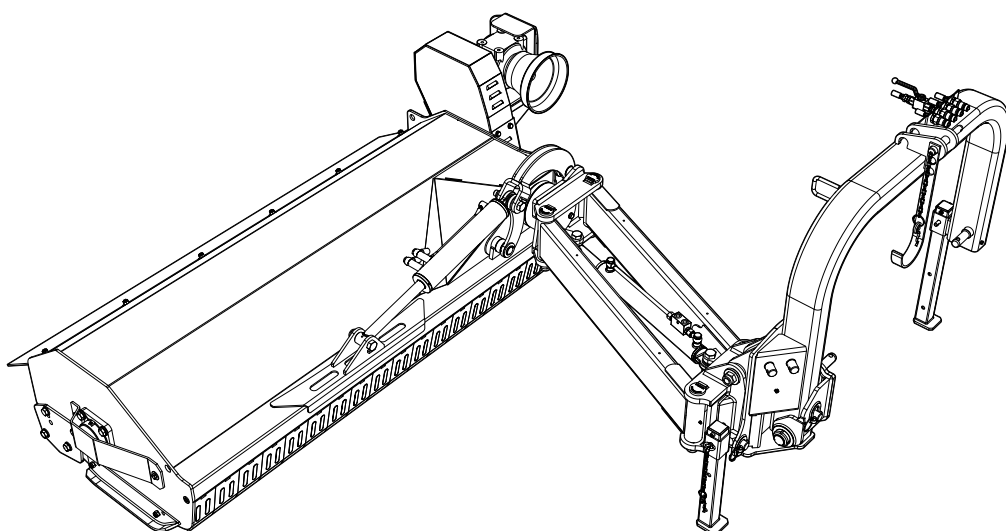




USE AND MAINTENANCE MANUAL

ZL-ZLE



SIDE SHREDDER

	Model	Serial number
ZL1600	(Left machine)	04
ZL1600	(Right machine)	05
ZL1800	(Left machine)	04
ZL1800	(Right machine)	05
ZL2000	(Right machine)	03
ZL2000	(Left machine)	03
ZLE1600	(Right machine)	01
ZLE1800	(Right machine)	01
ZLE2000	(Right machine)	01

EN

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DECLARATION OF CONFORMITY

The **CE Declaration of Conformity**, provided together with the machine, is the document with which the Manufacturer certifies, under its own responsibility, that it has complied with observance of the European Directives, the Standards and Technical Specifications necessary (specified in said Declaration) in order for the machine to conform to the basic requirements for sale and use in the European Union.

The Declaration of conformity must be considered as an integral part of the machine and must always accompany the machine until it is scrapped.

If this document is not delivered together with the machine or gets lost, please request a copy from the Manufacturer.

Dichiarazione di conformità

	N° <input style="width: 100%;" type="text"/>
<p>CE Declaration of Conformity According to 2006/42/CE Directive (that abrogate 98/37/CE Directive)</p>	
<p>The undersigned FERRI s.r.l. state on its own responsibility that the machine</p>	
description of machine	code series (flail head/series) serial no.
<p>complies with the Essential Safety and Health Protection Requirements of the 2006/42/CE Directive and to the electromagnetic compatibility for models equipped with electro/electronic devices according to the 2004/108/CE Directive. To answer to Conformity, according to the above mentioned Directives, following rules have been considered:</p>	
<p>As well as the technical detailed list:</p>	
<p>(Name and qualification of the delegate of the manufacturer)</p>	
<p>Signature of the delegate</p>	
<p>Tamara, (Place and date)</p>	<p>Person authorised to form the Technical file Dr. Sandro Ferri</p>
<p>FERRI s.r.l. – Via Govoni, 30 – 44034 Tamara (Ferrara) – Italia - Tel. +39.0532.866 866 - Fax +39.0532.866 851</p>	
(to cut along the outlined line)	
<p>To fill out by the Distributor with user's details</p>	
<p> WARRANTY COUPON Date <input style="width: 50px;" type="text"/></p>	
Series	<p>Surname <input style="width: 100%;" type="text"/> Name <input style="width: 100%;" type="text"/></p>
Machine Model	<p>Company Ragione Sociale <input style="width: 100%;" type="text"/> User Signature <input style="width: 100%;" type="text"/></p>
Serial N°	<p>Address <input style="width: 100%;" type="text"/></p>
Distributor Stamp	<p>City or Town <input style="width: 100%;" type="text"/> State/Prov <input style="width: 100%;" type="text"/> Postal <input style="width: 50px;" type="text"/></p>
	<p>Telefono <input style="width: 100%;" type="text"/> Fax <input style="width: 100%;" type="text"/></p>
	<p>Distributor stamp and signature <input style="width: 100%;" type="text"/> Serial N° <input style="width: 100%;" type="text"/> Series <input style="width: 100%;" type="text"/></p>
	<p>Machine Model <input style="width: 100%;" type="text"/></p>
	<p>Taken note of the Use and Maintenance Book and of the use's rules (Safety Rules included) <input style="width: 100%;" type="text"/></p>
	<p>User Signature (legible) <input style="width: 100%;" type="text"/></p>

The bottom part of the Declaration of Conformity contains the **Warranty Coupon** which must be completed in full and returned to the Manufacturer in order for the rights under the warranty to be valid (see Chapter 11).

The machine that is the subject of this manual complies with:

European Directives

2006/42/CE	Machine directive
-------------------	-------------------

Harmonized standards

UNI EN 4254-1	2009	Agricultural machinery - Safety - Part 1: General requirements
UNI EN 13524	2009	Highway maintenance machines. Safety requirements
UNI EN ISO 13857	2008	Safety of machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs
EN ISO 12100-2	2005	Safety of machinery – Basic concepts, general principles for design - Part 2: Basic terminology, methodology
EN ISO 12100-1	2005	Safety of machinery – Basic concepts, general principles for design - Part 1: Basic terminology, methodology

Technical specifications

ISO 11684	1995	Tractors, machinery for agriculture and forestry, powered lawn and garden equipment - Safety signs and hazard pictorials - General principles
UNI EN ISO 3767-2	1998	Tractors, machinery for agriculture and forestry, powered lawn and garden equipment - Symbols for operator controls and other displays - Part 2: Symbols for agricultural tractors and machinery

PRELIMINARY DECLARATION

SAFETY RULES

The safety instructions provided in this manual are preceded by a hazard symbol and a caution (CAUTION, WARNING and DANGER).

These precautions are intended to protect personal safety and the safety of those working and/or present in the danger zone of the machine.

Carefully read all the instructions provided in this manual.



THE WORD “CAUTION” REFERS TO SAFE CONDUCT PRACTICES BOTH IN OPERATING AND MAINTENANCE TO BE IMPLEMENTED FOR ALL PERSONS PRESENT IN THE DANGER ZONE OF THE MACHINE IN ORDER TO PREVENT ACCIDENTS.



THE WORD “WARNING” DENOTES A POTENTIAL OR HIDDEN DANGER THAT CAN CAUSE ACCIDENTS OR DEATH. IT IS USED TO ENCOURAGE OPERATORS AND THE OTHER PERSONS TO USE APPROPRIATE MEANS IN ORDER TO AVOID POSSIBLE ACCIDENTS.



THE WORD “DANGER” DENOTES A NON-PERMITTED PRACTICE THAT CAN CAUSE ACCIDENTS OR DEATH.

FAILURE TO OBSERVE THE INSTRUCTIONS, ESPECIALLY THOSE PRECEDED BY CAUTION, WARNING AND DANGER PRECAUTIONS, CAN CAUSE SERIOUS ACCIDENTS OR DEATH.

PREFACE

To operate safely it is necessary to:

- 1) Observe the general use precautions for all mechanical equipment, which are described in Chapter 2;
- 2) Always follow the use instructions contained in this manual.
- 3) In the case of difficulties in the installation, use or maintenance of the machine, contact specialised technical personnel (Manufacturer, Dealers, Technical Assistants, etc);
- 4) Never remove, tamper with or modify any part of the machine unless allowed specifically by this manual;
- 5) Repair or replace the protections and any worn or broken parts in the manner described in this manual;
- 6) Keep the safety decals perfectly legible;
- 7) Carry out maintenance operations in compliance with the instructions included in this manual;
- 8) Observe the safety rules established by law;
- 9) Always refer to qualified, authorised, adequately instructed and trained personnel.
- 10) Maintain all the guards in a perfect state of efficiency.



WARNING

All the technical measures for preventing the expulsion of objects adopted in the design of the machines do not allow absolute safety to be achieved.

Even if the machine is used correctly, there is always the possibility that small stones, splinters or other objects will get past the safety barriers and will be hurled a long distance.

It is absolutely mandatory to make sure that **THERE IS NOBODY INSIDE THE WORKING RANGE OF THE MACHINE (AT LEAST 50 METRES) WHILE IT IS OPERATING.**

Pay particular attention when working close to roads and/or buildings.



CAUTION

For machines equipped with electrical/electrohydraulic controls and/or a heat exchanger **IT IS ABSOLUTELY NECESSARY** to consult the assembly instructions for electrical connection before mounting them on the tractor.

Failure to observe the above-mentioned instructions can damage the electrical system and invalidate the warranty.

1 GENERAL INFORMATION

1.1 *Purpose and contents of the manual*

The purpose of this manual is to provide the customer with all the information necessary in order to use and manage the machine in a correct, independent and safe manner. The manual contains information on safety, technical aspects, operation, maintenance and spare parts.

Read this manual carefully and scrupulously observe the instructions provided before any use, check or operation of the machine.

Correct use and correct maintenance contribute to the good operation and the duration of the machine.

In the event of doubts or questions, please contact the Manufacturer.



This Manual has been drawn up according to the regulations in force at the time of printing.



**The illustrations have a purely indicative value.
Some elements might not graphically correspond to those actually fitted on the machine.**

1.1.1 *Who should read this manual*

The Manual is intended for the operator and the technicians responsible for the maintenance of the machine.

Operators must not carry out operations meant for qualified technicians.

The instructions contained in this manual are intended for an authorised qualified technician, appropriately instructed and trained on how to drive the tractor to which the machine is connected.

1.1.2 *Updates to the manual*

The information, descriptions, and illustrations contained in this manual reflect the state of the art at the moment of machine sale.

As part of the continuous commitment to improving its products and/or for market reasons, the Manufacturer reserves the right to modify the machine for technical or commercial reasons at any moment whatsoever without prior notice and without giving the purchaser any legal right to resolve the contract.

Any supplements must be conserved together with the manual and are to be considered as an integral part of the manual.

1.1.3 *Conservation*

This manual must be kept close to the machine and away from liquids and any other substance which could cause it to become illegible.

This manual and the Declaration of Conformity constitute an integral part of the machine up to the moment of its disposal. If the manual is lost or becomes unreadable, request a new copy from the Manufacturer.

1.1.4 *Copyrights*

The copyrights for this manual are the exclusive property of FERRI srl.

The technical texts, drawings and illustrations in this manual may not be disclosed or transmitted to third parties, not even in part, without the prior written authorisation of FERRI srl.

1.2 Spare parts

It is strongly recommended to use original "FERRI" spare parts to avoid altering the technical features of the machine.

FERRI is not responsible for any damage or injuries to the machine, persons or things due to the use of non-original parts.



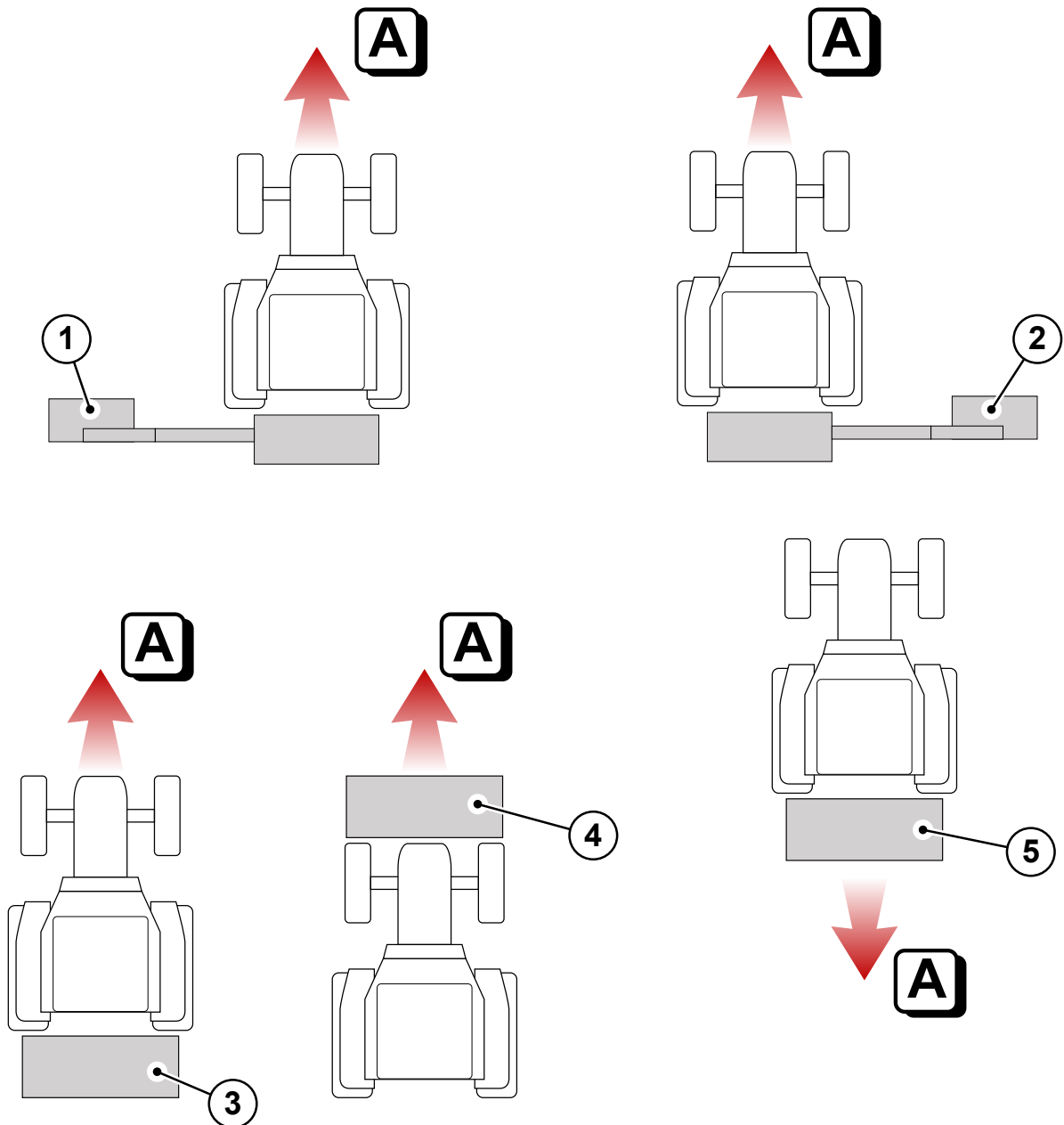
We recommend always using original spare parts and accessories. In addition to invalidating warranty coverage, the use of non-original parts and accessories will reduce the duration and performance of the machine.

1.3 Machine versions

During work, the machine version varies depending on the running direction and the position of the machine in relation to the tractor.

A	Direction of movement
1	Left machine
2	Right machine
3	Rear version
4	Front version
5	Back-face version

01-INFORMAZIONI GENERALI (Versione della macchina)



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2 SAFETY RULES

2.1 General safety rules

The machine was designed and manufactured according to appropriate safety standards. Before using the machine, carefully follow all the precautions and instructions contained in the manual in order to avoid accidents.

- ▶ Ensure that, on the ground where you are to work, there are no large stones or rocks, protruding tree stumps, metal elements of any kind (mesh, wires, cables, chains, tubes, etc.).
- ▶ Carefully follow the instructions for the adjustment of the machine height above ground.
- ▶ While working with the machine, ensure that there are no persons or animals within a radius of at least 50 metres.
- ▶ Never work “flush to the ground” on wet terrain. In these conditions, in fact, there is a risk of taking too much power from the motor, filling the rotor protective casing with pressed mud, and causing excessive wear on the flails and the drive belts, thereby compromising machine output and equilibrium.
- ▶ A tractor of appropriate power must be adopted for each machine. If a tractor with a power greater than the machine maximum absorbable power is used, use a PTO shaft with a clutch (torque limiting device), without which damage can be caused to the drive unit and the flail shaft.
- ▶ Examine the safety decals applied on the machine and described in this manual. To work safely, clean them and, if they are not legible, replace them with new decals.



FERRI declines all liability for damage caused by improper use of the machine.



Carefully check the machine before each start-up.



Before starting up the machine or carrying out maintenance work, carefully read all the instructions and safety messages contained in the manual and on the machine. Carefully follow all the accident prevention and safety rules.

- ▶ Before starting to use the machine you must be familiar with all its devices, controls and functions.
- ▶ Make sure that all the safety devices are in good condition and in the correct position. In the event of faults or damage, replace them immediately.
- ▶ Before getting off the tractor and before each maintenance operation, apply the parking brake, switch off the engine and remove the ignition key from the dashboard.
- ▶ The user is responsible for the maintenance of the machine.
- ▶ It is the responsibility of the owner to provide all the instructions to operators or employees before operating on the machine, according to regulations of the destination country.
- ▶ Only an operator who is adequately trained and instructed on the safety rules can operate on the machine.



DO NOT OPERATE on the machine if there are any persons and/or animals present within the working range of the machine.



Start the machine only when properly seated.
Read the instructions for starting up the machine that are contained in the operator's manual.

- ▶ Always keep the manual at hand so that you can consult it quickly. If the manual is lost or damaged, request a replacement copy from the Manufacturer.
- ▶ Disengage the power takeoff of the tractor (or self-propelled machine) before starting the motor of the machine.
- ▶ The machine is designed to be used by only one operator.
- ▶ It is strictly prohibited to work in poor physical conditions, or under the influence of alcohol, drugs or medicines.
- ▶ Keep the machine clean and free from foreign bodies (debris, tools, other objects), which could cause harm to the operator or damage to the machine.



Always wear the seat belts. Falls or overturning of the machine can cause serious injury or death.



This machine has been designed for use only with closed-cab tractors and/or self-propelled machines!

In the case of a tractor with an open cab, the following are required:

- 1) Personal protection equipment for the operator;
- 2) Shielding from thrown objects;
- 3) Roll Over Protective Structure (ROPS) for the self-propelled vehicle.

- ▶ Prolonged operations can cause physical and mental fatigue. Never operate the machine and tractor when tired or in a bored mental state.



It is absolutely forbidden to climb or to ride on the machine when it is moving.

- ▶ Ensure that the PTO shaft is correctly fitted after each operation of connecting the machine.
- ▶ Disconnect the machine from the tractor only on compact level ground, ensuring that it is still and stable.



Check that the guards of the PTO transmission shaft are in good condition.
When the machine is not coupled to the power unit, place the hydraulic pipes in the supports provided.

- ▶ In the event of breakage or deterioration of the PTO shaft guards, replace them immediately.
- ▶ Do not use the controls or the flexible pipes as handholds. These components are movable and do not offer steady support.
- ▶ Never work, walk or stand under the lifted arm. To avoid accidental falls, do not carry out maintenance operations under raised arm unless it is properly supported.
- ▶ Never use the arm to raise people or objects.



Do not, for any reason, get in between the tractor (or self-propelled machine) and the machine with the engine running and/or the power takeoff switched on.



WARNING

Avoid contact with hot surfaces including:

- 1) Oil tank;
- 2) Pumps;
- 3) Motors;
- 4) Valves;
- 5) Gearbox;
- 6) Hydraulic pipe joints.

To avoid scalds and/or burns, use protective gloves and goggles during maintenance work on hot surfaces.

Preferably use the machine in daytime.

In conditions of reduced visibility, use the lighting system of the tractor.

If the machine is used at night:

- 1) Provide an auxiliary lighting system in order to guarantee good visibility in the whole work area;
- 2) Do not create dangerous reflections for the operator;
- 3) Have sufficient lighting in the cab in order to guarantee identification of the controls.



WARNING

Operate only in environments that are well lit by natural or artificial light. During work the operator must have visibility of at least 100 metres.



DANGER

Avoid contact with guard-rails or concrete structures so as not to damage the flails.



DANGER

Replace bent or broken flails with new flails. Never straighten or weld the flails because doing so can reduce their strength and compromise safety.



WARNING

Carefully inspect the area in which you will be operating and remove all debris or foreign material in order to avoid damage to the machine, to persons and/or things. Any objects that cannot be removed must be clearly marked and avoided by the operator. Stop cutting immediately if the flails strike a foreign object.



DANGER

Never run the tractor engine in a closed location without adequate ventilation. The exhaust fumes can be hazardous to health.



DANGER

ENSURE THAT THE CUTTING FLAILS HAVE STOPPED COMPLETELY BEFORE APPROACHING THE MACHINE.



DANGER

Before leaving the tractor seat and before each maintenance operation, always engage the parking brake and disengage the PTO. Stop the engine, remove the key from the dashboard, and wait for all moving parts to stop.



DANGER

Never let children or other people up on top or operate the tractor or the machine. Falls can cause serious injury or death.



The user may carry out only those maintenance operations that are described in this manual.



Make sure to perform all maintenance operations (routine and extraordinary) on the tractor (or self-propelled machine) to which the machine will be connected.

- ▶ Do not modify the equipment in any way. Unauthorised modification may impair the function and/or safety of the machine and could affect the life of the equipment. In such a case, the user will be the only party responsible in case of damage or injury.



Do not tamper with, remove or make inefficient the guards and/or safety devices of the machine.

- ▶ Use exclusively original “FERRI” spare parts.

FERRI declines all responsibility in case of:

- ▶ Improper use of the machine or use by untrained personnel;
- ▶ Serious shortcomings in the required maintenance;
- ▶ Unauthorised modifications or interventions;
- ▶ Use of non-original spare parts or parts not specifically intended for this model;
- ▶ Total or partial failure to observe the instructions;
- ▶ Failure to observe the common rules for safety at work;

2.2 Safety rules concerning road traffic



Whenever the public road network must be used, scrupulously respect the highway code. Pay particular attention to the speed limit.

Observe the following rules when using the public road network with the machine coupled to the tractor (or self-propelled machine):

- ▶ Make sure that all the lights and reflectors are correctly working and positioned, clean, and clearly visible as required by local regulations.
- ▶ Before heading out onto the road, consider installing optional light bars.
- ▶ When driving on public roads, observe all road regulations.
- ▶ Before entering public roads from muddy or unpaved terrain, clean the tires of the tractor (or self-propelled machine) thoroughly of any residual mud.



Make sure the steering and brakes of the tractor (or self-propelled machine) are in excellent condition and operate properly.

- ▶ Switch off the tractor PTO.
- ▶ Never transport the machine with the moving flail holder shaft, not even for short distances. Make sure that the rotor control is disengaged and the moving parts of the machine have all come to a complete stop.
- ▶ Lock the machine with the safety devices provided.
- ▶ If the machine is used for verge maintenance on public roads:
 - 1) The machine must only be driven by personnel specifically instructed in safe use;
 - 2) The safety procedures imposed by the competent Body must be adopted;
 - 3) Follow the machine with a vehicle, positioned at a distance of approximately 20-30 metres, in order to notify road traffic of the possible danger;
 - 4) Place appropriate notices ahead of the machine so that vehicles arriving on the other side of the road will be able to stay at a safe distance from the working range of the machine;
- ▶ Do not allow anyone to ride on the tractor (or self-propelled machine) or on the machine during transport.
- ▶ Reduce speed on rough roads and surfaces.
- ▶ Use rotating flashing lights on the tractor (or self-propelled machine) during the transport, unless they are prohibited by local safety regulations.
- ▶ Make sure that the machine has been correctly installed on the tractor (or self-propelled machine) and that all the safety pins have been mounted correctly.
- ▶ Use the lifting device of the tractor (or self-propelled machine) to raise the machine coupled to the 3-point coupling to the maximum height above the ground.
- ▶ Test the tractor (or self-propelled machine) at low speed and then increase it slowly. Try the brakes gently to determine the stopping characteristics of the tractor (or self-propelled machine) with the machine coupled.



Always proceed at a moderate speed, especially on rough surfaces and steep gradients, to avoid overbalancing. The weight of the machine alters the stability of the tractor (or self-propelled machine) and influences its behaviour on the road, steering and braking capacity.

Check the lifting capacity and the stability of the tractor (or self-propelled machine) to avoid its tipping over and/or losing the grip of the steering wheels.

2.3 Safety rules during use



Always check the machine carefully before starting up and particularly the integrity of the accident prevention protections.



Many objects such as cables, ropes, wires, stones, chains or debris may be expelled outside the machine at high speed after impact with the flails. Inspect the cutting area and remove any potentially dangerous objects from the site.

- ▶ When working with the machine take care to avoid contact with fixed objects such as: road drain wells, shafts, stones, guard rails, tracks. Such contact could cause the flails to break throwing them into the air at very high speed.
- ▶ If metal wires, ropes, chains or similar, get tangled around the rotor, disengage the rotor control and the other controls. Switch off the engine of the tractor (or self-propelled machine). Apply the parking brake. Remove the ignition key from the control panel of the tractor (or self-propelled machine). Wait for all the moving parts to stop moving in order to avoid damage or dangerous situations. **Put working gloves on, clear the rotor with the aid of pliers or shears. Do not try to remove the objects entangled in the rotor by inverting its rotational direction.**
- ▶ **Do not use the machine when there are anomalous or excessive vibrations, as this would cause breakages and/or serious damage. Inspect the machine to find the cause of the vibration and solve the problem. If the problem persists, contact an authorised workshop immediately.**
- ▶ Do not let the flail holder rotor turn when the machine is raised.
- ▶ Do not operate with the arm in extension when working on sloping ground. On each occasion check the stability of the tractor (or self-propelled machine). Perform the stability test in safety keeping the flail head horizontal and as close as possible to the ground. Then extend the arm slowly.
- ▶ Before using the hydraulic controls for the movements of the machine, make sure that there are no persons, animal or things within the working range of the machine.
- ▶ It is absolutely forbidden to keep the rotor running during the lifting or lowering of the shredding flail head.
- ▶ Read and carefully follow the Operator's Manual and all safety decals before operating, servicing, repairing and/or replacing parts of the machine.
- ▶ Never let anyone climb up onto the tractor (or self-propelled machine) and/or onto the equipment.
- ▶ Check all guards and shields. If they are damaged, repair and/or replace them before starting up the equipment.
- ▶ Keep hands, feet, hair and clothing away from all moving parts.
- ▶ Disengage all controls and stop the engine. Apply the parking brake and remove the ignition key from the control panel of the tractor (or self-propelled machine). Wait for all the moving parts to stop before performing any operation for maintenance, repair or replacement of machine parts.
- ▶ Before operating, always check to make sure that there are no children or persons inside the machine danger area. If necessary, stop all the moving parts of the machine.
- ▶ Keep all hydraulic fittings, couplers and tubes tightened. Make sure that there are no oil leakages.
- ▶ Keep all the lights, reflectors, and rearview mirrors of the tractor (or self-propelled machine) constantly clean and in good working order.
- ▶ Use the rotating flashing light on the tractor (or self-propelled machine) whenever the machine is running or during transport.
- ▶ Never insert your hands or feet beneath the machine or near its working parts while the equipment is working or the engine of the tractor (or self-propelled machine) is running.
- ▶ Objects can be thrown out with sufficient force to severely injure people within the working range of the machine (at least 50 metres). Make sure that there are no persons near the machine when it is running.
- ▶ Inspect the area in which operation will be performed, and make sure that there are no hidden obstacles.
- ▶ Do not stop or start suddenly when going up or down a hill.
- ▶ Review all the instructions with all operators at least once a year.
- ▶ Never leave the driving seat of the tractor (or self-propelled machine) while the machine is in the lifted position. Lower the machine to the ground, disengage the PTO and switch off the engine of the tractor (or self-propelled machine) before leaving the driving seat.
- ▶ Never leave the machine unsupervised with the tractor (or self-propelled machine) running.


WARNING

Safe operating speed depends on terrain condition, the type of material to be cut, as well as its density and height.


WARNING

Use slow operating speeds if working on steep slopes, overhead constructions, ditches and when obstacles or debris on the ground must be avoided.

2.3.1 Responsibility of the operator or the owner

It is responsibility of the owner or the operator to read this manual and instruct all operators before they begin working with this machine. Risk analysis and accident prevention depend on the prudence, attention and common sense of the personnel involved in operation, transport, maintenance and storage of the equipment or in its use and service maintenance.

Follow all the instructions from beginning to end. Safety is in everybody's interest. Following all the recommended safety procedures allows working safely, both for operators and for persons in the machine working area. Operators who have not followed instructional training are not qualified to operate with the machine.

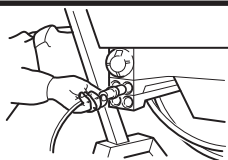
2.4 Safety rules concerning the hydraulic system



Any intervention or maintenance on the hydraulic system has to be carried out by specifically instructed personnel.

WARNING

- ▶ Replace any hydraulic hoses that are abraded, worn or cut and any metal pipes that are deformed.
- ▶ Do not try to repair the hydraulic system, the connections or hoses using tape, clamps or anything else. The hydraulic system operates under high-pressure. Makeshift repairs can be hazardous.
- ▶ Before applying pressure to the system, make sure all components are tightened well and that all the hydraulic lines, the hoses and couplings are not damaged.
- ▶ Stop immediately in the case of oil leaks.
- ▶ **IMPORTANT: Never search for oil leaks with bare hands. Wear suitable working gloves.**
- ▶ Oil under high pressure may seep into the skin causing serious infections or toxic reaction. In this case contact a doctor immediately.
- ▶ Check the state of wear of the hydraulic pipes. If they are worn (or at least every 6 years) replace them.
- ▶ Before working on the hydraulic system, lower the end tool, release all the pressure and turn off the tractor.
- ▶ Dispose of used oil and greases in accordance with anti-pollution rules.
- ▶ In tractors equipped with a hydraulic system, the pressure of the system must not exceed 190 bars.
- ▶ When the machine is not coupled to the power unit, place the hydraulic pipes in the supports provided.



Make sure that the hydraulic pipes are fitted and mounted correctly. If they are inverted this will cause movements opposite to those commanded.



Make sure that there is no pressure inside the hydraulic system before proceeding with maintenance or repair operations. If there is pressure, use the hydraulic controls repeatedly in order to release the pressure in the system.

