

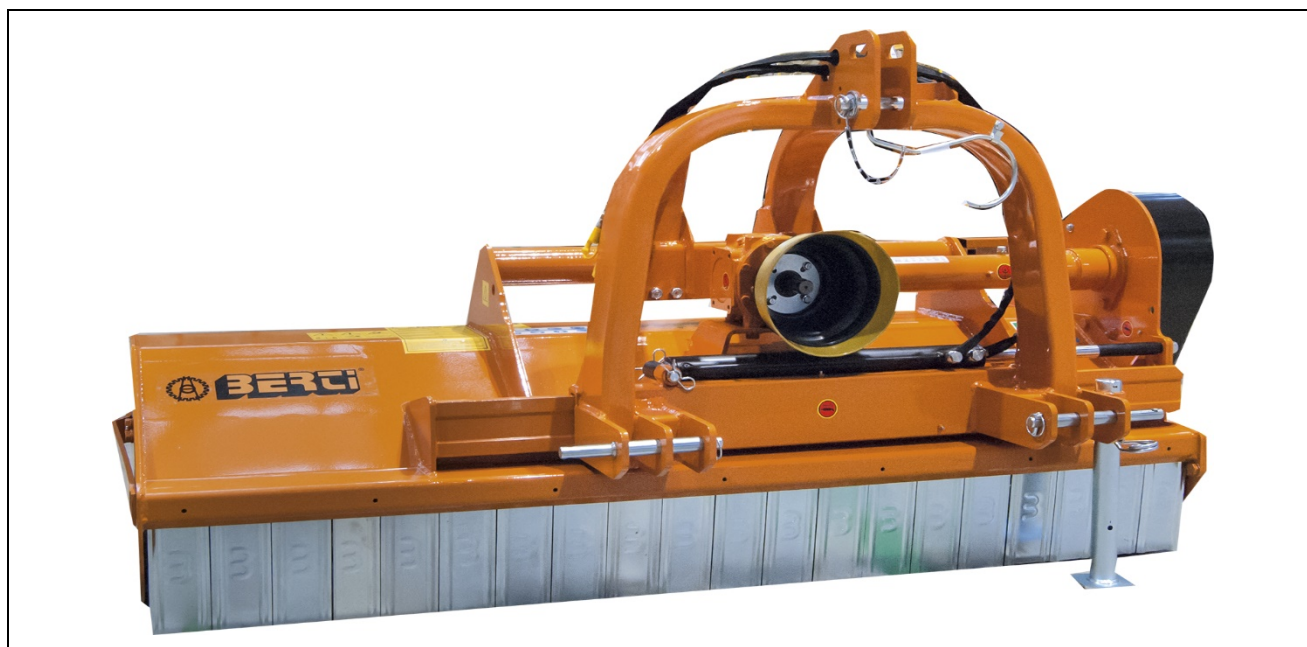


INSTRUCTION MANUAL

MULCHER

Trademark:
Model:

BERTI Macchine Agricole
TFB/M



 *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 instruction manual is divided into clearly marked chapters.

The indications contained by this manual are intended for professional users, with specific knowledge regarding the methods of use of the machine, authorised, trained and properly educated.

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.

The manual must always accompany the machine, even if the latter is sold. If the manual is damaged or lost, a copy should be requested to the Manufacturer of the machine or to the owner. This manual is 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 always be kept in an accessible place, so that it can be immediately consulted in case of need.



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 personnel.	Persons purposely trained and enabled to carry out maintenance or repair interventions requiring a particular knowledge of the machine, of its functioning, of the relative safety devices and their intervention modalities.
Safety Personnel	Personnel in charge of making sure that no persons are inside the machine operating area.
Manufacturer	Company that produces the mulcher → Berti Macchine Agricole S.p.A.
Three-point connection	Connection device that allows connecting the mulcher to the tractor by setting the width of the parallel of the tractor. The adjustment rods of the parallels have notches along the thread of the logs, in which are engraved the categories. The three-point connection may be of category cat. 1, Cat. 2, Cat. 3 or Cat. 4 (if Cat. 3 mulcher must be connected simply adjust the registers of the parallels of the tractor on Cat. 3, so that the tractor will be perfectly aligned with the measurements of the mulcher).
	The operating area, fixed at 50 m , delimits the machine operating area and should be considered

Machine operating area	“dangerous zone” . Persons, property and animals must remain outside the machine operating area.
	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.
	PLEASE NOTE

1. INFORMATIONS REGARDING THE INSTRUCTION MANUAL

This manual should be considered an integral part of the machine and must be stored together with it in case of re-sell until its dismantling.

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

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

1.2. COPYRIGHTS

The copyrights of this manual belong 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 standard with:

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



Figure 1

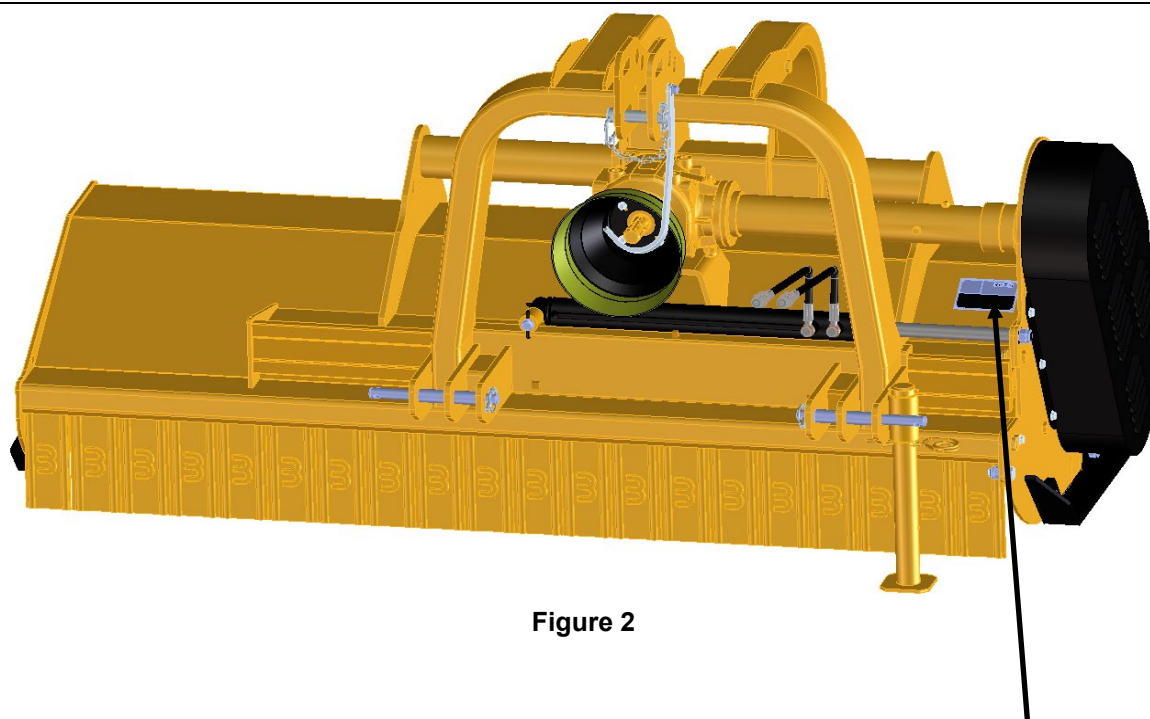


Figure 2

Plate location

1.4. CE CERTIFICATE OF CONFORMITY OF THE MACHINE

	BERTI BERTI MACCHINE AGRICOLE S.p.A. Via Musi 1/a - 3 - 37042 CALDIERO (Verona) - ITALY Tel. +39.045.6139711 - Fax +39.045.6150251 info@bertima.it - www.bertima.it		
Dichiarazione CE di Conformità ai sensi della direttiva 2006/42/CE EC Certificate of Conformity - conforming Directive 2006/42/CE EG Konformitätserklärung entsprechend der EU-Richtlinie 2006/42/CE Déclaration CE de conformité à la directive de la 2006/42/CE			
La Ditta / We / Wir / Nous		BERTI Macchine Agricole S.p.A. 37042 CALDIERO - VERONA - ITALY	
dichiara sotto la propria responsabilità nella sua 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>. Per la verifica delle macchine sono state consultate le seguenti norme armonizzate: declare in sole responsibility, in quality of Manufacturer, that the product to which this certificate applies, conforms to the basic safety and health requirements of <u>Directive 2006/42/CE</u>, and according to the European harmonized standards: erklären in alleiniger Verantwortung, als Hersteller, dass das Produkt auf das sich diese Erklärung bezieht, mit den grundlegenden Sicherheits- und Gesundheitsschutzanforderungen der <u>EU-Richtlinie 2006/42/CE</u>, und mit den Anforderungen der gemeinsamen EU-Richtlinien konform ist: déclarons sous notre seule responsabilité, comme Fabricante, 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>. Nos déclarons que les normes harmonisées suivantes ont été appliqué: <u>UNI EN 12524:2003 A1:2009</u> <u>UNI EN ISO 13857:2002</u> <u>UNI EN ISO 13857-1/2:1998</u> <u>UNI EN ISO 12100:2010</u> Nonché le seguenti specifiche tecniche: And the following technical specifications: Und die folgende technische Ausstellungen: Et les spécifications techniques suivantes: <u>ISO 11684:1995</u>			
MODELLO -- TYPE		TA 180	
MATRICOLA -- N° DE SERIE		XXXXXXXXXX	
Legale rappresentante e custode del fascicolo tecnico Legal representative and custodial of the technical pamphlet Gesetzlicher Vertreter und Hüter des technischen Heft Représentant juridique et dépositaire du dossier technique		BERTI Macchine Agricole S.p.A. BERTI MARIO 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.I. di VR03068950241			

1.5. MACHINE INFORMATION

1.5.1. SPECIFIED USE

The mulcher for vineyard, orchard and undergrowth model TFB/M has been designed to be used exclusively in the agricultural sector, for mulching grass, runners, bushes and woody material up to a diameter of about 10 cm.

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.

