

INSTRUCTION MANUAL

MULCHER

Trademark:
Model:

BERTI Macchine Agricole
MINI – MINI/S



📖 Before using the machine, carefully read this Manual 📖

ORIGINAL VERSION

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INTRODUCTION

This instruction manual describes the operating mode and contains all instructions necessary to properly use and maintain (perform ordinary and periodical maintenance operations) the mulcher that will be referred to from now on as machine.

This manual is divided into identifiable chapters, for easy reference.

The indications contained in this manual are intended for a professional user, who must have specific knowledge regarding use of the machine and must be authorised, instructed and appropriately trained,

The use of original spare parts and accessories is recommended. The use of unoriginal parts triggers invalidity of the warranty and may cause dangers, reducing the lifetime and performance of the machine as well as serious damages/injury to persons, property and animals.

In the event of transfer or re-sale, this instruction manual must always accompany the machine. If it is damaged or lost, a copy must be requested from the Manufacturer of the machine or previous owner. The manual is considered an integral part of the machine.



For the USER: Before using the machine you must carefully read this instruction manual in which are indicated the actions to be performed for proper use of the machine, paying particular attention to all the safety-related regulations. Abuse of performance and lack of compliance with the use and safety standards render the user responsible for any damages that may occur to persons, things or animals as a result of the use of the equipment.

The manufacturer of the machine does not directly control the field in which it is used, the method used or the method of maintenance and therefore the user is responsible to respect the rules of common sense in the operating areas, especially in the critical ones, paying utmost attention to its own safety, to the safety of other persons, animals and property, always assessing the danger before performing any operation.

If the user delegates the use of the machine to a third party, it is their responsibility to make sure that the other user has properly read and understood this instruction manual.

This instruction manual must be on hand for immediate consultation, if necessary.



For the DISTRIBUTOR, RESELLER and IMPORTER: the person responsible to deliver the machine to the end user must ensure application to the tractor. Therefore it is their responsibility to read this instruction manual and understand its contents before finally delivering the machine. It is also his responsibility to train the final user and make sure that the latter has read and understood the indications in the instruction manual.

GLOSSARY

Machine	Mulcher.
Tractor	Motorised vehicle used to tow other vehicles, especially agricultural machines.
User	The user is considered as the owner and/or staff, the operator/user in charge of operating, cleaning, maintaining and repairing the machine, able to recognise and therefore avoid the dangers arising from the use of the machine.
Specialised staff	Those persons especially trained and enabled to perform maintenance interventions or repairs that require particular knowledge of the machine, its operation, safety devices and methods of intervention.
Safety staff	Personnel in charge of making sure that no persons are inside the machine operating area.
Manufacturer	Company that produces the → Berti Macchine Agricole S.p.A. hydraulic hedge mower
	DANGER - This signal indicates an imminent and real dangerous situation, that may cause serious injuries or death if not avoided.
	WARNING - This signal indicates a potentially dangerous situation, that may cause serious injuries or death if not avoided. Dangers marked by this signal present a lesser degree of risk of serious injury or death than those indicated by the signal DANGER.
	CAUTION - This signal indicates a potentially dangerous situation, that may cause minor injuries or moderate wounds. The symbol is used to inform that certain actions may cause personal injuries or damage.
	NOTA BENE

1. INFORMATIONS REGARDING THE INSTRUCTION MANUAL

This manual is an integral part of the machine and must accompany the same in the event of resale and until its demolition.
If this manual should be lost or damaged, a copy of it must be requested from the manufacturer ("BERTI macchine agricole S.p.A.", via Musi 1/A - 3, Caldiero - Verona., Tel. +39.045.6139711) or from the Retailer.



The presence of this symbol, in all three of its versions, informs the user to pay utmost attention to the subject in case.

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.

1.1. MANUAL UPDATE

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 to make modifications to the machine at any time for technical or marketing reasons. These modifications do not oblige the Manufacturer to intervene on machines marketed up to that time and do not invalidate this documentation.

Any subsequent supplements to the manual that the Manufacturer considers appropriate to supply, must be kept together with the manual and considered as an integral part of the same.

1.2. COPYRIGHTS

The copyright for this manual belongs to the Manufacturer. This manual contains texts, drawings and technical designs that may not be shared with third parties, either completely or partially, without written authorisation from the Manufacturer.

1.3. MACHINE IDENTIFICATION PLATE AND CE MARKING

Every machine is equipped with an identification plate, containing the following data:

- CE Marking;
- Country of fabrication;
- Manufacturer's name and address;
- Model and type;
- Serial number and year of manufacture;
- Weight

The machine is supplied as per standard with:

- The machine use and maintenance manual;
- The manufacturer "EC" declaration of conformity.

Fixed version:

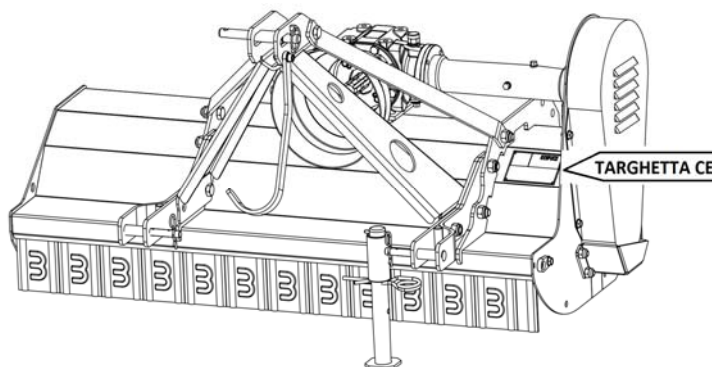


Figure 1



Movable version:

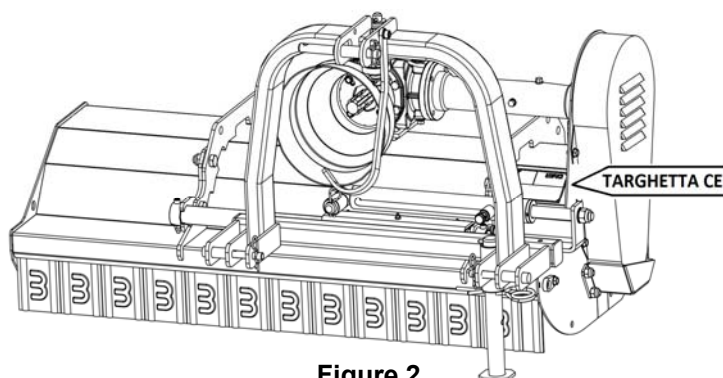


Figure 2

1.4. CE CERTIFICATE OF CONFORMITY OF THE MACHINE

		
BERTI MACCHINE AGRICOLE S.p.A. Via Musi 1/A - 3 - 37042 CALDIERO (Verona) - ITALY Tel. +39 045 6139711 - Fax +39 045 6150251 info@berti.it - www.berti.it		
CE Dichiarazione CE di Conformità ai sensi della direttiva 2006/42/CE e 2004/108/CE(*) EC Certificate of Conformity - conforming to EEC Directives 2006/42/CE and 2004/108/CE(*) EG Konformitätserklärung entsprechend der EU-Richtlinie 2006/42/CE und 2004/108/CE(*) Déclaration de conformité pour la CEE conforme à la directive de la 2006/42/CE et 2004/108/CE(*)		
La Ditta / We / Wir / Nous		BERTI Macchine Agricole S.p.A. Via Musi 1/A-3 37042 CALDIERO - VERONA - ITALY
dichiara sotto la propria responsabilità, in qualità di costruttore, che la macchina a cui si applica questa dichiarazione è conforme ai requisiti essenziali di sicurezza e di tutela della salute di cui alla <u>Direttiva 2006/42/CE</u> e 2004/108/CE(*). Per la verifica delle macchine sono state consultate le seguenti norme armonizzate: declare in sole responsibility, that the product to which this certificate applies, conforms to the basic safety and health requirements of <u>EEC Directives 2006/42/CE</u> and 2004/108/CE(*), and according to the European harmonized standards: erklären in alleiniger Verantwortung, dass das Produkt auf das sich diese Erklärung bezieht mit den grundlegenden Sicherheits- und Gesundheitsschutzanforderungen der <u>EU-Richtlinie 2006/42/CE</u> und 2004/108/CE(*), und mit den Anforderungen der gemeinsamen EU-Richtlinien konform ist: déclarons sous notre seule responsabilité que le produit faisant l'objet de la déclaration est conforme aux prescriptions fondamentales en matière de sécurité et de santé stipulées dans la <u>Directive de la 2006/42/CE</u> et 2004/108/CE(*). Nos déclarations que les normes harmonisées suivantes ont été appliquées: UNI EN ISO 4254-1:2012 UNI EN ISO 4254-2:2010 UNI EN 15811:2010 Nonché le seguenti specifiche tecniche: And the following technical specifications: Und die folgende technische Ausstellungen: Et les spécifications techniques suivantes: ISO 1694:1995 UNI EN ISO 3767-2:1998(*) (*) Valido solo se la macchina è dotata di dispositivi e accessori soggetti alle direttive/norme armonizzate/specifiche tecniche ivi indicate. Valid only if the machine is equipped with devices and accessories that are subjected to the directives/harmonized norms/technical terms here indicated. Nur gueltig, wenn die Maschine mit Teilen und Zubehoer ausgestattet ist, die den hier angegebenen Richtlinien, Normen und Technischen Daten entsprechen. Valable uniquement si la machine est équipée avec des dispositifs et accessoires assujettis aux directives/normes harmonisées/spécifications techniques indiquées ici.		
MODELLO – TYPE XXXXXXXXXXXX MATRICOLA – N° DE SERIE XXXXXXXXXXXX		
Custode del modello tecnico: MARIO BERTI C/o Ufficio Tecnico: BERTI MACCHINE AGRICOLE S.p.A. Via Musi 1/A - 3 - 37042 CALDIERO (Verona) - ITALY Caldiero, 02 26/02/2013		per la società / for the Company für die Firma / pour la société BERTI Macchine Agricole S.p.A. BERTIARIO Amministratore Unico
La presente certificazione è parte integrante della macchina This EC certificate is an integral part of the unit Die hier beigelegte Erklärung ist wesentlicher Bestandteil der Maschine Cette déclaration de conformité est partie intégrative de l'appareil		
Cod. Fisc. e Reg. Impr. di VR n° 00068150234 - P.IVA : 00068150234 - R.E.A. VR 84849 - Cap. Soc. € 151.704,00 Iv Società soggetta a direzione e coordinamento da parte della società HB Holding Berti S.r.l. R.L. di VR03066902341		

1.5. MACHINE INFORMATION

1.5.1. SPECIFIED USE

The MINI mulcher is intended to be used exclusively in the agricultural sector, for mulching in green areas, parks and pitches, depending on the tool used.

The machine is towed by the tractor via the three-point hitch and acts on the ground in virtue of its own weight and the rotation of the rotor, activated by the tractor power points via cardan connection.

The machine is not suitable to be used in other sectors than in agriculture.

NEVER USE THE MACHINE FOR DIFFERENT PURPOSES FROM THOSE PROVIDED!

The use of the mulcher is strictly forbidden if connected to a tractor with different features from those listed in paragraph 1.5.3, on soils with stones, scrap metal, wire and any other synthetic materials, to fell trees, to mill logs, on unstable land (such as land with heavy uphill or downhill, steep slopes, near cliffs, on very uneven land etc....) and in any other situations that may cause dangerous conditions and serious consequences for the user, things, persons and animals



PERICOLO

Any use of the machine different to that indicated in the instruction manual is considered unauthorised and dangerous.

1.5.2. DESCRIPTION

The machine has a working tool that is made up from a horizontal axle rotor, which mounts the mulching tools that turn at high speed.

The mulcher is made of:

- A frame;
- A system of fixed and movable connection on three points (possible hydraulic or mechanical movement);
- A tiller of category 0-1;
- A drive shaft coupling;
- A gearbox
- A distributor unit (pulleys, locking sets);
- A rotor;
- A series of mulching tools;
- A supporting device in stand-by position;
- CE accident prevention guards.

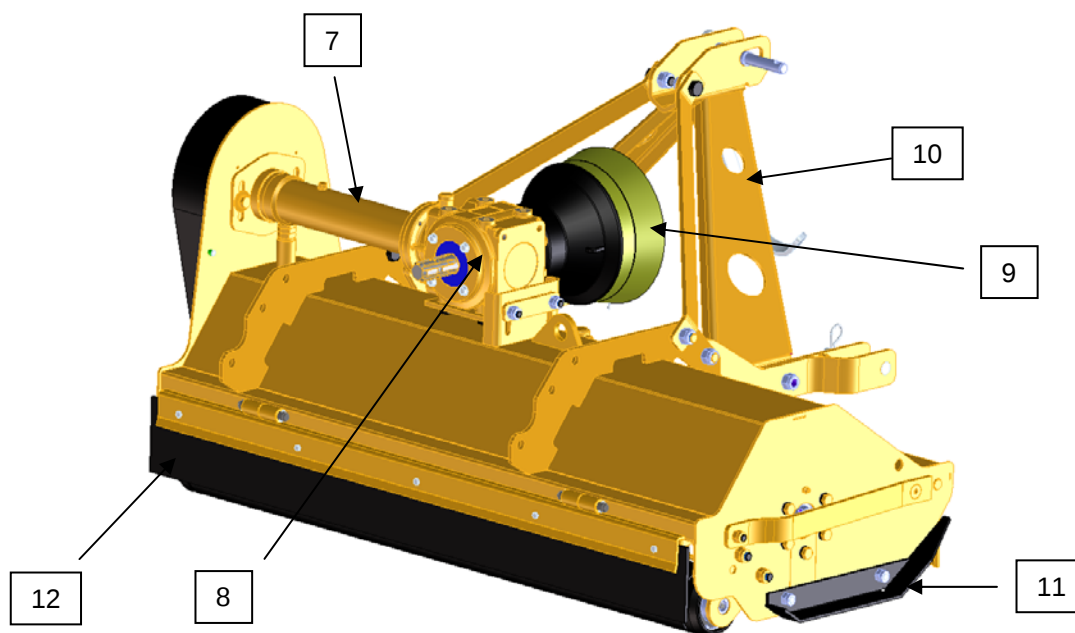


Figure 3

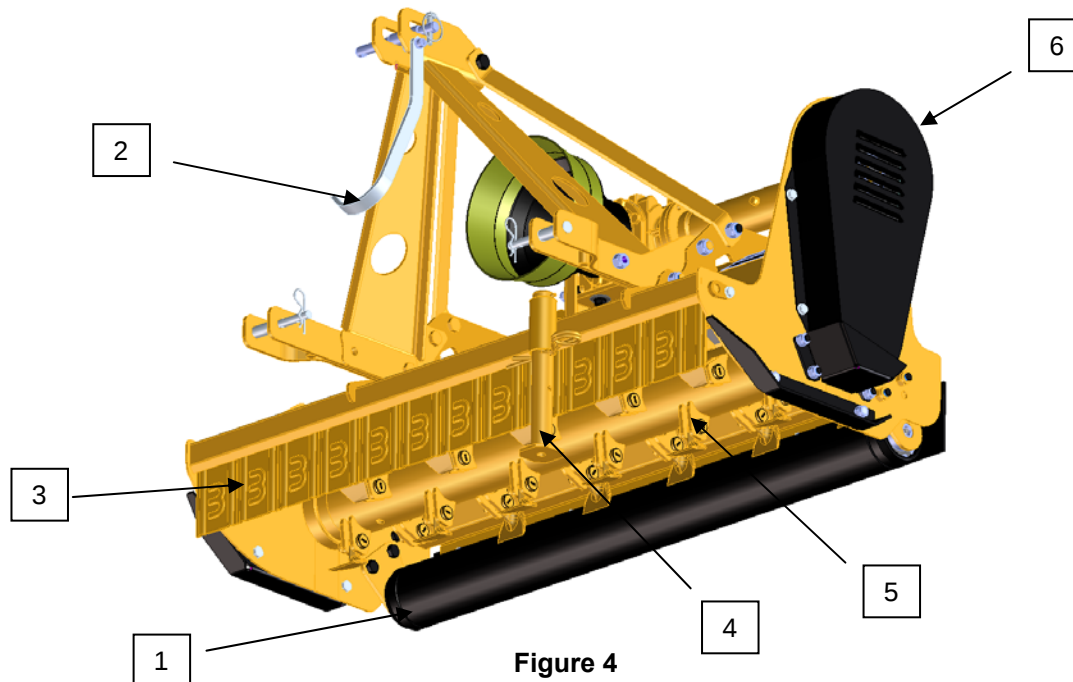


Figure 4

1 Levelling roll
2 Support cardan shaft in stand-by
3 Front protection devices with straps or chains
4 Support foot
5 Rotor
6 Casing

