

A series of horizontal dotted lines for writing.

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for writing. There are no margins, text, or other markings on the paper.

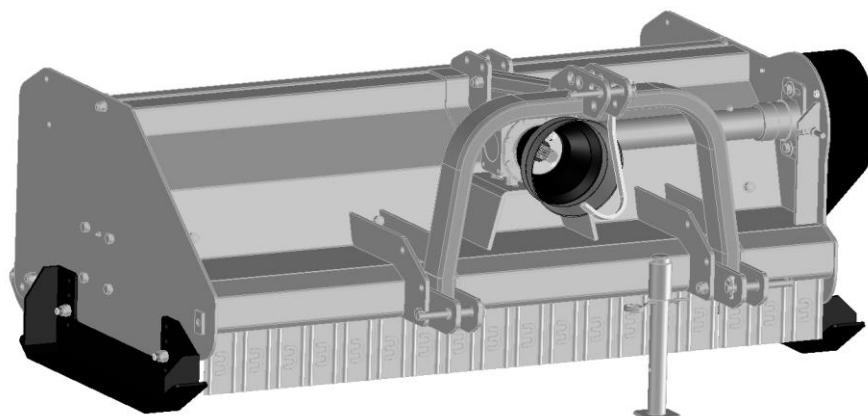
TRANSLATION INTO ENGLISH
OF THE ORIGINAL VERSION



INSTRUCTION MANUAL

STALKS-SHREDDER

Company: BERTI Macchine Agricole
Models: TSB



📖 Before using the machine, carefully read this Manual 📖

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1.0 Guarantee

Check, upon receipt of the machine, that it has not been damaged during shipment and that all accessories are present.

1.0.1 GUARANTEE TERMS

- The manufacturer guarantees its products for a period of 12 months from the date of delivery on the condition that the herein attached form is fully compiled in all its parts and sent to the manufacturer within 15 days of date of delivery.
- The manufacturer, in accordance with the aforementioned terms, agrees to supply under guarantee coverage all components to be replaced according to its own decision or to the opinion of its own authorized representatives regarding parts that have material or manufacturing defects. Shipping and labor costs in this regard shall in any case be charged to the customer.
- Guarantee coverage does not include payment for damages caused by improper use of the machine by the machine operator and for parts normally subject to wear and tear and breakage such as hammers, blades, belts, etc.
- The manufacturer is not responsible for accidents to the operator or to third parties caused by improper use of the machine.
- This guarantee is not valid whenever:
 - a) assistance and repairs were done by unauthorized individuals or companies;
 - b) the machine has been previously repaired or modified using non-original spare parts;
 - c) whenever there has been a mistake when maneuvering the machine;
 - d) there has been insufficient maintenance and/or lubrication;
 - e) when permissible power limits have been exceeded;
 - f) whenever the instructions in this manual are not duly complied with;
 - g) whenever unauthorized modifications have been brought to the machine.
- Machine breakdowns during or after the guarantee period shall not give rise to any right to interrupt payments for the goods that has already been delivered. No breakage or malfunction can be used as a pretext for delaying payments.
- The manufacturer reserves the right, at all times, to bring all due changes with the object of improving its own product and is not obligated to add these changes to previously manufactured machines that have already been delivered or are undergoing manufacture.
- These general guarantee terms replace and cancel all previous explicit or implicit guarantee conditions.

1.0.2 GUARANTEE CERTIFICATE

CERTIFICATO DI GARANZIA GUARANTEE CERTIFICATE GARANTIESCHEIN CERTIFICAT DE GARANTIE CERTIFICADO DE GARANTÍA GARANTIBEVIS GARANTIECERTIFICAAT			
FAC-SIMILE			
Nome / Name / Nom / Nombre / Namn / Naam Indirizzo / Address / Anschrift / Adresse / Dirección / Adress-Adres		<i>Si confermo di aver ricevuto il libretto uso e manutenzione e di essere stato informato circa il trattamento dei dati personali in base al Decreto Lgs. 196/03.</i> <i>We confirm to have received the instructions manual and that we have acquired all the information of the Legislative Decree 196/03 about the treatment of personal information.</i> <i>Wir bestätigen, dass wir das Betriebs- und Wartungshandbuch erhalten haben und dass wir alle Informationen über die Verarbeitung unserer persönlicher Daten (Verordnung 196/03) gelesen haben.</i> <i>Nous confirmons d'avoir reçu la notice d'emploi et d'entretien de l'appareil et d'être informés notamment le traitement de nos coordonnées selon le décret législatif 196/2003.</i> <i>Se confirma la recepción del manual de uso y mantenimiento y haber sido informado acerca del tratamiento de los datos personales en base al Decreto legislativo 196/03.</i> <i>Undertecknad bekräftar mottagandet av användar- och underhållsmanualen och har informerats angående hantering av personuppgifter enligt lagdekret 196/03.</i> <i>Ik bevestig de handleiding voor gebruik en onderhoud te hebben ontvangen en dat ik geïnformeerd werd betreffende de behandeling van mijn persoonlijke gegevens, krachtens het Wetsdecreet 196/03.</i> Firma dell'acquirente / Purchaser's signature / Unterschrift des Käufers / Signature de l'acheteur / Firma del comprador / Köparens underskrift / Handtekening van de koper Data /Date/Datum/Fecha	

2.0 Introduction

2.1 FOREWORD

This manual describes all instructions for operating and maintaining the machine in question as well as accident prevention standards.

We recommend reading it with care and attentively complying with all the procedures described in it before starting up, using or maintaining the machine because:



THE MANUFACTURER DECLINES ALL RESPONSIBILITY FOR DAMAGE CAUSED BY FAILURE TO COMPLY WITH THE STANDARDS AND GUIDELINES CONTAINED IN THIS MANUAL.

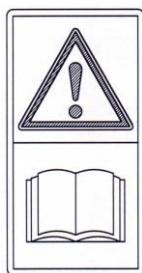


A series of pictograms are given in the manual to make it easier to read and to quickly attract the reader's attention to hazard situations and guidelines that cannot be avoided or sufficiently limited through use of technical protection systems or work organization measures and methods.

These pictograms, in other words, give information on objects and situations that may represent a specific danger.



WARNING:



The machine, during its use, can present danger situations: read this manual with care before using the machine.

What is described regards your safety and the safety of all employees and persons who may find themselves in the vicinity of this machine.

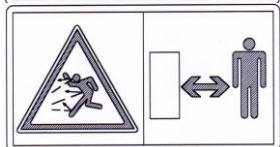
Whenever the machine is used by more than one person it is absolutely necessary for each user to examine this manual prior to using the machine.

This manual contains various pictograms that are used to attract your attention to the importance of the subject being dealt with.



WARNING:

It is dangerous to bring your hands or feet near to the tool when the rotor is in movement wait until the rotor has completely stopped before working on the machine! Always remember that the high inertia of the rotor means that it needs a few minutes before it stops.



WARNING:

In certain work situations the machine may project shredded material: always respect safety distances and make sure they are respected!



CODIFICATION SYSTEM:

This manual has an identification code for each machine component.

THIS IDENTIFICATION CODE MUST BE USED FOR:

1. ORDERING THE MACHINE ITSELF
2. ORDERING SPARE PARTS
3. REQUESTING TECHNICAL INFORMATION

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				
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 déclarons que les normes harmonisées suivantes ont été appliquées: UNI EN ISO 4254-12:2012 UNI EN ISO 4254-1:2010 UNI EN 15811:2010 Nonché le seguenti specifiche tecniche: And the following technical specifications: Und die folgende technische Ausstattungen: Et les spécifications techniques suivantes: ISO 11684:1995 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.						
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">MODELLO -- TYPE</td> <td>TRINCIASTOCCHI TSB 285 cm</td> </tr> <tr> <td>MATRICOLA -- N° DE SERIE</td> <td>666181400B</td> </tr> </table>			MODELLO -- TYPE	TRINCIASTOCCHI TSB 285 cm	MATRICOLA -- N° DE SERIE	666181400B
MODELLO -- TYPE	TRINCIASTOCCHI TSB 285 cm					
MATRICOLA -- N° DE SERIE	666181400B					
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> Custode del fascicolo tecnico MARIO BERTI C/o Ufficio Tecnico: BERTI MACCHINE AGRICOLE S.p.A. Via Musi 1/a - 3 - 37042 CALDIERO (Verona) - ITALY Caldiero, li 29/03/2014 </td> <td style="width: 50%; vertical-align: top; text-align: center;"> per la società / for the Company für die Firma / pour la société BERTI Macchine Agricole S.p.A. BERTI MARIO <i>Amministratore Unico</i> </td> </tr> </table>			Custode del fascicolo tecnico MARIO BERTI C/o Ufficio Tecnico: BERTI MACCHINE AGRICOLE S.p.A. Via Musi 1/a - 3 - 37042 CALDIERO (Verona) - ITALY Caldiero, li 29/03/2014	per la società / for the Company für die Firma / pour la société BERTI Macchine Agricole S.p.A. BERTI MARIO <i>Amministratore Unico</i>		
Custode del fascicolo tecnico MARIO BERTI C/o Ufficio Tecnico: BERTI MACCHINE AGRICOLE S.p.A. Via Musi 1/a - 3 - 37042 CALDIERO (Verona) - ITALY Caldiero, li 29/03/2014	per la società / for the Company für die Firma / pour la société BERTI Macchine Agricole S.p.A. BERTI MARIO <i>Amministratore Unico</i>					
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 VR03066950241						

MACHINE INFORMATION

The mulcher model TSB is been designed to be used exclusively in the agricultural sector, for mulching grass, maize stalks, corn stalks, sunflowers, vegetables, sugar cane, potatoes, pasture topping and set aside applications, according to the type of 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.

