fig.6.27).
- Release the element slowly until it is totally supported by the hook.



Never dwell under the lifted element or while it is going up, a wrong hooking might make the element fall back down.



Fig. 6.26

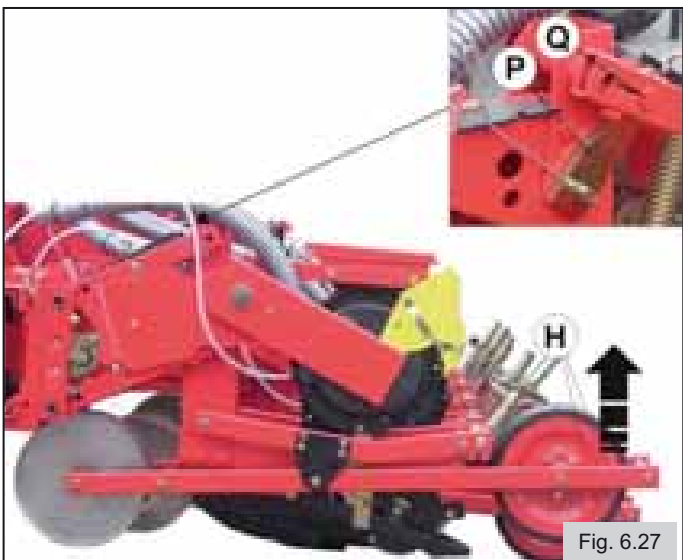


Fig. 6.27

6.4 SETTING THE SOWING INTERVAL

The main gearbox permits to change the sowing parameters (sowing interval) to all sowing devices by changing a single gear.

6.4.1 SETTING THE SOWING INTERVAL

The gearbox contains a table similar to the one found below.

The table is divided as follows:

Part 1 shows the various combinations that can be obtained from gears **A** and **B**.


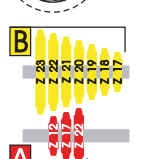

Part 2 shows different types of disks that can be employed.

Part 3 shows the sowing distances that can be achieved based on the gears and type of disk used.

Example: you wish to sow some corn at a distance of **25 cm** with a **24 hole** disc.


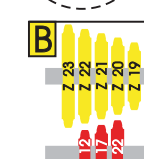
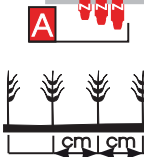
To find the gear pair to be used you should:

- Find the size closest to the required one in the column of the **24 hole** disc (in this case = 25 cm)
- Obtain the pair of gears to be used on the same line in the two columns marked **(A)** and **(B)** (in this case **A = 12 teeth** and **B = 21 teeth**)

		1	2	3						
		A	B	12	18	24	36	48	60	72
22-17	22,1	14,7	11,0	7,4	5,5	4,4	3,7			
22-18	23,4	15,6	11,7	7,8	5,8	4,7	3,9			
22-19	24,7	16,4	12,3	8,2	6,2	4,9	4,1			
22-20	26,0	17,3	13,0	8,7	6,5	5,2	4,3			
22-21	27,3	18,2	13,6	9,1	6,8	5,5	4,5			
22-22	28,5	19,0	14,3	9,5	7,1	5,7	4,8			
17-18	30,2	20,2	15,1	10,1	7,6	6,0	5,0			
17-19	31,9	21,3	16,0	10,6	8,0	6,4	5,3			
17-20	33,6	22,4	16,8	11,2	8,4	6,7	5,6			
17-21	35,3	23,5	17,6	11,8	8,8	7,1	5,9			
17-22	36,9	24,6	18,5	12,3	9,2	7,4	6,2			
17-23	38,6	25,7	19,3	12,9	9,7	7,7	6,4			
12-17	40,4	27,0	20,2	13,5	10,1	8,1	6,7			
12-18	42,8	28,5	21,4	14,3	10,7	8,6	7,1			
12-19	45,2	30,1	22,6	15,1	11,3	9,0	7,5			
12-20	47,6	31,7	23,8	15,9	11,9	9,5	7,9			
12-21	50,0	33,3	25,0	16,7	12,5	10,0	8,3			
12-22	52,3	34,9	26,2	17,4	13,1	10,5	8,7			
12-23	54,7	36,5	27,4	18,2	13,7	10,9	9,1			

*Valori teorici *Theoretical values *Valeurs théoriques
*Theoretische Werte *Valores teóricas