7 Extension
8 Gearbox
9 Counter-cap
10 Tiller
11 Support slides
12 Rear protection rubber

Mulcher Mod. **MINI (fixed version)**

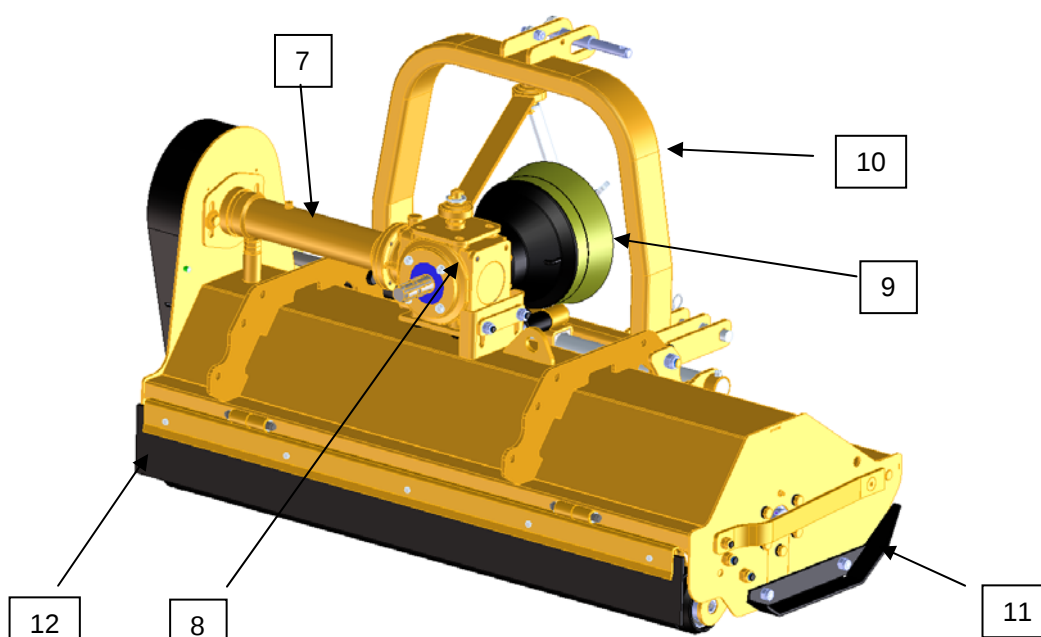


Figure 5

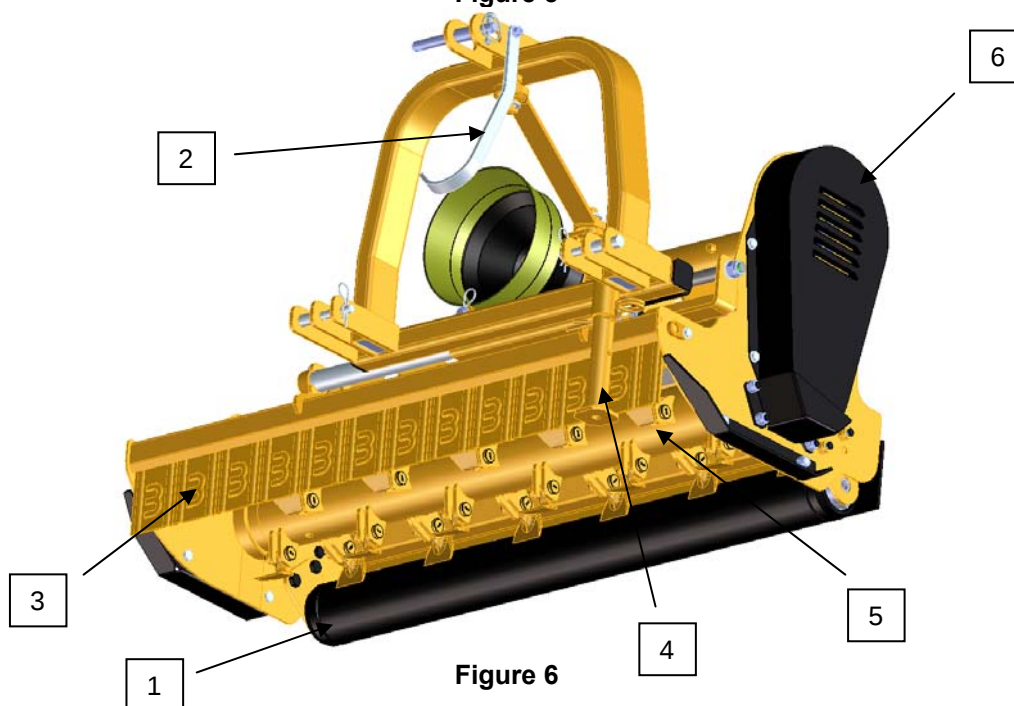


Figure 6

1 Levelling roll
2 Support cardan shaft in stand-by
3 Front protection devices with straps or chains
4 Support foot
5 Rotor
6 Casing

7 Extension
8 Gearbox
9 Counter-cap
10 Tiller
11 Support slides
12 Rear protection rubber

Mulcher Mod. **MINI (movable version)**

1.5.3. TECHNICAL DATA

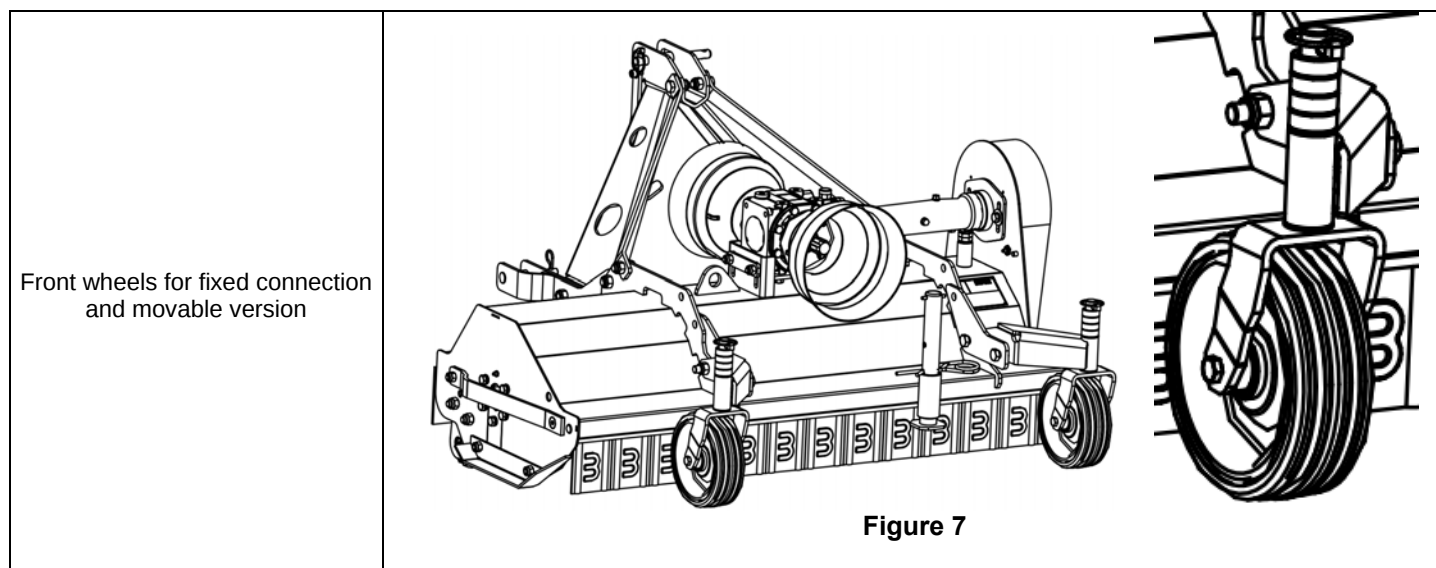
The machine operates behind the tractor and can be applied on tractors with power between 9 and 19 kW (12 - 25 HP). The drawing and the tables below, indicate the machine operation field.

Mod.												
	cm	Min	Max	mm		n°	n°	PTO	A	B	C	Kg
MINI 115	115	12	35	530 620	32	64	3	540 (1000)	75	129	85	220
MINI 125	125	12	35	530 720	34	68	3	540 (1000)	75	139	85	230
MINI 145	145	12	35	615 835	40	80	3	540 (1000)	75	159	85	250

Table 1

*With the hydraulic movement, add 35 kg

1.5.4. ACCESSORIES



1.6. MATERIALS THROW



During some of the operations performed with the machine, you may check the materials projection; in particular, you should pay utmost attention to:

- Make sure that the protections of the operating components and the rear inspection hood are properly placed and effective;
- Periodically maintain and clean the machine;
- Make sure that there are no persons, animals or property in the machine operating area as they may become hurt/damaged.



The use of the machine is strictly forbidden if the tractor to which is connected is not provided with cabin made of anti-break / armoured / shatter-proof glass and fixed guards (e.g. metallic grid). The final user must provide the tractor with guards suitable to resist the impact with the materials/objects thrown at high speed from the machine depending on the current state of the art technologies and must contact the manufacturer to request all necessary information.

1.7. NOISE AND VIBRATIONS LEVEL

 PERICOLO 	Even when operating without load, the machine exceeds 80dB(A) and the operators must use hearing protective equipment against the noise generated during operation: use earphones or earplugs. In compliance with the standards in force, after installing the machine and before starting it, the user must perform the noise emission measurements on the assembly made of tractor-mulcher. In time there may be an increase in the level of noise from the tractor - mulcher assembly due to phenomena of wear: it is advisable to regularly carry out assessment of risk from exposure to noise. The use of P.P.E. is mandatory and must ensure the dejection of the noise level registered in compliance with the standards in force. The vibrations to the tractor-mulcher assembly are included in the vibrations produced by the tractor alone. Excessive vibrations may be caused by a fault in the machine that must be immediately signalled and eliminated to protect the reliability of the machine and/or cause damages to the operator's health. Always work with suitable environmental conditions (e.g. with perfect visibility, terrain able to sustain the weight of the tractor-mulcher assembly, with slopes that allow proper vertical and lateral stability of the tractor-mulcher assembly etc.).
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2. ACCIDENT PREVENTION AND SAFETY STANDARDS:

2.1. GENERAL SAFETY STANDARDS

A proper use of the machine and compliance with the standards indicated in this manual along with thorough appliance of all precautions to avoid any dangerous situations, will help to avoid accidents or damage, extending the machine lifetime and will minimise faults.

The Company "BERTI Macchine Agricole S.p.A." declines any responsibility, objective or subjective, if the indications contained in this instruction manual are not respected.

 PERICOLO	The machine must not be used in sectors other than agricultural and a use different from that specified is considered improper.
 PERICOLO	The machine must only be used by one operator driving the tractor.
 PERICOLO	The user must check the proper connection between tractor and mulcher. The weight that can be lifted by the tractor in the most unfavourable conditions must be greater than the weight of the mulcher.
 PERICOLO	Before getting out of the tractor and before performing any maintenance operations on the mulcher, use the parking brake, turn off the engine, remove the ignition keys from the dashboard, and wait for 5 minutes inside the cabin to ensure that the rotor and relative tools completely stop.

 PERICOLO	It is forbidden to abandon and/or leave the tractor-mulcher assembly while the mulcher is still running.
 PERICOLO	The use of the machine is strictly forbidden if the tractor to which is connected is not provided with cabin made of anti-break / armoured / shatter-proof glass and fixed guards (e.g. metallic grid). The final user must provide the tractor with guards suitable to resist the impact with the materials/objects thrown at high speed from the machine depending on the current state of the art technologies and must contact the manufacturer to request all necessary information.
 PERICOLO	During use, the user must have proper visibility of the working areas that present dangers, therefore the mirrors and the windows of the tractor must be properly cleaned.
 PERICOLO	During the operating phases, the user must always stay inside the cabin, where he is safe. It is strictly forbidden the operation with the doors/windows open. Projected objects hazard!
 PERICOLO	The machine must only be used by authorised, educated and appropriately trained staff. 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 licence and must be an adult. The operator must contact the manufacturer if in doubt regarding use of the machine or interpretation of this manual.
 PERICOLO	Never use the machine without knowing its features.
 PERICOLO	The manual must always be on hand such that it can be consulted when necessary. If it is lost or damaged, request a replacement copy from the manufacturer.
 PERICOLO	The user must use all the safety devices and personal protection equipment (P.P.E.) during machine use, adjustment, repair and handling phases. 

 PERICOLO	During use, if operating with dry products (hay, straw, etc.), the machine may generate dust. It is recommended to periodically check the cab ventilation system filter and to always use suitable protection systems for the respiratory tract, such as dust masks.
 PERICOLO	The operator assigned to the machine must not wear clothing that can cause entanglement.
 PERICOLO	It is strictly forbidden to use the machine for lifting persons, animals or objects.
 PERICOLO	It is strictly forbidden to use the machine for transporting persons, animals or objects.
 PERICOLO	It is strictly forbidden to use the flexible tubes as supports; these components are mobile and do not offer proper support.
 PERICOLO	The operating area must be thoroughly inspected before using the machine, paying attention to remove any stones, iron residues, steel cables, manholes, strains and all those materials and obstacles without any limitation which may constitute a source of danger, accidents and serious damage to the user, people, animals and things.
 PERICOLO	The operator must make sure that no person or animal stops within the radius of action of the same during machine functioning. The user is responsible of stopping the machine immediately and clearing the machine operating area from people and animals. Never activate the machine near to persons or animals within or transiting through the machine working range.
 PERICOLO	If the machine is used in public areas and on roads, take all necessary precautions for the safety of persons, animals and property, for example, using safety personnel, warning signs, placing them at the ends of the machine operating area, according to the laws in force in the country of use.
 PERICOLO	Never work in areas with strong counter slope, on slippery surfaces and in areas / zones that reduce the adhesion of the tractor to the ground. Always pay great attention when changing direction.

 PERICOLO	Use the machine during the day and under conditions of perfect visibility.
 PERICOLO	It is strictly forbidden to operate in adverse environmental conditions, for example during storms, snows, in windy, rainy or cloudy days, etc.
 PERICOLO	Avoid working on muddy, sandy or soft terrain.
 PERICOLO	Pay attention to the risk of accidental ignition of the electric arc machine with overhead power lines.
 PERICOLO	Do not use the machine if you are tired, ill or under the effect of alcohol, medicines or drugs.
 PERICOLO	Carefully check the machine each time before starting it.
 PERICOLO	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.
 PERICOLO	It is strictly forbidden to remove or tamper with the guards and/or safety devices.
 PERICOLO	Make sure that the safety pictograms are in good condition, legible and clean. If the pictograms have deteriorated, they must be replaced with other originals obtained from the manufacturer and placed in the position indicated in the instruction manual (paragraph 2.3.2). If dirty, clean them with a damp cloth.

 ATTENZIONE	The signs applied to the machine provide a series of important instructions: comply with them for your own safety.
 PERICOLO	It is strictly forbidden to perform any modification that may alter the original condition of the machine.
 PERICOLO	Any arbitrary modification made to this machine relieves the manufacturer from any liability for damage or injury, which can happen to the operators, third parties and objects.
 PERICOLO	Keep the machine free from foreign materials (debris, tools, other items), which may damage the operation or the operator.
	In the following paragraphs are listed other highly important safety standards. It is mandatory to read the entire instruction manual before using the machine.

2.2. FIRE-FIGHTING MEASURES

 ATTENZIONE	Keep in the tractor an extinguisher of proper capacity and maintain periodically. The hand extinguisher may only be used by personnel that know how to use it. The user is therefore responsible for providing proper training via particular courses.
 ATTENZIONE	The personnel that use the machine must know the main intervention techniques in case of fire.
 ATTENZIONE	Do not use the machine in areas that present explosion and/or fire hazard.
 ATTENZIONE	Maintenance residues, such as, straps or replaced materials containing flammable residues must be kept away from sources of ignition and disposed of in accordance with applicable laws in the country of use.

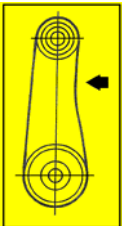
	Use appropriate extinguishing means: e.g. carbon dioxide, foam, chemical powder.
	Do not weld in the proximity of tanks, pipes, cans, electrical cables or flammable materials in general.
	When welding protect flammable parts with appropriate guards.

2.3. SAFETY SIGNS

Make sure the safety pictograms are in good conditions. If the pictograms have deteriorated, replace them with originals obtained from the manufacturer and place them in the position indicated in the operating and maintenance manual. Make sure that the safety pictograms are readable. Clean them using a cloth, water and soap.

2.3.1. DESCRIPTION OF THE PICTOGRAMS PLACED ON THE MACHINE

1		ATTENTION: it indicates the following dangers: do not stand between the equipments and the tractor, pay attention to the rotating parts, do not stand behind the tractor, risk of shearing, pay attention to the rotating tools for your hands and feet.
2		ATTENTION: it indicates the following risks: pay attention to hot parts and to the foldable parts of the machine, pay attention to the projection of objects
3		ATTENTION: read carefully the use and maintenance manual , every action on the machine should be executed after switching off the tractor, after removing the ignition key and inserting the hand brake, pay attention to the pipes under pressure.
4		WARNING-DANGER minimum safety distance 50 m.

5		WARNING - DANGER of coming into contact with moving elements. Do not place your hands and feet near the transmission belts.
6		PERSONAL PROTECTIVE EQUIPMENT.
7		LIFTING POINT.
8		OIL LEVEL.
9		GREASING POINTS.
10		CARDAN SHAFT ROTATING AT 540 rpm.
11		CARDAN SHAFT ROTATING AT 1000 rpm.
12		TENSIONED BELTS.