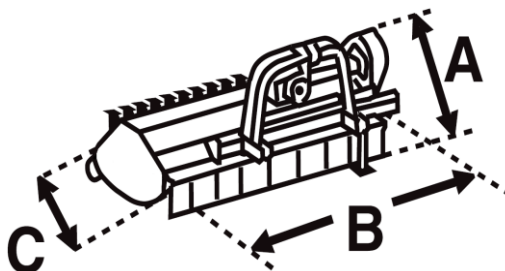
The machine is not suitable to be used in other sectors than in agriculture.

**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..

TECHNICAL DATA

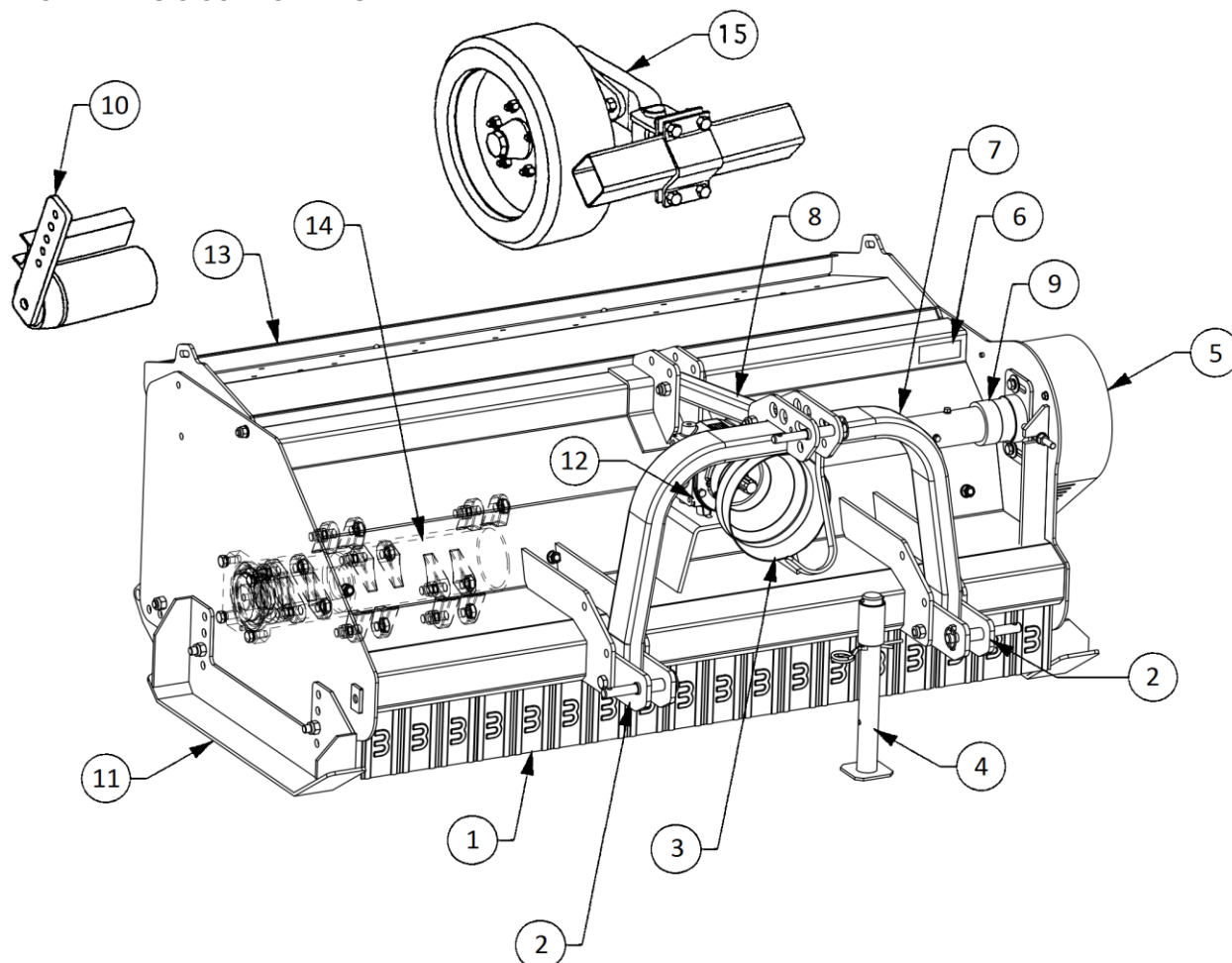
The machine TSB can be applied on tractors with power between 36 and 103 kW (50 - 140 HP). The drawing and the tables below, indicate the machine operation field.



MODEL: TSB		160	180	200	220	230	250	280
Work width	Cm	160	180	200	220	230	250	280
Width B	Cm	174	194	214	234	244	264	294
Length C	Cm	110	110	110	110	110	116	116
Height A	Cm	74	74	74	74	74	80	80
Weight	Kg	680	730	790	850	880	1010	1120
Number of tools: hammers blades	n.	20	22	24	26	28	30	34
	n.	60	66	72	78	84	90	102
Minimum tractor power	HP	50	50	50	50	50	60	70
PTO speed *	RPM	540	540	540	540	540	1000	1000
Number of belts	n.	3	4	4	4	4	4	5

3.0 Machine model and basic components

3.1 MACHINE BASIC COMPONENTS



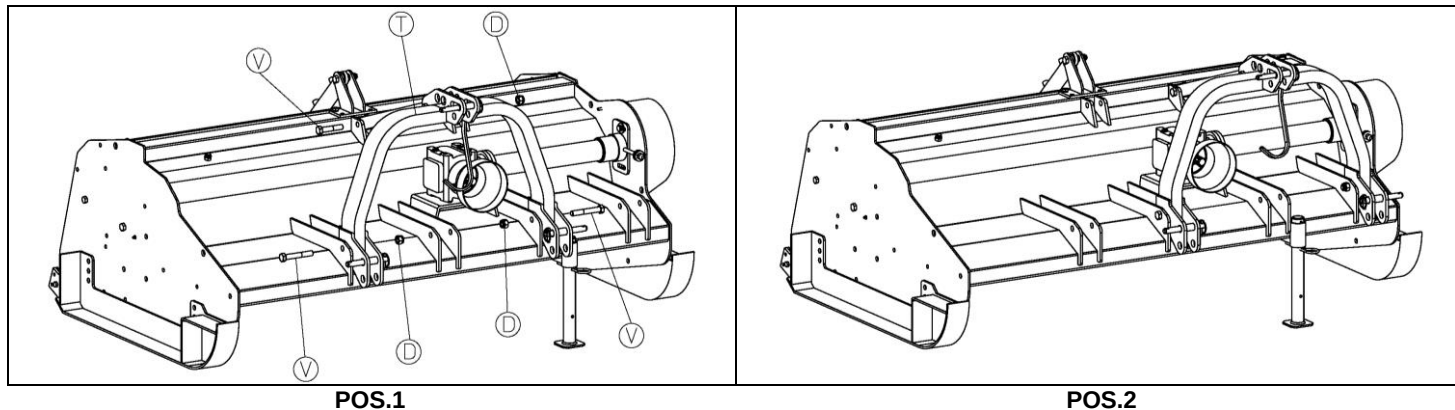
NAME OF MARKED PARTS:

Pos.	Denomination
1	Front protection flaps
2	Parallel connection brakets
3	Counter cowling
4	Support foot
5	Transmission casing
6	EC plate for the identification of the machine
7	Drawbar
8	Top link tie rod
9	Extension
10	Levelling roller
11	Skid
12	Gearbox
13	Rear hood
14	Rotor
15	Steering wheel

3.2 LINKAGE'S SIDE SHIFT

TSB

The linkage of the machine can have two positions.



In position 1, the machine works in centre and in line with the tractor's PTO.

In position 2, the machine works off-set to the right side. Loose the screw V and nuts D, switch the linkage itself in such position (as displayed in the drawing) and tight again all screws and nuts.

3.3 STANDARD TOOLS

Our original tools are the result of careful research and lengthy experience: they are made out of high quality steel that undergoes special thermal treatments to guarantee great toughness and wear resistance.

Dimensions and weights are strictly controlled: rotors do not need to be newly dynamically balanced if tools are partially or totally replaced. Broken or excessively worn tools can transmit vibrations to the machine. When this happens immediately stop working and only start up again after you have replaced the tools.

