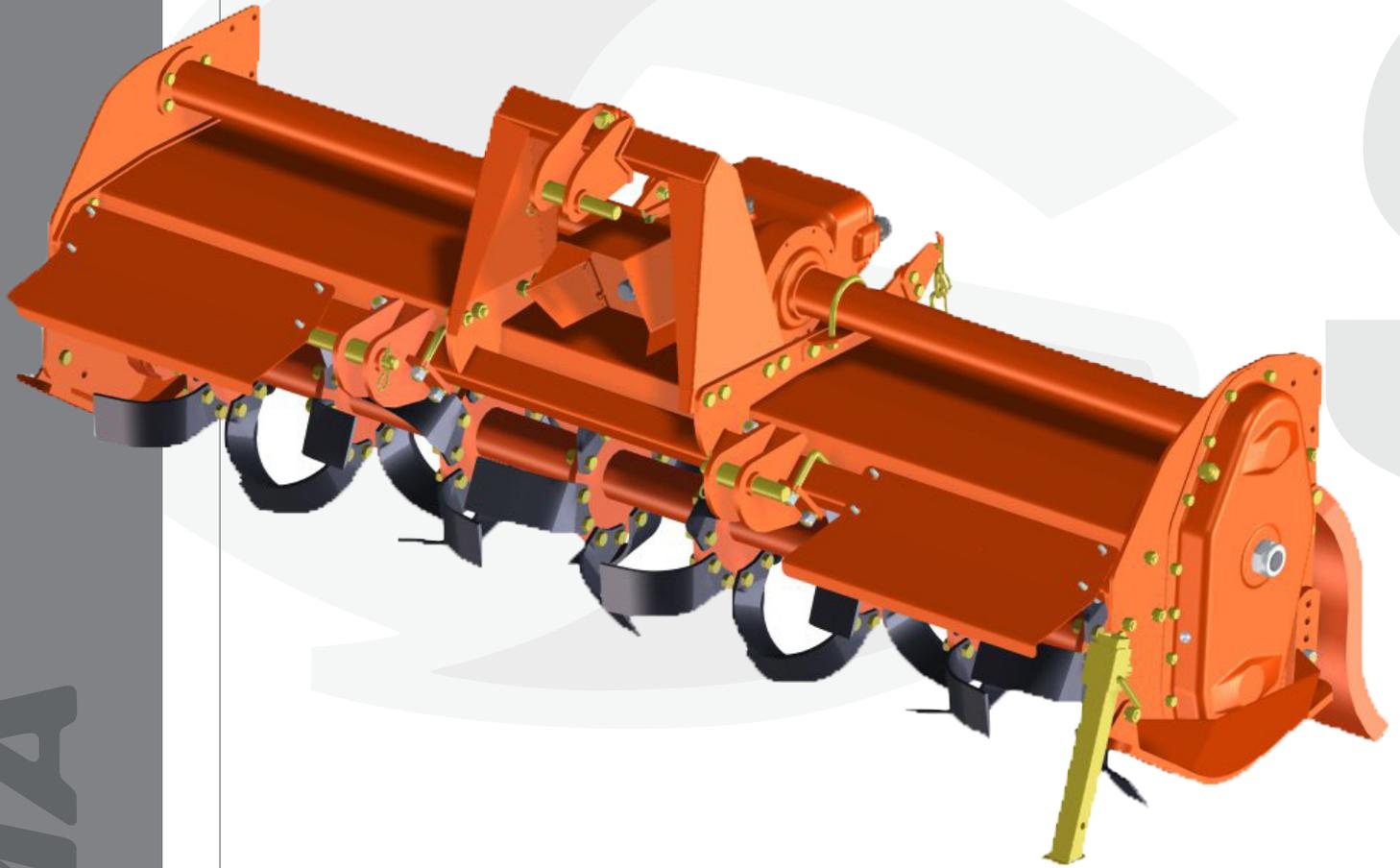


CE



**RM** Tiller

# USE AND MAINTENANCE MANUAL

903844002~01



TRANSLATION OF ORIGINAL INSTRUCTIONS

MADE IN ITALY





# INDEX

<b>1.</b>	<b>INTRODUCTION</b>	<b>5</b>
1.1	SOME NOTES REGARDING THE USER MANUAL	5
1.2	DECLARATION OF CONFORMITY	6
1.3	LIST OF RESIDUAL RISKS	7
1.4	DELIVERY LETTER	8
1.5	TILLER IDENTIFICATION AND MANUAL CODE	9
1.6	GENERAL DELIVERY NOTES	10
1.7	DECLARED USE	11
1.8	TILLER COMPOSITION	12
1.9	STANDARD AND OPTIONAL SET-UPS	12
<b>2.</b>	<b>SAFETY</b>	<b>14</b>
2.1	DEFINITIONS (UNI EN ISO 12100-1:2009)	14
2.2	CONVENTIONAL SYMBOLS	14
2.3	SAFETY PRESCRIPTIONS	15
2.4	OPERATOR REQUISITES	15
2.5	CLOTHING AND PPE	16
2.6	MACHINE USE	16
2.7	SAFETY DEVICES	17
2.8	REASONABLY PREDICTABLE INCORRECT USE	17
2.9	ZERO ENERGY STATE	17
2.10	POSITION OF PICTOGRAMS ON THE MACHINE	18
<b>3.</b>	<b>UNLOADING AND UNPACKING THE TILLER</b>	<b>21</b>
3.1	TILLER PROTECTED BY HEAT-SHRINKABLE FILM	21
3.2	TILLER IN WOODEN CRATE	22
<b>4.</b>	<b>TECHNICAL FEATURES</b>	<b>24</b>
<b>5.</b>	<b>START-UP</b>	<b>26</b>
5.1	CARDAN SHAFT CONNECTION	26
5.2	3-POINT HITCH CONNECTION	28
5.3	ROAD TRANSPORT	29
<b>6.</b>	<b>ADJUSTMENTS</b>	<b>29</b>
6.1	ROTATION SPEED CHANGE	29
6.2	CLUTCH ADJUSTMENT	30
6.3	WORKING HEIGHT ADJUSTMENT	30
6.4	COVERS ADJUSTMENT	31
6.5	MACHINING	31
<b>7.</b>	<b>STOPS</b>	<b>33</b>
<b>8.</b>	<b>ROUTINE MAINTENANCE</b>	<b>35</b>
8.1	CONTROL AND REPLACEMENT OF THE OIL IN THE GEARBOX UNIT	36
8.2	CONTROL AND REPLACEMENT OF THE OIL IN THE LATERAL DRIVE SUMP	37
8.3	CONTROL AND REPLACEMENT OF THE OIL IN THE EXTERNAL ROTOR LATERAL SUPPORT	37
8.4	GREASING	37
8.5	REPLACING HOES/BLADES	37
8.6	CARDAN SHAFT	38
<b>9.</b>	<b>CLEANING</b>	<b>38</b>
<b>10.</b>	<b>STORAGE AND WINTERING</b>	<b>39</b>
<b>11.</b>	<b>SCRAPPING</b>	<b>39</b>



<b>12.</b>	<b>QUICK CONSULTATION TABLES</b>	<b>40</b>
12.1	COUPLING TORQUE TABLE	40
12.2	TROUBLESHOOTING	40
12.3	LUBRICATION INTERVALS	41
<b>13.</b>	<b>SPARE PARTS</b>	<b>42</b>
<b>14.</b>	<b>WARRANTY</b>	<b>42</b>



# Congratulations on your purchase of the RM Tiller

The RM Tiller is manufactured by SICMA S.p.A, which has been producing agricultural machines for over 40 years.

The RM Tiller has all safety and quality requisites required for this type of equipment.

Remember that to obtain the best performance and make the best of the production features, it is necessary to know the instructions and information contained in this manual and follow the same.

## 1. INTRODUCTION

### 1.1 SOME NOTES REGARDING THE USER MANUAL

Remember that the USER MANUAL is not an accessory of the tiller but is an INTEGRAL part and a SAFETY MEASURE (EN 12100-1).

For this reason:

- kept in a good state
- it must be kept near to the equipment
- pass it to any operator user, maintenance technician, handler or successive owner.

In this way, the tiller can be used in the best way for all functions for which it has been manufactured and in maximum safety.

The manual must not be damaged, it must remain integral (do not rip the sheets), must be kept away from humidity and heat. During consultation it must not be covered in grease or its legibility deteriorated.

If this manual is lost or damaged, ask for a copy from the Manufacturer or nearest Dealer.

To ease consultation, the manual has been divided into parts so that every phase is described well.

With these arrangements, SICMA intends to unmistakably call the operator's attention to the dangerous situations that may occur.



## 1.2 DECLARATION OF CONFORMITY

The machine is delivered accompanied by the following Declaration of Conformity.

### CE DECLARATION OF CONFORMITY

pursuant to Directive 2006/42/CE

The Company

Sicma s.p.a. – C. da Cerreto, 39 – 66010 Miglianico (Ch) – Italy  
Tél.: +39 0871 95841 – Fax +39 0871 950295  
e-mail: info@sicma.it – http://www.sicma.it

declares under his own responsibility that the machine:

Type: TILLER  
Model: RM  
Serial number:

is conform with the essential health and safety requisites of Directive 2006/42/EC.

To verify the conformity with the above Directive, the following have been consulted:

EN Harmonised Standards:

- UNI EN ISO 4254 – 1:2006, EN ISO 4254 – 5:2009, UNI EN ISO 12100 – 2:2009

National and International technical Specifications and Standards:

- ISO 11684:1995, ISO 13852:1996, UNI 9456:1989.

The person authorised to fill-in the Technical File is Mr. Lorenzo Aurora (Sole Director)



Miglianico, 15-03-2011

**Lorenzo Aurora**  
**SOLE DIRECTOR**

### 1.3 LIST OF RESIDUAL RISKS

Even though SICMA has done everything possible to be in line with state-of-the-art safety and in compliance with all Directives, Laws and Standards available, some residual risks still exist:

- CUT/CRUSHING HAZARD DUE TO CONTACT WITH TOOLS (rotor)
- ENTANGLEMENT/Dragging HAZARD (rotor and Cardan shaft)
- OVERTURNING/CRUSHING HAZARD (tiller)
- BURNS HAZARD (gearbox)
- CUT/SHEARING HAZARD (rear covers)

Therefore, anyone using the machine or performing maintenance on the same, must be trained and aware of the fact that dangers exist and in spite the use of protections to reduce them, it is not possible to eliminate them totally.

The staff assigned to these operations must always have the use and maintenance manual available for consultation.

The use and maintenance manual states all indications requested from point 1.7.4 (User instructions) of Attachment 1 of the Machinery Directive and specific request is made to comply with the prescriptions, so as not to cause accidents that can injure persons.



## 1.4 DELIVERY LETTER

The tiller has been manufactured in compliance with the 2006/42/CE Directive,  
and has been designed in compliance with the guide lines of the Technical Standards relative to the tillers, specifically UNI EN ISO 4254-1:2010 and UNI EN ISO 4254-5:2009.

Therefore, the machine does not represent a danger for the operator if used according to the instructions in this manual and on condition that the safety devices are kept constantly efficient.

This form attests receipt of the tiller:

- the safety devices are present
- this manual has been delivered



SICMA INFORMS THAT ANY MODIFICATION OR TAMPERING OF THE TILLER OR ANY OPERATION PERFORMED IN DISAGREEMENT WITH THAT WRITTEN IN THIS MANUAL, ESPECIALLY FAILURE TO COMPLY WITH THE SAFETY PROVISIONS, AS WELL AS MAKING THE WARRANTY NULL AND VOID, RELIEVES SICMA FROM ANY LIABILITY FOR DAMAGE TO OBJECTS AND INJURY TO PERSONS.

Some of the devices described in this manual may not be present on your machine, depending on the chosen set up and the market of destination.

It must be remembered that all technical values refer to the standard tiller (see Chap. 4 “Technical Features”) and the drawings and any other document delivered along with the tiller are the property of SICMA, which reserves all rights and reminds that they cannot be made available to third parties without its written approval.

Therefore, any reproduction, even partial, of the text and illustrations is prohibited.

The information, descriptions and illustrations contained in this manual reflect the state of the art of the machine at the moment it was put on the market.

The Manufacturer reserves the right, at any time, to apply modifications to the machinery for technical or commercial reasons. Such modifications do not oblige the Manufacturer to intervene on machines sold up until that moment, nor to consider this publication inadequate.

Any integration that the Manufacturer will consider opportune to supply later on must be preserved together with the manual and be considered an integral part of the same.



### 1.5 TILLER IDENTIFICATION AND MANUAL CODE

For any after-sales requests or information regarding the tiller, contact SICMA or its after-sales centres always stating the model and the serial number stated on the plate.

The identification code of this manual is written on the cover. Write the number in a different place so that if this manual is lost or damaged, another copy can be requested from SICMA or the nearest dealer by also stating the serial number visible in the marking.