DO NOT USE THE MACHINE FOR PURPOSES DIFFERENTLY 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 other use of the machine (different from that indicated in the instruction manual) should be considered unauthorised and therefore dangerous.

1.5.2. DESCRIPTION

The machine has an operating component consisting of a rotor with horizontal axis, on which are mounted the mulcher tools, that rotates at high speed.

The mulcher is made of:

- A frame;
- A three-points moveable connection system;
- A tiller of category 1-2;
- A mechanical and hydraulic movement system;
- A drive shaft coupling;
- A gearbox
- A distributor unit (pulleys, locking sets, automatic belt tensioner);
- A rotor;
- A series of mulching tools;
- A supporting device in stand-by position;
- CE accident prevention guards.

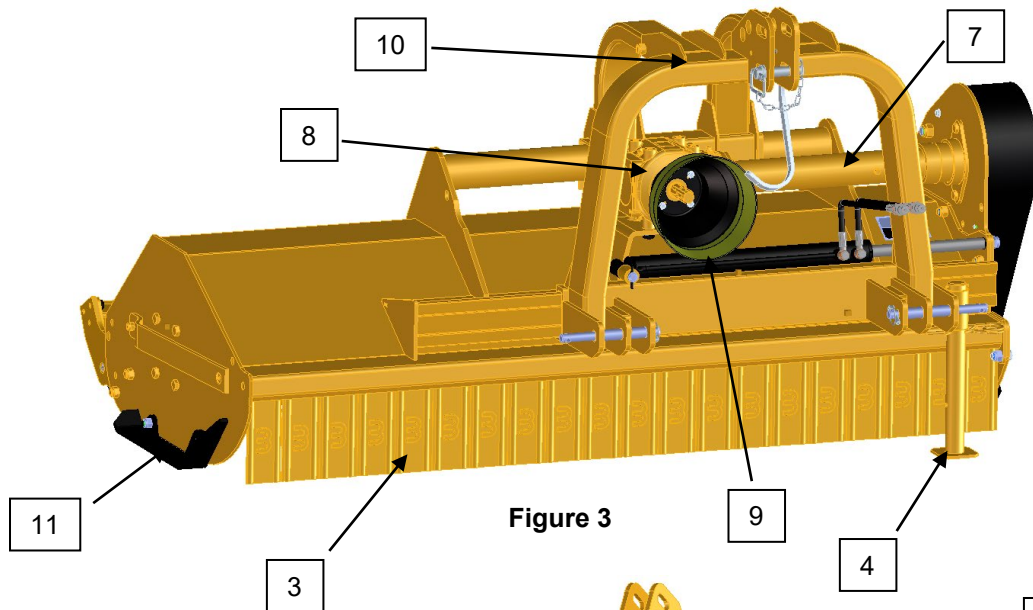


Figure 3

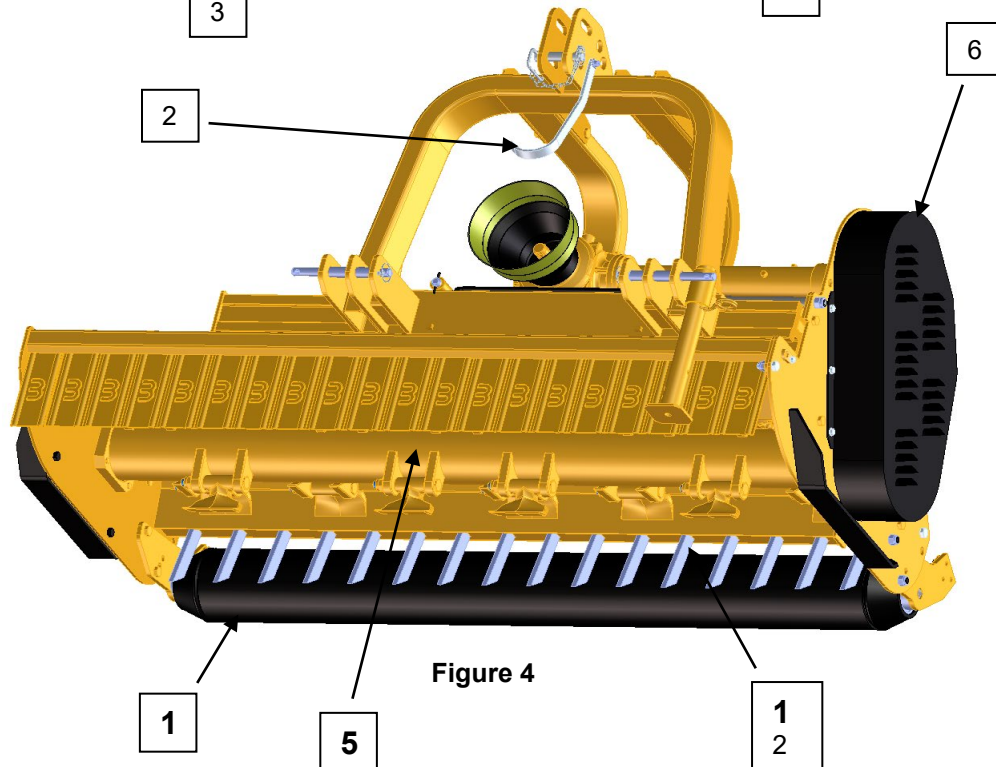


Figure 4

- 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 with three-point tie rod
- 11 Support slides
- 12 Rakes

Mulcher Mod. **TFB/M**

1.5.3. TECHNICAL DATA

The machine operates behind the tractor and can be applied on tractors with power between 51 and 110 kW (70 - 150 HP). The drawing and the tables below, indicate the machine operation field.

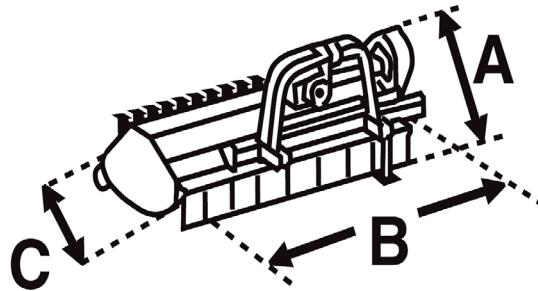
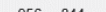
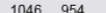
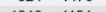
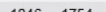


Figure 5

Mod.		 HP										
		Min	Max									
	cm			mm	n°	n°	PTO	A	B	C	min	max
TFB/M 180	180	70	110	  	16	5	540 (1000)	115	200	140	875	995
TFB/M 200	200	70	110	 	18	5	540 (1000)	115	220	140	925	1050
TFB/M 200 Special	200	80	150	 	18	5	540 (1000)	120	220	140	990	1125
TFB/M 220	220	80	150	 	20	5	540 (1000)	120	240	140	1050	1195
TFB/M 250	250	100	150	 	22	5	1000	120	270	140	1125	1280
TFB/M 280	280	100	150	 	26	5	1000	120	300	140	1195	1365
TFB/M 300	288	100	150	 	28	5	1000	120	320	140	1235	1415

Attacco centrale
Centre mounted linkage
Mittiger Anbau
Attelage axial.

Mod.	
	mm
TFB/M 270	1616 1084 1094 1606
TFB/M 280	1616 1184 1094 1706
TFB/M 300	1616 1384 1094 1906

Table 1

1.6. MATERIALS THROW



During some of the operations performed with the machine, you may check the materials throw; 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



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.).

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. Danger from thrown objects!
 PERICOLO	The machine must be used exclusively by authorised, instructed and trained operators. The operator, besides having read and understood the instructions contained in this manual, must also be sufficiently prepared on the proper use of the machine and must have a driving 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 should be 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. The filters of the cabin ventilation system should be periodically checked and operators should always wear proper protection devices for the respiratory system, such as anti-dust masks.
 PERICOLO	the operator assigned to the machine must not wear items of 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 and animals standing or transiting within the radius of action of the machine.
 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. Pay the utmost attention to changes of 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	Check the machine thoroughly before each start-up.
 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 proper condition, readable and clean. If the pictograms have deteriorated, they must be replaced with other original versions requested from the manufacturer and placed in the position indicated by the use and instruction manual (paragraph 2.3.2). If necessary, clean with a damp cloth.
 ATTENZIONE	The signs applied to the machine provide a series of important indications: their compliance will determine your safety.
 PERICOLO	It is strictly forbidden to perform any modification that may alter the original condition of the machine.
 PERICOLO	Any arbitrary modification made on this machine lifts the manufacturer from any responsibility for damage or injuries that could result to operators, third parties or to objects.

	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

	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.
	The personnel that use the machine must know the main intervention techniques in case of fire.
	Do not use the machine in areas that present explosion and/or fire hazard..
	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 perform any welding near containers, tubes, tanks, electric wires, or flammable materials in general.
	In case of welding protect with appropriate screens the flammable parts.

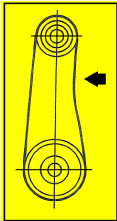
2.3. SAFETY SIGNS

Make sure the safety pictograms are in good conditions. If the pictograms have deteriorated, they must be replaced with other original versions requested from the manufacturer and placed in the position indicated by the use and maintenance manual. Make sure that the safety pictograms are readable. Clean them using a cloth, water and soap.

2.3.1.DESCRPTION OF THE PICTOGRAMS PLACED ON THE MACHINE

	WARNING: the machine must be used, adjusted and maintained in properly equipped workshops only after reading the maintenance and use manual. For further information consult chapter 3 - 4 in this instruction manual.
	WARNING – DANGER this machine must only be used by one operator.
	WARNING: it is strictly forbidden to get into or be transported by the machine.
	WARNING – DANGER of falling of suspended parts. Apply mechanical locking systems.
	WARNING - DANGER hands shearing risk.
	WARNING - DANGER of coming into contact with rotating elements. Keep a safe distance.
	WARNING - DANGER of thrown objects. Keep a safe distance.