		A - B	12	18	24	36	48
22-17	22,1	14,7	11,0	7,4	5,5		
22-18	23,4	15,6	11,7	7,8	5,8		
22-19	24,7	16,4	12,3	8,2	6,2		
22-20	26,0	17,3	13,0	8,7	6,5		
22-21	27,3	18,2	13,6	9,1	6,8		
22-22	28,5	19,0	14,3	9,5	7,1		
17-18	30,2	20,2	15,1	10,1	7,6		
17-19	31,9	21,3	16,0	10,6	8,0		
17-20	33,6	22,4	16,8	11,2	8,4		
17-21	35,3	23,5	17,6	11,8	8,8		
17-22	36,9	24,6	18,5	12,3	9,2		
17-23	38,6	25,7	19,3	12,9	9,7		
12-17	40,4	27,0	20,2	13,5	10,1		
12-18	42,8	28,5	21,4	14,3	10,7		
12-19	45,2	30,1	22,6	15,1	11,3		
12-20	47,6	31,7	23,8	15,9	11,9		
12-21	50,0	33,3	25,0	16,7	12,5		
12-22	52,3	34,9	26,2	17,4	13,1		
12-23	54,7	36,5	27,4	18,2	13,7		

*Valori teorici *Theoretical values *Valeurs théoriques
*Theoretische Werte *Valores teóricas

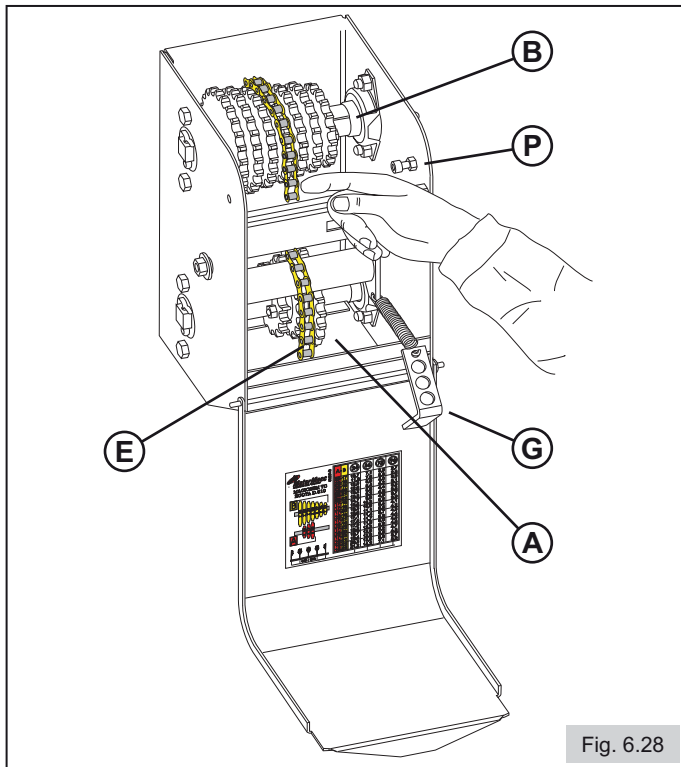
The data specified in the table are purely theoretical. They can change based on the conditions of the ground and of the wheels.

6.4.1 SETTING THE SELECTION RATIO

Table permits to obtain the pair of gears to be used to find the required sowing interval.

To set the transmission ratio on the gearbox proceed as follows: (Fig.6.28):

- Open the gearbox and unhook the spring lever of chain tightener **G** from bolt **P**.
- Loosen chain **E** unhooking it from the toothed gear of driven axle unit **C** and hook it to the required gear (in the example it is the second one from the left).
- Keep the chain in position, unhook it from the toothed gear of driving unit **B**, then displace the unit until the selected gear is aligned with the previous gear.
- Hook the chain tightener spring to bolt **P** again.
- Girare la ruota di trascinamento a mano per verificare il corretto funzionamento della trasmissione.
- Turn the capstan manually to make sure the transmission works correctly. Close the gearbox.

