

INSTRUCTION MANUAL

FOLDING POWER HARROWS

Mark: BERTI Macchine Agricole
Models:



INDIANO



ATLANTICO



Read this manual thoroughly before using the machine



INTRODUCTION.....	4
1 INFORMATION REGARDING THE INSTRUCTION MANUAL.....	5
1.1 MANUAL UPDATES	5
1.2 COPYRIGHT	5
1.3 MACHINE IDENTIFICATION PLATE AND CE MARK	5
1.4 MACHINE DECLARATION OF CONFORMITY	6
1.5 INFORMATION REGARDING THE MACHINE	7
1.5.1 DECLARED USE.....	7
1.5.2 MAIN COMPONENTS	7
1.5.3 DIMENSIONS AND WEIGHTS	8
1.5.4 TECHNICAL DATA.....	8
1.5.5 CENTRAL PTO DRIVE SHAFT.....	9
1.5.5 LATERAL PTO DRIVE SHAFTS.....	9
1.6 NOISE LEVEL AND VIBRATIONS	9
2 SAFETY AND ACCIDENT-PREVENTION STANDARDS	10
2.1 GENERAL SAFETY STANDARDS	10
2.2 FIRE PREVENTION MEASURES.....	12
2.3 SAFETY SIGNS	12
2.4 POSITION OF THE PICTOGRAMS ON THE MACHINE	13
3 USE.....	14
INTRODUCTION	14
3.1 HANDLING AND TRANSPORT	14
3.2 MACHINES SUPPLIED PARTIALLY DISASSEMBLED	14
3.3 TRANSIT ON PUBLIC ROADS	15
3.4 MACHINE TRANSPORT PROCEDURE	15
3.5 VISIBILITY	16
3.6 HITCHING THE MACHINE TO THE TRACTOR	16
3.6.1 HITCHING PROCEDURE.....	16
3.6.2 HYDRAULIC SYSTEM CONNECTION.....	17
3.7 ELECTRICAL CONNECTION	17
3.8 COLLEGAMENTO DELL'ALBERO CARDANICO	17
3.8.1 USING THE PTO DRIVE SHAFT.....	18
3.8.2 LATERAL PTO DRIVE SHAFTS.....	18
3.9 MOVEABLE SIDE PANELS	18
4 STARTING THE MACHINE	19
4.1 CLOSING AND OPENING THE MACHINE	19
4.1 WORK STAGE	20
4.2 RECOMMENDATIONS FOR USE.....	20
4.3 UNHITCHING THE MACHINE	21
5 ADJUSTMENTS.....	21
5.1 ADJUSTING WORK DEPTH	21
5.2 REFINING BAR	21
5.3 GEAR BOX	22
5.4 FLOATING POSITION MOD.: ATLANTICO	22
6 MAINTENANCE	22
6.1 MAINTENANCE OPERATIONS THAT CAN BE PERFORMED BY THE OPERATOR	23
6.1.1 COUPLING TORQUE TABLES	23
6.2 GREASING AND LUBRIFICATION	23
6.2.1 LUBRICATING THE CENTRAL GEAR REDUCER	24
6.2.2 LUBRICATING THE LATERAL GEAR REDUCER (MOD. INDIANO).....	24
6.2.3 LUBRICATING THE LATERAL GEAR (MOD. ATLANTICO).....	24
6.2.4 LUBRICATION OF THE TRANSMISSION BOX.....	25
6.2.5 GENERAL GREASING	25

6.2.6 LUBRICANTS TABLE.....	25
6.3 HOT POINTS OF THE MACHINE	26
6.4 CHECKING WEAR OF TOOLS	26
6.5 TOOLS REPLACEMENT PROCEDURE.....	26
6.6 PROCEDURE FOR REPLACING THE OLEODYNAMIC TUBE	26
6.7 STORAGE – RE-COMMISSIONING	27
6.8 INITIAL START-UP OR RECOMMISSIONING FOLLOWING A LONG PERIOD OF INACTIVITY	27
6.9 SCRAPPING	27
7 SCHEDULED MAINTENANCE TABLE	28
8 TROUBLESHOOTING TABLE	28
9 SPARE PARTS	29
10 WARRANTY	29

INTRODUCTION

This instruction manual contains the description of operation and the instructions necessary for performing the main operations, routine and periodic maintenance of the power harrow correctly, which will hereon be called machine.

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

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

Use of original spare parts and accessories is recommended. As well as invalidating the warranty, use of non-original spare parts could be dangerous, reducing lifespan and duration of the machine and serious injury/damage to persons, animal and objects.

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



ATTENZIONE

For the USER: Before starting to work with the machine purchased, it is mandatory to read this instruction manual which states all of the operational technical indications relative to the correct use of the machine, paying particular attention to all provisions concerning safety. The abuse of performance and the failure to comply with the Safety Standards and use make the operator liable for damage/injury caused to the equipment, objects, persons and animals.

The machine manufacturer does not have direct control over application, method of use and maintenance and it is therefore the user's responsibility to use common sense in the operating areas, doing everything possible to safeguard his own safety and that of third parties, animals and objects, evaluating the hazard every time before starting to work.

Whenever the user delegates the use of the machine to another user, he is responsible for having this instruction manual read thoroughly and checking that it has been understood and implemented.

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



ATTENZIONE

For the DEALER, the RETAILER and the IMPORTER: the person assigned to delivering the machine to the final user must perform application to the tractor. Therefore he must read this instruction manual and understand the content before the machine is assigned definitively. He is also responsible for training the final user and making sure that he has understood everything stated in the instruction manual.

GLOSSARIO

Macchina	Folding power harrow
Tractor	Vehicle equipped with an engine that is used to tow other vehicles, especially agricultural machines.
User	The user is considered as the owner and/or staff, the operator/user assigned to running the machine, cleaning it, performing maintenance and repairs and that can recognise hazards deriving from use of the machine, and therefore prevent them.
Specialised staff	Those persons especially trained and enabled to perform maintenance interventions or repairs that require particular knowledge of the machine, its operation, safety devices and methods of intervention.
Safety staff	Staff assigned to moving persons away from the working range of the machine.
Manufacturer	Company that produces the → Berti Macchine Agricole S.p.A. machine
 PERICOLO	DANGER - This sign indicates an imminent and real hazardous situation, which if not prevented, leads to serious injury and even death.
 ATTENZIONE	ATTENTION - This sign indicates a potential hazardous situation which, if not prevented, could lead to serious injury and even death. Hazards identified by this sign therefore represent a smaller risk of serious injury or death with respect to those indicated by the DANGER sign.
 CAUTELA	CAUTION - This sign indicates a potential hazardous situation which, if not prevented, could lead to slight injury or moderate wounds. The symbol is used to warn that determined practices can lead to consequential events that could cause wounds and personal damage.
 NOTA BENE	

1 INFORMATION REGARDING THE INSTRUCTION MANUAL

This manual is an integral part of the machine and must accompany the same in the event of re-sale and until its demolition.

If the manual is lost or damaged, request a copy from the manufacturer ("BERTI Macchine Agricole S.p.A.", via Musi 1/A – 3, Caldiero – Vr. Tel. +39.045.6139711) or from the Dealer.



The presence of this symbol, in its three versions, indicates that maximum attention must be paid to the subject discussed.

Some devices described in the manual may not be present on your machine. This is due to the set-up selected and the market to which the machine is destined.

1.1 MANUAL UPDATES

The information, descriptions and illustrations contained in the manual correspond with the current technology at the time of marketing the machine.

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

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

1.2 COPYRIGHT

The copyright for this manual belongs to the Manufacturer. This manual contains technical texts, drawings and illustrations, which must not be disclosed or transmitted to third parties in full or partially, without the written authorisation of the Manufacturer.

1.3 MACHINE IDENTIFICATION PLATE AND CE MARK

On the left side of the tractor's hitch of the machine there is the identification plate that gives the following information:

- "CE" Mark;
- Country of manufacturer;
- Name and address of the manufacturer;
- Model and type;
- Serial number with year of manufacturer;
- Weight.



The machine is supplied as per standard with:

- Machine use and maintenance manual;
- Manufacturer's "CE" Declaration of Conformity

1.4 MACHINE DECLARATION OF CONFORMITY



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 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 Direttiva 2006/42/CE 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 EEC Directives 2006/42/CE 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 EU-Richtlinie 2006/42/CE 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 Directive de la 2006/42/CE et 2004/108/CE(*). Nos déclarations que les normes harmonisées suivantes ont été appliquées:

UNI EN ISO 4254-5:2010
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.

MODELLO -- TYPE XXXXXXXXXXXXXXXXXXXXXXXX

MATRICOLA -- N° DE SERIE XXXXXXXX



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, Il 18/03/2016

per la società / for the Company
für die Firma / pour la société

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
Diese hier beigelegte Erklärung ist wesentlicher Bestandteil der Maschine
Cette déclaration de conformité est partie intégrative de l'appareil

Cod. Fisco 03681000464 - P.IVA n° 00681500234 - B.E.A. n° 03681500234 - C.A.B. n° 03681500234

1.5 INFORMATION REGARDING THE MACHINE

1.5.1 DECLARED USE

The folding power harrow is an agricultural machine with a working width from 3 meters and above, designed and built exclusively for agricultural use in open fields.

It is equipped with a three point hitch so that it can be hooked to the tractor's hydraulic lift.