**SICMA** CE

SICMA SPA - C.da Carreto, 39 - 66100 Miglianico (Ch) - Italy  
Tel: +39 0871 95841 Fax: +39 0871 950295 - Info@sicma.it - www.sicma.it

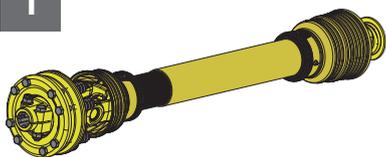
Type	Fresatrice
Model	RM210
Serial No	00216
Year	2011
Mass	445 Kg
Input	540 rpm

**MADE IN ITALY**



## 1.6 GENERAL DELIVERY NOTES

1

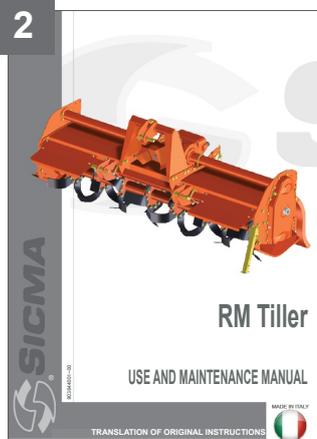


The tiller and its parts and/or accessories are normally delivered by lorry or container.

On receipt of the machine, check that:

- the supply corresponds with the order specifications (see transport document or packing-list)
- there is no damage to the tiller or accessories
- in the event of damage or missing pieces, inform the SICMA or its area representatives, the carrier or its insurance immediately in detail and/or with photos
- the spare parts or equipment supplied are sometimes in separate containers.

2



The machine is delivered by SICMA equipped with the following supplies:

- 1 - CARDAN SHAFT
- 2 - TILLER USE AND MAINTENANCE MANUAL
- 3 - CARDAN SHAFT USE AND MAINTENANCE MANUAL
- 4 - CE DECLARATION OF CONFORMITY

3



4

**CE DECLARATION OF CONFORMITY**  
pursuant to Directive 2006/42/CE

The Company  
Sicma s.p.a. - C. da Cerreto, 39 - 66010 Miglianico (Ch) - Italy  
Tel: +39 0871 95041 - Fax: +39 0871 950295  
e-mail: info@sicma.it - http://www.sicma.it

declares under his own responsibility that the machine:

Type: TILLER  
Model: RM  
Serial number: \_\_\_\_\_

is conform with the essential health and safety requisites of Directive 2006/42/EC.

To verify the conformity with the above Directive, the following have been consulted:  
EN Harmonised Standards:  
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The person authorised to fill-in the Technical File is Mr. Lorenzo Aurora (Sole Director)

Miglianico, 15-03-2011

**SICMA**

**Lorenzo Aurora**  
SOLE DIRECTOR

## 1.7 DECLARED USE

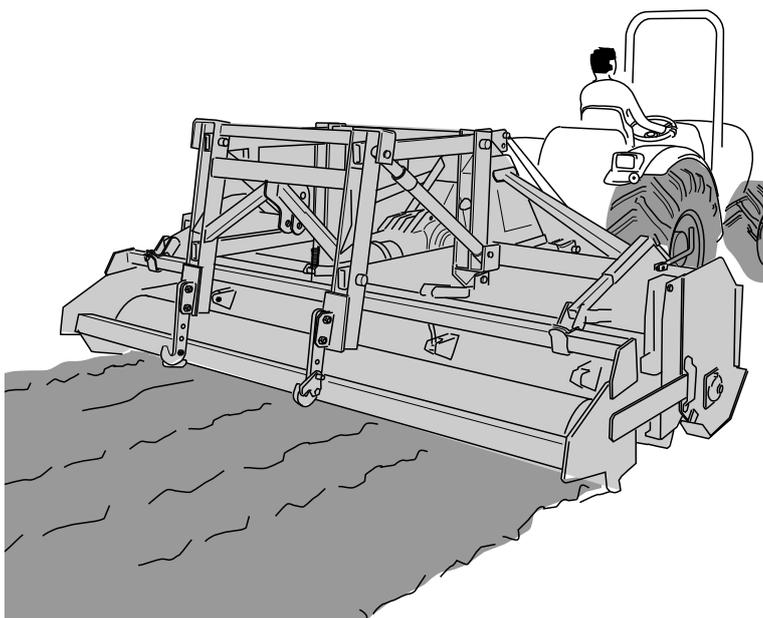
The RM Tiller has been designed expressly to work land and has been developed with the sole purpose of loosening, turning and oxygenating the land in order to prepare it for sowing.

It has been manufactured to be coupled to tractors that can support the weight of the tiller, with hydraulic lifting device and universal three point hitch and to be activated by the tractor PTO via Cardan transmission.

### USE ENVIRONMENT

The tiller works:

- in open fields, on non friable land, not excessively stony with a maximum gradient of 3°
- in environments with a temperature from 0° ÷ 50° C.



### IMPROPER USE

Any use different to that declared is to be considered improper.

Sometimes the operator uses the tiller incorrectly, below find some examples the must NOT BE PERFORMED.

The operator must not:

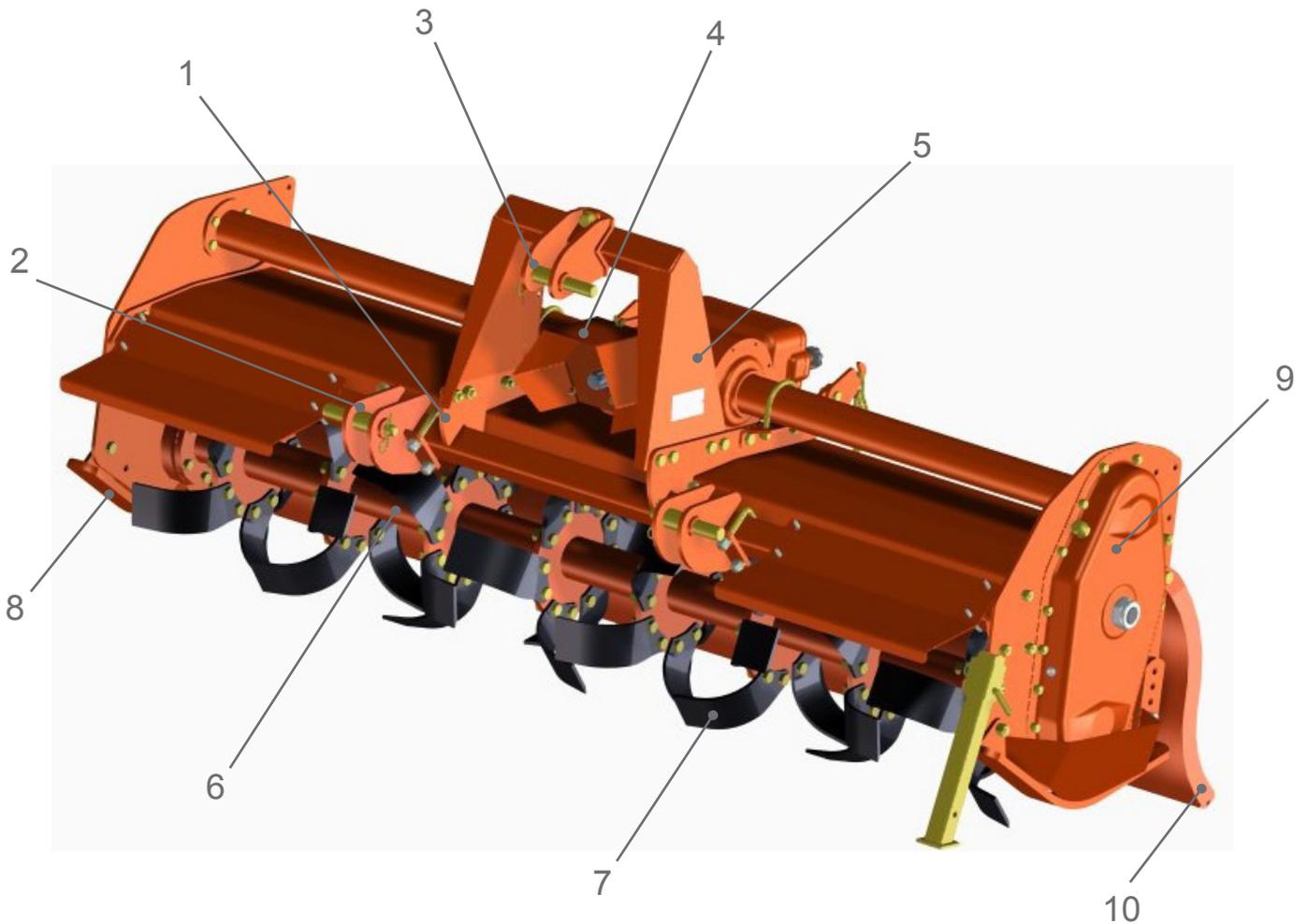
- connect the tiller to a Cardan shaft with greater or smaller power
- work in reverse gear compressing the earth with hood press
- couple the tiller to vehicles of unsuitable power or weight
- assemble the tiller without securing the rebound tie rods of the three-point hitch of the tractor's elevator
- lift the equipment when the PTO is rotating
- make curves or reverse with the tiller lowered.

Remember that the tiller is developed only with the purpose of the declared use.

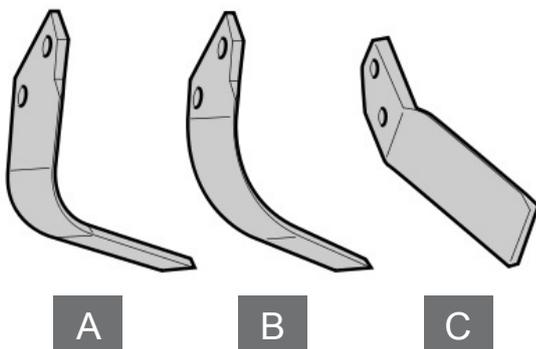
Any other use is to be considered improper.

## 1.8 TILLER COMPOSITION

- |    |                         |
|----|-------------------------|
| 1  | Chassis                 |
| 2  | Lower point hitches     |
| 3  | Upper three-point hitch |
| 4  | Cardan shaft protection |
| 5  | Third point mast        |
| 6  | Rotor                   |
| 7  | Hoes                    |
| 8  | Side skids              |
| 9  | Drive sump              |
| 10 | Bonnet                  |



## 1.9 STANDARD AND OPTIONAL SET-UPS



### TYPES OF TOOLS

A - SQUARE HOE

B - CURVED HOE

C - BLADE WITH 2 HOLES

## TYPES OF ROTOR

The purpose of the rotor is to work the earth in order to reduce the sods into smaller pieces, keeping the earth soft. Depending on the different features of earth to be worked, SICMA has developed and offers various types of rotor:

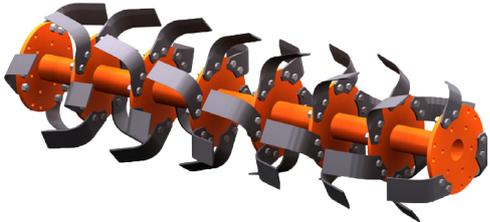
### ROTOR

A



A - STANDARD ROTOR: for land in normal conditions

B



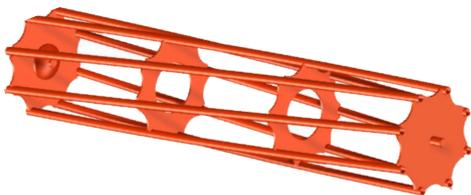
B - PUGLIA ROTOR: has the end hoes facing inwards and is recommended when working near to plants, avoiding damage to the roots

C



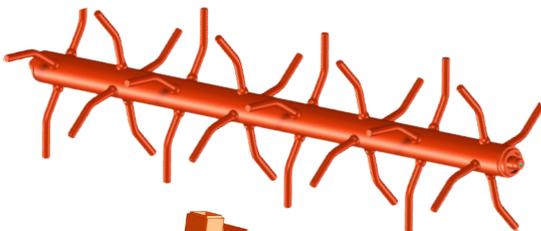
C - BLADE ROTOR: for wet and hard land

D



D - CAGE ROLLER: for dry land with average moisture and in the presence of small stones

E



E - SPIKED ROLLER: for stony, argillaceous land or with high level of humidity

F



F - FRONT WHEELS: for a further working height adjustment

G



G - CRUSHER: for grinding and conveying sods



## 2. SAFETY

During consultation of this use and maintenance manual and on the equipment itself, it is possible to find several symbols whose meanings are illustrated below.

### 2.1 DEFINITIONS (UNI EN ISO 12100-1:2009)

#### **DANGER:**

A potential source of physical injury or damage to health.

#### **DANGEROUS AREA:**

Any area within and/or in proximity of a machine in which the presence of a person constitutes a risk for the safety and health of the same.

The dangerous area is the area around the machine (attached to the tractor) up to a distance of 1 metre.

#### **EXPOSED PERSON:**

any person that is totally or partially inside a dangerous area.

#### **CRITICAL AREA**

The critical area is that between the tractor and the equipment (Cardan shaft area).

### 2.2 CONVENTIONAL SYMBOLS



#### **ATTENTION GENERAL HAZARD**

Informs the staff assigned that the operation described has the risk of physical injury if not performed with respect to the Safety Standards.



#### **NOTE**

Informs the staff assigned of information whose content is of relevant consideration and importance.



#### **WARNING**

Informs the staff assigned of information whose content can cause slight injury to persons or damage to the machine if not respected.



#### **MACHINE OPERATOR OR DRIVER**

Identifies qualified staff, i.e. with specific skills, as the operations are completely manual, therefore refer to the preparation and sensitivity of the machine driver to obtain the best qualitative results. It is therefore prohibited for the operator to perform operations that are the responsibility of the maintenance technician.