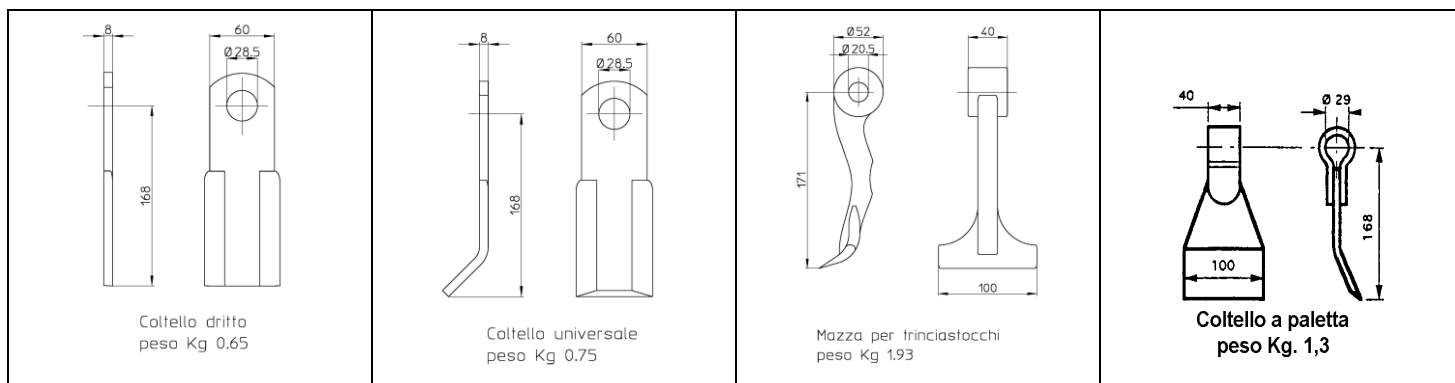
If vibrations are still present after replacing the tools then the rotor must be newly dynamically balanced.

Fastening screws are made of class 10.9 (UNI 3740) strength steel to guarantee a secure anchorage and a working life equal to that of the tools.



WARNING: ONLY INSTALL ORIGINAL TOOLS ON THE ROTOR

TYPES OF TOOLS



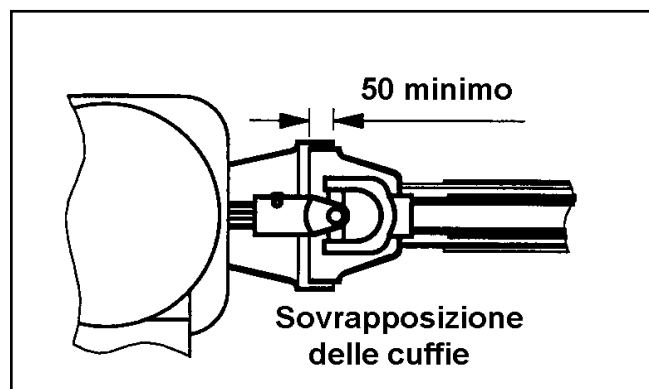
4.0 Cardan shaft

4.1 CARDAN SHAFT SPECIFICATIONS

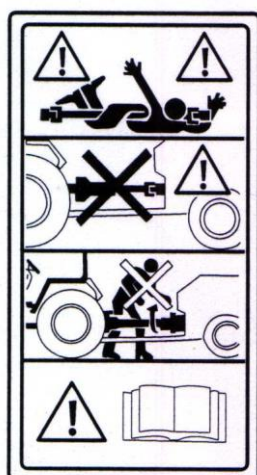
The cardan shaft is the drive component that powers the shredder: It must be selected based on specific criteria that define its dimensions and length.

Model	160	180	200	220	230	250	270	285	300
Tractor KW	22 ÷ 26	26 ÷ 29	29 ÷ 33	33 ÷ 37	33 ÷ 37	40 ÷ 48	51 ÷ 55	59 ÷ 74	59 ÷ 74
Power CV	30 ÷ 35	35 ÷ 40	40 ÷ 45	45 ÷ 50	45 ÷ 50	50 ÷ 65	70 ÷ 75	80 ÷ 100	80 ÷ 100
Size of the universal joint *	105	105	106	106	106	106	107	107	107

* The size of the joint shows the transmission power of the same; this instruction – book refers to the joint of the Bondioli & Pavesi Company. During the installation of the universal joint, you should check that it presents a superimposition of the guards of at least 50 mm – at straight joint. The length of the joint, (see quote K at page n. 12) will be calculated every time.



WARNING:



The cardan shaft, when it operates, can create hazard and danger situations.

Machine operators must:

- read and preserve the operating and maintenance booklet attached with the cardan shaft;
- check that the cardan shaft is suitable for transmitting the required power;
- use exclusively the cardan shaft supplied with the machine;
- check that guards are properly installed, whole and effective;
- replace worn, broken or missing guards;
- turn the tractor motor off before working on the cardan shaft or on the machine itself;
- never let children or extraneous persons come near to the machine when it is at work and/or undergoing maintenance;
- set the cardan shaft on its specific support when it is not in use;
- wear suitable garments (that cannot be caught by the machine or pulled into it), especially close-fitting garments (such as work overalls with safety wrists and ankles);

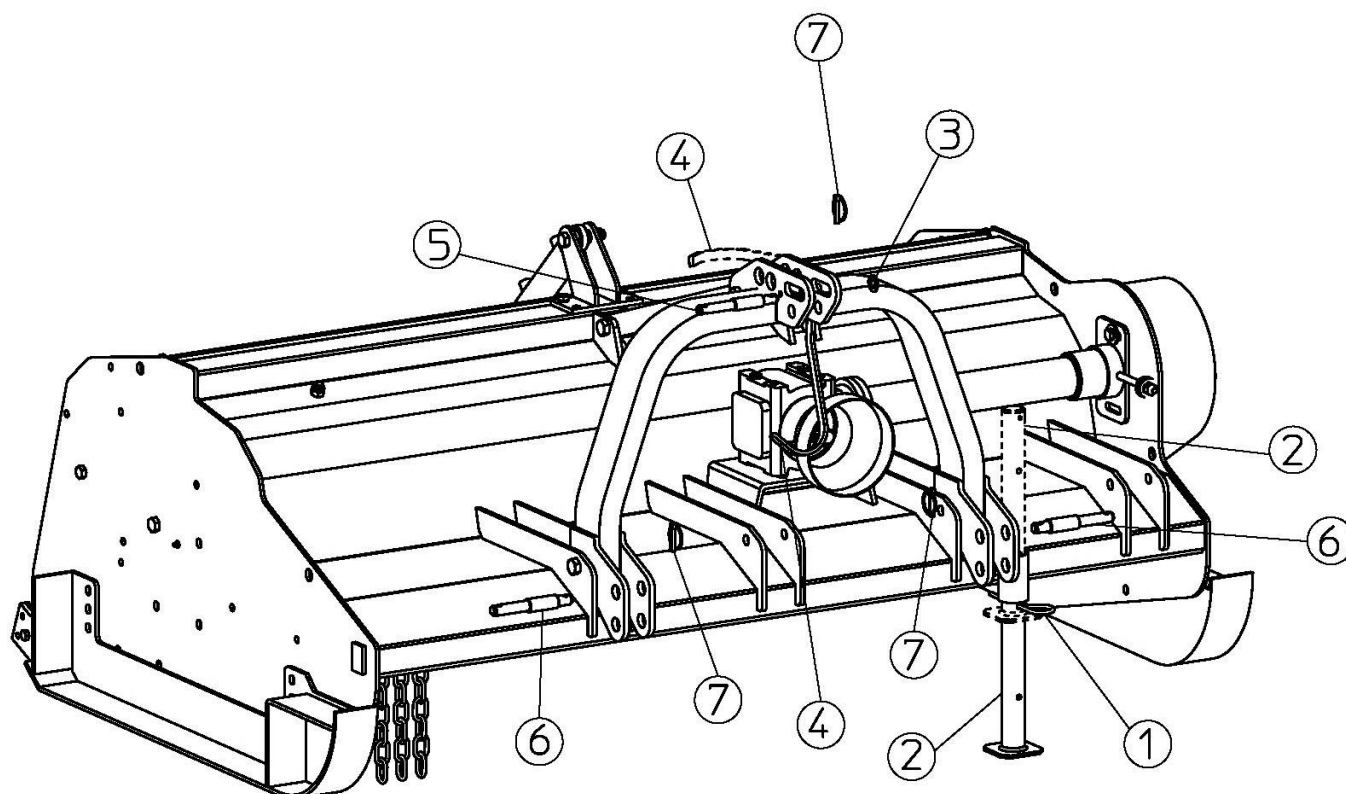
5.0 Installing the machine

5.1 CONNECTION TO THE THREE-POINT HITCH



WARNING:
THESE PROCEDURES ARE VERY HAZARDOUS:
AVOID STANDING IN FRONT OF THE MACHINE WHEN IT IS APPROACHED BY THE TRACTOR.
AVOID THE PRESENCE OF EXTRANEOUS PERSONS.
THE P.T.O. MUST BE DISENGAGED DURING THESE INSTALLATION PROCEDURES.

Before installing the machine make sure it is in perfect condition, resting on the ground and level and that lubricants are at proper levels and all components subject to wear and/or deterioration are perfectly efficient.
Also check that the size and weight of the tractor is suitable for carrying the machine.