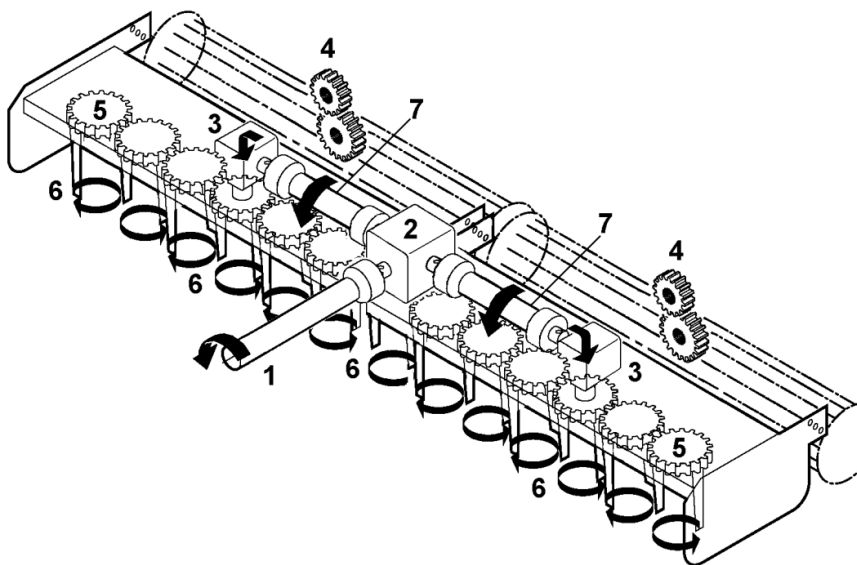
The machine is activated by the tractor's power takeoff, using the PTO drive shaft (1) connected to the central gear reducer (2).

From the central gear reducer (2) there are two lateral PTO drive shafts (7) that connect the lateral gear reducers (3) or lateral gear boxes (4) (for the Atlantico model) that then transmit the movement to two series of gears (5) which turn the tine bars, each one equipped with two teeth (6).

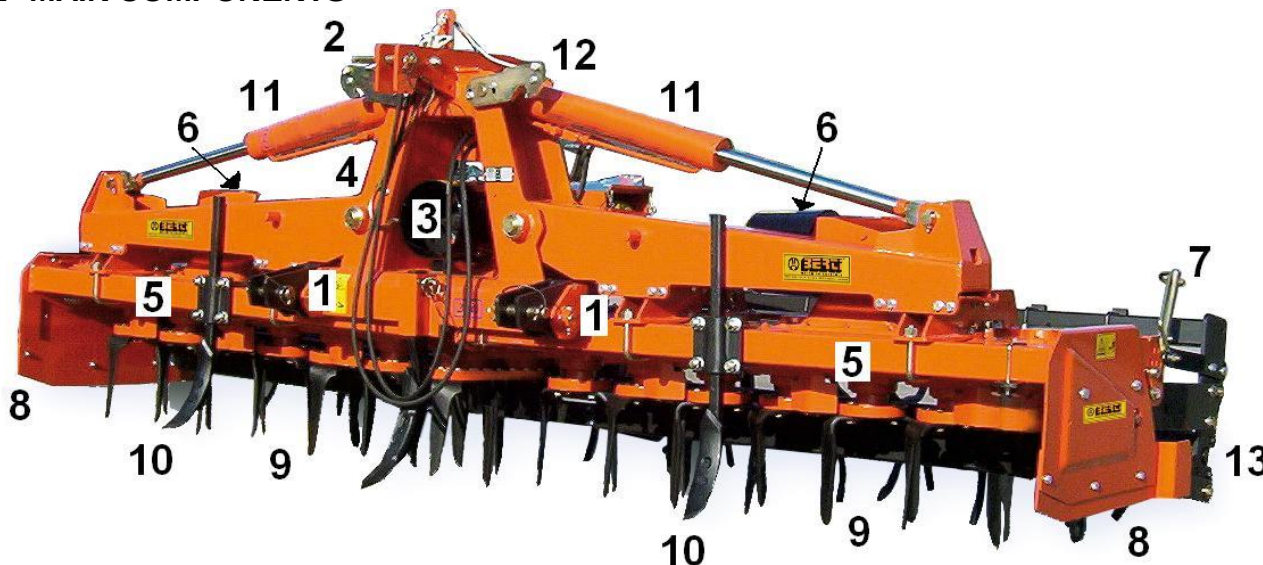
Due to the work of the gears, the tine bars move inversely in relation to each other, so excellent aeration and levelling of the soil is obtained, guaranteeing the best seedbed.

The degree of aeration depends on the speed of the tractor and the rotation speed of the teeth (6), which on the Atlantico model can be changed using the lateral gear boxes (4).

The construction with two separate series of gears fixed on a special frame allows it to be folded using hydraulic cylinders to reduce its size during transport to less than 2.5 meters.



1.5.2 MAIN COMPONENTS



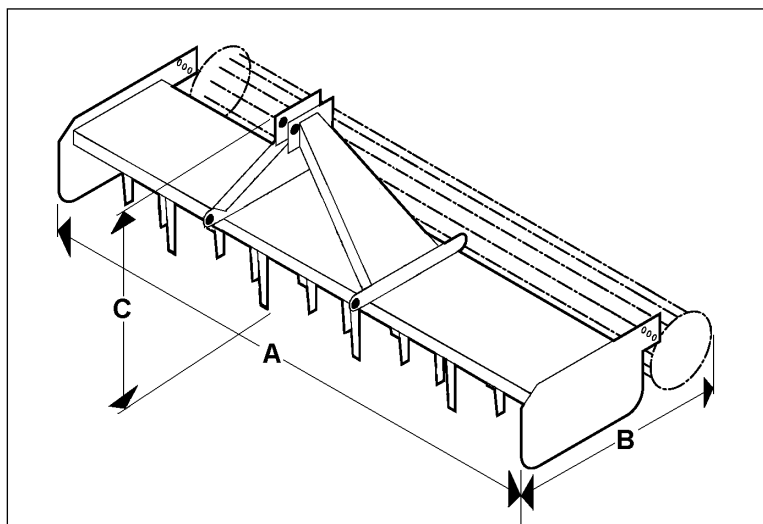
Pos.	Name	Pos.	Name
1	Lower arms tractor lifting device 3 point hitch	8	Moveable side panels
2	3 point hitch tractor lifting device 3 point hitch	9	Tine bars and teeth
3	Central gear reducer	10	Eradicator
4	Universal joint support	11	Harrow opening/closing cylinders
5	Gear transmission box	12	Closing safety hooks
6	Gear reducers or lateral gear boxes	13	Rear roller
7	Rear bar adjustment crank		

1.5.3 DIMENSIONS AND WEIGHTS

The drawing and the following diagram state all maximum clearance dimensions of the machines complete with rear roller.

The weight is relative to the machine complete with PTO drive shaft and roller (see table), excluding any accessories.

The diameter indicated in centimetres is in relation to the external roller diameter.



Model	Size	A cm	B cm	C cm	 Ø cm Kg		 Ø cm Kg		 Ø cm Kg		 Ø cm Kg	
					cm	Kg	cm	Kg	cm	Kg	cm	Kg
INDIANO	300	319	160	120	43	1315	48	1335	47	1405	48	1480
	360	366				1480		1500		1585		1685
	400	413				1645		1675		1760		1895
ATLANTICO	400	413	160	130	49	1990	55	2075	47	2095	48	2210
	450	460				2080		2155		2175		2340
	500	507				2170		2230		2250		2475

1.5.4 TECHNICAL DATA

Model	Size	Working width cm	Trans. width cm	Tractor hitches cat.	Power min/max Hp	n° PTO revs.	n° rotor revs.	n° teeth	Maximum working depth cm.
INDIANO	300	314	200	2	80/150	1000 1"3/8 Z=6	357	12+12	28
	360	361	200		100/150			14+14	
	400	408	200		130/150			16+16	
ATLANTICO	400	408	240	2/3	120/230	1000 1"3/8 Z=6	233 285 348* 427	16+16	28
	450	455	240		135/230			18+18	
	500	502	240		150/230			20+20	

1.5.5 CENTRAL PTO DRIVE SHAFT



ATTENZIONE

Every machine is supplied complete with «CE» marked universal joint, with safety device against overloads.

It is prohibited to exchange the supplied universal joint with joints different to the original as the correct margin of safety is no longer guaranteed.

The table gives the dimensions and features for recognition of the universal joint relative to each individual machine.

The PTO drive shaft guards must always be efficient, must be controlled periodically and fixed with the relative chains to prevent their rotation.

Read the instructions contained in the instruction book attached to each universal joint.

Model	L mm	A	B	
INDIANO	900	1"3/4 Z=6	1"3/8 Z=6	
ATLANTICO	900	1"3/4 Z=6	1"3/8 Z=6	

1.5.5 LATERAL PTO DRIVE SHAFTS



ATTENZIONE

On the lateral transmission of each machine there are two universal joints equipped with safety devices against overloads.

Replacing the provided universal joint with other joints that are different than the original is absolutely prohibited since the correct safety margin is no longer guaranteed.

The table shows the dimensions and characteristics of the lateral universal joints for each individual machine.

The PTO drive shaft guards must always be kept efficient; they should be periodically inspected and fastened with chains to stop them from rotating.

Modello	L mm	A	B	V	R mm	
INDIANO	760	1"3/8 Z=6	1"3/4 Z=6	12x60 8.8	60	
ATLANTICO	900	1"3/8 Z=6	1"3/4 Z=6	12x60 8.8	60	

V= bullone di sicurezza R= raggio di lavoro

1.6 NOISE LEVEL AND VIBRATIONS



PERICOLO



The machine exceeds 80 dB (A) also in idle running periods and hearing must be protected from the noise generated during work processes: use hearing protection or ear plugs.

It is mandatory for the user to measure sound emission from the tractor - mulcher unit following installation and always before commissioning the machine, in compliance with that envisioned by the Laws in force.

The noise level of the tractor - mulcher unit may increase through time due to wear: it is recommended to periodically evaluate the risk of exposure to noise.

The use of PPD is mandatory and they must guarantee the reduction of the noise level recorded in compliance with the Laws in force.