### MECHANICAL MAINTENANCE STAFF

Qualified technician able to intervene on mechanical parts in order to make all regulations, maintenance interventions and repairs necessary.



### EXTRAORDINARY INTERVENTIONS

Any maintenance interventions highlighted by the symbol at the side are to be requested from the manufacturer or authorised workshops.



### PERSONAL PROTECTIONS (PPE)

The presence of one of the symbols at the side imposes the use of the corresponding PPE by the operator, as the risk of accident is implicit.



### RECOMMENDATION

It refers to a work mode experimented on field, knowing well that every operator will develop his own way of operating.



## 2.3 SAFETY PRESCRIPTIONS

Even though SICMA has applied all possible safety devices on the equipment, it must be remembered that it can be dangerous for health if not used correctly. It is therefore advised to read and comply with the safety prescriptions listed below.

Before using the equipment, all operators **MUST** have read and understood the safety prescriptions and the entire user manual.

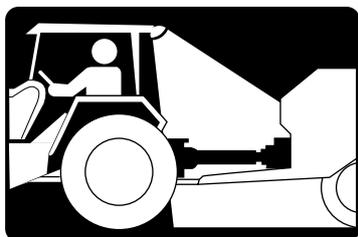
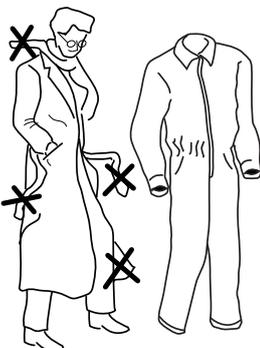
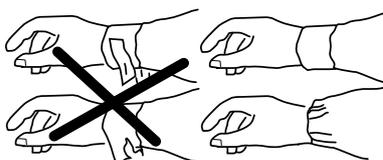
- the machine is not suitable to be used in other sectors than in agriculture
- any use different to that specified is to be considered improper
- the manual must always be on hand, in a way to consult it when necessary. If it should be lost or damaged, request a replacement copy from SICMA
- do not climb onto, sit on or rest on the equipment for any reason, whether it is on or in the zero energy state.

## 2.4 OPERATOR REQUISITES

- The machine must only be used by one operator driving the tractor.
- The machine must be used exclusively by authorised, instructed and trained operators. The operator, besides having read and understood the instructions contained in this manual, must also be sufficiently prepared on the proper use of the machine and must have a driving license. The operator must contact the dealer or the manufacturer if in doubt regarding use of the machine or interpretation of this manual.
- The operator must make sure that no person or animal stops within the radius of action of the same during machine functioning. Never activate the machine near to persons standing or transiting within the radius of action of the machine.
- Do not use the machine if you are tired, ill or under the effect of alcohol, medicines or drugs.

- The correct operator position is in the tractor driving seat. From this position he must also control that there are no persons exposed in the dangerous area in the work phase.

## 2.5 CLOTHING AND PPE



- Staff must use the safety supplies and PPE during use and maintenance of the vehicle.

The correct clothing to be worn during maintenance operations and use of the tiller is:

- gloves.
- accident-prevention shoes or boots with steel toe-cap
- glasses
- overall with elastic on the wrists, ankles and around the waist.

Moreover:

- given that the machine can generate emissions of dust during working, if the tractor does not have a closed cab, the operator must wear an anti-dust mask (especially on dry and dusty land)
- if the tractor does not have a sound-proof cab, the operator must wear hearing protections (especially on stony land)
- the operator assigned to the machine must not wear items of clothing that can cause entanglement (scarves, belts, wide sleeves, etc.).

## 2.6 MACHINE USE

- The machine is usually used during the day. If night-time use is exceptionally requested or use in conditions of reduced visibility, a tractor lighting system or an auxiliary lighting system must be used.
- Any arbitrary modification made on this machine lifts Sicma from any responsibility for damage or injuries that could result to operators, third parties or to objects.
- Check the machine thoroughly before each start-up.
- Check the tightness of all screws every day (consult the tightness table on page 40). If necessary, tighten them and also control the metal structures and repair them if necessary.
- Check that the retainer chains snap hooks of the Cardan shaft protection are hooked in the appropriate slot, in a way that the plastic protection remains at a standstill and does not turn with the Cardan shaft itself.
- Before getting out of the tractor and before any maintenance operation, activate the parking brake, turn the engine off, remove the ignition key from the dashboard and keep it.
- The hoes rotate rapidly when the machine is functioning: stay at a safe distance to prevent accidental contact with moving tools or with thrown objects.

## 2.7 SAFETY DEVICES

- Before using the machine, make sure that all safety devices are properly in place and in good conditions. If there are failures or damage to the guards, replace them immediately.
- Do not tamper with or bypass safety devices for any reason. After every cleaning and maintenance intervention, all of the safety devices must be restored and/or all protection guards closed. Check also that tools, cloths or various materials do not remain in the drive compartments.
- The signs applied to the machine supply a series of important indications: compliance with the same is for your safety.
- Make sure the safety pictograms are in good conditions. If the pictograms has deteriorated, they must be replaced with other original versions requested from the manufacturer and placed in the position indicated by the use and maintenance manual.

## 2.8 REASONABLY PREDICTABLE INCORRECT USE

The operator must not:

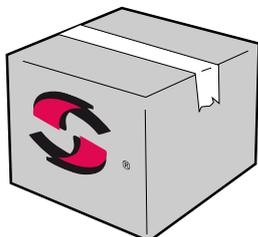
- connect the tiller to a Cardan shaft with greater or smaller power
- work in reverse gear compressing the earth with hood press
- make modifications to the equipment that could jeopardise safety
- perform makeshift repairs in order to work.

Moreover, it is prohibited to:

- couple the tiller to vehicles of unsuitable power or weight
- assemble the machine without securing the rebound tie rods of the three-point hitch of the tractor's elevator
- lift the equipment when the PTO is rotating
- tamper with hydraulic circuits
- use the machine to transport and/or to lift persons, animals or objects
- work on ground with gradient over 3°.

Sicma declines any liability for accidents deriving from the failure to comply with the prescriptions indicated below.

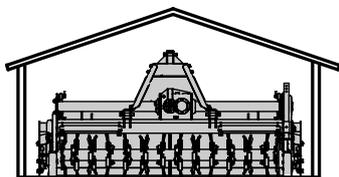
Given the particular stress to which the equipment is subjected and for safety reasons, if pieces are replaced, only use original spare parts.



## 2.9 ZERO ENERGY STATE

The "zero energy state" is defined as the state in which the tiller is to be taken before performing any cleaning, lubrication and maintenance operation. Perform the following operations to take the tiller to the "zero energy state":

- position the tiller on stable, flat land with maximum gradient of 3°
- disable the PTO from the tractor
- engage the tractor hand brake
- switch the tractor off, remove the key and keep it
- get off the tractor and disconnect the Cardan shaft from the PTO tractor
- disconnect the hydraulic points
- position the outrigger in the stop position
- disconnect the 3-point hitch.





## SAFETY PICTOGRAMS

1



### Attention

Read all instructions and safety rules carefully before using the machine. Stop engine and remove key before starting maintenance or repairs.

2



### Foot injury hazard

Keep at a safe distance from the machine.

3



### Thrown objects on entire body

Keep at a safe distance from the machine.

Hand injury hazard: do not open or remove safety guards while the machine is operating.

4



### Hand injury hazard

Keep safety guards in position while operating.

5



### Foot injury hazard

Rotating tools: keep a safety distance from the machine.

6



### Attachment point

For lifting the machine.

7



### Input 540 rpm

Use of a 540 rpm power takeoff

8



### Shearing hazard

Do not approach the hands.

9



### Burns hazard

Do not touch hot surfaces.

## IDENTIFICATION PICTOGRAMS

10



### CE plate

Stating the main data with serial number and CE mark

11

PTO SPEED	1	15	18	185
2	16	17	208	
3	17	16	235	
4	18	15	266	

540 rpm

### Gear plate

Number of rotor revs depending on the various gear combinations.

12



### RM Plate

Machine model

13



### Width plate

Width of the machine in cm

14



### OIL

Indication of lubrication oil load point



**ATTENTION CRUSHING HAZARD**



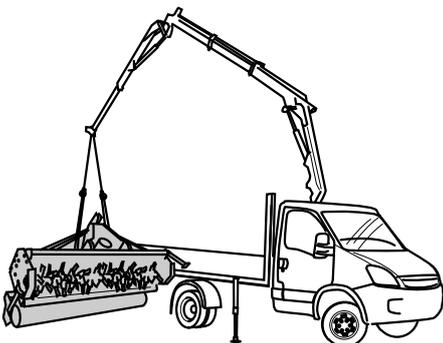
**ATTENTION GENERAL HAZARD**



**ATTENTION CRUSHING AND ENTRAPMENT HAZARD**



**ATTENTION SLEWING AND CRUSHING HAZARD**



**ATTENTION SLEWING AND CRUSHING HAZARD**

### 3. UNLOADING AND UNPACKING THE TILLER

#### ATTENTION

Qualified staff that has read and understood the safety prescriptions must unload the tiller from the lorry and handle the equipment in the work place.

A person in charge of operations must always be present during loading and unloading. In all cases, make sure that there are no persons, animals or objects in the unload area and behave as described in this manual.

The tiller is normally transported on a lorry, sometimes without packaging, sometimes protected by heat shrinkable film and other times in wooden cases.

#### ATTENTION

Read and understand the "Safety prescriptions" part before starting to transport and unpack the tiller.

#### 3.1 TILLER PROTECTED BY HEAT-SHRINKABLE FILM

##### NOTE

Before starting to unload the equipment from the lorry, read the entire sequence in a way to be prepared for every inconvenience in time.

Release the tiller from any fixing devices used to fasten it to the means of transport.

#### ATTENTION

Tiller unloading operations must be performed very slowly and the operator must make sure that there are no persons, animals and objects exposed in the unloading area.

#### ATTENTION

Before starting lifting

- check the good state of preservation of the ropes or chains used to lift the machine
- use ropes/chains with suitable capacity. Keep in mind that each individual rope/chain must be able to lift the weight of the tiller (see Part 3 "technical features")
- make sure that the hook bolts are fastened well
- in the event of chains with shorteners, make sure that this are also fastened correctly.

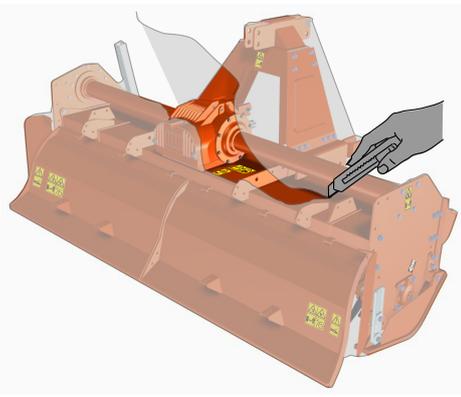
After having fastened the tiller with the ropes and/or chains, lift the equipment by a few centimetres to see if it is lifted in parallel: if it is not raised in parallel, adjust the length of the ropes/chains.

#### ATTENTION

Lift the tiller from the deck of the means of transport to a height of about 30 cm. unless obstacles are present, so that it does not swing. Position the tiller on the ground in proximity of the tractor.

Remove chains or ropes.

Once on the ground, unpack the equipment as described below.



#### ATTENTION CUTTING HAZARD

If the tiller arrives wrapped in a protective film, cut it using a Stanley knife; pay attention not to cut the hands and not to damage the tiller itself.

To perform this operation in safety, the operator must:

- wear cut-proof gloves
- take a Stanley knife
- paying attention not to injure the hands and not damage the tiller, cut the protection.

#### ATTENTION POLLUTION HAZARD

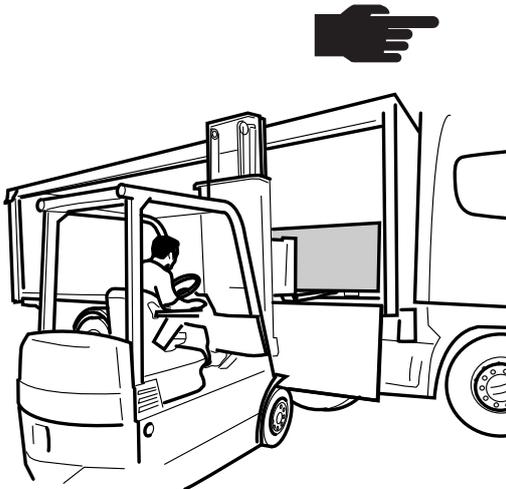
Once unpacked, do not disperse the packaging in the environment but contact a specialised agency for its withdrawal. Check the transport document or packing-list supplied and, if necessary, act as described in part 1 "General Delivery Notes".

### 3.2 TILLER IN WOODEN CRATE

#### NOTE

Before starting to unload the equipment from the lorry, read the entire sequence in a way to be prepared for every inconvenience in time.

If the tiller is contained inside a wooden crate, use a fork-lift truck with suitable capacity to unload it (consult technical features table to see tiller weight) or use the lorry's lifting arm.