DANGER

2.5 Fire-prevention methods

- ▶ Always keep a fire extinguisher of adequate capacity on board the vehicle and make sure that it is periodically recharged. The hand extinguisher is to be used by authorised personnel only.
- ▶ The personnel assigned to the vehicle must be trained in the firefighting techniques adopted.
- ▶ All fuels and most lubricants and hydraulic fluids are flammable.
- ▶ Switch off the engine before filling the tank with fuel.
- ▶ Never smoke while filling the tank with fuel or topping up hydraulic fluid levels.
- ▶ Never fill the fuel tank near open flames or in closed places.
- ▶ Never siphon fuel.
- ▶ Before starting the engine, make sure that there are no accumulations of spilt fuel, lubricants, or other fluids that might cause fire in the vicinity.
- ▶ Short-circuits can cause fires. Regularly check the conditions of the terminals to the batteries, cables, and electrical appliances.
- ▶ Never store flammable substances in inappropriate places.
- ▶ Never puncture or burn pressurised containers or canisters.
- ▶ Never accumulate material soaked with flammable substances.
- ▶ In order to reduce the risk of combustion to a minimum, clean the machine regularly using the appropriate equipment (compressed water or air spray cleaners).

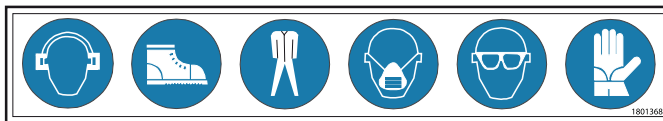


DANGER

When washing the machine, never spray water directly onto the electric boxes.

- ▶ Use the appropriate fire extinguishing methods (carbon dioxide, foam, chemical powder).
- ▶ Use sprays of water only to cool off surfaces exposed to fire.
- ▶ Never use petrol, solvent, or other flammable and/or toxic fluids to clean mechanical parts. Use commercially homologated, non-flammable, non-toxic solvents.
- ▶ Never weld near tanks, hoses, drums, electrical cables or electric materials in general.

2.6 Protection and equipment for the operator

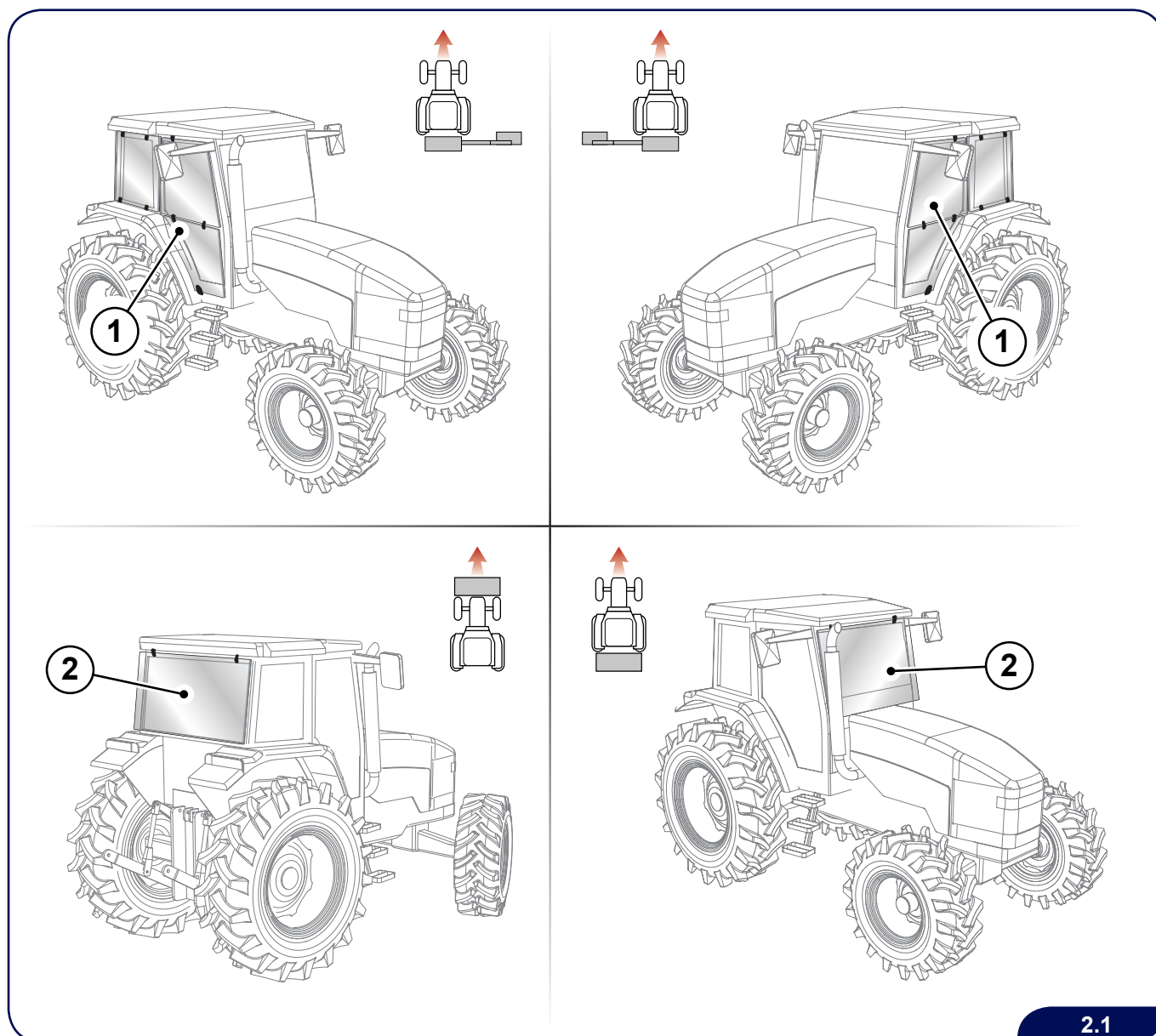


Always wear safety footwear, overalls, safety gloves and, if necessary, earmuffs and a dust mask during use and during machine maintenance, repair, handling and storage operations.

In order to protect the operator from the violent expulsion of splinters, stones or other materials, install on the driver's cab - on the work side (1) and on the rear or front side (2), a single pane 10 mm (0.39 in) thick that prevents the bodies expelled from the end tool of the machine:

- ▶ From breaking the windows of the cab.
- ▶ From causing injury to the operator.

Attach the machine only to tractors with approved type anti-roll over driving cab (ROPS).



2.6.1 Maintenance: safety rules

- ▶ When the operator leaves the driving position of the tractor (or self-propelled machine) he/she must:
 - 1) Lower the mower onto a horizontal surface. If there are supporting feet, position them and lower the machine onto the ground using the lift of the tractor (or self-propelled machine);
 - 2) Disconnect the mechanical, hydraulic and electric power of the machine;
 - 3) Engage the parking brake of the tractor (or self-propelled machine);
 - 4) Stop the engine of the tractor (or self-propelled machine) and remove the ignition key from the control panel.



Never work underneath the machine or under any parts of the machine that have been raised but are not properly supported, in order to avoid sudden or accidental falling which could cause serious injury or even the death of the operator.

- ▶ Keep the working area clean and dry.
- ▶ Be sure electrical outlets and tools are properly grounded.
- ▶ Use auxiliary lighting during maintenance operations.
- ▶ Use only tools, jacks and lifts of sufficient capacity for the job.
- ▶ Never work on the frame, rotor or underneath the machine unless the tractor (or self-propelled machine) engine is off and the PTO is disconnected.
- ▶ On completion of maintenance work, make sure that all guards are in place, properly secured and in good condition.
- ▶ We advise the maintenance technician to refrain from wearing cumbersome clothing or accessories that could get caught in the machine (sleeves without closed cuffs, belts, necklaces, bracelets, rings).
- ▶ Check the pressure of the hydraulic circuit before servicing the machine or disconnecting it from the tractor.
- ▶ Make sure that the end tool is correctly supported on the ground.
- ▶ Release any residual pressure remaining in the system.
- ▶ Disconnect all electric wires from the battery of the tractor (or self-propelled machine) when carrying out welding operations. Disconnect the electrical system of the tractor (or self-propelled machine) if the welding operations are performed with the machine mounted on the tractor itself.
- ▶ Before applying pressure to the hydraulic system, make sure all hydraulic lines, fittings and couplers are tight and in good condition.
- ▶ Periodically inspect all moving parts for wear. If necessary, replace them with original spare parts.
- ▶ Never weld or attempt to repair or make weldings on parts subject to movement in order to avoid vibrations that are harmful to the machine and its safety.



**Use a ladder or raised stand to access high spots which cannot be reached by the operator.
Slipping or falling can cause serious injury or death.
Do not lean the ladder against the machine.**

2.7 Working range of the machine

- ▶ Objects can be thrown out with sufficient force to severely injure people within the working range of the machine (at least 50 metres). Make sure that there are no persons near the machine when it is running.
- ▶ Stay out of the working range of the machine.
- ▶ Always know where all additional support personnel are located when the machine is operating. Never allow anyone within the danger area of machine.

2.8 Safety decals

- ▶ Keep safety decals clean and legible at all times.
- ▶ Replace all safety decals that are missing or illegible.
- ▶ Whenever changing parts of the machine on which a safety decal is mounted, remember to apply the decal again on the new part.
- ▶ Safety decals can be ordered from your local dealer or directly from the Manufacturer.



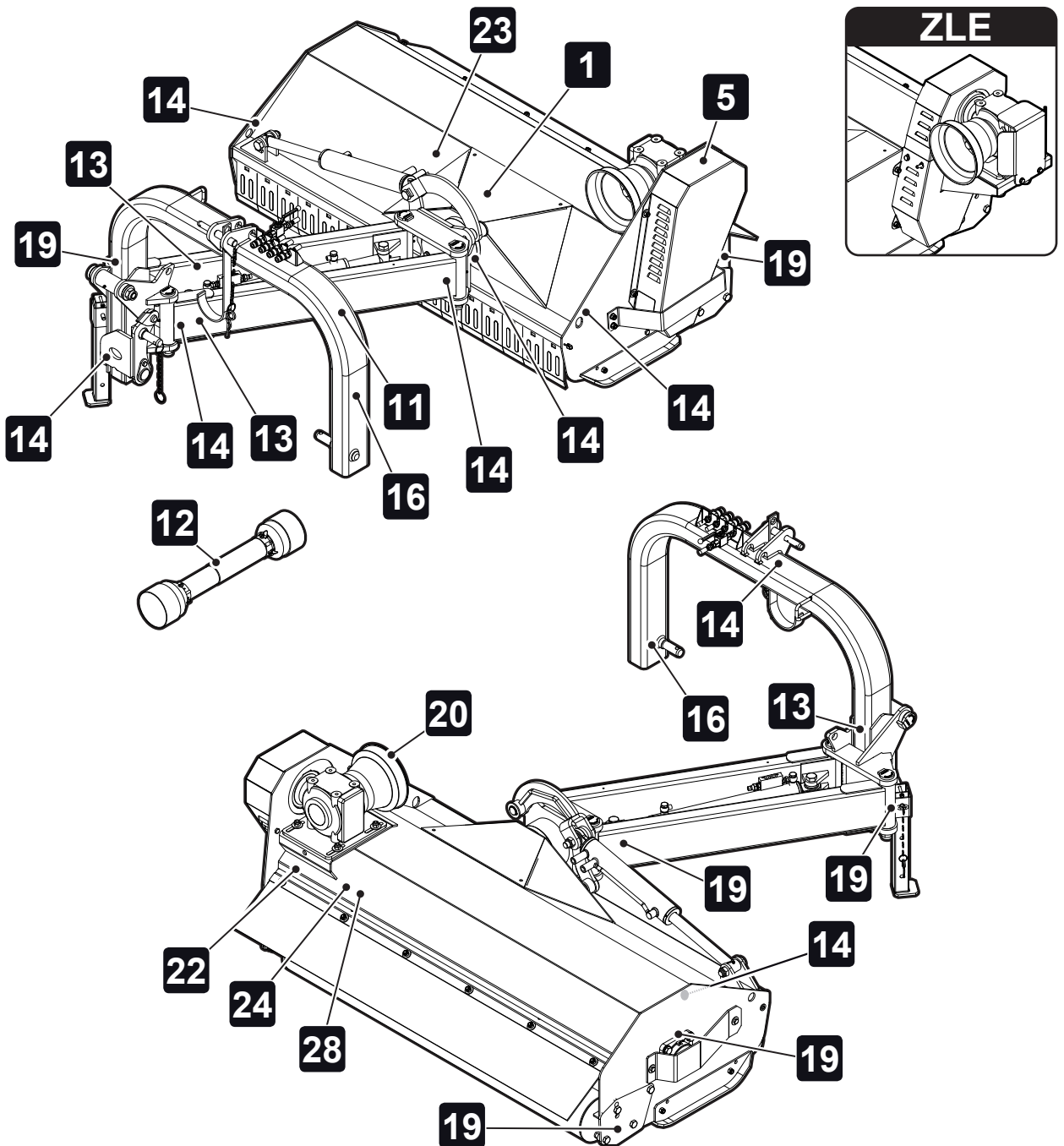
CAUTION











Ensure that the safety decals are legible.

Clean them with a cloth, soap and water.











Replace damaged safety decals with other of the same type; make sure to apply such decals in their original positions.

02-Pittogrammi di sicurezza












DESCRIPTION OF THE DECALS	
1	 <p>Carry out regulation and maintenance operations only after reading the use and maintenance manual, with the machine stopped and the key removed.</p>
2	 <p>Check the direction of rotation and the number of revolutions (540 rpm) of the tractor p.t.o. before switching on the PTO shaft.</p>
3	 <p>Check the direction of rotation and the number of revolutions (1000 rpm) of the tractor p.t.o. before switching on the PTO shaft.</p>
4	 <p>Danger of throwing materials. Keep at a distance of at least 50 metres from the machine.</p>
5	 <p>Do not remove or open the casings until the belts have stopped completely.</p>
6	 <p>It is forbidden to climb or to ride on the machine.</p>
7	 <p>Danger of crushing the limbs. Maintain safety distances.</p>
8	 <p>Take care when working near overhead electricity lines.</p>
9	 <p>Danger of injury to the limbs, DO NOT APPROACH THE MACHINE IN ACTION. In the event of extraneous material (metal wire, ropes, etc.) becoming twisted round the rotor, stop the machine immediately.</p>
10	 <p>Ensure that the rotor shaft and the other parts of the machine are completely stopped before approaching.</p>

DESCRIPTION OF THE DECALS

<p>11</p>		<p>Use the required personal protection equipment.</p>
<p>12</p>		<p>Keep at a distance from: PTO transmission shaft; Do not perform any maintenance and/or inspection operations when the power takeoff is switched on.</p>
<p>13</p>		<p>Risk of crushing and cutting the hands. Do not put your hands near the moving parts of the machine.</p>
<p>14</p>		<p>Coupling point for lifting the machine. To lift the machine, attach hooks to the machine exclusively in the points indicated.</p>
<p>15</p>		<p>Risk of falling of lifted parts of the machine. Do not stand below the machine or in its vicinity during the work phases.</p>
<p>16</p>		<p>Do not, for any reason, get in between the tractor and the machine with the engine running and/or the power takeoff switched on.</p>
<p>17</p>		<p>Ensure that the flails and the other parts of the machine are completely stopped before approaching.</p>
<p>18</p>		<p>To handle the machine with a fork-lift truck, use only the points indicated.</p>
<p>19</p>		<p>Grease points. Carry out routine maintenance every 8 working hours (see Chapter 7).</p>
<p>20</p>		<p>Indicates the direction of rotation and the number of revolutions (540 rpm) of the tractor power takeoff.</p>

02-Tabella Pittogrammi (ISO)

DESCRIPTION OF THE DECALS	
21	 <p>Indicates the direction of rotation and the number of revolutions (1000 rpm) of the tractor power takeoff.</p>
22	 <p>Single decal with a series of warning labels described above.</p>
23	 <p>Single decal with a series of warning labels described above.</p>
24	 <p>The machine has been designed to be driven by one single operator. Never let children or other people up on top or operate the tractor or the machine.</p>
25	 <p>Risk of scalding. Keep a safe distance from all heated surfaces.</p>
26	 <p>Single decal with a series of warning labels described above.</p>
27	 <p>Single decal with a series of warning labels described above.</p>
28	 <p>Keep at a safe distance from the working radius of the machine.</p>
29	 <p>Single decal with a series of warning labels described above.</p>

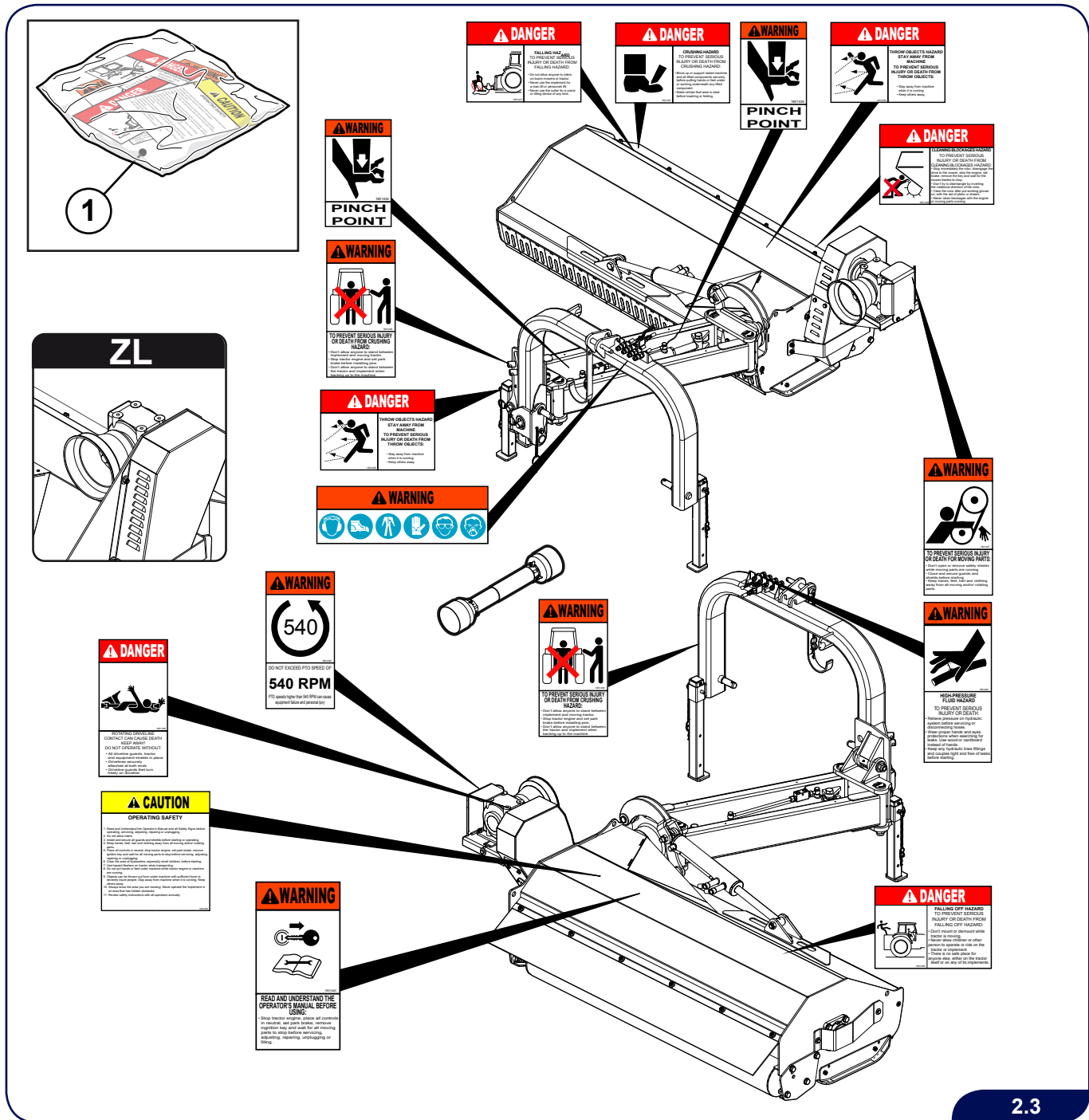
02-Tabella Pittogrammi (ISO)

2.8.1 Replacing safety decals

- ▶ Make sure that the area of application is clean and dry.
- ▶ Determine the exact position before you remove the protective paper from the decal.
- ▶ Remove a small portion of the protective paper from the adhesive decal.
- ▶ Align the decal over the specified area and carefully press the small exposed adhesive part.
- ▶ Remove the remaining part of the protective paper from the adhesive part and carefully press all over the decal until it sticks to the surface completely.
- ▶ The tiny blisters of air that may form and remain trapped beneath the surface of the decal can be eliminated by puncturing with a pin and then the decal can be flattened out by rubbing the previously removed protective paper backing over the decal surface.

2.8.2 Replacing "ISO" decals with "ANSI" decals

If the machine is sold in Countries outside the European Community where the ANSI Z535.4 reference standard is in force, make sure that when the machine is delivered the decals required by said standard are applied on it. If it is necessary to replace the ISO decals (yellow background) with ANSI decals, the Manufacturer provides a kit (1) of replacement decals to be applied (by the Retailer or at the End Customer's premises) as illustrated in the figure.



02-Pittogrammi di sicurezza ANSI

3 TECHNICAL CHARACTERISTICS

3.1 General description of the machine

Commercial name	Machine code
ZL1600 right	ZL16R
ZL1600 left	ZL16L
ZL1800 right	ZL18R
ZL1800 left	ZL18L
ZL2000 right	ZL20R
ZL2000 left	ZL20L
ZLE1600 right	LE 16R
ZLE1800 right	LE 18R
ZLE2000 right	LE 20R

The SHREDDERS of the ZL and ZLE series, were designed, built and protected for use exclusively in the agricultural and road upkeeping sectors for cutting grass, reeds, bushes and shrubs with a diameter of up to 4 cm approx. (1.57 inches).

In the design and construction, all necessary measures were taken to produce a high-quality, reliable product, fully complying with the regulations in force and with particular regard to accident prevention.

The machines to which this manual refers are carried by the tractor by means of a three-point coupling and they act on the ground depending on their own weight and on the rotation of the flail rotor activated by the power takeoff.

These machines are composed of a structure in which the working part is formed by a rotor with a horizontal axis. Shaped flails which rotate at a faster speed than the moving speed are connected to this rotor.

The machines have a system for adjusting the working height, obtained by means of lateral runners and a rear roller.

The machine is not indicated for use in sectors other than agriculture and road upkeeping.



The machine must be used by only one operator. Any use other than that specified is considered unauthorised and dangerous (improper use).

3.1.1 *Proper and improper use of the machine*



FOR SAFETY REASONS IT IS STRICTLY FORBIDDEN TO USE THE MACHINE IN CONDITIONS OTHER THAN THOSE RECOMMENDED.

The materials used for construction were selected according to the specific use for which the machine was designed and manufactured. Improper use can cause damage to persons and/or things and can compromise satisfactory operation.

Respect for the use, repair and maintenance conditions described in this manual constitutes an essential element of the intended use of the machine.

The use of the machine for activities not envisaged during its design phase and not listed in this manual shall release the Manufacturer from all direct or indirect liability.

Any arbitrary modification to the machine shall release the Manufacturer from all liability for damage or injury, however serious it may be, to operators, third parties and/or property.

Correct use of the machine and scrupulous observance of the provisions contained in this manual and the thorough application of all precautions in order to prevent dangerous situations, accidents or injuries will extend the machine's working life, improve performance, and minimise malfunctioning.

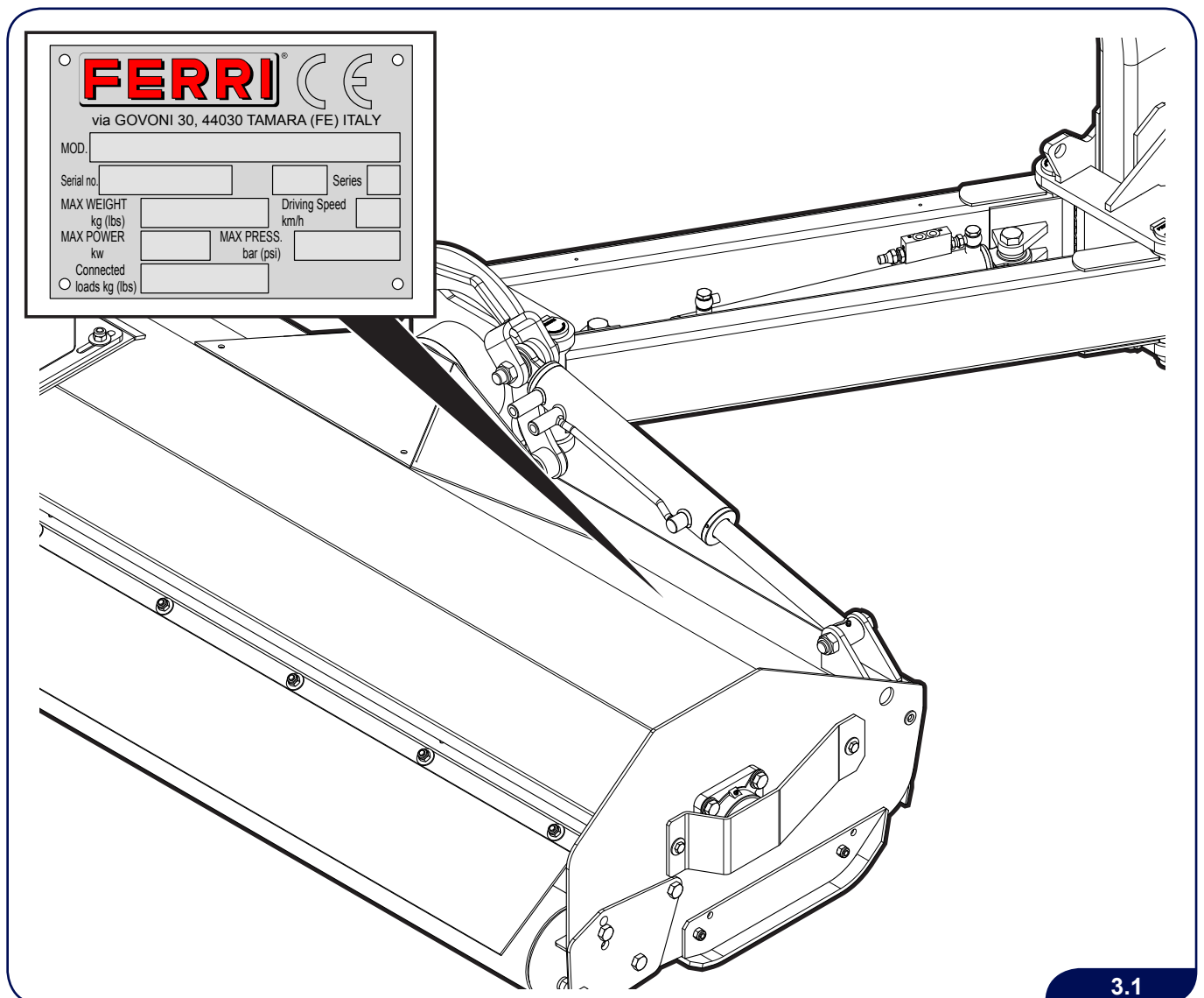


FERRI srl declines each and every objective liability deriving from failure to observe the regulations contained in this manual.

3.2 Machine identification

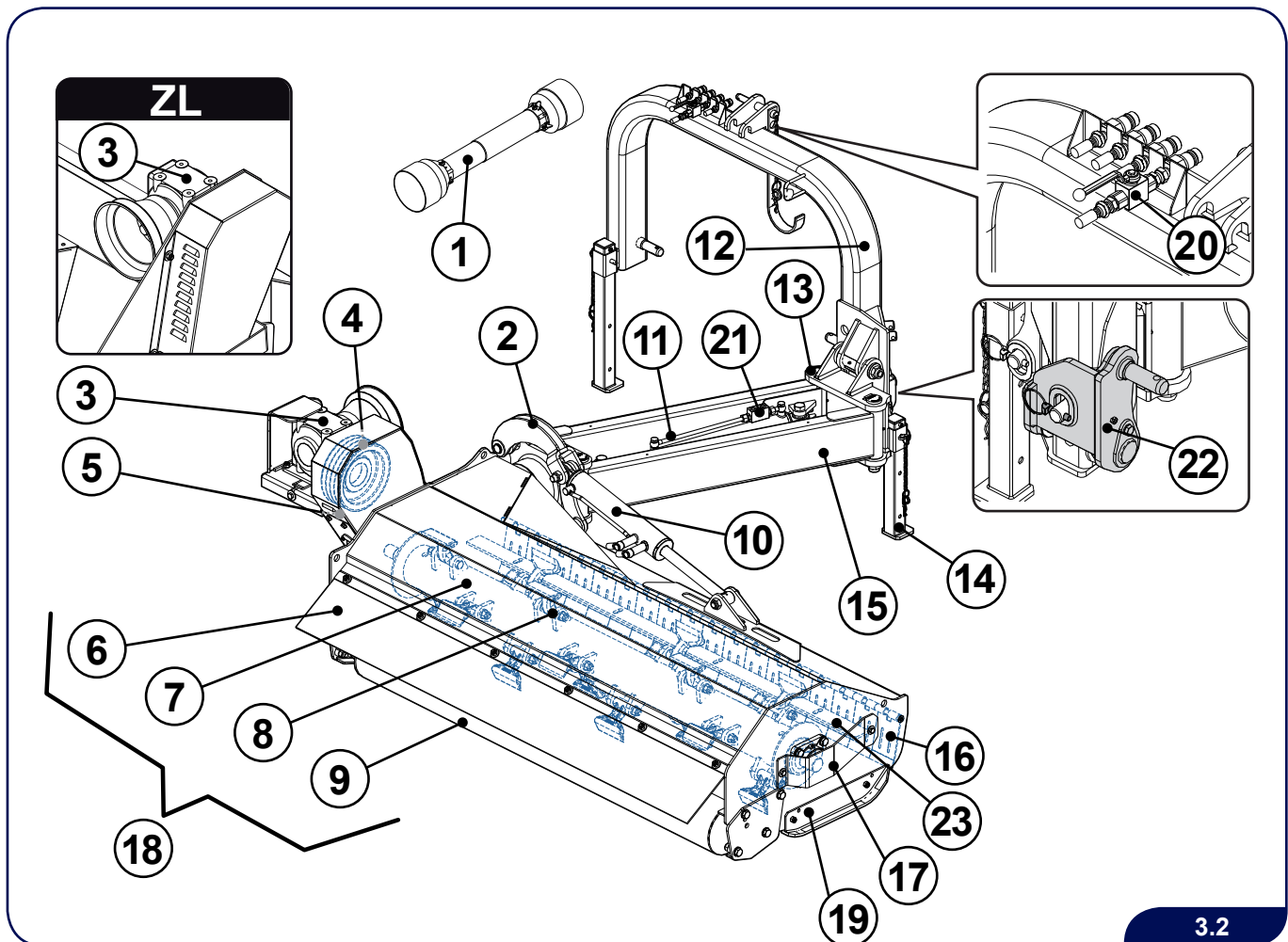
There is an identification plate attached to the machine frame, which includes the main technical data such as:

- 1) Data of the Manufacturer;
- 2) Series number;
- 3) Year of manufacture;
- 4) Weight of the machine;
- 5) Transmission power;
- 6) Maximum hydraulic pressure.