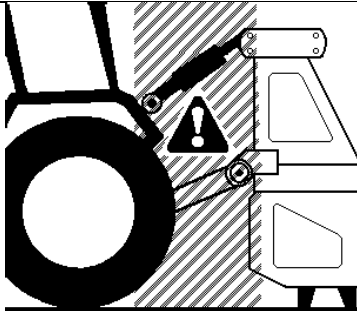
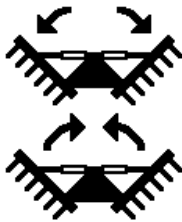
2 SAFETY AND ACCIDENT-PREVENTION STANDARDS

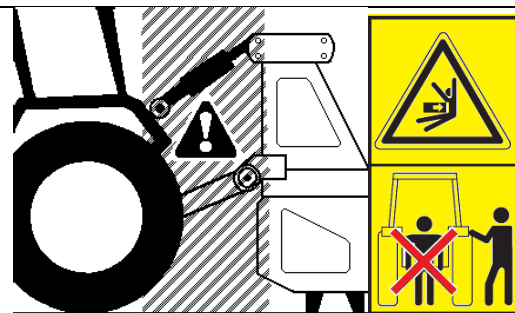
2.1 GENERAL SAFETY STANDARDS

Correct use of the machine, strict observance of the Standards indicated herein and the rigorous application of all precautions aimed at preventing dangerous situations, contribute to averting accidents or injuries, ensure better and longer operation of the machine and reduce faults to a minimum.

"BERTI MACCHINE AGRICOLE S.P.A." declines any objective and subjective liability in cases where the regulations indicated in this manual have not been applied and respected.

 PERICOLO	The machine is not designed to be used in sectors other than the agricultural sector and any use different to that specified is considered improper.	
	The machine must be used by a single operator driving the tractor. It is mandatory for the user to check the correct tractor - mulcher coupling.	
	Before getting off the tractor and before any maintenance on the mulcher, engage the parking brake, switch off the engine, remove the keys from the dashboard.	
	It is prohibited to abandon and/or leave the tractor-mulcher unit when the tractor is running.	
	During use, the user must have sufficient visibility of the work areas deemed dangerous. Therefore it is good practice to keep the tractor mirrors and windows in an excellent state.	
	The machine must only be used by authorised, educated and appropriately trained staff. As well as having read the instructions contained in this manual, the user assigned must have understood and assimilated the same, must have had sufficient preparation regarding the correct use of the machine, must have a driving license and be an adult. The operator must contact the manufacturer if in doubt regarding use of the machine and interpretation of this manual.	
	Never use the machine without knowing its features.	
	The manual must always be readily available so that it can be consulted when necessary. If it is lost or damaged, request a replacement copy from the manufacturer.	
	The user must use the safety devices and personal protection devices (PPD) during use, maintenance, regulation, repairs and handling of the machine.	
	The machine may emit dusts during use with dry products (hay, straw, etc.). It is recommended to periodically check the cab ventilation system filter and to always use suitable protection systems for the respiratory tract, such as dust masks.	
	The operator assigned to the machine must not wear clothing that can cause entanglement.	
	It is prohibited to use the machine to lift persons, animals or objects.	
	It is prohibited to use the flexible hoses as handholds. These components are mobile and are not a stable support.	
	The work area must be inspected before using the machine, removing any stones, scrap iron, steel cables, manholes, stumps and all materials and obstacles without limits, which can constitute a source of danger, accident and serious injury/damage to the user, persons, animals and objects.	
	The user must make sure that no person or animal stops within the machine work range during operation of the same. The user is responsible for stopping the machine immediately and clearing persons and animals from the work range. Never activate the machine near to persons or animals within or transiting through the machine working range.	
	If the machine is to be used on roads and public areas, all precautions must be taken to protect persons, animals and objects, for example using safety staff, warning signs, positioning them at the limits of the machine working range, in compliance with the Laws in force in the country of use.	
	Never work in areas with steep counterslopes, on slippery land and in areas/zones that reduce tractor adherence to the ground. Always pay great attention when changing direction.	
	Use the machine during the day and with perfect visibility.	
	It is prohibited to work in adverse weather conditions such as storms, snow, high winds, rain, fog etc..	

 PERICOLO	Do not operate the machine on muddy, sandy or soft ground.	
	Pay attention to the risk of unintentional contact of the machine with high voltage overhead lines.	
	Do not use the machine when ill, tired or under the influence of medication, drugs or alcohol..	
	Carefully check the machine each time before starting it..	
	Before using the machine, ensure that all the safety devices are correctly positioned and in good working order. If these are broken or damaged, replace them immediately.	
	It is prohibited to remove or tamper with all guards and/or safety devices.	
	Make sure that the safety pictograms are in good condition, legible and clean. If the pictograms have deteriorated, they must be replaced with other originals obtained from the manufacturer and placed in the position indicated in the instruction manual (paragraph 2.3). If dirty, clean them with a damp cloth.	
	The signs applied to the machine provide a series of important instructions: comply with them for your own safety.	
	It is prohibited to make any modification that alters the original state of the machine.	
	Any arbitrary modification made to this machine relieves the manufacturer from any liability for damage or injury, which can happen to the operators, third parties and objects.	
Keep the machine clean, eliminating foreign materials (debris, tools, various objects), which may damage its functioning or harm the operator.		
The area between the tractor and the machine is very dangerous, before accessing the same, make sure: • that the propeller shaft rotation has stopped • that the machine rests stably on the ground. • The tractor is off • that the parking brake is engaged • that a wedge or stone is inserted under the wheels.		
During machine opening and closing, make sure that there are no people, animals or objects in the machine's radius of action.		
	The following paragraphs list other very important Safety Standards. It is mandatory to read this instruction manual entirely before using the machine.	



2.2 FIRE PREVENTION MEASURES

 PERICOLO	Keep an extinguisher with suitable capacity on board the tractor and periodically service the same. The extinguisher must only be used by staff capable of operating it, therefore it is the user's responsibility to supply training courses.
	It is mandatory that staff assigned to operating the machine is informed regarding the principal procedures in the event of fire.
	Do not use the machine in areas with risk of explosions and/or fire.
	Maintenance residues, e.g. cloths or material replaced containing inflammable substances must be kept away from sources of ignition and disposed of in compliance with the Laws in force in the country of use.
	Use suitable extinguishing equipment: e.g. Carbon dioxide, foam, chemical powder.
	Do not weld in the proximity of tanks, pipes, cans, electrical cables or flammable materials in general.
	When welding protect flammable parts with appropriate guards.

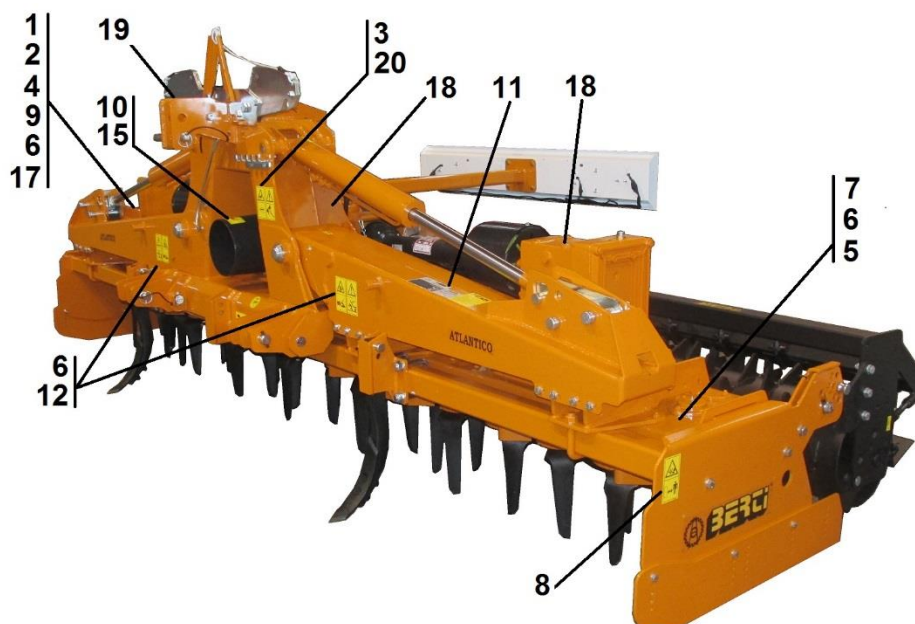
2.3 SAFETY SIGNS

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

1		ATTENTION: Read the instruction book before starting to operate.	2		Before any maintenance operation, stop the machine, rest it on the ground and consult the instruction book.
3		ATTENTION: Pipes with fluids. In the event of breakage of high pressure flexible hoses, pay attention to the jet of oil.	4		ATTENTION: it is prohibited to climb onto or be transported by the machine.
5		ATTENTION - DANGER never approach a working machine	6		ATTENTION - DANGER shearing hands.
7		ATTENTION – DANGER of projecting objects. Keep at a safe distance.	8		ATTENTION – DANGER of contact with rotating tools. Keep at a safe distance
9		Danger of crushing during the opening phase. Keep at a due distance from the machine.	10		ATTENTION - DANGER of entanglement with the PTO drive shaft. Do not place hands near moving parts.

11		PERSONAL PROTECTION DEVICES	12		Danger of crushing during opening. Keep a safe distance away from the machine
13		OIL LEVEL.	14		GREASING POINTS.
15		1000 rpm, mandatory working speed and direction of rotation of the PTO; working speeds must not be changed	16		LIFTING POINT.
17		ATTENTION – DANGER Wait until all moving components have completely stopped	18		Risk of scalding, do not touch the indicated surfaces during and after use.
19		Where applied it means that the component has a safety lock function for the machine, always make sure it is working correctly when used	20		Do not stand near the operator's platform with high-pressure flexible pipes unless protected by sheaths.

2.4 POSITION OF THE PICTOGRAMS ON THE MACHINE



3 USE

INTRODUCTION

	Before using the machine, the manual must have been read thoroughly, understood and you must have familiarised with the machine. Use is recommended by skilled and suitable trained persons.
 PERICOLO	Before climbing down from the tractor and before any maintenance operation on the tillers, engage the parking brake, switch the engine off and remove the ignition keys from the dashboard.
	The safety of the user and the persons present in the vicinity depend on his capacity of judgement and caution when using the machine. It is therefore necessary to be fully aware of its functionality and all Safety Standards relative to its use.
	The user must use the safety devices and personal protection devices (PPD) during use, maintenance, regulation, repairs and handling of the machine. 
	The machine must always be in good working order and must only be repaired using original spare parts.