13		NOTES ON WARRANTY
14		GENERAL WARNINGS

2.3.2. POSITION OF PICTOGRAMS ON THE MACHINE

The pictograms are inserted as indicated in diagram:

MINI (fixed connection)

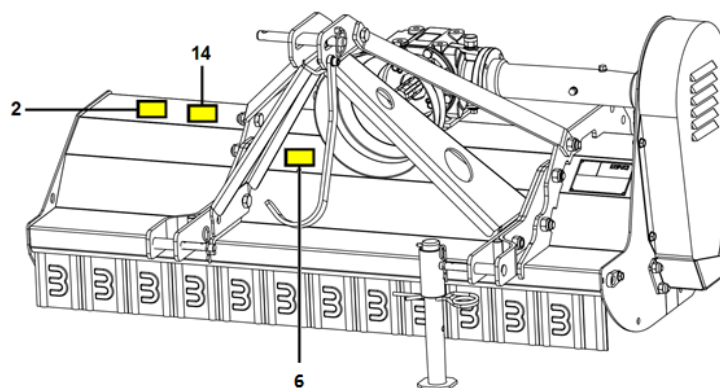


Figure 8

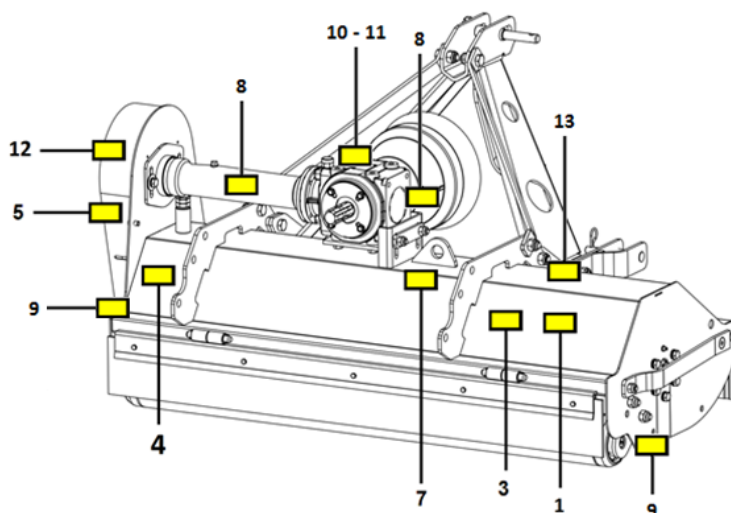


Figure 9

MINI (movable version)

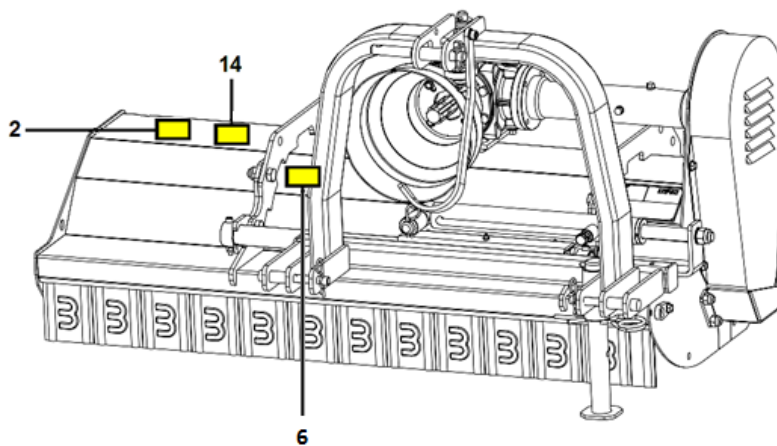


Figure 10

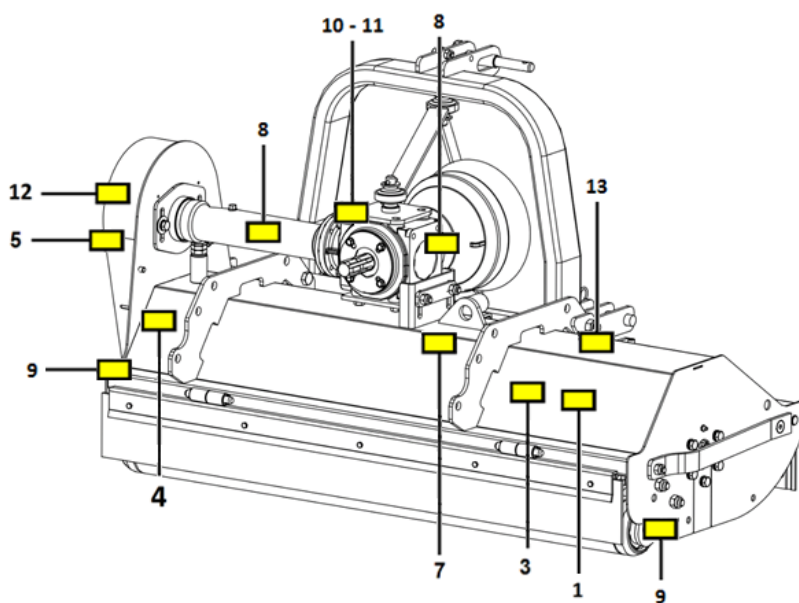


Figure 11

3. USE

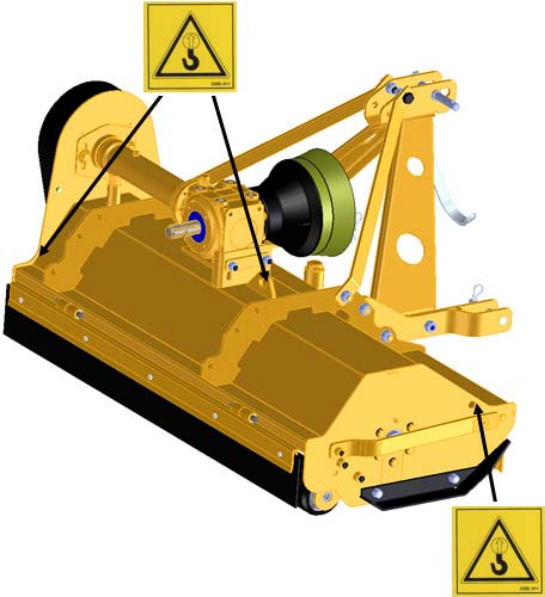
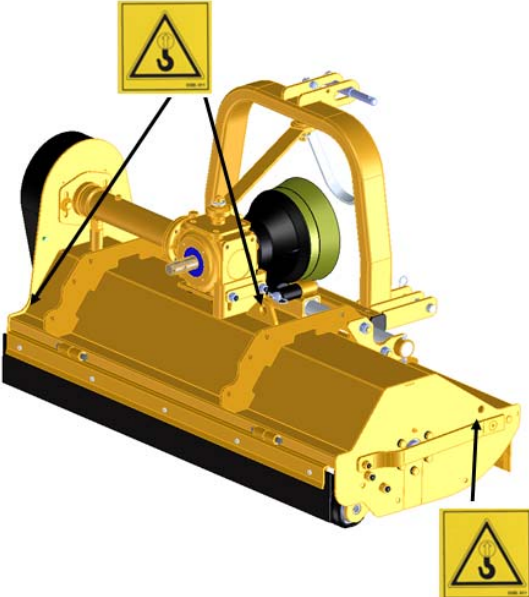
3.1. INTRODUCTION

	Before using the machine, carefully read and understand the instruction manual and get familiarised with the machine. The machine may only be used by expert and properly trained users.
 ATTENZIONE	Keep all the parts of your body inside the tractor cabin, to reduce to a minimum the exposure to any external dangers such as thrown objects.
 ATTENZIONE	Before getting out of the tractor and before performing any maintenance operations on the mulcher, use the parking brake, turn off the engine, remove the ignition keys from the dashboard, and wait for 5 minutes inside the cabin to ensure that the rotor and relative tools completely stop.

 ATTENZIONE	The safety of the user and of the people around him depends on his judgement and prudence in the use of the machine. It is therefore necessary to be fully aware of its functionality and all Safety Standards relative to its use.
 ATTENZIONE	The user must use all the safety devices and personal protection equipment (P.P.E.) during machine use, adjustment, repair and handling phases. 
 ATTENZIONE	The machine must always be in good working order and must only be repaired using original spare parts.

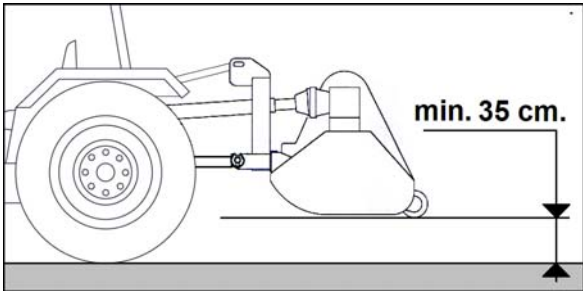
3.2. HANDLING AND TRANSPORTATION

Pay maximum attention to safety during loading and unloading operations, which must be performed by qualified staff.
If the machine is lifted, it is mandatory to use the appropriate lifting points indicated in the pictograms (figure 15-16). Always perform a visual check before moving the machine so as to prevent unstable parts creating dangerous situations.

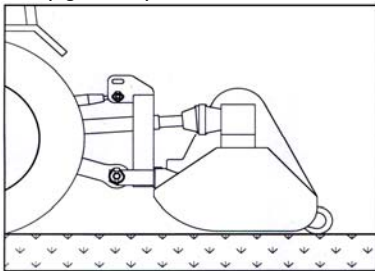
 CAUTELA	Never lift or handle the machine by fastening it to the rotor! The manufacturer declines any responsibility regarding any damages to persons, animals and property due to incorrect handling of the machine using lifting and transportation means of lower capacity than the weight values indicated in the table from paragraph 1.5.3. TECHNICAL DATA.
	MINI (fixed version)  Figure 12 MINI (movable version)  Figure 13

	The machine is delivered fully assembled and in order to use it, you must simply connect it to the tractor.
--	--

3.2.1. TRANSPORTATION IN PUBLIC AREAS

	If the machine must be transported on a public road, the road regulations must be strictly respected, paying utmost attention in choosing the speed.
	Before starting the transportation on the public road, you must install (if necessary) optional light bars.
	The means must be provided with orange or yellow blinking light.
	Before entering on a public road from a non-paved or dirty area, you must thoroughly clean the tires of the tractor from any residual mud.
	During the transport on the road, the mulcher must be kept in transportation position at 35 cm from the ground and the PTO of the tractor must be switched off.  Figure 14 Before transport, check that all machine parts are integral and in good working order.

3.2.2. MACHINE TRANSPORT PROCEDURE

	Before being transported, all machine parts must be in optimal status.
	1. Disengage the P.T.O. and wait for the rotor to stop completely; 2. Lift the machine as much as necessary and keep it on its levelling roll/wheels, so that the transmission organs do not touch the ground (figure 15);  Figure 15



ATTENZIONE

The machine weight changes the stability of the tractor-mulcher 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-mulcher complex.

Check the lifting capability and tractor stability using the following formula and, if necessary, apply ballasts on the front.

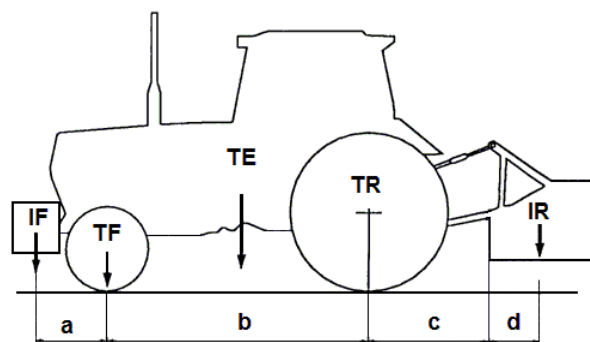


Figure 4

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

T_E	=	Weight of the tractor (empty)
T_F	=	Front axle load (empty tractor)
T_R	=	Rear axle load (empty tractor)
I_R	=	Rear mulcher weight/rear ballast
I_F	=	Front mulcher weight/front ballast
a	=	Distance from the centre of gravity of the front mulcher/front ballast to the centre of the front axle
b	=	Tractor wheelbase
c	=	Distance from the centre of the rear axle to the centre of the ball of the parallels of the tractor
d	=	Distance from the centre of the ball of the parallels of the tractor to the centre of gravity of the rear mulcher/rear ballast

N.B.: if the machine is mounted on certified agricultural tractors and registered before the 6th May 1997, the following relation should also be checked: $M < 0.3XT$.



ATTENZIONE

The road transportation must be performed paying maximum attention to avoid putting the persons or other vehicles in danger.



ATTENZIONE

During the transport, the machine must be properly secured and must stay within the outline of the tractor.

3.3. VISIBILITY

The working areas can be controlled using the rear view mirrors of the tractor and the operator's range of view.



ATTENZIONE

While moving in reverse, dark areas may be created that cannot be seen using the rear view mirrors.

3.4. CONNECTION OF THE MACHINE TO THE TRACTOR

Before installing the machine, make sure that it is in perfect condition, placed on the ground, levelled and in stable position, that there is a proper amount of lubricant, that all parts subject to wear and/or deterioration are efficient and that the protections are complete and functioning.

 ATTENZIONE	The user must check the proper connection between tractor and mulcher. The lifting capacity and the stability of the tractor must comply with the parameters described in chapter 3.2.2.
 PERICOLO	It is strictly forbidden to stand between the mulcher and the tractor during the connection phases and any unauthorised persons must be requested to leave the machine operating area.
 ATTENZIONE	Before using the machine, the operator must know the commands and the features of the machine.
 ATTENZIONE	Always keep all the parts of your body inside the tractor cabin, to reduce to a minimum the exposure to any external dangers such as thrown objects.
 PERICOLO	Before getting out of the tractor and before performing any maintenance operations on the mulcher, use the parking brake, turn off the engine, remove the ignition keys from the dashboard, and wait for 5 minutes inside the cabin as to make sure that the rotor and relative tools completely stop.

3.4.1. CONNECTION PROCEDURE

The machine must be connected to the tractor with a 1000 rpm driven power take-off, having suitable weight and power, in compliance with the standards in force in the country of use.

 ATTENZIONE	The user must use all the safety devices and personal protection equipment (P.P.E.) during machine use, adjustment, repair and handling phases. 
 ATTENZIONE	The following operations are very hazardous. Avoid standing in front of the machine during the approach of the working vehicle. Avoid the presence of uninvolved persons. During the installation phases, the PTO of the machine should be disengaged.
	1. Remove the safety pin and the pins from the connection inlets 1 of the machine (figure 18);



2. With the tractor in reverse and activating the elevator, make the lower arms 1 match to the lower corresponding connection inlets 1 of the mulcher (figure 17-18);

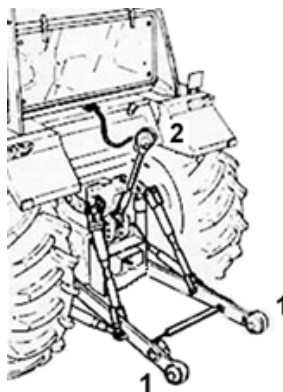


Figure 17

3. Use the tractor parking brake, turn the engine off, remove the keys from the dashboard and get off the machine;
4. Insert the pins and lock them with the relating safety pins;
5. Connect the third point of the tractor in the same way 2, with the corresponding inlet 2 on the machine;
6. Adjust the third point so as the machine stands horizontally as regards the ground;
7. Lift and fix every supporting foot of the machine;