The data given on the identification plate are indispensable whenever asking for spare parts.

3.3 Description of the parts



03-Dati tecnici (ZL)

3.2

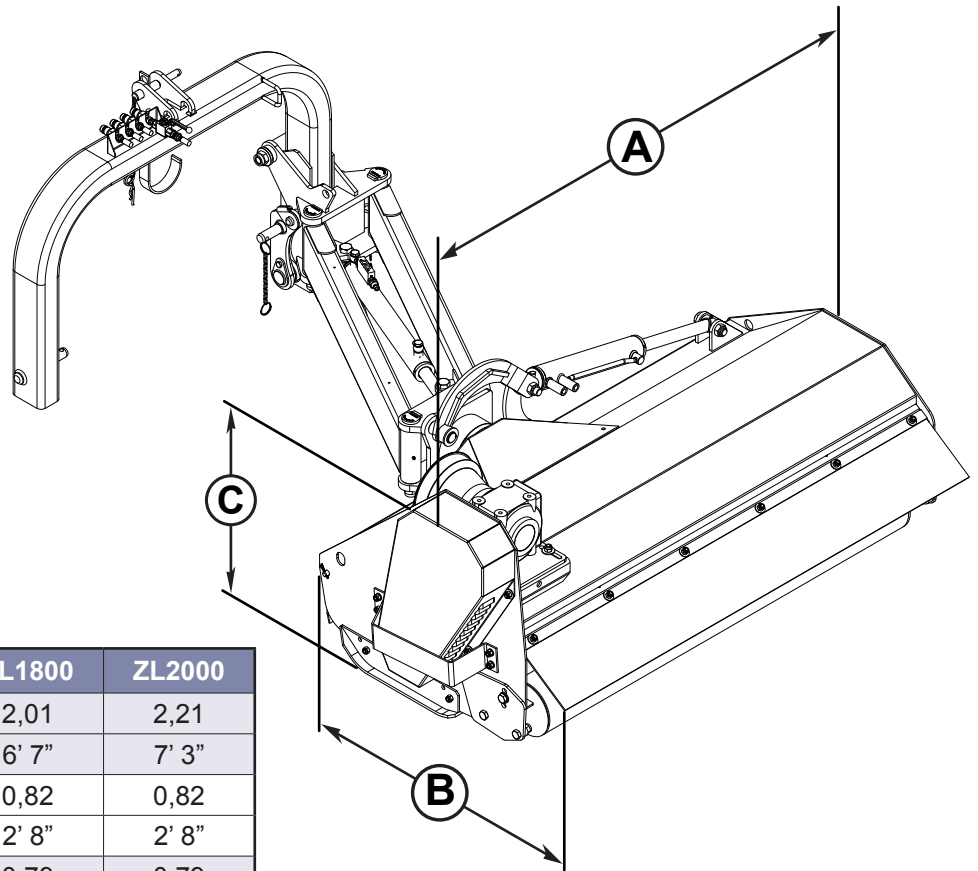
1	PTO shaft	13	Arm support joint
2	Flail head orientation joint	14	Support foot
3	Gearbox	15	Lateral movement arms
4	Pulleys	16	Front guard
5	Belts	17	Rotor bearing guard
6	Rear guard	18	Shredding flail head
7	Flail holder shaft	19	Runners
8	Flails	20	Flail head locking valve for transport
9	Support roller	21	Stop valve
10	Flail head orientation hydraulic ram	22	Mechanical safety
11	Lateral movement hydraulic ram	23	Shredding blade adjustment
12	3-point coupling		

3.4 Technical Data (ZL)

		TAB 1		
Model		ZL1600	ZL1800	ZL2000
Working width	cm (in)	160 (63)	180 (71)	200 (79)
Min. tractor width	cm (in)	180 (71)	200 (79)	220 (87)
Minimum/maximum tractor power	HP (KW)	50/100 (37/74)	60/100 (44/74)	70/100 (51/74)
Min. tractor weight	kg (lbs)	2400 (5290)	2600 (5732)	2800 (6173)
PTO speed	rpm	540	540	540
Max. absorbed power (*)	HP (KW)	50 (37)	50 (37)	50 (37)
Machine weight/Shaft weight	kg	632/25	658/25	695/25
	(lbs)	(1393/55)	(1450/55)	(1532/55)
Tractor coupling	cat.	II	II	II
Rotor speed	rpm	2250	2250	2250
Peripheral speed	m/sec	53	53	53
Multi-use flails	No.	48	54	60
Hammers	No.	16	18	20
Articulated flails	No.	72	84	84
Hydraulic system pressure	Bar (PSI)	190 (2750)	190 (2750)	190 (2750)
Hydraulic oil	type	ISO-L-HM68	ISO-L-HM68	ISO-L-HM68
Belts	No.	3	3	4

(*) For work in which the absorption is above the maximum power indicated, use a PTO shaft with a clutch (torque limiting device).

03-Dati tecnici (ZL)



		ZL1600	ZL1800	ZL2000
A	m	1,81	2,01	2,21
	ft	5' 11"	6' 7"	7' 3"
B	m	0,82	0,82	0,82
	ft	2' 8"	2' 8"	2' 8"
C	m	0,79	0,79	0,79
	ft	2' 7"	2' 7"	2' 7"

3.5 Technical Data (ZLE)

		TAB 1		
Model		ZLE1600	ZLE1800	ZLE2000
Working width	cm (in)	160 (63)	180 (71)	200 (79)
Min. tractor width	cm (in)	180 (71)	200 (79)	220 (87)
Minimum/maximum tractor power	HP (KW)	50/100 (37/74)	60/100 (44/74)	70/100 (51/74)
Min. tractor weight	kg (lbs)	2400 (5290)	2600 (5732)	2800 (6173)
PTO speed	rpm	540	540	540
Max. absorbed power (*)	HP (KW)	50 (37)	50 (37)	50 (37)
Machine weight/Shaft weight	kg	665/25	695/25	725/25
	(lbs)	(1466/55)	(1532/55)	(1598/55)
Tractor coupling	cat.	II	II	II
Rotor speed	rpm	2250	2250	2250
Peripheral speed	m/sec	53	53	53
Multi-use flails	No.	48	54	60
Hammers	No.	16	18	20
Articulated flails	No.	72	84	84
Hydraulic system pressure	Bar (PSI)	190 (2750)	190 (2750)	190 (2750)
Hydraulic oil	type	ISO-L-HM68	ISO-L-HM68	ISO-L-HM68
Belts	No.	3	3	4
Optional belts	No.	4	4	/

(*) For work in which the absorption is above the maximum power indicated, use a PTO shaft with a clutch (torque limiting device).

		ZLE1600	ZLE1800	ZLE2000
A	m	2,11	2,31	2,51
	ft	6' 11"	7' 7"	8' 3"
B	m	0,82	0,82	0,82
	ft	2' 8"	2' 8"	2' 8"
C	m	0,75	0,75	0,75
	ft	2' 6"	2' 6"	2' 6"

03-Dati tecnici (ZL)

3.5 Noise level

The noise level produced is checked on all the models of machines produced by FERRI. The noise values indicated are emission levels and do not necessarily represent safe operational levels. The relationship between emission levels and exposure levels cannot be reliably used to establish whether further precautions are required or not. The factors which determine the exposure level to which the operator is subject include the duration of exposure, the characteristics of the work environment and other sources of noise (number of machines, nearby activities etc). The permitted exposure levels can vary from one country to another. The information provided allows the user of the machine to make the best possible evaluation of the danger and risk to which he/she is subject.

	Sound pressure (LPA)	Acoustic power (LWA)
Closed cab	77,2 - 78,5 dB(A)	97,4 dB(A)
Open cab	91,1 - 92,4 dB(A)	111,3 dB(A)

The tests were performed on a tractor (or self-propelled machine) selected by sample. The data may vary according to the application.

03-Rumorosità



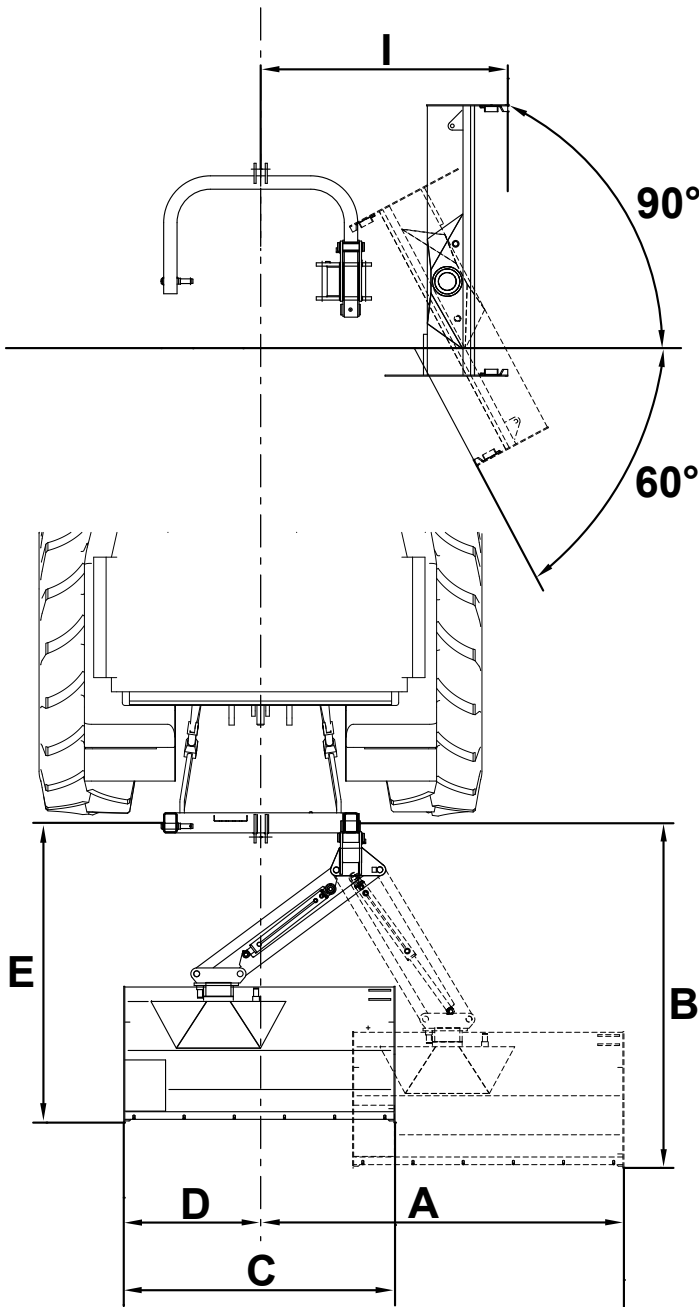
Use personal protection equipment (headphones) if the acoustic level exceeds 85 dB or if the machine is used on a tractor without a cab or with a cab with the windows open. Prolonged exposure can cause serious damage to hearing (noise level greater than 85 dB) or result in partial or permanent hearing loss (noise level greater than 90 dB).



According to the data measured in the various positions examined, in the absence of a soundproofed cab, personal hearing protection equipment must be used.

3.6 Radius of work

The data relating to the width of cut covered by the machine are provided below.



TAB 2		ZL1600	ZL1800	ZL2000
A	m	2,20	2,40	2,60
	ft	7' 3"	7' 10"	8' 6"
B	m	1,91	1,91	1,91
	ft	6' 3"	6' 3"	6' 3"
C	m	1,60	1,80	2,00
	ft	5' 3"	5' 11"	6' 7"
D	m	0,82	0,82	0,82
	ft	2' 8"	2' 8"	2' 8"
E	m	1,62	1,62	1,62
	ft	5' 4"	5' 4"	5' 4"
I	m	1,49	1,49	1,49
	ft	4' 11"	4' 11"	4' 11"

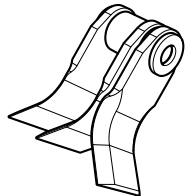
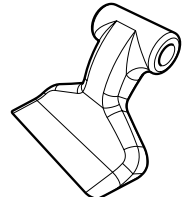
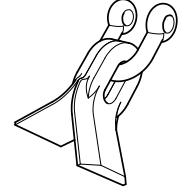
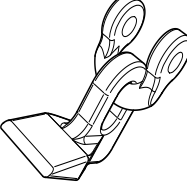
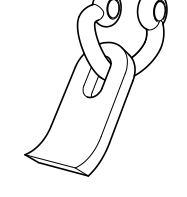
TAB 2		ZLE1600	ZLE1800	ZLE2000
A	m	2,80	3,00	3,20
	ft	9' 2"	9' 10"	10' 6"
B	m	1,92	1,92	1,92
	ft	6' 4"	6' 4"	6' 4"
C	m	1,60	1,80	2,00
	ft	5' 3"	5' 11"	6' 7"
D	m	0,16	0,16	0,16
	ft	0' 6-3/10"	0' 6-3/10"	0' 6-3/10"
E	m	1,80	1,80	1,80
	ft	5' 11"	5' 11"	5' 11"
I	m	1,68	1,68	1,68
	ft	5' 6"	5' 6"	5' 6"

03-Raggio di lavoro (più modelli)

3.7 Optional equipment

3.7.1 Flails

Depending on the type of material to be cut, use the most appropriate flails.
The following table lists the cutting flails that may be fitted on the machine and their respective characteristics.

TYPE OF CUTTING FLAILS		
DESCRIPTION		
INTERCHANGEABLE ON THE SAME ROTOR	Multi-use “Y” flails for grass, shrubs, sticks and bushes up to 3 cm (1.18 inches) diameter.	
	Hammers for grass, wood and prunings up to 4 cm (1.57 inches) diameter.	
INTERCHANGEABLE ON THE SAME ROTOR	Articulated “Y” flails for grass, shrubs and bushes up to 2.5 cm (0.98 inches) diameter.	
	Hook flails for grass, hedges and bushes up to 2 cm (0.78 inches) diameter.	
	Paddle flails for grass and hedges up to 1 cm (0.39 inches) diameter.	

03-Utensili (ZL)

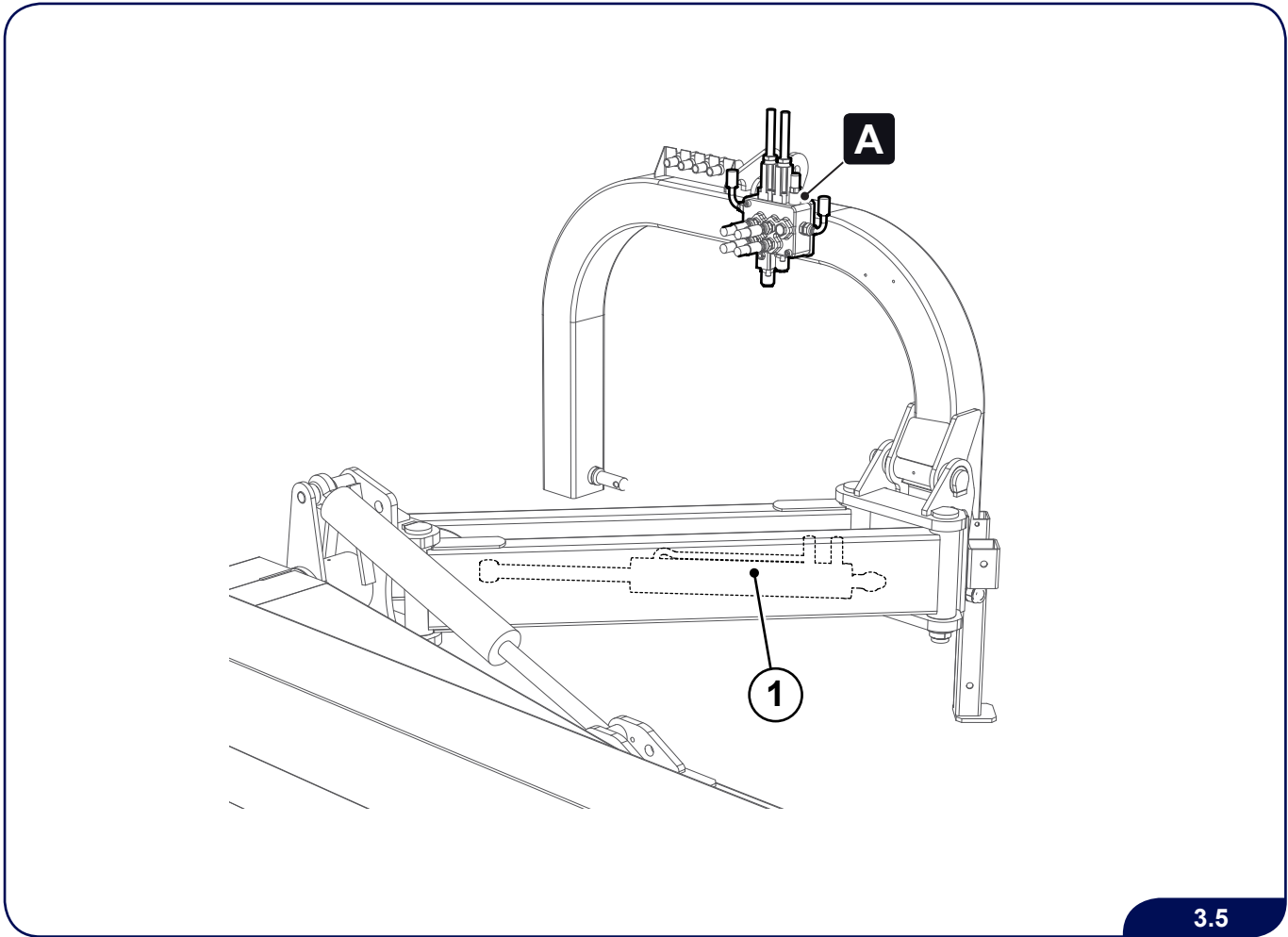
N.B.: Do not use on stony ground.



If irregularities or strange noises are noticed after changing the flails, contact the manufacturer.

3.7.2 Controls with distributor

For tractors equipped with only one oil pressure tap or on specific demand by the customer, it is possible to fit a two lever control distributor (A) with flexible pipes, also envisaged with the float system for operating the hydraulic ram (1).



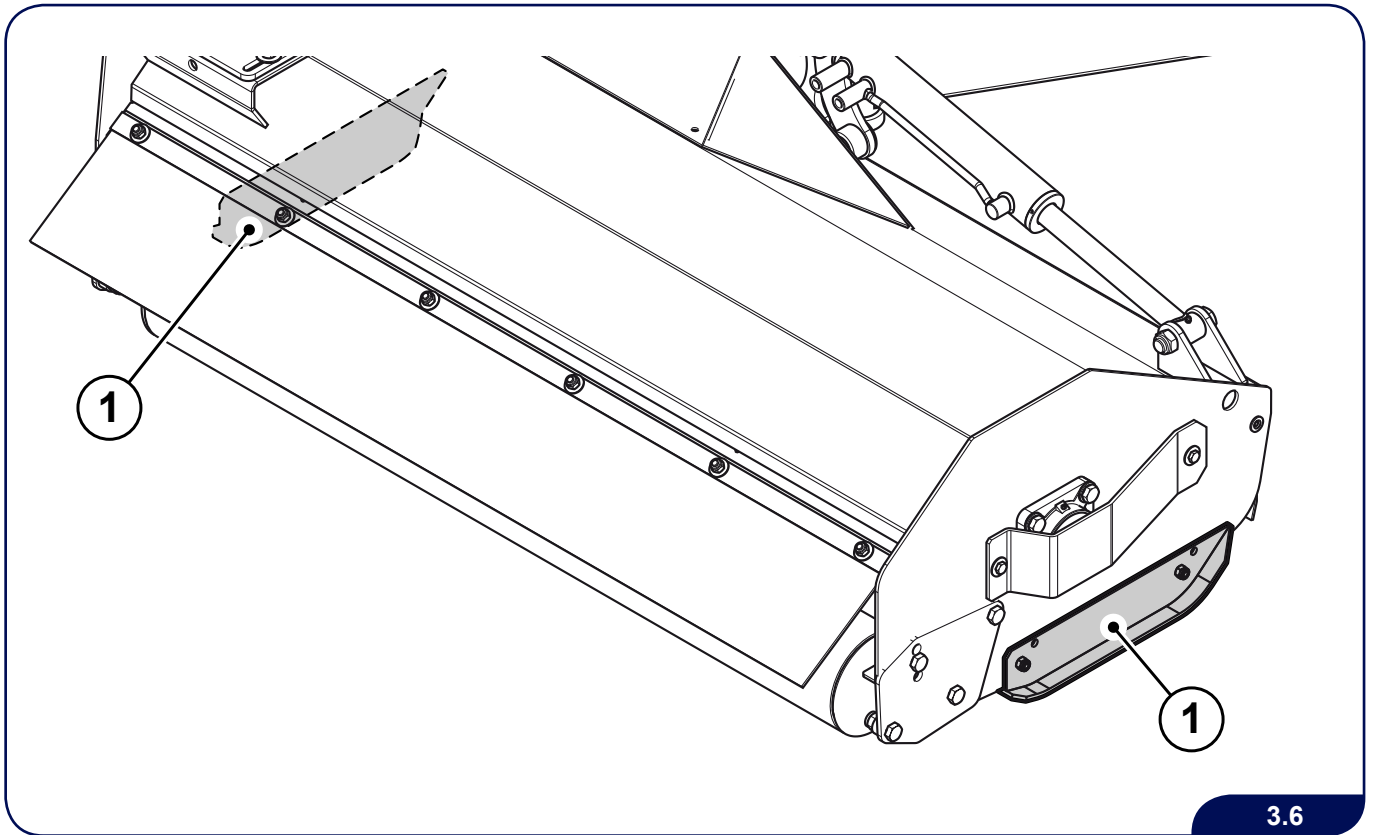
03-Comandi con distributore

3.5

3.7.3 Runners

The runners (1) allow:

- 1) Adjustment of the working height of the machine, in combination with the support roller (see Chapter 5);
- 2) Prevent premature wearing of the cutting flails.



03-Varianti (Slitte) (ZL)

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4 INSTALLATION AND HANDLING



Always wear safety footwear, overalls, safety gloves and, if necessary, earmuffs and a dust mask during use and during machine maintenance, repair, handling and storage operations.

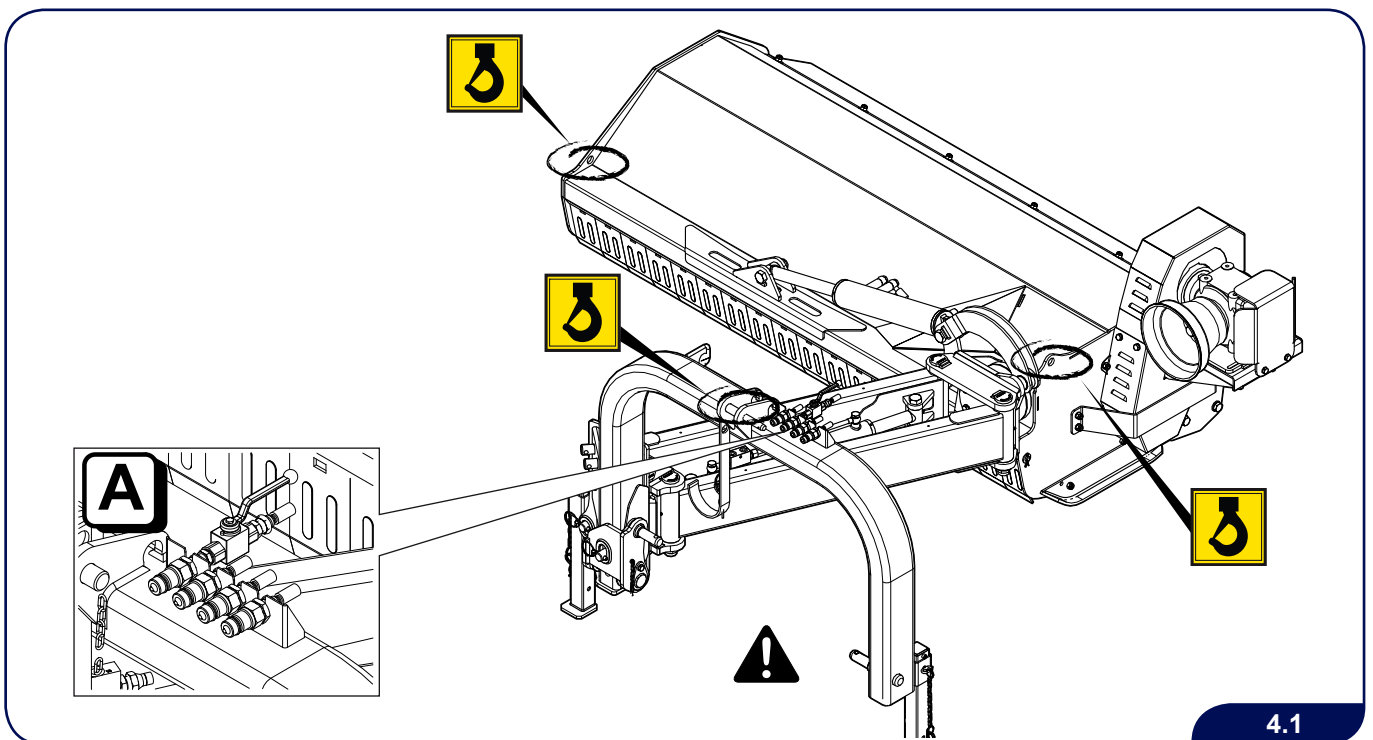
4.1 *Lifting*



To lift the machine, use safety hooks and cables with a suitable lifting capacity, to be inserted only in the points indicated for lifting, identified by the decals applied on the machine.

The machine may be placed on a wooden board and suitably anchored to it.
 The subsequent handling of the machine must be carried out exclusively by means of a fork-lift truck.
 The handling operation must be carried out by qualified and trained personnel (sling operators, fork-lift operators, etc.).
 Pay attention during machine lifting operations to potential movements of the third point attachment in relation to the machine.
 It is advisable to keep the tap closed (A), in order to prevent the shredding flail head from moving (flail head orientation hydraulic ram blocking).

04-Sollevamento (ZL)



Lifting is a delicate manoeuvre, always carried out at the user's risk.

4.2 Removal of packaging and pre-assembly

There is packaging available for the transport of the machine, which requires some pre-assembly operations to be carried out before installation of the machine to the tractor.



FOR SAFETY REASONS IT IS STRICTLY FORBIDDEN TO USE THE MACHINE IN CONDITIONS OTHER THAN THOSE RECOMMENDED.

To perform the transport and assembly operations of the machine safely, use a fork lift truck and/or lifting device/hoist of adequate capacity to carry the weight of the machine.

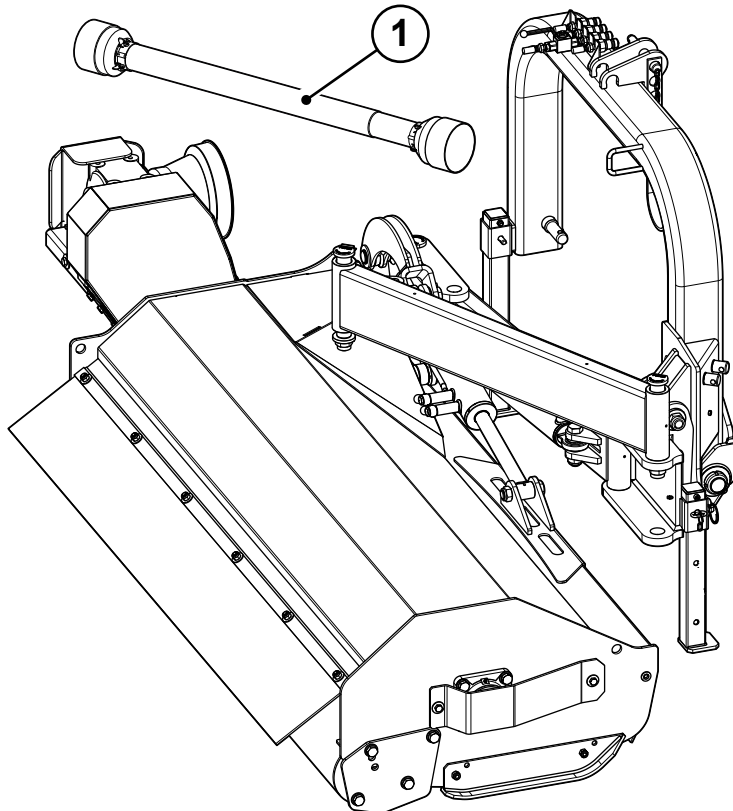
Assembly operations:

For transport reasons the machine is delivered packaged and partially disassembled inside a wooden box. The box is designed to be transported by means of a fork-lift truck.



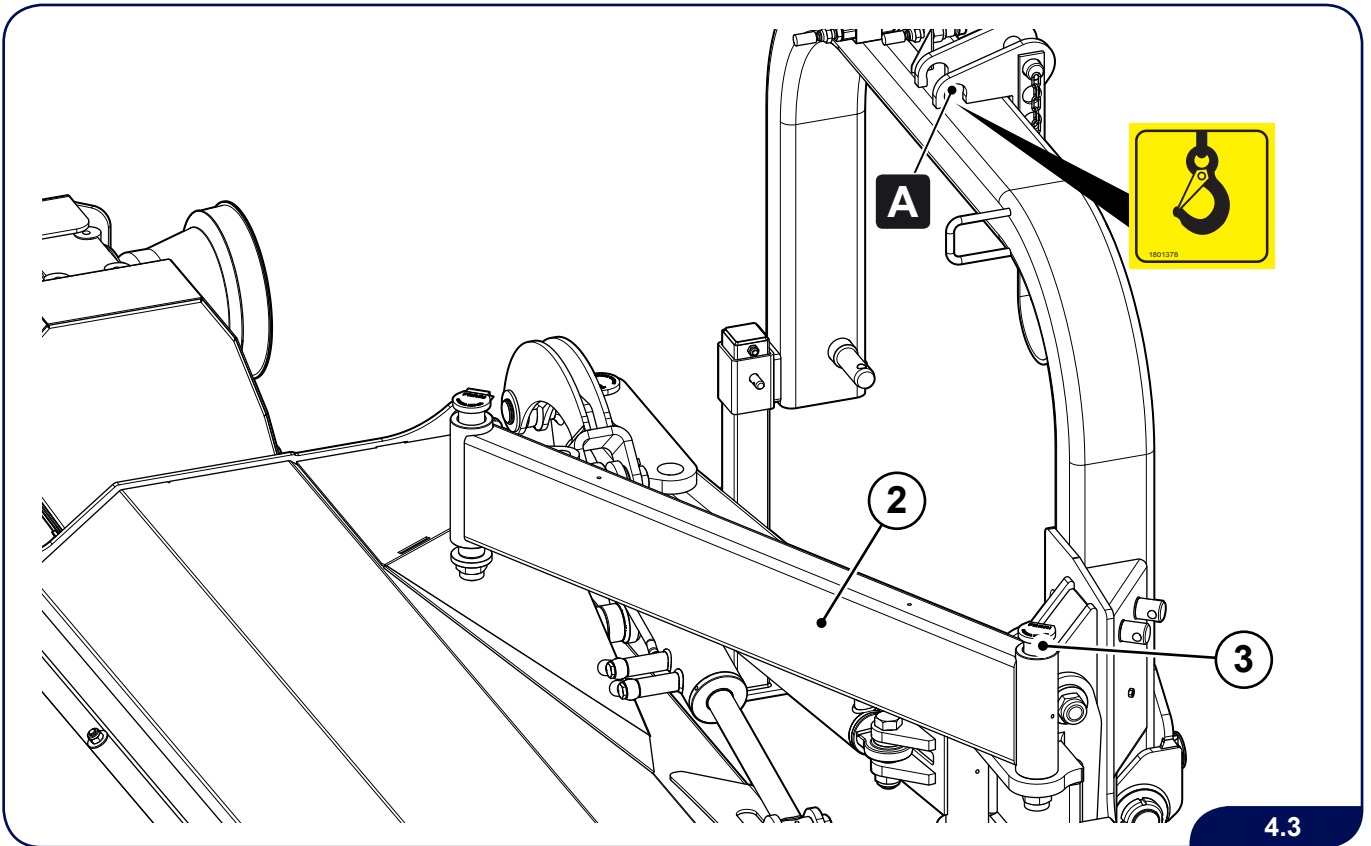
It is advisable to assign such handling operations to qualified and properly trained personnel (sling operators, fork-lift operators, etc.).