**ATTENTION CRUSHING AND ENTRAPMENT HAZARD**

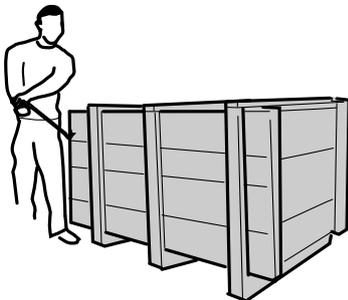
#### ATTENTION

Tiller unloading operations must be performed very slowly and the operator must make sure that there are no persons, animals and objects exposed in the unloading area.

Insert the fork lift forks as indicated in the figure.

Lift the crate from the deck of the means of transport to a height of about 30 cm. unless obstacles are present.

Position the crate on the ground in proximity of the tractor.



Wear gloves and using a suitable tool, remove the cover from the wooden case.

Use a fork lift truck with suitable capacity (see part 4 "Technical features"). After having fastened the tiller with the ropes and/or chains, lift the equipment by a few centimetres to see if it is lifted in parallel, otherwise adjust the length of the ropes/chains.

Use ropes/chains with suitable capacity to lift the tiller.

Lift the tiller a max. of 30 cm from the crate and position it near to the tractor.



**ATTENTION SLEWING AND  
CRUSHING HAZARD**



**ATTENTION POLLUTION HAZARD**

once unpacked, do not disperse the packaging in the environment but contact a specialised agency for its withdrawal or keep it for other transports. Check the transport document or packing-list supplied and, if necessary, act as described in chapter 1 "General Delivery Notes".



**ATTENTION OVERTURNING  
HAZARD**

**ATTENTION**

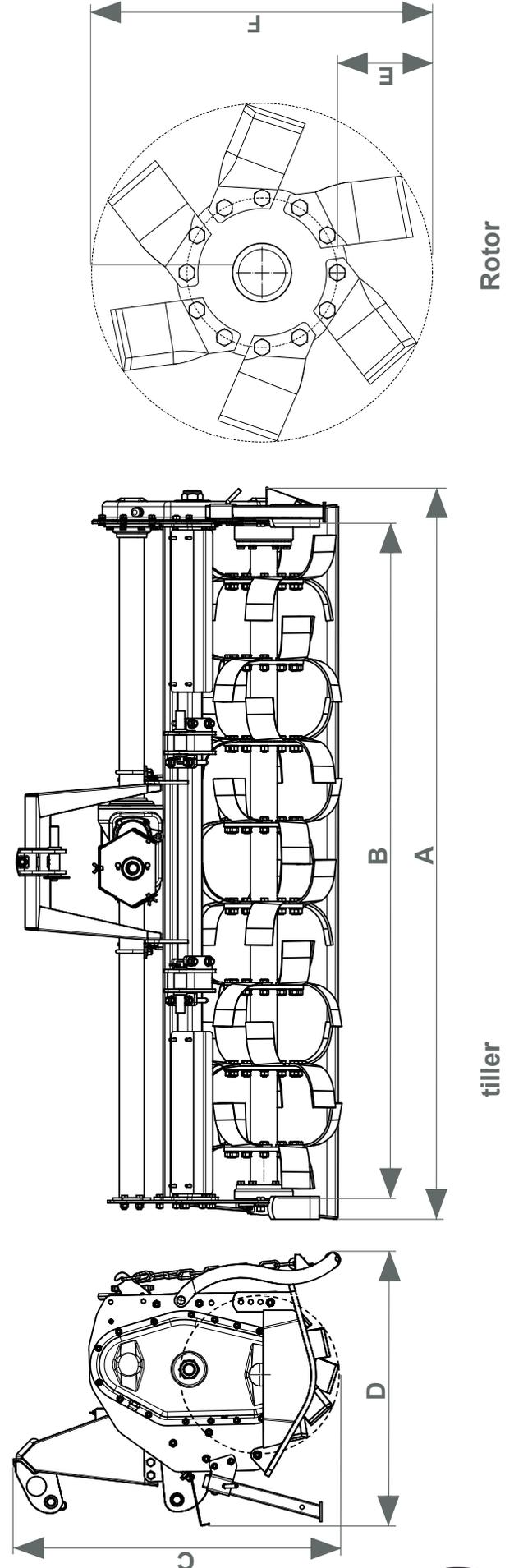
Remember that no matter how stable the equipment, during successive transport operations, it must ALWAYS:

- be well fastened to the lorry, paying attention not to crush any hydraulic pipes
- be positioned in the centre of the lorry and not at the edges. In this way, overturning dangers are prevented, due to curves or uneven roads.

## 4. TECHNICAL FEATURES

Below find the table stating the technical features of the RM Tiller.

	RM 110	RM 120	RM 135	RM 150	RM 160	RM 170	RM 185	RM 210	RM 235
Overall width (A)	1268	1368	1504	1654	1754	1854	2004	2254	2504
Working width (B)	1100	1200	1336	1486	1586	1686	1836	2086	2336
Height (C)	996	996	996	996	996	996	996	996	996
Side clearance (D)	843	843	843	843	843	843	843	843	843
Work depth (E)	145	145	145	145	145	145	145	145	145
WEIGHT (standard version)	375	390	405	430	440	455	475	515	555
	827	860	893	948	970	1003	1047	1135	1224
Number of rotor revs (without gear)	221								
Number of rotor revs (with gear)	185-208-235-266								
Rotor pipe diameter	82,5	82,5	82,5	82,5	82,5	82,5	82,5	82,5	82,5
Rotor pipe thickness	10	10	10	10	10	10	10	10	10
Rotor work diameter (F)	510	510	510	510	510	510	510	510	510
Number of hoes	16	20	20	24	24	28	28	32	36
	24	30	30	36	36	42	42	48	54
Type of hoes	YES	YES	YES	YES	YES	YES	YES	YES	YES
	YES	YES	YES	YES	YES	YES	YES	YES	YES
Minimum tractor power	CV	40	40	50	50	50	60	60	60
Tractor hitch category	cat	1°-2°	1°-2°	1°-2°	1°-2°	1°-2°	1°-2°	1°-2°	1°-2°
PTO speed	rpm	540	540	540	540	540	540	540	540





	RM 110	RM 120	RM 135	RM 150	RM 160	RM 170	RM 185	RM 210	RM 235
Weight	-	-	-	-	120	130	140	155	170
G	-	-	-	-	1700	1800	1950	2200	2450
H	-	-	-	-	880	880	880	880	880
I	-	-	-	-	750	750	750	750	750
L	-	-	-	-	484	484	484	484	484
Weight	-	-	-	-	125	135	145	160	175
G	-	-	-	-	1700	1800	1950	2200	2450
H	-	-	-	-	845	845	845	845	845
I	-	-	-	-	715	715	715	715	715
L	-	-	-	-	364	364	364	364	364
M	250	250	250	250	250	250	250	250	250
N	600	600	600	600	600	600	600	600	600
O	315	315	315	315	315	315	315	315	315
P	280	280	280	280	280	280	280	280	280
Q	495	495	495	495	495	495	495	495	495
R	345	345	345	345	345	345	345	345	345
S	615	615	615	615	615	615	615	615	615
T	360	360	360	360	360	360	360	360	360

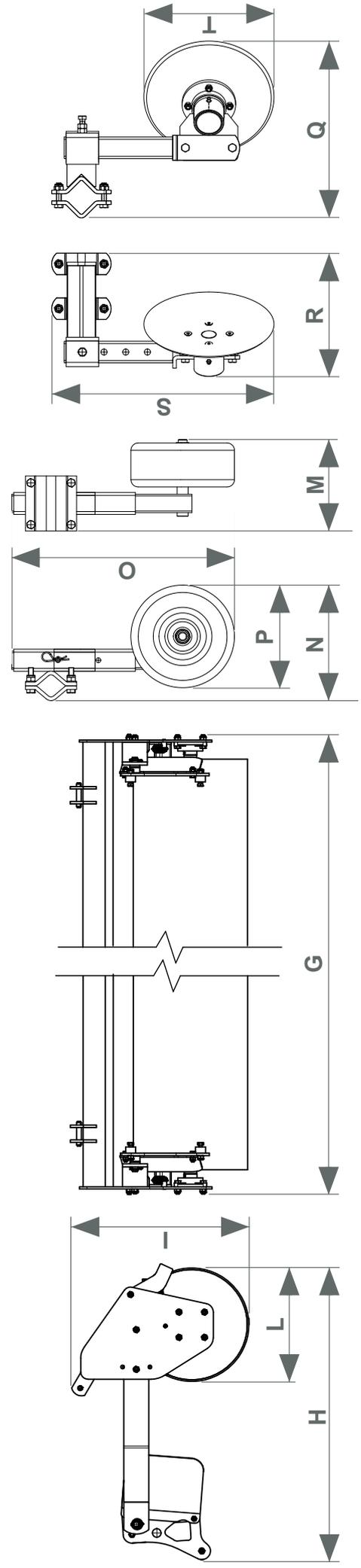
Optional

Spiked rollers

Cage roller

Front wheels

Crusher



Front wheel

Rear roller

Crusher

## 5. START-UP



### ATTENTION

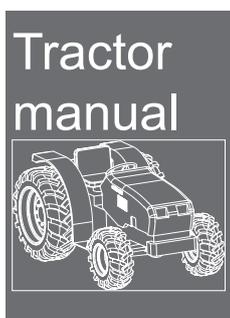
Only qualified operators and which have read and understood the safety prescriptions can carry out the operations described below. Moreover, they must check that there are no persons, animals and objects exposed in the area where the connection is made to the tractor.

The operator and any aids must have PPE available and wear them as required.

The tiller can only be moved if hitched to the tractor. To do this, follow the instructions given below step-by-step

The operations that follow must be performed according to the order indicated.

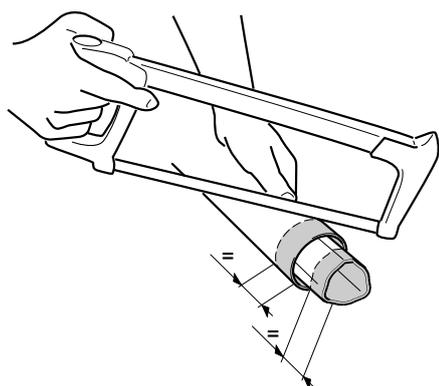
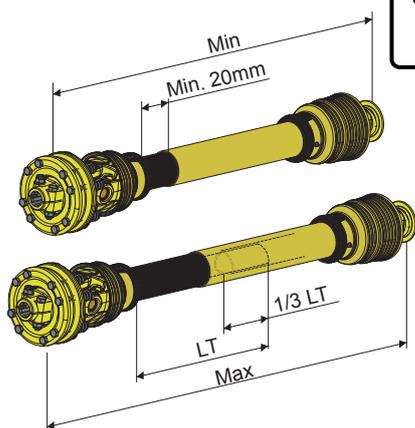
- CARDAN SHAFT CONNECTION
- 3-POINT HITCH CONNECTION TO THE TRACTOR



### 5.1 CARDAN SHAFT CONNECTION

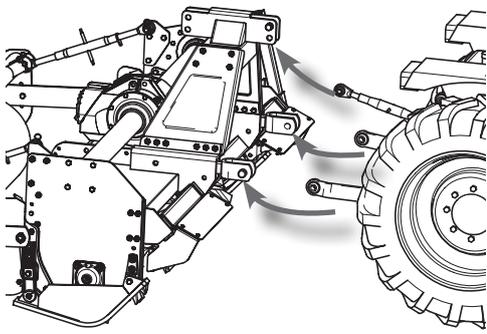
Before assembling the Cardan shaft, the operator must:

- read the Cardan shaft and tractor manual.
- check that the number of revs. and the direction of rotation of the tractor PTO correspond to those of the tiller. If the direction of rotation of the tiller does not correspond to that of the tractor, contact the dealer or an authorised workshop.
- check that the Cardan shaft minimum and maximum lengths are those required by tiller-tractor coupling. Remember that when at maximum extension, the pipes must overlap at least 1/3 of the length of the internal pipe. Moreover, in the maximum closure position of the pipes, the minimum play allowed of the plastic protections must be at least 2 cm. in order to prevent damage to the protections and the reducer. If this is not the case, it must be shortened suitably butting cutting that necessary. Consult the Cardan shaft use and maintenance manual or contact the authorised dealer.

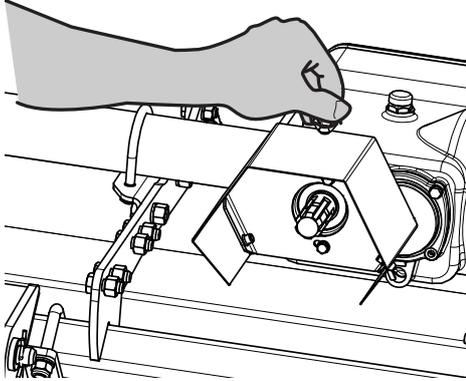


To connect the Cardan shaft, the operator must:

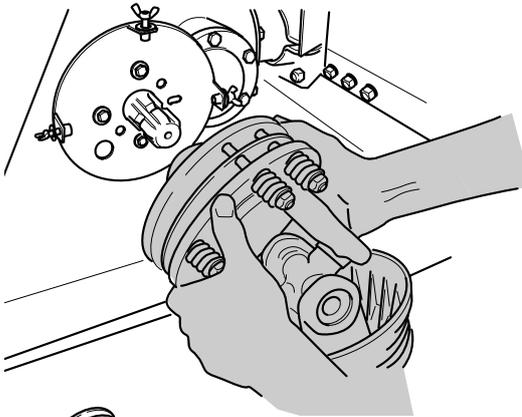
Slowly approach the tractor to the tiller, position in a way that the lifting



device arms of the tractor are aligned with the two lateral pins of the tiller. Once in position, engage the hand brake, switch the engine off, remove the key and keep it and climb down from the tractor. Check that the Cardan shaft protection is integral as per image at the side. If this is not the case, act accordingly consulting the relative user manual.