Proceed as follows after making these checks:

1. remove the safety pins (7) and pull out the gudgeon pins (5-6);
2. carefully bring the tractor close to the hitch until it centers the holes on the connections parallel with those on the drawbar;
3. brake the tractor and turn it off;
4. thread the gudgeon pins (6) into the parallel connections and insert the related safety pins (7);
5. adjust the arm tie-rods in order to prevent the machine from oscillating to the right and left;
6. mount the cardan shaft, making sure the push-buttons are properly inserted in the specific slots (see paragraph 5.2);
7. turn the cardan support bracket backward (4);
8. mount the third point tie-rod, insert the gudgeon pin supplied (5), the washer (3) and the related safety pin (7);
9. adjust the length of the third hitch point so that the gudgeon pin is located in the center of the slot;
10. block the third hitch point tie-rod in place;
11. lift the support foot (2);
12. hook-up the sideshift movement hoses (if the machine is equipped with hydraulic rear hood)



WARNING:
CHECK THAT SAFETY PINS A ARE PROPERLY INSERTED AND THAT CHAINS C ARE IN EFFICIENT WORKING ORDER.
MAKE SURE YOU HAVE PUT THE ANTI-EXIT DEVICES INTO THE HITCH PINS

5.2 INSTALLING THE CARDAN SHAFT



THE MANUFACTURER GUARANTEES THAT THE CARDAN SHAFT, SUPPLIED WITH THE MACHINE, IS SUITABLE FOR SAFELY SUPPORTING POWER ABSORPTION LEVELS DURING WORK PROCESSES AS LONG AS ALL OPERATING AND USE CONDITIONS ARE COMPLIED WITH.

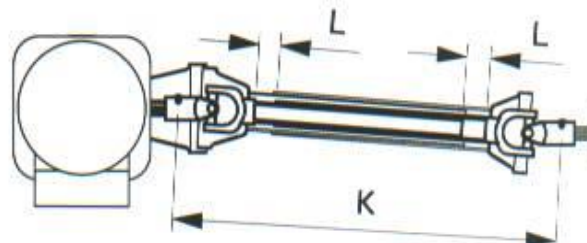
WHEN THE CARDAN SHAFT IS REPLACED IT CAN BE REPLACED BY ANOTHER THAT MEETS EC STANDARDS AND THAT IS SUITABLE FOR TRANSMITTING THE POWER RATINGS INDICATED IN THE TABLE AT PARAGRAPH 4.1.

CAREFULLY READ THE INSTRUCTION BOOKLET THAT COMES WITH THE CARDAN SHAFT BEFORE PERFORMING THESE PROCEDURES.



WHEN FIRST INSTALLING THE CARDAN SHAFT:

Measure the distance K between the races of the P.T.O. push-buttons with the machine rested on the ground and level and with the overgear axially aligned with the tractor's P.T.O.: if the length of the cardan shaft that is supplied needs to be modified make sure that the telescoping tubes overlap for a length that permits between 40 and 50 mm of play L at their ends.



IMPORTANT:

THIS PROCEDURE MUST BE DONE THE FIRST TIME THE SHAFT IS INSTALLED, EVERY TIME IT IS REPLACED AND EVERY TIME THE MACHINE IS INSTALLED ON ANOTHER TRACTOR.

WARNING:

AFTER INSTALLING THE CARDAN SHAFT FASTEN THE ANTI-ROTATION CHAINS OF THE GUARDS ON THE TRACTOR SIDE AND ON THE MACHINE SIDE.

When the machine is put away for storage always set the cardan shaft on its specific support bracket S provided on the three-point drawbar to avoid build-up of dirt or deformation or breakage of the protective guard.



IMPORTANT:

GREASE THE CARDAN SHAFT ACCORDING TO THE RECOMMENDATIONS GIVEN IN THE CARDAN SHAFT'S MANUAL.

IMPORTANT:

NEVER WORK WITH CARDAN SHAFTS WITHOUT THEIR SAFETY GUARDS

READ THE INSTRUCTION BOOKLET THAT COMES WITH THE CARDAN SHAFT WITH CARE.

5.3 DISCONNECTING FROM THE MACHINE



WARNING:

THE PROCEDURES DESCRIBED BELOW CAN CREATE DANGER SITUATIONS: KEEP EXTRANEIOUS PERSONS AWAY FROM WHERE THE MACHINE WILL BE POSITIONED AND FROM ITS IMMEDIATE VICINITY.

Carefully comply with the following instructions when disconnecting the machine from the tractor. For more information you can also consult paragraph 5.1 "INSTALLING THE MACHINE".

Proceed as follows to disconnect the machine:

1. disengage the P.T.O;
2. rest the machine on the levelling roller;
3. put the tractor's brake on;
4. lower support foot (2);
5. set the machine completely on the ground and turn the tractor off
6. disconnect the third hitch point tie-rod;
7. turn the cardan shaft support bracket forward (4);
8. disconnect the cardan shaft from the tractor and rest it on the bracket (4);
9. disconnect the parallel connections;
10. disconnect sideshift movement hoses (if the machine is equipped with hydraulic sideshift movement)

Put the hitch gudgeon pins and safety snap pins back in their housings on the drawbar so you will find them again when you want to use the machine again.

6.0 Operating instructions

6.1 GENERAL INSTRUCTIONS

The Mod. TSB is designed and built for mulching grass, pruning and vegetable residue in general as maize stalks etc.

It can be used:

- to shred grass and pruning branches in vineyards and orchards in general with branches with maximum 2 cm diameters
- to shred under wood
- to shred nursery and garden residue
- to shred maize stalks, cereals and open fields cultivations in general

It is prohibited to use them:

- if they are coupled with undersized tractors
- if there are loose stones on the surface of the terrain
- if terrains do not permit stable tractor operation, such as steep rising or descending slopes, the vicinity of ditches or cliffs, very uneven terrain, etc.
- to shred branches with diameters greater than 2 cm.
- to cut down trees and bushes
- in situations that require sharp turns
- in reverse gear



IMPORTANT:

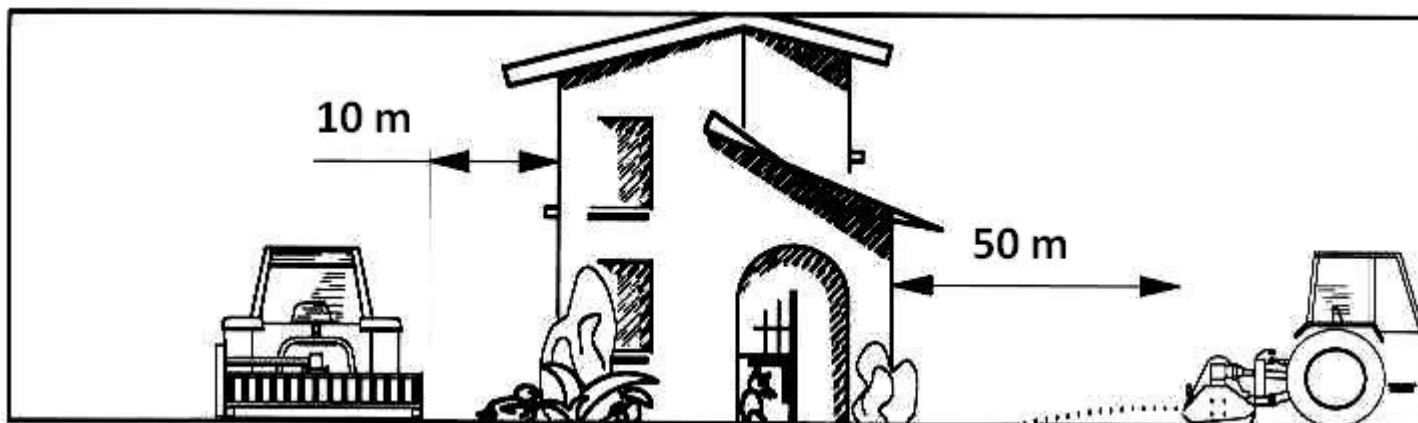
REMEMBER THAT YOUR OWN VISIBILITY AND THAT OF OTHER VEHICLES MAY BE IMPAIRED WHEN WORKING ON DUSTY TERRAIN..