	ATTENTION: the foldable parts of the machine may fall.
	WARNING – DANGER of crushing. Do not stand between the tractor and the mulcher.
	WARNING - DANGER of coming into contact with moving elements. Do not place your hands and feet near the transmission belts.
	WARNING - DANGER of entanglement and pulling. Do not place your hands and feet near the moving parts.
	WARNING - DANGER of burns. Keep a safe distance.
	WARNING - DANGER of coming into contact with moving elements. Wait for the moving parts to stop.
	WARNING - DANGER of crushing, dangerous area due to machine displacement.
	PERSONAL PROTECTIVE EQUIPMENT.

	GREASING POINTS.
	OIL LEVEL.
	WARNING - DANGER minimum safety distance 50 m.
	LIFTING POINT.
	TENSIONED BELTS.
	CARDAN SHAFT ROTATING AT 540 rpm.
	DO NOT REMOVE THE BELTS TENSIONER.

The pictograms are inserted as indicated in diagram:



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. Therefore the functions of the machine and the safety standards must be properly known.
 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 be in perfect functioning condition and must be repaired using only original spare parts.

3.2. HANDLING AND TRANSPORTATION

pay utmost attention to safety during the loading and unloading operations, that must be performed only by specialised personnel. When lifting the machine you must use the appropriate lifting points, indicated in the pictograms (figure 7). Visually check the machine before handling it as to make sure that the unstable parts do not represent a danger.

 CAUTELA	Never lift or handle the machine anchoring it to the rotor!
-------------	---



ATTENZIONE

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**

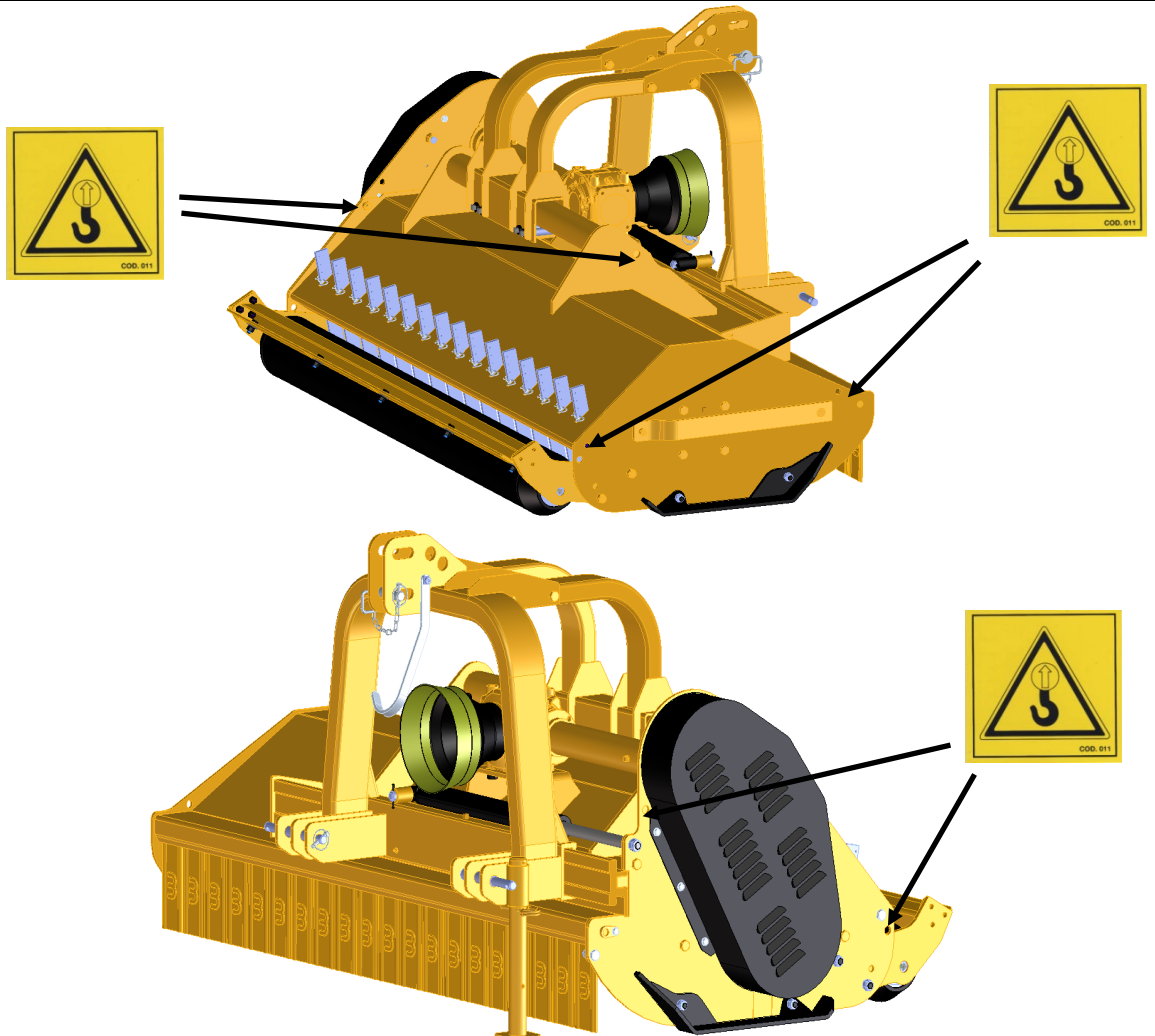


Figure 7



ATTENZIONE

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

 ATTENZIONE	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.
 ATTENZIONE	During the transport on the road, the mulcher must be kept in transportation position and the PTO of the tractor must be switched off.

3.2.2. MACHINE TRANSPORT PROCEDURE

 ATTENZIONE	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 8);
	Figure 8
 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.

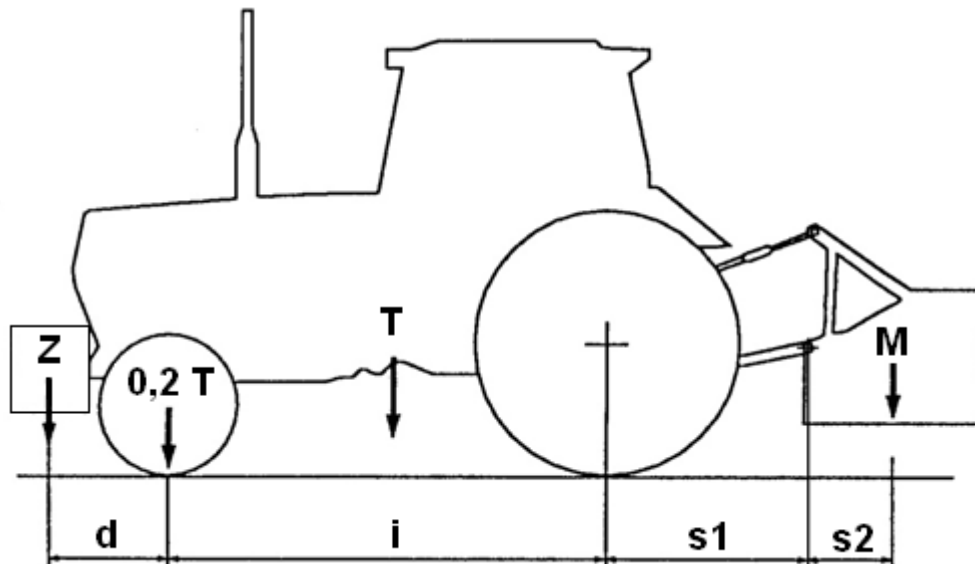


Figure 9

$$M \cdot (s_1 + s_2) \leq 0.2 T \cdot i + Z (d + i)$$

$$M \leq 0.3 T$$

- i** = Tractor wheelbase
- d** = Distance between the front axis and the ballasts
- s₁** = Distance between centre of the rear axle and centre of the lower connection points
- s₂** = Distance between the centre of the lower connection points and barycentre of the arm of the mulcher
- T** = Weight of the tractor + 75Kg (operator)
- Z** = Weight of the ballast
- M** = Weight of the machine

 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.
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3.4. CONNECTION OF THE MACHINE TO THE TRACTOR

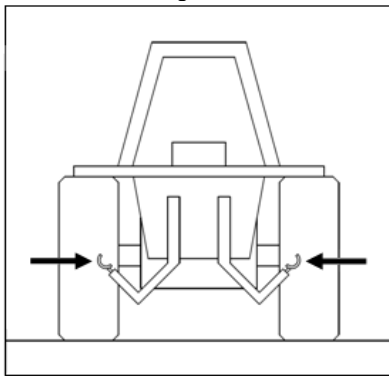
Before installing the machine, make sure that it is in perfect condition, placed on the ground, levelled and in stable position, that there is a proper amount of lubricant, that all parts subject to wear and/or deterioration are efficient and that the protections are complete and functioning.

 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.

	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.