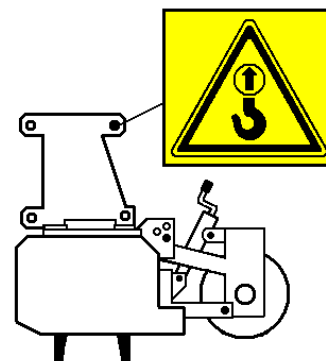
3.1 HANDLING AND TRANSPORT

Pay maximum attention to safety during loading and unloading operations, which must be performed by qualified staff. (slingers, forklift operators etc.). Check suitability of the lifting means by referring to the dimensions and weights table on page 8.

If the machine must be lifted, a suitable hook and lifting chain must be used, applied in the point indicated in the pictogram.

To transport the machine use a vehicle with adequate power and dimensions and appropriately fitted.

Once loaded, the machine and any detached parts (e.g. the propeller shaft), must be fastened down using anchoring ropes.



The operations stated can have dangerous situations; moreover, given the dimensions and weights of the parts, a suitable lifting means must be used.

3.2 MACHINES SUPPLIED PARTIALLY DISASSEMBLED

Per motivi d'ingombro, possono essere fornite macchine con gruppi staccati, **comunque contenuti e fissati nello stesso imballo**. Normally they are the side and front guards, and/or the roller whose weight varies according to width and type.

Assemble these parts, also making reference to the spare parts catalogue tables.

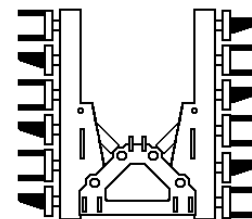
In particular, respect the values of the coupling torques of the screws supplied, as indicated in the table on page 23.

3.3 TRANSIT ON PUBLIC ROADS



ATTENZIONE

If you need to travel over a public road, you must close the machine (see chapter 4.1) to reduce its size as indicated in the regulations. Also check that all parts of the machine are intact and in good condition. The operator must also inspect and bring the machine up to regulations in full compliance with current Highway Code Regulations for the country where it is being used. In case you have to travel a public road, you are expected to strictly comply with the Highway Code, paying particular attention to speed.



Moreover, it is important to check the following before going onto public roads:

- It is mandatory to equip the vehicle with a flashing yellow or orange light.
- you must thoroughly clean the tractor tyres from mud residues
- the tractor PTO must be disconnected
- check that all machine parts are integral and in good working order
- that the machine is blocked and does not swing sideways, operate on the lifting device adjustment chains
- that the guards are present for the elements projected outside the clearance area
- if envisioned, clearance signs must be applied
- that load limits on the axles are respected. (see next chapter)
- the machine is high enough with respect to the ground, in order to prevent contact with the same

3.4 MACHINE TRANSPORT PROCEDURE



ATTENZIONE

The weight of the machine modifies the stability of the tractor-tiller unit, affecting the ability to steer and brake, therefore you must travel at moderate speed.

In particular, remember that the front axle must always be burdened with a load equal to at least 20% of the tractor weight. Check the lifting capacity and stability of the tractor via the following formula and, if necessary, apply ballasts to the front.

				$M \times (S+E) \leq 0,2 \times T \times i + Z (D + i)$	
<i>i</i> = tractor wheel c/c distance <i>D</i> = distance of the front axle from the ballasts <i>S</i> = distance between the centre of the rear axle and the centre of the lower arms hitch spheres of the tractor lifting device <i>E*</i> = distance from the plough barycentre to the lower arms hitch spheres of the tractor lifting device (see table below) <i>T</i> = tractor mass + 75 kg (operator) <i>Z</i> = ballast mass <i>M**</i> = machine mass (see dimensions and weights of page 8)					
Quota E mm	INDIANO 800	ATLANTICO 850			

If the machine is assembled onto tractors that were type-approved and registered before 6 May 1997, check that the following formula is respected: $M < 0.3 \times T$

3.5 VISIBILITY

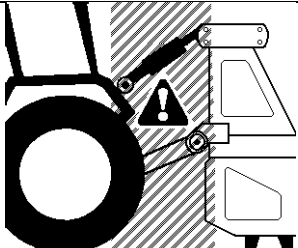


ATTENZIONE

The work areas can be controlled with the tractor rear view mirrors and the operator's sight. When reversing dead spots may be created, which are not visible in the rear view mirrors.

3.6 HITCHING THE MACHINE TO THE TRACTOR

Before installing the machine, check that it is in perfect working order, resting on the ground and in a stable position. Check that the lubricants are at the correct level and that all parts subject to wear and/or deterioration are perfectly efficient and that the guards are integral and functioning.

 PERICOLO	It is mandatory to check the correct tractor - mulcher coupling. The lifting capacity and the stability of the tractor must respect the parameters described in chapter 3.4 The area between the tractor and the machine is very dangerous, before accessing the same to make the connection: • operate on flat and solid ground • switch the tractor is off • engage the parking brake • move away all unauthorised persons from the machine working range 
 ATTENZIONE	Before using the machine you need to familiarise with the controls and their operation. Always keep all body parts inside the tractor cab in all circumstances, to minimise the possibility of exposure to any external dangers Before getting off the tractor and before any maintenance on the mulcher, engage the parking brake, switch off the engine, remove the key from the dashboard.

3.6.1 HITCHING PROCEDURE

Check the compatibility of the tractor with the machine to be connected (power, hitches category, PTO speed etc.), respecting the values stated in the technical data table on page 8.

Coupling to tractors with higher or lower power could cause dangers due to stability and unexpected breakage



The user must use the safety devices and personal protection devices (PPD) during use, maintenance, regulation, repairs and handling of the machine.

These procedures are very hazardous.

Avoid standing in front of the machine when it is approached by the tractor.

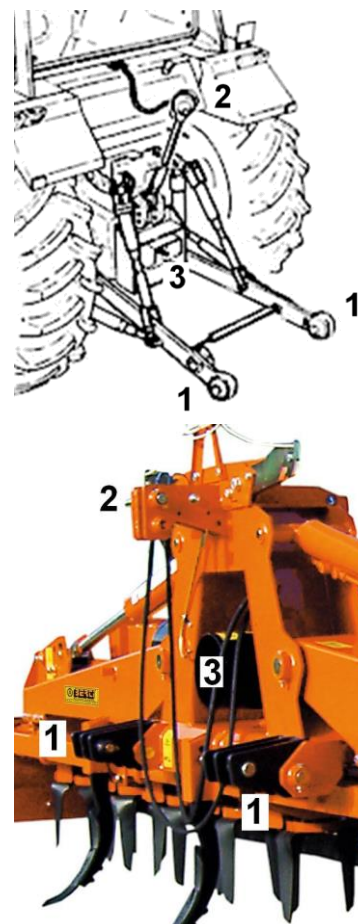
Avoid the presence of extraneous persons.

The P.T.O. must be disengaged during these installation procedures.

After having verified that previously described, connect the machine to the tractor, observing the following procedure:

- Remove the shear pins and the pins from the machine hitch ports 1
- With the tractor in reverse gear and by activating the lifting device, fit the lower arms 1 with the corresponding lower hitch ports 1 of the harrow
- Insert the pins and block them with the relative shear pins
- In the same way, connect the third point of the tractor 2 to the corresponding port 2 on the machine
- Adjust the third point in a way that the machine is horizontal to the ground

ATTENTION: MAKE SURE THE SHEAR PINS HAVE BEEN INSERTED INTO THE PINS OF THE HITCH PORTS 1 AND 2



ATTENZIONE

3.6.2 HYDRAULIC SYSTEM CONNECTION

INDIANO and ATLANTICO folding harrows are equipped with a double-acting hydraulic system for closing them during transport. Make sure the pins and any tractor couplings as well as safety locks are functioning properly and in the correct seats. Connect the two hydraulic circuit quick connect couplings to the two tractor sockets (a pressure of 160/190 bar is needed). Follow the direct line from the cylinders to the tractor, making sure to keep the tubes far away from moving parts.

At this point the equipment is still lying on the ground, hooked to the tractor with the 3 point hitches and with the hydraulic fittings connected.

3.7 ELECTRICAL CONNECTION

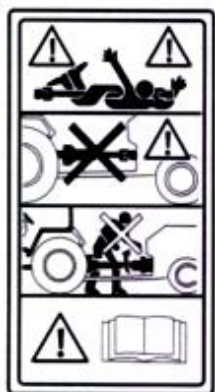
In order for the rear light bar to work, the 7-pin plug on the machine must be connected to the 7-pin plug on the tractor. The system must be at 12 volts.

The 7-pin plug on the machine is connected according to the diagram shown. Before using the machine, always check that all lights are functioning properly.

If they must be changed, only use 12 volt bulbs, of the same strength and size as those removed.