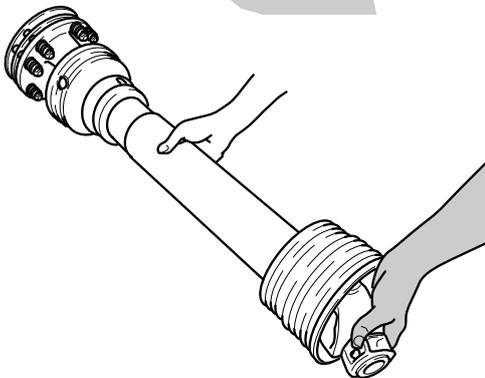


Loosen the 3 screws that fix the tiller PTO protection and remove it.

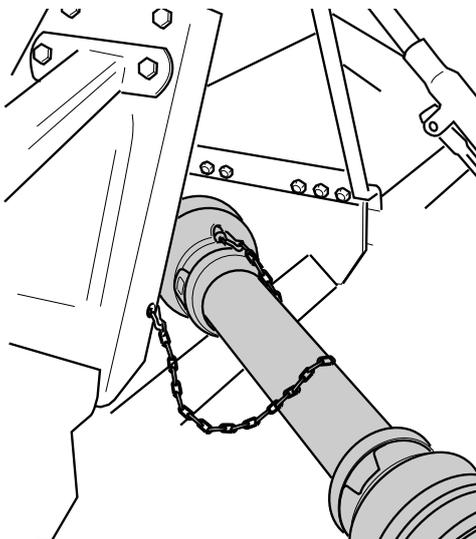


Direct the Cardan correctly, so that the clutch is positioned from the side of the equipment. In the event of joint without clutch, to position the Cardan correctly, refer to the figure of the tractor embossed on the external protection pipe.

Insert the Cardan shaft hub on the tiller PTO. Once it is ensured that the clutch has entered completely, tighten the double bolt with two 21 mm wrenches.



Re-position the protection on the tiller PTO  
Tighten the 3 fastening screws that were loosened previously.  
Insert the Cardan shaft onto the tractor PTO, holding the safety pin pressed. Release the pin and retract with the Cardan until the pin itself engages in the relevant seat with an audible "click".



Attach the snap hook of the Cardan shaft protection retainer chain in the relevant slot on the upper third point sheet steel. Carry out the same operation on the tractor PTO.



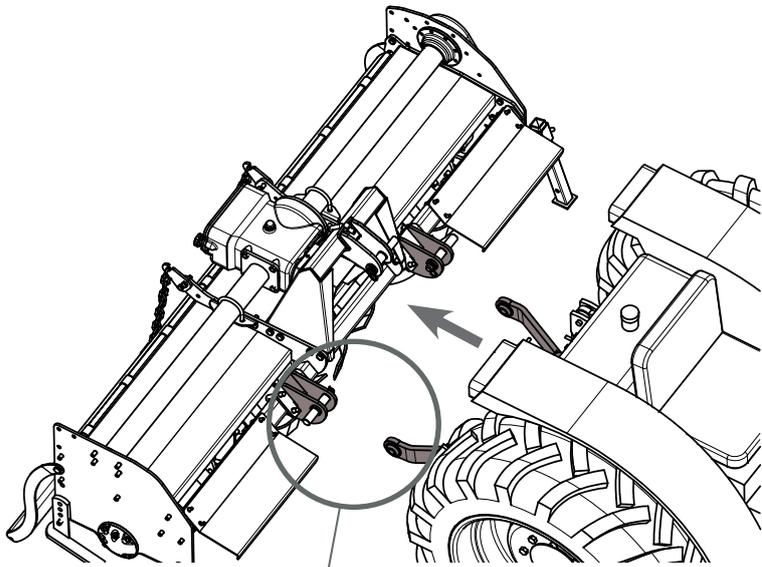
## 5.2 3-POINT HITCH CONNECTION



**INPUT 540**  
540 rpm

The machine must be connected to the tractor with a 540 rpm driven power take-off, having suitable weight and power and with standard 1st or 2nd category hitch.

Proceed as follows to hitch the machine to the tractor:



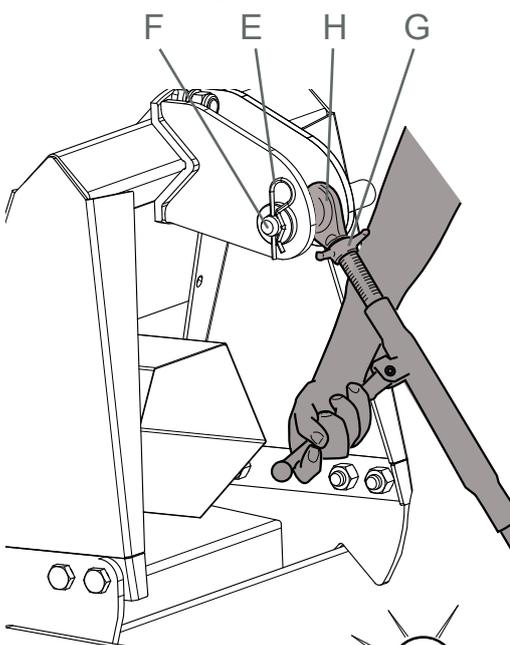
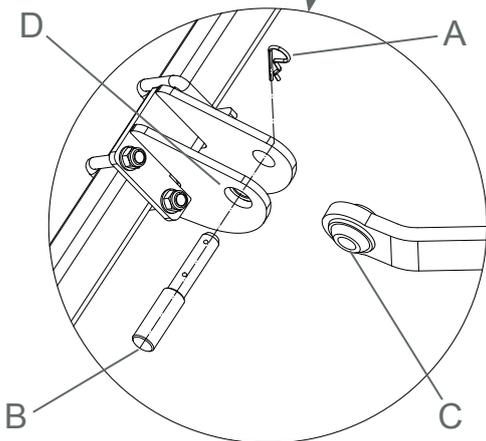
- remove the split pin A of pin B
- slide pin B out
- climb onto the tractor and switch the engine on
- release the hand brake
- reverse slowly until the tractor lifting device arm joint C combines with the lower third point of the tiller D
- switch the engine off, engage the hand brake, remove the key and keep it and climb down from the tractor
- Insert the pin into the hole of the lower third point of the tiller and into the hole of the tractor arm joint.
- re-insert the split pin.

Proceed in the same way with the other lower hitch.

- Block the rebound tie-rods of the tractor lifting arms to prevent the machine oscillating laterally, compromising the transversal stability of the complex.

To connect the upper third point, the operator must:

- remove the split pin E of the pin F of the upper third point of the tiller.
- slide pin F out
- release the tie-rod G of the tractor upper third point and insert it into the upper third point H of the tiller
- re-insert the pin F and the split pin E into the tiller upper third point and into the tractor tie-rod joint
- lift the tiller until the machine and tractor power points are taken to the same height and register the tensioner, taking the machine to a horizontal position
- adjust the length of the tie-rod so that the upper part of the frame is parallel to the ground.



It is always good practice to make sure that the tiller PTO axis is parallel to the ground thus reducing the stress to a minimum on the power take-off and extending the working life of the tiller.

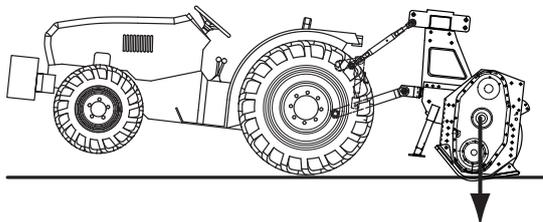




**ATTENTION OVERTURNING  
HAZARD**

## CHECK THE STABILITY OF THE TRACTOR-TILLER COMPLEX.

Tiller weight changes the stability of the tractor-tiller complex, influencing steering and braking capability. Therefore proceed at a moderate speed. In particular, remember that the front axis must always be encumbered by a weight equal to at least 20% of the total weight of the tractor-tiller complex. Check the lifting capability and tractor stability using the following formula and, if necessary, apply ballasts on the front.



$$M \times (S1+S2) \leq 0.2 T \times i + Z \times (d+i)$$

$$M \leq 0.3T$$

**i** = wheel base

**d** = distance from the front axis from the ballasts

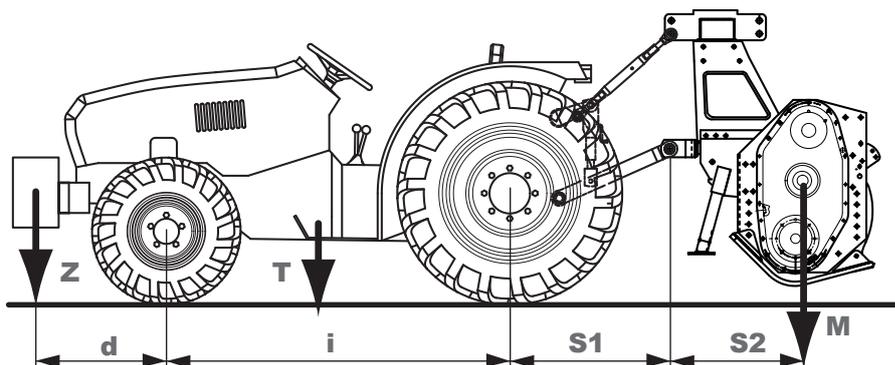
**S1** = distance between centre of the rear axle and centre of the lower hitch points

**S2** = distance between the centre of the lower hitch points and barycentre of the tiller

**T** = weight of the tractor + 75Kg (operator)

**Z** = weight of the ballast

**M** = weight of the machine



## 5.3 ROAD TRANSPORT

Articles 61 and 104 of the Highway Code of the Italian State prescribe that the maximum width of vehicles on roads is 2.55 metres. As a consequence, all measurements of the RM available are authorised for road transport, in compliance with the other prescriptions of the Highway Code.

If the Country of reference is not Italy, follow the Highway Code Standards of the country of use.

## 6. ADJUSTMENTS

### 6.1 ROTATION SPEED CHANGE

At time of purchase it is possible to choose among two configurations of the RM machine: with and without speed gear.

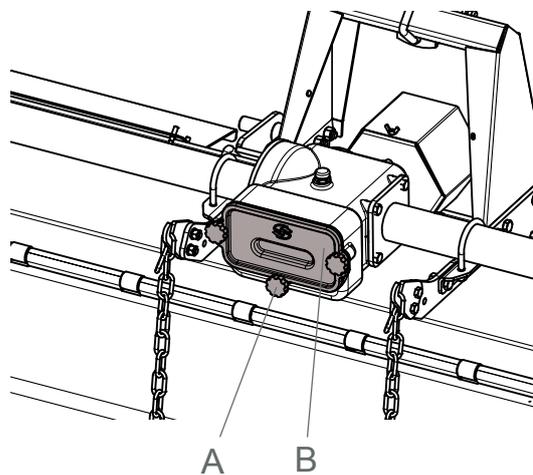
In the event the tiller has the speed gear, to modify the rotation speed of the rotor, the positions relative to the straight gears contained in the gear box must be exchanged.

Before making the replacement, wait for the gear box to have cooled down and wear the relevant PPE, in particular gloves as there is a hands burning hazard present.



**ATTENTION BURNS  
HAZARD**





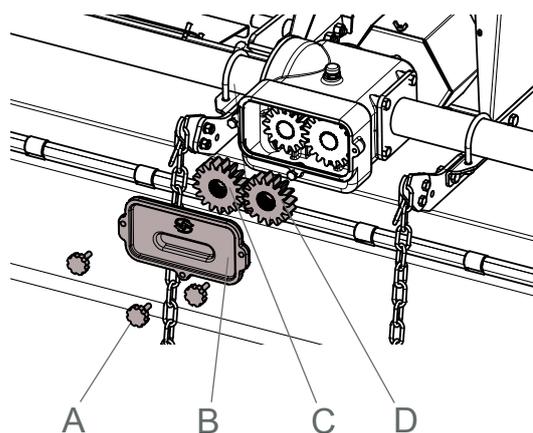
To regulate or replace the gears torque, first remove the oil from the gear unit boxes as indicated in point 8.1.

Decide at what tractor rotation speed to work at, consulting the following table.

pto rpm	Z1	Z2	N. revs. rotor
540	15	18	185
	16	17	208
	17	16	235
	18	15	266

(standard configuration)

Unscrew the 3 screws "A" of the gears support lid "B". Inside there are 2 pins that support 2 reserve gears "C" and "D" (that do not work and are used to guarantee the other speeds). The gears are flush fitted onto two drive shafts. To change the speed, invert the 2 gears that work or replace the 2 reserve gears. Re-position the gears support lid and tighten the 3 screws again.