- 1) Arrange the still packaged machine in a flat position;
- 2) Free the work area from any obstacles;
- 3) Remove the fastening elements and the PTO shaft packaging (1);
- 4) Move the PTO shaft (1) manually or using a gantry crane;
- 5) Position the PTO shaft (1) on the ground in a safe position without cluttering up the work area.



4.2

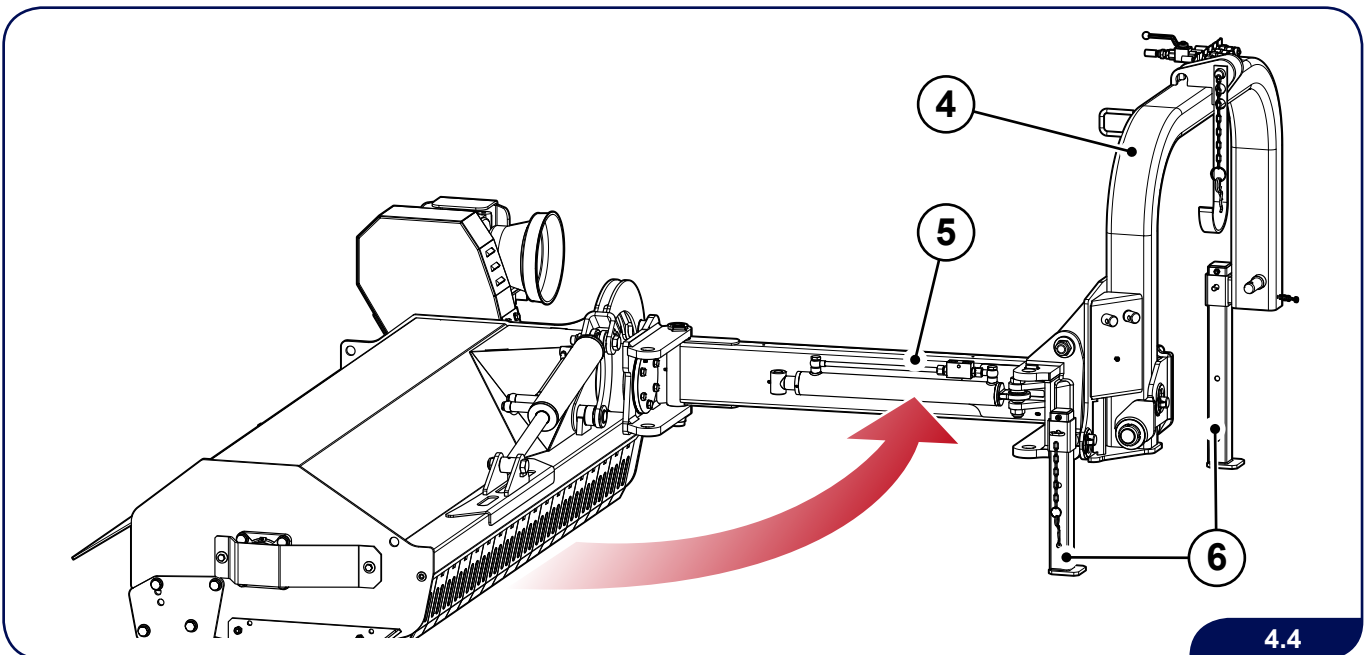
- 6) Dismantle pin (3), using the relevant wrench and remove arm (2) positioning it outside the work area;
- 7) Connect a hook to a hoist of suitable capacity using a belt or chain;
- 8) Insert the hook in the hole provided in the arc (A) and slightly tension the belt/chain.



04-Rimozione imballo (ZL-ZLE)

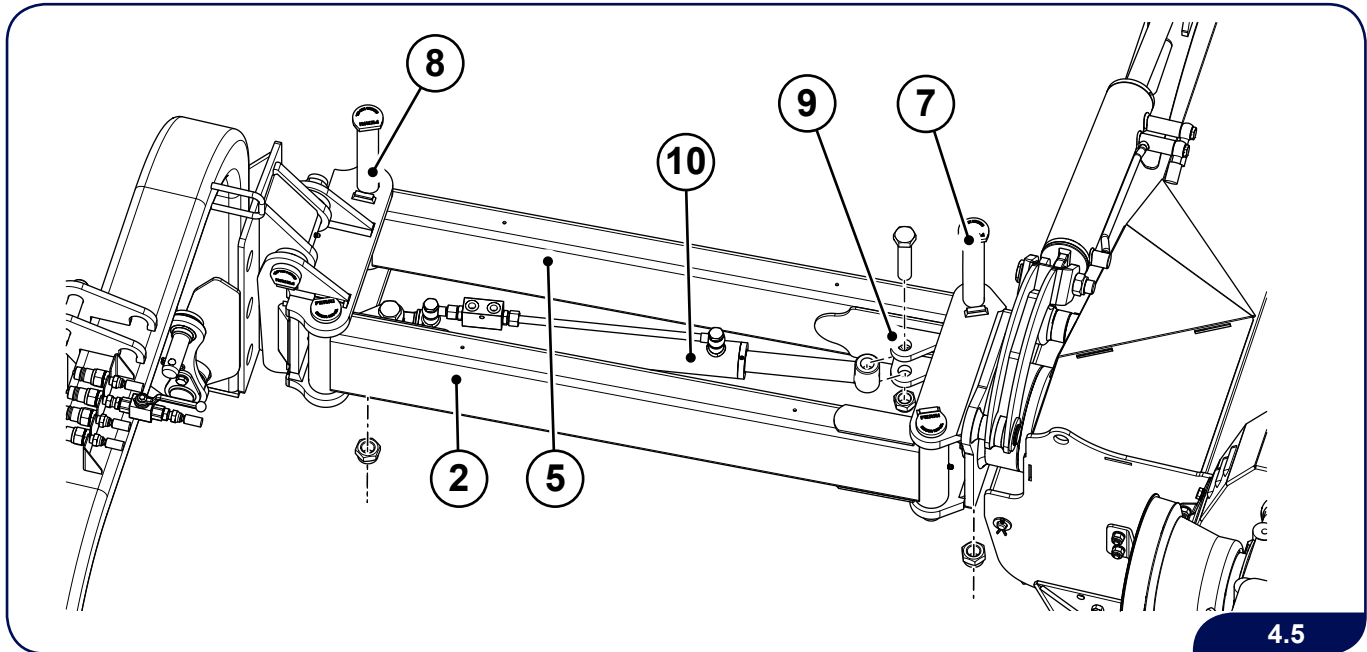
4.3

- 9) Move the arc (4) so as to be able to open the articulation arm (5) still connected to the machine;
- 10) Using the support feet (6) connect the arc (4) on the ground and keep it safe with the tensioned belt/chain.

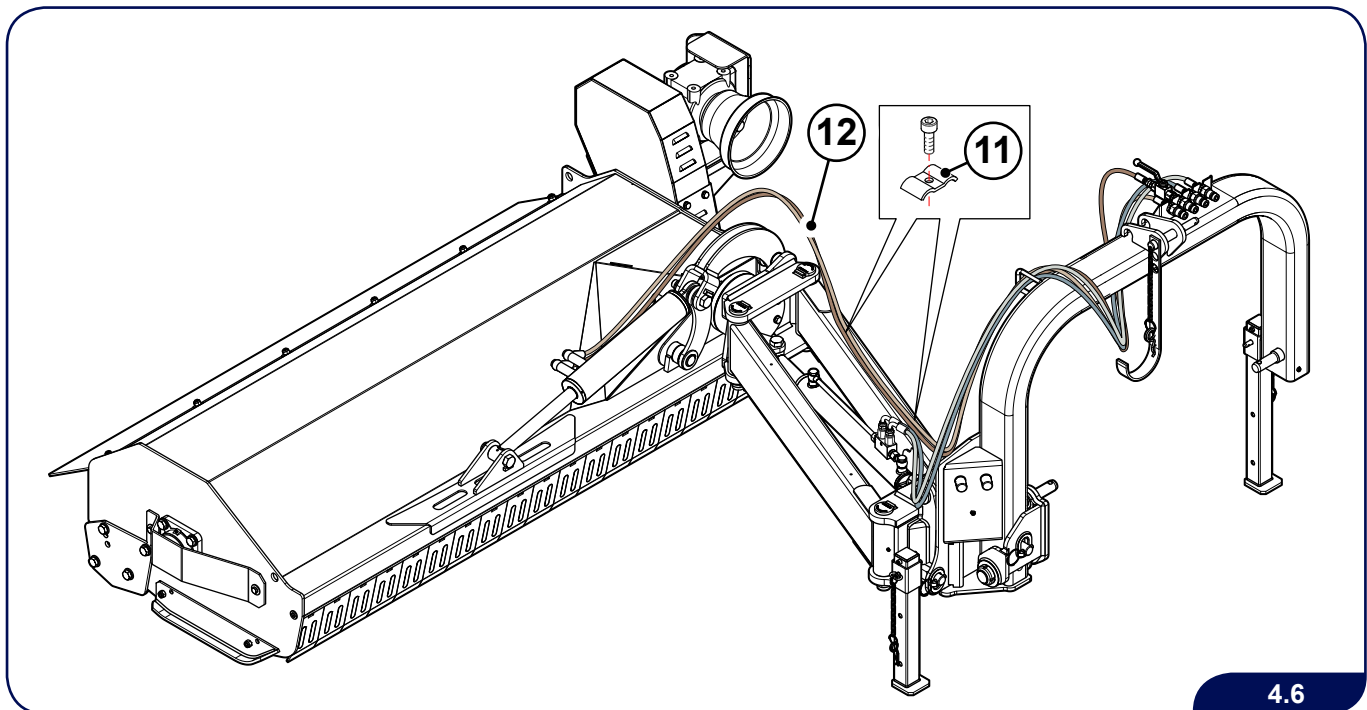


4.4

- 11)** Connect in sequence the machine side arm articulation pin (7), the arc side arm pin (8) and the articulation hydraulic ram (9).
- 12)** To open the hydraulic ram and be able to assemble it on the arms (2-5), use a compressor that allows the hydraulic ram stem (10) to be opened easily.



- 13)** Fix the hydraulic hoses (12) using the collars (11).



04-Rimozione imballo (ZL-ZLE)

4.3 Coupling to tractor



Prior to coupling the machine to the tractor, make sure that:

- A) All the controls have been disabled;
- B) The tractor engine has been switched off;
- C) The parking brake has been applied;
- D) The ignition key has been removed from the dashboard;
- E) All moving parts have come to a complete stop.

Illuminate the work areas whenever visibility is scarce.

During coupling operations keep all unauthorised people at least 5 metres away from the coupling point.



Position the tractor on a level compact area to avoid lateral loading of the machine on the stabilisers.

- ▶ Before connecting the machine to the three-point coupling on the tractor, position the safety device of the lifting arm in order to avoid involuntary and/or accidental lifting or lowering.
- ▶ The three-point coupling on the tractor and the machine must coincide. If they do not, adapt them accordingly.



In the tractor lifting arm linkage system zone there is a risk of injury due to the presence of points where crushing and cutting can occur.
Do not use the external control for lifting the machine.

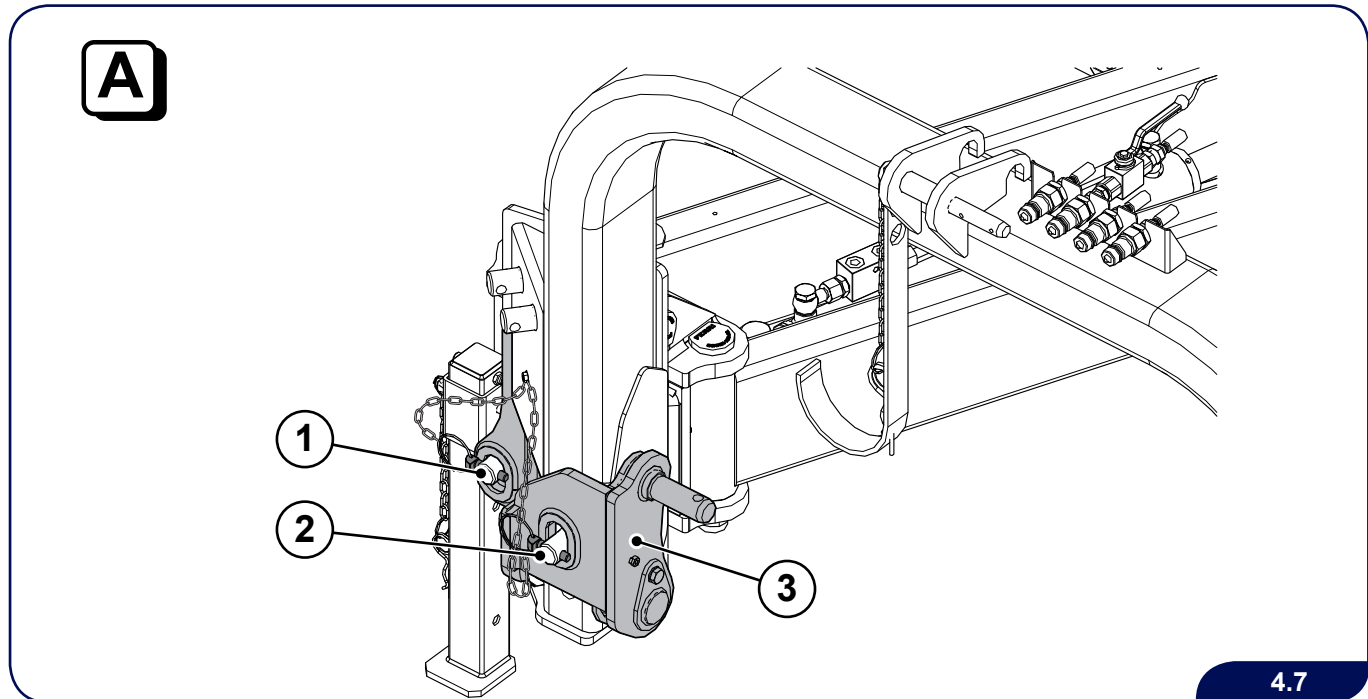


During coupling phases do not allow anybody to remain between the tractor and the tool.

Configuration A

Parking or attaching to tractor:

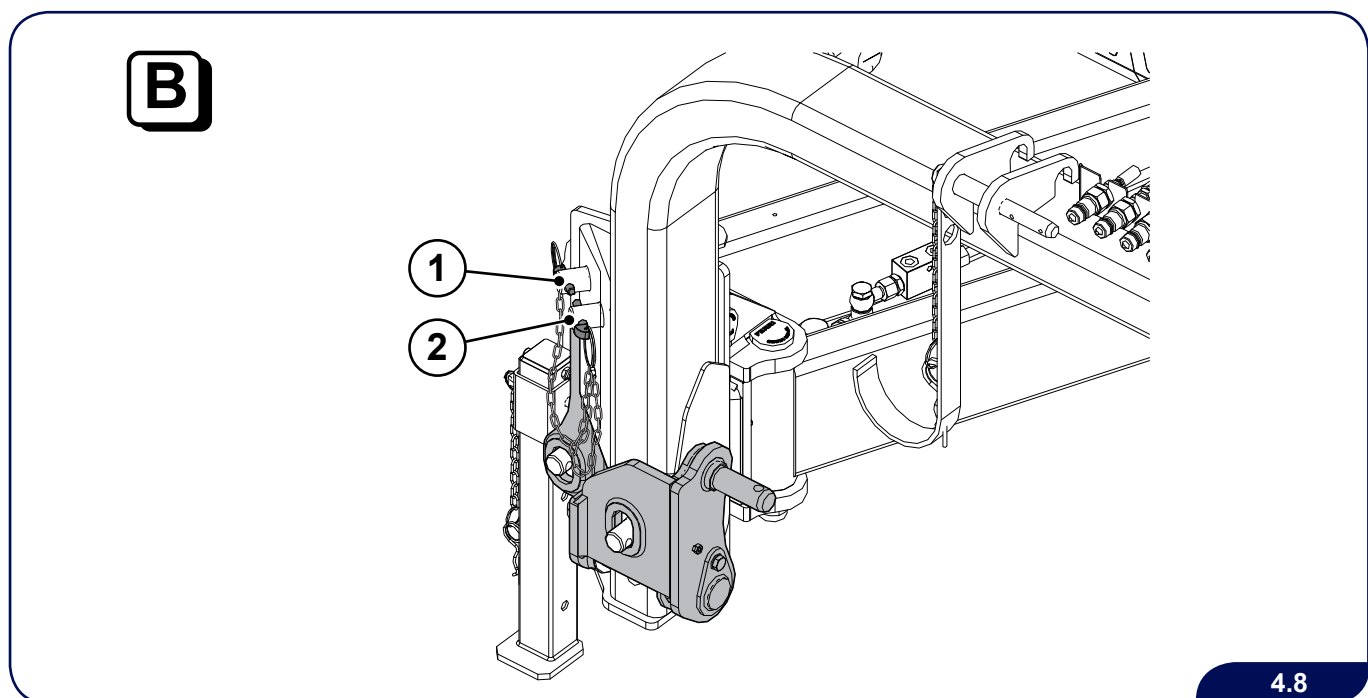
- 1) Ensure that pins (1 and 2) are in position **A**;
- 2) Ensure that the safety attachment (2) is locked in a vertical position;
- 3) Ensure that the pins are correctly locked using the relevant safety split pin.



Configuration B

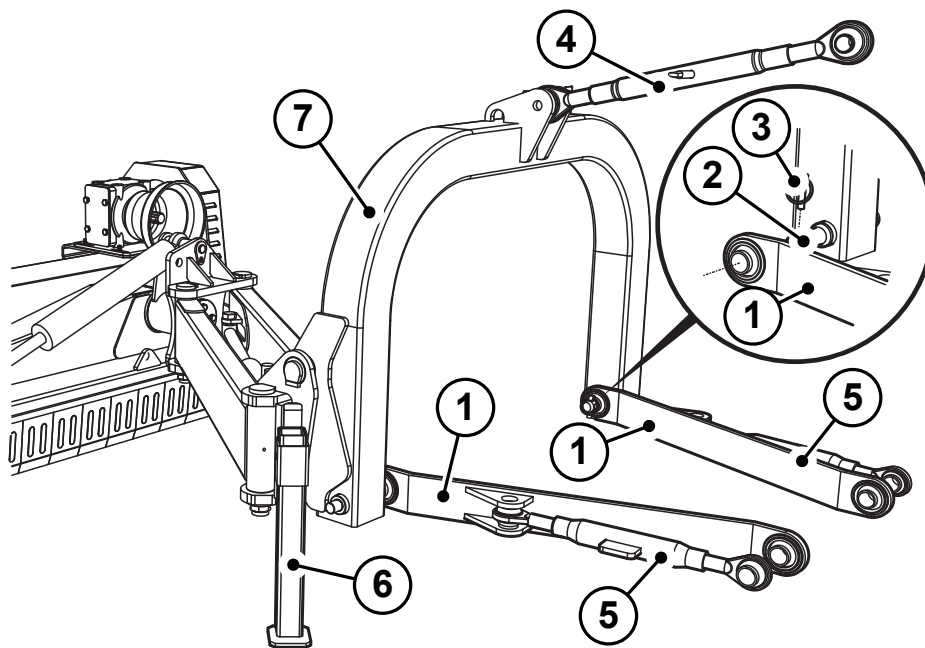
Work position:

- 1) Position pins (1 and 2) in position **B**;



4.3.1 Attaching without a Quick Hitch

- 1) Move the 2 tractor hydraulic lifting device arms (1) towards the attachments of the machine so that (2) they overlap.
- 2) Insert the lifting device arms into the attachments (2) and lock them with the safety (3) pins.
- 3) Fit the third point stabiliser (4). Raise the machine and adjust until the third point arc (7) is perpendicular to the ground. Tighten the 2 arms (1) of the lifting device using the respective stabilisers (5) and position the machine in a central position.
- 4) Ensure that the locks, in their respective assemble pins, are blocked.
- 5) Raise the support foot (6) (only if present).
- 6) Connect the hydraulic ram control pipes to the tractor, ensuring to not invert them during assembly.



4.9

4.3.2 Attaching with a Quick Hitch

- 1) Adjust the height of the tractor's hydraulic lifting device arms so that the lifting hooks are lower than the attachment pins on the machine.
- 2) Ensure that the 3 attachment pins are correctly assembled.
- 3) Align the tractor's hydraulic lifting device hooks reversing slowly.
- 4) When the lifting device's quick hitch is positioned under the machine's 3-point coupling pins, slowly raise the tractor's hydraulic lifting device. Ensure that the tractor's hydraulic lifting quick hitches are completely inserted inside the machine's 3-point coupling pins.
- 5) Block the hydraulic lifting device hook lock.
- 6) Connect the hydraulic ram control pipes to the tractor, ensuring to not invert them during assembly.

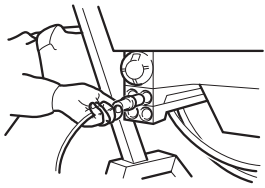


Insert and lock the safety pins into the pin hole and make sure that they are locked in place. Also lock the third point coupling anti-unscrew device.



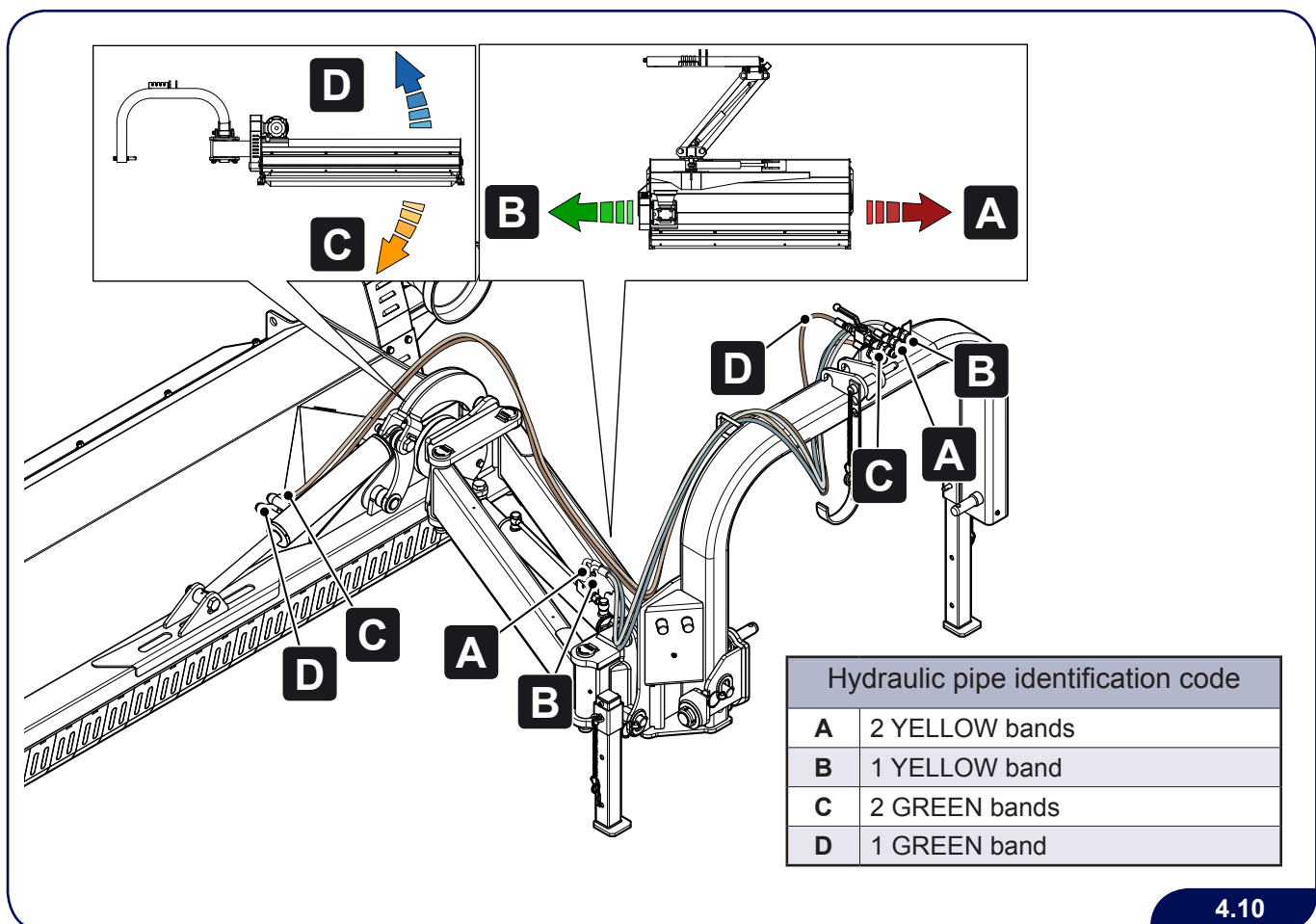
Do not operate with the flail head leaning towards the back or front part to not compromise the efficiency of the accident prevention devices fitted on the machine. Ensure that the flail head is parallel to the ground during operation.

4.3.3 Hydraulic connections for lateral movement



Make sure that the hydraulic hoses are fitted and mounted correctly. If they are inverted this will cause movements opposite to those commanded.

- 1) Connect the hydraulic hoses with quick hitch on the tractor after having checked that all attachments are clean and in optimum condition.
- 2) Connect the male couplers to the quick hitch on the tractor. Ensure that they are properly attached.
- 3) Give pressure to the hydraulic system and in the event of detecting a loss of pressure, take all possible precautions to prevent accidents.
- 4) Liquids under pressure, above all the oil in a hydraulic circuit, can cause serious injuries and lead to infections. In the event of accidents see a doctor.
- 5) Once the shredding operation has finished, fix the hydraulic hoses, unhooked from the tractor, to the appropriate supports.
- 6) Clean the couplings at the end of the hoses and the area around the quick hitch of the tractor using a clean cloth.
- 7) Before servicing the hydraulic system, shut down the tractor engine (if in action) and cut the pressure to the circuit.
- 8) Do not dispose of used oil and grease residue into the environment. Deliver it to a suitable waste disposal centre.

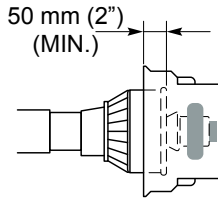


04-Collegamenti idraulici spostamento laterale (con rotazione)

4.4 Fitting the PTO shaft

Before using the PTO shaft, carefully read the use and maintenance manual.

PTO SHAFT SPECIFICATIONS	
No. Splines	6
Fitting	1" 3/8



If the PTO shaft supplied with the machine is not being used, check that the cowlings of the machine and of the tractor are overlapped on the protection of the PTO shaft at least by the amount contemplated by the safety regulations in force (50 mm/1.97 in).



Do not exceed a PTO shaft angle of 15°, since operating at more than 15° will reduce the PTO shaft life by 75% and will invalidate the warranty.
If it is necessary to work with greater inclination angles, use PTO shafts with a double homokinetic joint.
If the same equipment is used on different tractors (with and without Quick-Hitch), you must use different drivelines.
A Quick-Hitch will change the distance between coupling-tractor and coupling-equipment.
Check the distance between the two couplers.

Use only PTO transmission shafts with unbroken protections.
 The length of the PTO shaft must be suited to the type of tractor used.
 When the PTO shaft is detached from the tractor power takeoff, it must ALWAYS be placed on the support provided.



For correct and safe operation of the machine, use exclusively PTO shafts bearing the CE mark.



Check the direction of rotation and the number of revs of the tractor p.t.o. before fitting the PTO shaft.



Before getting off the tractor and before every operation, always engage the parking brake and disengage the PTO. Turn off the engine and remove the ignition key from the dashboard.

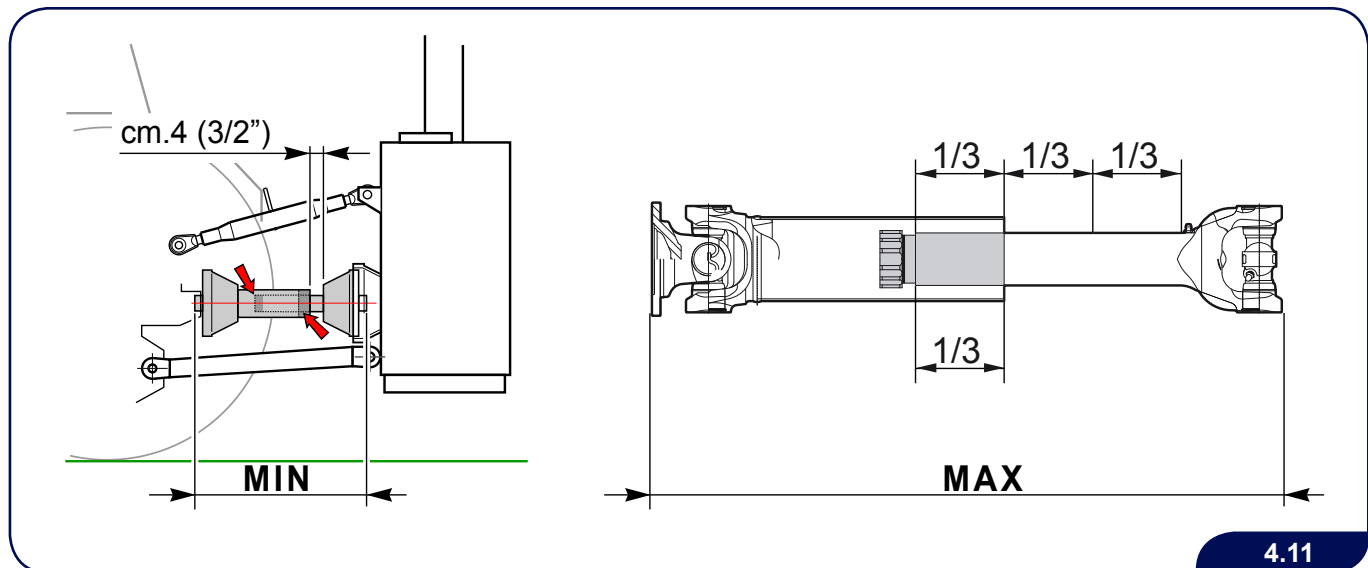


Absolutely avoid going beyond the PTO shaft area (when PTO shaft is at a standstill or when it is moving).