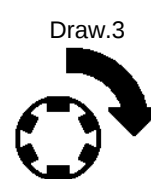
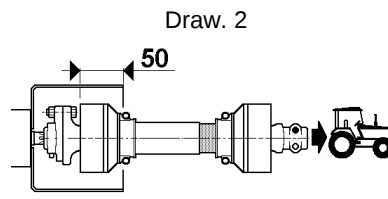
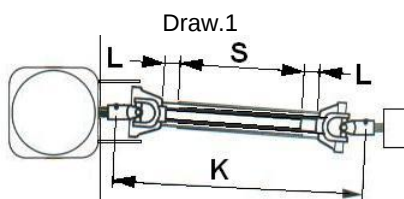
	N°	Use	colour	
1	L	left indicator	yellow	
2	31	mass	white	
3	-	-	-	
4	R	right indicator	green	
5	58 R	Right and Left position light and plate light	brown	
6	54	stop light	red	
7	-	-	-	

3.8 COLLEGAMENTO DELL'ALBERO CARDANICO



During operation, the PTO drive shaft can cause risks and hazardous situations. Therefore:

- read and keep the use and maintenance handbook attached to the PTO drive shaft;
- only use the PTO drive shaft supplied with the machine;
- check that guards are properly installed, integral and effective;
- replace worn, broken or missing guards;
- switch the tractor motor off before working on the PTO drive shaft or on the machine itself;
- never allow children or unauthorised persons come near to the machine when it is operating and/or undergoing maintenance;
- when not in use, rest the PTO drive shaft on a relevant support;
- wear suitable garments (that cannot be caught by the machine or pulled into it), especially close-fitting garments (e.g. work overalls with safety wrists and ankles)..
- On first installation of the PTO drive shaft, measure the distance K between the P.T.O. buttons grooves with the machine resting on the ground, level and with the overgear axially aligned with the tractor's P.T.O. If necessary, adapt the length of the PTO drive shaft, making sure that the telescopic tubes overlap for a length S that permits between 40 and 50 mm of play L at their ends. This operation must be carried out on commissioning, at every replacement and every time the machine is installed on another tractor.(draw. 1)
- After assembly of the PTO drive shaft, fix the guard using the appropriate chains on both sides. When the machine is put to rest, house the PTO drive shaft on a relevant support, envisioned on the three-point drawbar. After installation of the propeller shaft, lift and lower the machine several times to check that the shaft pipes are free to slide without jamming and that the minimum overlapping distance **S** is **150 mm.**
- Check that there is overlap of at least 50 mm between the propeller shaft guard and the guard mounted on the machine PTO, as envisioned by the Safety Standards (Draw. 2)
- Check the direction of rotation of the propeller shaft PTO. Looking from the rear of the tractor it must turn clockwise.(Draw. 3)



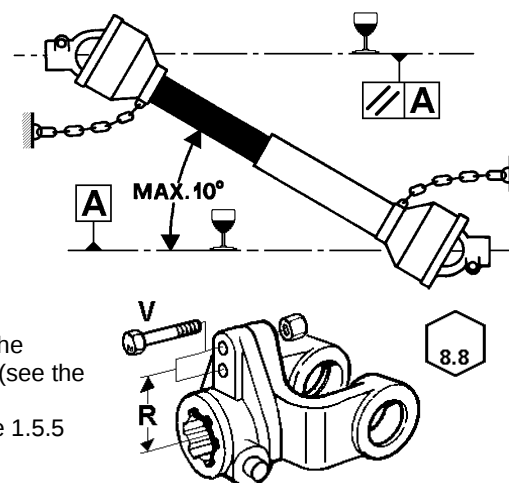
3.8.1 USING THE PTO DRIVE SHAFT

Read the instruction book attached to the PTO drive shaft thoroughly. To guarantee correct use and long duration, the following Standards must be respected:

- Adjust the 3rd tie-rod in a way that, during the job, the power take-offs always work in parallel. Trunnion breakage is prevented in this way.
- Always disconnect the PTO when the PTO drive shaft makes an angle that is too wide (over 10 degrees) and when it is not used..
- Block the rotation of the PTO drive shaft guard using the chains supplied.

Each PTO drive shaft is fitted with a shear bolt V against overloads, in the event the safety bolt V is broken it is to be replaced with a bolt V of equal size and material (see the value on the bolt head).

It is positioned in the exact hole indicated (R) for each type of machine. See table 1.5.5 which shows the V and R values



ATTENZIONE

Grease the PTO drive shaft according to the recommendations envisioned in the instruction manual referring to the same.

Do not work with PTO drive shafts that have no protections.

Read the instruction handbook attached to the PTO drive shaft thoroughly.

Check that the safety pins are well inserted and efficient.

Make sure the restraining devices have been inserted inside the connection jack.

3.8.2 LATERAL PTO DRIVE SHAFTS

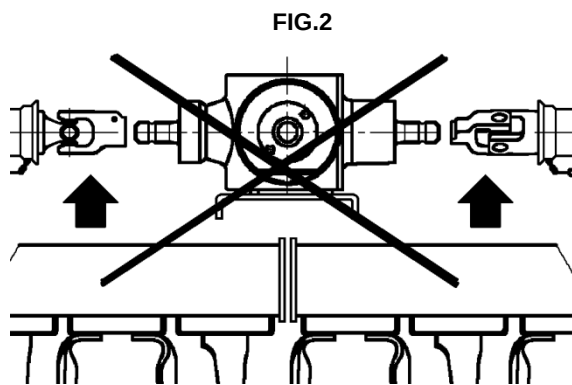
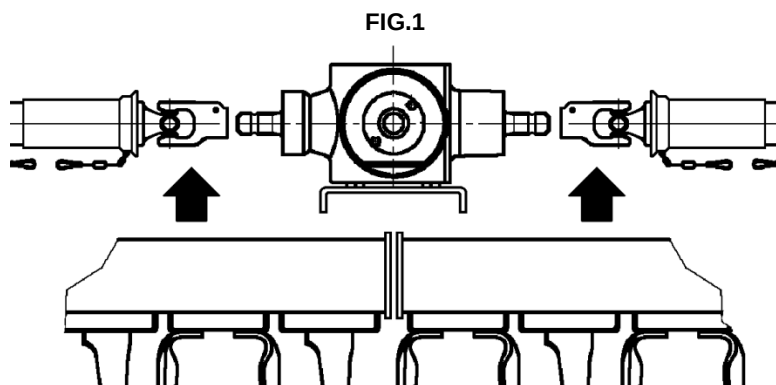


ATTENZIONE

For any operations on the lateral drive shafts, cleaning, replacement or other, pay close attention to the adjustment of the prongs of the two lateral shafts on the central gear reducer; they must always be in phase as indicated in Fig. 1

If mounted NOT in phase as in Fig. 2, closing the machine leads to breakage.

The Manufacturer denies all responsibility due to failure to comply as described.



3.9 MOVEABLE SIDE PANELS

The moveable side panels are safety components; during work they must penetrate the ground for at least 10 mm, when worn they must be replaced. Their height can be regulated using bolts B.



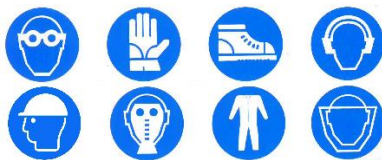
4 STARTING THE MACHINE



ATTENZIONE

Before each start-up, follow that stated below:

- Do not allow persons, animals or objects to approach or stop in the machine's work range.
- Before using the machine you need to familiarise with the controls and their work operation.
- Always keep the guards integral, in position and perfectly efficient.
- The tractor must have the engine off, the parking brake engaged, the power take-off disengaged, the ignition key removed from the dashboard and kept in a safe place by the user.
- Always inspect the machine, controlling tightness of all screws and nuts and the presence of damage which must be repaired before start-up, in order to take the machine back to its original state.
- Check that the position and the conditions of the ground in the work area do not jeopardise the stability of the tractor – tiller in any way.
- Make sure that the safety pictograms are in good condition. If the pictograms have deteriorated, replace them with originals obtained from the manufacturer and place them in the position indicated in the instruction manual. Make that all safety pictograms are legible. Clean them using a damp cloth.
- The user must use the safety devices and personal protection devices (PPD) during use, maintenance, regulation, repairs and handling of the machine.



4.1 CLOSING AND OPENING THE MACHINE

Make sure that there are no people, animals or objects located inside the machine; on the tractor, operate the lift and raise the harrow about 50 cm from the ground, make sure that cord C for opening the safety hooks directly reaches your driving position and that you can move it without difficulty.

Now we are ready for the opening and closing procedure.

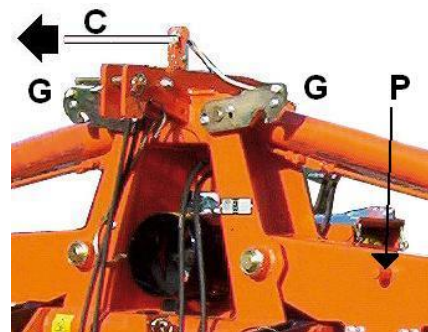


ATTENZIONE



CLOSING

- operate the manifold lever that closes the machine and proceed with the complete closing manoeuvre until the two moveable parts of the harrow have reached the limit and the pins P correspond with the hook seats G
- Loosen the grip on the cord so that the descent of the hooks G allows them to completely enter into the pins P
- Operate the manifold lever which opens the equipment so that the pins push against the end hook seat. In this position the machine is completely blocked, preventing any accidental opening.



OPENING

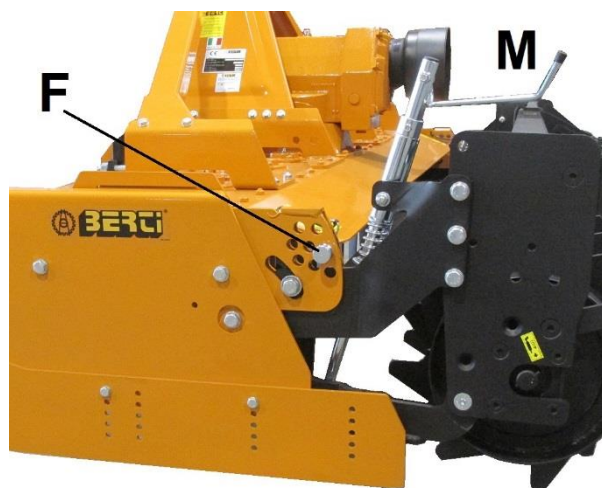
- Operate the hydraulic manifold lever that closes the harrow until the limit is reached, unblocking the 2 hooks G
- Pull the cord A and lift the two hooks G
- Slowly operate the hydraulic manifold lever and open the equipment, keeping the cord A taut, proceed without jolts until both of the halves of the harrow are in a horizontal position.

Perform opening and closing manoeuvres very slowly, always paying close attention to be sure that there are no people, animals or objects nearby, in order to ensure the complete load of the hydraulic system (about 5 litres).