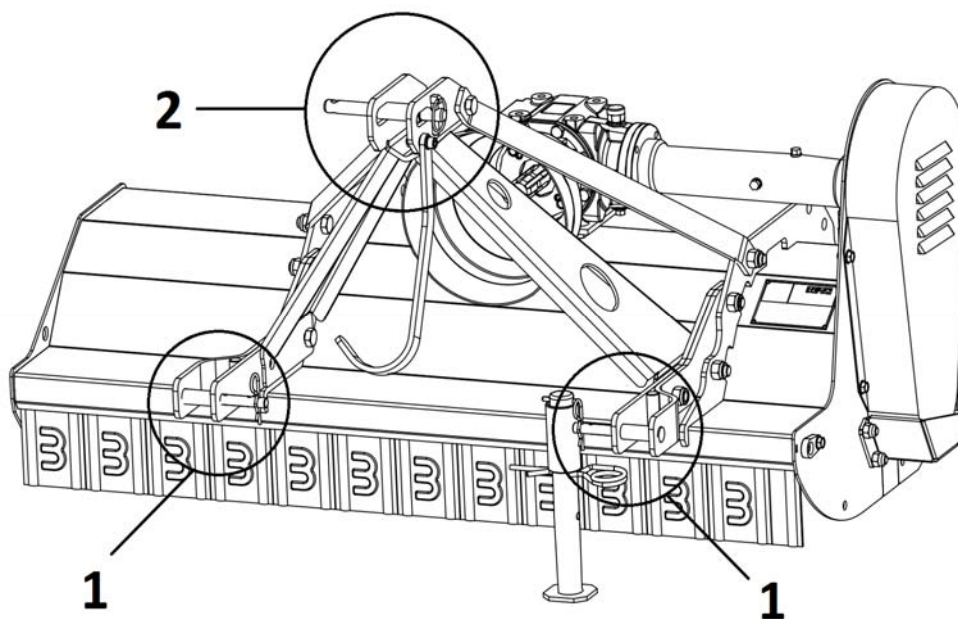
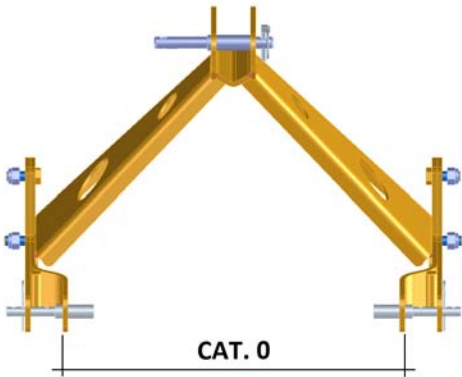
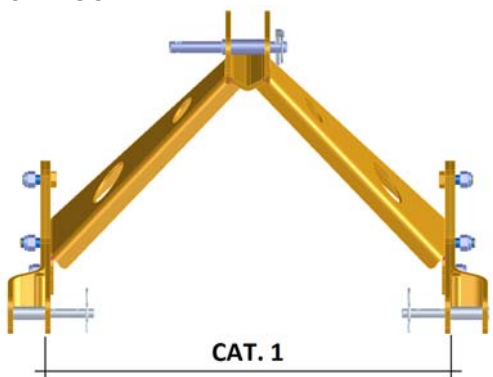
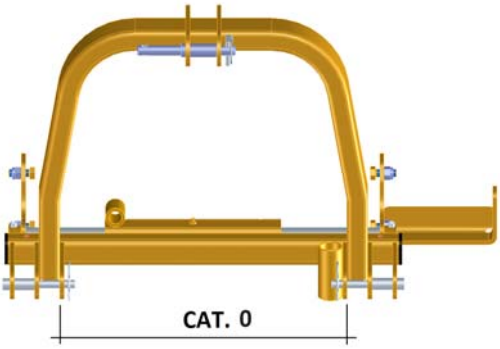
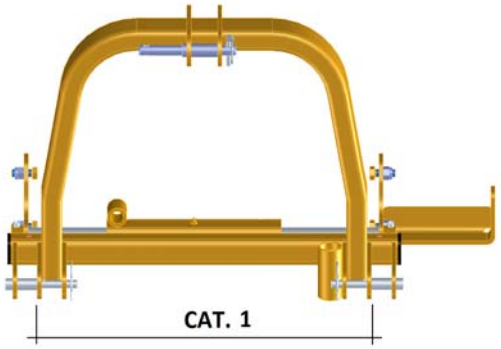
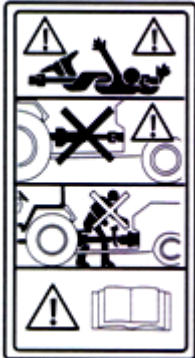
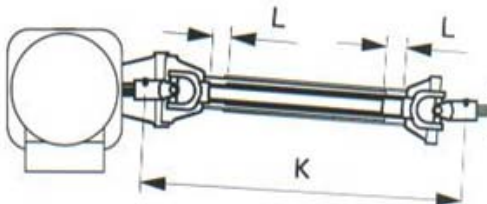
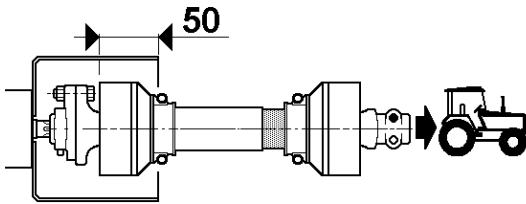
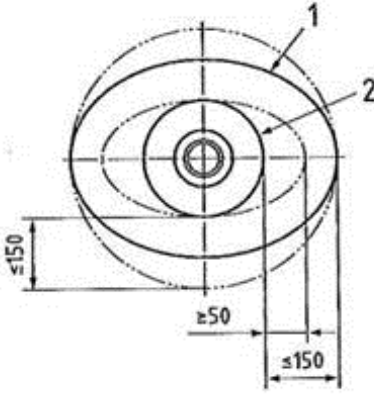
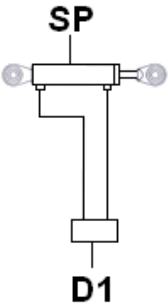


Figure 18

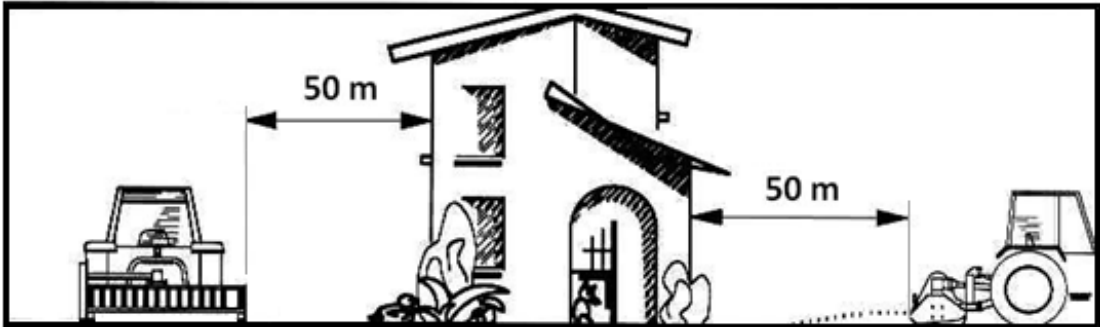
	0 CATEGORY  CAT. 0 Figure 19 1 CATEGORY  CAT. 1 Figure 20  0 CATEGORY  CAT. 0 Figure 21 1 CATEGORY  CAT. 1 Figure 22
 ATTENZIONE	ATTENTION: BE SURE OF HAVING INSERTED THE SAFETY PINS INTO THE PINS OF THE CONNECTION INLETS 1 AND 2. The following operations are very hazardous. Avoid standing in front of the mulcher during the approach of the working vehicle. Avoid the presence of uninvolved persons. During the installation phases, the PTO of the mulcher should be disengaged.
	8. Block lifting bars of the tractor to prevent the machine oscillating laterally, compromising the transversal stability of the complex.
	9. Insert the Cardan shaft onto the splined shaft of the machine, 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 "clack". If you do not hear the "clack", repeat the procedure;
 ATTENZIONE	10. Do not use a cardan shaft without proper protections compliant to the law requirements. DO NOT CLIMB ON THE CARDAN SHAFT, EVEN IF IT IS STOPPED. The cardan shaft is the transmission component that drives the mulcher; it must be chosen based on specific criteria that define its size and length. In the table below, the size of the cardan shaft is greater than the power absorbed during operations. This choice is necessary in order to ensure high resistance of the cardan shaft, in the phase of maximum extension.

	The manufacturer ensures that the cardan shaft provided along with the machine is of appropriate size to safely sustain the power absorbed during operations, if the use conditions respected. If replacing the cardan shaft, another one may be installed in compliance with CE standards, able to transmit the power indicated in table 2 of this paragraph.																								
 ATTENZIONE	<table><tr><th rowspan="2">Model</th><th colspan="2">Maximum absorbed power</th><th colspan="2">Power transmitted from the cardan shaft at 540 rpm</th></tr><tr><th>kw</th><th>HP</th><th>kw</th><th>HP</th></tr><tr><td>MINI 115</td><td>9 – 12</td><td>12 – 16</td><td>22</td><td>30</td></tr><tr><td>MINI 125</td><td>11 – 13</td><td>15 – 18</td><td>22</td><td>30</td></tr><tr><td>MINI 145</td><td>13 – 18</td><td>18 – 25</td><td>22</td><td>30</td></tr></table> Table 2	Model	Maximum absorbed power		Power transmitted from the cardan shaft at 540 rpm		kw	HP	kw	HP	MINI 115	9 – 12	12 – 16	22	30	MINI 125	11 – 13	15 – 18	22	30	MINI 145	13 – 18	18 – 25	22	30
Model	Maximum absorbed power		Power transmitted from the cardan shaft at 540 rpm																						
	kw	HP	kw	HP																					
MINI 115	9 – 12	12 – 16	22	30																					
MINI 125	11 – 13	15 – 18	22	30																					
MINI 145	13 – 18	18 – 25	22	30																					
	Before performing any operation, carefully read the instruction booklet attached to the cardan shaft.																								
	During operation, the cardan shaft may generate dangerous situations. Therefore you should: • Read and store the use and maintenance booklet near the cardan shaft; • Make sure that the cardan shaft is appropriate for transferring the required power; • Only use the cardan shaft delivered with the machine; • Make sure that the guards are properly installed, complete and functioning; • Replace the worn, damaged or missing guards; • Turn off the engine of the tractor before operating on the cardan shaft or on the machine; • Do not allow children or unauthorised persons to go near the machine during operation and/or maintenance interventions; • When not used, place the cardan shaft on appropriate support; • Wear appropriate clothing (non-resistance, not loose), especially tight clothes (e.g. : overalls with wrist and ankle protection).																								
 ATTENZIONE	When installing the cardan shaft for the first time, measure the distance K between the grooves of the P.T.O. buttons with the machine placed on the ground, levelled and with the multiplier aligned with the P.T.O. of the tractor; if necessary adapt the length of the provided cardan shaft, making sure that the telescopic tubes are staked by length as to create at the ends a jog L of 40 - 50 mm (figure 23).  Figure 23																								
	This operation must be performed at the first installation, after each replacement and every time the machine is installed on another tractor. After installing the cardan shaft, fasten the guard on both sides using appropriate chains. When the machine is in stand by, place the cardan shaft on the appropriate supporting bar, provided on the three-point tiller to avoid any dirt accumulation, deformation or breakage of the guard. After installing the cardan shaft perform some opening, closing and articulation movements on the machine to make sure that the tubes of the shaft are free to slide without any obstacles.																								

 ATTENZIONE	Check that between the guard of the cardan shaft and the guard mounted on the PTO of the machine, a minimum overlap of 50 mm is present, as required from the safety standards.  Figure 5
 ATTENZIONE	Check that between the guard of the cardan shaft and the guard mounted on the PTO of the machine a minimum radial space between 50 and 150 mm is present so as to allow a hand to be inserted.  Figure 6 1 - Machine protective cap 2 - Cardan shaft protective cap
 ATTENZIONE	Check the rotating direction of the PTO of the cardan, on the tractor, looking from the rear side, it should rotate in clockwise.  Figure 26
 ATTENZIONE	Grease the cardan shaft following the recommendations provided in the instruction manual of the cardan shaft. Do not operate with cardan shafts without guards. Carefully read the instruction booklet attached to the cardan shaft.
	11. If the hydraulic jack is present: connect the transmission tubes of the jacks (figure 27);  SP: movement jack D1: double effect distributor Figure 27

	The machine is equipped with a jack that triggers the movement; the machine is supplied from the tractor hydraulic system via the quick coupling tubes. the tractor must be provided with a double effect distributor with operating pressure of 140-160 bar.
	After connecting the tubes, perform some movement operations to discharge any air bubbles that may form inside the jack.
 ATTENZIONE	Check that all safety pins are properly inserted and functioning correctly. Make sure that you inserted the anti-threading devices in the coupling pin. Make sure that the quick couplings are properly inserted.
	12. The machine is ready to be started.

3.5. STARTING THE MACHINE

 ATTENZIONE	Before starting the machine, you must follow the indications below:
	- Make sure that there are no persons, animals and things in the machine operating area as there are dangers, such as objects being thrown at high speed, that may cause serious injuries or death. Keep a minimum safety distance equal to the machine operating radius of 50 m.
	 Figure 28
	- Do not allow any persons, animals or things to get near and to stand in the machine operating radius. - Before using the machine, the operator must know the commands and the features of the machine.
 ATTENZIONE	The user must use all the safety devices and personal protection equipment (P.P.E.) during machine use, adjustment, repair and handling phases.
	
	- Always keep the guards in perfect state, properly placed and effective. - The engine of the tractor must be stopped, the parking brake engaged, the PTO disengaged, the ignition key out of the dashboard and placed in a secure place. - The rotor and relative machine tools must be stopped. - Always check the machine verifying the nuts fastening, checking for any damage; if any damage is found, it must be repaired before starting the machine and thus restoring the machine to its original state.

	- Supervise the operating area removing any stones, metallic pieces, steel cables or any other dangerous materials. Take all the necessary safety precautions as to keep yourself and other persons safe. Protect the cabin or the control area against falling/objects thrown at high speed using anti-break / armoured / shatter-proof windows and fixed guards (e.g. metallic grid) that can resist impacts in compliance to the state of the art technologies. Contact the manufacturer to request any further information regarding this case.
	- Check the position and status of the terrain in the operating area; make sure that they do not affect in any way the stability of the assembly tractor-mulcher.
	- Make sure the safety pictograms are in good conditions. If the pictograms are deteriorated, they must be replaced with other original versions requested from the manufacturer and placed in the position indicated by the instruction manual.
	- Make sure that the safety pictograms are readable. Clean them using a wet cloth.

STARTING PROCEDURE

	1. Using the distributor that controls the movement jack, move the machine until it reaches the operating area;
	2. Using the elevator commands, lower the machine until reaching the desired cutting height;
	3. Engage the P.T.O. and gradually accelerate the tractor until reaching the operating speed of 540 rpm (option 1000 rpm /min)
	4. Engage running mode and start the operating process;
	5. Go along a short distance with the machine engaged;
	6. Decelerate the tractor as much as possible;
	7. Stop the tractor engine, engage the parking brake, disengage the PTO, take the ignition key out of the dashboard and place it in a secure place.
	8. Get off the tractor and make sure that there are no oil losses at the mulcher hydraulic tubes couplings;
	9. Do not use your bare hands to check for any loss of liquids under pressure;
	10. Check the quality of the worked performed; if the quality is not good enough, adjust the operating height using the elevator, avoiding the contact between the cutting components (hammers or blades) and the terrain; repeat the steps from point 1 and if necessary review the machine adjustment operations indicated in paragraph 3.5.1.

3.5.1. MACHINE ADJUSTMENTS

3.5.1.1. RECOMMENDED SPEEDS

Adjust the operating speed, using the size (diameter) and volume of the material to be mulched, as well as the degree of shredding to be obtained. The machine must work exclusively in compliance with the declared use.

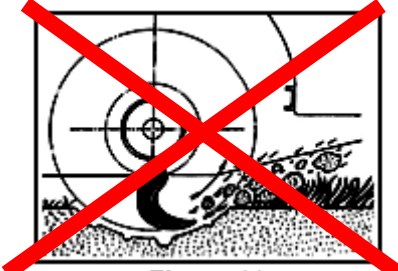
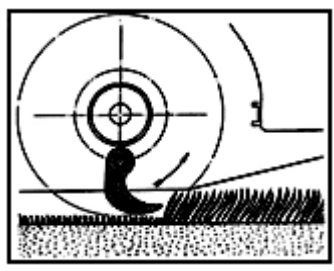
	Excess speed puts excessive stress on mobile machine parts, thus wearing them out ahead of time. In this case the amount of shredded material will be poor; it may cause the machine to throw large pieces of material that may put the operator in danger.
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In the table below are indicated the recommended speeds that should be respected in order to obtain maximum performance and in particular:

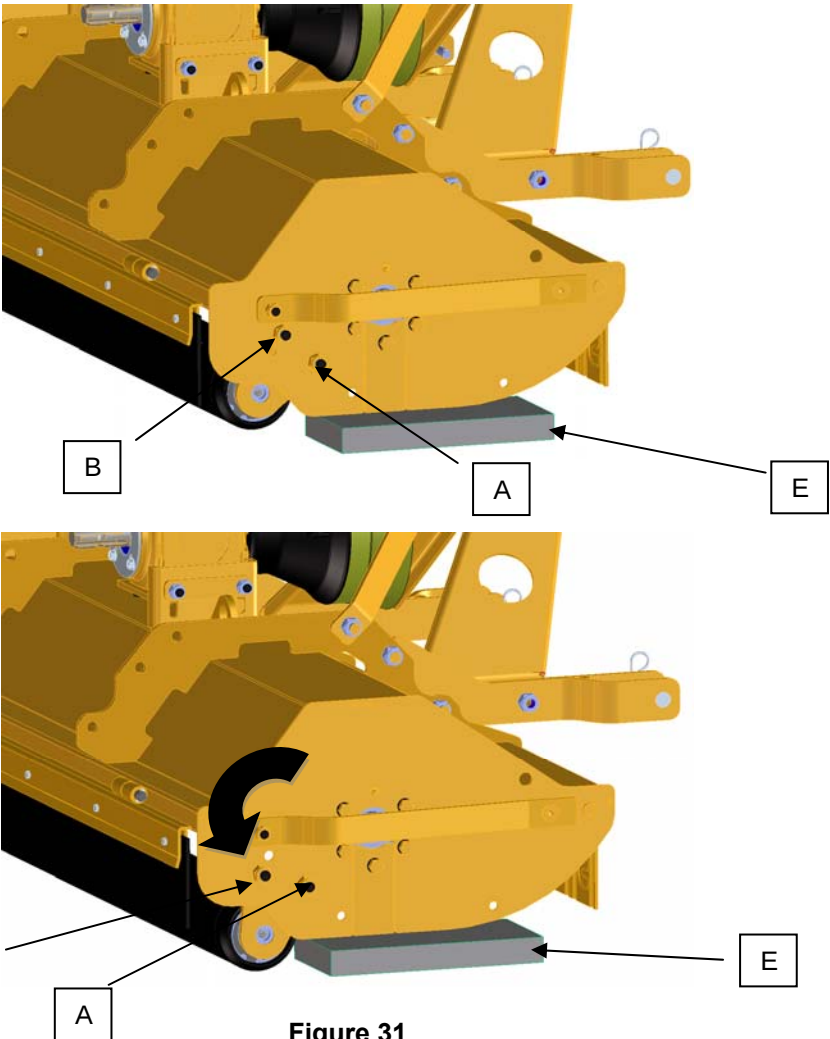
	RECOMMENDED FORWARD SPEED (km/h)														
TYPE OF MATERIAL	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	8
Sparse grass															
Grass that has not been mowed															

Table 3

3.5.1.2. CUTTING HEIGHT ADJUSTMENT

	Before adjusting the machine cutting height, carefully read and fully understand the instruction manual.
	All adjustment operations must be performed at authorised workshops by specialised personnel.
	The operating height must be adjusted as to make sure that the cutting tools (hammers or blades) do not come into contact with the terrain causing projection (figure 29-30).
	 Figure 29 NO  Figure 30 YES

In order to adjust the cutting and therefore the operating height, act on the position of the levelling roll of the machine as follows:

 ATTENZIONE	In order to perform the operations described below, make sure that the engine of the tractor is off, the parking brake engaged, the PTO disengaged, the ignition key out of the dashboard and properly stored.
 PERICOLO	At the workshop, use appropriate equipment to support and move the machine especially regarding the maximum weight that can be lifted and sustained (see table 1.5.3. for data related to the machine) in compliance with the laws in force in the country of use.
	1. Level the machine leaving a thickness E of about 8 cm under the sides; 2. Make sure that the PTO is disengaged, brake and turn off the tractor; 3. Loosen bolt A and remove bolt B; 4. Rotate the plate of the roll, until centring the slot in the desired position of the plate with that of the side; 5. Remount bolt B; 6. Tighten bolts A and B  Figure 31
	The adjustment operations must be performed both on the left and on the right side of the machine.