04-Montaggio albero cardanico

Whenever the machine is being coupled to a tractor for the first time, you must observe the following instructions:

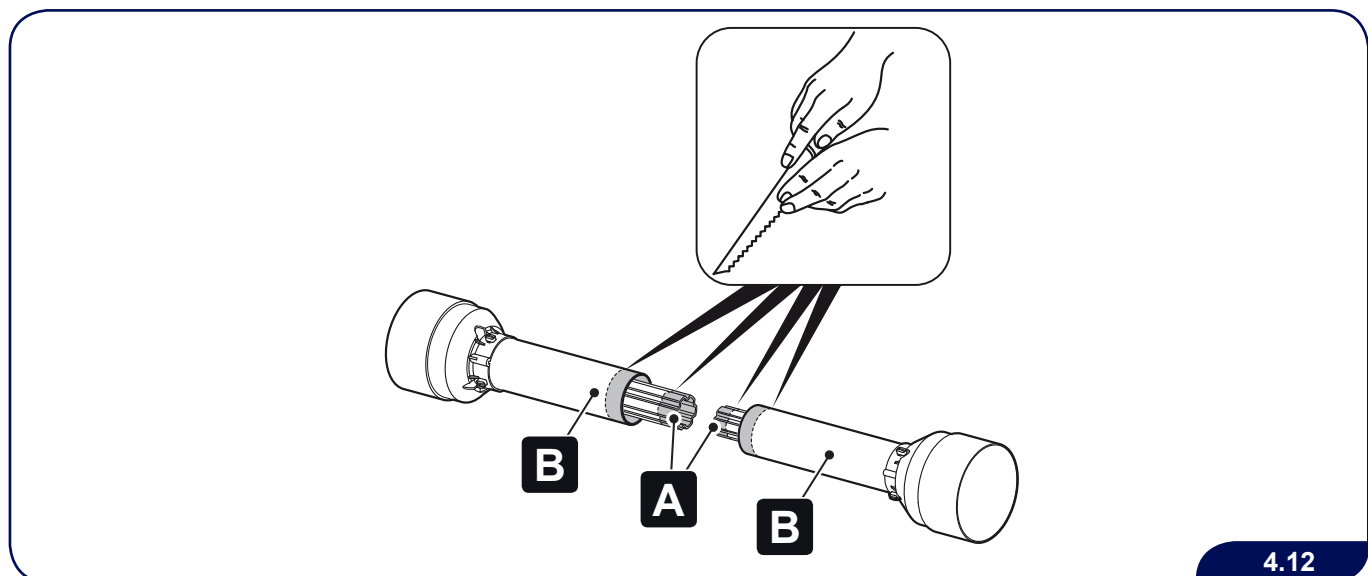
- ▶ In the condition of maximum steering, the PTO shaft must not be completely closed in order to avoid damage to the gearbox. If the PTO shaft is too long, shorten it as described in this paragraph.
- ▶ Make sure that the towing eyelet is positioned at the most appropriate height for coupling to the tractor. Otherwise, adjust the height of the eyelet as required.
- ▶ Transport the PTO shaft in a horizontal position in order to prevent potential disengagement from causing accidents or damaging the protections.
- ▶ Clean and lubricate the power takeoff and the gearbox coupling.
- ▶ Lubricate the PTO shaft if necessary. Follow the indications supplied by the PTO manufacturer (see PTO Use and Maintenance Manual).
- ▶ Using the tractor hydraulic lifting device, position the machine at the closest point between the respective power takeoffs and check the length of the PTO shaft. The semi-shafts of the PTO shaft must be overlapped by at least $\frac{1}{3}$ of their length in the maximum pulled-out position, and they must have a free span of at least 4 cm (1.57 in) in the maximum pushed-in position.



4.11

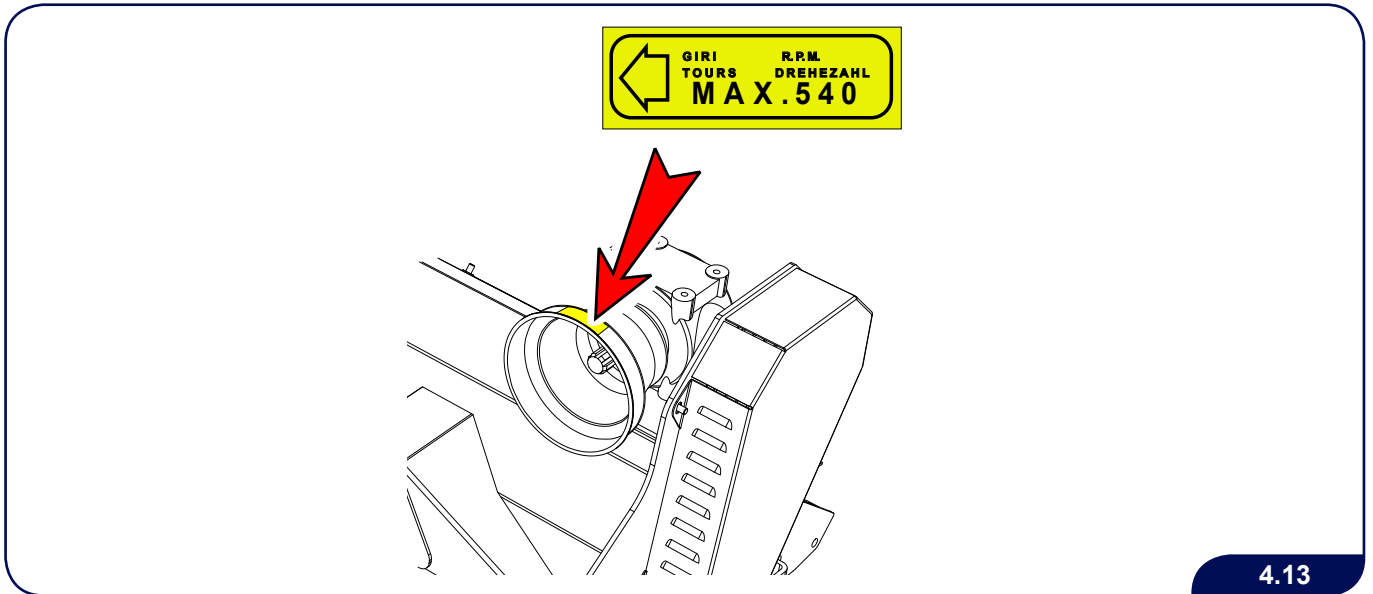
04-Montaggio albero cardanico

- ▶ Check that the length of overlap between the shaped pipes is not less than $\frac{2}{3}$ of the stroke with the PTO shaft closed. Otherwise, cut the excess part of both the telescopic pipes (A) and the guards (B). **Cut only the male part and NEVER the female part.**



4.12

- ▶ Fit the PTO shaft onto the machine gearbox assembly. Respect the assembly direction required by the Manufacturer and indicated on the outer covering of the protection and on the tractor power takeoff.



4.13

04-Montaggio albero cardanico



CAUTION

Always connect the PTO shaft last of all to the tractor PTO, and disconnect it first of all at the end of work.

- ▶ Fasten the protections of the PTO shaft with chains to the machine and to the tractor to prevent their rotation.
- ▶ Ensure that the anti-removal safety block (button) is correctly inserted and blocked in its housing.
- ▶ The overlap between cowling and PTO shaft must not be less than 5 cm (1.97 in).
- ▶ To connect the machine to the tractor PTO using the PTO shaft, pull the coupling collar back and align the splines with those of the PTO coupling.
- ▶ Push the coupling inside that of the PTO and release the locking collar. Move the coupling until it is inserted as well as possible to the PTO shaft.
- ▶ Push and pull the PTO shaft back and forth to ensure a secure attachment.
- ▶ Check that the PTO shaft slides easily and that the couplings rotate freely.



CAUTION

If the PTO shaft does not slide easily, pull it apart and clean the splines and re-insert it. Be sure the couplings are phased and the splines are in good condition. If the shaft does not slide freely and the couplings are not aligned, do not force the shaft as this will cause irreparable damage.

- ▶ Connect the PTO shaft to the tractor, retracting the safety pin. Make sure that the pin returns to the safety position in order to have the coupling assembled correctly. Be sure the coupling is locked in position.
- ▶ Always stop the power takeoff when lifting the tool or when the manoeuvring angles are too large.



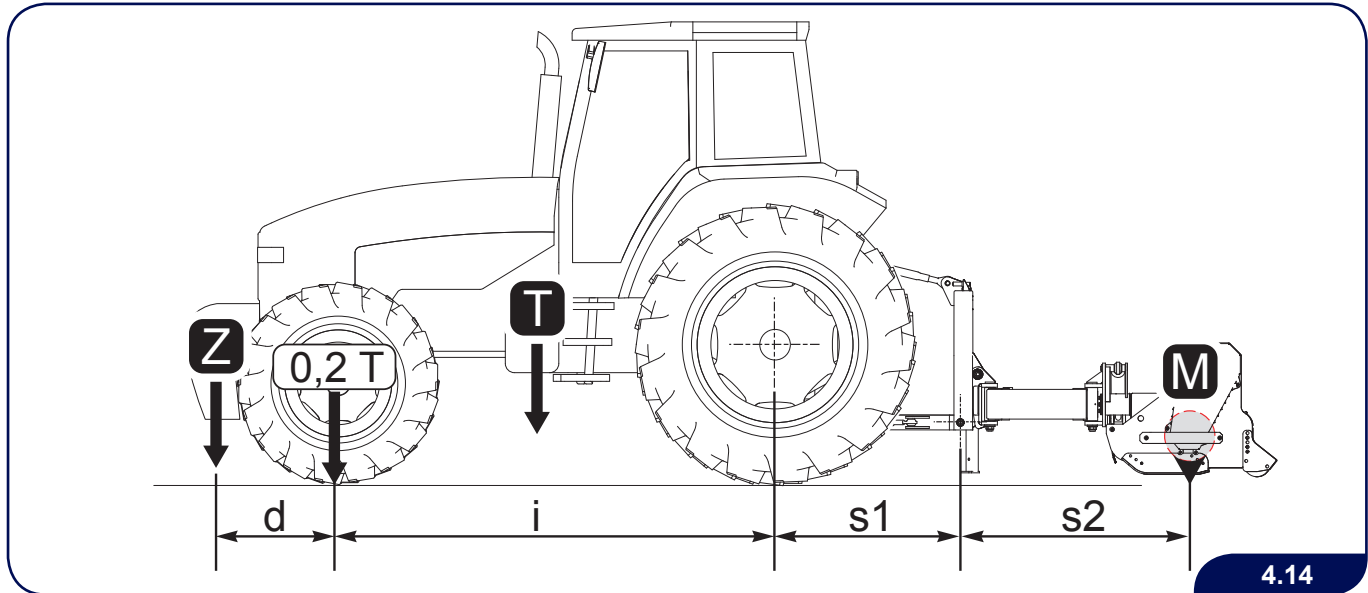
CAUTION

FERRI declines all responsibility for damage caused by incorrect assembly and use of the PTO transmission.

4.5 Tractor stability

Check the lifting capacity and the longitudinal stability of the tractor by means of the following formula. Add ballast at the front if necessary.

To determine the total weight of the machine, add up the weight of all the components (see Chapter 3).



4.14

$$M \times (s1+s2) \leq 0.2 T \times i + Z(d+i)$$

$$M \leq 0.3 T$$

i	=	tractor wheel base
d	=	distance of front axle from ballast
s1	=	overhang of the rear axle of the machine coupling points
s2	=	height of the machine coupling points from the centre of gravity
T	=	mass of the tractor + 75 kg (operator)
Z	=	mass of ballast
M	=	mass of the fully loaded machine



WARNING

The front axle of the tractor is lightened according to the weight attached at the time of coupling to the shredder. **THE LOAD ON THE FRONT AXLE MUST BE AT LEAST 20% of the total mass tractor/equipment ready to be used.**

Check the lifting capacity and the stability of the tractor to avoid its tipping and/or losing the grip of the steering wheels.

Lift the machine completely and check that the tractor does not pitch.

When the machine is at its maximum extension, check the stability of the tractor: open the arms slowly and keep the shredding flail head as close as possible to the ground. If necessary, ballast the tractor rear wheel opposite the extended arms.



CAUTION

Do not work with the arms extended while the tractor is sitting on sloping ground. During transport, move the machine into the central position.

4.6 Detachment from the tractor

Proceed as follows to uncouple the machine from the tractor:

- 1) Apply the tractor parking brake.
- 2) Close the arms (for side shredders).
- 3) Lower the machine support feet (if present) and lock them into place.
- 4) Position the machine on the ground using the tractor hydraulic lifting device.
- 5) Switch off the tractor PTO.
- 6) Switch off the tractor engine.
- 7) Remove the ignition key from the control panel.
- 8) Remove the PTO shaft by working on the anti-removal triggers and place it on the corresponding support.
- 9) Release the stabiliser of the third point coupling and remove the respective peg and pin.
- 10) Fasten the third point coupling to the respective support on the tractor.
- 11) Release the hydraulic lifting device arms from the machine coupling points by removing the respective anti-removal triggers and connection pins.
- 12) Get back on the tractor and start the engine.
- 13) Drive away carefully.

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5 ADJUSTMENTS



Always wear safety footwear, overalls, safety gloves and, if necessary, earmuffs and a dust mask during use and during machine maintenance, repair, handling and storage operations.

5.1 Working speed adjustment

Safe working speed depends on terrain condition, grass type to be cut, density, height of cut and the degree of chopping required.

In any case the optimum speed ranges from 2-5 Km/h (1,24-3,10 Mph).

5.2 Adjusting the cutting height



Position the tractor on flat ground in order to avoid the application of lateral stress on the machine linkage system. Before adjusting, turn off the engine, put the hand brake on, switch off the power and take the key out of the ignition.



Never work or carry out maintenance operations or repairs under the machine or its components unless these are securely supported on blocks or supports, in order to prevent sudden falling of components which could cause serious injury or death.

Correct adjustment of the machine working height allows:

- ▶ jobs to be performed in a workmanlike manner;
- ▶ improved performance of the machine - tractor assembly;
- ▶ a considerable reduction of wear on the lateral runners (if present).

By adjusting the height of the support roller it is possible to vary the cutting height.

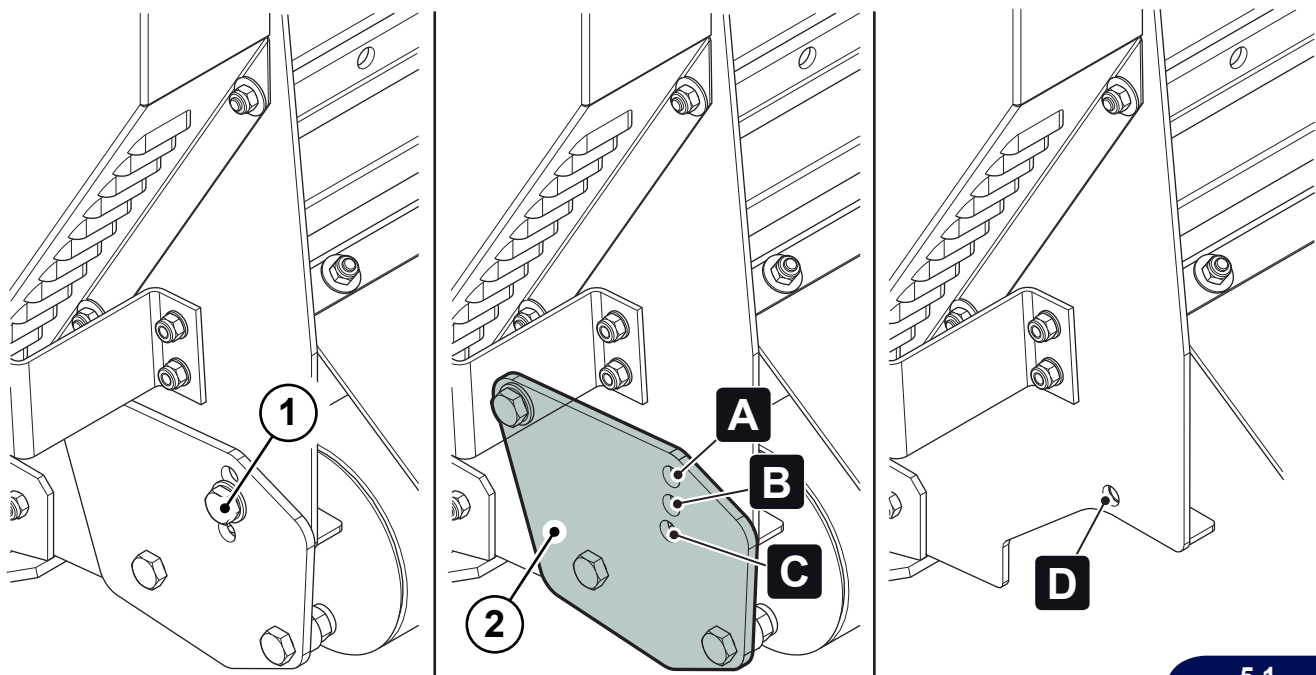


The flails must never touch the ground.

To perform adjustment, proceed as follows, on both sides of the flail head:

- ▶ Maintain the shredder in a horizontal position and lifted off the ground;
- ▶ Uncrew the screw (1);
- ▶ Depending on the degree of finishing that you want to obtain, align one of the three adjusting holes (A,B,C) of plate (2) connected to the support roller, to the hole on the frame (D).
- ▶ Tighten the screw (1) in the new position.

Height between roller and maximum cutting circumference								
A	mm	60	B	mm	40	C	mm	12
	in	2,36		in	1,57		in	0,47



5.1

To perform adjustment of the runners (if present), proceed as follows on both sides of the flail head:

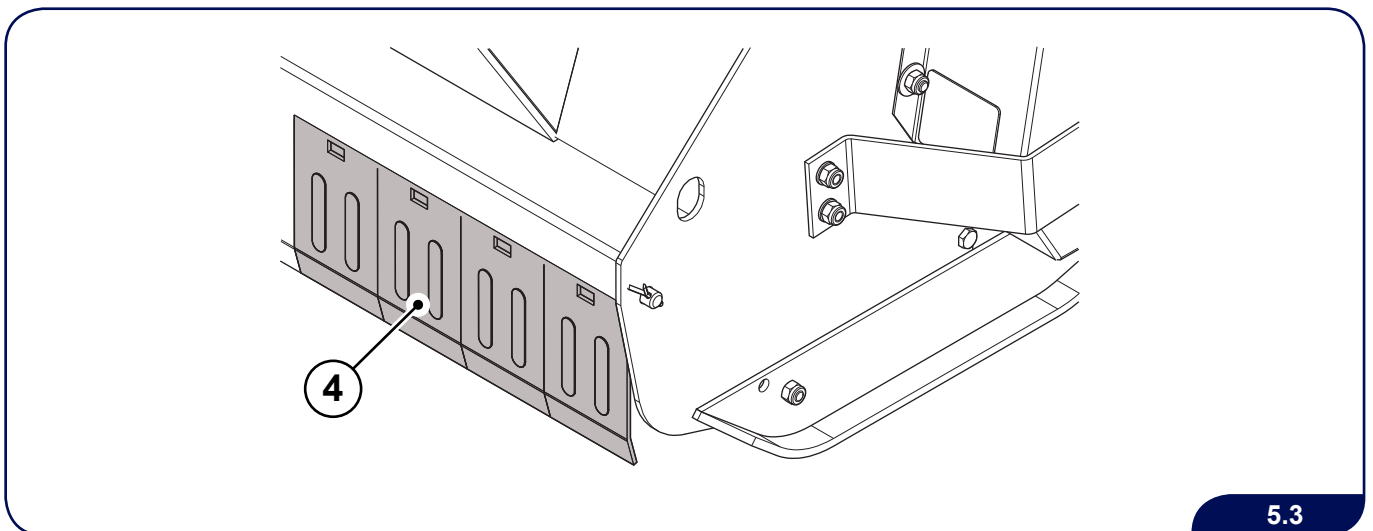
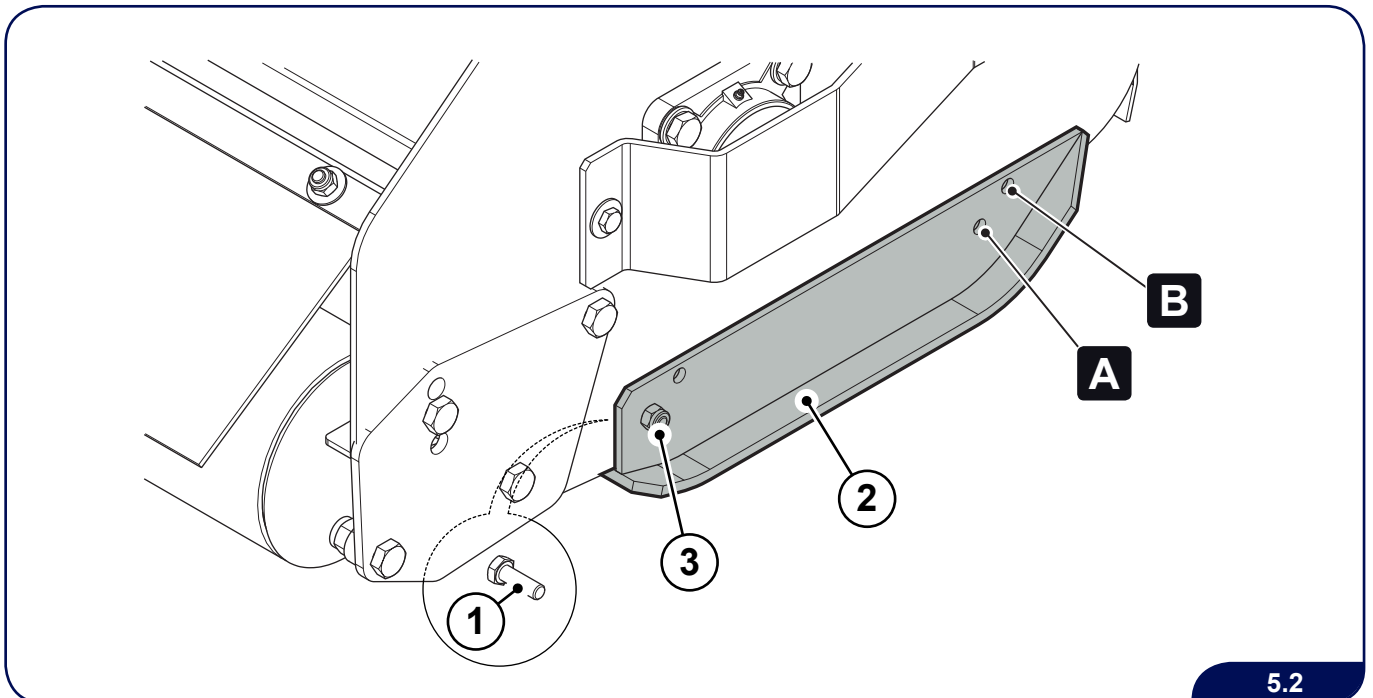
- 1) Maintain the shredder in a horizontal position and lifted off the ground;
- 2) Unscrew the screws (1) and the nut (3);
- 3) Depending on the degree of finishing that you want to obtain, align one of the two holes (A,B) on the runner (2) with the hole on the frame;
- 4) Tighten the screw (1) and the nut (3) in the new position;
- 5) Position the runners near the support roller **A** high/high - **B** medium/medium.

The runner adjustment has to be carried out together with the support roller adjustment.

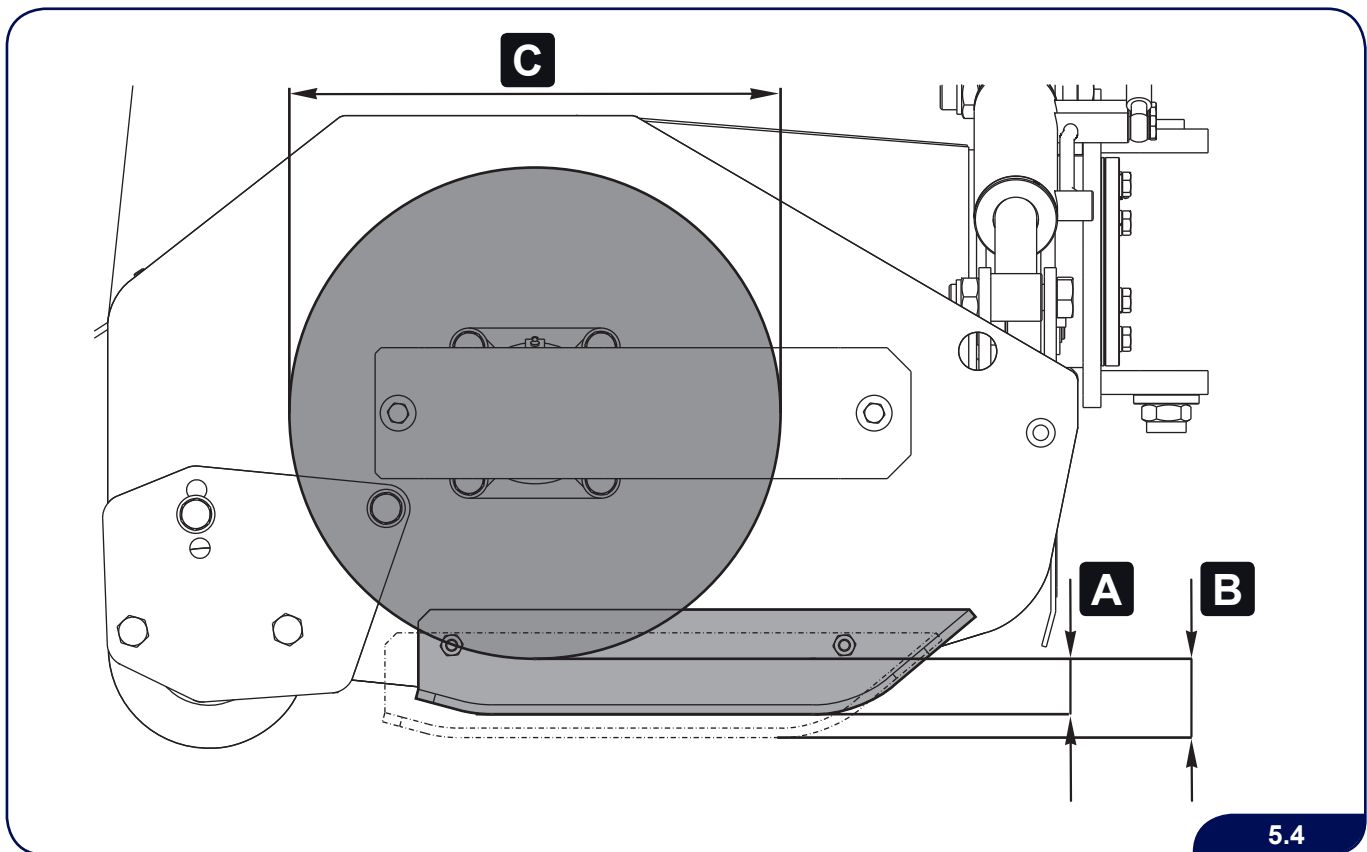


Pay attention in adjustment operations, to prevent the guards (4) being too far from the ground when the machine is in use, in which case they will not hold back solid bodies thrown up by the rotating flails.

05-Regolazione altezza di taglio (ZL)



		A	B	C
	mm	48	68	410
	in	1,89	2,68	16,14
	mm	40	60	426
	in	1,57	2,36	16,77
	mm	30,5	50,5	445
	in	1,20	1,99	17,52
	mm	51	71	404
	in	2,01	2,80	15,91
	mm	30	50	446
	in	1,18	1,97	17,56



05-Regolazione altezza di taglio (ZL)

5.4

5.3 Adjusting the belt tension

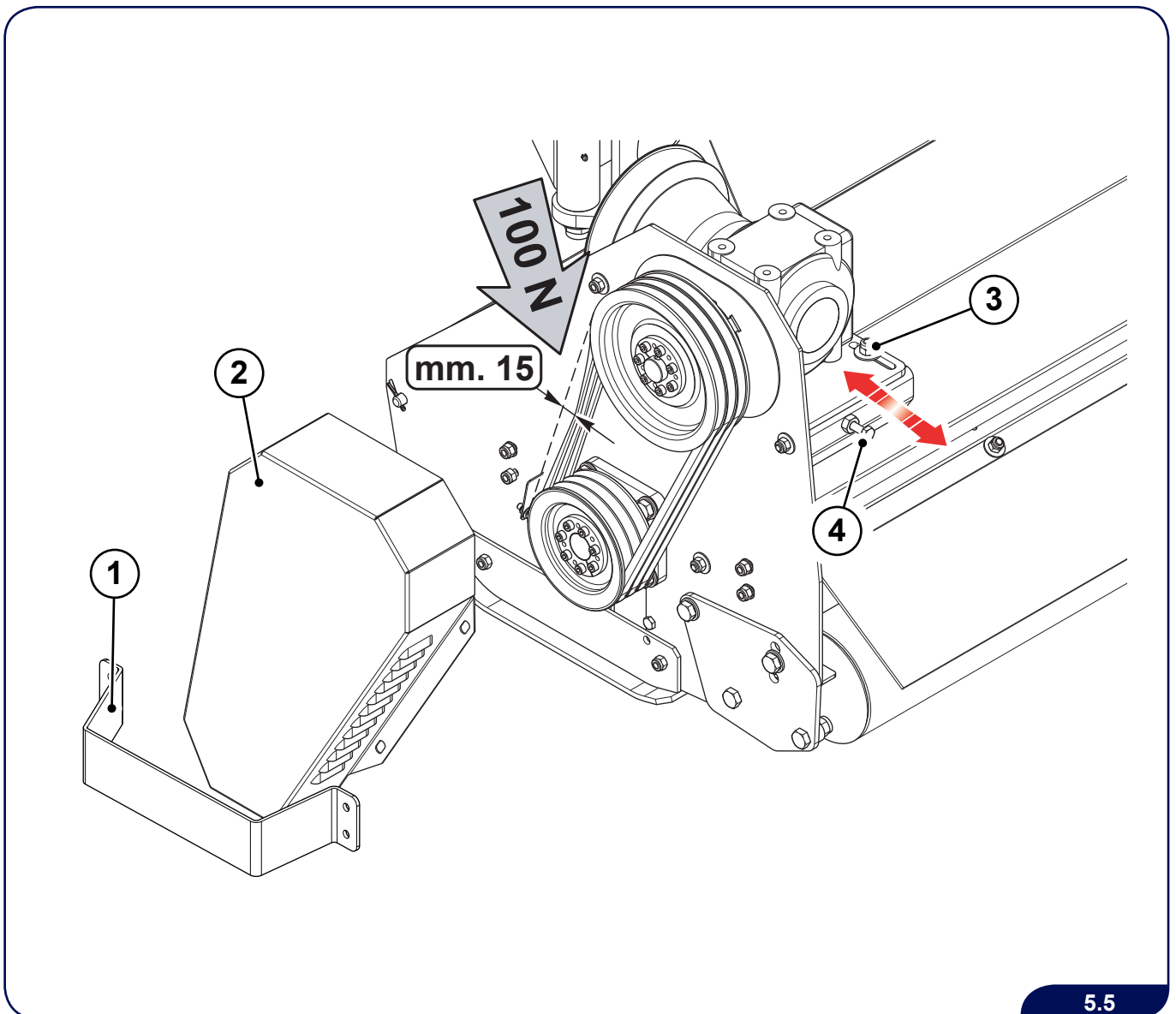


Position the tractor on flat ground in order to avoid lateral loading of the machine on the stabilisers. Before adjusting, turn off the engine, put the hand brake on, switch off the power and take the key out of the ignition.