## 6.2 CLUTCH ADJUSTMENT

The joint and the clutch associated to the machine are dimensioned to transmit suitable power to the machine itself and the calibration value is already set in the factory, therefore it is not recommended to modify the clutch calibration in order to prevent damage to the machine or the Cardan joint. SICMA does not respond to machine damage deriving from incorrect modification of the clutch calibration.

However, the regulation can be made if it is realised that the clutch is engaged too frequently, even though working on easy land, i.e. soft and not compact: this means that clutch calibration is too low.

The clutch associated to the Cardan Shaft is a FD2 EUROCARDAN, with standard calibration of 900Nm. If the clutch calibration must be increased, screw the springs hold down nut by 1/4 of a turn (using two 17 mm wrenches): there will be a transmissible torque increase of about 140 Nm. Loosen the nuts if calibration is to be decreased.

In the event the clutch is not to be used for a long period, it is recommended to loosen the nuts that compress the springs in order to prevent that the disks "stick" to one another (seizure). Upon re-use of the safety device, for correct calibration carry out the following operations:

- manually tighten the nuts until they rest against the springs
- use two 17 mm wrench to loosen the nuts by 1.5 turns each.



Attention: make sure that the height of all compressed springs is the same in order to prevent clutch malfunctioning.

Warning: The clutch springs do not have to be close-wound because the machine would no longer be protected against any overloads.

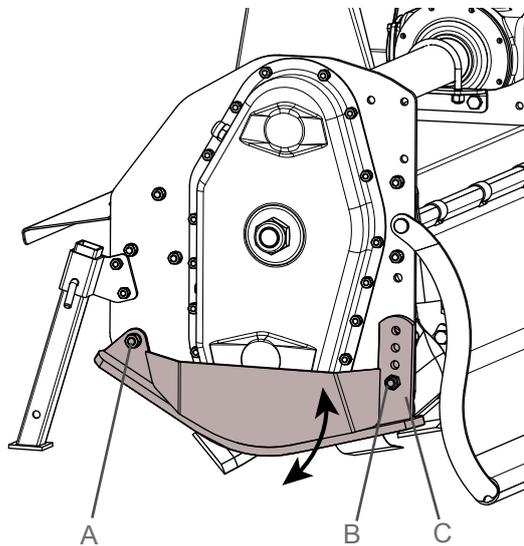
## 6.3 WORKING HEIGHT ADJUSTMENT

The work height can be modified by operating on the position of the skids or any rear roller (optional).

To modify the position of the skids, after having lifted the tiller, operate as described:



Attention Hand cutting and shearing hazard



Loosen bolt A using 21 mm wrench and followed by bolt B and until the toothed plate D can run. Turn the skid until the desired position is reached. Perform the same operation on the opposite skid, making sure that both skids are adjusted to the same height.

Whenever your machine has a roller, the skids are not adjustable and the tilling depth also depends on its position.

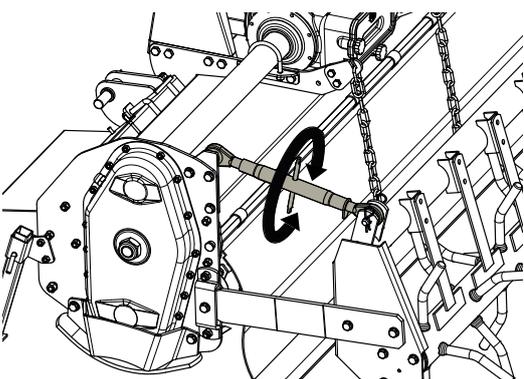
The function of the rollers is to flatten, level or compact the land after it has been tilled in order to prevent non-uniformity (see page 13).

To adjust the roller, turn the relevant lever as per figure.

To increase the tilling depth, the height of the rear roller must be increased with respect to the hoes-support rotor, vice versa to decrease it.

Make sure that the roller has been positioned at the same height on both sides.

Finally check that the tiller is parallel to the ground and, if necessary, regulate its planarity by operating on the tie-rod lever of the upper 3 points hitch.



## 6.4 COVERS ADJUSTMENT

If the tiller has rear cover with chain, the inclination can be adjusted by simply shortening or lengthening the tract of taught chain.

When performing the following operations, pay attention not to put the hands between the two covers (RM 235). During regulation of the rear lid, do not lift/lower it from the sides but only from the lower edge.



Attention Hand cutting and shearing hazard

If the tiller has cover with bonnet presses, the inclination can be adjusted to obtain more or less land compacting.

If the cover is to be opened further:

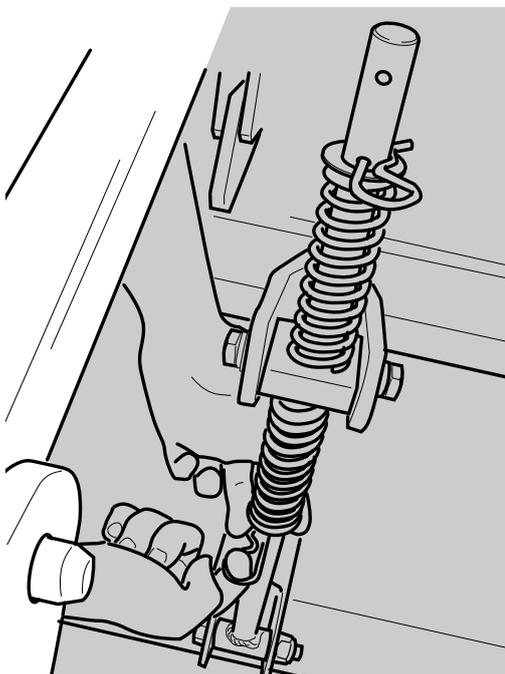
- remove the upper split pin of the bonnet press rod and position it in the upper hole
- lift the cover making the springs run manually upwards along the rod,
- remove the lower split pin of the bonnet press rod and re-insert it in the upper hole
- Perform the same procedure for the other semi-cover
- If the cover is to be closed further, proceed in the opposite direction.

## 6.5 MACHINING

Once all controls and regulations have been performed, with the tractor connected to the tiller (via 3 point hitch, but with Cardan shaft disconnected), switch the tractor on and go to the work area, remembering to keep the hoes lifted so that they do not touch the ground (at least 20 cm).

To work, the tiller must be connected to a tractor. It is from the tractor itself that all tiller controls are managed.

The operator must refer to the tractor manual in order to use the tiller.



## WARNING

Before starting work, make sure that no people or animals are within the radius of action of the machine.

Make sure all equipment protections are present and efficient.

The machine must only be used by one operator positioned inside the tractor driving cab.

Make sure there are no restrictions that prevent movements. If there are restrictions, release the equipment from any fastening device.

## PREVENTIVE MAINTENANCE

Before using the machine for the first time, or after a long period of inactivity, carry out the following:

- check that the machine is not damaged
- check the mechanical parts, are in good conditions and not rusted
- check the state of wear of the tools
- grease all mobile parts precisely
- check that there is no oil leakage coming from fittings or piping
- check that all safety guards are properly positioned
- visually check the machine before all use. Tighten any loose bolts according to the coupling torque tables given on page 40
- check the oil level in the gear box unit, in the lateral drive sump and in the external side rotor support and top-up to the correct level if necessary (see chap. 8 "Routine maintenance")
- grease the rear roller supports (optional).

Use the following lubricants for lubrication:

- oil: **AGIP-ENI BLASIA 150**
- grease: **AGIP GREASE MU EP 2**



## NOTE

Before working with the equipment, read the entire sequence in a way to be prepared for every inconvenience in time.

It is good practice to start the equipment in reduced normal conditions especially in cold environments, to allow the system to run-in and to prevent equipment malfunctioning.

On arrival at the work place, the operator must:

- engage the hand brake
- switch the engine off
- remove the ignition key and keep it
- get off the tractor
- check that there are no persons, animals and objects in the exposed area
- connect the Cardan shaft to the tractor PTO as described in point 5.1.

Once connected to the Cardan shaft, the operator must:

- turn the tractor engine on
- release the hand brake
- work at a maximum speed of 6 km/h reducing it to about 2 km/h if the land is difficult to work (hard, stony, etc.).

Keep the tractor engine running at a rev speed that assures the machine the needed power for its use.

Run a short way with the tiller working and check the quality of the work carried out. If it does not satisfy you, repeat and review the machine adjustment operations.



Attention Feet cutting and shearing hazard



Attention Thrown objects hazard



Never place hands and feet near to the tools-holder rotor when it is rotating (or when in zero energy state).

During functioning, the machine can project material from the rear part: make sure that animals and persons are at least 5 metres from the machine.

In the operations involving change of direction, turning and going in reverse, disengage the power take-off and lift the tiller slightly from the ground, in order to avoid structure damage.

When the job has been finished, the operator must:

- engage the hand brake
- switch the engine off
- remove the ignition key and keep it
- get off the tractor
- disconnect the Cardan shaft from the tractor PTO and place it in the relevant support hook
- Climb onto the tractor and release the hand brake
- Switch the tractor on
- Paying attention during movement that there are no exposed persons, animals or objects, take the tiller into the deposit.

Once having reached the deposit, the operator must:

- engage the hand brake
- switch the engine off
- remove the ignition key and keep it
- clean the tiller (see chap.9 "CLEANING")
- check that there are no oil leaks, stop any leaks present (Ground pollution hazard)
- check and if necessary, replace any worn parts (see chap. 8 "Maintenance").

#### NOTE

If the equipment stops during working, consult par.12.2 "Troubleshooting".

## 7. STOPS

### ATTENTION GENERAL HAZARD

Only qualified operators and which have read and understood the safety prescriptions (Chap. 2) can carry out the operations described below. Moreover, they must check that there are no persons, animals and objects exposed in the dangerous area.

The equipment must be stopped in the following ways:

- Temporary stop
- Stop at the end of the day
- Stop for long periods
- Emergency stop

Below find the description of how to behave in each case.

### TEMPORARY STOP

To stop the tiller temporarily, just deactivate the rotation of the tractor PTO by activating the relevant control in the tractor control panel.

If the operator must get off the tractor, he must:

- engage the hand brake
- switch the engine off
- remove the ignition key and keep it
- get off the tractor.

#### STOP AT THE END OF THE DAY

- engage the hand brake
- switch the engine off
- remove the ignition key and keep it
- get off the tractor
- disconnect the Cardan shaft from the PTO tractor
- clean the tiller (see chap.9 "CLEANING")
- check that there are no oil leaks, stop any leaks present (Ground pollution hazard)
- check and if necessary, replace any worn parts (see chap. 8 "Routine maintenance").

#### STOP FOR LONG PERIODS

When the machine is parked for long periods of time:

- activate the tractor parking brake
- lower the machine resting feet
- place the tiller on the ground
- turn the tractor engine off
- remove the ignition key from the control panel and keep it
- descend from the driver position
- detach the Cardan shaft
- rest the Cardan shaft on the relevant support
- pull out the split pin and the gudgeon and detach the tie rod (upper third point)
- fix the tie-rod to the appropriate support on the tractor
- pull out the slip pins and the connecting gudgeons and then the tractor's rear hydraulic lift arms from the tiller's hitch points
- get back onto the tractor
- start the tractor and move away carefully
- clean the tiller (see chap.9 "CLEANING")
- lubricate all of the tiller with an anti-rust product.

The machine must be parked on flat land and within a protected area, so as to prevent unauthorised staff from approaching.

#### EMERGENCY STOP

To stop the tiller in emergency conditions, just deactivate the rotation of the tractor PTO by activating the relevant control in the tractor control panel. At this point, engage the hand brake, switch the engine off, remove the key and keep it.

Identify the cause of the emergency stop and, if necessary, consult par. 12.2 "Troubleshooting".

Decide:

- if necessary, take the equipment to the zero energy state
- if after-sales assistance must be requested
- if it can be repaired.

Once the cause of the emergency stop has been eliminated, the equipment has been re-started.



## 8. ROUTINE MAINTENANCE



**ATTENTION GENERAL  
HAZARD**

### ATTENTION

Only qualified operators and which have read and understood the safety prescriptions (Chap. 2) can carry out the operations described below. Moreover, they must check that there are no persons, animals and objects exposed in the dangerous area.

The operator must know and scrupulously follow the indications and must have put the machine out of service.

The periodic controls and the maintenance operations described in this chapter must be performed in the times and ways established and are the operator's responsibility.

Failure to comply with Standards and maintenance times jeopardises the good functioning of the machine and its duration and as a consequence the validity of the warranty.

For any other maintenance, consult par. 12.2 "Troubleshooting" or contact the Manufacturer or its after-sales centres.

Considering the complexity of the equipment, repairs, modifications, extraordinary maintenance different to those mentioned below **MUST NOT** be performed without having consulted the Manufacturer or its after-sales centres. Depending on the case, these will give authorisation to proceed along with all instructions necessary or they will recommend the intervention of one of its own technicians.

These precautions are due to the fact that, incorrect or unsuitable operations can lead to abnormal functioning conditions, causing damage to the equipment and risks to staff.



**ATTENTION  
OVERTURNING, CRUSHING  
HAZARD**

### ATTENTION

Before performing maintenance, read all of this part in a way to be prepared for every inconvenience in time.

### ATTENTION

Ensure stability of the equipment (tractor and tiller) before performing any maintenance intervention (the maximum gradient limit of the ground is 3°).