3.6. MACHINE IN WORK STAGE

 PERICOLO	Before starting the operating cycle, make sure that are met all indications in chapter 2 "ACCIDENT PREVENTION SAFETY STANDARDS" and those in chapter 3 paragraphs 3.1, 3.2, 3.3, 3.4 and 3.5.
 PERICOLO	The operating area must be thoroughly inspected before using the machine, paying attention to remove any stones, iron residues, steel cables, manholes, strains and all those materials and obstacles without any limitation which may constitute a source of danger, accidents and serious damage to the user, people, animals and things.
 PERICOLO	When operating on the roadside, the operating radius of the tractor must be delimited using appropriate signals, safety personnel and means in compliance with the laws in force in the country of use.
 PERICOLO	The operator must make sure that no person or animal stops within the radius of action of the same during machine functioning. The user must immediately stop the machine and keep away any unauthorised person. Never activate the machine near to persons standing or transiting within the radius of action of the machine.
 PERICOLO	It is strictly forbidden the use of the machine away from the terrain to cut down trees or hedges as the risk of pieces being thrown is high. The use of the mulcher is strictly forbidden if the tractor to which it is connected is not provided with cabin made of anti-break / armoured / shatter-proof glass and fixed guards (e.g. metallic grid). The final user must provide the tractor with guards suitable to resist the impact with the materials/objects thrown at high speed from the machine depending on the current state of the art technologies and must contact the manufacturer to request all necessary information.
 ATTENZIONE	As at the beginning of the machine lifetime is performed a general settlement of all the mechanical and hydraulic connections, it is essential to carry out the controls of the machine with the utmost accuracy.
 PERICOLO	Make sure that all machine parts function regularly when operating. The majority of the inconveniences and faults that may arise during the use of the machine are due to the fact that the fastening components loosen over time.
 PERICOLO	It is strictly forbidden to remove and/or change the guards installed on the machine.

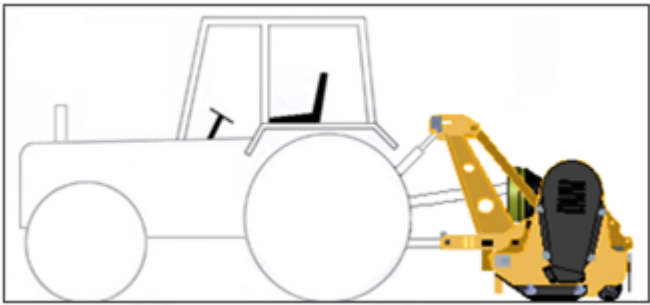
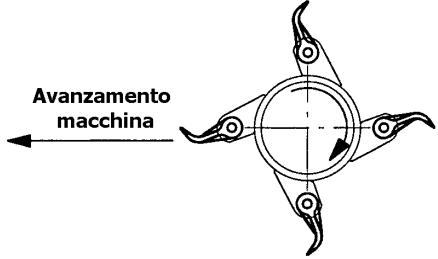
 ATTENZIONE	In the operations of change of direction, turn and reverse, slightly raise the head from the ground, after switching off the power to the machine, in order to avoid damage to the structure.
 PERICOLO	Pay attention to the risk of accidental ignition of the electric arc machine with overhead power lines.
 PERICOLO	It is strictly forbidden to adopt configurations that prevent the user working on the tractor from seeing the machine.
 PERICOLO	It is strictly forbidden to adopt configurations that put at risk the stability of the tractor - mulcher assembly. The tractor must always stay on plane terrains that can sustain its weight. The user must periodically assess the risk, depending on the working area, assuming full responsibility for the damage caused due to any incorrect assessment.
 ATTENZIONE	It is strictly forbidden to use the machine as sustain point for the tractor. The pressure exerted by the tractor would collapse the frame of the machine with consequent rupture of the same.
 ATTENZIONE	Never lean or press the rotor on logs, rocks because it could bend and then rotate unbalanced. Using the machine while damaged will affect its structural integrity due to unexpected and uncontrollable breakages.
 PERICOLO	Never use the machine on stones, especially if there is very dry grass or bushes. The sparks that result when the tools come into contact with the stones may generate fire. In case of fire, immediately contact the relevant authorities and move away, if possible, the tractor-mulcher assembly, taking it to a safe area, follow the procedure in paragraph 3.7. and go to a safe place.
 PERICOLO	At the end of the operating process the machine must be placed on the ground. Before getting out of the tractor, use the parking brake, turn off the engine, remove the ignition keys from the dashboard, and wait for 5 minutes inside the cabin to make sure that the rotor and relative tools completely stop.

	If during operation the mulcher remains entangled in the thick vegetation or any metallic scrap, such as, brambles, shrubs, thick bushes, steel cables and any other material that may stop the proper operation of the machine, the operator must engage the tractor brake, turn off the engine, remove the ignition keys from the dashboard, and wait for 5 minutes inside the cabin as to make sure that the rotor and relative tools completely stop. At this point the operator must manually free the machine following all applicable safety standards. Check for any damage/breakage and proceed to immediate repair of the same using original spare parts. If there are no damages, get in the tractor and proceed with the operation following the indications in paragraph 3.5 "Machine start-up" and paragraph 3.6 "Machine running".
--	--

MULCHING PROCEDURE

	It is recommended to perform the operations at a constant speed, appropriate for the quantity of material to be mulched. This way the production of shredded material will be optimal and the risk of ejection of large sized pieces will be reduced to a minimum.
	The tractor must always stay on plane terrains that can sustain its weight.

Go near the area in which you want to operate and proceed as follows:

	1. With the tractor engine idling, insert the PTO of the same.
	2. Gradually accelerate until reaching a speed of 540 rpm (upon request 1000 rpm);
	3. Start the operating cycle modulating the movement speed as for the machine to complete the shredding of the material and at the same time download on the ground the mulched product;
	If the vegetation is very thick or high, you may pass one time over it with the mulcher lifted from the ground and the second time with the mulcher on the ground to complete the operation.
 Figure 32	 Figure 33
	The mulcher should not be moved to a new operating area if the rotor and the tools haven't stopped yet.

3.7. MACHINE VERSIONS

The machine is intended to be used in a traditional way, but also with tractors with reverse driving or with front connection. To pass from the traditional way of working with tractor with reverse or front driving, or vice-versa, you need to adapt the machine to the new system.

FIXED CONNECTION VERSION

STANDARD DRIVING, MACHINE ON REAR ELEVATOR, PULLING:

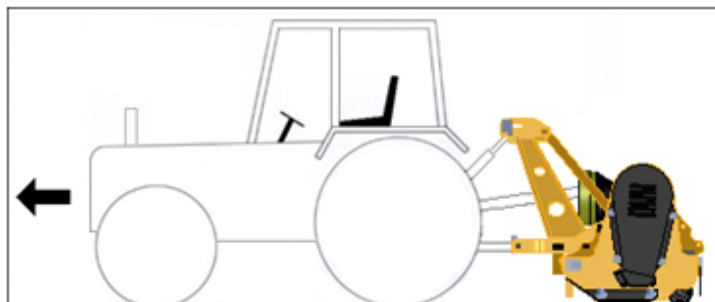


Figure 34

FRONT DRIVING, MACHINE ON REAR ELEVATOR, PUSHING:

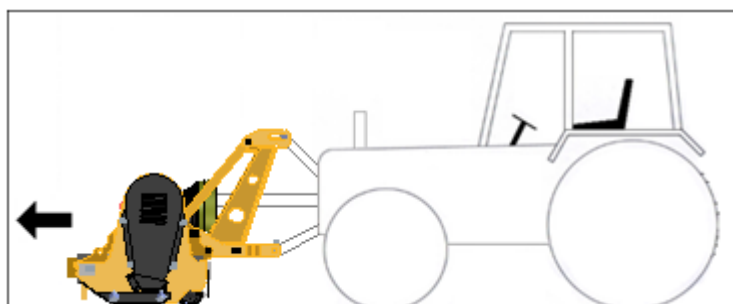
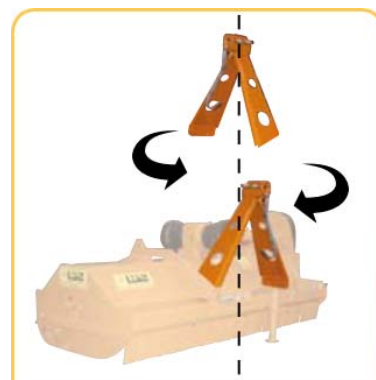


Figure 35



REVERSE DRIVING, MACHINE ON REAR ELEVATOR, PUSHING:

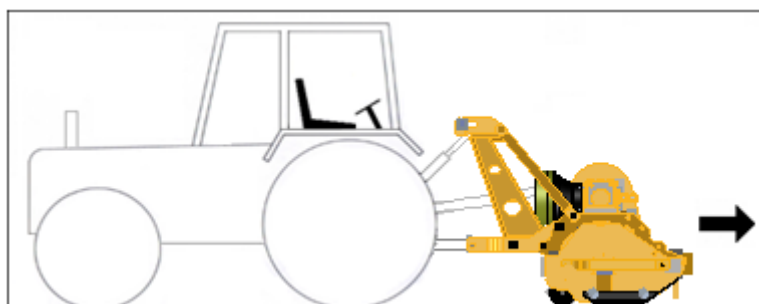
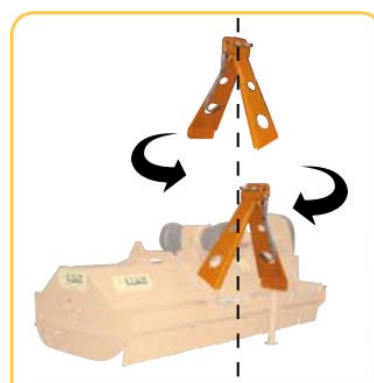


Figure 36



Gear box with double free wheel

MOVABLE CONNECTION VERSION

The machine is equipped with lateral movement, which can be activated in a mechanical or hydraulic way:

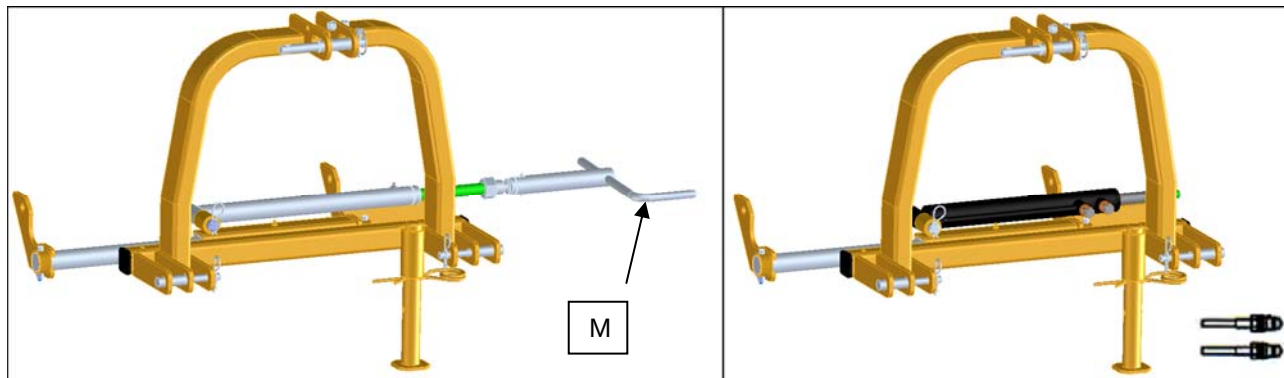


Figure 37

Mechanical lateral movement with screw and crank	Lateral movement with hydraulic jack
This kind of movement allows the movement of the machine through the action operated on the M crank.	This kind of movement can be applied to all tractors equipped with additional double effect distributor with operating pressure of 140-160 bar.

As for the version with fixed connection, the movable version can be applied on a rear lifter (pulling), on front elevator (pushing) and on rear elevator (pushing, reverse driving).



Figure 38

Mod.												
	cm	Min	Max	mm	n°	n°	PTO	A	B	C	Kg	
MINI/S 115	115	12	35	670 480 350 800	32	64	3	540 (1000)	75	129	85	250
MINI/S 125	125	12	35	670 580 350 900	34	68	3	540 (1000)	75	139	85	260
MINI/S 145	145	12	35	755 695 435 1015	40	80	3	540 (1000)	75	159	85	280

3.8. MACHINE STOPPAGE

In order to stop the machine, the tractor PTO must be disengaged and the rotor and related tools will also stop.



PERICOLO

Always remain inside the cab during operations and make sure there are no persons, animals or objects within the work range of the machine. Any intervention on the machine must be performed with the parking brake engaged, the engine stopped, the ignition key removed from the dashboard and kept and only after waiting for about 5 minutes inside the cabin to allow the rotor and related tools to stop completely.

3.9. MACHINE DISCONNECTION

When disconnecting the machine from the tractor you must:

	1. Make sure that the tractor- mulcher assembly is placed on a stable, levelled terrain.
	2. Lower the machine resting feet.
	3. Disengage the tractor PTO and wait for the rotor and related tools to stop;
	4. Bring the engine of the tractor in idle mode, use the parking break, turn off the tractor, remove the ignition key from the dashboard and store it properly;
	5. Descend from the driver position.
	6. Disconnect the cardan shaft using the appropriate triggers;
	7. Rest the Cardan shaft on the relevant support.
	8. Disconnect the tie rod of the third point;
	9. Fix the third point to the appropriate support on the tractor.
	10. Disconnect the arms of the rear hydraulic elevator of the tractor from the parallel connection points of the mulcher;
	11. Disconnect the supply cables of the jack;
	12. Get back inside the tractor.
	13. Start the engine and move away carefully.
	The machine must be parked on flat land and within a protected area, so as to prevent unauthorised staff from approaching.

3.10. CLOGGING

	Before removing the machine clogs, carefully read and fully understand the instruction manual.
	Keep in mind that any change of the field conditions, such as the type and the amount of material to be mulched, may clog the mulcher.
	If the machine clogs, follow the indications in paragraph 3.8 "MACHINE DISCONNECTION" and bring the machine to an authorised workshop .

At the workshop:

	1. Hook the machine, turn it over and place it on appropriate supports;
	At the workshop, use appropriate equipment (hoists and beams) to move the machine especially regarding the maximum weight that can be lifted and sustained (see table 1.5.3. for data related to the machine).
	2. Manually unclog the machine;
	3. Check for any damage/breakage and proceed to immediate repair of the same using original spare parts.
	4. After completing all operations, turn the machine over and place it on the ground;
	5. Repeat the actions described in paragraphs 3.4 and 3.5 "Machine connection and start-up" and resume work following the methods described in paragraph 3.6.

4. MAINTENANCE

	In case of damage of the machine, the user must perform the machine shut-down procedure, set the tractor engine to idle mode, use the parking break, turn off the engine, disengage the PTO, remove the ignition key and wait inside the cabin for about 5 minutes until the rotor and the tools of the machine stop. Descend from the driver position to check the nature of the problem and contact the authorised workshops in order to solve it.
---	--

Before starting any maintenance operation, implement the following precautions:

	Before performing any maintenance operation, carefully read and fully understand the instruction manual.
	The machine must be brought in a properly equipped workshop, authorised to perform all ordinary and extraordinary maintenance operations with specialised personnel. The machine must be stopped and disconnected from the tractor. The maintenance and repair operations must not be performed in open space or in improperly equipped workshops.
	The specialised staff must use the safety devices and personal protection devices (PPD) during use, maintenance, regulation, repairs and handling of the machine. 
	Any maintenance operation can be performed only after the temperature of the oil and other hot parts of the machine is below 60 °C.