ZL:

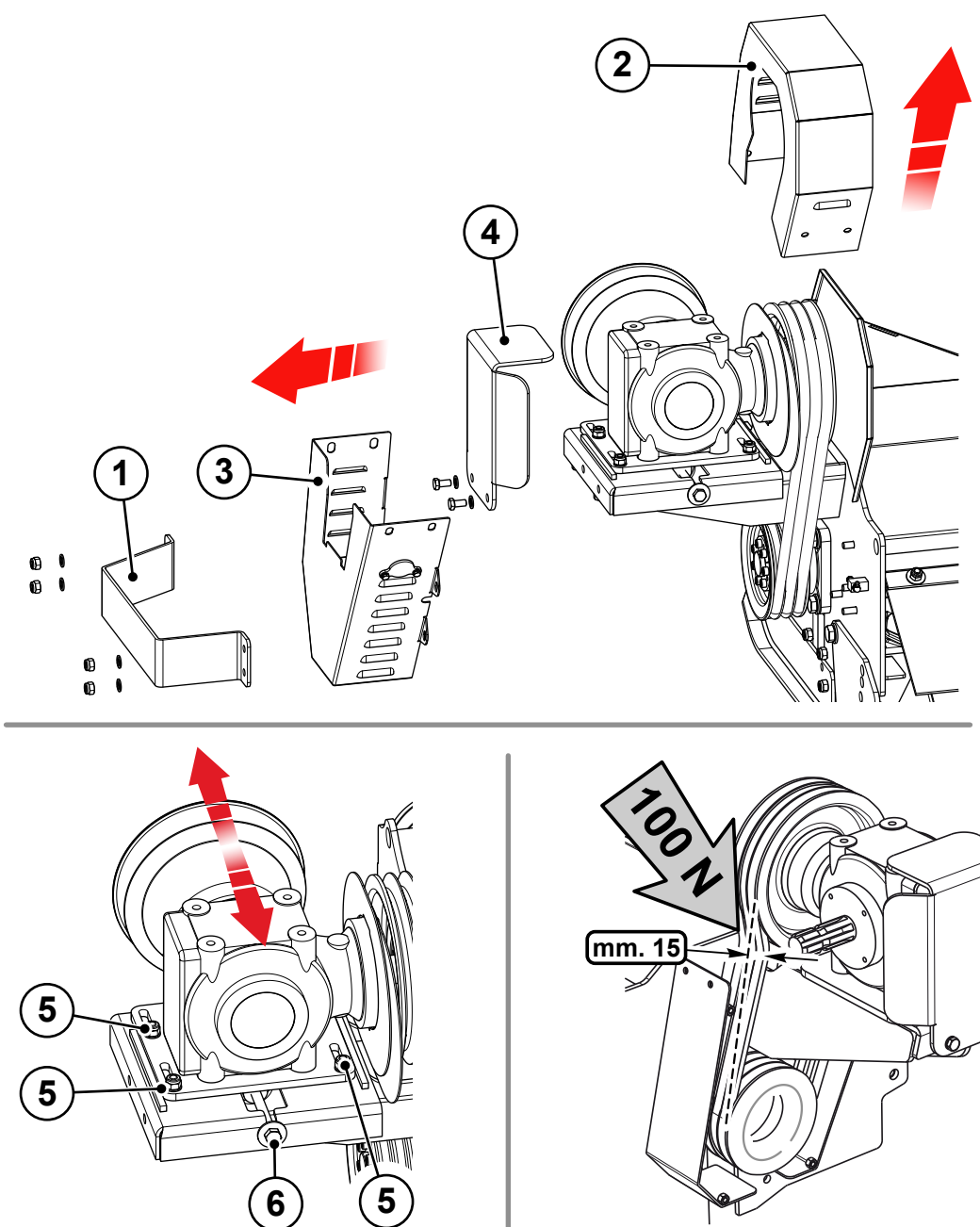
- 1) Remove the protection (1);
- 2) Remove the protective casing (2) from the belts;
- 3) Loosen the 4 nuts (3) that block the gearbox;
- 4) Adjust the stabiliser (4) to obtain a belt tension in order that, with a pressure of **100 N** (measured with a dynamometer positioned in the middle of the upper belt), a maximum bend of 15 mm is obtained.
- 5) At the end, loosen the 4 nuts (3) that block the gearbox;
- 6) Reassemble all protections following the inverse procedure.

05-Regolazione tensione cinghie (ZL)



For ZLE:

- 1) Remove the protection (1);
- 2) Remove the protective casings from the belts (2 - 3);
- 3) Remove the protection (4);
- 4) Loosen the 4 nuts (5) that block the gearbox;
- 5) Adjust the stabiliser (4) to obtain a belt tension such as, with a pressure of 100 N (measured with a dynamometer positioned in the middle of the upper belt), a maximum bend of 15 mm is obtained;
- 6) At the end, loosen the 4 nuts that block the gearbox (5);
- 7) Reassemble all protections following the inverse procedure.



5.4 Adjustment of chopped material length

This adjustment mechanism enables the operator to choose working efficiency in relation to the type of cutting flails, the length of the material to be cut and the desired working speed during operation.

- 1) Place the machine in the road transport position (therefore at 90° from the ground).



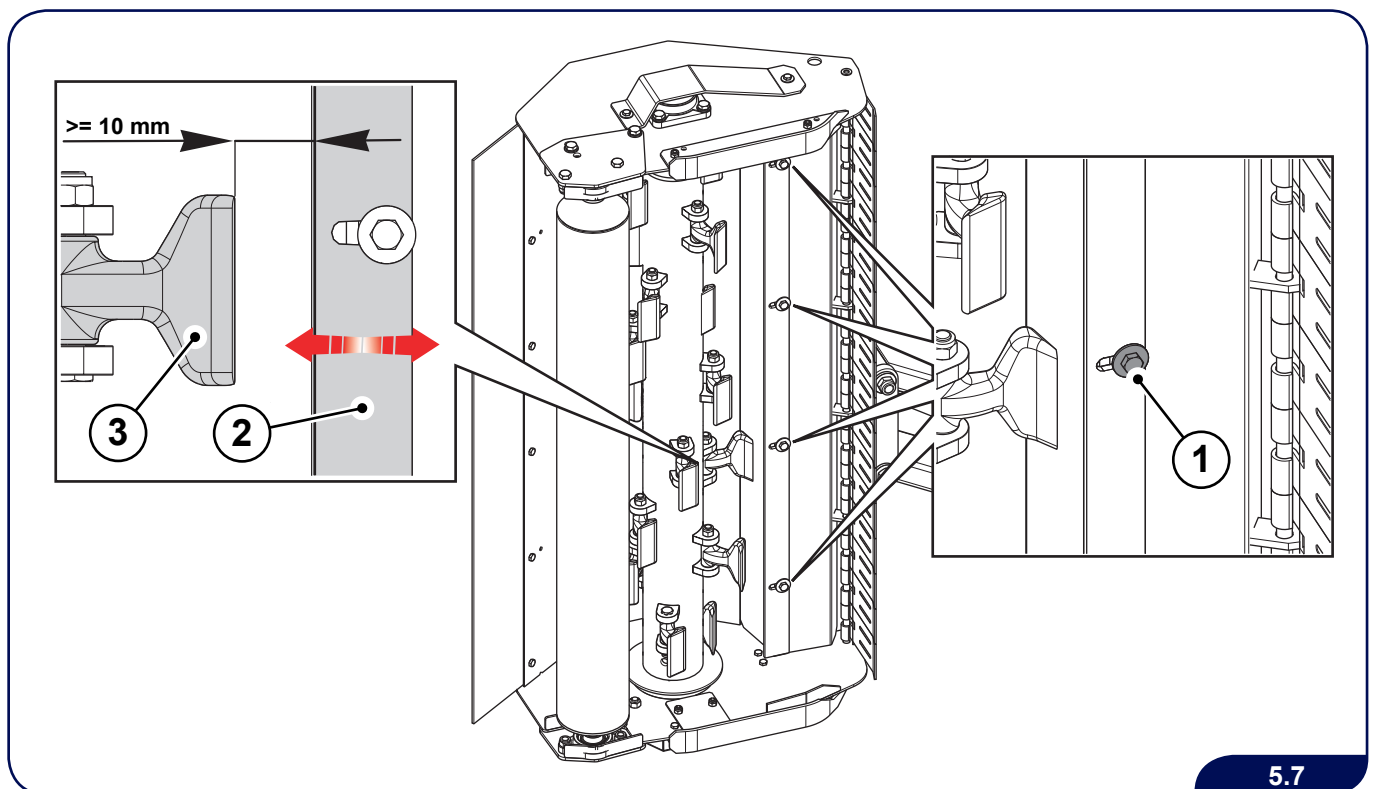
Before adjusting, turn off the engine, put the hand brake on, switch off the power and take the key out of the ignition.

- 2) Loosen the four retaining screws (1).
- 3) Adjust the blade (2), by drawing it nearer to or further away from the cutting flails (3) in relation to the result that is desired:
 - ▶ Reduce the distance between the blade (2) and flails (3), to obtain more finely chopped material;
 - ▶ Increase the distance between the blade (2) and flails (3), to enable the tractor to work at a faster speed.



The distance between the blade and the flails must not be less than 10 mm.

- 4) Ensure that the distance between the blade (2) and the cutting flails (3) is the same along the whole length of the blade.
- 5) Tighten the screws (1).



05-Regolazione lunghezze trinciato (ZL)

5.7

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6 USE AND OPERATING RULES



Always wear safety footwear, overalls, safety gloves and, if necessary, earmuffs and a dust mask during use and during machine maintenance, repair, handling and storage operations.

6.1 Controls

Set the machine control levers inside the cab in an ergonomic position for the driver and fastened to a solid support on the tractor.

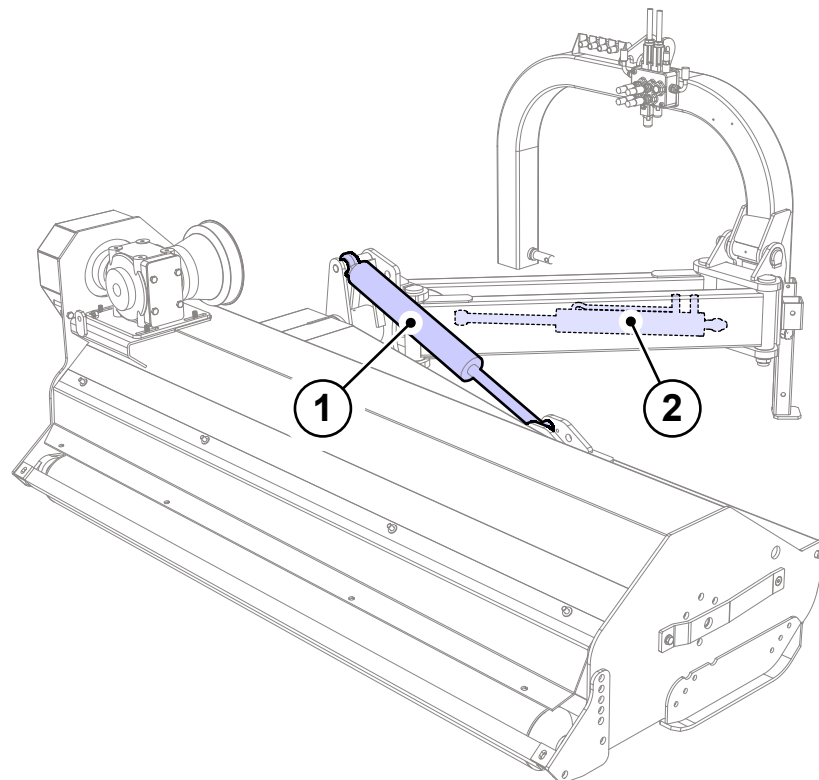
Always keep all parts of your body inside the cab in order to minimise the risk of exposure to any possible external hazards.



Before operating the machine, familiarise yourself with all the controls and their functions.

In reference to the following figure:

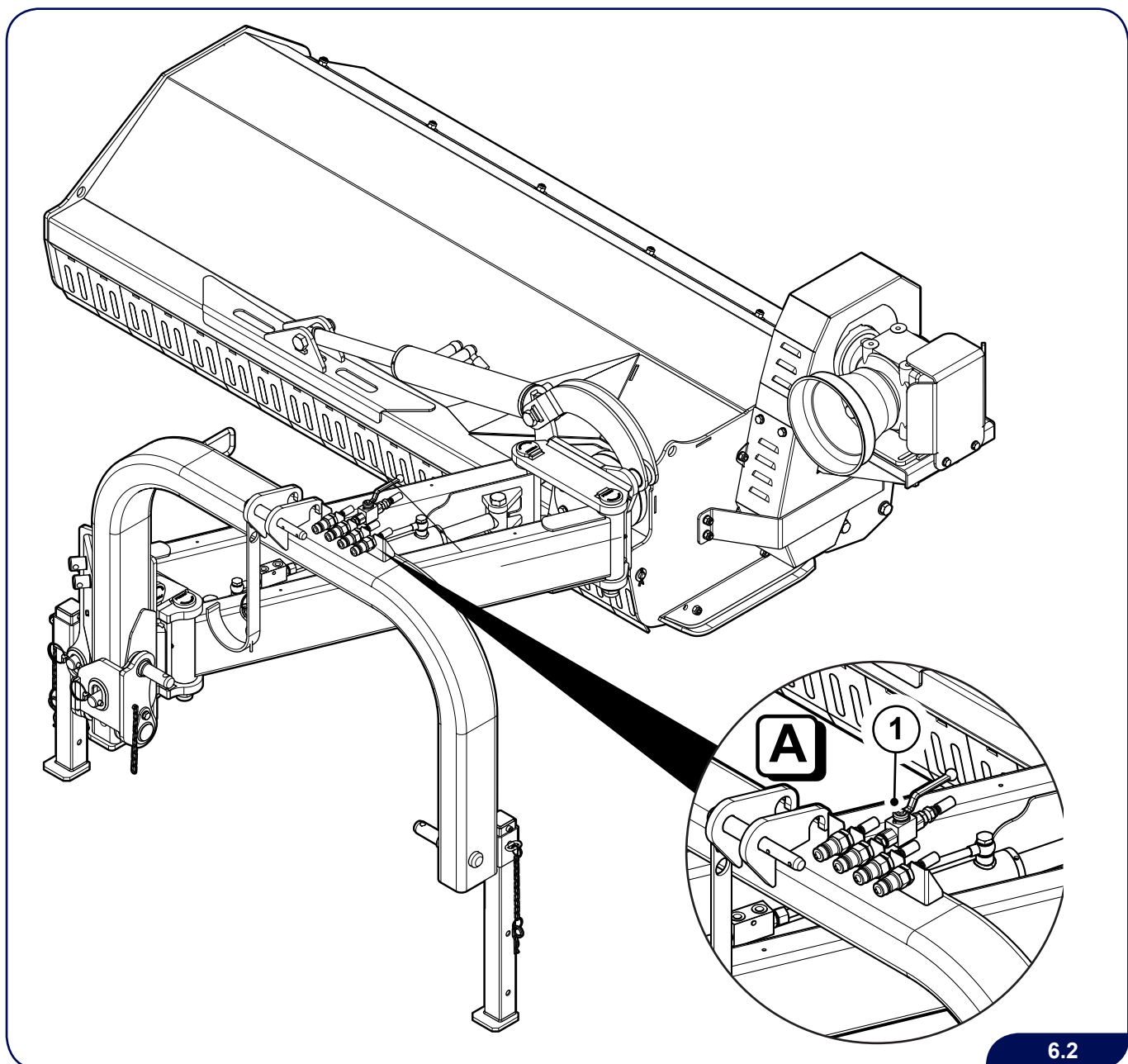
- 1) the hydraulic ram (1) controls the orientation of the shredder;
- 2) the hydraulic ram (2) controls the lateral movement of the shredder.



6.2 Positioning of the machine during operation

To position the machine correctly during operation, proceed as follows:

- 1) Make sure that there is sufficient space between the working range of the machine and other equipment and/or things.
- 2) Completely open tap (1) in position **A** to unblock the shredding flail head. In this way, using the controls in the cab, the operator can put the machine into working phase from the transport position with the flail head in a vertical position.
- 3) Lower the tractor three point coupling lifting device until the shredding flail head is parallel to the ground.
- 4) Adjust the three point coupling to the position required and lock it in place.
- 5) Familiarise yourself with the hydraulic control levers that manoeuvre the machine during work.



6.3 Starting

6.3.1 Preliminary checks

- ▶ Make an overall visual inspection of the machine.
- ▶ Check the tightening of all the screws.
- ▶ Check the integrity of the guards.
- ▶ Check the level of oil in the transmission unit.
- ▶ Check the cutting unit (the condition of the shaft, the wear on the flails, etc.) and make sure that all the various parts are correctly tightened.
- ▶ Make sure that there are no leakages of oil from fittings or tubes.
- ▶ Check the correct operation of the electric system and the light bar (if present).
- ▶ Make sure that the speed and rotation direction of the tractor power takeoff are the same as those required by the machine (see the sticker on the gearbox).
- ▶ If applied on a self-propelled machine, check the number of motor revolutions and the available oil flow necessary for the hydraulic motor of the shredding flail head.
- ▶ Make sure that there are no people and/or animals present within a range of 50 metres.
- ▶ Grease all the parts of the machine.



DANGER

IF THE INSTRUCTIONS ARE NOT OBSERVED, THE USER WILL BE CONSIDERED LIABLE FOR ANY AND ALL CIVIL AND/OR CRIMINAL DAMAGE THAT MAY BE CAUSED.

6.3.2 Starting up the machine



WARNING

Do not start the machine while the cutting flails are immersed in the vegetation to be cut.

- 1) Keep the tractor engine running at low rpm.
- 2) Apply force to the PTO lever slowly in order to start the rotor.
- 3) Once the PTO has been inserted at low rpm, begin gradually raising engine rpm until it reaches the normal operating level.
- 4) Wait until the flail shaft rotor reaches maximum speed before proceeding with mowing.



CAUTION

Whenever unusual noises and/or vibrations occur, immediately uncouple the PTO.

- 5) Accelerate the tractor slowly and smoothly until optimum work speed is reached (see Chapter 5).
- 6) Use all the controls progressively in order to keep the machine running smoothly.
- 7) Always run the machine at an advance speed that is equal to or slightly lower than optimum speed.



CAUTION

**Do not allow the PTO to exceed the maximum allowed value for the equipment being used.
If it exceeds the maximum allowed value, the conditions will no longer be safe and serious damage could be caused to the machine.**



WARNING

**Use the machine with an oil temperature higher than 30°C.
Heat up the oil while keeping a hydraulic ram in the end-of-stroke position.**

6.4 Working mode



During use of the machine, there may be emission of dust.
Use tractors with a cab with filters on the ventilation system, or use suitable systems to protect the airways, such as dust masks or masks with a filter.

Operate the machine briefly and then check to see if the work performed is satisfactory. If it is not, re-adjust the machine (see Chapter 5).



WARNING In the event of clogging on the rotor, before getting off the tractor and before any other operation, apply the parking brake, and switch off the engine. Remove the ignition key from the dashboard and wait until all the moving parts have stopped.



WARNING In the operation of extending and closing the machine, lift it slightly from the ground, to avoid damage to the structure.



WARNING To avoid damages to the structure of the machine or the arms during changes of direction or when reversing, raise the machine from the ground and uncouple the PTO, avoiding operation with the arm and/or the shredding flail head.



WARNING Do not let the flails turn when the flail head is raised from the ground. The possibility of objects being thrown by the flails can cause serious accidents or death.

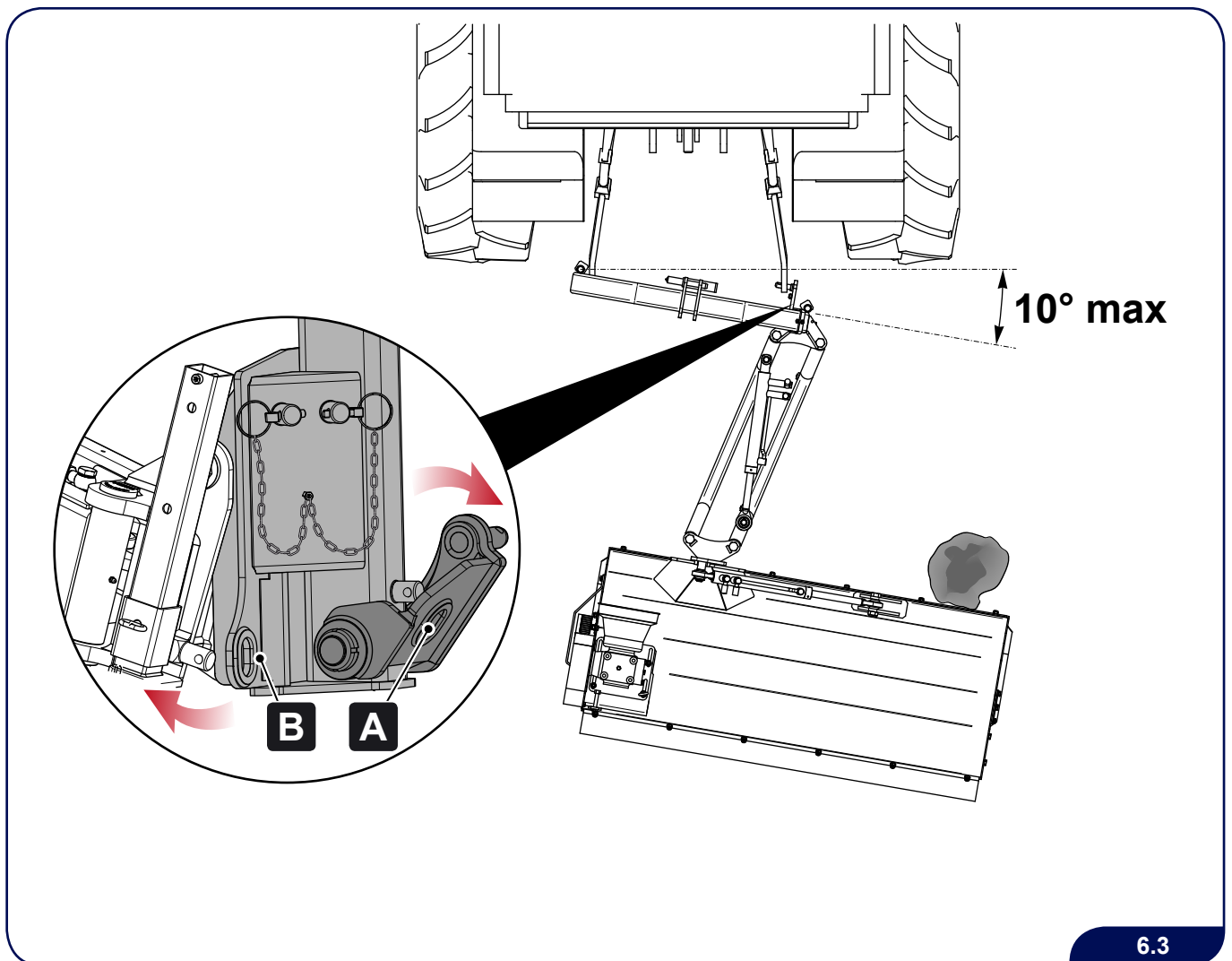
6.4.1 Arm safety

The machine is equipped with a mechanical safety device (A), which is set into operation when the shredding flail head encounters an obstacle and the tractor continues moving forward. This device enables the 3-point coupling, and consequently the whole machine, to be moved back, providing the operator with the necessary time to carry out manoeuvres to get around the obstacle. Once beyond the obstacle, or the action of the obstacle has ceased, the machine will automatically return to the correct work configuration.

The 3-point coupling also has another joint (B) to allow the machine to support the possible disjointedness in the terrain in a longitudinal direction.

When approaching obstacles, advance with caution as the space for folding is limited.

06-Sicurezza bracci (ZL)



6.3



When folding the arms, do not go beyond an angle of 10°, to avoid stressing anomalously the frame structure of the machine and the arms themselves.

6.5 *Stopping*

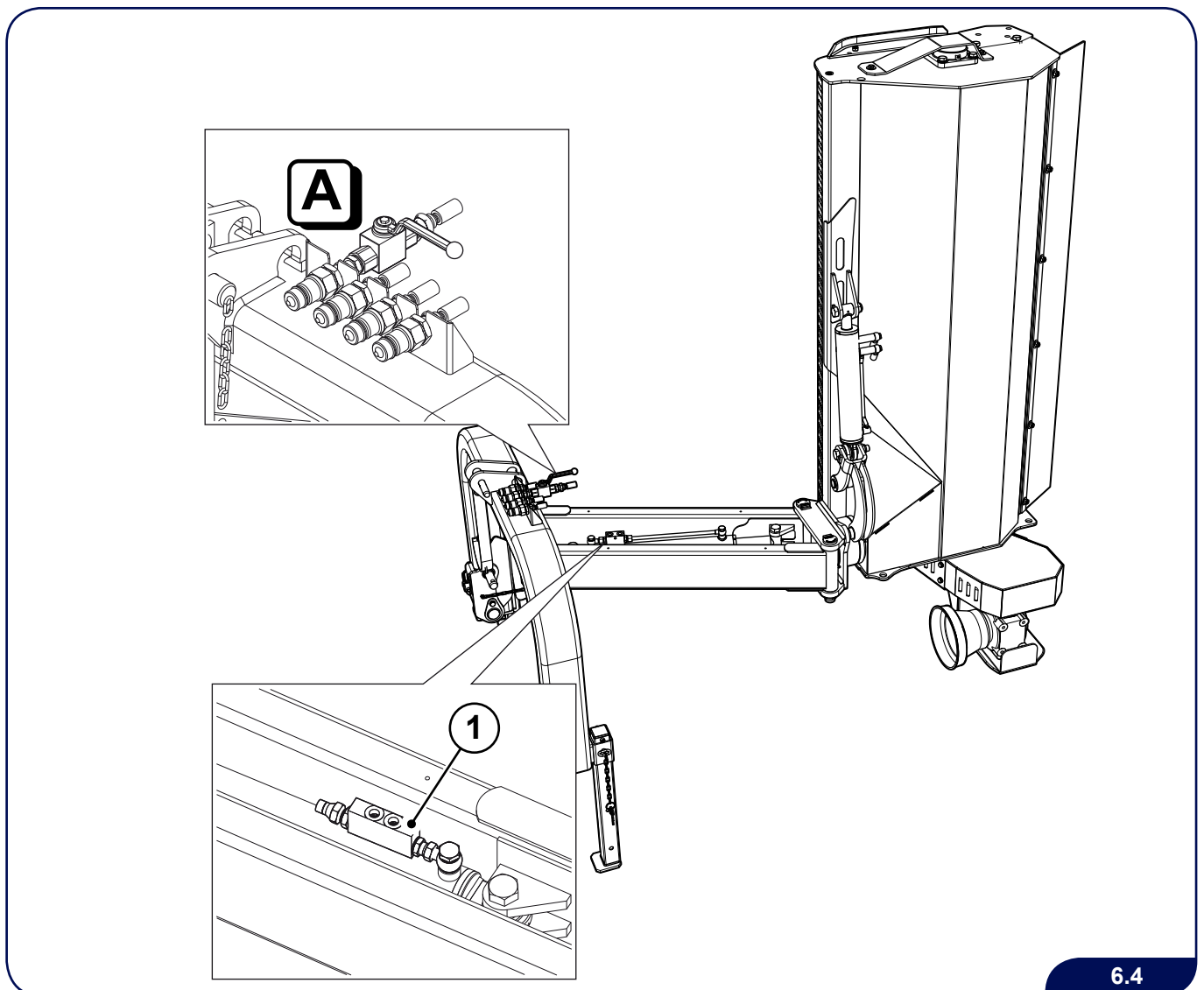
Before stopping the tractor:

- 1) Close the arms and lower the flail head to the ground;
- 2) Disengage the rotor drive and wait till the rotor has completely stopped (approx. 30 sec.);
- 3) Turn off the tractor, take the starting key out and apply the parking brake;
- 4) If the ground is sloping, insert wedges to block the tractor wheels.
- 5) Wait for all the moving parts to stop completely before switching off the tractor or moving the tractor to another place (machine not in operation).

6.6 Transport position

For transport by road it is necessary to:

- ▶ Observe all the road transport requirements.
- ▶ Attach appropriate signs indicating machine overall dimensions and footprint.
- ▶ Not lift the machine excessively to prevent the PTO shaft, with the power take off disconnected, exceeding 30° inclination and becoming damaged.
- ▶ Fit a rear bar with warning lights if the machine profile covers the tractor tail lights.
- ▶ Check that the levers operating hydraulic lifting are blocked, to avoid the machine coming down during transport.
- ▶ Close the tap (position “A”) to:
 - 1) Block the machine in the correct position;
 - 2) Prevent descent;
 - 3) Ensure a blocked stationary position during transport;
 - 4) The blocking valve (1), automatically enables the machine to remain firmly blocked in any position, particularly in the transport position.
- ▶ Consult paragraph 2.2 -**Safety rules concerning road traffic** in this manual.



06-Posizione di trasporto (ZL)

6.4



Do not activate the machine flail holder rotor with the tractor PTO when the unit is in transport position.

Choose an appropriate transfer speed above all when loaded with tools that can produce strong displacements in front or behind or when the road is uneven, bumpy or sloping.