	The user must use all the safety devices and personal protection equipment (P.P.E.) during machine use, adjustment, repair and handling phases. 
	1. Remove the safety pins (1), remove the washer (2) and the plugs (3) (figure 11);
	2. Move the tractor in reverse until the rear lifting bars reach the couplings of the mulcher (figure 10);  Figure 10
	3. Use the tractor parking brake, turn the engine off, remove the keys from the dashboard and get off the machine;
	4. Connect the third point (tensioner) of the machine to the tractor, insert the provided pin (3), the washer (2) and the relative safety pin (1); adjust the length of the third point as to make sure that the pin is placed in the centre of the slot;
	5. Insert the pegs (7) and the relative safety pins (1);
	6. Lift the mulcher until the machine and tractor power points are taken to the same height and register the tensioner, taking the mulcher to a horizontal position; lift the support foot (6);

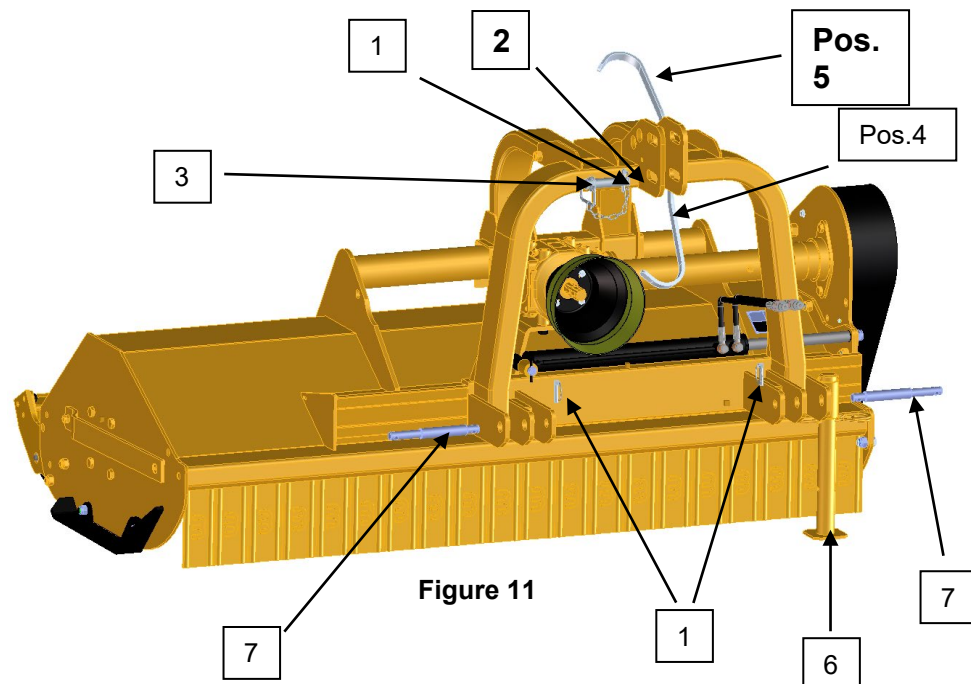


Figure 11

7. Block lifting bars of the tractor to prevent the machine oscillating laterally, compromising the transversal stability of the complex.

8. 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;

9. 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



ATTENZIONE

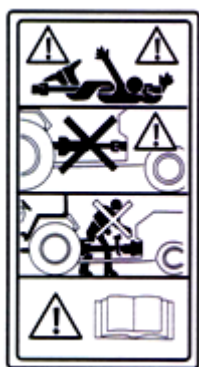
Model	Maximum absorbed power		Power transmitted from the cardan shaft at 540 rpm	
	kw	HP	kw	HP
TFB/M 180	40 – 44	55 – 60	44	60
TFB/M 200	44 – 48	60 – 65	44	60
TFB/M 200 Special	51 – 55	70 – 75	51	70
TFB/M 220	51 – 55	70 – 75	51	70

Model	Maximum absorbed power		Power transmitted from the cardan shaft at 1000 rpm	
	kw	HP	kw	HP
TFB/M 250	55 – 59	75 – 80	51	70
TFB/M 280	59 – 103	80 – 140	59	80
TFB/M 300	66 – 103	90 – 140	66	90

Table 2



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 12).

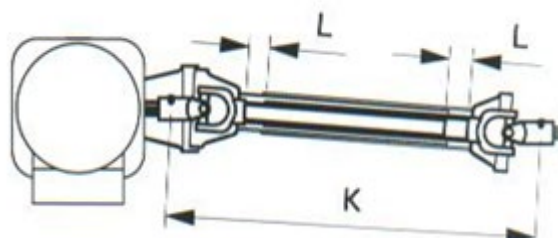


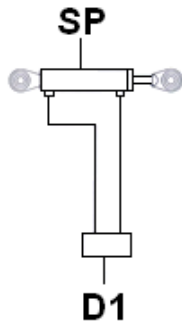
Figure 12

This operation must be performed at the first installation, after each replacement and every time the machine is installed on another tractor.

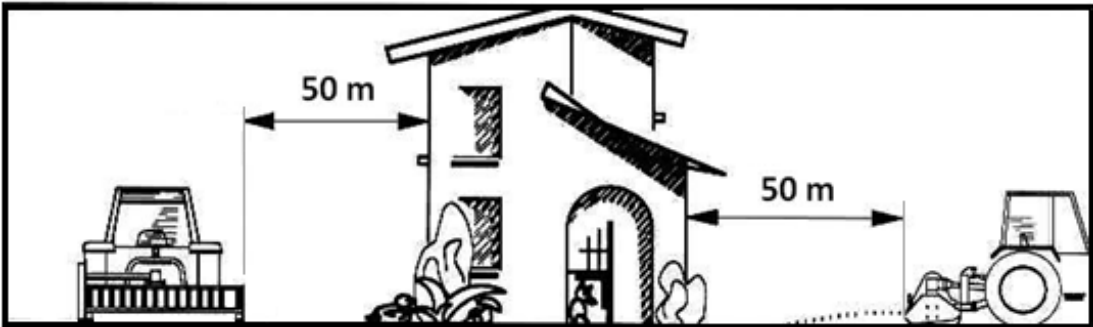
After installing the cardan shaft, fasten the guard on both sides using appropriate chains.

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	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.
	10. Rotate the sustaining bracket of the cardan from position (4) to position (5) (figure 11);
	11. If the hydraulic jack is present: connect the transmission tubes of the jacks (figure 13);  SP: movement jack D1: double effect distributor Figure 13
	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 14
	- 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

 PERICOLO	1. Using the distributor that controls the movement jack, move the machine until it reaches the operating area;
 PERICOLO	2. Using the elevator commands, lower the machine until reaching the desired cutting height;
 ATTENZIONE	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;
 PERICOLO	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 ADJUSTMENT

3.5.1.1. ADVANCEMENT SPEED

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 be used only for the intended purposes.

	Excessive speed stresses the mobile components of the machine, reducing their lifetime. 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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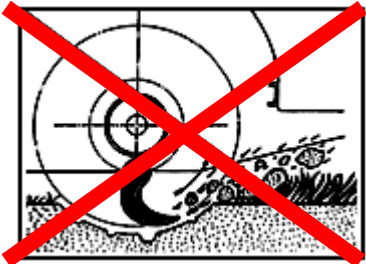
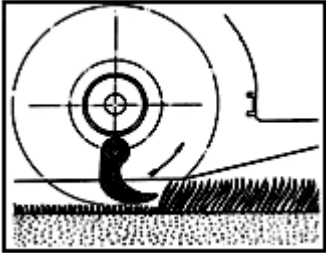
In the table below are indicated the recommended speeds that should be respected in order to obtain maximum performance and in particular:

TYPE OF MATERIAL	RECOMMENDED FORWARD SPEED (km/h)														
	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															
Shoots up to 6 cm in diameter															
Shoots up to 10 cm in diameter															
Bushes - branches															

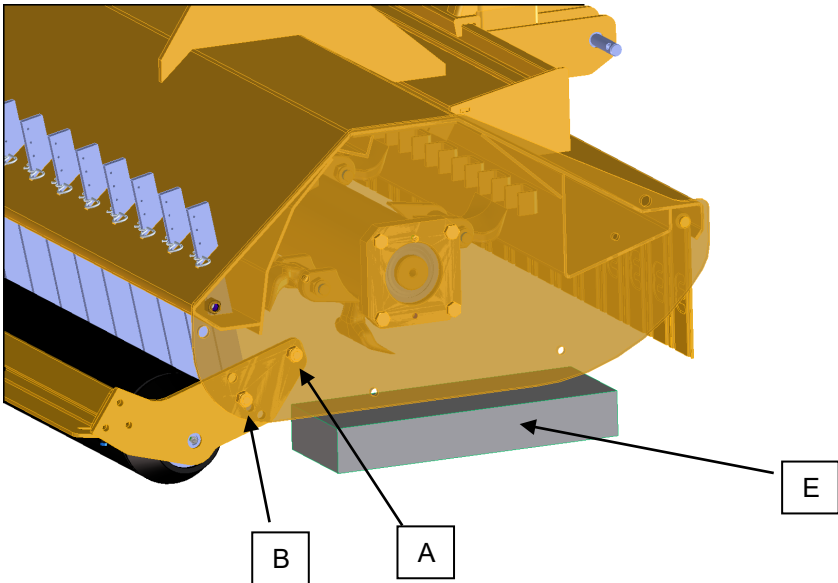
Table 3

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 15-16).

	 Figure 15 NO	 Figure 16 YES
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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. 

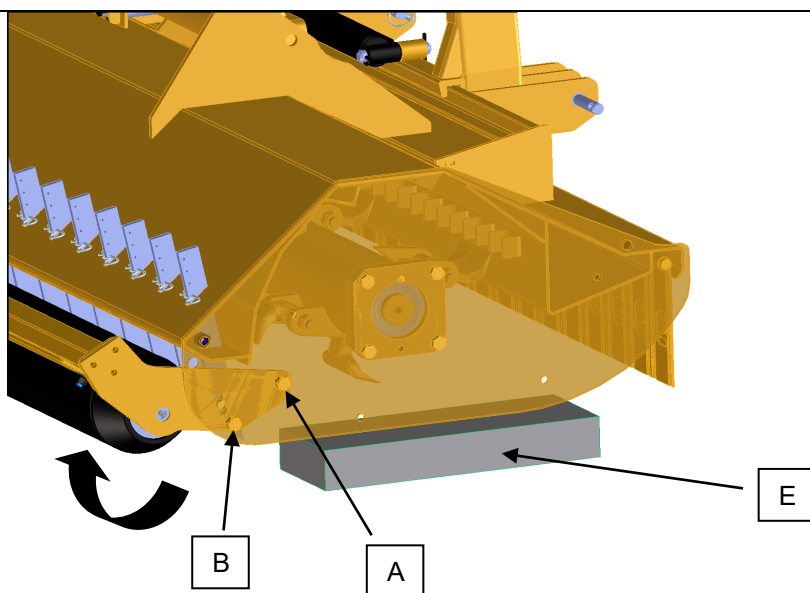


Figure 17



The adjustment operations must be performed both on the left and on the right side of the machine.

3.6. MACHINE RUNNING

 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 during operation all machine organs operate properly. 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.