 PERICOLO	Do not carry out repairs of which you have no knowledge. Always follow instructions and contact the manufacturer if they are not available.
 ATTENZIONE	Do not use lifting points different to those prescribed.
 ATTENZIONE	Make sure that the lifting equipment is suitable to carry out the operations in compliance with Safety Standards in the country of use.
 ATTENZIONE	Any maintenance residues, such as, straps or replaced materials containing flammable residues must be kept away from sources of ignition and disposed of in accordance with applicable laws in the country of use.
 ATTENZIONE	The gathered oil must be disposed of in compliance with the laws in force in the country of use.

4.1. MACHINE HOT POINTS

Before any maintenance intervention, make sure that the potentially hot parts have dropped to a temperature below 60°C.
Pay extreme attention to:

- Drive sump;
- Gearbox;
- Pulleys and belts;
- Hydraulic tubes.

4.2. MAINTENANCE INTERVENTIONS

Qualified staff must precisely know and follow the indications and must stop and disconnect the machine following the indications in paragraphs 3.7. and 3.8.

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 maintenance times and regulations jeopardises the correct operation of the machine and its duration and consequently makes warranty validity null and void.

Intensify the frequency of maintenance in heavy duty operating conditions (frequent stopping and starting, extended winter period, etc....).

4.2.1. COUPLING TORQUES TABLES

Ø vite	Hexagon	Class		8.8		10.9		12.9	
		Pitch		Pitch		Pitch		Pitch	
		Coarse	Fine	Coarse	Fine	Coarse	Fine	Coarse	Fine
	mm	mm	mm	Nm	Nm	Nm	Nm	Nm	Nm
M8	13,00	1,25	1,00	20	22	29	31	34	37
				25	27	35	38	42	46
M10	17,00	1,50	1,25	40	42	57	59	68	71
				50	53	70	74	84	89
M12	19,00	1,75	1,50	69	72	97	101	116	121
				85	89	119	125	143	150
M14	22,00	2,00	1,50	110	118	154	166	185	199
				135	148	190	208	228	250
M16	24,00	2,00	1,50	128	180	240	253	287	303
				212	226	298	318	357	382
M18	27,00	2,50	2,00	235	248	330	349	397	419
				290	310	402	436	490	523
M20	30,00	2,50	2,00	332	347	467	489	561	586
				413	436	580	614	697	736
M22	34,00	2,50	2,00	454	474	639	666	767	799
				568	597	798	840	958	1.008
M24	36,00	3,00	2,00	574	617	808	868	969	1.041
				714	781	1.004	1.098	1.204	1.317

4.2.2. GREASING

Periodic and systematic greasing and lubrication of the machine maintain its performance and increase its useful life span. Grease the indicated points using an appropriate universal greasing pump that can be found in any workshop.

LUBRICATION OF THE TRANSMISSION UNIT:

 ATTENZIONE	Before taking any action on the transmission unit, properly clean the areas around the caps, to avoid any dirt intrusion inside the units.
--	---

For the transmission units:

- 1- During the first 20 hours check the oil level in the gearbox: the oil should reach the level hole. If necessary, add some more oil; then check the oil level every 50 hours;
- 2- After the first 40 working hours replace all the oil in the multiplier. Then repeat the operation every 250 working hours.

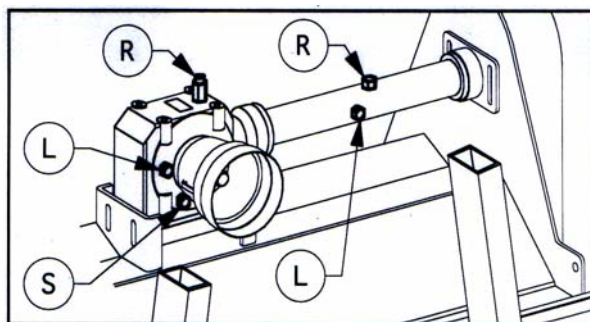


Figure 39

R: oil discharge hole
L: oil level hole
S: oil discharge hole

OVERALL GREASING:

 ATTENZIONE	Before taking any action on the machine greasing points, properly clean the areas around the caps, to avoid any dirt intrusion inside the points.
----------------	--

	Periodic and systematic greasing and lubrication of the machine maintain its performance and increase its useful life span.
--	--

	Only use a manual greasing pump in order to prevent laceration of the bearing seals and the grease passage piping.
--	---

Pos.	Name	Lubrication intervals	Notes
RT	Rotor	8 hours	Grease by activating the manual pump 1-2 times to prevent damage to the internal seals of the supports.
RL	Levelling roll	8 hours	Grease by activating the manual pump 1-2 times to prevent damage to the internal seals of the supports.
SP	Movement	8 hours	Grease it using the manual pump 1-2 times on the greaser of the movement.
SM	Mechanical movement	8 hours	Grease it using the manual pump 1-2 times on the manual pump of the greaser of the mechanical movement.

Table 4

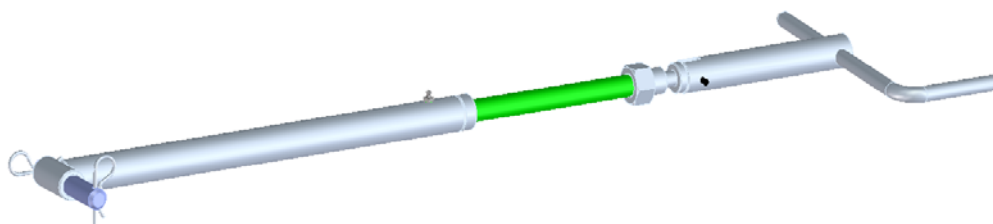
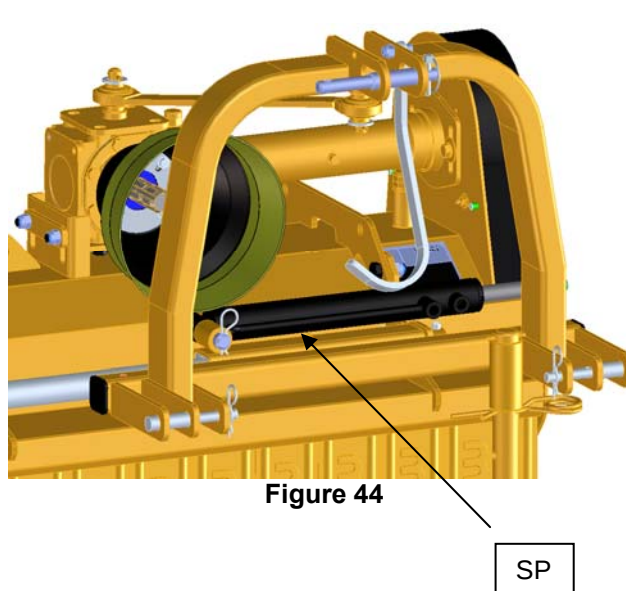
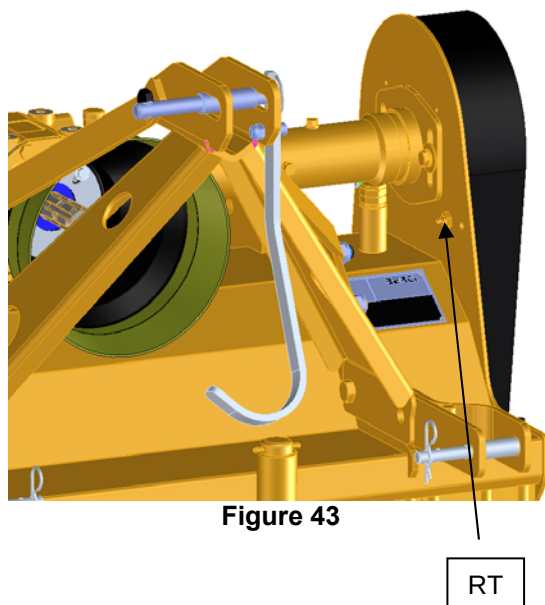
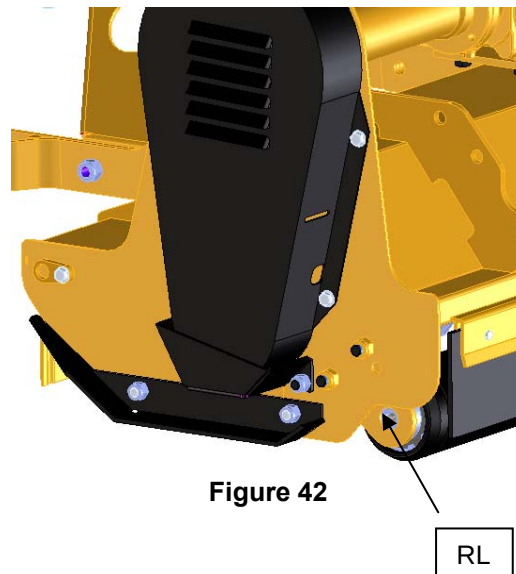
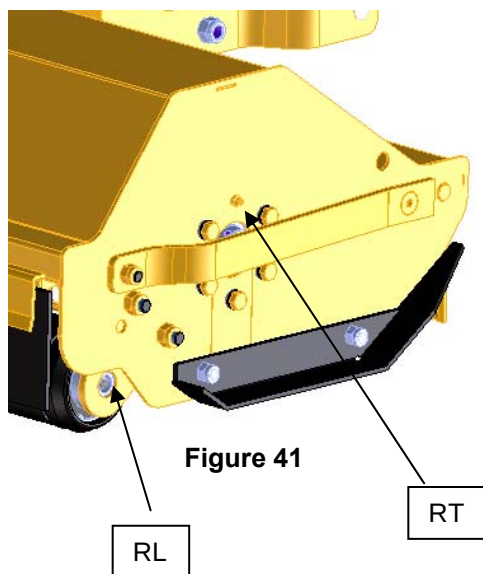


Figure 40

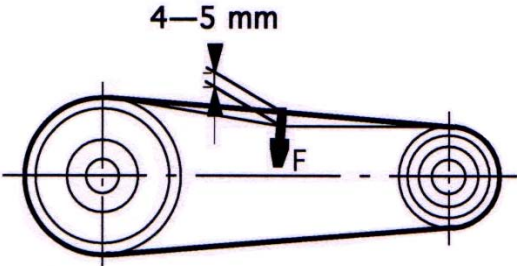


COMPATIBLE LUBRICANTS:

GREASING POINT	REFERENCE LIUBRICANT AGIP	IP	ESSO	SHELL	MOBIL	BP	TOTAL
GEARBOX AND EXTENSION	BLASIA 460	MELLANA OIL 460	SPARTAN EP 460	OMALA 460	MOBILGEAR 634	ENERGOL GR-XP 460	CARTER EP 460
OVERALL GREASING	GREASE MU EP 2	MOBILUX EP 2	BEACON EP 2	ALVANIA GR. EP 2	MOBILUX EP 2	GREASE LTX EP 2	MULTIS EP 2

Table 5

4.2.3. ADJUSTMENT OF TRANSMISSION BELT TENSION

	Before adjusting the tension of the belts, carefully read and fully understand the instruction manual.
 PERICOLO	All adjustment operations must be performed at authorised workshops by specialised personnel.
 ATTENZIONE	Place the machine on levelled terrain, with the head resting on the ground, the engine stopped, the parking brake engaged, the PTO disengaged, the ignition key out of the dashboard and properly stored.
 ATTENZIONE	The belts are tensioned when, by applying on each belt a power F of 4-5Kg, at the centre between the two pulleys, the measurable breakage is 4-5 mm approximately.  Figure 45
 ATTENZIONE	That said is very important. Check the belts tension: if necessary adjust the belts so as the breakage complies with the above mentioned data. This operation should be executed after the first 4 working hours and, afterwards, every 50 hours.

BELTS TENSIONING PROCEDURE:

For the adjustment, proceed in the following way:

- 1- Remove the under crankcase SC and the crankcase C of the transmission cover (figure 50);
- 2- Unscrew the V1 screw placed on the support plate of the gear box (figure 51);
- 3- Unscrew the V2 screws placed on the belt tensioner plate;
- 4- By acting on the T tensioning nuts, tension the belts;
- 5- Block the T nuts;
- 6- Fasten the screws V1 and V2;
- 7- Mount the crankcase C and the under crankcase SC by fixing them with the appropriate screws.



ATTENZIONE

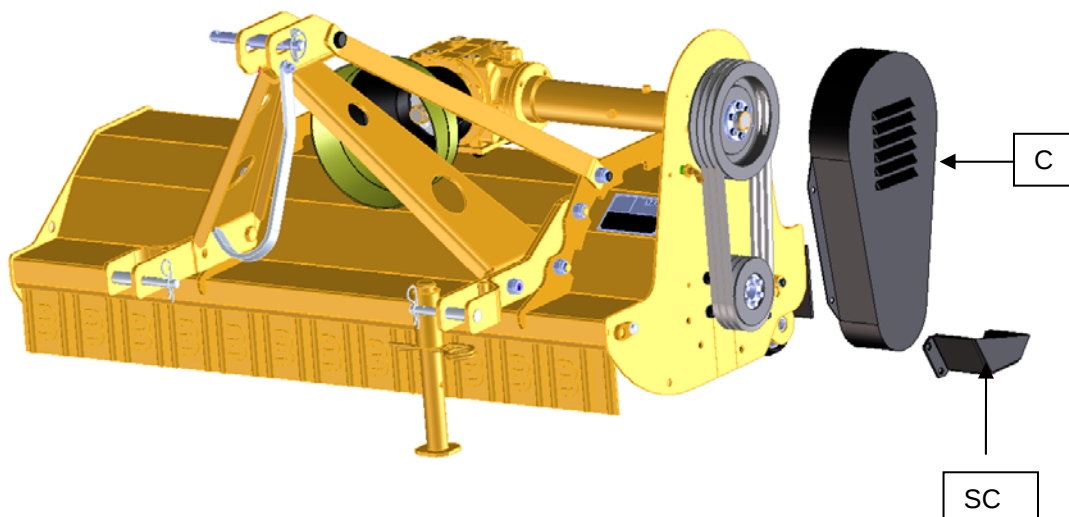


Figure 46



ATTENZIONE

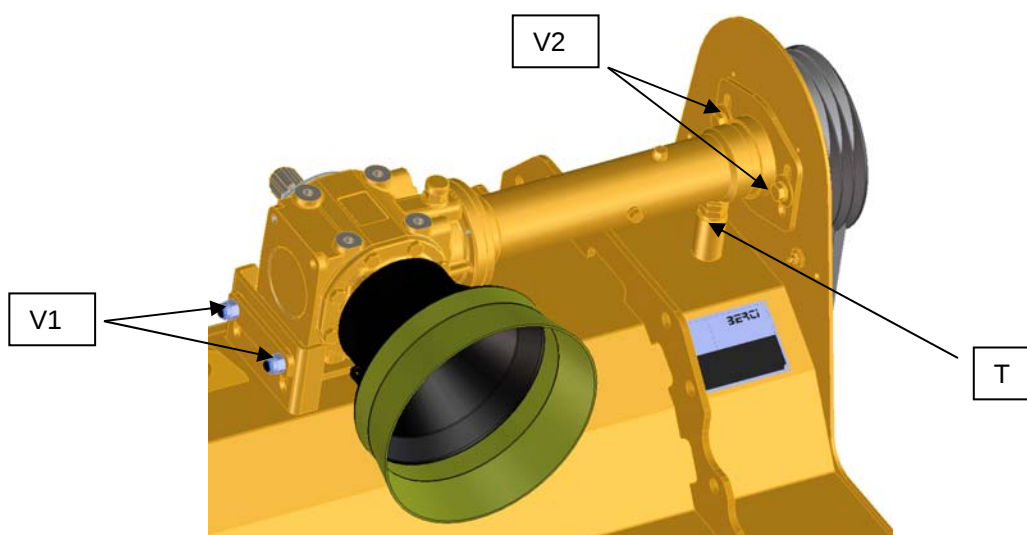


Figure 47

4.2.4. REPLACING THE TRANSMISSION BELTS

The transmission belts replacement operations must be performed while the mulcher is placed on the ground, the tractor stopped, the PTO disengaged, the ignition key out of the dashboard.

	1. Remove the under crankcase SC and the crankcase C of the transmission cover; 2. Unscrew the V1 screws placed on the support plate of the gear box; 3. Unscrew the V2 screws placed on the belt tensioner plate; 4. Unscrew the tensioning nuts T;
	5. Now there should be no more pressure on the belts, thus allowing the operator to replace them;
	6. Check for any damages; if any, proceed to immediate repair;

 CAUTELA	The V-belts must be mounted without forcing them, without using screwdrivers, crowbars, etc. that may damage the belt itself. Proper assembly allows money and time saving and increases the belt lifetime.
 ATTENZIONE	When you need to check the tensioning or re-tension the belts tensioner, follow the indications in chapter 4.2.3.
	7. Once the replacement done, check that the pulleys are aligned among themselves (use an F ruler as indicated in figure 48); Figure 48
	8. Unscrew the V2 screws, the tensioning nuts T and the screws V1; 9. Mount the crankcase C and the under crankcase SC by fixing them with the appropriate screws.
 ATTENZIONE	Do not work without belts protection casing.

After replacing the belts, adjust them as described in chapter 4.2.2.