Before carrying out any maintenance operation, the operator must take the tiller to the zero energy state (See par. 2.10)

The maintenance technician and any aids must have PPE available and wear them as required.

Do not perform repairs of which you have no knowledge. Always follow the instructions. If they are missing, contact the supplier or expert personnel.

Do not use lifting points different from those prescribed.

Make sure that the chosen lifting device is suitable to carry out operations in compliance with safety Standards.

Do not leave the tractor engine running in closed places if they do not have a ventilation system suitable to remove toxic gas exhaust concentrated in the air.

Avoid prolonged and repeated skin contact with lubricants as they could harm skin and cause other syndromes.

Do not ingest fuels/lubricants/fluids. In the event of accidental contact the eyes, wash them well with water.

Do not weld in closed places or in those which are not appropriately ventilated.



**ATTENTION GENERAL  
HAZARD**



Do not weld on painted surfaces, to prevent the formation of toxic vapours. Remove paint with suitable products and then wash the surfaces and let them dry.

SICMA INFORMS THAT ANY MODIFICATION OR TAMPERING OF THE TILLER OR ANY OPERATION PERFORMED IN DISAGREEMENT WITH THAT WRITTEN IN THIS MANUAL, ESPECIALLY FAILURE TO COMPLY WITH THE SAFETY PROVISIONS, AS WELL AS MAKING THE WARRANTY NULL AND VOID, RELIEVES SICMA FROM ANY LIABILITY FOR DAMAGE TO OBJECTS AND INJURY TO PERSONS.



**ATTENTION BURNS  
HAZARD**



**ATTENTION POLLUTION  
HAZARD OF THE LAND AND  
WATER TABLES**

## 8.1 CONTROL AND REPLACEMENT OF THE OIL IN THE GEARBOX UNIT

### ATTENTION

Wait for the gearbox to have cooled down before touching it.

### ATTENTION

The operator must pay attention to oil leaks and perform relative maintenance immediately. Moreover, oil must not be poured onto the ground when topping-up or replacing the oil.

The oil level control in the gear unit box must be performed verifying the mark left by the oil itself on the load cap dip-stick A, which must be between the two reference signs (minimum and maximum).

The control must be performed every 50 working hours.

If top-up is necessary, proceed as follows:

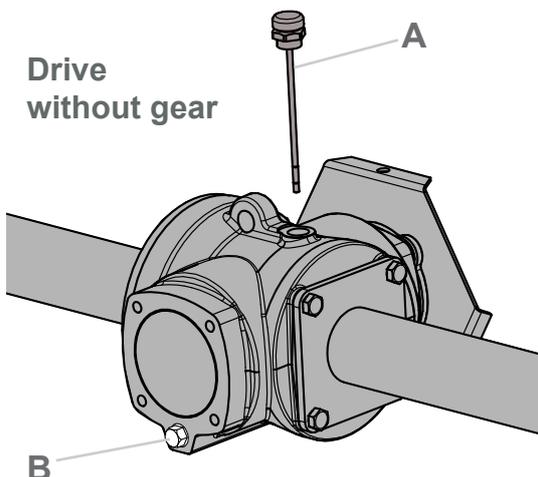
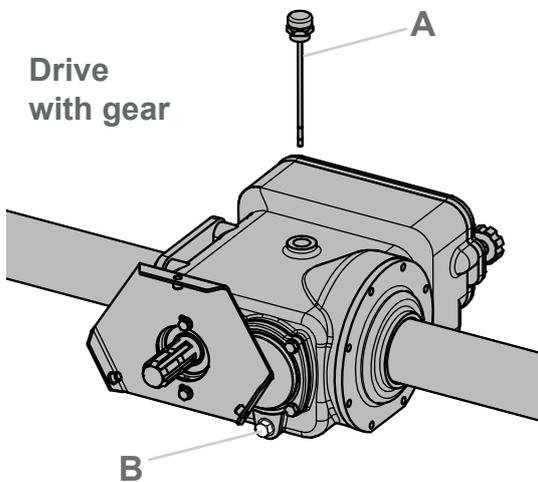
- use a 27 mm wrench to remove the oil load cap A
- top-up the AGIP-ENI BLASIA 150 oil to the level on the dip-stick
- re-insert the load cap and tighten it with force using the 27 mm wrench operated previously.

The oil on the gearbox unit must be replaced as follows:

- the first time after the first 50 hours of work
- every 500 hours of work.

To change the oil:

- position a container under the oil drain
- loosen the oil drain cap B (lower part of the sump) and allow the oil to flow out completely
- dispose of the drained oil in appropriate containers for waste oils
- screw the previously unscrewed oil drain cap B
- loosen the oil load cap A (upper part of the sump)
- use a small funnel to top-up with AGIP-ENI BLASIA 150 oil until the level is reached
- top-up and tighten the oil load cap A.



## 8.2 CONTROL AND REPLACEMENT OF THE OIL IN THE LATERAL DRIVE SUMP

The oil level in the lateral drive sump must be controlled every 50 working hours, verifying that it is visible inside the inspection window of the oil level lateral cap C.

If top-up is necessary, proceed as follows:

- use a 24 mm wrench to remove the oil load cap D
- top-up the AGIP-ENI BLASIA 150 oil until it is visible inside the cap C inspection window
- screw the load cap D again by tightening it using a 24 mm wrench.

The oil in the lateral drive sump must be replaced as follows every 500 hours of work

## 8.3 CONTROL AND REPLACEMENT OF THE OIL IN THE EXTERNAL ROTOR LATERAL SUPPORT

The oil level in the rotor lateral support must be controlled every 50 working hours, verifying that the oil present is visible inside the inspection window of the cap E situated on the support itself.

If top-up is necessary, proceed as follows:

- use a 15mm wrench to loosen the oil load cap F
- top-up the AGIP-ENI BLASIA 150 oil until it is clearly visible inside the cap E inspection window
- tighten the load cap by tightening appropriately using the 15mm wrench.

The oil rotor lateral support must be replaced as follows:

- the first time after the first 50 hours of work.
- every 500 hours of work.

To change the oil:

- remove the lateral skid in correspondence with the lateral support by loosening bolts H and I
- position a container under the support
- use a 17mm wrench to loosen the four bolts G that fasten the lateral support and allow the oil to flow between the support and plate
- dispose of the drained oil in appropriate containers for waste oils
- use a 17mm wrench to tighten the four previously loosened bolts
- top-up the AGIP-ENI BLASIA 150 oil until it is visible inside the cap E inspection window
- tighten the load cap F appropriately using the 17 mm wrench.

## 8.4 GREASING

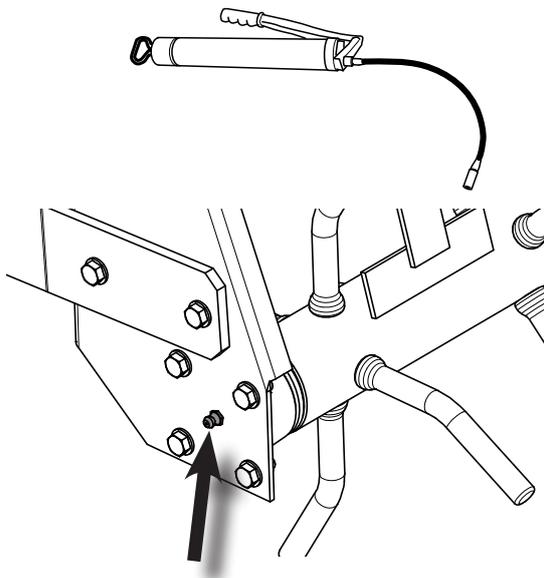
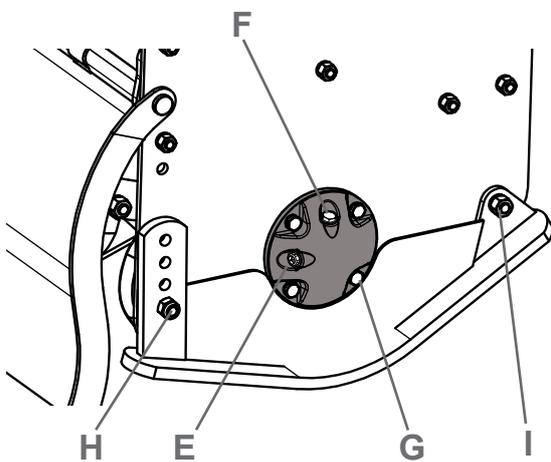
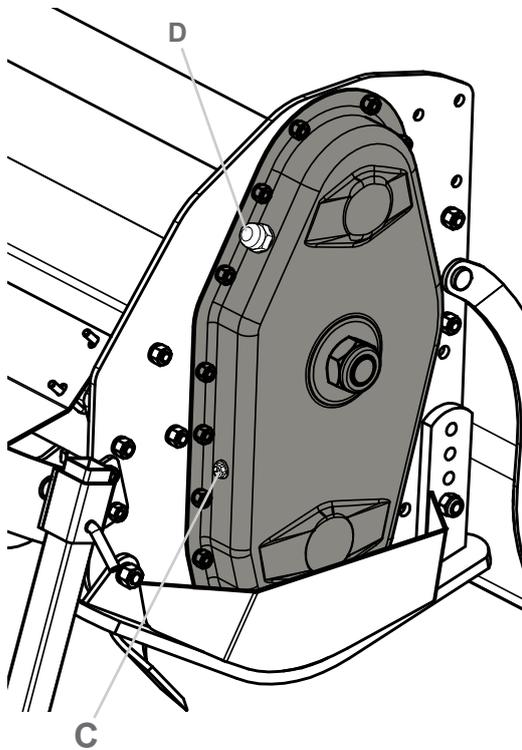
Greasing operations are performed using a relevant manual greasing pump, as shown in the figure.

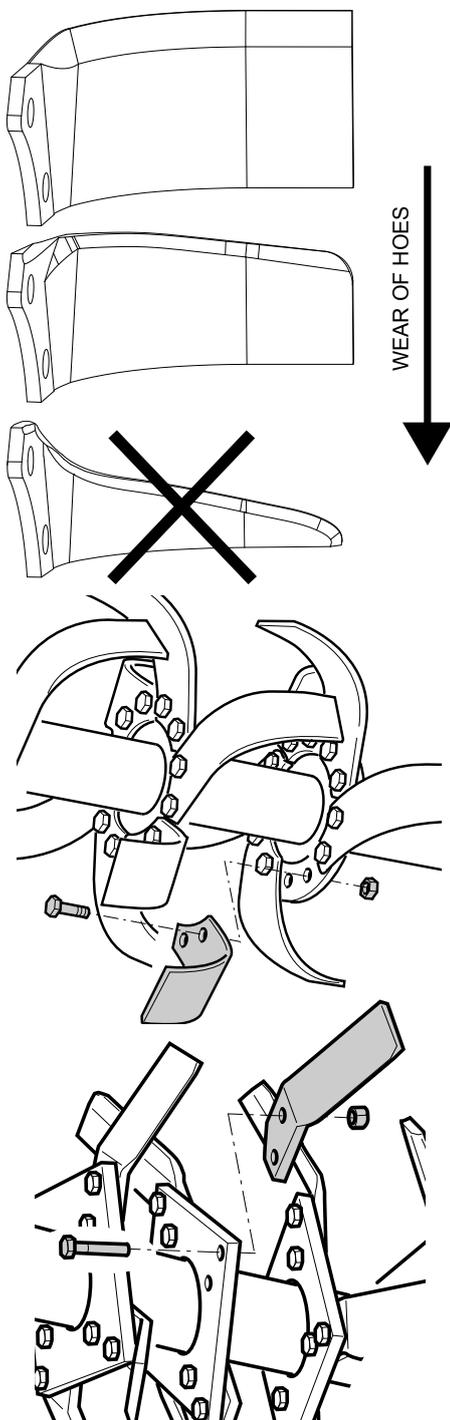
### GREASING REAR ROLLER SUPPORTS

The rear roller supports greasing points must be greased every 8 working hours using AGIP GREASE MU EP 2 grease.

## 8.5 REPLACING HOES/BLADES

Every 50 hours of work, visually check the wear of the hoes/blades. The hoes/blades must be replaced when the ground has unworked rows due to lack of covering between the hoes and/or the hoes are visually worn. Wear depends on the hours worked, the type of land etc....





**Use of non-original tools can cause anomalous vibrations for the machine.**

When replacing tools with the tiller lifted, do not trust the capacity of the tractor's hydraulic lift: insert mechanical posts or support tripods between the machine and the ground in order to avoid unwanted and dangerous descents of the machine.

To perform the following operations, the operator must wear gloves and glasses and must NEVER be positioned UNDER the rotor.

Operate as follows to replace the hoes/blades:

If the tiller does not have a roller:

- hitch the tiller to the tractor without Cardan shaft
- lift the tiller max. 10 cm from the ground
- strut the tiller with supports of suitable size
- use two 24 mm wrenches and, on the basis of the hoe/blade to be replaced, loosen the relative bolts
- remove one worn hoe/blade at a time and re-mount the new one, paying attention to re-mount it exactly in the original position, tightening the bolts correctly and as shown in the table on page 40
- proceed in the same way for the other hoes/blades.