4.1 WORK STAGE

Make sure that all previously-described Standards are satisfied. With the machine correctly hitched to the tractor, move towards the working area and then proceed as follows:

- 1) Operating the lift control, lower the machine until the tines of the harrow are 5/10 cm from the ground;
- 2) Engage the PTO and gradually accelerate the tractor speed until the PTO tractor engine speed is reached;
- 3) Operating the lift controls, slowly lower the harrow until it is resting at its limit on posterior roller adjustment pin F, put it in gear and begin working (the lift must remain in the floating position);
- 4) Travel a short distance, stop the rotation of the tines, turn the tractor off and then check:
 - A. **The depth of the work:** adjustable through the position of the 2 lateral pins F
 - B. **the levelling of the ground:** adjustable using the 2 cranks M that adjust the refining bar
 - C. **aeration:** adjustable with the tractor speed or the variation of the number of rotations if the machine has a gear box (for adjustments see chapter 5)



4.2 RECOMMENDATIONS FOR USE

- Never curve or reverse with the work machine in the ground fig. 1 and fig. 2
- Adjust the tractor third point in a way that the machine always works slightly inclined backwards in a manner that angle A is always equal to 90° or slightly larger (2° or 3°). Entry into the ground to be worked is thus favoured Fig.3
- Working machine speed must never exceed 8 km/hour
- Always put the machine into the ground slowly, avoiding sudden downward movements
- Moderate speed on stony ground
- When working on hills, if possible proceed «by climbing» up the slope..

Fig.1

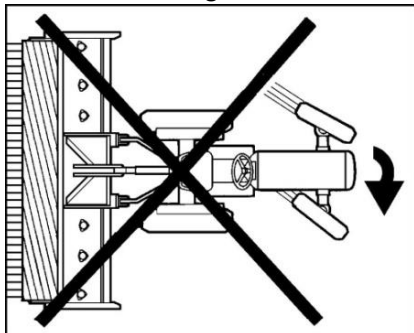


fig.2

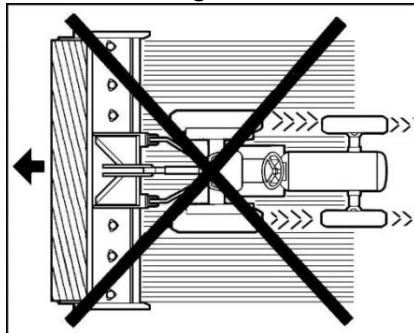
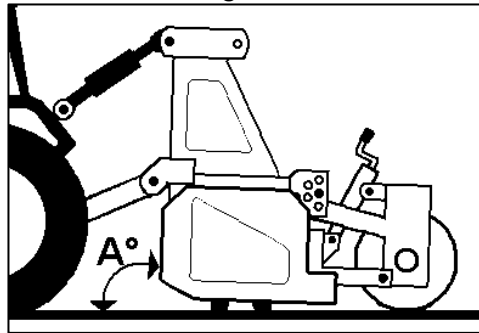


fig.3



ATTENZIONE

During the work phase, the rotating blades may lift stones or sharp objects. Therefore check that there are no persons or animals within the machine working range and that the operator is protected from any projected pieces.

4.3 UNHITCHING THE MACHINE



The procedures described below can create danger situations: keep extraneous persons away from where the machine will be positioned and from its immediate vicinity. The user must use the safety devices and personal protection devices (PPD) during use, maintenance, regulation, repairs and handling of the machine.



Comply rigorously with the following instructions in order to unhook the machine from the tractor:

1. Make sure that the tractor is on flat, stable ground;;
2. Disengage the P.T.O.;
3. Put the tractor's brakes on;
4. rest the machine completely on the ground and switch the tractor off;
5. disconnect the third point fixing pin;
6. remove the pins from the lower arms and move the lifting device downwards
7. Disconnect the cardan shaft from the tractor and rest it on the bracket;
8. Remove the two rapid couplings on the hydraulic tubes from the tractor manifold
9. disconnect the 12 volt plug from the rear light bar

Put the connection pins and safety clip pins back in their housings on the drawbar so you will be sure to find them when you use the machine again.

5 ADJUSTMENTS



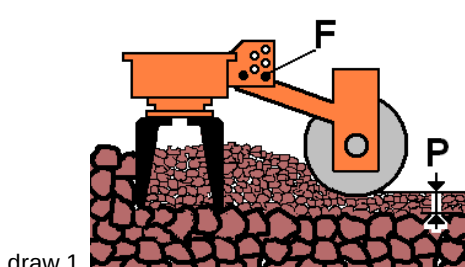
Attention: be sure that the P.T.O. is disengaged. The tractor must be braked and switched off or disconnected.

5.1 ADJUSTING WORK DEPTH

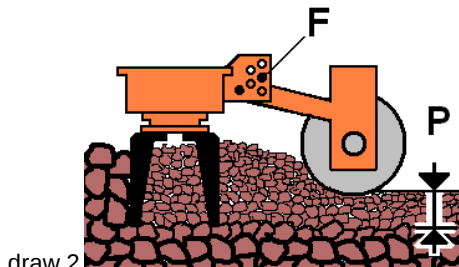
The adjustment of the work depth P of the machine is determined by the position of the rear levelling roller.

Adjust the rear levelling roller by loosening the pins F positioning them on one of the holes that are present on the adjustment plates.

To decrease the depth the pin must be positioned on a low position (draw. 1) , to increase the pin must be positioned on a high position (draw.2)



draw.1



draw.2



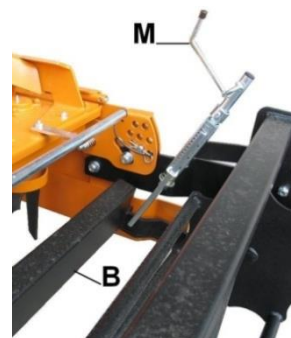
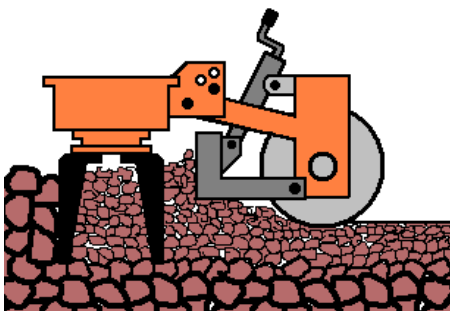
5.2 REFINING BAR

The rear refining bar is for refining and levelling the earth. It is adjusted so that it is always full of soil preventing it from coming out the top. Avoid loading the bar with too much soil as this wastes power.

Adjustments to the refining bar B are done using the 2 cranks M located on the sides of the bar.

Since the refining bar is mounted on a roller, it often doesn't need to be adjusted to vary with the adjustment of the roller.

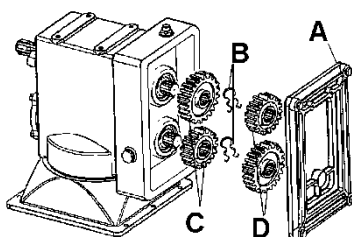
Please Note: On rocky ground, it is advised to lift the bar all the way up in order to not gather stones



The operations described above must be performed on both sides of the roller, respecting the same regulation

5.3 GEAR BOX

The degree of refinement to be obtained is linked to the type of soil and the number of rotor rotations. In machine mod.: ATLANTICO, there are two lateral gear boxes which allow for the selection of the ideal speed regarding the maximum torque speed supplied by the tractor.



			P.d.F. 1000
1°	17	23	232
2°	19	21	285
3°	21	19	348
4°	23	17	426

mod. ATLANTICO

This allows for the best levelling with minimum fuel consumption which is the best harrow/tractor performance.

To change the speed, remove the rear cover A, remove the two retaining pins B then invert the two gears or mount the other two that are supplied, reset the pins B and the cover D. In order to choose the correct speed, consult the labels located on the gears and illustrated here..

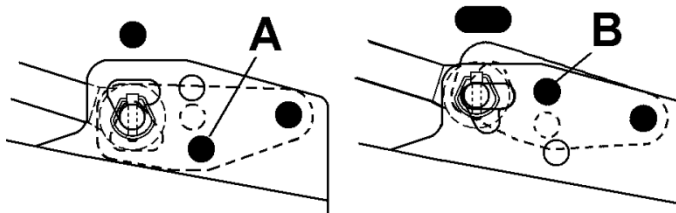


During this operation, it is best to position the changes in such a way as to prevent oil spills (slightly closing the harrow), if this operation is performed after prolonged machine use, allow it to cool in order to avoid burns, always use the proper protections when performing these operations.

5.4 FLOATING POSITION MOD.: ATLANTICO

For models with larger working width (mod.: Atlantico) in order to work on ground that is not perfectly level (hills, small valleys), sometimes it is necessary that the two parts can adapt themselves to the terrain.

To transform the machine from position "A fixed" to "B floating" you must operate the pin that blocks the lift cylinder hooks, moving them to position A or B..



6 MAINTENANCE



In case of failure, the operator must switch off the PTO drive shaft rotation, remove the ignition key, get off the tractor to assess the problem and intervene on the machine if needed.



The user must use the safety devices and personal protection devices (PPD) during use, maintenance, regulation, repairs and handling of the machine.



This instruction manual must have been read and understood thoroughly before performing any maintenance on the machine.

Please note that all maintenance must be performed by qualified and trained personnel with the machine stopped.

It is prohibited to perform maintenance and repairs in the open and in places that are not suitably equipped.

Used oil must be properly recovered and should not be released in the environment, since, according to the prevailing legislation, it is classified as hazardous waste and as such should be given to specialised collection sites. Therefore contact the nearest Used Oils Consortium.