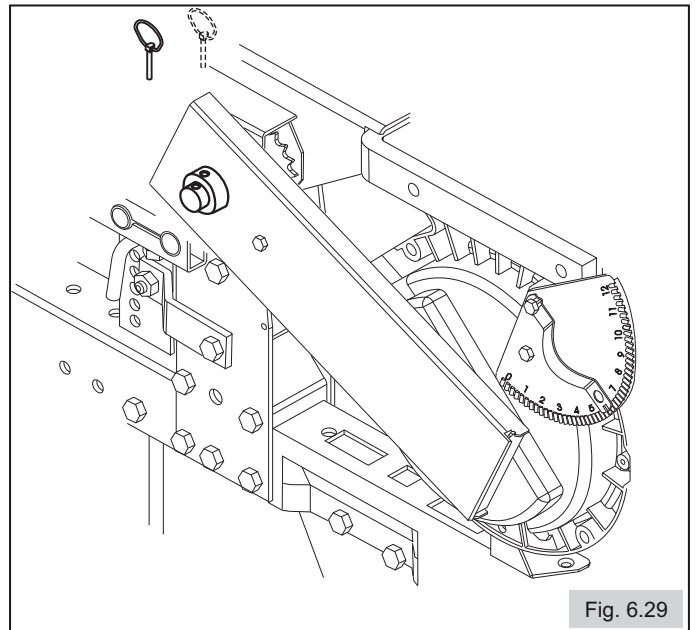


The three gears of driving axle (A) can slide axially.



When working on gearboxes and anyway on any transmission gears, make sure the tractor engine is off and the parking brake is pulled. Furthermore make sure nobody can let the transmission gear turn, even accidentally, while you are setting the transmission ratio.

6.4.2 HOW TO CUT OFF A SOWING ELEMENT


This type of gearbox permits to cut off one or more elements from sowing; in fact the transmission includes a system to cut off each element from transmission (Fig 6.29). Just remove the pin and insert it in the outer hole of the hub to cut off the motion of the distributor disc.




SOWING TABLE





A



B








58220140

A - B	4	6	12	18	24	36	48	60	72	96	120	144
22-17	66,2	44,1	22,1	14,7	11,0	7,4	5,5	4,4	3,7	2,8	2,2	1,8
22-18	70,1	46,7	23,4	15,6	11,7	7,8	5,8	4,7	3,9	2,9	2,3	1,9
22-19	74,0	49,3	24,7	16,4	12,3	8,2	6,2	4,9	4,1	3,1	2,5	2,1
22-20	77,9	51,9	26,0	17,3	13,0	8,7	6,5	5,2	4,3	3,2	2,6	2,2
22-21	81,8	54,5	27,3	18,2	13,6	9,1	6,8	5,5	4,5	3,4	2,7	2,3
22-22	85,6	57,1	28,5	19,0	14,3	9,5	7,1	5,7	4,8	3,6	2,9	2,4
17-18	90,7	60,5	30,2	20,2	15,1	10,1	7,6	6,0	5,0	3,8	3,0	2,5
17-19	95,7	63,8	31,9	21,3	16,0	10,6	8,0	6,4	5,3	4,0	3,2	2,7
17-20	100,8	67,2	33,6	22,4	16,8	11,2	8,4	6,7	5,6	4,2	3,4	2,8
17-21	105,8	70,5	35,3	23,5	17,6	11,8	8,8	7,1	5,9	4,4	3,5	2,9
17-22	110,8	73,9	36,9	24,6	18,5	12,3	9,2	7,4	6,2	4,6	3,7	3,1
17-23	115,9	77,2	38,6	25,7	19,3	12,9	9,7	7,7	6,4	4,8	3,9	3,2
12-17	121,3	80,9	40,4	27,0	20,2	13,5	10,1	8,1	6,7	5,1	4,0	3,4
12-18	128,5	85,6	42,8	28,5	21,4	14,3	10,7	8,6	7,1	5,4	4,3	3,6
12-19	135,6	90,4	45,2	30,1	22,6	15,1	11,3	9,0	7,5	5,7	4,5	3,8
12-20	142,7	95,2	47,6	31,7	23,8	15,9	11,9	9,5	7,9	5,9	4,8	4,0
12-21	149,9	99,9	50,0	33,3	25,0	16,7	12,5	10,0	8,3	6,2	5,0	4,2
12-22	157,0	104,7	52,3	34,9	26,2	17,4	13,1	10,5	8,7	6,5	5,2	4,4
12-23	164,2	109,4	54,7	36,5	27,4	18,2	13,7	10,9	9,1	6,8	5,5	4,6


*Valori teorici
*Theoretical values
*Valeurs théoriques
*Theoretische Werte
*Valores teóricos