6.2 INSTRUCTIONS FOR USE IN THE FIELD



This paragraph gives instructions for safely using the machine in its work area:

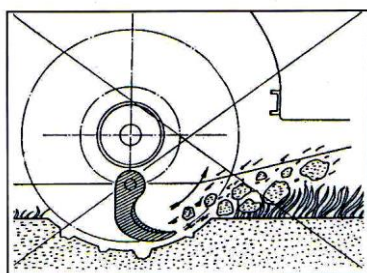
- a. carefully check that the machine operates properly before using it for the first time in the field: do this by rotating the rotor for a few minutes without any load, applying the instructions illustrated in paragraph 7.6 Perform this same check every time you start using the machine again;
- b. whenever turning around when working always disengage the tractor's P.T.O., wait until the rotor stops, lift the machine and then reverse your direction of operation;
- c. always make sure, when working, that nobody is present in the machine's residual risk zone;
- d. disengage the P.T.O. before lifting the machine, do not operate the machine while it is lifted and always stop the machine before descending from the tractor;
- e. respect safe distances when working near houses or roads:
 - 10 meters on the side;
 - 50 meters to the rear;



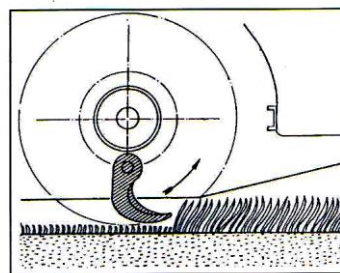
6.3 USE IN THE FIELD

Approach the work zone with the machine correctly hitched to the tractor and then proceed as follows:

1. act on hoist controls to lower the machine until the rear roller rests on the terrain and the tools come near the terrain without touching it;
2. engage the P.T.O. and gradually accelerate the tractor until you reach the P.T.O.'s standard operating speed (540 or 1 000 RPM depending on the information on the label on the protective cowling);
3. put the tractor in gear and start to work;
4. use the hoist to adjust working height as necessary. Avoid having cutting tools (hammers or blades) come in contact with the terrain;
5. adjust the tractor's forward speed as necessary: paragraph 6.4 gives several recommended guideline speeds;
6. adjust the position of the roller to increase or decrease cutting height above the terrain (minimum cutting height is 30 mm). See the instructions in paragraphs 8.1 and 8.2 to adjust roller height.



NO



YES

6.4 FORWARD SPEED



Remember that the forward speed of the tractor must adapt to the type and quantity of material being shredded. EXCESS SPEEDS put excessive stresses on drive components, wearing them out ahead of time.

This will produce poor-quality shredded material, the possible expulsion of large pieces of material which, because of their greater inertia may be projected beyond forecast safety limits.

The following table contains speeds we recommend to get maximum performance from the machine:

RECOMMENDED FORWARD SPEED (km/h)

Material	0,5	1	1,5	2	2,5	3	3,5	4	4,5	5	5,5	6	7	8	9	10	11	12
Maize, straw stalks																		
Beetroot, potato leaves																		
Artichokes																		
Rice																		
Grass																		
Small runners (Ø max 2 cm)																		

7.0 Machine maintenance

7.1 IMPORTANT WARNINGS AND OPERATING INSTRUCTIONS



The structure, design and efficiency of this machine may cause operators to underestimate risks that can arise during maintenance and/or repair procedures. Scrupulously comply with the guidelines described in this manual for all maintenance and/or repair procedures in order to avoid any risks inherent to these tasks.

Here we list a few general precautions:

- read the operating and maintenance manual with care;
- perform all maintenance and/or repair in suitable work sites;
- prepare a suitable storage site for the machine;
- collect recovered oil in specific disposal containers;
- use suitable tools with the proper skill;
- employ personal protection devices (DPI).



READ THIS MANUAL WITH CARE.

This manual must be read with care in order to prevent all risks when performing specific operations, whether when working with the machine or during maintenance and/or repair.

Turn to specialists to do everything that is not specifically indicated in this operating and maintenance manual.

WARNING:

IT IS VERY DANGEROUS TO WORK ON THE MACHINE WITHOUT SUFFICIENT INFORMATION ON WORK PROCEDURES.



PERFORM MAINTENANCE AND/OR REPAIR IN SUITABLE WORK SITES.

Suitable work sites include a flat, paved and well illuminated support surface that is sufficiently large and, if possible, located inside a building. It must always be possible, when working on the machine, to keep it in a stable position. It may, if necessary, be sustained by special support devices designed to guarantee stability even when the machine is subjected to stresses.



PREPARE A SUITABLE STORAGE SITE FOR THE MACHINE.

Store the machine in a covered area. Remember that:

- the machine must be safely positioned so that it will not fall over and so that hook-up and release procedures are simple and easy;
- entryways must permit easy passage;
- the tractor engine must only operate inside the storage site the amount of time necessary for entering and exiting and for maneuvering: avoid build-up of exhaust gases;
- keep the storage site orderly to make machine movements as easy as possible.



COLLECT RECOVERED OIL IN SPECIFIC DISPOSAL CONTAINERS.

Used oil is harmful to the environment and to health. Use all necessary precautions when disposing of used oils. Comply with currently valid legislation in your own country regarding environmental protection and waste disposal legislation.

It is good practice, when changing oil, to wear protective gloves. Carefully wash body parts of the skin comes in contact with the used oil.



USE SUITABLE TOOLS WITH PROPER SKILL

Appropriate tools must be used even for the simplest tasks: improper use or incorrect tools can cause serious risks and hazards for persons. In this regard you should also use personal protection devices (DPI).

It is also good practice to keep tools in good shape and transport them with care



EMPLOY PERSONAL PROTECTION DEVICES (DPI).

Personal protection devices must be used in accordance with current standards in your own country and depending on the type of task being performed.

We give all the relative specifications on the "Working in Safe Conditions" chapter.

PREVENTIVE GUIDELINES

Follow these guidelines to best use and maintain the machine:

- a. After the first 4 work hours and subsequently at 50 hour work intervals:
 1. check that all bolts are tight;
 2. check the tension of drive belts;
 3. check lubricant levels;
- b. If the machine will be inactive for a long time period:
 1. clean the machine with care;
 2. check its condition and take all necessary measures so it will be ready for prompt use;
 3. keep the machine indoors during the winter where temperatures do not drop much below 0°C (zero degrees Centigrade)
- c. The first time the machine is used again:
 1. grease all bearings;
 2. check lubricant levels;
 3. check the condition of the transmission;
 4. before reinstalling the cardan shaft make sure it is the one supplied with the machine and that all protective devices are complete and in proper operating order.
- d. Periodically check the state of all protective devices: replace those that are deformed, broken or missing.

7.3 ROUTINE MAINTENANCE



Moving parts must be protected according to current law to prevent the hazards of contact, catching, pulling and crushing of body parts. Always check that:

- a) moving parts are protected and that their protective devices are sound and efficient;
- b) protective devices are always put back in position whenever they are removed in order to perform maintenance;
- c) always wear suitable clothing according to specified Personal Protection Measures.



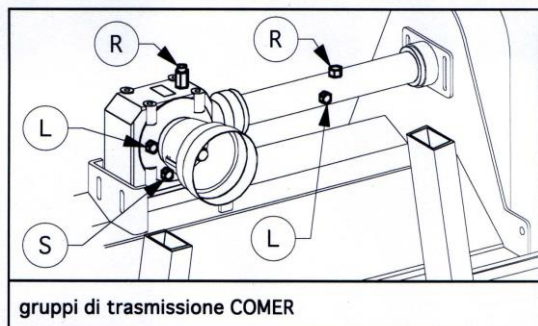
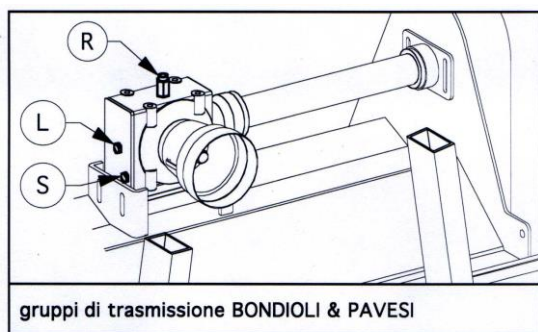
WARNING:

THE P.T.O. MUST BE DISENGAGED AND THE TRACTOR OFF AND PROPERLY BRAKED OR DISCONNECTED BEFORE BEGINNING ANY MAINTENANCE PROCEDURES

Here are several maintenance phases that must be periodically carried out in order for the machine to always be in good condition.

7.3.1 GREASING AND LUBRICATION

Systematic and periodic machine greasing and lubrication keep it performing well and prolong its working life



TRANSMISSION SYSTEMS:

Carefully clean components around plugs before working on transmission systems: this prevents dirt from penetrating into these systems.