The following operations must be carried out before starting any maintenance operation:

- during maintenance the machine must be placed on flat and compact ground;
- switch off the tractor engine, operate the parking brake and remove the key from the dashboard;
- Only perform any maintenance when the temperature of the oil has dropped below 60°C.;
- always use appropriate Personal Protection Equipment (safety shoes, overalls and work gloves, etc....);
- provide all forms of accident prevention for the type of operation being conducted;
- if you use compressed air to clean the machine, you must protect yourself with special glasses;
- when maintenance operations lead to access machine parts that cannot be reached from the ground, and in all cases points higher than 1.50 m from the ground, use a ladder or platform in compliance with the Standards in force;

- do not carry out repairs that you do not know. Always follow instructions and if without these contact the dealer or experienced staff;
- attention: replace worn or cracked tubes every time they are damaged;
- Do not use lifting points different to those prescribed.
- Make sure that the lifting equipment is suitable to carry out the operations in compliance with Safety Standards in the country of use;
- do not keep the tractor engine running indoors and without a suitable ventilation system to dispose of harmful exhaust gases which are concentrated in the air .
- avoid prolonged or repeated skin contact with fuels/lubricants/fluids, as it may create skin disorders or other syndromes;
- do not ingest fuels/lubricants/fluids. In case of accidental contact with eyes, rinse the affected area thoroughly with clean water, eventually consult a doctor;
- operate with extreme caution because of the possible high-temperature of oil/fluid discharged;
- do not weld in closed or unsuitably ventilated environments;
- do not weld on or in proximity of painted surfaces, to prevent the development of toxic vapours. Remove paint with suitable products, then wash the surfaces and leave to dry.
- relieve pressure from the circuits before working;
- do not use your hands to detect leakage of fluids under pressure; leakage of fluid under pressure can penetrate the skin and eyes with very serious consequences.

6.1 MAINTENANCE OPERATIONS THAT CAN BE PERFORMED BY THE OPERATOR

The work described in the following paragraphs does not require any specialisation.

The operator must know and follow the directions exactly and decommission the machine (as described in paragraph 4.3).

Periodic inspections and maintenance must be performed in the times and manner prescribed and are the operator's responsibility.

Failure to comply with rules and maintenance schedules undermine the proper operation of the machine and its duration and thus voids the warranty.

Increasing the frequency of maintenance in harsh operating conditions (frequent stops and starts, prolonged winter season, etc).

To use and maintain the machine at best, follow the instructions (after the first 4 hours and then every 50 hours), check the fixing of all bolts, check fixing of all bolts, pins, plugs; respecting the coupling torques indicated in the following tables

6.1.1 COUPLING TORQUE TABLES

Coupling torque table for 8.8 steel screws

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

Coupling torque table for 10.9 steel screws

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

6.2 GREASING AND LUBRIFICATION

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

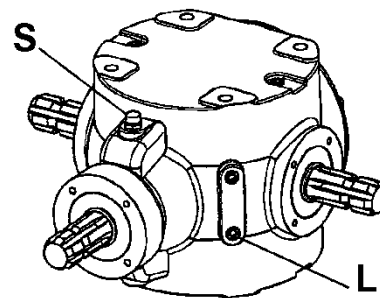
6.2.1 LUBRICATING THE CENTRAL GEAR REDUCER

Carefully clean components around plugs before working on gearbox or multispeed gearbox, this prevents dirt from penetrating into these systems.
Proceed as follows:

- 1- check the oil level during the first 20 working hours: oil must come up to the level hole L. Add oil as required. Perform the next oil level checks at 50 hour intervals;
- 2- After the first 40 working hours totally replace the oil in the gearbox. Then repeat this every 250 working hours.

Check the level from cap L, introduce oil into the cap S. To prevent some pressures inside the transmission group, keep clean cap S, in case of damage, replace it only with a cap with the same characteristics

Recommended lubricant: see table 6.2.4



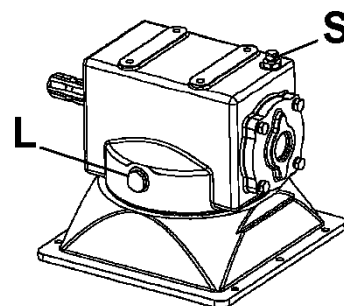
6.2.2 LUBRICATING THE LATERAL GEAR REDUCER (MOD. INDIANO)

Before operating on the lateral gear reducers on the Indiano model, carefully clean components around plugs, this prevents dirt from penetrating into these systems.
Proceed as follows:

- 1- check the oil level during the first 20 working hours: oil must come up to the level hole L. Add oil as required. Perform the next oil level checks at 50 hour intervals;
- 2- After the first 40 working hours totally replace the oil in the gearbox. Then repeat this every 250 working hours.

Check the level from cap L, introduce oil into the cap S. To prevent some pressures inside the transmission group, keep clean cap S, in case of damage, replace it only with a cap with the same characteristics

Recommended lubricant: see table 6.2.4



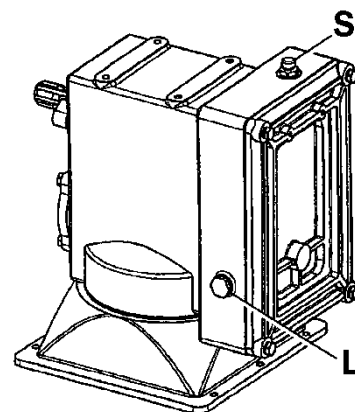
6.2.3 LUBRICATING THE LATERAL GEAR (MOD. ATLANTICO)

Before operating on the lateral gear on the Atlantico model, carefully clean components around plugs, this prevents dirt from penetrating into these systems.
Proceed as follows:

- 2- check the oil level during the first 20 working hours: oil must come up to the level hole L. Add oil as required. Perform the next oil level checks at 50 hour intervals;
- 1- After the first 40 working hours totally replace the oil in the gearbox. Then repeat this every 250 working hours.

Check the level from cap L, introduce oil into the cap S. To prevent some pressures inside the transmission group, keep clean cap S, in case of damage, replace it only with a cap with the same characteristics.

Recommended lubricant: see table 6.2.4



Risk of scalding, do not touch the indicated surfaces during and after use.

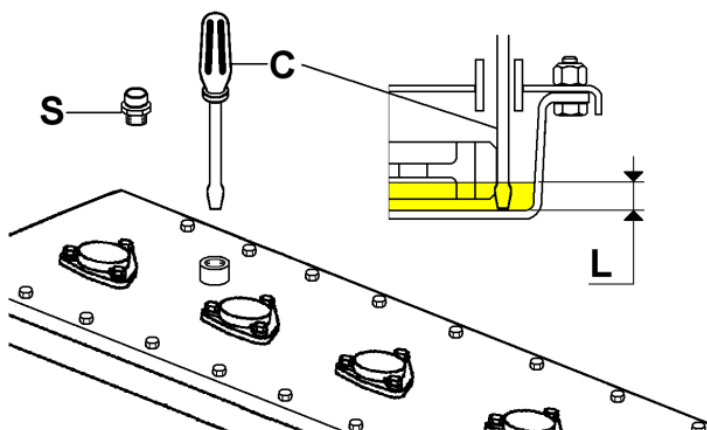
6.2.4 LUBRICATION OF THE TRANSMISSION BOX

Carefully clean the parts around cap S before working on the transmission box, this prevents dirt from penetrating inside the box itself.

- Remove the cap S.
- With a clean screwdriver C used as a "dipstick", check that the level L is at least 20 mm from the bottom.
- If necessary, top-up with oil of the same type.
- Re-mount the level cap S.

The vent cap S must always be kept clean in order to prevent pressures inside the transmission casing. In the event of damage of the same, it must be replaced only with a cap with the same features

The check must be made periodically every 50 working hours



Recommended lubricant: see table 6.2.4



ATTENZIONE

All level control operations must be performed with the machine at rest for at least 2 hours and resting on a perfectly level surface.

The oil used must be appropriately recovered and must not be disposed of in the environment, as, according to the Laws in force, it is classified as dangerous waste and as such, must be taken to relevant collection centres. The "Mandatory Consortium for Used Oils" must be contacted for the collection of waste oils.

6.2.5 GENERAL GREASING

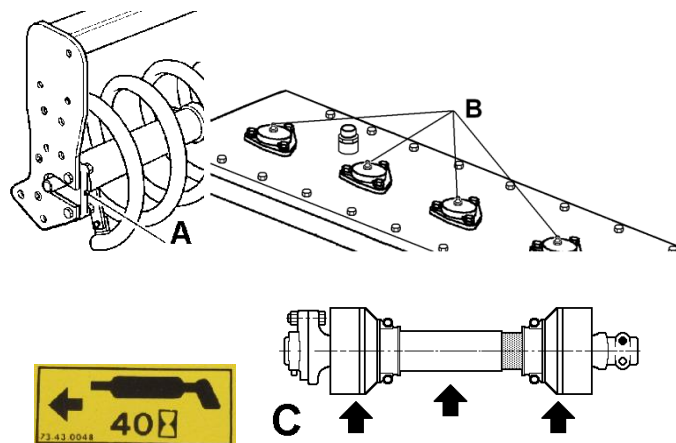
Use a relevant greaser pump and lubricate all points fitted with a greaser and indicated with the sticker illustrated at the side. Only use a manual greasing pump in order to prevent laceration of the bearing seals and the grease passage piping. Lubricate the following points periodically::

A - LEVELLING ROLLER grease after every 8 hours of work on both sides of the roller, pumping grease into the appropriate fitting F.