Entering the road after work, pay attention to the cleanliness of the pneumatics and the working parts to prevent dirtying the roadside with earth or other materials.



During transport moderate your speed above all on rough roads. The weight of the machine could make driving difficult and cause damage to the machine.

During road transport the power take off must be disconnected.

7 ROUTINE MAINTENANCE



Always wear safety footwear, overalls, safety gloves and, if necessary, earmuffs and a dust mask during use and during machine maintenance, repair, handling and storage operations.

7.1 General information

The criteria for routine maintenance of the machine are provided below, based on the company's experience and on advice received from our customers.

These criteria are not exhaustive and may, therefore, be supplemented thanks to the collaboration of our customers.

Good routine maintenance keeps down the operating costs of the machine and allows you to make the most of its potential.

For specific repair or maintenance operations where it may be necessary to lift the machine from the ground or to tilt it, always use proper tools, lifters or hoists that are appropriate for this purpose (see Chapter 4).

Always use authorised dealerships and workshops.

For the replacement of machine parts, use only genuine spare parts supplied by the Manufacturer or by authorised dealers.

07-MANUTENZIONE ORDINARIA



Before carrying out any type of maintenance:

- 1) Wait until all moving parts come to a complete stop;**
- 2) Lower the machine to ground level;**
- 3) Disconnect the power takeoff;**
- 4) Switch off the engine of the tractor (or self-propelled machine);**
- 5) Apply the parking brake;**
- 6) Take out the ignition key;**
- 7) Get off the tractor to check the extent of the problem;**
- 8) Wait for the oil and the hot surfaces to cool down;**
- 9) Proceed with any interventions required on the machine.**

7.2 Checklist

The Checklist serves to schedule all the maintenance operations and to monitor the frequency with which they are performed in order to ensure the correct routine maintenance of the machine.

The manufacturer recommends keeping the original document attached to the instruction manual, and creating personal copies for every authorised technician, to make a note of the interventions carried out on the machine.

7.2.1 Every 8 working hours or daily

- ▶ Check that screws and nuts are tightened
- ▶ Check that the tools are not worn and are intact
- ▶ Check that the accident prevention protections are intact
- ▶ Grease pins, bearings, universal joints and PTO shaft telescopic barrel, etc.

7.2.2 Every 50 working hours or every month

- ▶ Check the tension and efficiency of the transmission belts (where fitted)
- ▶ Check the oil level of the tank or gearbox
- ▶ Visually check the machine to identify the presence of any breakages or damage
- ▶ Check that the heat exchanger is clean and free from debris or leaves
- ▶ Check that the rotor bearings do not overheat during operation

Intervention date	Manager	Intervention date	Manager

07-Checklist_new

7.2.3 Every 200 working hours

- ▶ Check the rotor flails are not worn
- ▶ Check the balancing of the rotor
- ▶ Check the conditions of the oil filter cartridge (outlet and inlet where fitted)
- ▶ Check the correct adjustment of the controls

Intervention date	Manager	Intervention date	Manager

07-Checklist_new

7.3 Oil table

The following table lists the oils to be used for topping up the levels.

		TYPE		CLASSIFICATION	
		BLASIA 220		ISO VG 220	
		litres		gallons	
TAB 5	OIL QUANTITY IN THE GEAR BOX	ZL1600	1,3	0,34	
		ZL1800	1,3	0,34	
		ZL2000	1,3	0,34	
		ZLE1600	1,3	0,34	
		ZLE1800	1,3	0,34	
		ZLE2000	1,3	0,34	

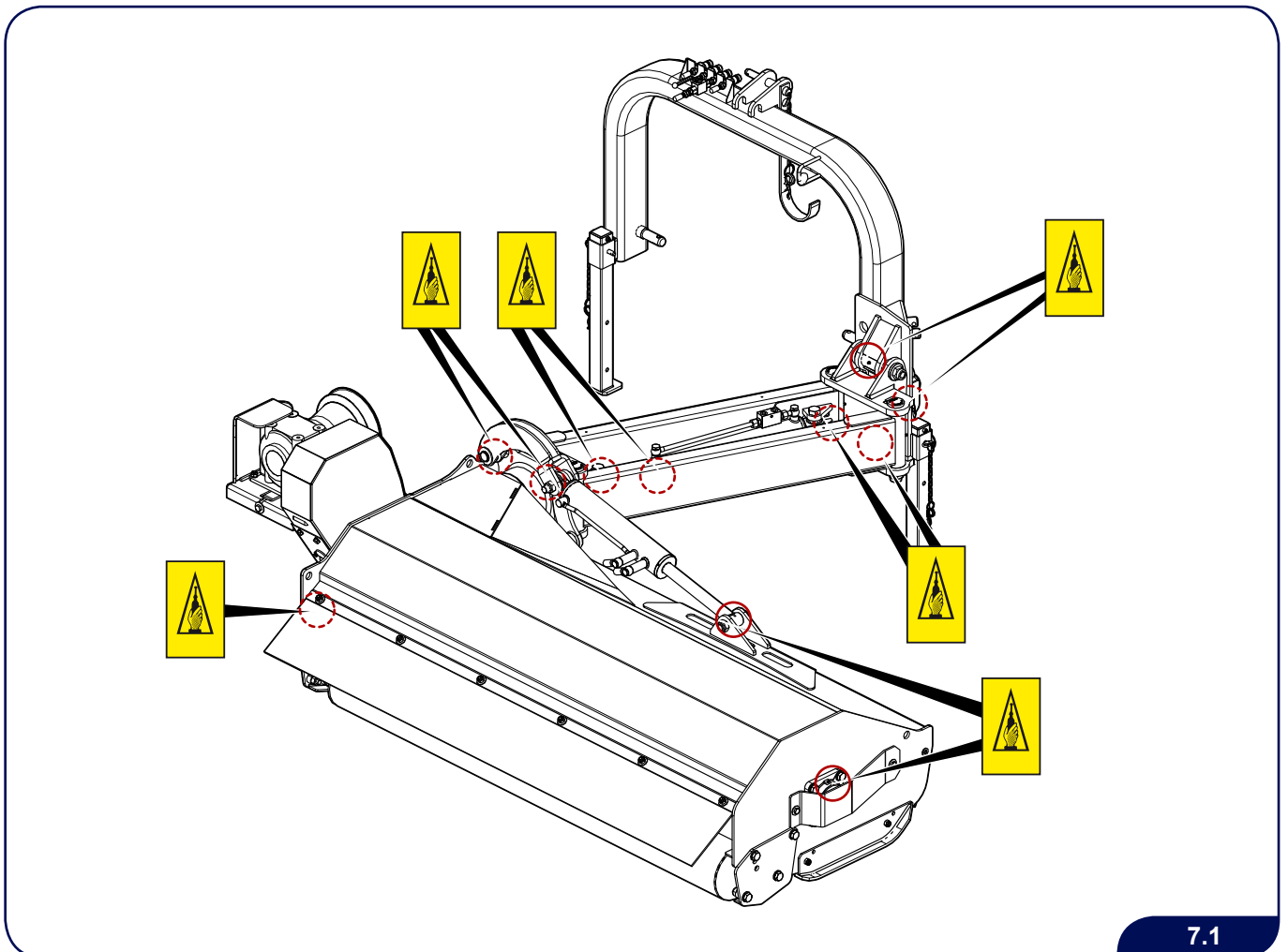
07-Tabella oli

7.4 Greasing

LUBRICANT	
TYPE	CLASSIFICATION
AGIP GR MU EP/2	SAE90

- ▶ Use a hand-held grease gun for all greasing.
- ▶ Wipe the grease nozzle with a clean dry cloth, to avoid injecting dirt and grit.
- ▶ Under particularly taxing work conditions, perform lubrication operations more frequently than the every 8 hours usually adopted.
- ▶ Replace or repair damaged or broken nozzles immediately.
- ▶ If the nozzles will not take grease, remove and clean them thoroughly. Also clean the lubricant passageway. Replace the nozzle if necessary.
- ▶ In the event of long inactivity, repeat these operations before using the machine again.

07-Ingrassaggio



7.1



INCREASE THE FREQUENCY OF MACHINE MAINTENANCE IF IT IS BEING USED IN PARTICULARLY TAXING WORK CONDITIONS.

7.5 *State of the belts*



Check for correct belt tension every 50 hours.
Replace the belts every 500 hours.

New belts

If the belts are new, make the first check after 4 hours of work to check how they are settling and the degree of tension.

Used belts

If the belts are settled or have been used for more than 24 hours, check the state of wear and, if necessary, restore the correct tension value (see Chapter 5).

7.6 Fastening the hydraulic hose couplings

Check that the hydraulic hose couplings have been correctly fastened (**TAB 2**).

TAB 2		
Screw thread type	Tightening torque MIN. N.m	Tightening torque MAX. N.m
1/8	12	14
1/4	14	16
3/8	25	28
1/2	45	60
5/8	55	70
3/4	90	110
1"	120	140
1" 1/4	170	190
1" 1/2	200	245



CAUTION

Tightening torque table for the cylindrical screw thread GAS UNI ISO 228 1 83 - BSPP

07-Serraggio viti

TAB 3	
Screw thread type	Tightening torque N.m
M12 x 1.5	20
M14 x 1.5	38
M16 x 1.5	45
M18 x 1.5	51
M20 x 1.5	58
M22 x 1.5	74
M24 x 1.5	74
M26 x 1.5	105
M30 x 2	135
M36 x 2	166
M45 x 2	290
M52 x 2	330



CAUTION





Tightening torque table for metric thread screws UNI 5541 - 65 UNI 5542 - 65

7.7 Bolt tightening

Check that the bolts are correctly tightened (TAB 3).

TAB 3															
STANDARD DIN 267		new ▶		4.8		5.8		6.8		8.8		10.9		12.9	
 mm	 mm	Pitch		Pitch		Pitch		Pitch		Pitch		Pitch		Pitch	
		● mm	○ mm	● Nm	○ Nm	● Nm	○ Nm	● Nm	○ Nm	● Nm	○ Nm	● Nm	○ Nm	● Nm	○ Nm
M2	4	0,4	-	0,2	-	0,2	-	0,2	-	0,3	-	0,4	-	0,5	-
				0,2	-	0,2	-	0,3	-	0,4	-	0,5	-	0,6	-
M2.5	5	0,45	-	0,3	-	0,4	-	0,5	-	0,6	-	0,9	-	1,1	-
				0,4	-	0,5	-	0,6	-	0,8	-	1,1	-	1,3	-
M3	5,5	0,5	-	0,5	-	0,7	-	0,8	-	1,1	-	1,5	-	1,8	-
				0,6	-	0,8	-	1,0	-	1,3	-	1,9	-	2,3	-
M3.5	6	0,6	-	0,8	-	1,1	-	1,3	-	1,7	-	2,4	-	2,8	-
				1,0	-	1,3	-	1,5	-	2,1	-	2,9	-	3,5	-
M4	7	0,7	-	1,3	-	1,6	-	1,9	-	2,5	-	3,5	-	4,2	-
				1,5	-	1,9	-	2,3	-	3,1	-	4,3	-	5,2	-
M5	8	0,8	-	2,5	-	3,1	-	3,7	-	4,9	-	6,9	-	8,3	-
				3,0	-	3,8	-	4,5	-	6,0	-	8,5	-	10	-
M6	10	1,0	-	4,2	-	5,3	-	6,4	-	8,5	-	12	-	14	-
				5,2	-	6,5	-	7,8	-	10	-	15	-	18	-
M7	11	1,0	-	7,0	-	8,7	-	10	-	14	-	20	-	24	-
				8,6	-	11	-	13	-	17	-	24	-	29	-
M8	13	1,25	1,0	10	11	13	14	15	16	20	22	29	31	34	37
				13	14	16	17	19	20	25	27	35	38	42	46
M10	17	1,5	1,25	20	21	25	26	30	32	40	42	57	59	68	71
				25	26	31	33	37	39	50	53	70	74	84	89
M12	19	1,75	1,5	34	36	43	45	52	54	69	72	97	101	116	121
				42	45	53	56	64	67	85	89	119	125	143	150
M14	22	2,0	1,5	55	59	68	74	82	89	110	118	154	166	185	199
				68	74	84	92	101	111	135	148	190	208	228	250
M16	24	2,0	1,5	85	90	106	112	128	135	128	180	240	253	287	303
				106	113	132	141	159	170	212	226	298	318	357	382
M18	27	2,5	2,0	118	124	147	155	176	186	235	248	330	349	397	419
				145	155	182	194	218	233	290	310	402	436	490	523
M20	30	2,5	2,0	166	174	208	217	249	261	332	347	467	489	561	586
				206	218	258	273	310	327	413	436	580	614	697	736
M22	34	2,5	2,0	227	237	284	296	341	355	454	474	639	666	767	799
				284	299	355	373	426	448	568	597	798	840	958	1.008
M24	36	3,0	2,0	287	309	359	386	431	463	574	617	808	868	969	1.041
				357	390	446	488	535	586	714	781	1.004	1.098	1.204	1.317
M27	41	3,0	2,0	420	448	525	561	630	673	840	897	1.181	1.261	1.418	1.513
				525	570	656	712	788	855	1.050	1.139	1.477	1.602	1.772	1.923
M30	46	3,5	2,0	573	624	716	780	859	936	1.146	1.248	1.611	1.754	1.933	2.105
				714	795	893	994	1.072	1.193	1.429	1.590	2.009	2.236	2.411	2.648

07-Serraggio viti

SYMBOL	MEANING
	Screw
	Hex head
	Large
	Fine

The torque values reported in table 3 correspond to 80% of the yield stress limit. In each column two values are reported of which the first refers to a friction coefficient of 0.10 and the second to a coefficient of 0.14. For our applications it is advised to refer to the values corresponding to the coefficient of 0.14.

The couplings are to be considered orientative in that they can notably vary in measurement in relation to the type of joint (rigid, semi-rigid, elastic etc.), the material on which the screws are tightened, the length of the screws, the type of screwdriver employed for tightening (impulse, friction, continuous torque etc.), the condition of the edging finish etc.

If the joint is carried out with nuts or self locking rings, the torque value should be increased by approx. 15%

7.7 Before use or putting into service after a long period of inactivity

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

- ▶ Check that the machine is not damaged;
- ▶ Check that the mechanical parts are in good condition and free of rust;
- ▶ Check the level of liquid in the hydraulic system;
- ▶ Check the state of wear of the flails;
- ▶ Check that the light bar and the electric system work;
- ▶ Clean away any protective substances covering the moving parts;
- ▶ Thoroughly grease all the moving parts;
- ▶ Make sure that there are no leakages of oil from fittings or tubes;
- ▶ Check that all the guards are positioned correctly;
- ▶ Check that the system functions properly;
- ▶ Protect all the electrical connections with anti-oxidants.

7.8 Parking or storage

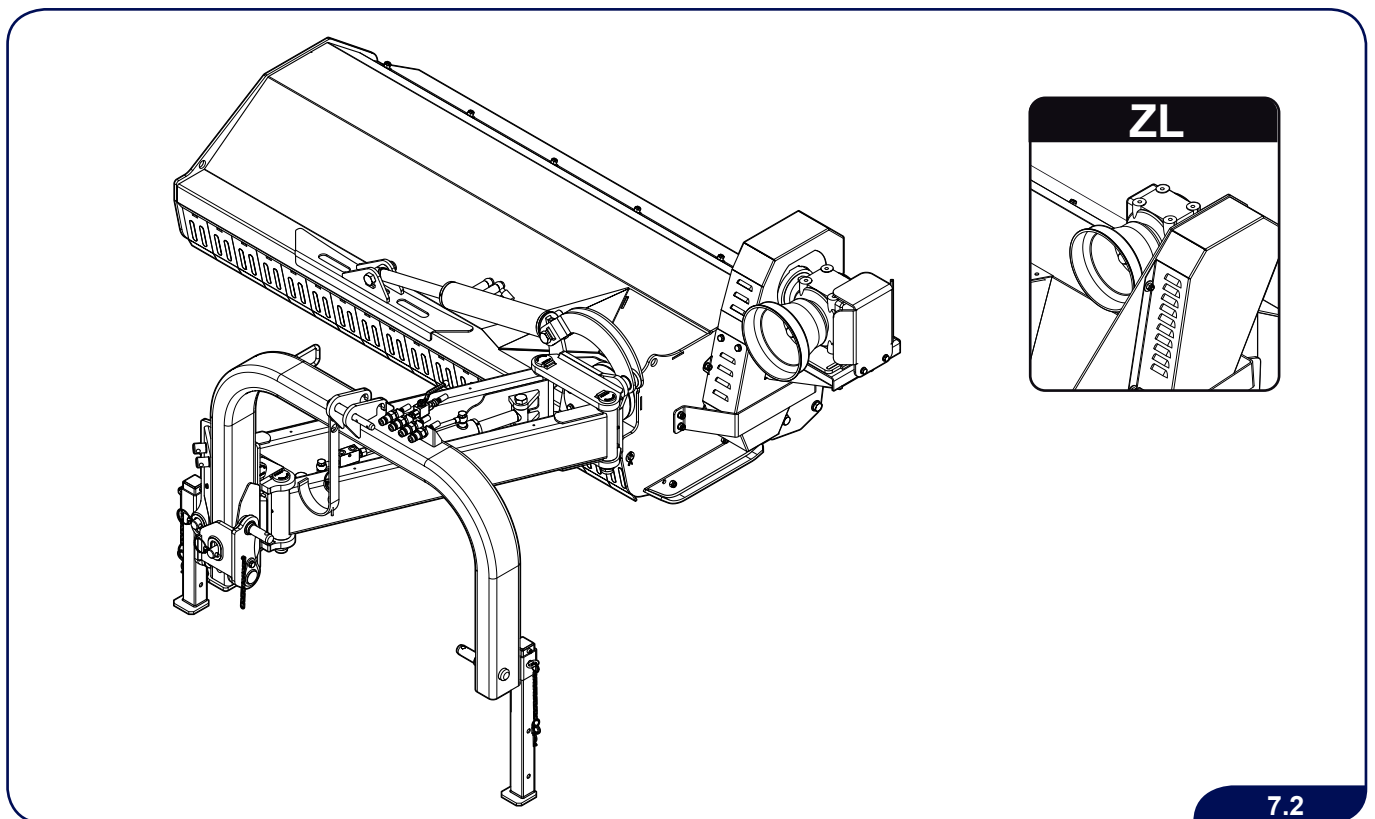
Whenever the machine will not be used for a long period of time, take the following measures to keep it in good condition and free of dust and rust.

- ▶ Detach the machine from the tractor (see Chapter 4).
- ▶ Thoroughly wash the machine in order to remove all debris, residues, dirt or mud.
- ▶ Make a general visual inspection of the machine to identify any structural damage and/or deep abrasions on the paintwork. Touch up all scratches and dents in the body with paint in order to prevent rust from forming. Replace and/or repair any damaged parts.
- ▶ Check the integrity and the state of wear of the flails and supports. If worn, replace them.
- ▶ Check the integrity of the accident-prevention guards of the machine. Replace and/or repair any damaged guards.
- ▶ Inspect all hydraulic hoses, couplers and fittings. Tighten any loose fittings. Replace any hose that is damaged, abraded or cut, or if the fitting crimping is damaged.
- ▶ Check that the original safety decals are intact, legible and in their correct positions. Immediately replace any damaged and/or illegible decals.
- ▶ If any lesions, abrasions or damage are found, make the necessary repairs.
- ▶ Grease all the mechanical parts, the tightening pins, and the coupling head to the PTO shaft. Make sure that all grease cavities have been filled with grease in order to remove any residual water from washing the machine. This operation protects the seal of the bearings.
- ▶ Store the machine in an area sheltered from atmospheric agents and far from all possible human activities.
- ▶ Store the machine in a flat, dry area.
- ▶ Support the frame with the corresponding supports in order to increase the stability of the machine.
- ▶ Cover the machine with a tarpaulin, tying it suitably.



Never dispose of used oil into the environment. Oil is classified as special waste and must be brought to the appropriate collection centres according to the regulations in force. Contact the nearest Collection centre for used oil.

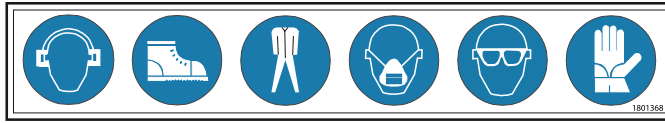
07-Messa in parcheggio o deposito (THFLC)



7.2

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8 EXTRAORDINARY MAINTENANCE



Always wear safety footwear, overalls, safety gloves and, if necessary, earmuffs and a dust mask during use and during machine maintenance, repair, handling and storage operations.



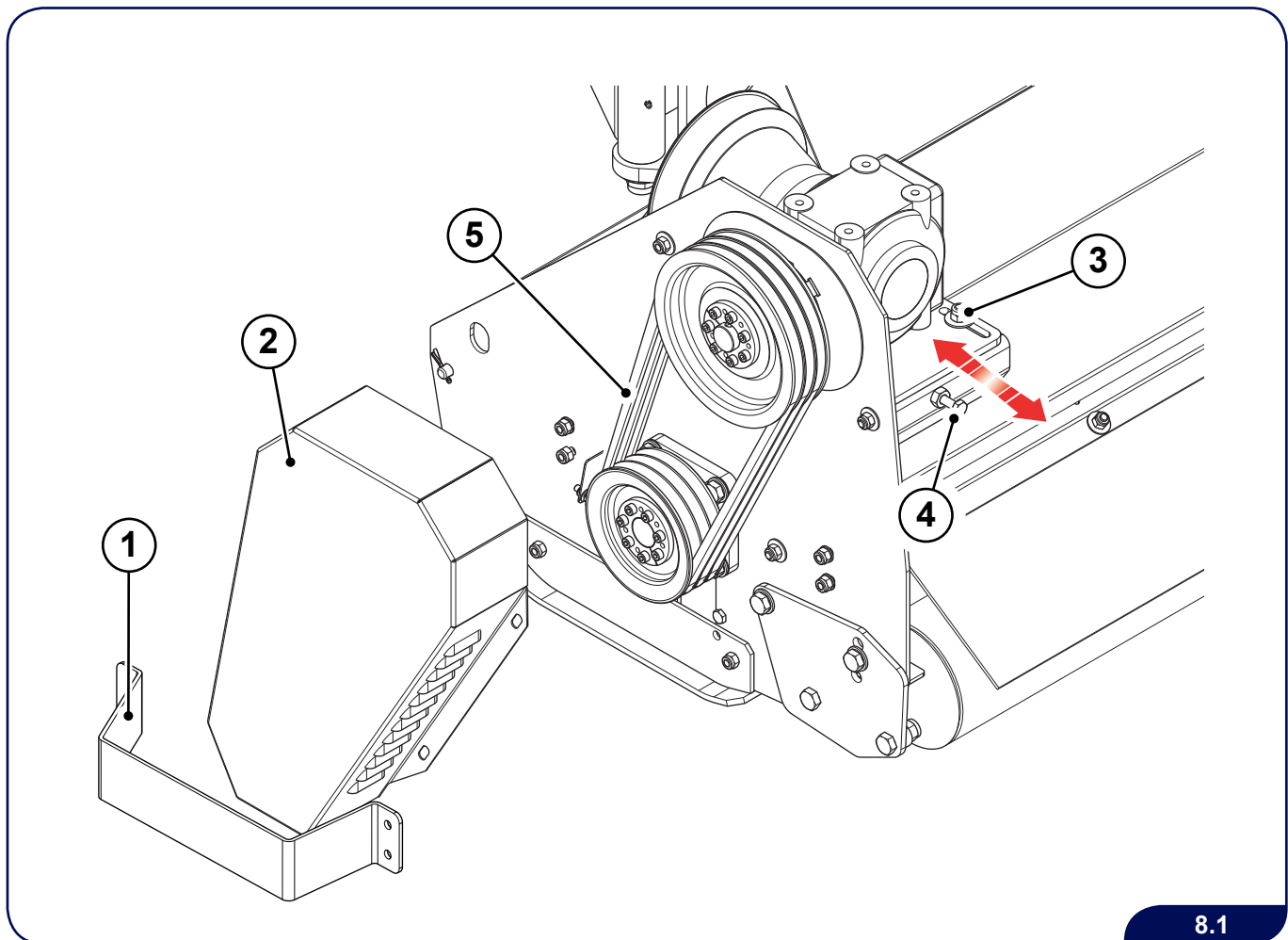
Before carrying out any type of maintenance:

- 1) Wait until all moving parts come to a complete stop;
- 2) Lower the machine to ground level;
- 3) Disconnect the power takeoff;
- 4) Switch off the engine of the tractor (or self-propelled machine);
- 5) Apply the parking brake;
- 6) Take out the ignition key;
- 7) Get off the tractor to check the extent of the problem;
- 8) Wait for the oil and the hot surfaces to cool down;
- 9) Proceed with any interventions required on the machine.

8.1 Belt replacement

For ZL:

- 1) Remove the protection (1);
- 2) Remove the protective casing (2) from the belts;
- 3) Loosen the 3 nuts (3) that block the plate;
- 4) Loosen the stabiliser (4);
- 5) The pulley can be moved to consequently reduce belt tension;
- 6) Remove the belts (5) from the respective pulley wheels and replace them with new ones;
- 7) After replacing the belts (5), adjust as indicated in Chapter 5;
- 8) Reassemble all protections following the inverse procedure.



08-Sostituzione delle cinghie (ZL)

8.1

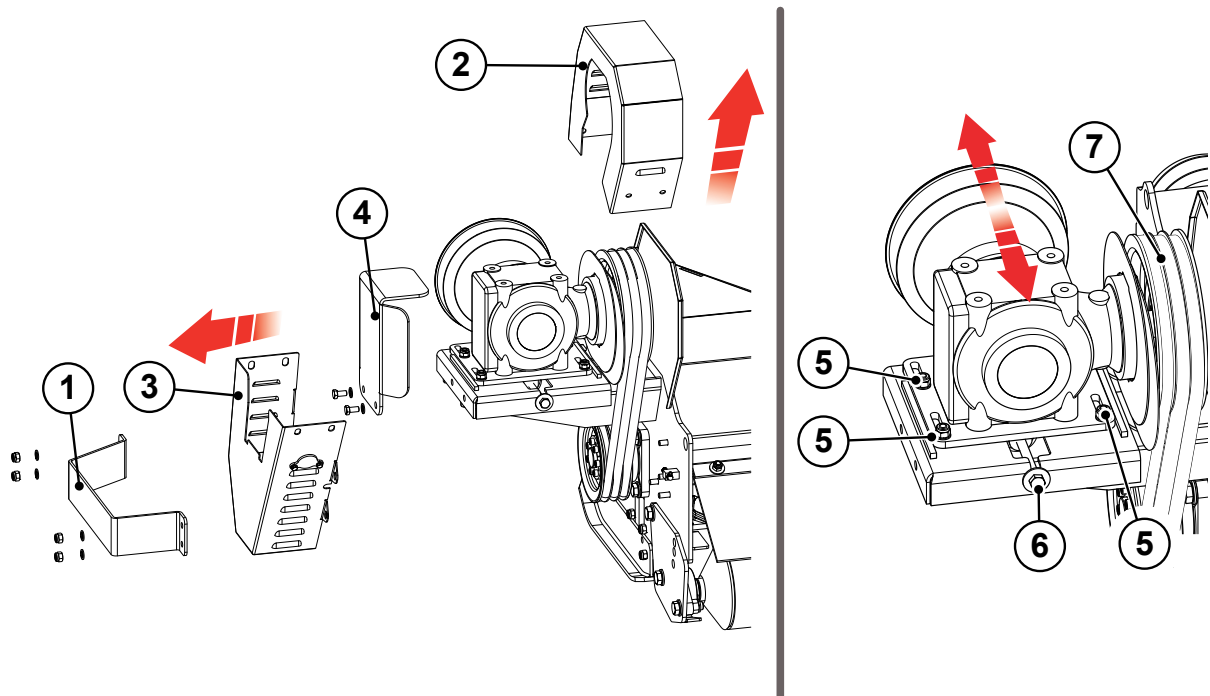


Replace all belts in the set even if only one belt is deteriorated.

For ZLE:

- 1) Remove the protection (1);
- 2) Remove the protective casings from the belts (2 - 3);
- 3) Remove the protection (4);
- 4) Loosen the 4 nuts (5) that block the gearbox;
- 5) Proceed on the stabiliser (6);
- 6) Move the pulley consequently reducing the belt tension;
- 7) Remove the belts (7) from the respective pulley wheels and replace them with new ones;
- 8) After replacing the belts (7), adjust as indicated in Chapter 5;
- 9) Reassemble all protections following the inverse procedure.

08-Sostituzione delle cinghie (ZL)



8.2



Replace all belts in the set even if only one belt is deteriorated.

8.2 Pulley replacement

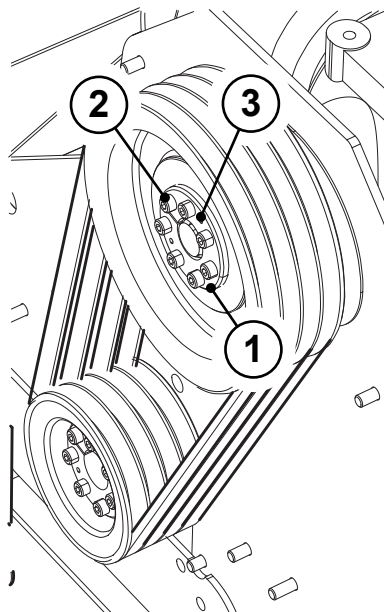
The pulleys are fixed to their relative shafts using a taper bush (1).

To disassemble the pulley proceed as follows:

- 1) Loosen the screws (2) with the appropriate wrench;
- 2) Remove the screws (2) and insert them in the threaded holes (3) tightening uniformly;
- 3) After a few turns of the screws the pulley should be extracted easily from the shaft.

To assemble the pulleys proceed as follows:

- 1) Insert the taper bush (1) in the pulley holes;
- 2) Couple the entire unit to the shaft, ensuring the pulley is in the correct position;
- 3) Tighten the screws uniformly (2) with the appropriate torque wrench $M=40Nm$.



8.3

08-Sostituzione delle pulegge



Carry out a visual check of all the belts before fitting them.
In the event that deterioration is noted even if only on one belt, change the whole set.

8.3 Pipe replacement


WARNING

Any intervention or maintenance on the hydraulic system has to be carried out by specifically instructed personnel.

- ▶ Before working on the hydraulic system, release all residual pressure, working with the engine off and using all the control levers.
- ▶ Pay particular attention to cleanliness: dust, chips or other material can cause an irreparable damage to the hydraulic components.
- ▶ Replace any damaged pipes with original spare parts. When fastening be careful not to twist them and bear in mind their complete range of movement.
- ▶ Do not spill any oil when replacing pipes. Collect the oil in containers and deliver it to the special oil collection centres.


WARNING

Check the state of wear of the hydraulic pipes every day. Replace them in the case of abrasions or cracks.