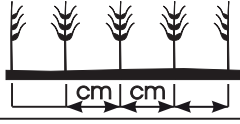



A



B





58220139

A - B	4	6	12	18	24	36	48	60	72	96	120	144
22-17	74,0	49,3	24,7	16,4	12,3	8,2	6,2	4,9	4,1	3,1	2,5	2,1
22-18	78,3	52,2	26,1	17,4	13,1	8,7	6,5	5,2	4,4	3,3	2,6	2,2
22-19	82,7	55,1	27,6	18,4	13,8	9,2	6,9	5,5	4,6	3,4	2,8	2,3
22-20	87,0	58,0	29,0	19,3	14,5	9,7	7,3	5,8	4,8	3,6	2,9	2,4
22-21	91,4	60,9	30,5	20,3	15,2	10,2	7,6	6,1	5,1	3,8	3,0	2,5
22-22	95,7	63,8	31,9	21,3	16,0	10,6	8,0	6,4	5,3	4,0	3,2	2,7
17-18	101,4	67,6	33,8	22,5	16,9	11,3	8,4	6,8	5,6	4,2	3,4	2,8
17-19	107,0	71,3	35,7	23,8	17,8	11,9	8,9	7,1	5,9	4,5	3,6	3,0
17-20	112,6	75,1	37,5	25,0	18,8	12,5	9,4	7,5	6,3	4,7	3,8	3,1
17-21	118,2	78,8	39,4	26,3	19,7	13,1	9,9	7,9	6,6	4,9	3,9	3,3
17-22	123,9	82,6	41,3	27,5	20,6	13,8	10,3	8,3	6,9	5,2	4,1	3,4
17-23	129,5	86,3	43,2	28,8	21,6	14,4	10,8	8,6	7,2	5,4	4,3	3,6
12-17	135,6	90,4	45,2	30,1	22,6	15,1	11,3	9,0	7,5	5,7	4,5	3,8
12-18	143,6	95,7	47,9	31,9	23,9	16,0	12,0	9,6	8,0	6,0	4,8	4,0
12-19	151,6	101,0	50,5	33,7	25,3	16,8	12,6	10,1	8,4	6,3	5,1	4,2
12-20	159,5	106,4	53,2	35,5	26,6	17,7	13,3	10,6	8,9	6,6	5,3	4,4
12-21	167,5	111,7	55,8	37,2	27,9	18,6	14,0	11,2	9,3	7,0	5,6	4,7
12-22	175,5	117,0	58,5	39,0	29,2	19,5	14,6	11,7	9,7	7,3	5,8	4,9
12-23	183,5	122,3	61,2	40,8	30,6	20,4	15,3	12,2	10,2	7,6	6,1	5,1

*Valori teorici
*Theoretical values
*Valeurs théoriques
*Theoretische Werte
*Valores teóricos

7 MAINTENANCE



In case of damage, the operator must stop the machine, take off the ignition key, jump off the tractor and determine the entity of the damage and then proceed to intervene on the machine.

Please note that all maintenance operations must be carried out by qualified and trained workers, when the machine is off.

It is also very important that all maintenance or repair interventions are not carried outside but in a specific equipped garage.



During the operations of use, regulation, maintenance, repair or movement, the operator must make use of the adequate Personal Protective Equipment.

Before starting all maintenance operation, the following instructions must be followed:

- During the maintenance the machine must be placed on an even surface;
- Turn off the engine of the tractor, pull the drum brake and take out the ignition key from the panel;
- Always make correct use of the Personal Protection Equipment (protective shoes, overall and gloves, mask);
- Use all the accident prevention means relative to the operation under way.
- Where using compressed air to clean the machine, you must use protective eye wear;
- When the maintenance of the machine requires to access parts that cannot be reached from standing on the ground, or points higher than 1,50 m, use a stairs or platforms in compliance with the in rule regulations;
- Do not carry out unfamiliar reparations. Always follow instructions and where they are missing, contact the manufacturer or expert personnel.

Warning: replace the hydraulic pipes when these are damaged.

- Do not employ lifting means other than those specified;
- Make sure that the lifting mean chosen is suitable for the operations to be carried out and is in compliance with the safety regulations;
- Do not keep the engine of the machine on in closed areas with no ventilation system able to eliminate the exhausting gases concentrating in the air;
- Avoid long and repeated skin contacts with fuels/lubricants/fluids, since these could generate inflammations or other skin pathologies;
- Do not ingest fuels/lubricants/fluids. In case of accidental contact with the eyes, carefully wash the area with water;
- Do not weld in closed areas or with an inappropriate ventilation;
- Do not weld on or besides painted surfaces to avoid the propagation of toxic fumes. Remove the paint with specific products, then wash the surface and let dry;
- When using compressed air, always wear goggles with side-protections, and mask in order to avoid the danger of personal lesions due to dust particles. It is preferred to clean the machine in ventilated areas.