B - UPPER TRANSMISSION CASE BEARINGS grease after every 40 hours of work with 2 pumps per fitting

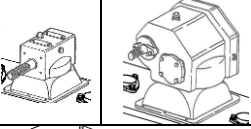
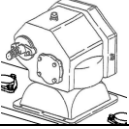
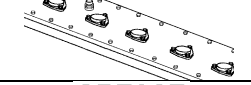
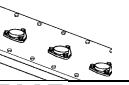
C - lubricate the propeller shaft every 8 hours as indicated in the relative use and maintenance manual, supplied by the propeller shaft manufacturer

Recommended lubricant: see table 6.2.6



6.2.6 LUBRICANTS TABLE

The following table shows the sticker applied to the Stella mod. machine tank, the reference lubricant is highlighted with grey background

		LUBRIFICANTI RACCOMANDATI - recommended lubricant empfohlenen Schmiermittel - lubrifiant recommandé						
		AGIP	IP - API	ESSO	SHELL	MOBIL	BP	TOTAL
		ROTRA 85W-140	PONTIAX HD 85W/140	GEAR OIL GX 85W/140	SPIRAX A 85W/140	MOBILUBE HD 85W/140	ENERGEAR HYPO 85W/140	EP 85W/140
		GREASE MU 00	APIGREASE PGX 00	BEACON EP 00	ALVANIA GR. GL 00	CHASSIS GREASE LBZ	ENERGREA SE LS-EP 00	MULTIS EP 00
		GREASE MU EP 2	ATHESIA EP GREASE 2	BEACON EP 2	ALVANIA GR. EP 2	MOBILUX EP 2	GREASE LTX 2	MULTIS EP 2

6.3 HOT POINTS OF THE MACHINE

Before any maintenance operations ensure that potentially hot parts have cooled.
Pay utmost attention to:

- Speed reducer or gear;
- Lateral transmission casing;
- Any hydraulic piping.

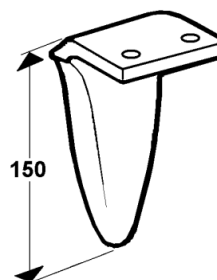


6.4 CHECKING WEAR OF TOOLS

The teeth with which the machine is fitted are suitable for working land with normal conformation. They are produced in high tensile toughened boron steel..

If teeth are subject to wear and must be replaced when they have a length of $L=150\text{mm}$.

In the event of continuous work at great depths or on rocky ground, the teeth must be replaced earlier, in order to prevent damage and wear to the tine bars. Check wear and integrity of the hoes and their fixing to the flanges every day.

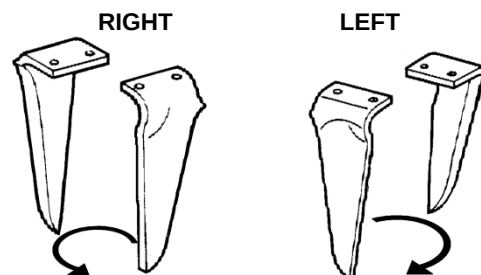


6.5 TOOLS REPLACEMENT PROCEDURE

If, during work one should accidentally bend (or break) it must be replaced immediately being careful to reset the new tooth in the same position as the one to be replaced.

If more than one tooth is to be replaced, it is advised to always remove and reset one tooth at a time in order to prevent positioning errors.

The cutting edge should be oriented in the rotation direction. The correct position of the cutting edge is shown in the figure.



In order to replace used or broken teeth, the harrow must be placed on two sturdy sawhorses that are capable of supporting it without danger in order to be able to work in complete safety.



ATTENTION: only mount original hoes and fixing screws.

6.6 PROCEDURE FOR REPLACING THE OLEODYNAMIC TUBE

These machines are equipped with a hydraulic system. In the event a tube is ruptured, proceed as follows:



1. Before removing an hydraulic tube, make sure you have vented any residual pressure in the system;
2. Precisely identify the damaged tube and loosen the two connecting points with the appropriate spanner, paying attention to possible leaking of hydraulic fluid.
3. Replace the damaged tube using only original replacement parts;
4. Make sure the attachment points are in perfect condition (threads, seals, etc.), before installing the new tube;
5. With the proper spanners, turn the connectors on the hydraulic tubes that have leaks in a clockwise direction. Do not over-tighten to prevent damage to the threads on the connectors.

Any waste material from maintenance, for example rags or replaced materials that contain flammable residues must be kept away from sources of ignition and disposed of in compliance with the current laws in the country where used.

Oil collected must be disposed of in compliance with the current laws in the country where used, see chapter 6.9

6.7 STORAGE – RE-COMMISSIONING

If the machine is immobilised for long periods, store it in a place sheltered from the elements and protect it from damage. Before re-commissioning, it is advisable clean the machine thoroughly and grease all mechanical parts to protect it from rust. Keep it stored in an open position if possible so that the gear and transmission bearings and all gears remain protected.

Before long periods of inactivity, ensure that the following is observed:

- clean the machine thoroughly;
- carry out a general visual check of the machine in order to identify any structural damage, detect any deep scratches in the paintwork, check that original safety pictograms are present in their positions and that they are integral and legible;
- grease all mechanical parts including the stems of the hydraulic cylinders;;
- if possible, store the machine in a covered place, on a level and smooth surface.

For the collection of exhausted oil it is compulsory to contact the “**Mandatory Used Oils Consortium**”.



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

6.8 INITIAL START-UP OR RECOMMISSIONING FOLLOWING A LONG PERIOD OF INACTIVITY

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

- Check that the machine is not damaged;
- Check that the mechanical units are in satisfactory condition and not rusted;
- Check the wear of the tools;
- ingrassare accuratamente tutte le parti mobili;
- Accurately grease all mobile parts;
- Check that all protective devices are correctly positioned.
- check that original safety pictograms are present in their positions and that they are integral and legible;

6.9 SCRAPPING

In the event that the machine is scrapped, it must be discarded in the appropriate sites in accordance with the regulations in force. Before scrapping, separate the plastic and rubber parts, electrical and electronic parts. Recover any used oil and discard at the appropriate collection centres.



ATTENZIONE

The used oil must be suitably recovered and not discarded into the environment since, according to legal regulations in force, it is classified as hazardous waste and as such must be delivered to the appropriate collection centre. For the collection of exhausted oil it is compulsory to contact the “Mandatory Used Oils Consortium”.

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

7 SCHEDULED MAINTENANCE TABLE

Description	FREQUENCY
GENERAL MACHINE CHECKS	
Levelling roller greasing	Every 8 operating hours
Cardan shaft greasing	Every 8 operating hours
Greasing the upper bearings in the transmission casing	Every 40 operating hours
Check bolt tightness	After the first 4 hours and then every 50 hours
Check wear of tools	Before every job
Replace tools	When damaged or shorter than 150 mm
GEAR REDUCERS, GEAR BOXES	
Check oil level	Every 20 operating hours
Change oil	After the first 40 hours and then every 250 hours

8 TROUBLESHOOTING TABLE

FAULT	CAUSE	REMEDY
Insufficient depth	• depth roller position • worn teeth • high advancement speed • ground too hard	• adjust the work depth • replace the tools • reduce speed, tractor with insufficient power • work with several passes
Excessive ploughing	• low advancement speed • low refining bar	• increase the advancement speed • lift the refining bar
Poor ploughing	• high advancement speed • high refining bar • ground too wet	• reduce the advancement speed • lower the refining bar • do not work
Rotors jamming	• low rear hood • ground too wet • high advancement speed	• lift the rear hood • do not work • reduce the speed
The machine vibrates	• foreign bodies blocked • hoes mounted reversely • hoes worn or broken • propeller shaft PTO not parallel	• check and remove them • check and mount them correctly • replace • adjust the parallelism with the third point
The machine works from one side	• lifting device arm's length • depth skids position	• check the length reduce lifting device swinging • check that the 2 adjustments are the same

9 SPARE PARTS

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

- type of vehicle;
- serial number;
- spare part code that can be obtained from the Spare Parts Catalogue.

If it is a component that is part of a major unit (rotor, overgear unit, guards), you should also specify the model and serial number of the unit.

10 WARRANTY

On delivery, check that the machine has not been damaged during transport and that the accessories are complete.

WARRANTY CONDITIONS:

- The manufacturer guarantees its products for a period of 12 months from the date of delivery on the condition that the attached form is filled-in in full and sent to the manufacturer within 15 days of date of delivery (the delivery document acts as evidence).
- In accordance with the aforementioned terms, the manufacturer agrees to supply all components to be replaced under warranty according to its own evaluation or the opinion of its authorised representatives regarding parts that have material or manufacturing defects. Shipping and labour costs shall in any case be charged to the customer.
- The warranty does not include payment for damage caused by improper use of the machine by the operator and for parts normally subject to wear and tear and breakage such as: hammers, blades, belts, etc.
- The manufacturer is not liable for accidents involving the operator or third parties, deriving from improper use of the machine.
- This warranty is not valid in the case in which:
 - a) the maintenance and repairs have been performed by unauthorised individuals or companies;
 - b) the machine has been previously repaired or modified with non-original spare parts;
 - c) in the event of an incorrect manoeuvre;
 - d) due to insufficient maintenance and/or lubrication;
 - e) when permissible power limits have been exceeded;
 - f) whenever the instructions given in this manual are not followed;
 - g) whenever unauthorised modifications have been made.
- Machine breakdowns during or after the warranty period shall not give rise to any right to interrupt payments for the goods that have already been delivered. No breakage or malfunction can be used as a pretext for delaying payment.
- The manufacturer reserves the right, at all times, to make any modifications in order to improve its own product and is not obliged to add these modifications to previously manufactured machines, which have already been delivered or are undergoing manufacture.

These general warranty terms replace and cancel all previous explicit or implicit terms.

CERTIFICATO DI GARANZIA GUARANTEE CERTIFICATE GARANTIESCHEIN CERTIFICAT DE GARANTIE CERTIFICADO DE GARANTÍA GARANTIEBEVIS GARANTIECERTIFICAAT	 
<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 Legislativo 196/03.</i> <i>We confirm to have received the instructions manual and that we were informed about 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>	
Nome / Name / Nom / Nombre / Nomin / Naam Indirizzo / Address / Anschrift / Adresse / Dirección / Adresse / Adres	
Firma dell'acquirente / Purchaser's signature / Unterschrift des Käufers / Signature de l'acheteur / Firma del comprador / Köpares underskrift / Handtekening van de koper Data / Date / Datum / Fecha	

RICHIEDETE SEMPRE RICAMBI ORIGINALI
USE GENUINE PARTS ONLY
BENUTZEN SIE NUR ORIGINALTEILE
EXIGEZ LES PIECES DE RECHANGE



Via Musi, 1/A-3- 37042 Caldiero (VR) ITALY
Tel. +39.045.6139711 – Fax +39.045.6150251
www.bertima.it - info@bertima.it