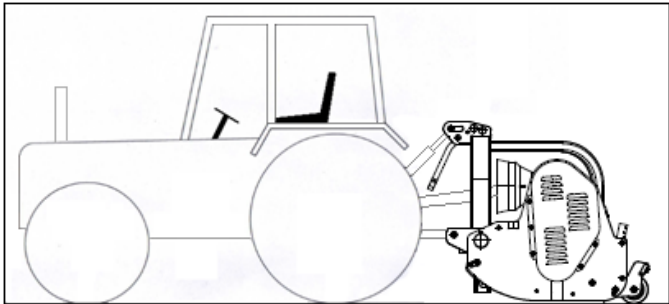
 ATTENZIONE	In the operations of change of direction, turn and reverse, slightly raise the head from the ground, after switching off the power to the machine, in order to avoid damage to the structure.
 PERICOLO	Pay attention to the risk of accidental ignition of the electric arc machine with overhead 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".
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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 18	 Figure 19
	The mulcher should not be moved to a new operating area if the rotor and the tools haven't stopped yet.

3.7. MACHINE STOPPAGE

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

	Make sure that during all operations, the operator stays all the time inside the cabin and there are no persons, animals or things in the machine action radius. 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.
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3.8. 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 form approaching.

3.9. CLOGGING

	Before removing the machine clogs, carefully read and fully understand the instruction manual.
 ATTENZIONE	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.
 ATTENZIONE	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;
 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).
	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

 ATTENZIONE	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.
 PERICOLO	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.
 ATTENZIONE	The specialised personnel must use all the safety devices and personal protection equipment (P.P.E.) during machine use, adjustment, repair and handling phases. 
 ATTENZIONE	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 perform repairs of which you have no knowledge. Always follow the instructions. If they are missing, contact the manufacturer.
 ATTENZIONE	Do not use lifting points different from those prescribed.
 ATTENZIONE	Make sure that the chosen lifting device is suitable to carry out operations in compliance with the safety Standards in force 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 temperature of the hot parts is below 60°C.
Pay utmost attention to the:

- Drive sump;
- Gearbox;
- Pulleys, automatic belt tensioner 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 Standards and maintenance times jeopardises the good functioning of the machine and its duration and as a consequence the validity of the warranty.

Increase the frequency of the maintenances in heavy duty conditions (frequent start-ups and shut-downs, prolonged winter, etc.)

4.2.1. TABLE OF TIGHTENING TORQUES

Table tightening torques for steel screws 8.8

Coarse pitch screw	M8	M10	M12	M14	M16	M20	M24
Tightening torque Nm	25	49	86	135	210	410	710
Fine pitch screw	M8x1	M10x1.25	M12x1.25	M14x1.5	M16x1.5	M20x1.5	M24x2
Tightening torque Nm	27	52	95	150	225	460	780

Table tightening torques for steel screws 10.9

Coarse pitch screw	M8	M10	M12	M14	M16	M20	M24
Tightening torque Nm	35	69	120	190	295	580	1000
Fine pitch screw	M8x1	M10x1.25	M12x1.25	M14x1.5	M16x1.5	M20x1.5	M24x2
Tightening torque Nm	38	73	135	210	315	640	1100

4.2.2. GREASING

Periodical greasing and lubrication of the machine will keep its performances high and increase its lifetime.
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.

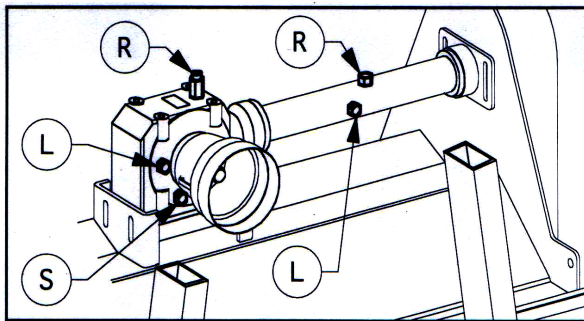


Figure 20

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

OVERALL GREASING:

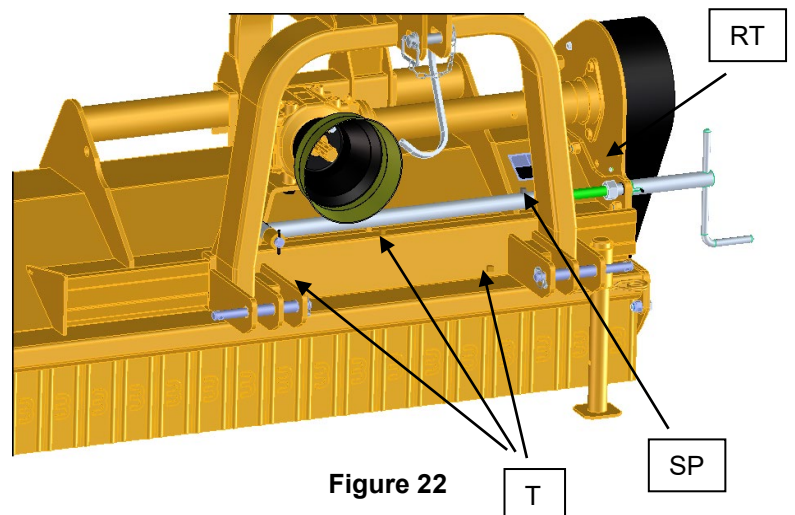
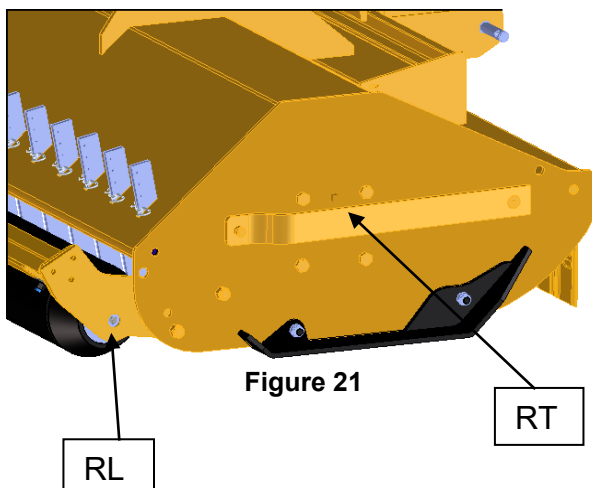


ATTENZIONE

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

Pos.	Name:	Lubrication intervals	Notes
RT	Exciter	8 hours	Grease it using the manual pump 1-2 times, to avoid damaging the inner seals of the supports.
RL	Levelling roll	8 hours	Grease it using the manual pump 1-2 times, to avoid damaging the inner seals of the supports.
T	Tiller	8 hours	Grease it using the manual pump 1-2 times on the 3 grease fittings of the tiller.
SP	Mechanical movement	8 hours	Grease it using the manual pump 1-2 times on the 3 grease fittings of the mechanical movement.
TA1	Automatic belt tensioner	8 hours	Grease it using the manual pump 1-2 times.

	Periodical greasing and lubrication of the machine will keep its performances high and increase its lifetime.
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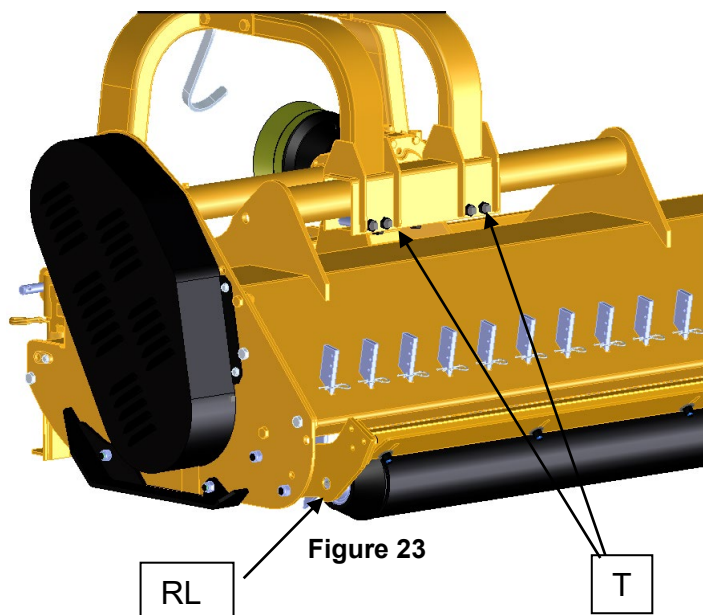


Figure 23

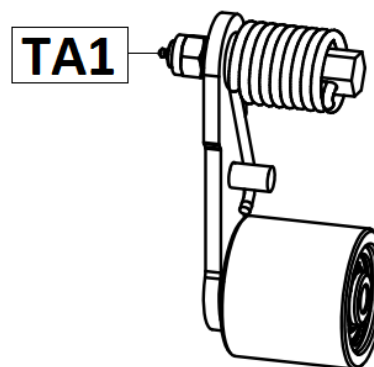


Figure 24

Only use manual greasing pumps, to avoid piercing the seals of the bearings and tubes.

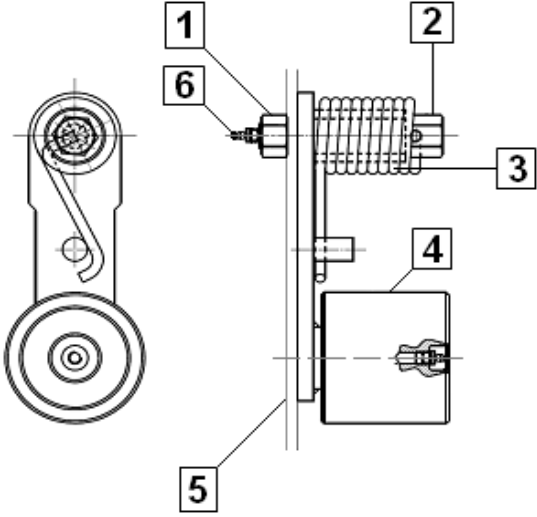
 LUBRIFICANTI RACCOMANDATI - recommended lubricant empfohlenen Schmiermittel - lubrifiant recommandé							
	PETRONAS	ENI	BP	MOBIL	SHELL	TAMOIL	TOTAL
	GEAR MEP 320	BLASIA 320	ENERGOL GR-XP 320	MOBILGEAR 632	OMALA S2 GX 320	CARTER EP 320	CARTER SP 320
GREASE 	AMBRA GRS PLUS EP2	GREASE MU EP 2	GREASE LTX EP 2	MOBILPLEX EP 2	GADUS S2 V220 2	TAMLITH EXTRA BLU EP2	MULTIS EP 2

4.2.3. ADJUSTMENT OF TRANSMISSION BELTS TENSIONING

	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. Thanks to the automatic belt tensioner, is not necessary to adjust the belts tension. An intervention of the belts tension may be necessary only in case of: • Mechanical breakage of the automatic tensioner spring (figure 25); • Loosening of the nuts that fasten the tensioner.