7.1 MAINTENANCE INTERVENTIONS THAT MAY BE CARRIED OUT BY THE OPERATOR

The interventions described in the following paragraphs do not require a technical specialization. The operator must know and accurately perform the indications and must have turned off the machine.

Periodical check-ups and maintenance operations must be carried out in the periods and modalities described and are at charge of the operator.

Not observing the periods and modalities of maintenance will endanger the correct functioning of the machine, thus breaking the warranty validity.

Intensify the frequency of maintenance interventions in case of hard use (frequent arrests and start-ups, very hard soils, etc...).

- Regularly check that the signs and safety disposals on the machine are in good state and that nothing endangers their correct functioning.
- Regularly check the condition of painted and galvanized parts of the seeder. Avoid leaving residues from chemical products on the machine.
- Regularly paint all of the parts for joining and fixing (rods, screws, nuts, etc...) also inspect that these are well tight and correctly positioned. Do not use the machine in the instance where fixtures are not in order or correctly attached.
- The sowing machine was mounted with most of the movements built on auto-lubricant bushings, only the transmission chains and some pins need to be periodically greased (distribute a thin layer of grease on the rollers and on the gear units). In case there is a fertilizer spreader mounted on the machine, periodically grease the roller chains and the gear units of the mechanical operation.
- It is good practice to keep the machine clean, we recommend washing it with water, including all the individual parts, after using it each time.
- This operation is particularly necessary if a fertilizer spreader is being used (the chemical components are particularly aggressive) and in this case the clearing must be carried out at the end of every working day, with a special care in the washing of the tanks, of the VarioVolumex (see accessories) and of all of those areas in contact with the fertilizer.
- Immediately clean all fertilizer or other chemical/biological product fell on the frame or on the fixing U-bolts in the respect of all the safety regulations supplied at the purchase of this product.

7.2 FREQUENCY OF INTERVENTIONS

Below, you will find information on intervention time frames for some operations to be carried out in order to prolong the perfect operation of the seeder. The frequency suggested is purely used by way of example and is subject to change dependent on the type of service, environment, seasonal factors, etc.

- **NEW MACHINE**

Control the tightening of all the screws and nuts, control that all the transmissions are free to operate.

- **AT THE BEGINNING OF THE SEEDING SEASON**

Check the state of use of the equipment by starting the machine unloaded.

- **DAILY**

Wash the seeder with water, particularly all the parts which have been in contact with chemical products, i.e. tanks, distributors, distribution pipes. Check that there are no residues from chemical products inside the distribution components - they may cause blockages and/or malfunctions.

- **WEEKLY**

Check the condition of the seeding discs;

Verify the state of the coulters or anti-plough disk with relative tool;

Check the condition of the seed distributor sealing gaskets;

Check the condition of the extraction pipes and the vacuum pump transmission belt;

Verify the state of the transmissions;

Grease the pin of the frame arms.

- **LONG-TERM STORAGE**

At the end of the season or where the machine will not be used for an extended time frame, we recommend:

Wash the equipment abundantly with water and in particular the tanks of chemical products and then let dry.

Carefully check all parts and then replacing those damaged or worn.

Fully tight all screws and bolts.

Oil the Easy-set guide, all of the transmission chains, lubricate all the non-painted parts.

Protect the equipment with a cover and place it stably in a dry place, out of reach of those unqualified to use it.

Maintain clean from materials that may obstacle the sowing parts like dirt, rocks or roots, grass, etc... and that may cause the obstruction of the sowing tool, the malfunctioning of the anti-plough disk or the blocking of the compression wheels.

- Performing these simple operations will be very advantageous since at the start of a new season the equipment will be in perfect conditions.

7.3 SPARE PARTS

Repair work and part replacement should be carried out using original spare parts requested from an authorised dealer. It is important to remember that any request for spare parts should be accompanied by the following information:

- Machine type.
- Machine serial number.
- Spare part item code (available from the Spare parts catalogue).



MaterMacc

Matermacc S.p.A.

Via Gemona, 18 - 33078 San Vito al Tagliamento (PN) ITALIA



0434/85267



0434/85517

www.matermacc.it - info@matermacc.it