If the tiller has a roller:

- obtain two safety stands suitable to support the weight of the tiller and its optionals
- with the aid of the tractor, lift the tiller and rest it on the stands
- be positioned in front of the machine
- use two 24 mm wrenches and, on the basis of the hoe/blade to be replaced, loosen the relative bolts
- remove one worn hoe/blade at a time and re-mount the new one, paying attention to re-mount it exactly in the original position, tightening the bolts correctly and as shown in the table on page 40
- proceed in the same way for the other hoes/blades.

## 8.6 CARDAN SHAFT

For lubrication and for maintenance interventions, behave as described in the use and maintenance manual by the manufacturer of the Cardan shaft installed.

## 9. CLEANING

### ATTENTION GENERAL HAZARD

Only qualified operators and which have read and understood the safety prescriptions (Chap. 2) can carry out the operations described below. Moreover, they must check that there are no persons, animals and objects exposed in the dangerous area.

### ATTENTION

During cleaning, use cut-proof gloves and accident-prevention shoes and pay particular attention not to put hands onto the hoes/blades.

The operator must clean the tiller on solid, flat ground and must take the tiller to the zero energy state

If compressed air is used to clean the machine, appropriate glasses are needed.

It is good practice to wash the equipment externally with a jet of water after every job.



**ATTENTION CUTTING HAZARD**



Clean the tiller with a jet of water (high-pressure water jet machine) especially the following parts:

- frame surface
- hoes/blades
- mast
- cover
- rotor

Dry using compressed air after washing.

To be able to clean the rotor compartment:

- Lift the rear cover
- fix the chain in the relative hook
- if it is not possible to access the rear compartment, access the front compartment.

When washing has been completed, protect the metal parts that are not painted with lubricant oil

## 10. STORAGE AND WINTERING

If the machine is immobilised for long periods, it must be stored in a place sheltered from atmospheric conditions and be protected to avoid damage. Before setting it aside, clean the whole machine and lubricate all mechanical parts to protect them from rust.

Before setting the machine aside for long periods, operate as follows:

- free the rotor and the tools from tilling residues
- clean the machine thoroughly
- carry out a general visual control of the machine to identify structural damage, to detect deep paint abrasions, to check that all original safety pictograms are in place, and that they are integral and legible
- grease all mechanical parts and fastening pins
- if possible, recover the machine in a covered place, on flat and consistent ground.



If the machine has disk safety devices (clutch), after having made note of the height of the compressed springs, it is recommended to loosen the screws (see par. 6.2) that compress the springs in order to prevent that the disks block against each other (seizure).

## 11. SCRAPPING

In the event of scrapping, the machine must be disposed of in suitable waste disposal sites, in compliance with the Law in force.

In Italy, before scrapping, separate the plastic or rubber parts from the metal ones. The parts made only in plastic, aluminium, steel, can be re-cycled, if collected by appropriate centres.

Recover any waste oils and dispose of them in the relevant collection centres. Used oil must be recovered and not be dispersed in the environment, because, according to the legal Standards in force, it is classified as dangerous waste and as such must be brought to the appropriate collection centres. For the collection of waste oils, it is mandatory to connect the "Consorzio Obbligatorio Oli Usati" (Mandatory Consortium for Used Oils) ([www.coou.it](http://www.coou.it); free phone 800-863048).

For the other countries, refer to the relative anti-pollution regulations in force.



## 12. QUICK CONSULTATION TABLES

The following pages, state the conditions and hypothesis of intervention for each of the cases stated above, in table form.

### 12.1 COUPLING TORQUE TABLE

Check the efficiency of all screws and bolts every day. If necessary, replace them immediately and repositioning them (screws, washer, nut) in the same sequence as they were removed.

COUPLING TORQUE				
Threading	bolt class			
	8.8		10.9	
	Nm	Lb-ft	Nm	Lb-ft
M6	11	8.5	17	12
M8	28	20	40	30
M10	55	40	80	60
M12	95	70	140	105
M14	150	110	225	165
M16	240	175	305	225
M18	330	250	475	350

### 12.2 TROUBLESHOOTING



#### NOTE

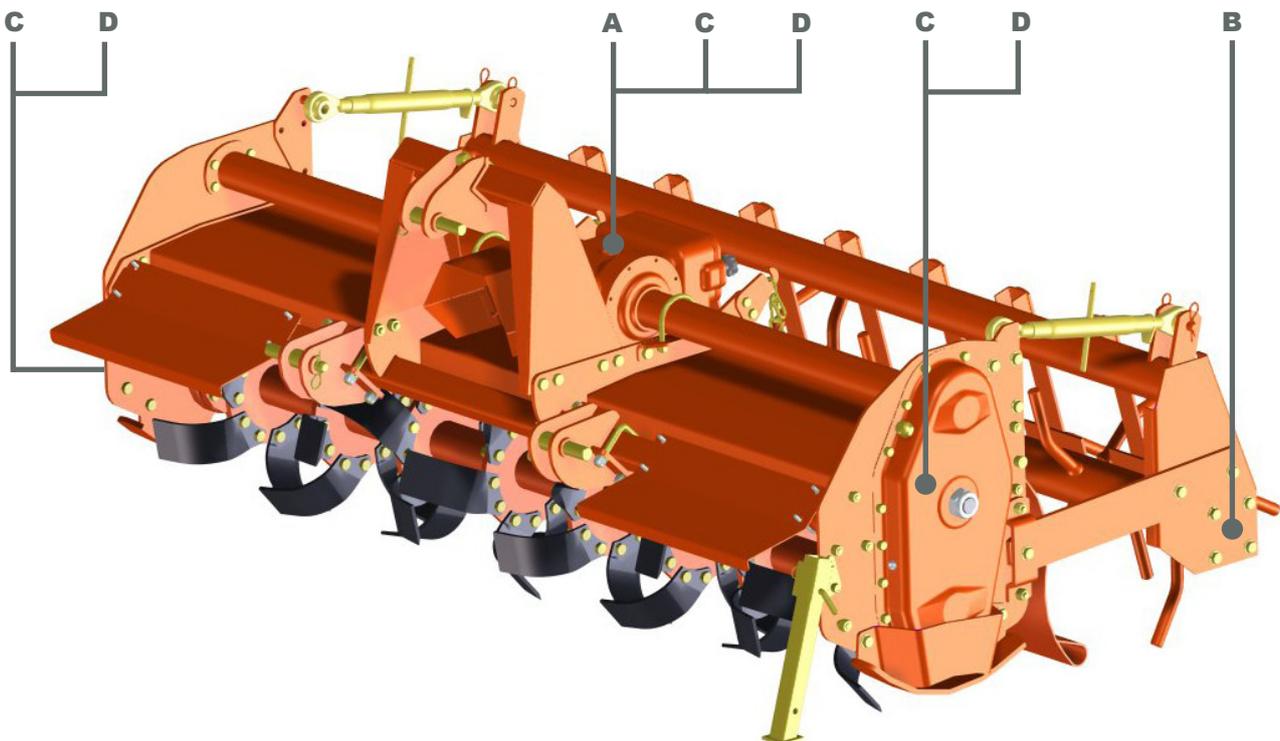
Before performing the solutions suggested, make another attempt at functioning to see if the anomaly persists. In the event of intervention, start at the most elementary solution. If the anomaly remains in spite of the solutions, contact the manufacturer's after-sales centres.

ANOMALY	CAUSE	REMEDY
Oil leak from the gear box or lateral drive sump	<ul style="list-style-type: none"> <li>Too much oil in the box or lateral sump</li> <li>Vent cap with faulty valve</li> <li>Load/drain/level caps loose</li> <li>Damaged gaskets</li> </ul>	<ul style="list-style-type: none"> <li>Restore the correct oil level</li> <li>Replace the vent cap</li> <li>Tighten the load/drain/level caps</li> <li>Replace the gaskets</li> </ul>
Tilling not uniform	<ul style="list-style-type: none"> <li>Worn or damaged tools</li> <li>Machine not well adjusted (unaligned skids or rollers)</li> <li>Machine clogged</li> </ul>	<ul style="list-style-type: none"> <li>Replace the tools</li> <li>Carry out adjustments</li> <li>Decrease tractor advancement speed</li> <li>Clean the tilling chamber</li> </ul>
Bevel gear unit overheating	<ul style="list-style-type: none"> <li>Insufficient oil</li> <li>No oil</li> <li>Heavy ground</li> </ul>	<ul style="list-style-type: none"> <li>Top-up the oil</li> <li>Restore the oil level</li> <li>Reduce advancement speed</li> </ul>
Premature tool wear	<ul style="list-style-type: none"> <li>Sandy or muddy ground</li> </ul>	<ul style="list-style-type: none"> <li>Reduce advancement speed</li> </ul>
Tools breakage	<ul style="list-style-type: none"> <li>Stony ground</li> </ul>	<ul style="list-style-type: none"> <li>Reduce advancement speed</li> </ul>
Machine noise or vibrations	<ul style="list-style-type: none"> <li>Very hard ground</li> <li>Rotor unbalanced or damaged</li> <li>Damaged, worn or missing tools</li> <li>Worn bearings</li> <li>PTO not correctly positioned with respect to the tractor PTO</li> <li>The tiller works too tilted forward or in reverse</li> </ul>	<ul style="list-style-type: none"> <li>Reduce advancement speed</li> <li>Check/replace the rotor</li> <li>Check/replace the tools</li> <li>Replace bearings</li> <li>Adjust the Cardan shaft correctly</li> <li>Adjust the upper third point so that the tiller surface is parallel to the ground</li> </ul>

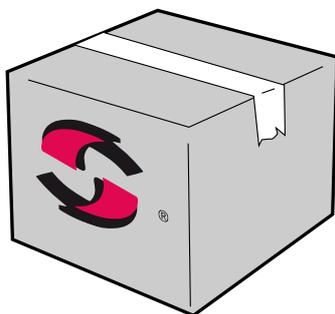
ANOMALY	CAUSE	REMEDY
Excessive power absorption	<ul style="list-style-type: none"> <li>Volume of land worked too high</li> <li>Excessive work depth</li> <li>Excessive rotor rotation speed</li> <li>Tilling chamber clogging (humid land)</li> </ul>	<ul style="list-style-type: none"> <li>Decrease working depth by regulating skid heights</li> <li>Reduce gear speed</li> <li>Lift the rear cover to facilitate the escape of earth</li> </ul>
Little pulverization of the land	<ul style="list-style-type: none"> <li>Rear cover too open</li> <li>Excessive advancement speed</li> <li>Rotor rotation speed too slow</li> </ul>	<ul style="list-style-type: none"> <li>Lower rear cover</li> <li>Reduce advancement speed</li> <li>Increase gear speed</li> </ul>
The tiller bounces of the land	<ul style="list-style-type: none"> <li>Hoes positioning not helical</li> <li>Hoes inverted, worn or broken</li> <li>Rotor deformed or with foreign bodies between the hoes</li> <li>Ground too hard</li> </ul>	<ul style="list-style-type: none"> <li>Restore the correct helical positioning of the hoes</li> <li>Replace the hoes</li> <li>Replace the rotor</li> <li>Pass several times</li> </ul>

### 12.3 LUBRICATION INTERVALS

	INTERVAL IN HOURS	DESCRIPTION OF THE INTERVENTION
<b>A</b>	AFTER THE FIRST 50 HOURS OF WORK	<ul style="list-style-type: none"> <li>replace the oil in the gear unit box</li> </ul>
<b>B</b>	EVERY 8 HOURS OF WORK	<ul style="list-style-type: none"> <li>grease the rear roll supports</li> </ul>
<b>C</b>	EVERY 50 HOURS OF WORK	<ul style="list-style-type: none"> <li>check the oil level in the gear box unit and top-up to the correct level if necessary</li> <li>check the oil level in the lateral drive sump and top-up if necessary</li> <li>check the oil level in the lateral support of the external rotor and top-up if necessary</li> </ul>
<b>D</b>	EVERY 500 HOURS OF WORK	<ul style="list-style-type: none"> <li>replace the oil in the gear unit box</li> <li>replace the oil in the lateral drive sump</li> <li>replace the oil in the lateral support of the external rotor</li> </ul>



RECOMMENDED LUBRICANTS	
OIL	AGIP-ENI BLASIA 150
GREASE	AGIP GREASE MU EP 2



### 13. SPARE PARTS

Repairs and replacements must be performed using original spare parts, which must be requested from the Dealer. Remember that the request for spare parts must be correct and accompanied by the following indications:

- machine type;
- serial number;
- code and description of the spare part requested can be obtained from the Spare Parts Exploded Diagram;
- quantity requested.

Given the particular stress to which the equipment is subjected and for safety reasons, if pieces are replaced, only use original spare parts.

### 14. WARRANTY

In order to make use of the contractual warranty supplied by the Manufacturer, the operator must scrupulously comply with the precautions indicated in the Use and Maintenance Manual and in particular:

- respect the limits of use envisioned by the Manufacturer;
- do not make modifications or variations to the machine without the written approval of the Manufacturer;
- always perform all maintenance interventions prescribed;
- always use original spare parts;
- make sure that the staff assigned to using the vehicle has the necessary skill requisites and training.

The contractual warranty is not applied if the conditions stated above are not respected, even also partially.

The use of spare parts not approved by the Manufacturer invalidates any warranty and relieves the Manufacturer or Dealer from any liability due to malfunctioning or accidents.

The removal or the modification of guards and protections relieves the Manufacturer from all liability due to damage/injury caused to objects and/or persons.





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