4.2.5. HYDRAULIC PLANT

 ATTENZIONE	Check the machine visually to make sure that there are no loose fittings, piping with scratches, cuts or other signs of wear. Tighten the loosened fittings and replace the worn or damaged pipes.
--	---

The hydraulic system diagram is indicated in figure 49 and is made of:

SP: Movement jack A2 – B2: Tractor distributor	Figure 49
---	--

In order to connect the machine consult chapter 3 paragraph 3.4

HYDRAULIC TUBING REPLACEMENT PROCEDURE

 ATTENZIONE	1. Before removing a hydraulic tube, make sure that any residual pressure was discharged from the system;
	2. Precisely identify the damaged tube and loosen using an appropriate key the two connection points, paying attention to any possible leakages of hydraulic fluid;
 ATTENZIONE	3. Replace the damaged tube using only original spare parts;
	4. Before installing the new tube make sure that the connection points are in proper state (threads, seals, etc.);
	5. With the proper tools screw clockwise the fittings of the hydraulic tubes that present leakage. Do not tighten excessively so as not to ruin the threading on the fittings.
 ATTENZIONE	Any maintenance residues, such as, straps or replaced materials containing flammable residues must be kept away from sources of ignition and disposed of in accordance with applicable laws in the country of use. The gathered oil must be disposed of in compliance with the laws in force in the country of use.

4.2.6. TOOLS WEAR CHECK

The mulcher tools must be visually checked for any signs of wear. Replace them if the material is not perfectly cut or when observing that a slight increase of the absorbed power generates a significant increase of the oil temperature of the mulcher. If the machine is used with tools that are not sharpened, its performance will decrease.

The dimensions and the weights of the tools are strictly controlled: if they are replaced completely, the rotor might not require a new dynamic balancing (refer to: "TOOLS REPLACEMENT PROCEDURE")

BROKEN TOOLS
Broken tools or tools that are too worn transmit vibrations to the machine. In this case, stop the job immediately and only start again after the tools have been replaced.

 ATTENZIONE	Replace the worn and/or damaged tools with original tools distinguished by the Berti mark.
--	---

Hammer type "G":

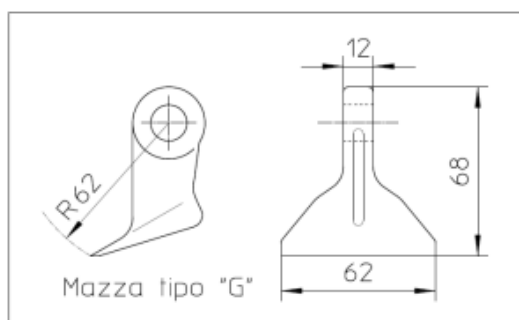


Figure 50

Universal blade "Y":

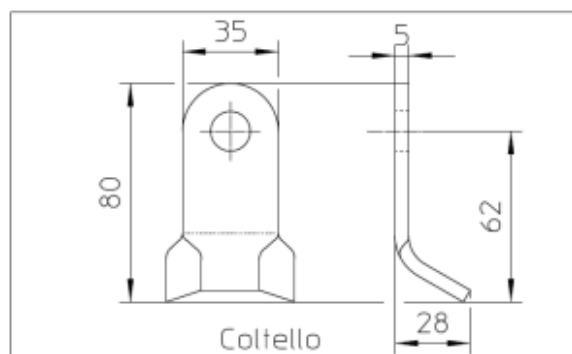
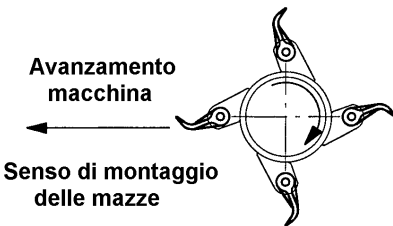
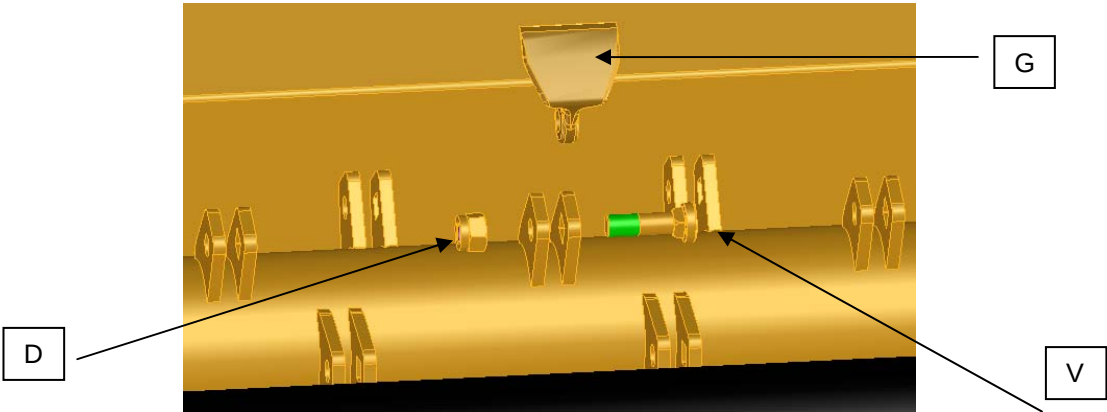


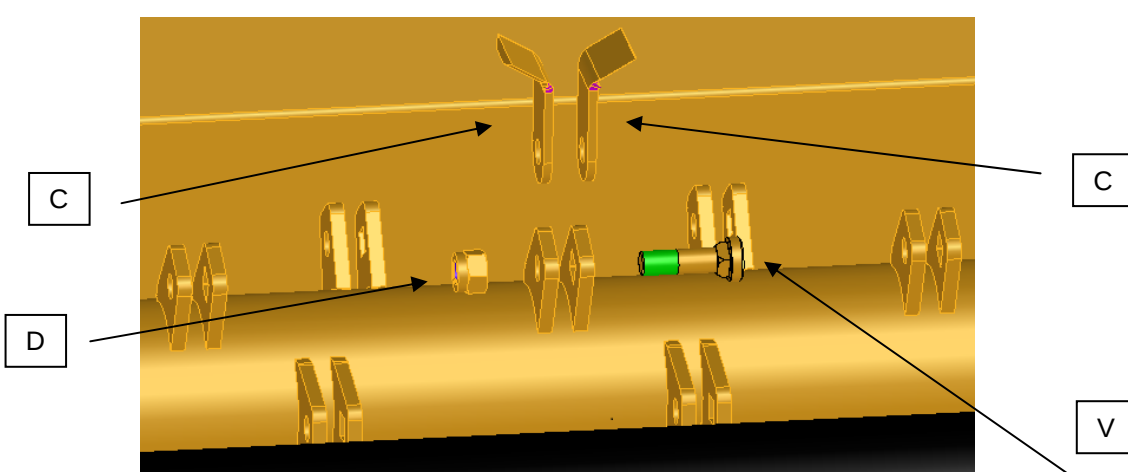
Figure 51

Duration of the tools depends on the type of use and type of land worked. They should be fully replaced after about 200 working hours.

4.2.6.1. TOOLS REPLACEMENT PROCEDURE

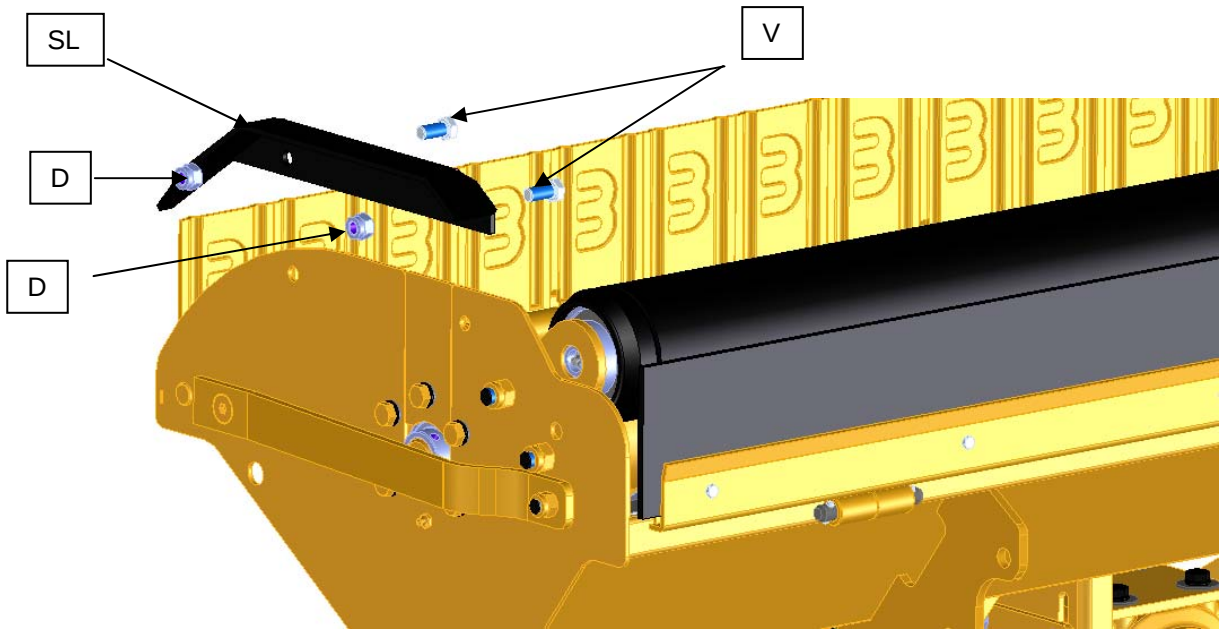
 ATTENZIONE	If an individual tool must be replaced, it is recommended to replace the entire range. Not using original spare parts can cause the machine to vibrate anomalously. Pay attention to the direction in which you assemble the tools.  Figure 52
 PERICOLO	Hook the machine, turn it over and place it on appropriate supports; At the workshop, use appropriate equipment (hoists and beams) to move the machine especially regarding the maximum weight that can be lifted and sustained (see table 1.5.3. for data related to the machine) in compliance with the laws in force in the country of use.
	IF THE MACHINE ROTOR USES HAMMERS, PROCEED AS FOLLOWS:
	Unscrew nut D, pick up hammer G and remove screw V (Figure 53). After removing the hammer, check the wear condition of the supports, paying particular attention to the oval holes, the squared housing of the screw head. If any of the described phenomena are present, contact the manufacturer and request further indications.  Figure 53

	Replace the new hammer G placing it between the rotor supports, insert the new screw paying attention to match the square head of the screw with the square housing on the support.
	Mount the new nut and fasten it.

	IF THE MACHINE ROTOR USES BLADES, PROCEED AS FOLLOWS:
	Unscrew nut D, pick up the blades C and remove screw V (Figure 54). After removing the blades, check the wear condition of the supports, paying particular attention to the oval holes, the squared housing of the screw head. If any of the described phenomena are present, contact the manufacturer and request further indications.  Figure 54
	Replace the new blades C placing them between the rotor supports, insert the new screw paying attention to match the square head of the screw with the square housing on the support.
	Mount the new nut and fasten it.
	After completing all the operations, turn the machine over once again, place it on the ground and repeat the connection and start-up procedure described in paragraphs 3.4. and 3.5.
 ATTENZIONE	Pay attention to the direction in which you assemble the tools. If they are mounted in the wrong direction they cannot cut.
 PERICOLO	If after replacing the tools, the vibrations persist, proceed with a new dynamic balancing of the rotor at a specialised workshop.
 ATTENZIONE	Periodically check the hammers screws and nuts fastening; if they are loose, the rotor may get damaged and dangerous ejections may occur.
	Our spare parts guarantee complete and correct use of your machine again.

4.2.7. SUPPORT SLIDES REPLACEMENT

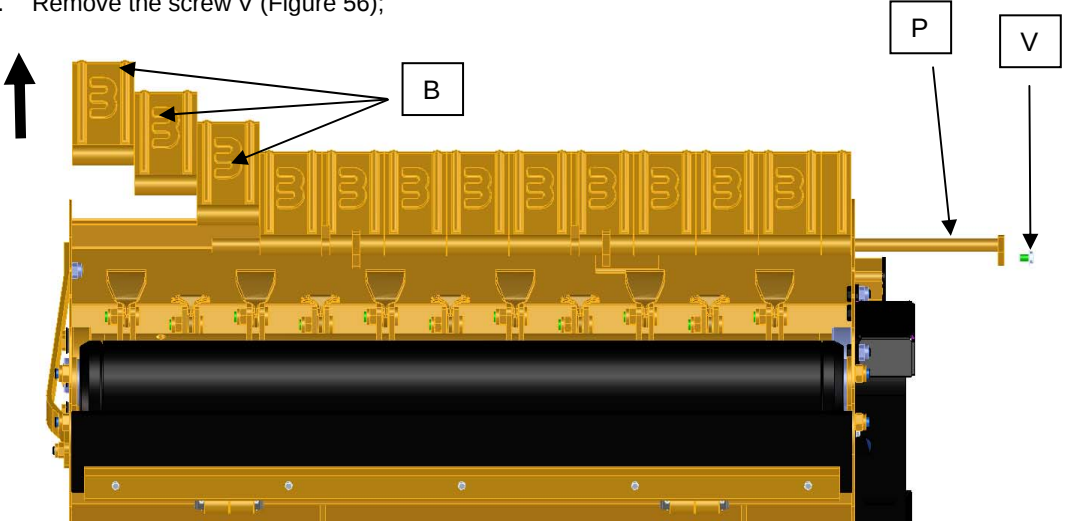
The machine is equipped with anti-wear slides that can be replaced in the following mode:

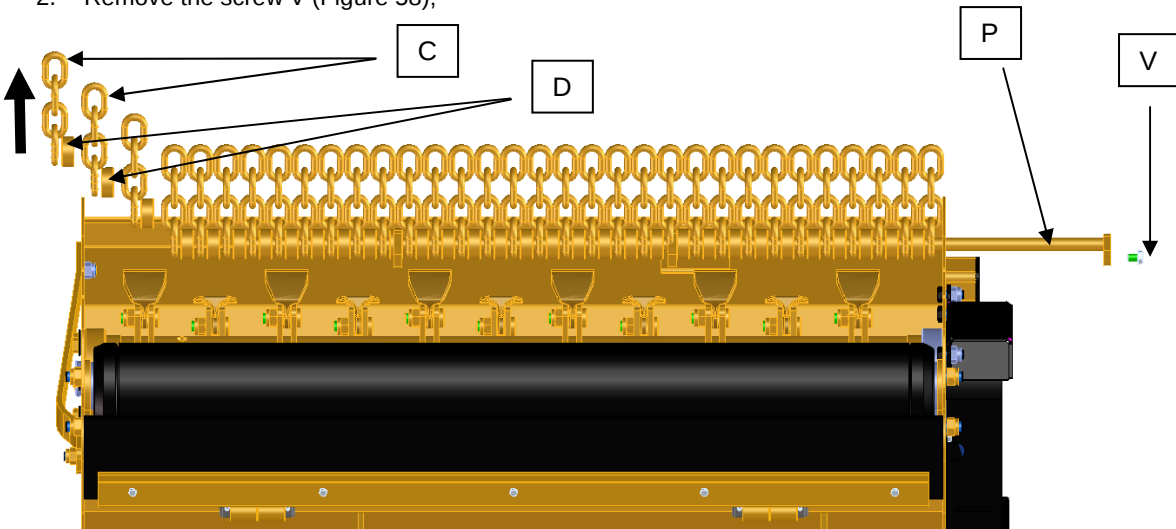
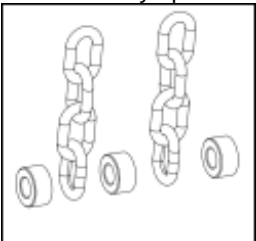
	1. Turn the machine over and place it on appropriate supports; In the workshop, use suitable equipment to handle and support the machine especially in terms of liftable and sustainable weight (see table 1 paragraph 1.5.3), in compliance with the Laws in force in the country of use.
 Figure 55	2. Unscrew the nuts D and remove the screws V as shown in figure 55;
	3. Replace the anti-wear slides SL both from the right and from the left side of the machine;
	4. Mount the screws V using the appropriate nuts D;
	5. After completing all the operations, turn the machine over once again, place it on the ground and repeat the connection and start-up procedure described in paragraphs 3.4. and 3.5.

4.2.8. REPLACEMENT OF THE FRONT GUARDS OF THE MACHINE

The machine is equipped with frontal guards consisting of panels or chains fastened to the machine crate.

FRONT GUARDS - PANELS	
	the panels must be properly stored. Operating without panels means operating without guards, and therefore the use of the machine in such conditions is considered improper. The manufacturer declines any responsibility for serious damages/accidents to persons, property and animals due to improper use of the machine.
	1. Hook the machine, turn it over and place it on appropriate supports;

 PERICOLO	At the workshop, use appropriate equipment (hoists and beams) to move the machine especially regarding the maximum weight that can be lifted and sustained (see table 1.5.3. for data related to the machine) in compliance with the laws in force in the country of use.
	2. Remove the screw V (Figure 56);  Figure 56
 ATTENZIONE	3. Gradually unscrew the front protection pin P, making sure that the panels B do not fall to the ground;
	4. Check for any damages; if any, proceed to immediate repair;
	5. Replace the panels introducing them into the through-pin P; near the supports of the through-pin thread introduce the notched panels leaving no gap between these panels.  Figure 57
	6. Tighten the screw V.
	Reposition the machine on the ground and repeat the "Connection and start-up" procedure described in paragraphs 3.4. and 3.5.
	Our spare parts guarantee complete and correct use of your machine again.