WARNING

Change the hydraulic pipes at least every 6 years.


CAUTION

Remember to open the oil suction cocks after replacing the hydraulic pipes. The pump only needs to rotate “dry” for a few seconds to be irretrievably ruined.


CAUTION

Periodically check the state of the filters and the level of hydraulic oil in the tank in order to avoid contamination, overheating or other damage to the hydraulic system.

8.4 *Pin replacement*

Carry out this operation by means of a lifting device or hoist, to avoid parts that are not fixed from falling or causing a loss of balance.

When replacing parts, clean and grease their housing.

8.5 Rotor

The rotor shaft has already been electronically balanced: If a flail has to be replaced, change the whole set. Fitting non-original flails causes vibrations or the breakage of the rolling bearings.



To replace damaged parts or flails, contact the specialised personnel of the FERRI Assistance Service or authorised dealers.



If irregularities or strange noises are noticed after changing the flails, contact FERRI immediately.

8.6 Guards



Always check the general condition (integrity, fixing, etc.) of the guards.
Guards which are deformed, damaged or not fixed correctly, do not guarantee the working safety for which they have been designed.
IF THE INSTRUCTIONS ARE NOT OBSERVED, THE USER WILL BE CONSIDERED LIABLE FOR ANY AND ALL CIVIL AND/OR CRIMINAL DAMAGE THAT MAY BE CAUSED.

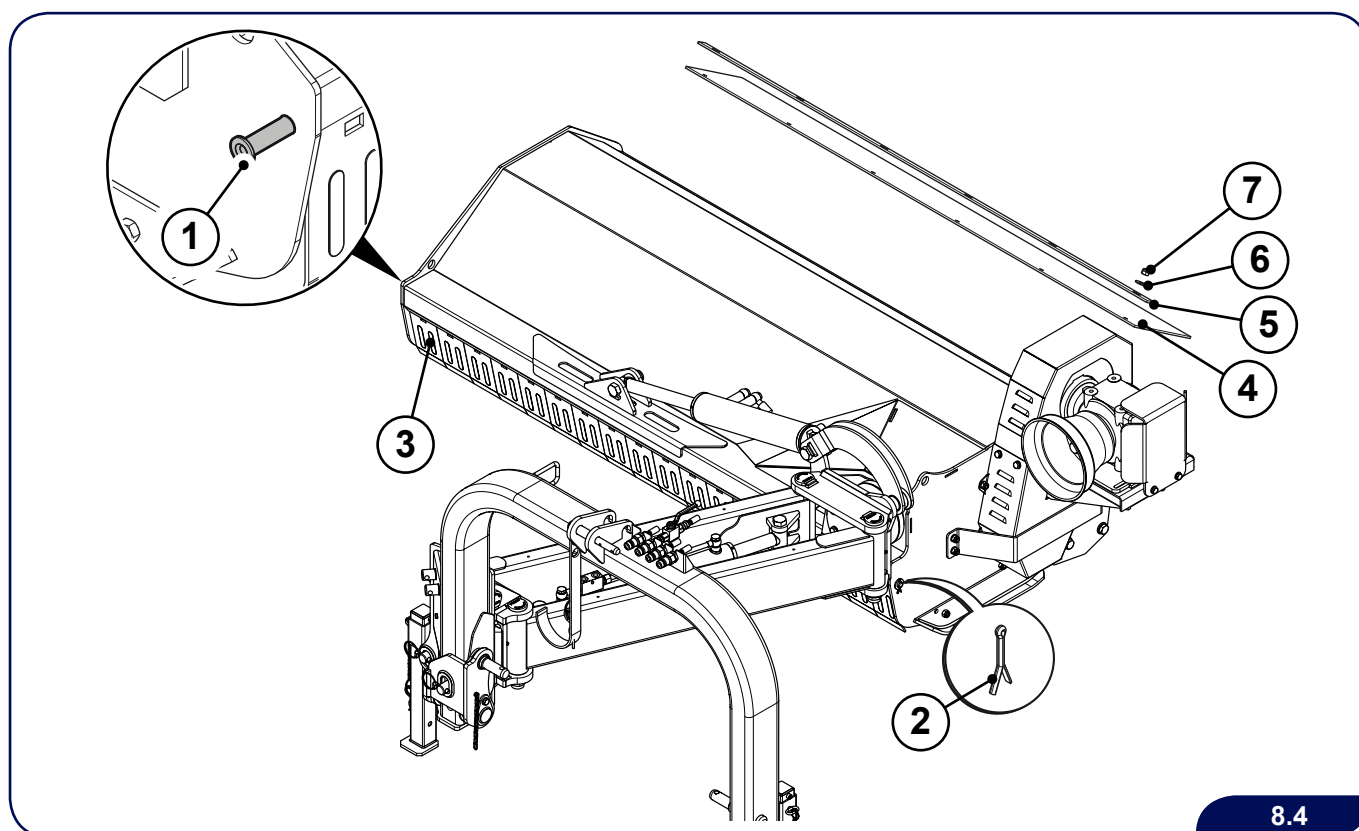
8.6.1 Flaps

At the end of every working day, check the perfect working order of the flaps ensuring that they are intact and able to oscillate.

Clean the machine in the areas covered in mud or dirt, to ensure the mobility of the flaps (spray with a lubricant if necessary).

To replace damaged flaps, proceed as follows:

- 1) Remove the split pin (2) and extract the fixing rod (1);
- 2) Replace the damaged flaps (3);
- 3) Reassemble the fixing rod (1);
- 4) Unscrew the nuts (7) and the washers (6);
- 5) Extract the fixing rod (5);
- 6) Replace any guards (4) that are damaged;
- 7) Reposition the fixing rod (5);
- 8) Tighten the nuts (7) and the washers (6);



8.4



Use exclusively original spare parts.

8.7 Flail replacement

If the flails are excessively worn, replace them. In the event of partial breakage of the flail, replace both it and the diametrically opposite one in order to maintain equilibrium.

To change the flails, lift the machine and work below it.

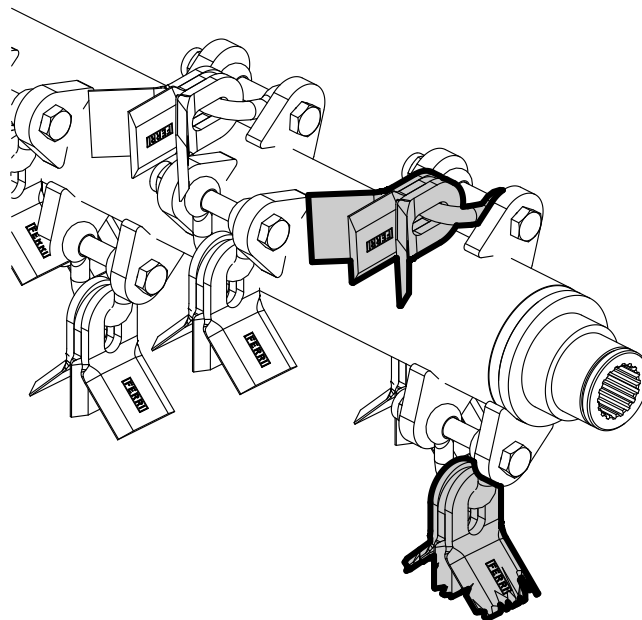
Raise the head by means of the tractor lift and support it in order to guard against any unintentional lowering of the lift.



Do not rely on the holding power of the hydraulic lift: insert trestles or mechanical struts between the machine and the ground, to avoid the accidental descent of the head.

Make sure that the PTO is disengaged, apply the parking brake, switch off the engine and remove the key from the dashboard.

08-Sostituzione degli utensili



8.5



When replacing the flails, DO NOT REMOVE THE BALANCING WEIGHTS from their original position.



If irregularities or strange noises are noticed after changing the flails, contact FERRI immediately.



Replace bent or broken flails with new flails. For safety reasons, never attempt to straighten the flails or to perform welding on them because this can reduce their strength.



Use exclusively original FERRI spare parts.

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9 TROUBLE SHOOTING CHART



Always wear safety footwear, overalls, safety gloves and, if necessary, earmuffs and a dust mask during use and during machine maintenance, repair, handling and storage operations.

9.1 Trouble shooting chart

The maintenance operations authorised by FERRI srl are the ones indicated in Chapter 7 – “ROUTINE MAINTENANCE”.

The content of this chapter is not exhaustive. Instead, it aims to provide information on the most common problems in order to help specialised technicians to find the fault in question.

The suggestions provided under “REMEDIES” in the following tables **DO NOT AUTHORISE** interventions that may compromise safety.



WARNING

To replace damaged the parts or flails, contact the specialised personnel of the FERRI Assistance Service or authorised dealers.

9.1.1 General

The following information regards common problems that occur in all the machines (flail heads, shredders, flail hedge mowers, etc) and problems typical of specific types of machine.

PROBLEMS	PROBABLE CAUSE	REMEDIES
Irregular cut	Worn, bent or broken flails	Replace
	The machine is not positioned parallel to the ground	Adjust the stabilizers connected to the tractor or the flail head rotation hydraulic ram
	Difficulty in unloading chopped material caused by excessive advance speed	Reduce advanced speed
	The rotor turns at insufficient rpm	Check the rpm on the tractor PTO and adjust it to the number of rpm required by the machine (see the machine technical data)
	Damaged motor and/or pump	Repair or replace the motor or the pump
	Slipping of the belts on the pulleys	Correct the belt tension

PROBLEMS	PROBABLE CAUSE	REMEDIES
Incorrect cutting height	Incorrect roller position	Adjust the roller in order to reduce or increase cutting height
Excessive machine operating noise	Loose bolts	Check and correct the tightening of screws and nuts if necessary
	Machine with cracks or initial signs of breakage	Have the frames repaired at authorised Ferri workshops. Check to see if there are any moving parts unbalanced and correct the defect
	Worn bearings	Replace
Gearbox noise	Lack of oil	Fill to level
	Worn or damaged gears	Repair or replace
	Worn or damaged bearings	Repair or replace
Premature flail wear	Flails touch the ground or work on rocky soil	Adjust height of cut
Breakage of roller bearings	Violent impact on the ground when the machine is lowered	Lower it gently
	Dirty or little greased bearings	Clean and/or grease
Flail-holder shaft speed decreases	The hydraulic circuit loses pressure	Check the efficiency of the pump and the hydraulic motor. Check the hydraulic system pressure settings. These checks must be performed at specialised workshops

PROBLEMS	PROBABLE CAUSE	REMEDIES
Vibrations	Broken, worn or missing flails	Replace the flails
	Unbalanced flail holder shaft	Check rotor balancing and have repairs or replacements made in authorised Ferri workshops
	Worn flail holder shaft bearings	Have it replaced in specialised workshops
	Moving parts unbalanced	Identify the part responsible for the problem (unbalanced rotor, defective bearing, broken or missing flail, etc.) and have it repaired or replaced at authorised Ferri workshops
	Couplings at the two ends of the PTO shaft out of parallel alignment	Check the coupling of the machine to the tractor and check the adjustments
	Flails blocked	Stop the machine and free them
	Plant waste or foreign objects wrapped around the rotor shaft and/or the cutting flails or encrustation visible on the cutting tools or supports	Remove waste/foreign objects or replace cutting tools (in this case, always replace opposing pairs). Clean the rotor and the cutting flails
	Loose bolts	Check and correct the tightening of screws and nuts if necessary
	Rotor flanges not perfectly adherent to the walls of the machine. Deformed machine side panels	Check the conditions of the machine side panels and repair if necessary. Check the correct assembly of the flanges and the tightening of the screws

PROBLEMS	PROBABLE CAUSE	REMEDIES
Hydraulic oil overheating (over 80°C)	Excessive material to chop	Reduce advance speed
	Hydraulic system requires checking	Get an authorised FERRI workshop to check the state of the filter, the hydraulic pipes, the setting of the valves etc.
	Malfunctioning heat exchanger	Check the electric system for the heat exchanger and thermostat
	Excessive rotor rpm	Check the tractor PTO rpm and reduce it as prescribed for the machine in use
Excessive backlash in the arms and joints	Worn pins or bushes	Replace
Flail-holder rotor speed is lower than expected	Loose belts	Restore right belt tightness
The flail head shifts backward during working	Incorrect max. pressure valve setting	Have valve pressure setting checked at authorised Ferri workshops
	Leakage of oil from hydraulic ram	Check the hydraulic ram oil seals and sealing in general and have repairs or replacements made at authorised Ferri workshops
	Advance speed excessive for the type of working being performed	Reduce advanced speed
Arm lower involuntarily	Excessive oil leakage from the hydraulic ram; oil seals worn-out inside the hydraulic ram	Check the hydraulic ram oil seals and sealing in general and have repairs or replacements made at authorised Ferri workshops
Excessive stiffness of the arm during work	Incorrect max. pressure valve setting	Have valve pressure setting checked at authorised Ferri workshops
Belts overheating	Belt slipping. Excessive belt tension	Check the pre-tension of the belts
	Working speed not suitable to the quantity of material to chop	Reduce work speed
	Flails touching the ground	Adjust height of cut

PROBLEMS	PROBABLE CAUSE	REMEDIES
Leakage of oil from motor	Motor gasket damaged	Replace motor gasket
		Check the condition of the discharge filter and replace if necessary
	Oil leakage onto the motor	Check the condition of the joints, seals, and hoses (especially for drainage). Replace if clogged or damaged
Pump makes excessive noise	Pump worn-out or damaged	Repair or replace the pump at authorised Ferri workshops. Check the condition of the discharge filter and replace if necessary
	Wrong oil in the hydraulic system	Check the condition of the oil in the tank and change if necessary
Pump makes excessive noise	Pump worn-out or damaged	Repair or replace the pump at authorised Ferri workshops. Check the condition of the discharge filter and replace if necessary
	Wrong oil in the hydraulic system	Check the condition of the oil in the tank and change if necessary
Difficulty in sliding out the PTO shaft	PTO shaft not lubricated	Lubricate the PTO shaft
	Bent PTO	Replace the PTO
Excessive play in the arm pins	Worn pins	Replace the pins
	Worn bushings	Replace bushings
Excessive noise from the arm hinges	Insufficient lubrication for clogging in the lubrication duct	Check the condition of the grease gun, clean and replace if damaged. Check clogging in the lubrication duct

PROBLEMS	PROBABLE CAUSE	REMEDIES
Irregular arm operation	Manoeuvre speed not suitable	Adjust the number of tractor PTO rpm
		Adjust the manoeuvre speed of the function involved by means of adjustable choke (if present). Otherwise, contact an authorised workshop
	Air present inside hydraulic circuit	Bleed the air from inside the circuit
Flail head rotor fails to start	Limited hydraulic flow	Check motor operation. Repair or replace motor
		Make sure that the hydraulic hoses are not clogged or damaged. Repair or replace the hydraulic hoses
		Make sure that the discharge filter or delivery filter (if present) is not clogged. If it is clogged, replace it
	Check the rotor distributor flexible hose control cable. Adjust the cable	
	Mechanical transmission missing	Check bevel gear pair box operation. Repair or replace
Leakage of oil from the pump	Oil excited from the pump	Check the condition of the joints, seals, and hoses (especially for drainage). Replace if clogged or damaged
Belts break too soon	Belt tension too high	Check the pre-tension of the belts
	Pulleys out of alignment	Align the belts
	Flails touch the ground	Adjust height of cut
	Tractor has more power than can be withstood by the machine	Connect the machine to a tractor with adequate power
Belts slip on pulleys	Insufficient belt tension	Check the pre-tension of the belts

10 SCRAPPING AND DISPOSAL

If the machine is to be scrapped, it must be disposed of in suitable waste disposal sites in accordance with the regulations in force.

In the case of demolition of the machine, all parts that could constitute a hazard must be made safe.

Recover any old oil and dispose of it in special oil disposal centres.

Before scrapping the machine, separate plastic or rubber parts, electric and electronic material.

The materials that make up the machine, and which must be disposed of in a differentiated manner, are:

- ▶ Steel
- ▶ Mineral oil
- ▶ Rubber
- ▶ Plastic
- ▶ Electrical system wires

The parts consisting exclusively of plastic, aluminium and steel can be recycled at appropriated differentiated collection centres.



Never dispose of used oil into the environment. Oil is classified as special waste and must be brought to the appropriate collection centres according to the regulations in force.

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11 WARRANTY

At the moment of delivery, check that the machine and the disassembled accessories have not been damaged by transport or handling.

Any complaints must be sent in writing to FERRI within 8 (eight) days of the date of receiving the machine, enclosing a copy of the delivery documents countersigned by the person in charge of transport or handling.

The purchaser can exercise his rights under the warranty only if he has:

- ▶ Respected the clauses in the supply contract;
- ▶ Respected the general warranty conditions, indicated on the coupon "General Warranty Conditions", with all the parts filled in, and signed the DELIVERY CERTIFICATE.

For the replacement of machine parts, use only original spare parts supplied by the Manufacturer or by authorised dealers.

When ordering spare parts, specify the data listed on the machine identification plate, in particular:

- 1) Series
- 2) Year of manufacture
- 3) Serial number

FERRI ensures the spare parts for a minimum period of **10 years from the end of production of the series**.

11-GARANZIA

To fill out by the Distributor with user's details

Series <input type="text"/> Date <input type="text"/> Machine Model <input type="text"/> Serial N° <input type="text"/> Distributor Stamp <input type="text"/>	FERRI WARRANTY COUPON		Date <input type="text"/>	
	Surname <input type="text"/>		Name <input type="text"/>	
	Company Ragione Sociale <input type="text"/>		User Signature <input type="text"/>	
	Address <input type="text"/>			
	City or Town <input type="text"/>		State/Prov <input type="text"/>	Postal <input type="text"/>
	Telefono <input type="text"/>		Fax <input type="text"/>	
	Distributor stamp and signature <input type="text"/>		Serial N° <input type="text"/>	Series <input type="text"/>
			Machine Model <input type="text"/>	
	Taken note of the Use and Maintenance Book and of the use's rules (Safety Rules included)			
				User Signature (legible) <input type="text"/>

11.1

11.1 Voiding of the Warranty

THE GUARANTEE IS NO LONGER VALID WHEN:

- ▶ The fault is due to errors in manoeuvring;
- ▶ Routine maintenance has not been carried out;
- ▶ Routine maintenance has been performed in a way that is technically incorrect;
- ▶ Routine maintenance has been carried out by unqualified personnel;
- ▶ The power limit of the machine has been exceeded;
- ▶ **Spare parts are used that are not original and at any rate not supplied or authorised by FERRI;**
- ▶ The instructions contained in this manual have not been followed;

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12 OPTIONAL UNITS



Always wear safety footwear, overalls, safety gloves and, if necessary, earmuffs and a dust mask during use and during machine maintenance, repair, handling and storage operations.



Before carrying out any type of maintenance:

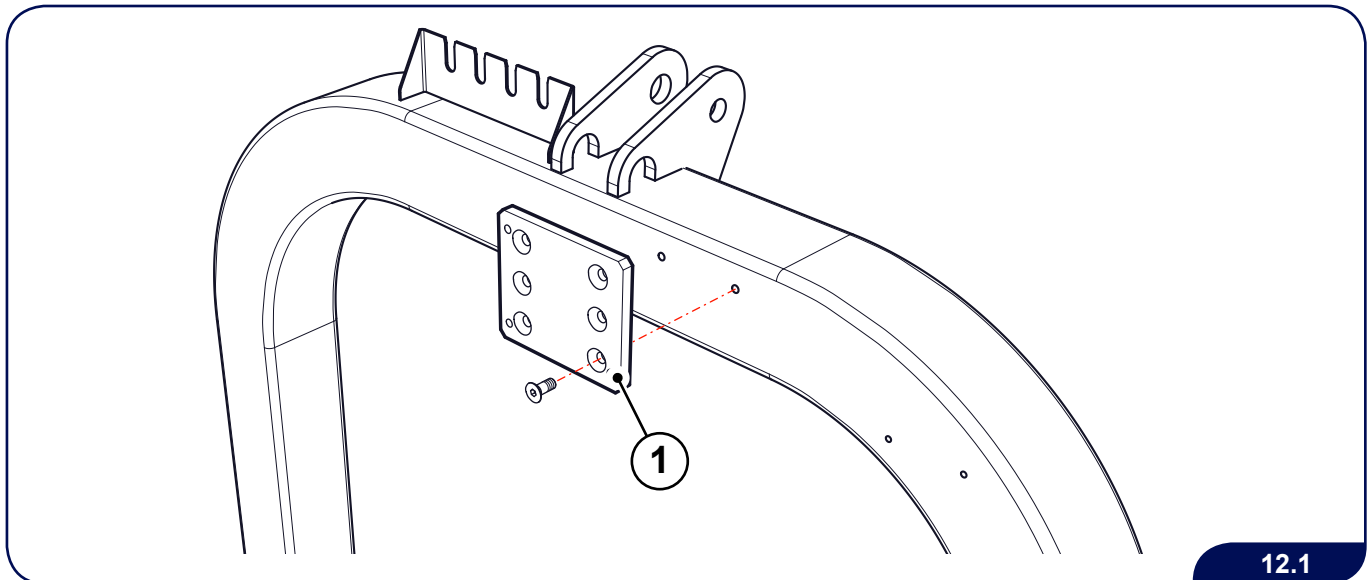
- 1) Wait until all moving parts come to a complete stop;
- 2) Lower the machine to ground level;
- 3) Disconnect the power takeoff;
- 4) Switch off the engine of the tractor (or self-propelled machine);
- 5) Apply the parking brake;
- 6) Take out the ignition key;
- 7) Get off the tractor to check the extent of the problem;
- 8) Wait for the oil and the hot surfaces to cool down;
- 9) Proceed with any interventions required on the machine.

12.1 Controls with distributor

For tractors equipped with only one oil pressure tap or on specific demand by the customer, it is also possible to fit a hydraulic ram control distributor provided with a float system to control the shredder's orientation.

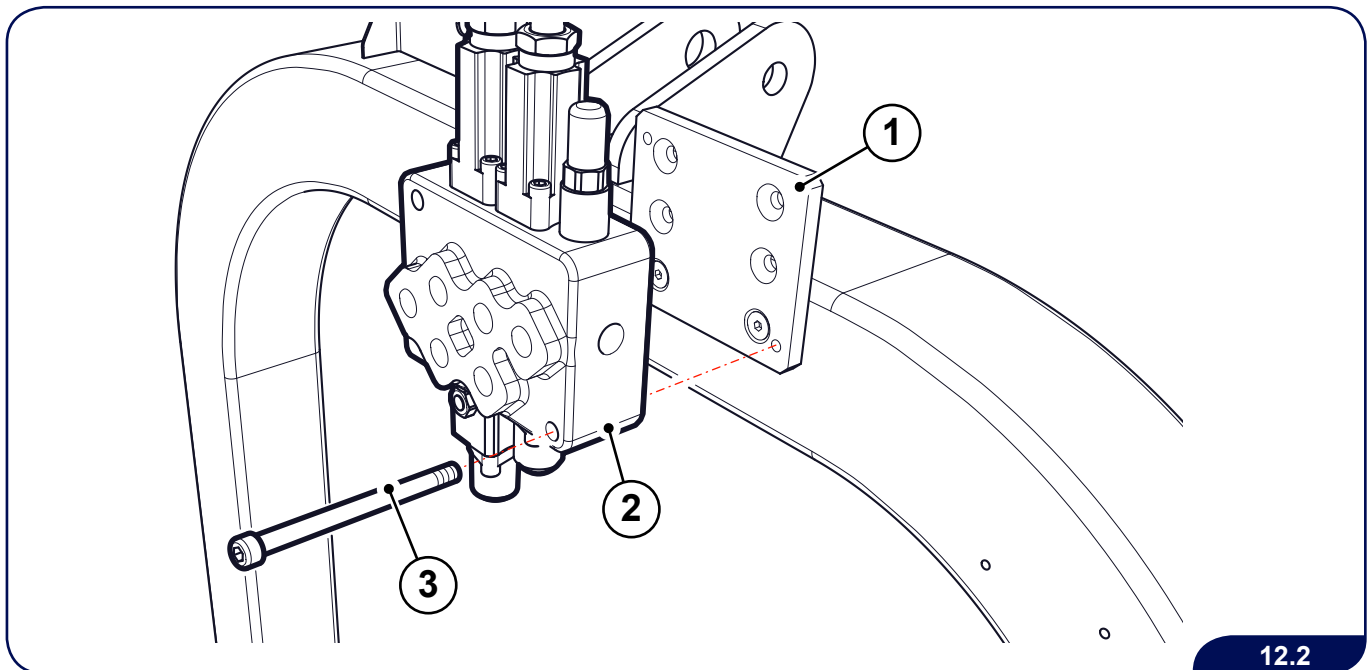
12.1.1 Assembly procedure

- 1) Screw or seal the plate (1) to the three-point coupling in the indicated position.



12.1

- 2) Fit the distributor (2) fixing it to the plate (1) with the relative fastening screws (3).



12.2

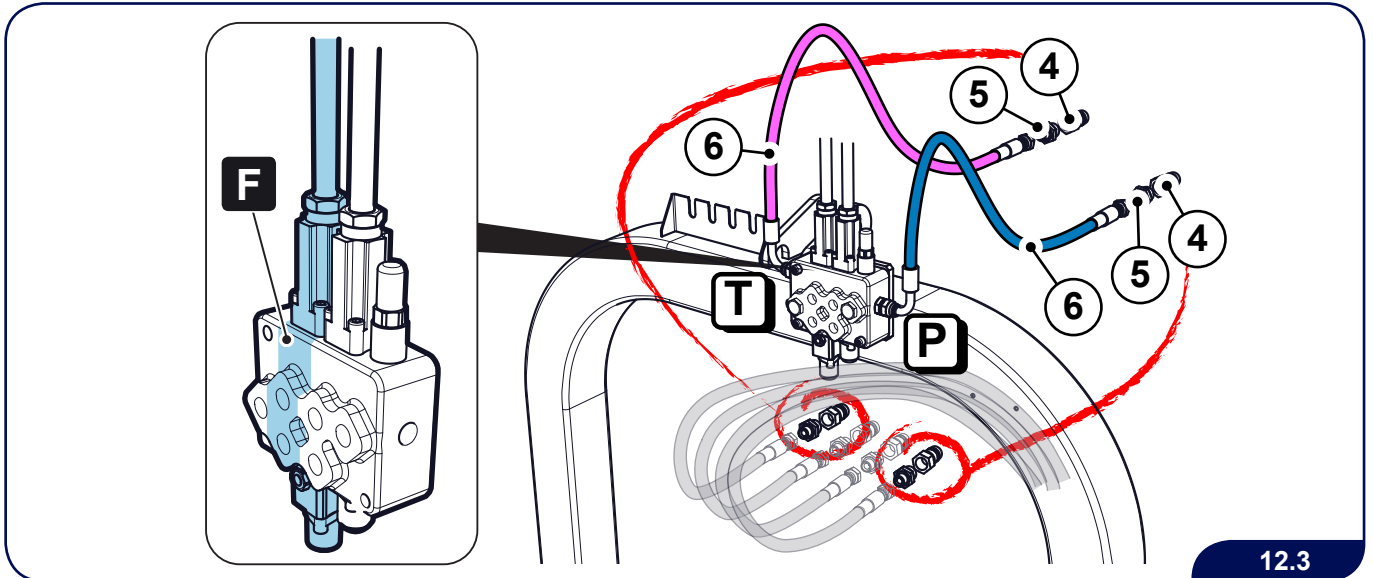
12-Comandi con distributore (ZMT-ZMTE)

- 3) Screw the reduction couplings (5) with the relative sealing washers. Disassembly the four quick hitches (4) from the hoses and install them on the supply hoses (6).

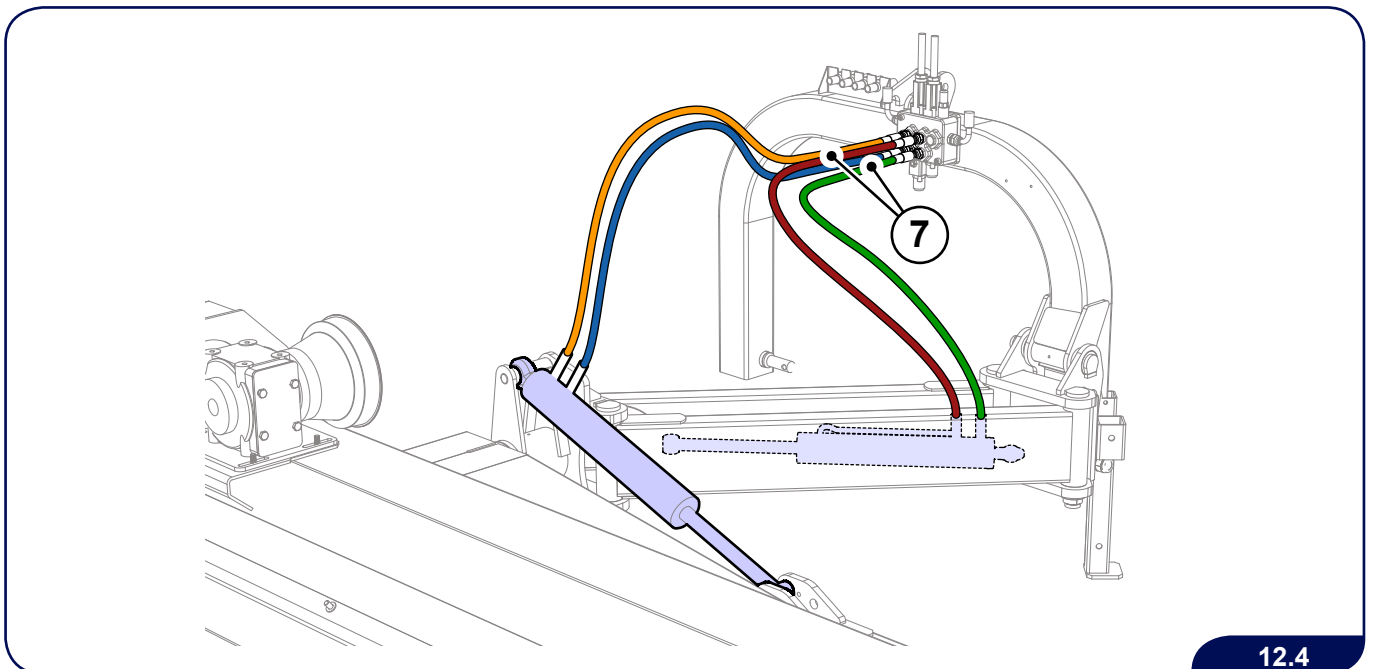


CAUTION

Replace properly the two unused quick hitches.



- 4) Screw the four reduction couplings to the distributor with the relative sealing washers. Connect the pipes (7) to the distributor as indicated in the figure.



CAUTION

The floating element (F) must be connected to the shredder orientation hydraulic ram (1) (see Chapter 6).

12-Comandi con distributore (ZMT-ZMTE)

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