Transmission systems require the following checks:

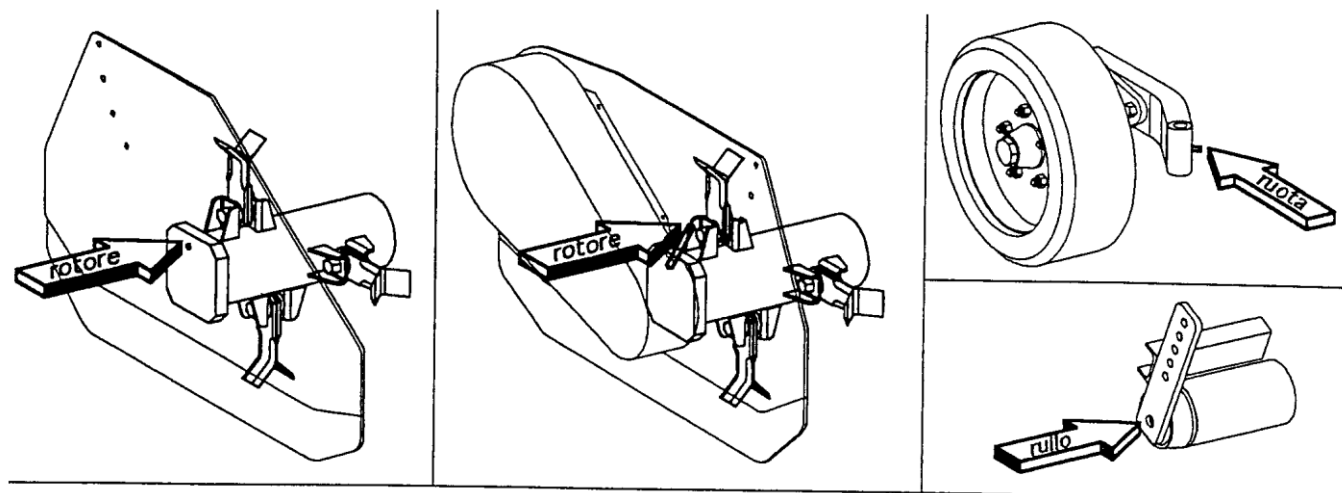
- 1- check the oil levels in the overgear and the extension during the first 20 work hours: oil must come up to the level hole. Add oil as required. Perform the next oil level checks at 50 hour intervals
- 2- totally replace the oil in the overgear and the extension after the first 40 work hours. Subsequently replace oil every 250 work hours;

There are various points for filling and checking oil levels depending on the type of transmission systems that are installed. Follow their instructions for performing an exact check.

The protective bowling must be removed in order to drain oil from COMER transmission systems.

R: oil refill hole
L: oil level hole
S: oil drain hole

ROTOR ROLLER AND WHEEL



ROTOR: Grease every 8 work hours, giving a maximum of 1-2 pumps to avoid damage to internal bearing seals.

ROLLER: Grease every 8 work hours (every 4 work hours on sandy terrain), pumping in grease until it exits.

WHEEL: Grease every 8 work hours (every 4 work hours on sandy terrain), pumping in grease until it exits.

LINKAGE: Grease every 8 work hours pumping in grease until it exits.

LUBRICANTS TO BE USED

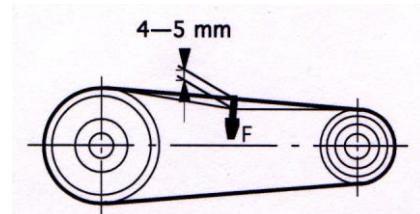
GREASING POINT	REFERENCE LUBRICANT AGIP	IP	ESSO	SHELL	MOBIL	BP	TOTAL
GEARBOX AND EXTENSION	BLASIA 460	MELLANA OIL 460	SPARTAN EP 460	OMALA 460	MOBILGEAR 634	ENERGOL GR-XP 460	CARTER EP 460
OVERALL GREASING	GREASE MU EP 2	MOBILUX EP 2	BEACON EP 2	ALVANIA GR. EP 2	MOBILUX EP 2	GREASE LTX EP 2	MULTIS EP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

7.4 BELTS TENSION

Belts are properly stretched when they deflect about 4-5 mm when an approximate 4-5 Kg. force F is applied in the centre between the two pulleys.

It is very important to check belt tension:
make all necessary adjustments so that deflection agrees with the above-indicated value.

Check and adjustment must be done after the first 4 work hours and subsequently at 50 hour intervals

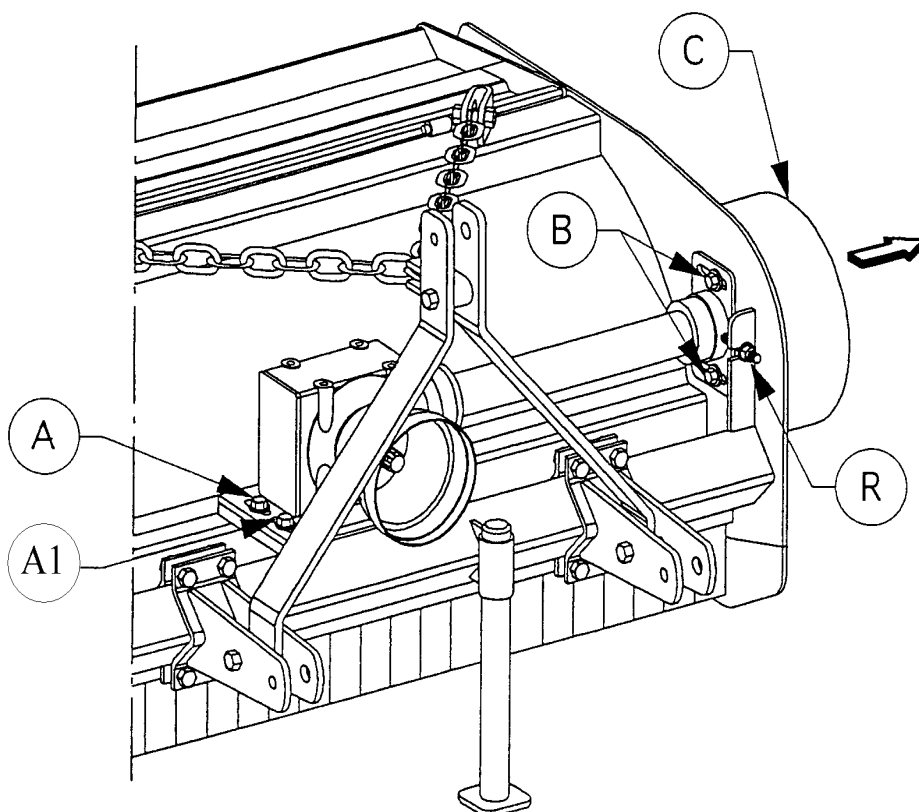


WARNING:

MAKE SURE THE P.T.O. IS DISENGAGED AND THE TRACTOR IS BRAKED AND OFF OR DISCONNECTED FROM THE MACHINE WHEN PERFORMING THE ABOVE-DESCRIBED PROCEDURES.

Proceed as follows to adjust belt tension:

- 1- remove transmission cover casing C;
- 2- loosen screws A and A 1 on the overgear bearing side;
- 3- loosen screws B on the flank side;
- 4- re-stretch the belts using stretching screw R;
- 5- regulate the adjustment screw on plate until the overgear extension is parallel to the frame: this must also align the pulleys;
- 6- use a rule to check that they are aligned; use the two adjustment screws to correct alignment if the pulleys are not aligned;
- 7- tighten screws A, A 1 and B;
- 8- reinstall casing C, fastening it in place with the screws.



WARNING:

DO NOT WORK WITHOUT THE BELT PROTECTION CASING

7.5 REPLACING THE HAMMERS



WARNING:

TO PERFORM THESE PROCEDURES MAKE SURE THE P.T.O. IS DISENGAGED AND THAT THE TRACTOR IS RAKED AND OFF OR DISCONNECTED FROM THE MACHINE.

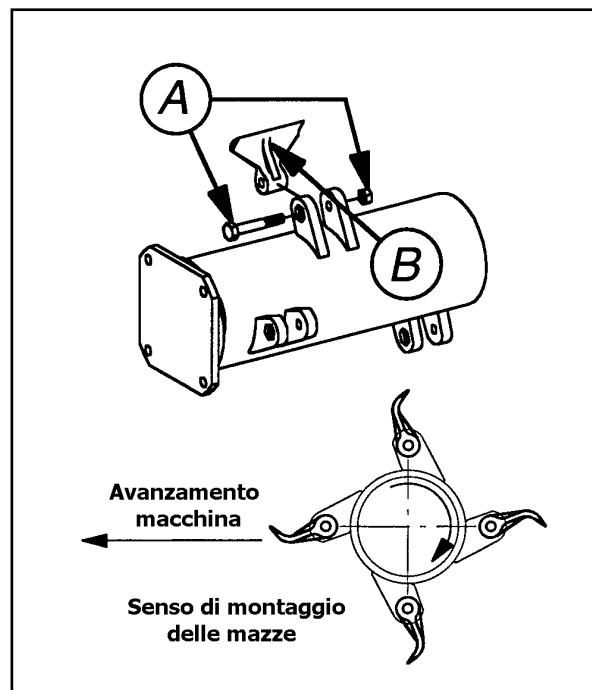
REPLACING THE HAMMERS

Perform the following procedures:

1. set the machine on the level;
2. brake and turn the tractor off or disconnect it;
3. pull out the rakes, open the rear hood and block it in its open position;
4. completely unscrew and remove bolt A;
5. replace hammer B and install a new bolt, being sure to insert the head of the screw in the hexagon machined on the small support. Tighten firmly.
- 1- 6. close the hood and fasten it with the screws

Machine forward

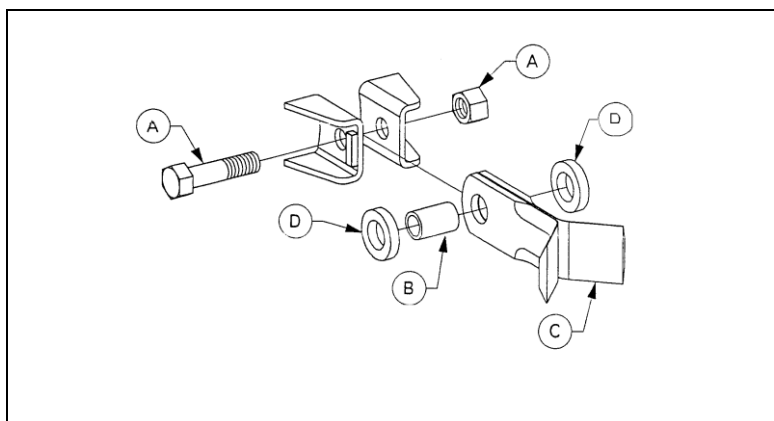
Direction of hammer assembly



REPLACING THE BLADES

Perform the following procedures.