FRONT GUARDS - CHAINS	
 PERICOLO	The panels must be properly stored. Operating without chains means operating without guards, and therefore the use of the machine in such conditions is considered improper. The manufacturer declines any responsibility for serious damages/accidents to persons, property and animals due to improper use of the machine.
	1. Hook the machine, turn it over and place it on appropriate supports;
 PERICOLO	At the workshop, use appropriate equipment (hoists and beams) to move the machine especially regarding the maximum weight that can be lifted and sustained (see table 1.5.3. for data related to the machine) in compliance with the laws in force in the country of use.
	2. Remove the screw V (Figure 58);  Figure 58
 ATTENZIONE	3. Gradually unscrew the front protection pin P, making sure that the chains C and the spacers D do not fall to the ground;
	4. Check for any damages; if any, proceed to immediate repair;
	5. Replace the chains A and spacers D, inserting the inside the through-axle pin P; Respect the order of the chains and spacers assembly operations as indicated in figure 59.  Figure 59
	6. Tighten the screw V.
	Reposition the machine on the ground and repeat the connection and start-up procedure described in paragraphs 3.4. and 3.5.



Our spare parts guarantee complete and correct use of your machine again.

4.2.9. REPLACEMENT OF THE REAR TYRE

The machine has a rear guard consisting of a rubber fabric sheet fixed on a suitable support by means of bolts.



PERICOLO

In the workshop, use suitable equipment to handle and support the machine especially in terms of liftable and sustainable weight (see table 1 paragraph 1.5.3), in compliance with the Laws in force in the country of use.

1. Disconnect the machine from the tractor;
2. Unscrew the nuts D and remove the screws V as in figure 60, ensuring that the rubber fabric sheet G and the support S do not fall to the ground;

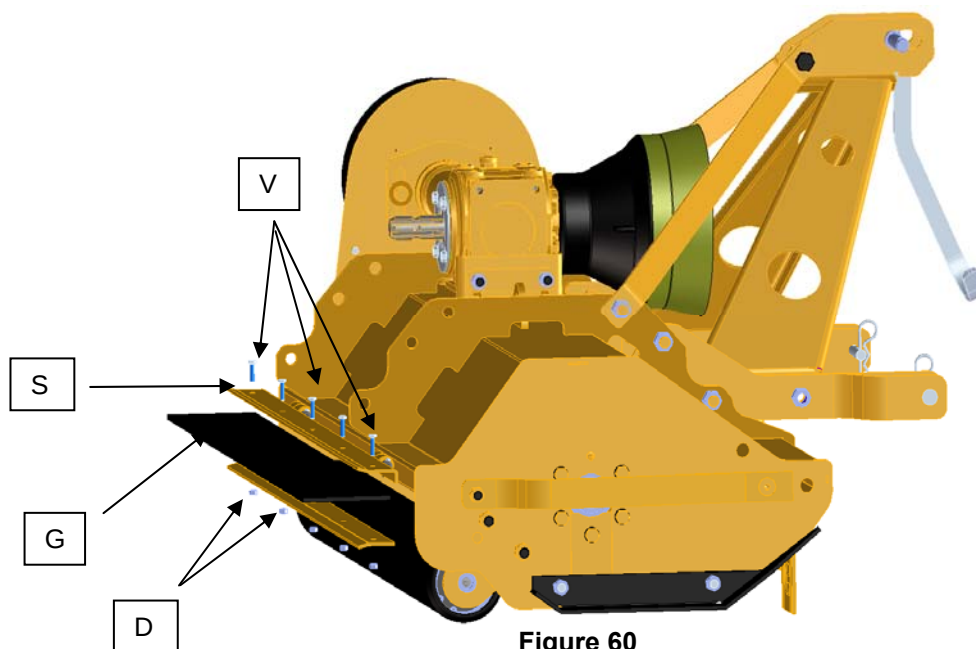


Figure 60

3. Check for any damage to the support S which must be immediately repaired to restore the original state;
4. Replace the rubber fabric sheet G;
5. Support the new rubber fabric sheet G in support S, taking care to arrange it well in the housing S. Pierce the rubber at the holes T (figure 61);

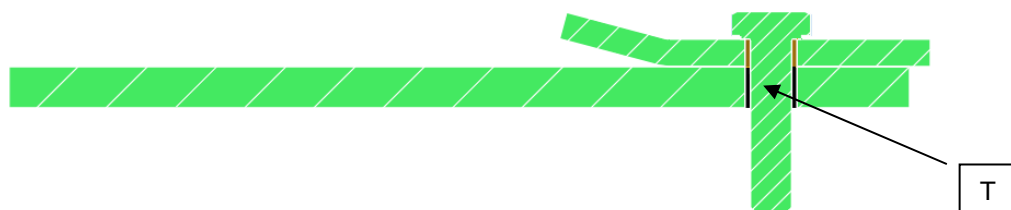
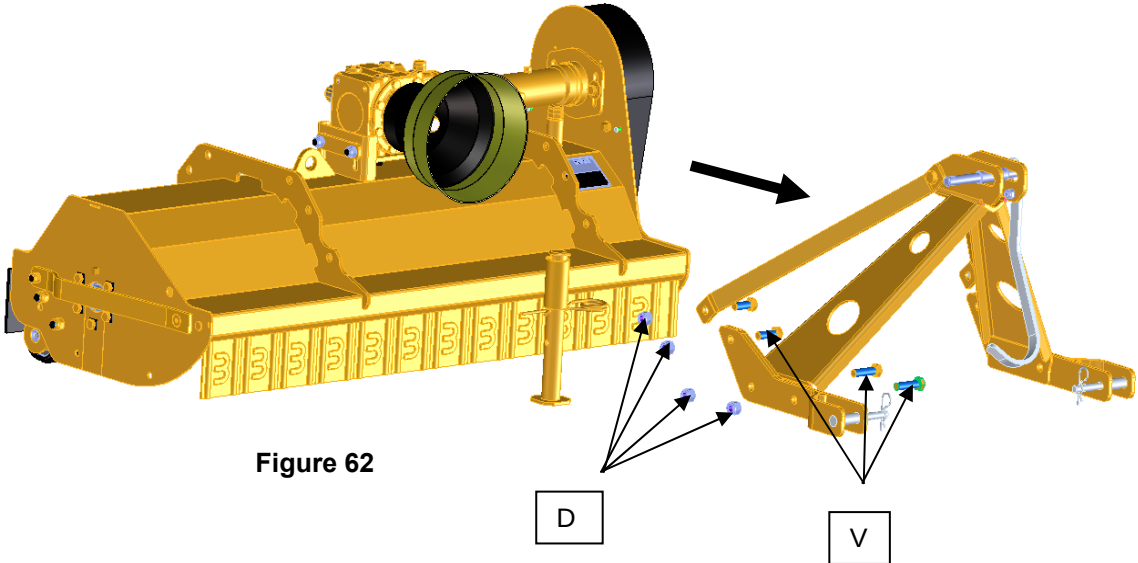
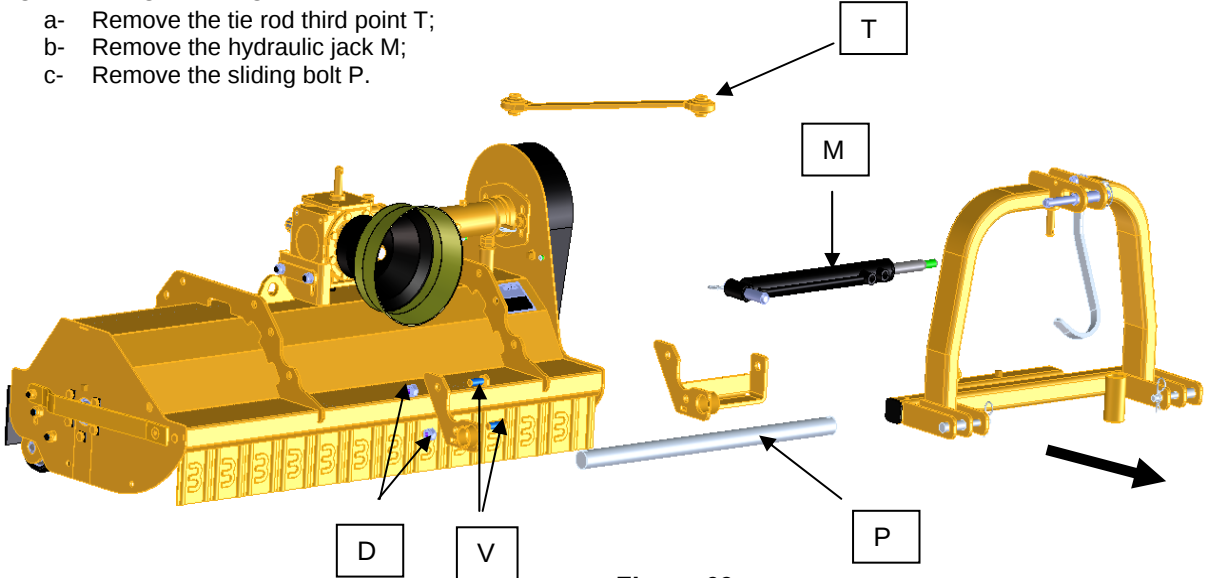


Figure 61

6. Place the rubber fabric sheet with the respective support at the rear of the machine;
7. Tighten the screws V;
8. Once all the operations have been finished, repeat the procedure of "Connection and Start up of the machine" described in paragraph 3.4. to 3.5.

4.2.10. TILLER REPLACEMENT

Only replace the tiller with tie rod in case of breakage or extraordinary maintenance.

 PERICOLO	1. Unscrew the nuts D and remove the screws V;
	FIXED CONNECTION:  Figure 62
	MOVABLE CONNECTION: - a- Remove the tie rod third point T; - b- Remove the hydraulic jack M; - c- Remove the sliding bolt P.  Figure 63
	2. Check for any damages; if any, proceed to immediate repair;
	3. After completing all the operations, fit the tiller on the machine and repeat the "Connection and Start-up" procedure described in paragraphs 3.4. and 3.5.



Our spare parts guarantee complete and correct use of your machine again.

4.2.11. CLEANING THE MACHINE

Periodically clean the machine using water under pressure, paying particular attention to any flammable residues. Ensure that the hot parts of the machine are free of straw, hay or residues of flammable materials.

4.3. STORAGE - WINTERING

If the machine is immobilised for long periods, store it in a place sheltered from the elements and protect it from damage.

Before any garaging, it is good practice to operate as follows:

- Free the rotor and the tools from shredder 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.



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



ATTENZIONE

In order to dispose of the oil and of all the other materials used for gathering, cleaning it, etc., follow the standards in force in the country of use.

4.4. SCRAPPING



ATTENZIONE

If the machine is scrapped, it must be disposed of in the appropriate waste sites in accordance with the laws in force in the country of use.

Before scrapping, separate the plastic and rubber parts, electrical and electronic parts (if present).

Recover any used oil and discard at the appropriate collection centres.

Parts consisting only of plastic, aluminium or steel may be recycled if collected by the appropriate centres.

4.5. SCHEDULED MAINTENANCE TABLE

Description	Controls
GENERAL MACHINE CHECKS	
Rotor greasing	Every 8 working hours
Roll greasing	Every 8 working hours
Tiller greasing	Every 8 working hours
Automatic belt tensioner greasing	Every 8 working hours
Greasing mechanical movement	Every 8 working hours
Hood hinge greasing	Every 8 working hours
Greasing steering wheels optional	Every 8 working hours
Check machine bolt tightness	After the first 4 hours and then every 50 hours
Check belts tensioning	After the first 4 hours and then every 50 hours
Check wear and fixing of tools	Before every job
Replace tools, screws and nuts	Every 200 operating hours or when damaged or no longer sharp
Replace transmission belts	Every 400 hours or when too worn
Replace pulleys	Every 400 hours or when too worn
Rotor balancing	Every partial or total replacement of the tools
Support slides replacement	Every 400 hours or when too worn
Check guards integrity	Every machine start-up. Restore the guards if worn and/or damaged.
Check pictograms	Every machine start-up. Restore if worn and/or damaged.
HYDRAULIC SYSTEM	
Check tightness of hydraulic hoses	At every start-up and every seepage of liquid
Check the hydraulic hoses	Check at every start-up. Replace immediately in the event of damage, seepage

4.6. TROUBLESHOOTING TABLE

ANOMALY	CAUSE	SOLUTION
Uneven Mulching	• Worn or damaged tools • Improperly adjusted machine • Machine clogged • The rotor does not rotate as it should • Rotor roll support • Worn slides; • Terrain with excessive ripples	• Replace the tools • Carry out adjustments • Decrease tractor advancement speed • Check belt tension, the oil flow rate and the machine feed pressure • Replace the roll support • Replace the slides; • Make more working passages
Premature wear of the tools	• Stony/sandy land • Tools cutting height too low • The rotor rotates too quickly or too slowly	• Searching • Adjust cutting height • Check the machine adjustment
Machine noise	• Unbalanced rotor • Counter-weights loss • Damaged, worn or missing tools • Worn bearings	• Balancing in specialised workshop • Replace the tools • Replace bearings
Excessive heating of the gearbox	• Mulcher oil level too low • Oil finished • Constrictions on the machine feed lines • Excessive amount of material to be processed; • Mulcher oil cooling system too small	• Add more oil in the mulcher • Replace oil • Remove the quick couplings. • Make more passages or decrease the advancement speed. • Give more power to the cooling system
Frequent breakage of the gearbox oil seal	• Pressurised machine reservoir • Worn out engine	• Periodically vent the tank and contact the mulcher dealer • Replace the gearbox
Frequent breakage of bearings	• The machine frame is folded • No bearings lubrication • The rotor was stressed excessively • Unbalanced/folded rotor	• Replace the machine frame • Grease the bearings following the scheduled maintenance Table • Use the machine in compliance with the allowed working limits • Balancing performed at specialised workshop or rotor replacement
Rotor does not turn	• Foreign body stuck • Breakage of the bearing • Breakage of the gearbox • Breakage of the transmission • Breakage of the belts • Breakage of the rotor shaft • Disconnected hydraulic tubes • fault at the mulcher supply system	• Consult the "machine clogging" procedure • Seals and bearings replacement • Gearbox replacement • Transmission replacement • Belts replacement • Rotor replacement • Properly connect the hydraulic tubes • Contact the mulcher mechanic

Sealing rings broken/worn	• Excessive lubrication • High rotor rotation speed • Incorrect seals assembly	• Change the seal rings • Check the machine adjustment • Ask the manufacturer for further information
Chassis broken/unwelded	• Sheet steel worn • Excessively stressed frame and crushed to the ground • Unbalanced rotor	• Change the frame; • Change the frame; • Balance the rotor
Rear supporting roll locked	• Broken supports • Missed greasing • Folded support roll • Wet ground • Material encrusted on the supports	• Supports replacement • Grease • Replace the support roll • Avoid working in unfavourable working conditions • Clean the support lubricate
The rotor vibrates	• The rotor is unbalanced; • The tools are worn/broken, • Folded rotor	• Balancing in specialised workshop • Replace the worn and/ or deteriorated and/or missing tools • Replace the rotor

5. GENERAL CONDITIONS

5.1. SPARE PARTS

Repairs and replacements must be performed using original spare parts, which must be requested from the Dealer. Please note that the presence of spare parts should be properly accompanied by the following indications:

- machine type;
- serial number;
- Spare part code that can be found in the Spare Parts Catalogue.

Since this is a particular part of a main group (rotor, multiplier unit, guards), it will be necessary to also specify the model and the serial number of the group.

5.2. WARRANTY

Check on delivery that the machine was not damaged during transportation and that the accessories are complete.

CONDITIONS OF WARRANTY:

- The manufacturer ensures its products for a period of 12 months from the delivery, stating that the form attached hereto is shipped from the manufacturer and completely filled within 15 days from the delivery date (refer to the delivery tax document).
- In accordance with the terms mentioned above, the manufacturer is deemed to agree to provide warranty service all parts to be replaced according to his assessment, or in the opinion of its authorized representatives, with respect to defective parts in both the material and the construction. Shipping and labour costs shall in any case be charged to the customer.
- The warranty does not include payment for damages due to improper use of the machine or for parts subject to wear and tear such as: hammers, blades, belts, etc.
- The manufacturer is not responsible for accidents to the operator or third parties arising from improper use of the machine.
- This warranty is void if:
 - a) the maintenance and repairs have been performed by unauthorised individuals or companies;
 - b) the machine has been previously repaired or modified with non-original spare parts;
 - c) If there is confirmation of incorrect operation of the operator;
 - d) The machine was not properly maintained/lubricated;
 - e) The permitted power limit is exceeded;
 - f) Whenever the instructions given in this manual are not followed;
 - g) Any unauthorised modifications were performed.
- Any damages to the machine occurred during or after the period covered by the warranty, do not involve any right to suspend payments for already delivered goods. No breakage or malfunction can be used as a pretext for delaying payment.
- The manufacturer reserves the right to make any modifications considered necessary to improve its products at any moment and is not obliged to add these modifications to machines that have already been manufactured, delivered or are under construction.
- These general warranty conditions replace and cancel any other previous condition, expressed or implied.

5.3. NOTES

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