BELTS TENSION ADJUSTMENT PROCEDURE:

Proceed as follows to adjust the tension of the transmission belts:

	1. Remove the crankcase that covers the transmission;														
	2. After replacing the spring or any other damaged part, take the tensioning unit (figure 25) and place it on the side of the mulcher, inserting the hex bolt 30 as shown in figure 26;														
 Figure 25	<table border="1"> <thead> <tr> <th>Pos.</th><th>Name:</th></tr> </thead> <tbody> <tr> <td>1</td><td>Self-locking nut M20</td></tr> <tr> <td>2</td><td>Hex bolt of 30</td></tr> <tr> <td>3</td><td>Tensioning spring</td></tr> <tr> <td>4</td><td>Sliding point</td></tr> <tr> <td>5</td><td>Machine side</td></tr> <tr> <td>6</td><td>Greaser</td></tr> </tbody> </table> Table 4	Pos.	Name:	1	Self-locking nut M20	2	Hex bolt of 30	3	Tensioning spring	4	Sliding point	5	Machine side	6	Greaser
Pos.	Name:														
1	Self-locking nut M20														
2	Hex bolt of 30														
3	Tensioning spring														
4	Sliding point														
5	Machine side														
6	Greaser														
	3. Turning the tensioning unit on the bolt with hex 30, lean the sliding roll on the belts;														
	4. After leaning the roll. using a 30 key, turn the bolt and lock the nut M20, fastening it using another 30 key;														
 ATTENZIONE	The bolt must be turned at 90° (1/4 of a turn) with 2 or 3 belts, at 180 ° (half a turn) with 4 or 5 belts. Giving the correct PRE-LOAD to the spring, ensures proper tensioning of the belts!														
	5. Lock the counter-nut M20;														
	6. Now, after properly tensioning the belts, check that the belt tensioning unit may rotate freely. Put pressure on the roll, moving it away from the belts for a few inches and then release it. The roll should slide freely;														
	7. Remount the crankcase using the appropriate screws.														

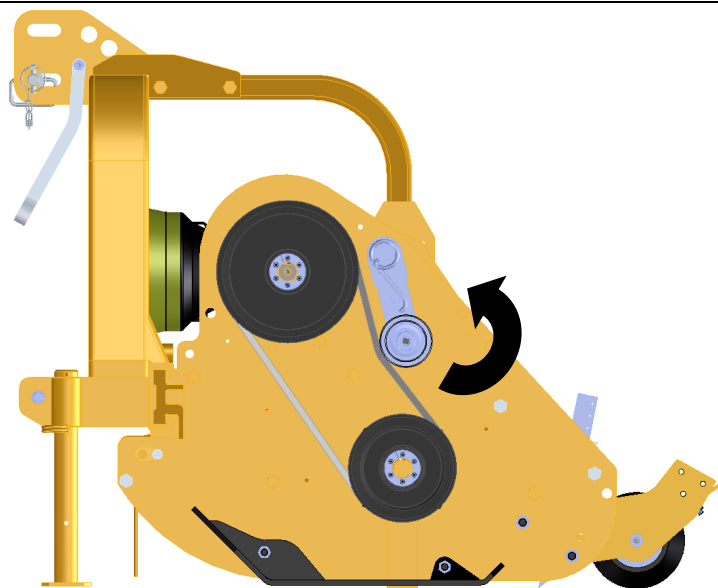


Figure 26



Do not use the machine without the belts protection crankcase

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 crankcase that covers the transmission;
2. Using a counterbalanced lever, put pressure on the roll pulling it outside until managing to insert a screw M10 x30÷40 in hole A, then release it, slowly leaning the belt tensioner plate on the screw inserted in hole A;

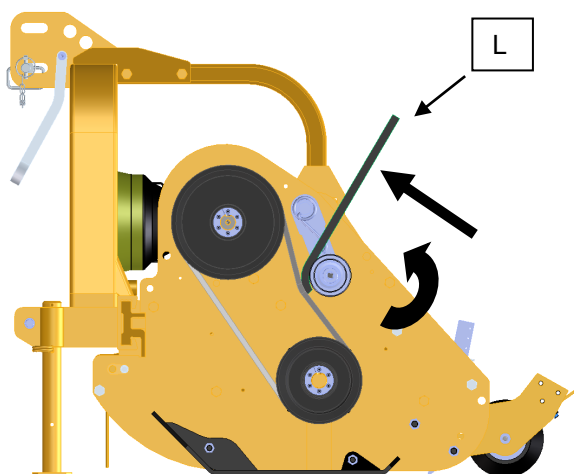


Figure 27

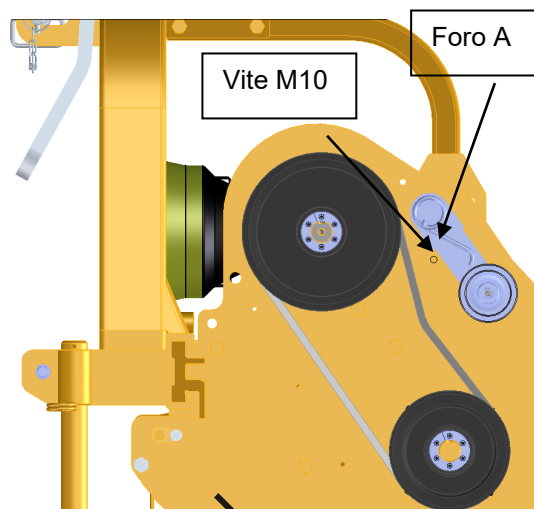
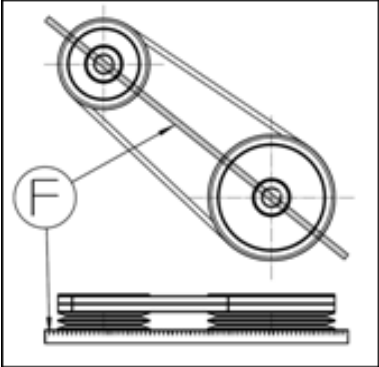


Figure 28

3. At this point there is no more pressure on the chains and they may be replaced.

 CAUTELA	The V-belts must be mounted without forcing them, without using screwdrivers, crowbars, etc. that may damage the belt it money and time saving and increases the belt lifetime.
	4. After replacing it, exert greater pressure on the sliding roll until removing the screw M10 from hole A, then slowly the belts and lean it on them. The roll sustained the initial pre-load and no further interventions are required;
 ATTENZIONE	When you need to check the tensioning or re-tension the belts tensioner, follow the indications in chapter 4.2.2.
	The pulleys should be aligned with each other: check with a ruler F that this is the case.  Figure 29
	5. Remount the crankcase using the appropriate screws.
 ATTENZIONE	Do not use the machine without the belts protection crankcase

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

4.2.5. HYDRAULIC SYSTEM

 ATTENZIONE	Visually check the machine, make sure tat there are no loosened couplings, damaged tubes, cuts or any other signs of wear. Tighten the loosened couplings and replace the damaged or worn tubes.
--	---

The hydraulic system diagram is indicated in figure 30 and is made of:

SP: Movement jack
A2 – B2: Tractor distributor

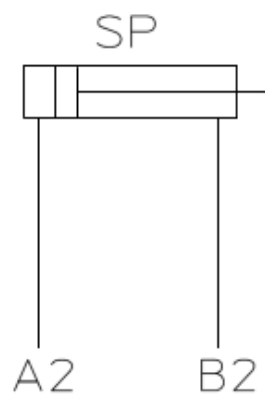


Figure 30

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 otherwise you will damage the threads of 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.
 ATTENZIONE	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")

Damaged or too worn tools might transmit vibrations to the machine; in this case the operating cycle should be stopped immediately and it should be restored only after replacing the tools.



replace the worn and/or damaged tools with original tools marked with the Berti brand.