- 1- set the machine on the level, brake and turn the tractor off or disconnect it;
 - 2- open the rear hood and block it in its open position
 - 3- completely unscrew and remove bolt A;
 - 4- replace blades C and install a new bolt, being sure to insert the head of the screw in the hexagon machined on the small support. Tighten firmly
- During this operation, be careful to replace the bushing B and the spacers D in the same positions as before the substitution.
- 1-close the hood and fasten it with the screws.



OUR ORIGINAL SPARE PARTS GUARANTEE COMPLETE AND CORRECT MACHINE OPERATION

7.6 POST-MAINTENANCE OPERATING TEST

It is good practice, after performing maintenance and/or repairs on the machine, to make a test to check that maintenance and/or repairs are effective and that the machine operates well.

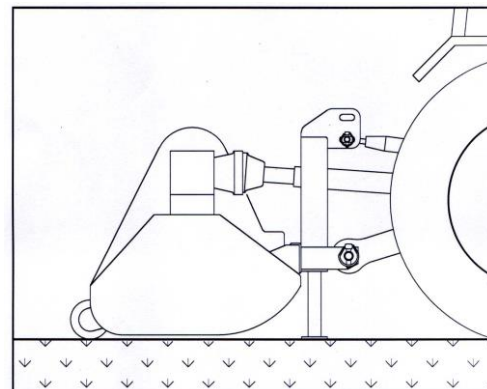
Proceed as follows:

1. if necessary connect the machine to the tractor (see paragraphs 5.1);
2. if necessary lower the support foot
3. lower the machine until it sits on the levelling roller and on the foot;
4. close rear hood C and fasten it in place with the screws;
5. make sure no extraneous persons are within 10 meters of the machine;
6. engage the P.T.O. and gradually accelerate until you reach operating speed (540 or 1000 RPM).

Check the tools if the machine vibrates during this test (see paragraph 3.4 and 7.5)

The rotor will have to be dynamically balanced again if you still note vibrations after having checked or replaced the shredding tools.

Turn to your authorized retailer to do this.



8.0 Adjustments



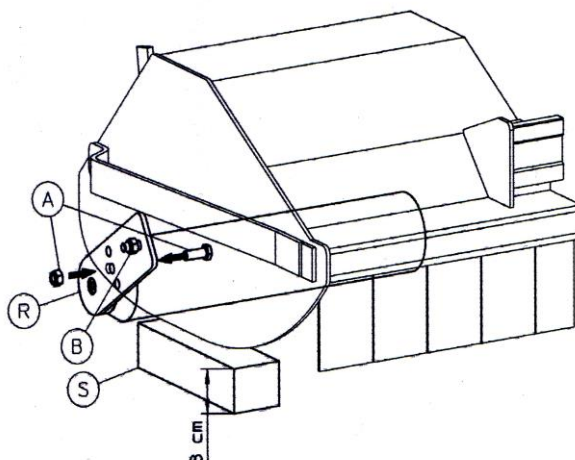
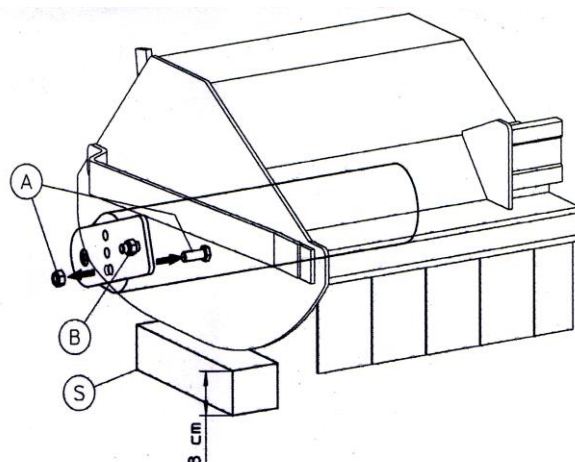
WARNING:
WHEN PERFORMING THE PROCEDURES
DESCRIBED BELOW MAKE SURE THE P.T.O. IS
DISENGAGED.
THE TRACTOR MUST BE BRAKED AND OFF OR
DISCONNECTED.

8.1 ADJUSTING THE LEVELLING ROLLER

Proceed as follows:

1. set the machine on the flat with an approx. 8 cm shim A under its sides;
2. make sure the P.T.O. is disengaged. Brake the tractor and turn it off;
3. totally unscrew and remove bolt A;
4. loosen bolt B;
5. turn the support plate until a hole on the plate is centered with the hole on the side;
6. reinstall bolts A and tighten them well;
7. tighten bolt B

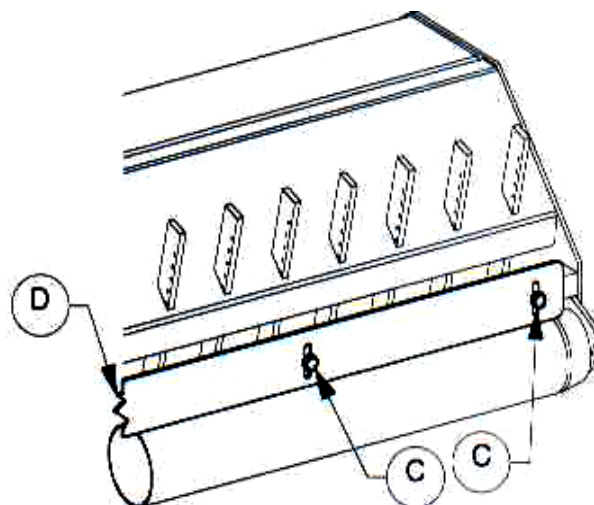
These procedures must be performed on both sides of the roller.



8.2 ADJUSTING THE ROLLER CLEANER

Proceed follows:

1. loosen bolts C on all adjustment slots;
2. adjust the distance of roller cleaner D, bringing it closer or farther away and being sure to position it parallel to the roller;
3. tighten all bolts C.



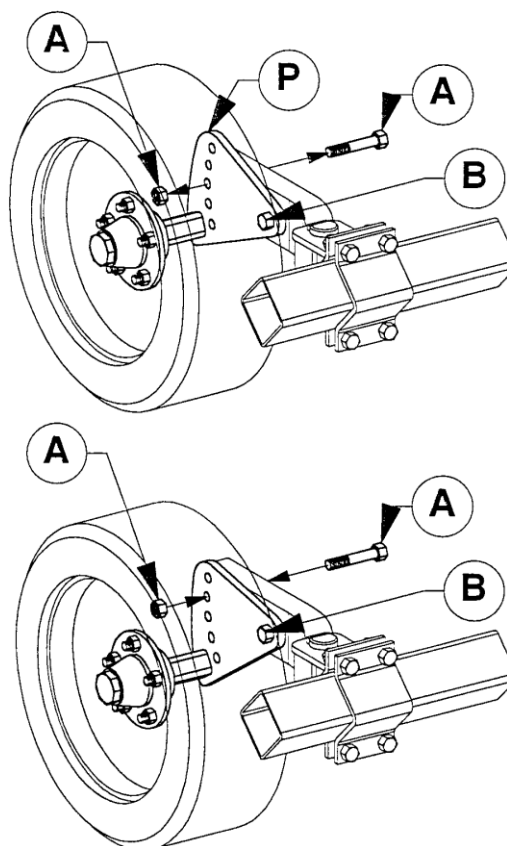
8.3 ADJUSTING THE WHEELS

WARNING:

BEFORE CARRYING OUT THESE OPERATIONS, PLACE THE MACHINE ON A LEVEL SURFACE WITH SPACERS OF THE CORRECT HEIGHT FOR ADJUSTMENTS UNDER THE SIDES, DISCONNECT THE P. T. O., BRAKE THE TRACTOR, SWITCH IT OFF AND REMOVE THE KEYS FROM THE DASHBOARD.

- 1- Completely unscrew bolt A and remove it.
- 2- Loosen bolt B.
- 3- Turn the wheel support plate P until a hole in the plate coincides with the hole in the wheel support bracket..
- 4- Reassemble bolt A and tighten it.
- 5- Tighten bolt B.

The operations are to be carried out on all the wheels supplied, taking care to turn the support plates by the same amount.