Hammer type "M":

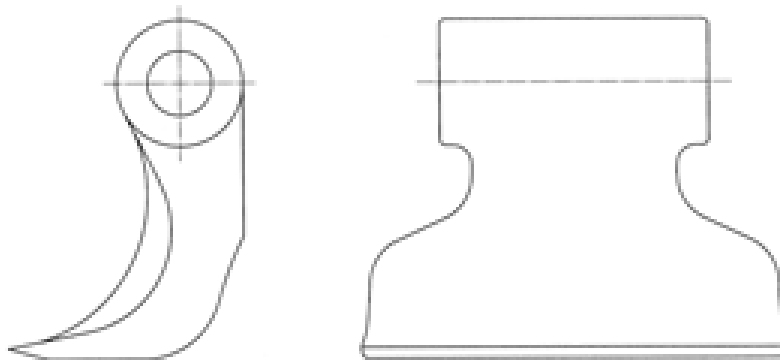
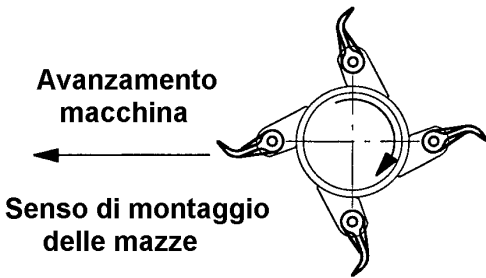
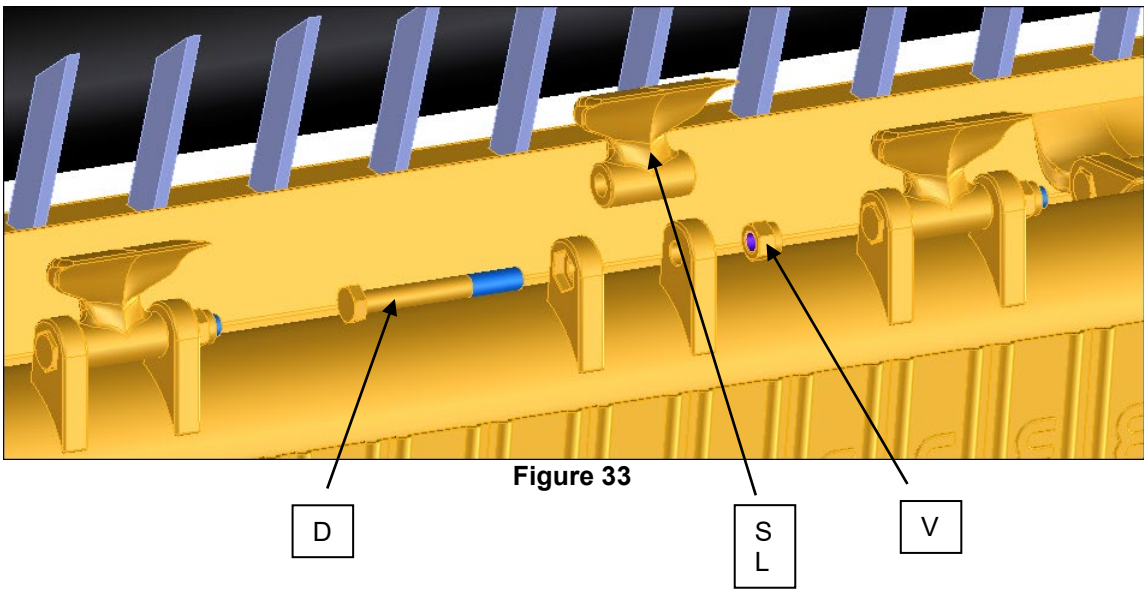


Figure 31

The lifetime of the tools depends on the type of operation for which they are used and on the type of terrain being processed. They should be fully replaced after about 200 working hours.

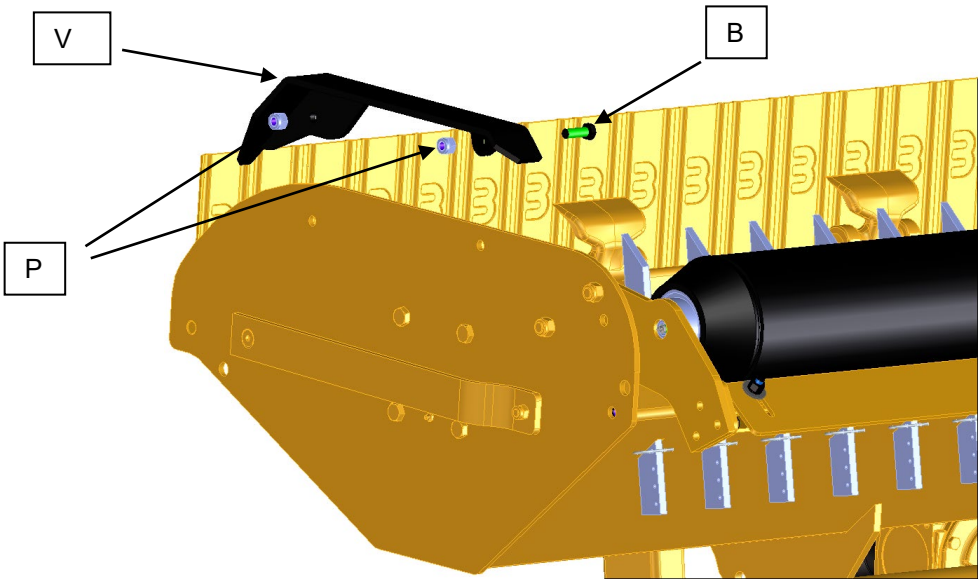
4.2.6.1. TOOLS REPLACEMENT PROCEDURE

 ATTENZIONE	If only one tool must be replaced, it is recommended to replace the entire series. Use of non-original tools can cause anomalous vibrations for the machine. Pay attention to the direction in which you assemble the tools.  Avanzamento macchina Senso di montaggio delle mazze Figure 32
 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.
	Unscrew nut D, pick up hammer M and remove screw V (Figure 33). 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 33 D S L V
	Replace the new hammer M 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.
	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 mounted in the wrong direction, the machine will not be able to 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.
	The original spare parts provided by our company ensure complete and correct repair of the machine.

4.2.7. SUPPORT SLIDES REPLACEMENT

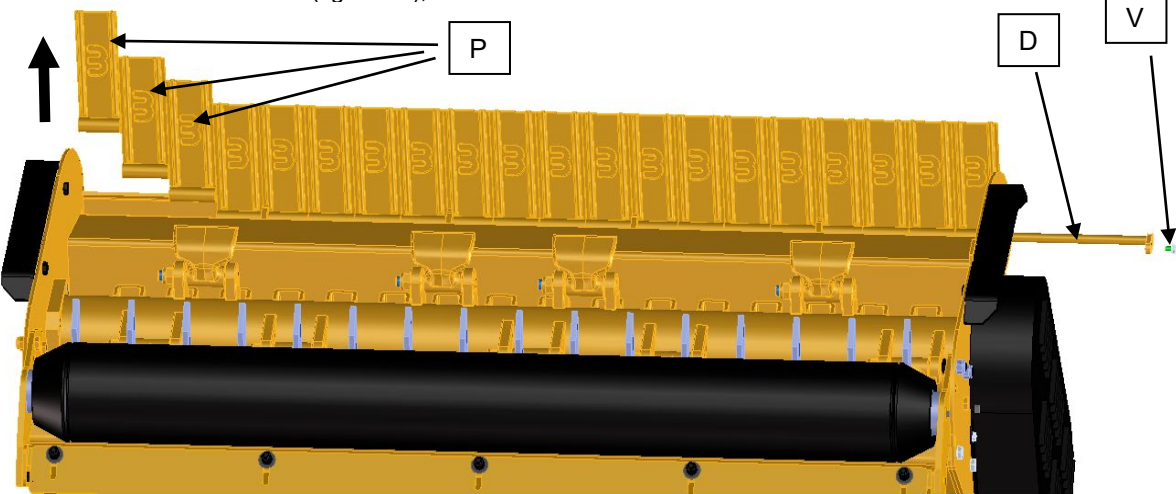
The machine is equipped with anti-wear slides that can be replaced in the following mode:

 PERICOLO	1. Turn the machine over and place it on appropriate supports; 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 paragraph 1.5.3) in compliance with the laws in force in the country of use.
	2. Unscrew the nuts D and remove the screws V as shown in figure 34;  Figure 34
	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	
 PERICOLO	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 35);  Figure 35
 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, inserting them inside the through-axe pin P;
Near the supports of the through-axe pin insert the truncated panels to stop the light from passing through the panels.

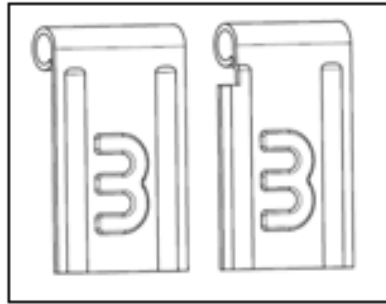


Figure 36

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.



The original spare parts provided by our company ensure complete and correct repair of the machine.

FRONT GUARDS - CHAINS



The chains 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;



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 37);

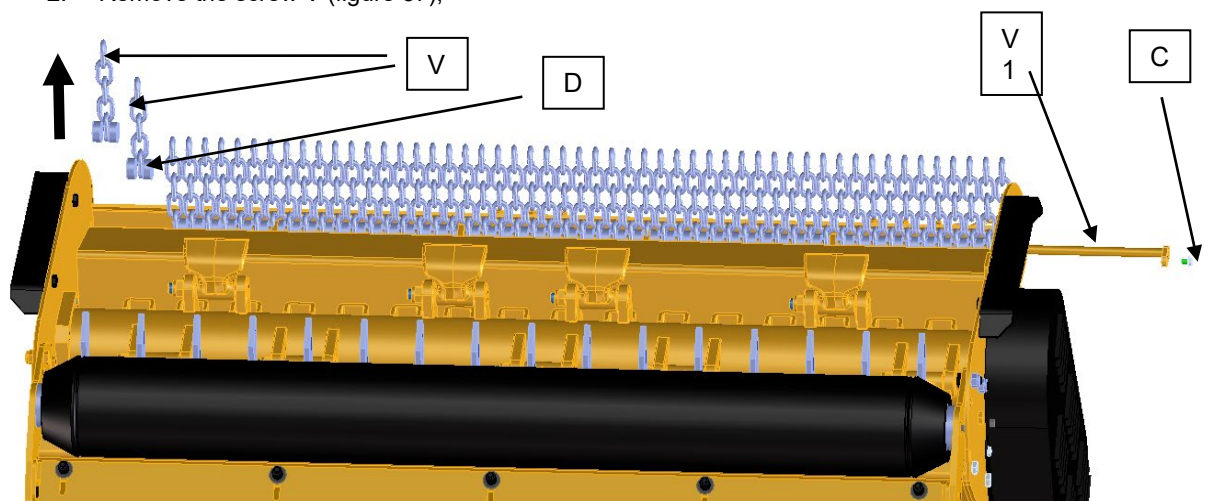
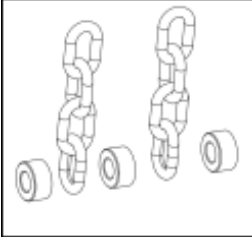