9.0 Safe working conditions

9.1 GENERAL PRECAUTIONS

1. Check that the machine has not been damaged during shipment. Immediately notify the manufacturer or the retailer if this is the case.
2. Make sure, before using the machine, that all protective devices are properly in place and in good condition. Replace protective devices immediately whenever they are broken or damaged.
3. Check the tightness of all bolts prior to use.
4. Never use the machine without its safety devices.
5. Keep the machine clean, eliminating all foreign matter that could damage operation or cause harm to the machine operator.
6. Always brake the tractor and turn its engine off before working on the machine's moving parts.
7. Be sure you are on flat terrain when disconnecting the machine from the tractor. Make sure the machine rests firmly on the ground.
8. Avoid jolts and blows that could jeopardize the stability of the machine when it is being installed.
9. Permit only authorized persons with driver's licenses for the tractor to use the machine.
10. Make sure there are not extraneous persons in the work and manoeuvring areas.
11. It is prohibited to stand within the working range of the machine when it is operating. Keep at a safe distance as indicated in this operating and maintenance manual.
12. Never transport persons, animals or property on the machine.
13. Use exclusively original spare parts.
14. **WARNING:** Never wear garments that could get caught in moving parts.
15. Always turn to the manufacturer or to authorized retailers for all clarifications you may require on operating and maintaining the machine.

9.2 SAFE OPERATION AND MAINTENANCE OF THE MACHINE

All due precautionary measures have been taken during design and manufacture of this machine to eliminate all risks for the machine operator. Residual risks, hazards and dangers may remain however regarding operation, use and maintenance and/or repair.

The following section gives all the instructions and information that is necessary or must be adopted to prevent the main risks connected with use of the machine in accordance with current safety regulations. These regard, in particular::

- connection between tractor and operating machine;
- protection of moving drive parts;
- projection of materials;
- noise;
- personal protection devices (DPI);
- stability.

9.2.1 CONNECTION BETWEEN TRACTOR AND OPERATING MACHINE

A common cause of injury regards procedures for hooking-up and releasing the machine from the tractor. Injuries are mainly caused by crushing or torn or injured muscles caused by exerting excess forces.

It is necessary for:

- all adjustments to be done with the machine on the level, the PTO disengaged and with the tractor braked and off;
- always make sure the machine is securely blocked and positioned in place when it is disconnected: this will prevent accidental movements or tipping over which can have serious consequences for persons or property in the vicinity of the machine;
- the tractor operator and the ground-level operator must coordinate their connection and release procedures;
- it is best to employ quick-connection systems or use a specific connection jack.



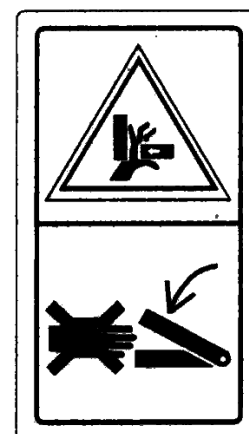
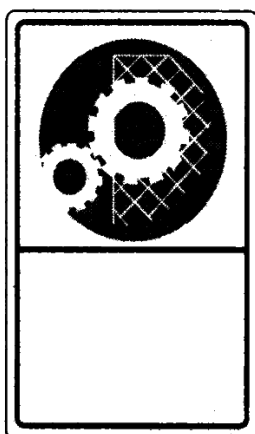
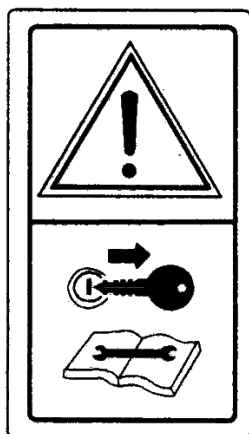
**NO STOP
BETWEEN THE
TRACTOR AND
THE MACHINE**

9.2.2 PROTECTION OF MOVING DRIVE PARTS

Injuries caused by being caught and pulled by moving drive parts are often very severe. They are caused both by inefficient protection due to broken or worn safety devices or by wearing unsuitable garments.

It is necessary for the P.T.O., cardan shaft, and all moving parts:

- to check the presence and condition of all safety guards and devices;
- to replace worn and/or broken safety devices;
- to avoid working in the vicinity of moving parts;
- to turn the tractor engine off before working on the transmission and the machine;
- to always prevent children or extraneous persons from approaching the machine when it is at work;
- to wear suitable close-fitting garments;



BEFORE DOING ANY WORK ON THE MACHINE ALWAYS READ THE OPERATING AND MAINTENANCE MANUAL WITH CARE, STOP THE TRACTOR'S ENGINE AND PULL THE KEYS OUT FROM ITS DASHBOARD.	MAKE SURE SAFETY GUARDS AND DEVICES ARE IN EFFICIENT OPERATING ORDER.	DANGER OF BEING CAUGHT AND PULLED IN. WARNING! DO NOT APPROACH MOVING PARTS.	DANGER OF CRUSHING. WARNING! DO NOT APPROACH REMOVABLE MACHINE PARTS.
--	---	--	---

9.2.3 PROJECTION OF MATERIALS



Materials can be projected by the machine in certain work situations. Pay particular attention to:

- make sure machine tool guards are efficient;
- perform proper routine cleaning and maintenance on the machine;
- check that there are no persons, animals or things within the working range of the machine.

9.2.4 NOISE



Protect your hearing from the noise generated when working with the machine: wear earmuffs or earplugs.

9.2.5 PERSONAL PROTECTION DEVICES



Personal protection devices that comply with current standards in your country must be used in function of the type of job being performed.

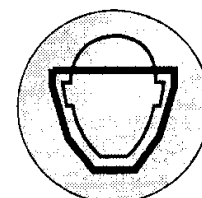
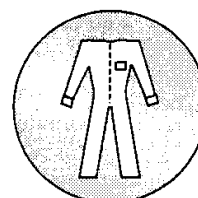
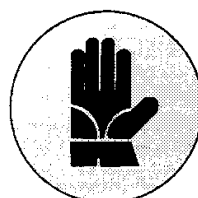
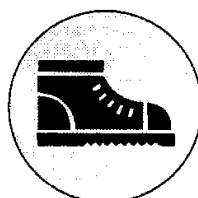
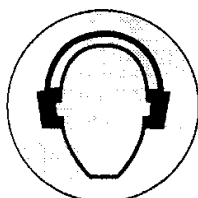
A Personal Protection Device is any equipment destined to be worn or held by the operator in order to protect him against one or more risks. Keep in mind, when selecting personal protection devices, that:

- Personal Protection Devices must be suited for the work conditions;
- they must not generate risks that are greater than the risk they should prevent;
- they must take the worker's ergonomic and physiological needs into account;
- they must adapt to the needs of each single user;
- if multiple Personal Protection Devices must be used at the same time because of the presence of multiple risks then they must be used in such a way that they are compatible with each other.

It is always good practice, when using operating machines, to wear suitable work garments. Avoid any garments that are loose or flappy,

Use the following Personal Protection Devices when performing routine or extraordinary maintenance and/or repairs:

- glasses or visors protecting against projection of splinters or objects;
- leather safety gloves protecting against punctures, cuts, burns, etc.;
- reinforced leather aprons or the like;
- safety shoes;



MANDATORY EYE
PROTECTION

MANDATORY
HEARING
PROTECTION

MANDATORY
SAFETY SHOES

MANDATORY
SAFETY GLOVES

MANDATORY
BODY
PROTECTION

MANDATORY FACE
PROTECTION

9.2.6 STABILITY



Machines for processing terrain are generally large and massive and have irregular shapes. They can, as a consequence, have stability problems both when they are alone and when they are connected to the tractor.

Stability problems can be avoided by carefully positioning them on flat surfaces and leaving sufficient room around them to perform all necessary manoeuvres.

When the machine is coupled to a tractor and becomes an integral part of it from the road circulation point of view it can alter the stability of the tractor or cause driving and working problems.

Remember, to work safely, that the formula given in the highway code to check vehicle stability is also applicable to the tractor/machine combination when it is at work.

$$M \times s \leq 0,2 T \times i + Z (d+i)$$

$$M \leq 0,3 \text{ (prudential value)}$$

$$Z \geq \frac{(M \times s) - (0,2 T \times i)}{(d+i)} \quad \text{(to calculate the ballast)}$$

where:

i = tractor wheel c/c distance (m)

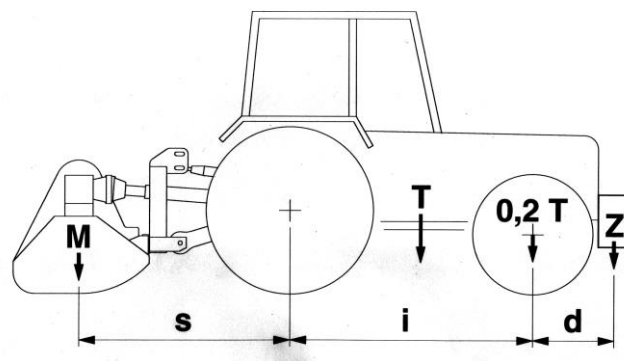
d = distance of the front axle from the front ballasts (m)

s = equipment overhang from the rear axle (m)

T = tractor mass (kg) (art. 275 D.P.R. 495/92)

Z = ballast mass (kg)

M = equipment mass (kg)



At least 20% of the total tractor operating machine mass must bear on the front axle of the tractor when it is in working order.