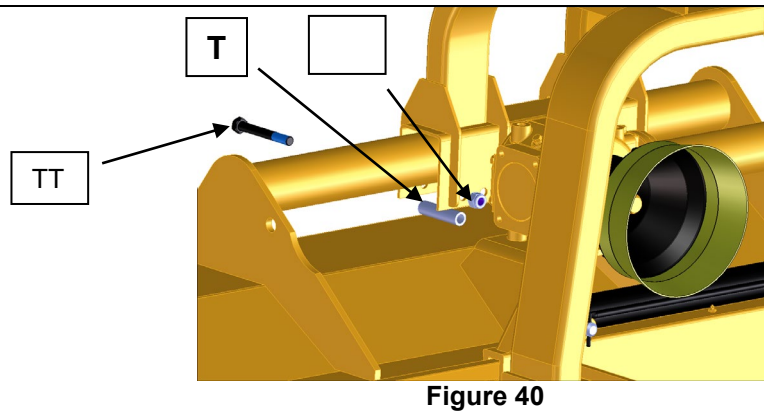
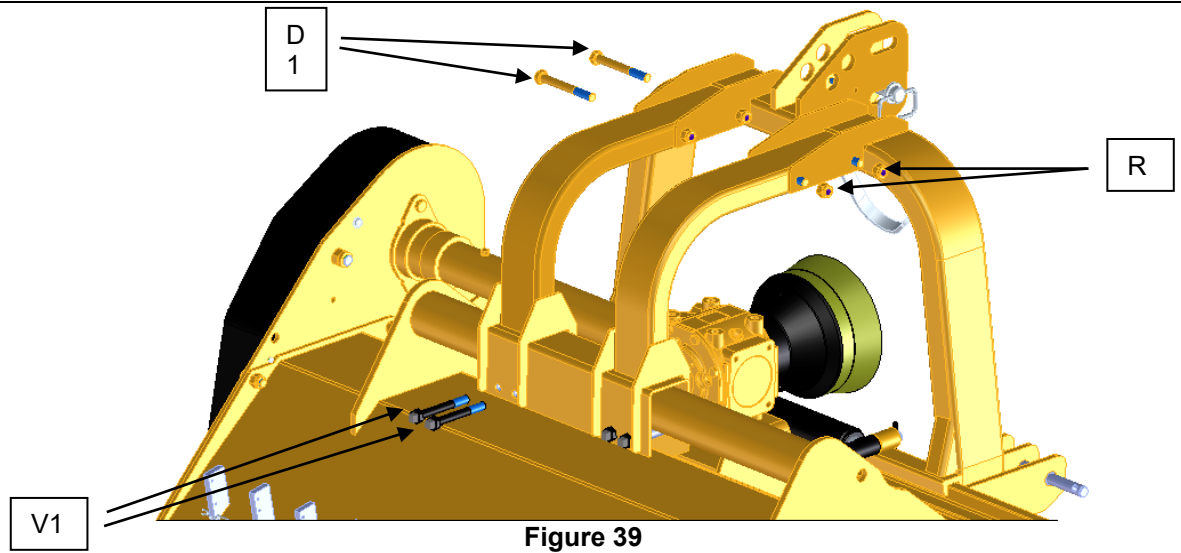
Figure 37

 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-axe pin P; Respect the order of the chains and spacers assembly operations as indicated in figure 38.  Figure 38
	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.
	The original spare parts provided by our company ensure complete and correct repair of the machine.

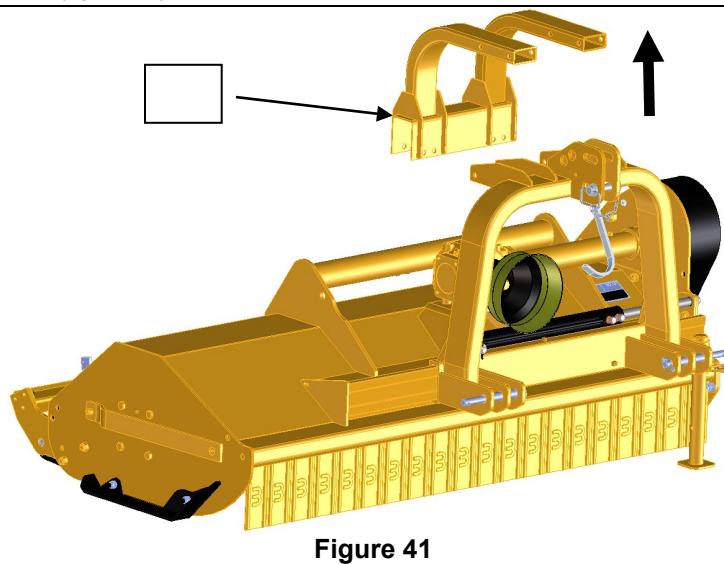
4.2.9. REPLACEMENT OF THE TILLER

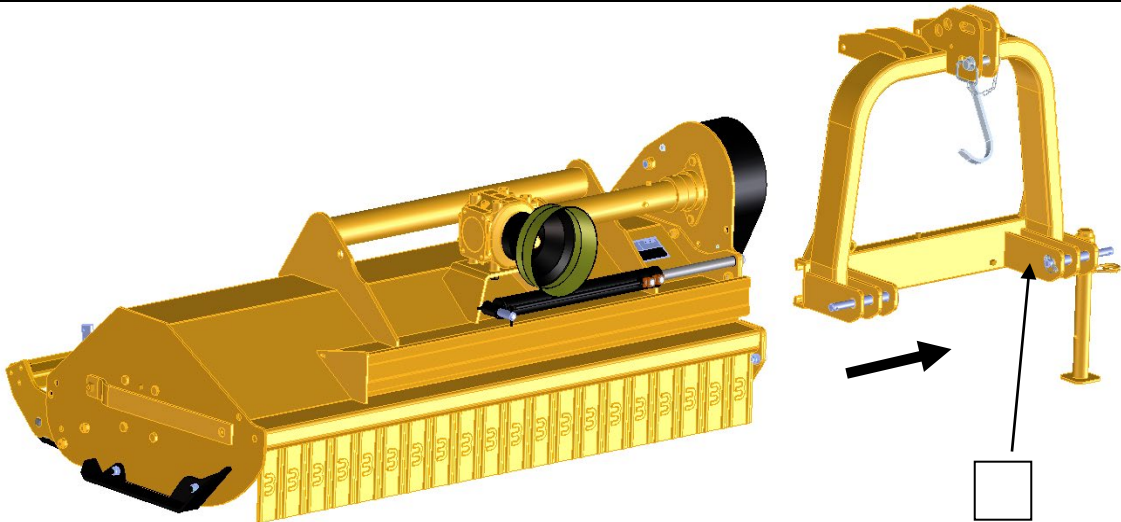
Only replace the tiller in case of breakage or extraordinary maintenance.

	1. Unscrew the nuts D and remove the screws V (figure 39);
	2. Unscrew the nuts D1 and remove the screws V1 (figure 39-40), making sure that the feeding rolls R does not fall to the ground;
 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 paragraph 1.5.3) in compliance with the laws in force in the country of use.



3. Pull out the tie rod TT (figure 41);



	4. Remove the tiller T from the machine (figure 42);
	 Figure 42
	5. Check for any damages; if any, proceed to immediate repair;
	6. After completing all the operations, fit the tiller and the tie rod on the machine and repeat the "Connection and Start-up" procedure described in paragraphs 3.4. and 3.5.
	The original spare parts provided by our company ensure complete and correct repair of the machine.

4.2.10. CLEANING THE MACHINE

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

4.3. STORAGE - WINTERING

If the machine is immobilised for long periods, it must be stored in a place sheltered from atmospheric conditions and be protected to avoid damage.

Before every wintering, proceed 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..



Make sure that the storage temperature is within 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

	In the event of scrapping, the machine must be disposed of in suitable waste disposal sites, in compliance with the Law in force in the country of use. Before scrapping, separate the parts in rubber or plastic, the electric and electronic equipment (if present). Recover any waste oils and dispose of them at relevant collection centres. The parts made only in plastic, aluminium, steel, can be re-cycled, if collected by appropriate centres.
--	---

4.5. SCHEDULED MAINTENANCE TABLE

Description	Checks
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:
Machine bolts fastening check	After the first 4 h and then every 50 h.
Belt tension check	After the first 4 h and then every 50 h.
Tools wear and fastening check	Before each work shift
Tools, screws and nuts replacement	Every 200 working hours or when damaged or when worn
Transmission belts replacement	Every 400 hours or when too worn out
Pulleys replacement	Every 400 hours or when too worn out
Rotor balancing	Every partial or total replacement of tools
Support slides replacement	Every 400 hours or when too worn out
Guards integrity check	Each machine start-up Restore the guards if worn out and/or damaged
Pictograms check	Each machine start-up Restore the guards if worn out and/or damaged
HYDRAULIC PLANT	
Hydraulic tubes fastening check	At each start-up and each fluid leakage
Check of the hydraulic tubes	Check at every start-up. In case of damage or seepage, replace immediately

4.6. TROUBLESHOOTING TABLE

ANOMALY	CAUSE	SOLUTION
Descending and uneven cutting	• 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 belts tensioning, oil capacity, supply pressure • Replace the roll support • Replace the slides • Make more working passages
Premature tool wear	• Terrain with stones or sandy • 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 • Blockages in the power circuit of the machine • 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 the bearings	• The machine frame is folded • The bearing were not lubricated • 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 operating limits • Balancing performed at specialised workshop or rotor replacement
The rotor does not rotate	• 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

Worn/thorn seal rings	• Excessive lubrication • High rotor rotation speed • Incorrect seals assembly	• Change the seal rings • Check the machine adjustment • Ask the manufacturer for further information
Broken/detached frame	• Worn blade • 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. Remember that the request for spare parts must be correct and 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. In any case, the transport and labour costs will 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 service and repairs are performed by individuals or unauthorised companies;
 - b) The machine was previously repaired or changed using unoriginal spare parts;
 - c) If there is confirmation of incorrect operation of the operator;
 - d) the machine was not properly maintained/lubricated;
 - e) The allowed power limit is exceeded;
 - f) The instructions described 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 fault may be used as a motive to delay the 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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